SUSPENSION

Front Axle - Repair Instructions - X3 Utility

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.

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

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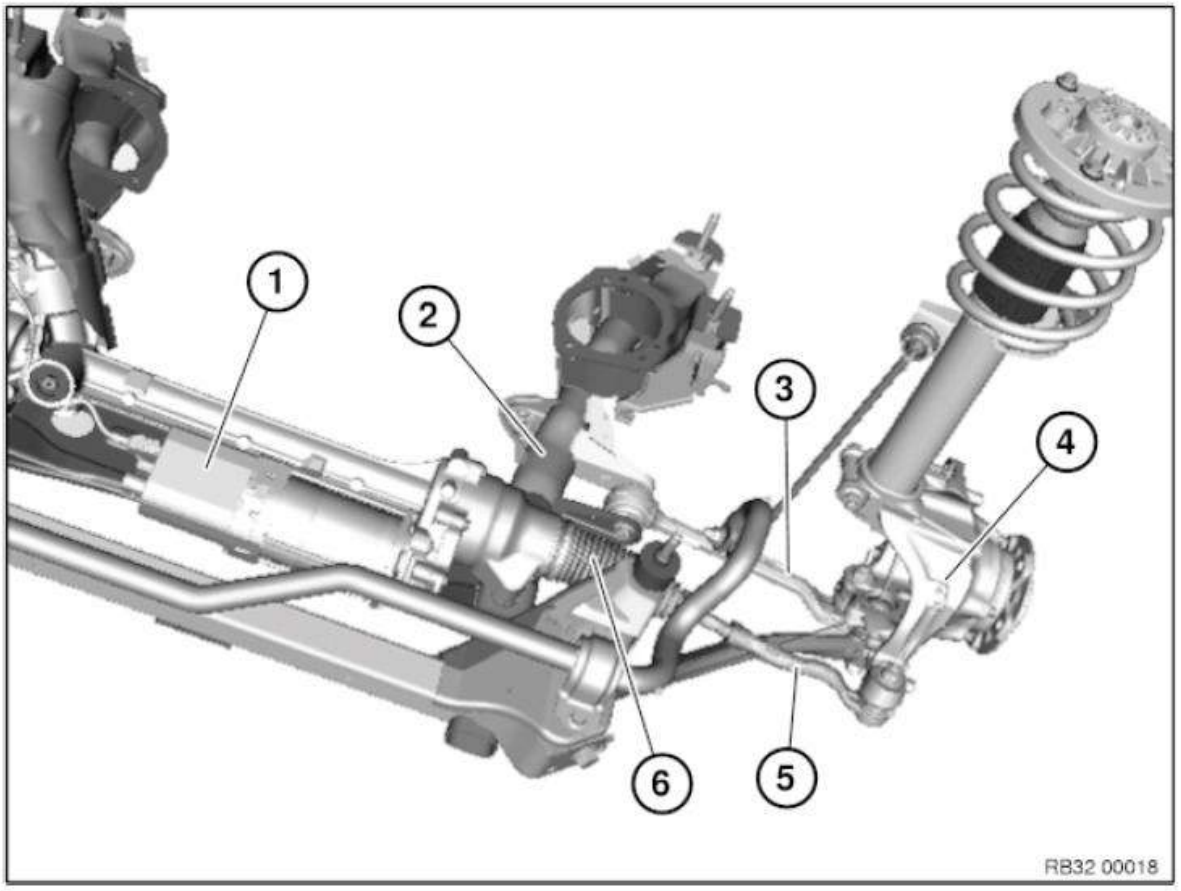


Fig. 1: Overview Of Front Axle Steering Wheel
Courtesy of BMW OF NORTH AMERICA, INC.

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

Release the following screw connections:

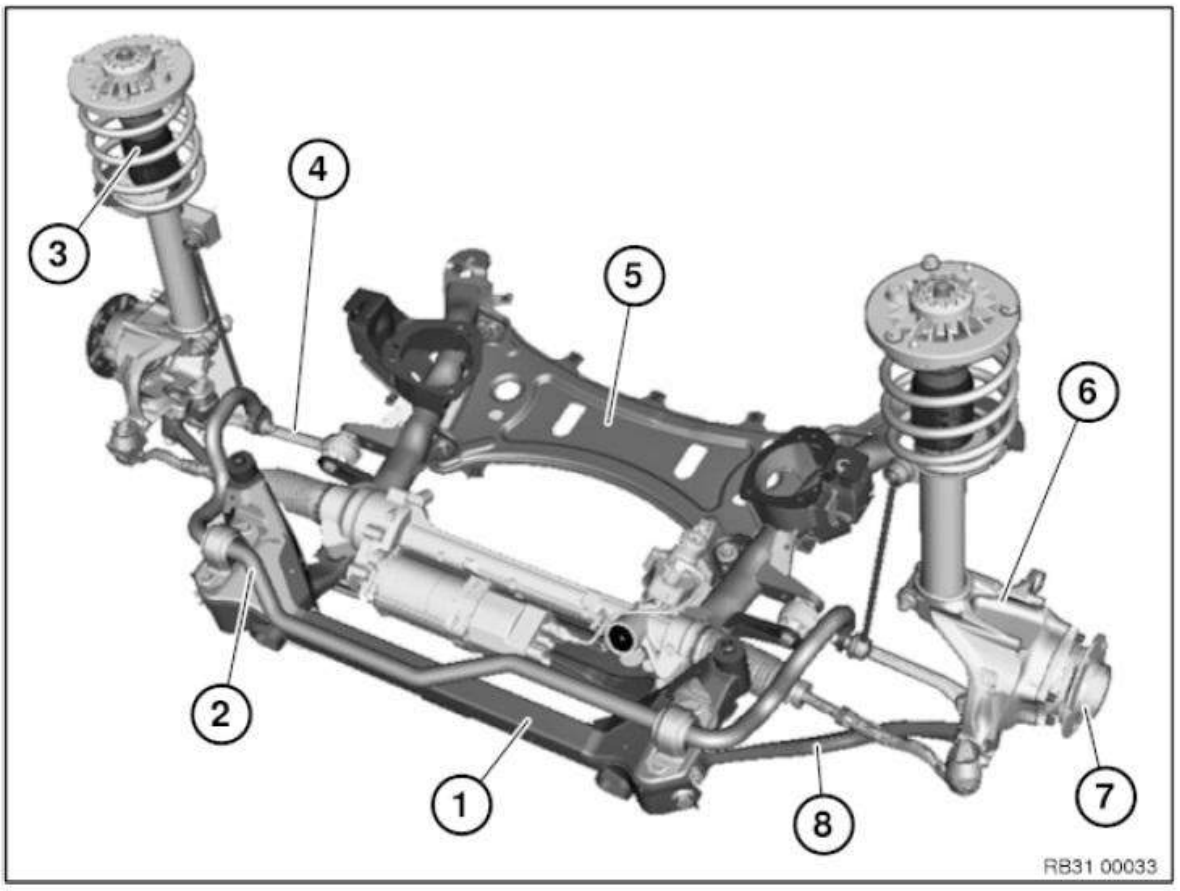
- Steering box to front axle support
- Lower wishbone to front axle support
- Track rod end to track rod

Replace the following components:

- Steering box (1)
- Front axle support (2)
- Wishbone, bottom (3)
- Swivel bearing (4)
- Track rod end (5)
- Track rod (6)

31 FRONT AXLE OVERVIEW

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1 Front axle support
2 Anti-roll bar / anti-roll bar link
3 Spring strut / support bearing / coil spring
4 Wishbone, ride height sensor
5 Reinforcement plate
6 Swivel bearing/guide joint
7 Wheel bearing
8 Trailing link

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

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

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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 00... INSTRUCTIONS (CHASSIS COMPONENTS MADE OF ALUMINIUM)

Due to the chemical and corrosion characteristics of aluminium, always comply with the following points when handling aluminium 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 chips! Cover components!
- Do not expose to temperatures > 80 Â°C, even for brief periods! Temperatures in paint facilities do not have the same impact

00..... LIFTING THE VEHICLE USING A VEHICLE HOIST

WARNING: **Danger to life!**
Read and follow operating instructions for vehicle hoist.
Do not exceed approved load-carrying capacity and load distribution of vehicle hoist.
Weight compensation may be necessary due to the loading situation of the vehicle.
This also applies in the event of considerable removal of parts or conversions on the vehicle.

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

IMPORTANT: Risk of damage!
Before driving onto a vehicle hoist, make sure there is sufficient ground clearance between the vehicle hoist and the vehicle.
The vehicle may only be raised with the vehicle hoist at the four jacking points.

Necessary preliminary work:

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

IMPORTANT: All four jacking points (1) must be available!
Never raise the vehicle without the jacking points (1)!

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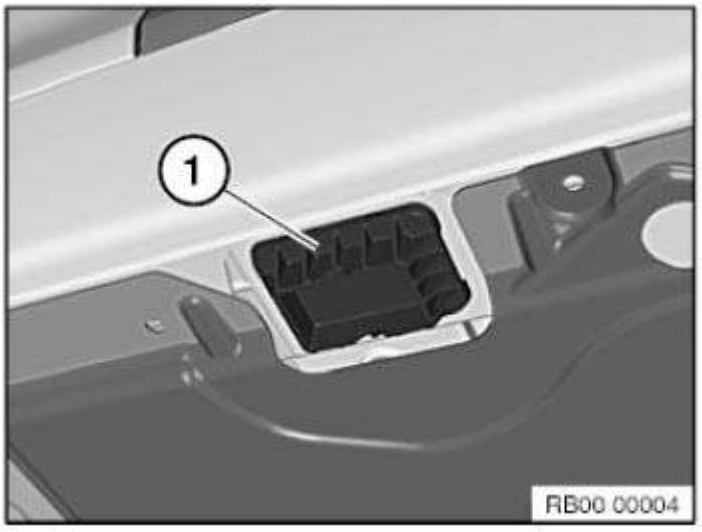


Fig. 3: Identifying Vehicle Without Jacking Points
Courtesy of BMW OF NORTH AMERICA, INC.

Risk of damage!
Align support plates (2) of lifting platform arms to jacking points (1) in such a way that no
IMPORTANT: adjoining components are touched and thereby damaged.
In hybrid cars there is a risk of damage to the high-voltage component behind the underbody panelling!

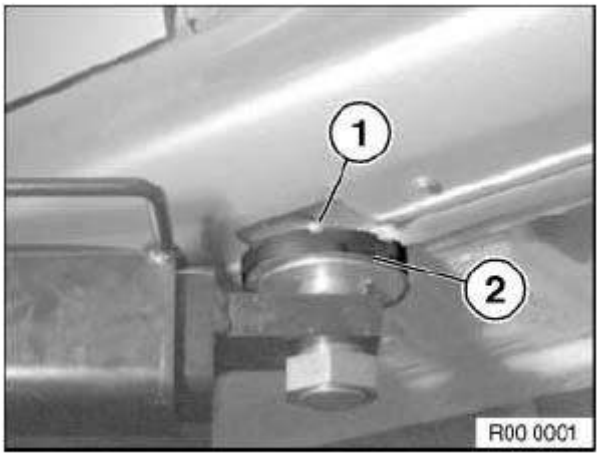


Fig. 4: Aligning Support Plates Of Lifting Platform Arms To Jacking Points
Courtesy of BMW OF NORTH AMERICA, INC.

Risk of damage!
Align the rubber block (2) with the jacking points (1) in such a way that no adjoining components are touched and thereby damaged.
IMPORTANT: **Never raise the vehicle without rubber blocks (or rigid foam blocks)!**
There is a major risk of damage to the vehicle underbody!
In hybrid cars there is a risk of damage to the high-voltage component behind the underbody panelling!

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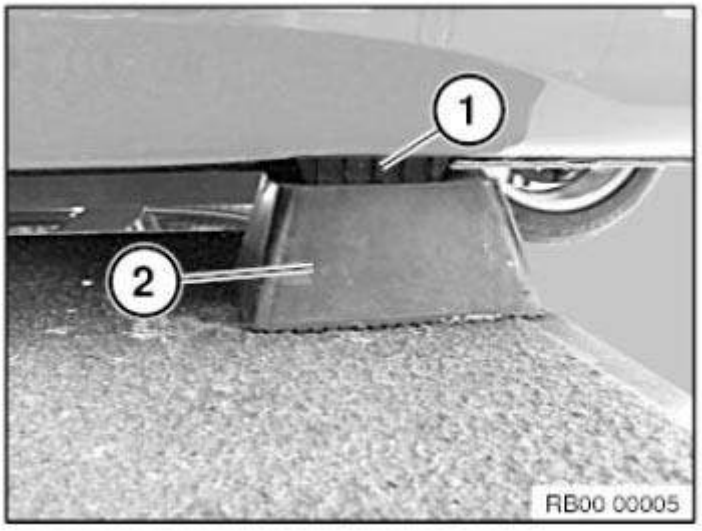


Fig. 5: Aligning Rubber Block With Jacking Points
Courtesy of BMW OF NORTH AMERICA, INC.

31 00 MOBILE TABLE LIFT

WARNING: **Danger of injury!**
Before beginning work, position table lift with the lower frame securely on the floor.
Danger area around mechanism below platform.

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

Follow the operating instructions from the equipment manufacturer.

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

Adaptations for mounting front axle with engine and transmission.

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

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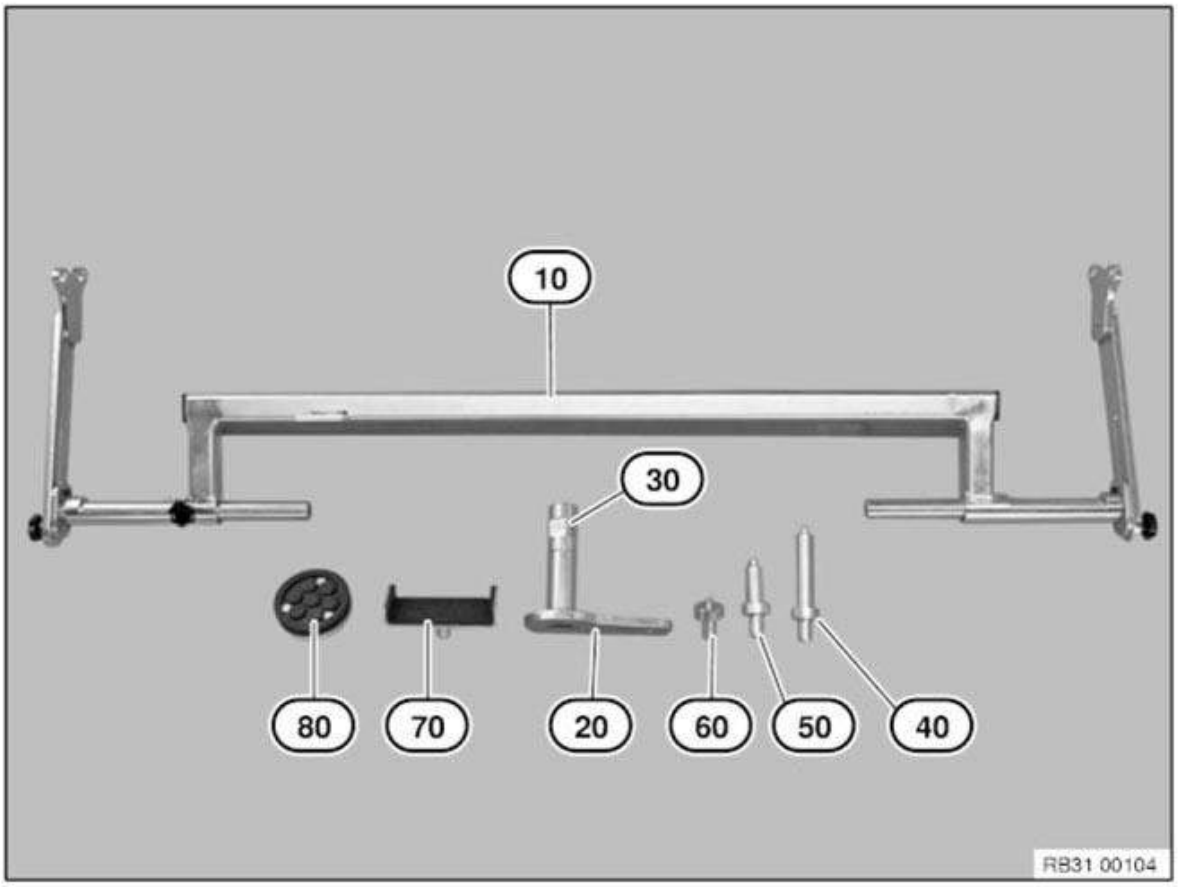


Fig. 6: Identifying Mobile Table Lift Parts
Courtesy of BMW OF NORTH AMERICA, INC.

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 3Â° on the long side and by 5Â° 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.

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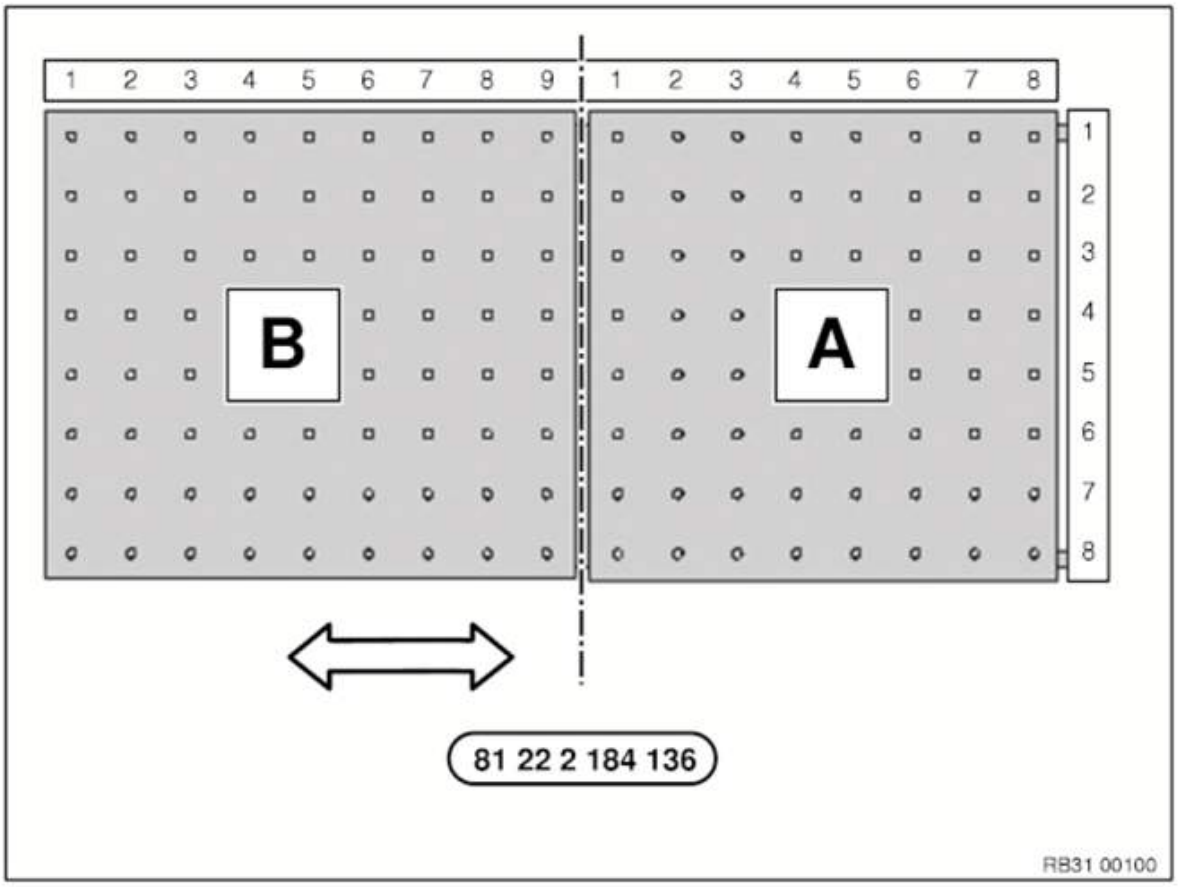


Fig. 7: Identifying Star Knob Screw On Working Plate
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Follow the operating instructions from the equipment manufacturer.

41 00... NOTES ON REPAIRING THREADS (A)

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

NOTE: **Damaged threads may be repaired with Helicoil thread inserts. Observe the PROCEDURE described in the example.**

Screw connection	Vehicle	Screw/bolt fastening point(s)	Helicoil thread insert
Front axle support to engine support	F01, F02, F03, F04, F07, F10, F11, F12, F13, F18	M12	M12x1.5x24
	F25	M14	M14x1.5x28
Rear axle support to side member	F01, F02, F03, F04, F07, F10, F11, F12, F13, F18	Â	M14x1.5x28
	F25	Â	M12x1.5x24
Support bearing screw connection, front axle	F25	Â	M8x1, 25x16

31 00... NOTES ON REPAIRING THREADS (B)

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

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

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Fig. 8: Identifying Helicoil Thread
Courtesy of BMW OF NORTH AMERICA, INC.

Procedure:

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

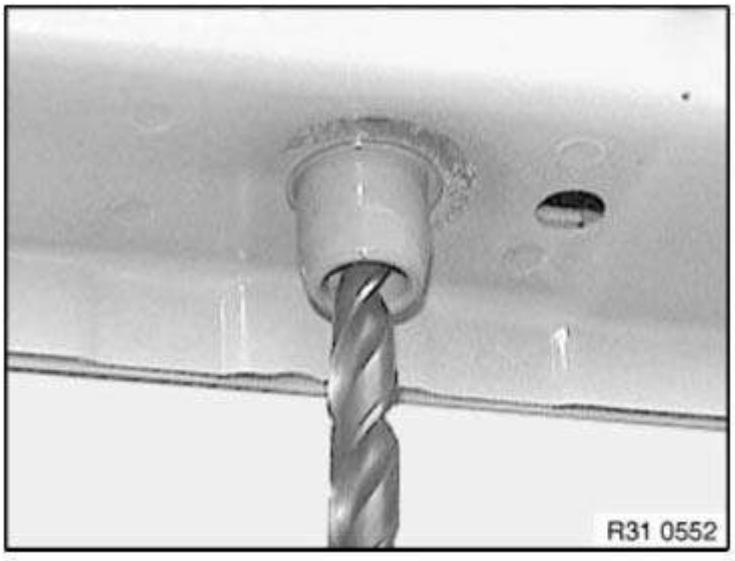


Fig. 9: Drilling Core Hole
Courtesy of BMW OF NORTH AMERICA, INC.

2. Create locating thread for Helicoil thread insert

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

3. Pick out Helicoil thread insert in accordance with the **TABLE** and screw into the locating thread until flush with the original thread

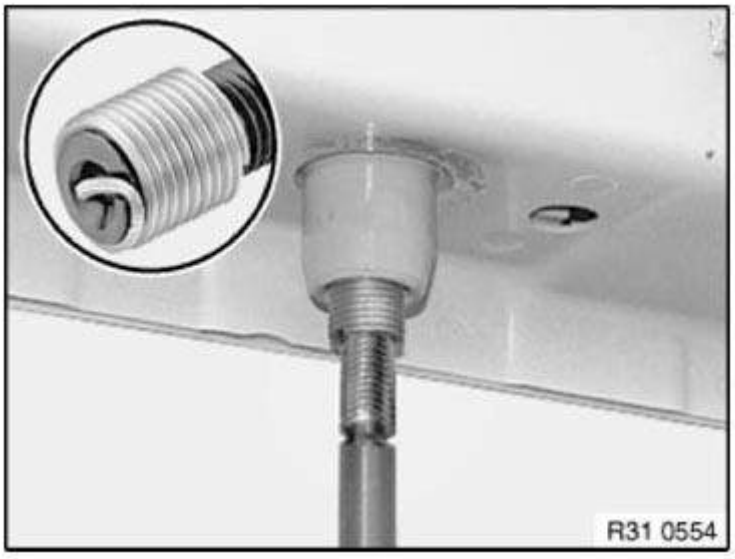


Fig. 11: Identifying Helicoil Thread
Courtesy of BMW OF NORTH AMERICA, INC.

4. Break drive pin and remove

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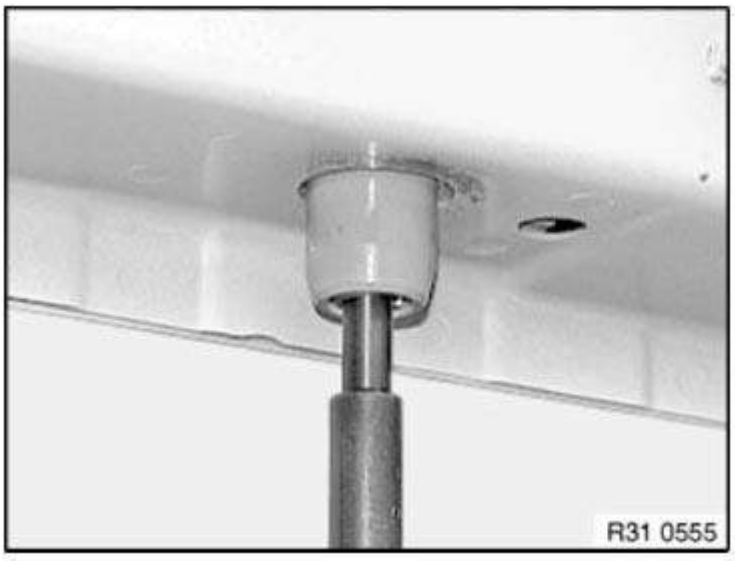
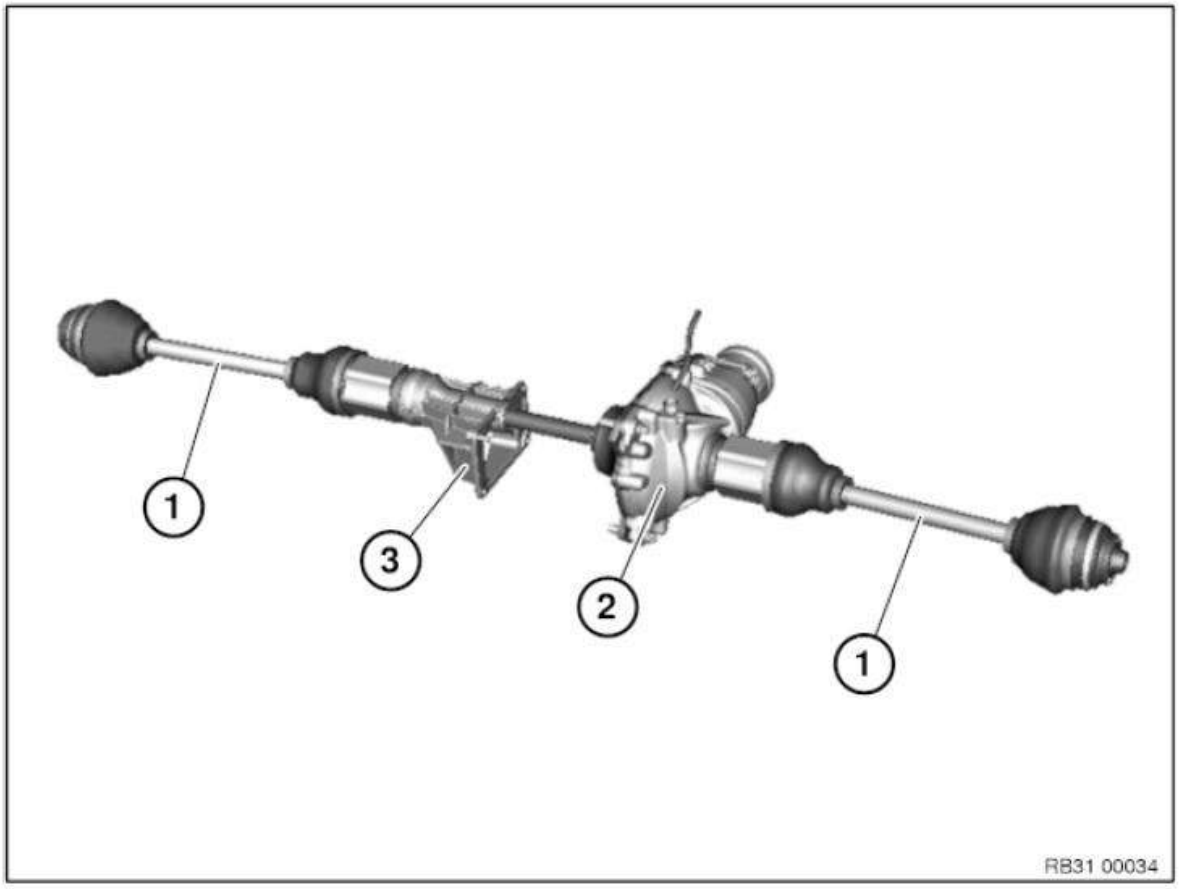


Fig. 12: Removing Drive Pin
Courtesy of BMW OF NORTH AMERICA, INC.

31..... OVERVIEW OF FRONT AXLE DIFFERENTIAL/OUTPUT SHAFTS

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1 Output shaft / gaiters

2 Front differential (incl. O-ring, shaft seals)

3 Bearing block (incl. O-ring, shaft seal)

Fig. 13: Overview Of Front Axle Differential/Output Shafts
Courtesy of BMW OF NORTH AMERICA, INC.

00..... RAISING VEHICLE WITH TROLLEY JACK

Observe the following trolley-jack-related instructions:

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

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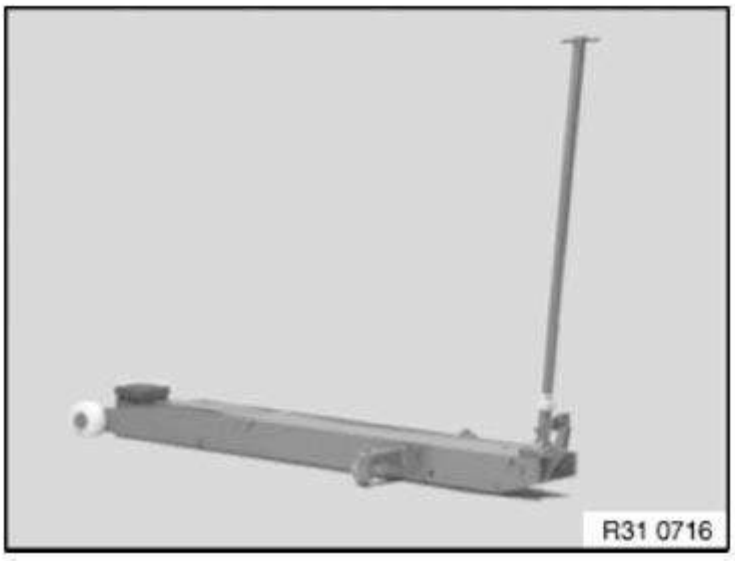


Fig. 14: Lifting Vehicle With Trolley Jack
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: All-wheel drive vehicles may only be raised with the stiffening plate fitted on the front axle! Raising directly on the front axle support without stiffening plate is not permissible!

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

1. Car jacking point
2. Side car jacking points
3. Rear axle final drive

NOTE: **It is not permitted to raise the vehicle at the rear differential cover!**

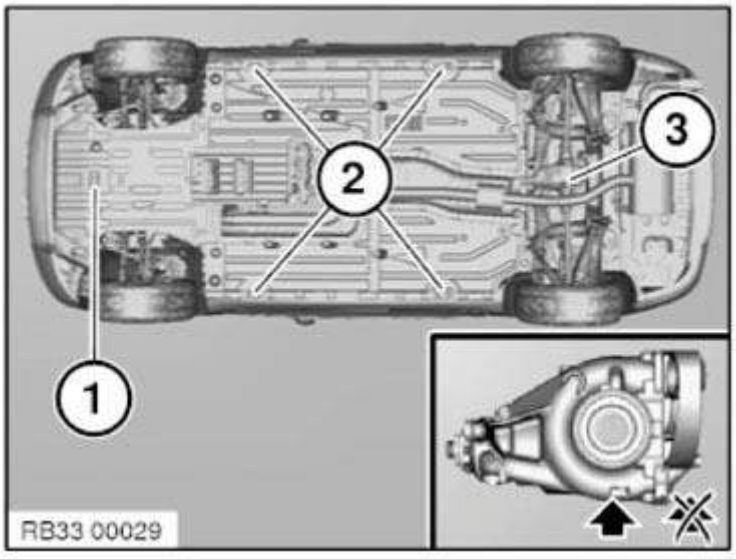


Fig. 15: Identifying Rear Axle Jacking Points
Courtesy of BMW OF NORTH AMERICA, INC.

Risk of damage!

Jacking point (1) must be present!

Align the rubber plate on the trolley jack to the jacking point (1) in such a way that there is no contact to

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adjacent components and that they are therefore not damaged.

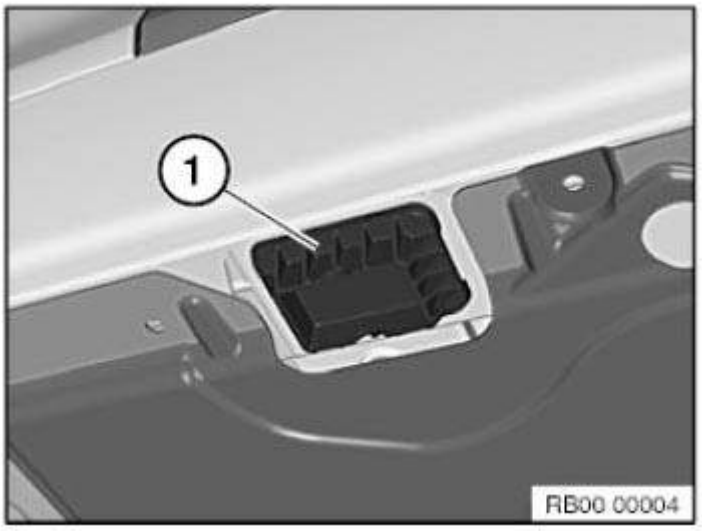


Fig. 16: Identifying Jacking Point
Courtesy of BMW OF NORTH AMERICA, INC.

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 safety 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.**

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.

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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

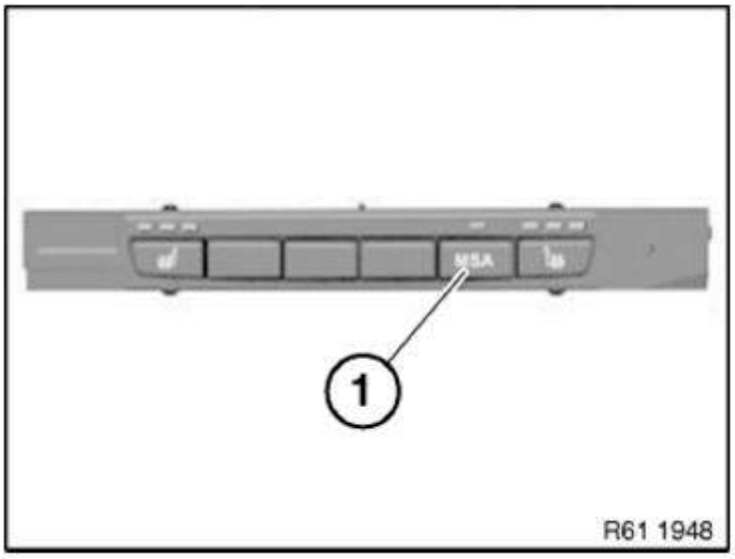


Fig. 17: Identifying MSA Button In Passenger Compartment
Courtesy of BMW OF NORTH AMERICA, INC.

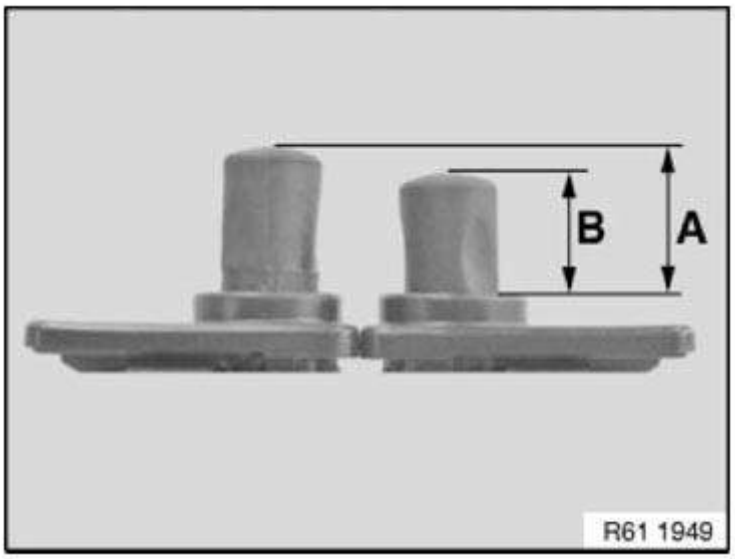
- Open engine bonnet/hood and ensure that engine hood/bonnet contact is not in workshop mode
  - Workshop mode

    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.



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Fig. 18: Identifying Engine Bonnet/Hood Dimension
Courtesy of BMW OF NORTH AMERICA, INC.

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 noninvolved 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.**

FRONT AXLE SUSPENSION

51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION

NOTE: **Illustration only an example. Detail deviations, depending on engine version, are possible.**

Unfasten screws (2).

Tightening torque 51 75 1AZ .

Remove front underbody protection (1).

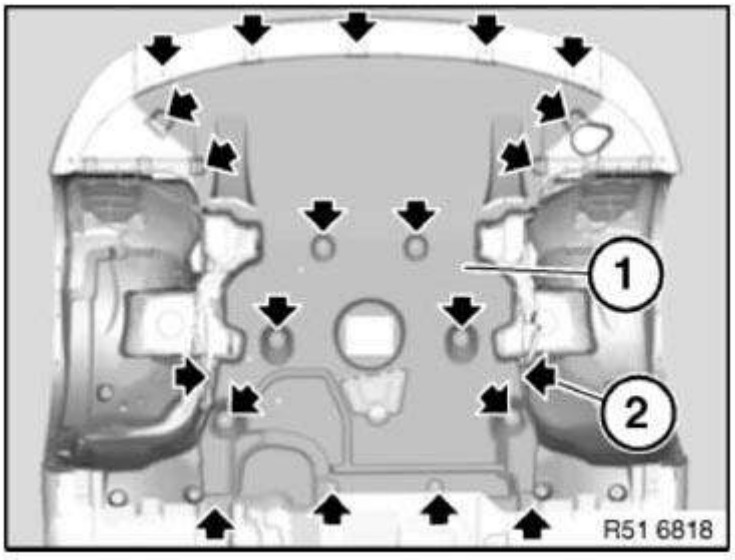


Fig. 19: Locating Screws Of Front Underbody Protection
Courtesy of BMW OF NORTH AMERICA, INC.

51 47 491 REMOVING AND INSTALLING/REPLACING REAR UNDERBODY PROTECTION

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NOTE: **Schematic diagram created using the F25 28iX as an example. There may be differences in detail in the case of other models.**

Release screws in area (1) and remove underbody protection (2).

Tightening torque **51 75 1AZ** .

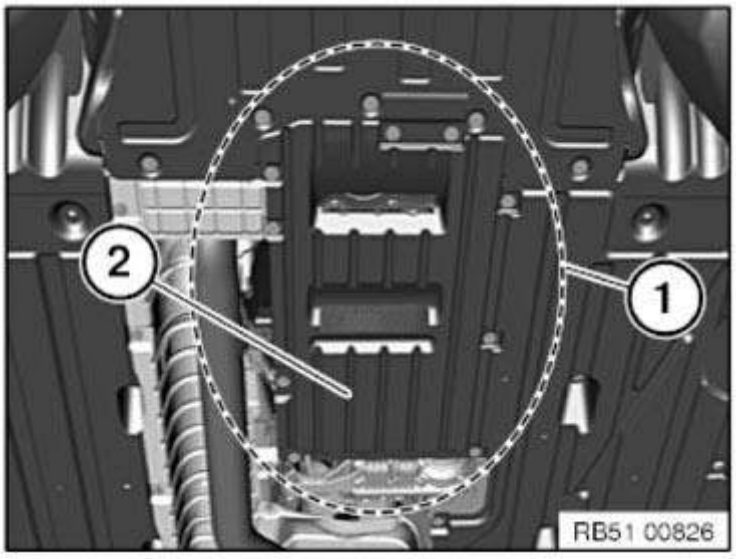


Fig. 20: Identifying Underbody Protection Screws Area
Courtesy of BMW OF NORTH AMERICA, INC.

31 10 010 REMOVING AND INSTALLING/REPLACING REINFORCEMENT PLATE

IMPORTANT: Observe safety instructions for raising the vehicle
Driving **without** reinforcement plate is not permitted!

Necessary preliminary work:

- Remove **UNDERBODY PROTECTION**.

Release screws (1).

Remove reinforcement plate (2).

Installation note:

Tightening torque **31 10 2AZ**

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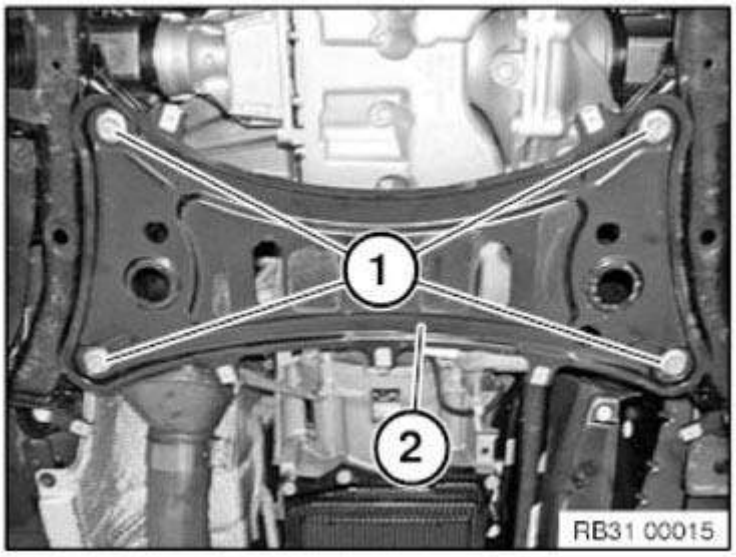


Fig. 21: Identifying Reinforcement Plate And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

FRONT SUB-FRAME

31 11 506 LOWERING/RAISING FRONT AXLE SUPPORT

Special tools required:

- 31 5 251
- 00 2 030
- 31 5 255
- 31 5 256

WARNING: **Danger of injury!**
Failure to comply with the following instructions may result in the vehicle slipping off the lifting platform and critically injuring other persons.
When supporting components, make sure that:

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

IMPORTANT: Before lowering/removing front axle support:
Observe SAFETY INFORMATION for raising the vehicle
In order to avoid damage to vehicle hoist, perform weight compensation on vehicle.
Load spring strut domes with sand bags.

WARNING:

- **SECURE ENGINE IN INSTALLATION POSITION WITH SPECIAL TOOL to prevent it from falling down.**

Necessary preliminary tasks:

- Secure ENGINE IN INSTALLATION POSITION .
- REMOVE UNDERBODY PROTECTION.
- Remove ANTI-ROLL BAR LINK FROM ANTI-ROLL BAR.
- Remove STEERING SHAFT FROM STEERING BOX .

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- Partially release left and right **WHEEL ARCH COVERS** .
- Only on left side at ride height sensor: Disconnect **PLUG CONNECTION ON SENSOR** .

Disconnect plug connection (1) on steering box.

Disconnect plug connections (2) on steering box and set down with left side member.

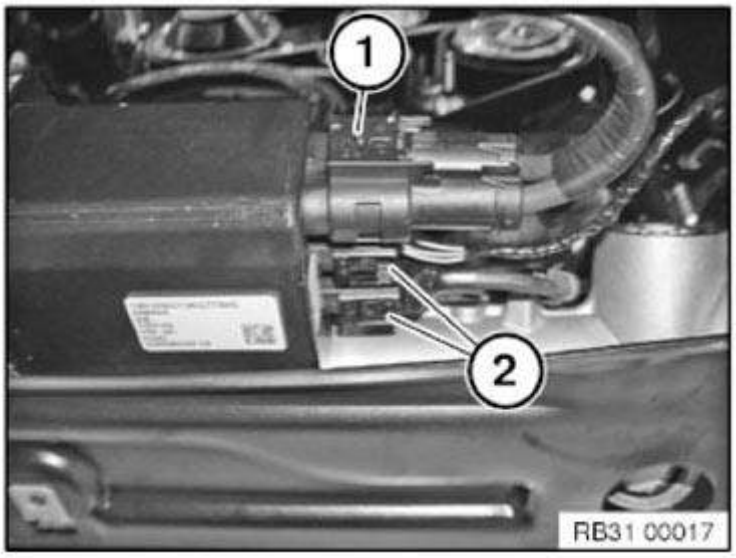


Fig. 22: Identifying Plug Connection On Steering Box
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip cable (1) of steering box on front axle support and set down with right side member.

Installation note:

Replace faulty cable clips.

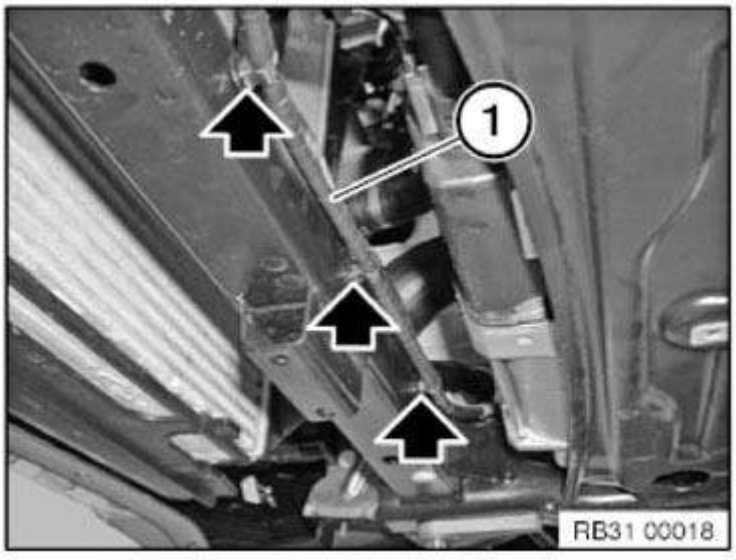


Fig. 23: Locating Screw Of Cable Steering Box
Courtesy of BMW OF NORTH AMERICA, INC.

N52T, N55:

Loosen screws on the coolant pipe (1).

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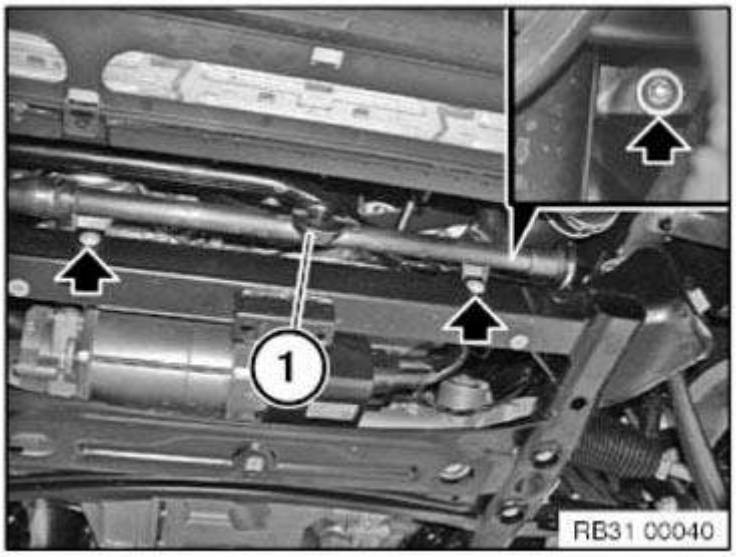


Fig. 24: Locating Screws On Coolant Pipe
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Make sure when lowering/removing the front axle that the cable of the steering box is not damaged.

Engage special tool **31 5 251** with a 2nd person helping completely on workshop jack **00 2 030** .

Insert special tools **31 5 255** in telescopic supports of a profile rail pair.

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

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

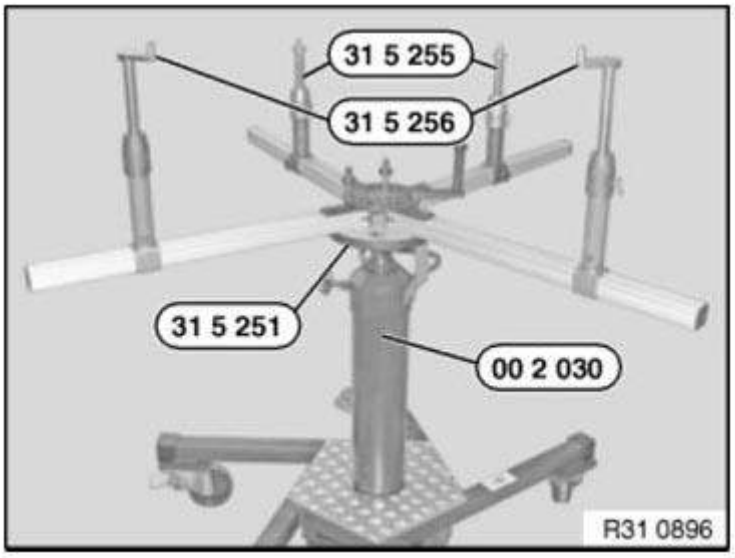


Fig. 25: Inserting Special Tools 31 5 256 In Telescopic Supports
Courtesy of BMW OF NORTH AMERICA, INC.

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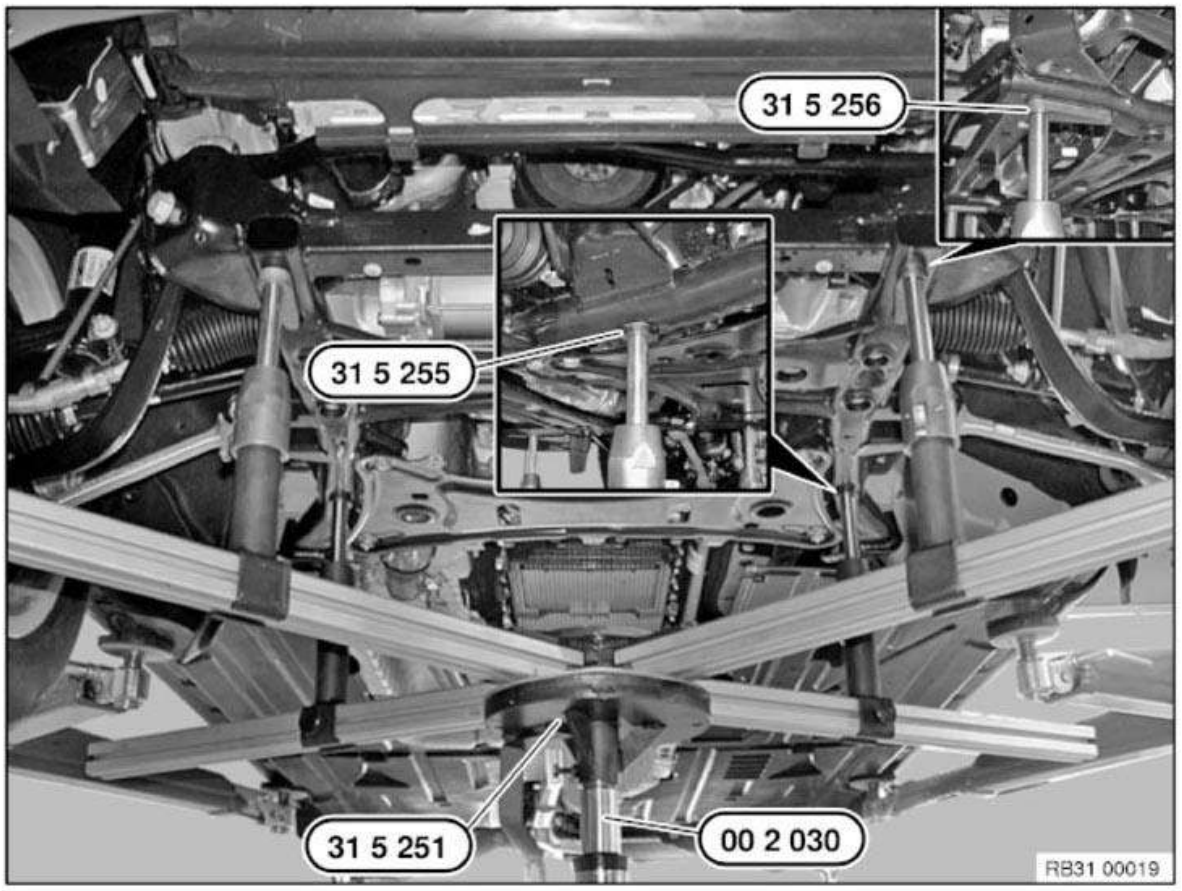


Fig. 26: Aligning Special Tools 31 5 251 To Front Axle Support
Courtesy of BMW OF NORTH AMERICA, INC.

The mounting points on the left side are shown:

Align special tools **31 5 251** , **31 5 255** and **31 5 256** to front axle support.

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

Release screws (1).

Tightening torque **31 10 1AZ** .

Lower front axle support.

Installation note:

Check thread for damage.

If necessary, repair with **HELICOIL THREAD INSERT**.

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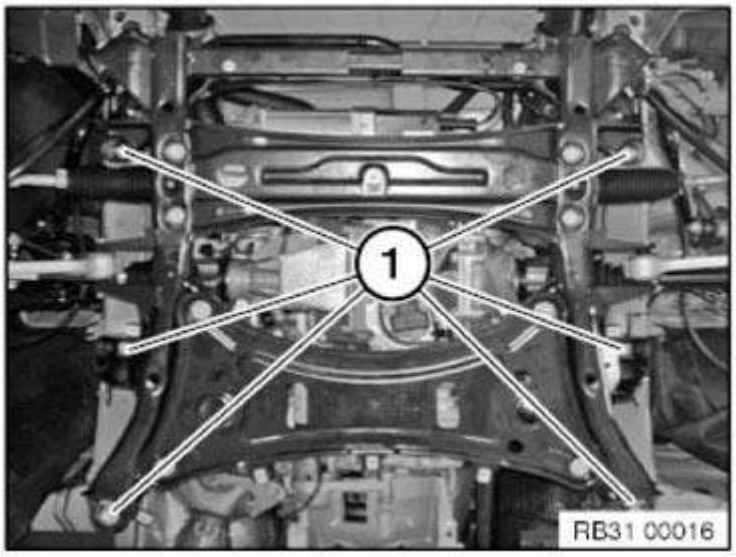


Fig. 27: Identifying Screws Of Front Axle Support
Courtesy of BMW OF NORTH AMERICA, INC.

31 11 001 REPLACING FRONT AXLE SUPPORT

WARNING: **Danger of injury!**
Failure to comply with the following instructions may result in the vehicle slipping off the lifting platform and critically injuring other persons.
When supporting components, make sure that:

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

IMPORTANT:
Before lowering/removing front axle support:
Observe **SAFETY INFORMATION** for raising the vehicle
In order to avoid damage to vehicle hoist, perform weight compensation on vehicle.
Load spring strut domes with sand bags.

WARNING: **SECURE ENGINE IN INSTALLATION POSITION WITH SPECIAL TOOL to prevent it from falling down.**

Necessary preliminary tasks:

- **SECURE** engine in installation position.
- **DISCONNECT** negative lead from battery.
- Remove **BOTH WISHBONES FROM THE FRONT AXLE SUPPORT**.
- Remove **BOTH TENSION STRUTS FROM FRONT AXLE CARRIER**.
- Remove **BOTH TRACK RODS AT THE SWIVEL BEARING** .
- Remove the **ANTI-ROLL LINK AT THE FRONT AXLE SUPPORT** and protect from falling.
- Lower **FRONT AXLE SUPPORT**.

Remove both engine mounts from front axle carrier. See **2211 ENGINE MOUNTING** .

Remove **steering box** . See **32 13 572 REPLACE ELECTRICAL STEERING GEAR (EPS) (N20/N47)** , **32 13 572 REPLACE ELECTRICAL STEERING BOX (EPS) (N52/N55/N57)** or **32 13 572 REPLACE ELECTRICAL STEERING GEAR (EPS) (N20/N47)** .

Remove **REINFORCEMENT PLATE**.

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Take the front axle support off the special tool with a helper and set onto a suitable support.

Installation note:

Use previous front axle support as a template for modifying or replacing small parts.

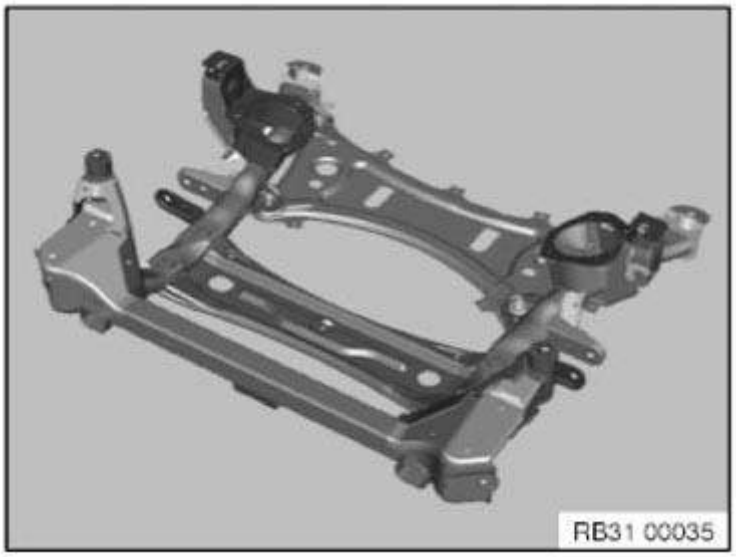


Fig. 28: Identifying Front Axle Support
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Perform **wheel alignment check** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD**

STRUTS WITH RUBBER MOUNTS

31 12 000 REMOVING AND INSTALLING LEFT OR RIGHT WISHBONE

Special tools required:

- **31 2 242**
- **31 2 246**
- **31 2 240**

NOTE: **If the wishbone is detached from the front axle support, it will be necessary to carry out the wheel alignment procedure . See 32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION or 32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD .**

Necessary preliminary work:

- Remove **FRONT WHEEL** .

IMPORTANT:
Do **not** release wishbone from swivel bearing with impact tool.
Check rubber boot and tension ring for damage!
When reinstalling the wishbone, check the seal seat for the tension ring between wishbone and swivel bearing and replace wishbone, if applicable!

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If necessary, remove link for ride-height sensor at wishbone on left.

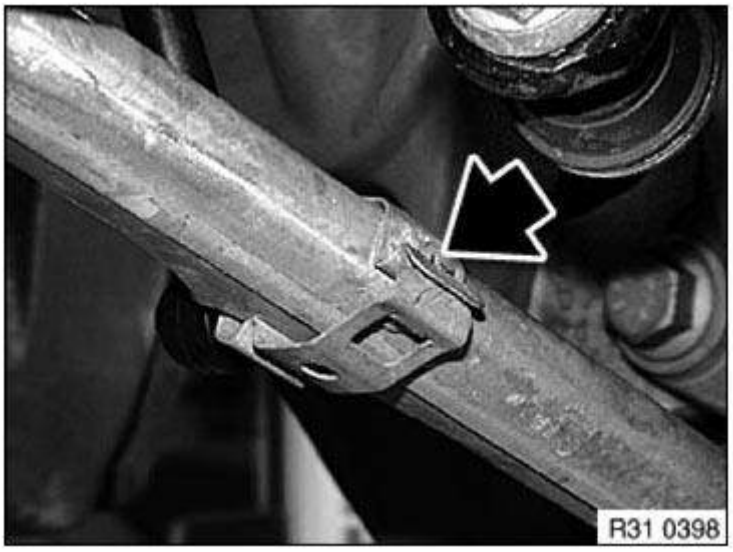


Fig. 29: Locating Wishbone From Swivel Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) approx. 3-4 thread turns; if necessary, counter support at Torx socket.

Tightening torque **31 12 4AZ** .

If necessary, replace lower section **31 2 242** with lower section **31 2 246**

Use special tool **31 2 240** to press wishbone from swivel bearing.

Unscrew nut (1) and remove control arm.

Installation note:

Keep journal on ball head and bushing in swivel bearing clean and free from oil and grease.

Replace self-locking nut.

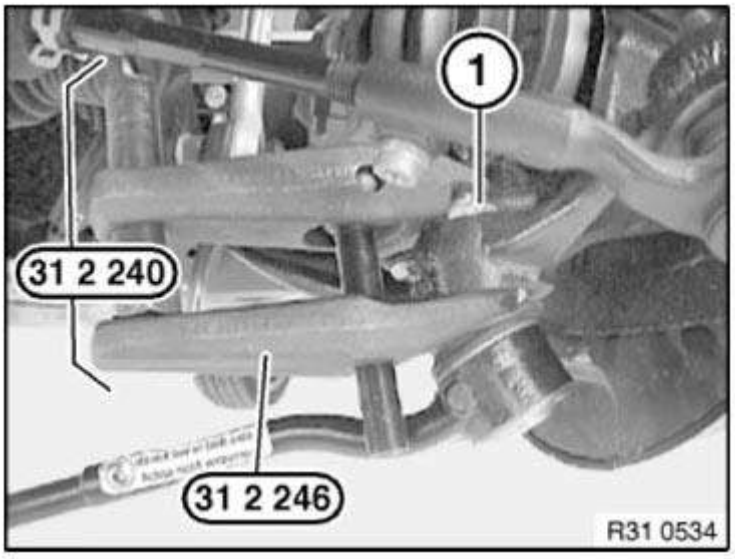


Fig. 30: Releasing Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

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Tightening torque **31 12 3AZ** .

Remove bolt towards front, remove wishbone (2).

Installation note:

Screw head must point in direction of travel.

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

Replace screw and nut.

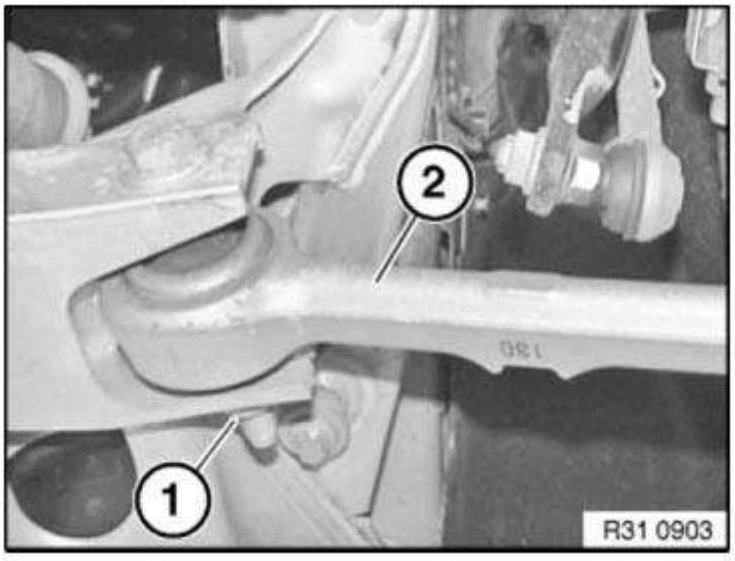


Fig. 31: Identifying Wishbone And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

31 12 080 REMOVING AND INSTALLING/REPLACING BOTH TRAILING LINKS

NOTE: **The procedure is described in Removing and installing/replacing left or right trailing link.**

31 12 026 REMOVING AND INSTALLING/REPLACING GUIDE JOINT IN SWIVEL BEARING

Necessary preliminary work:

- Remove **TENSION STRUT FROM GUIDE JOINT**.

Check the rubber gaiter and circlip for damage!
IMPORTANT: When removing and installing the trailing link, check the seat of the circlip seal between the trailing link and the wheel control joint and replace the wheel control joint if needed!

Release screw (1).

Tightening torque **31 12 5AZ**

Remove guide joint from swivel bearing.

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Installation note:

Rework thread in swivel bearing.

Keep guide joint and bore hole in swivel bearing clean and free from oil and grease.

Replace microencapsulated screw.

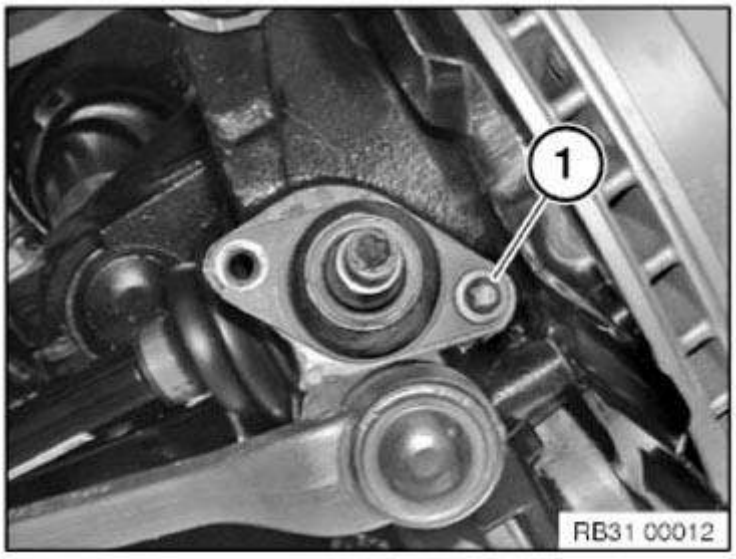


Fig. 32: Identifying Guide Joint Screw
Courtesy of BMW OF NORTH AMERICA, INC.

31 12 050 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT TRAILING LINK

Special tools required:

- 31 2 242
- 31 2 246
- 31 2 240

Necessary preliminary tasks:

- Remove FRONT WHEEL .
- Remove UNDERBODY PROTECTION.
- Partially loosen the LOWER WHEEL ARCH COVER (FRONT SECTION) .

IMPORTANT:	Do **not** release trailing link from wheel control joint with impact tool! Check the rubber gaiter and circlip for damage! When removing and installing the trailing link, check the seat of the circlip seal between the trailing link and the wheel control joint and replace the wheel control joint if needed!

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

Tightening torque 31 12 2AZ

Installation note:

Replace self-locking nut.

Perform steering angle.

Release screw (2).

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Tightening torque **31 12 5AZ**

Installation note:

Rework thread in swivel bearing.

Replace microencapsulated screw.

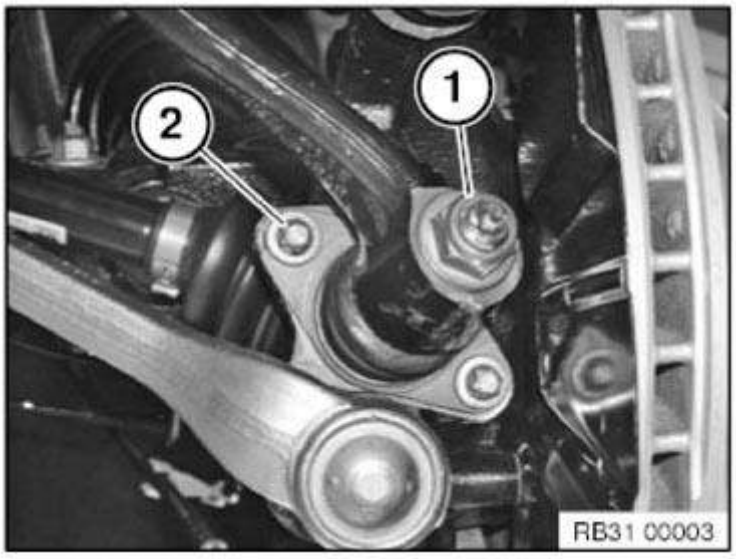


Fig. 33: Identifying Screw And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

If necessary, screw nut (1) onto guide joint by a few turns.

If necessary, replace lower section **31 2 242** with lower section **31 2 246**

Press trailing link out of the guide joint with special tool **31 2 240** .

Unscrew nut (1) and remove trailing link.

Installation note:

Keep journal on guide joint and bushing in tension strut clean and free from oil and grease.

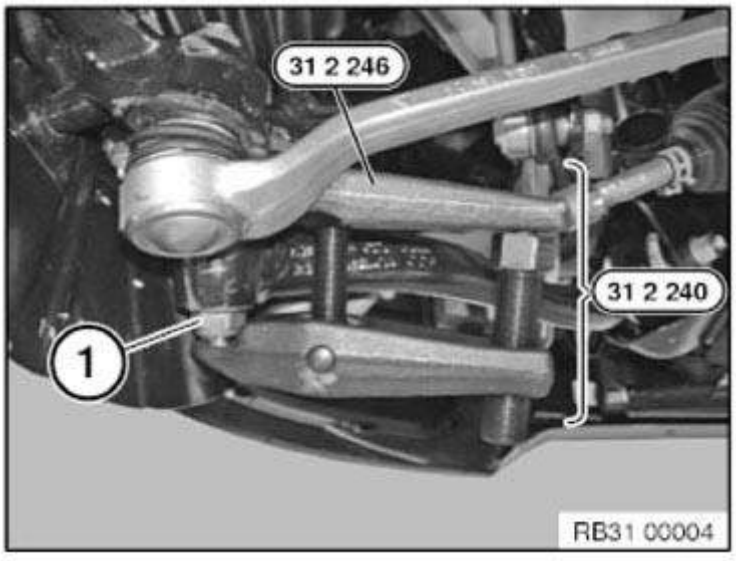


Fig. 34: Pressing Trailing Link
Courtesy of BMW OF NORTH AMERICA, INC.

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Release screws (1).

Remove holder for underbody protection (2).

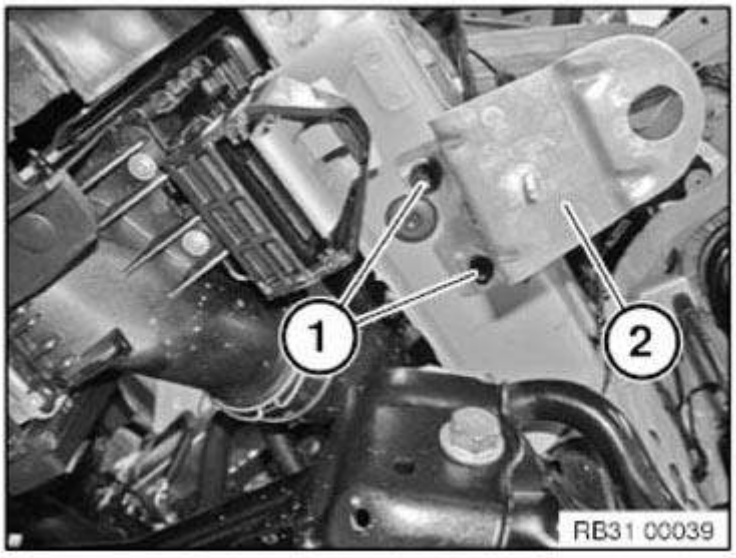


Fig. 35: Identifying Screws And Holder For Underbody Protection
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

Tightening torque **31 12 1AZ**

Remove screw towards front.

Remove tension strut.

Installation note:

Replace screw and nut.

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

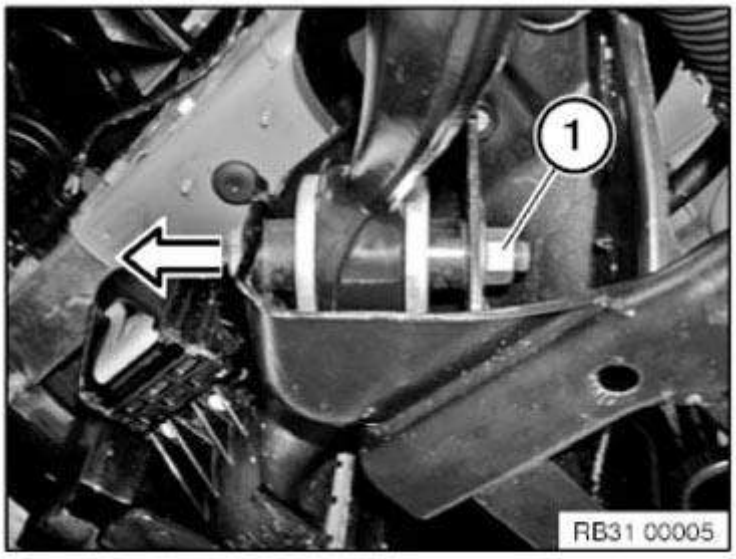


Fig. 36: Removing Tension Strut
Courtesy of BMW OF NORTH AMERICA, INC.

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Special tools required:

- 31 1 051
- 31 1 054
- 33 3 054

NOTE: **When replacing the rubber mount in the wishbone, a wheel alignment . See 32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION or 32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD must be performed after the installation is complete.**

Necessary preliminary work:

- Remove WISHBONE.

Press rubber mount out with special tools 31 1 051 , 31 1 054 and 33 3 054 .

Installation note:

Keep rubber mount and bore in control arm clean and free from grease.

Press rubber mount in and out at chamfered side of wishbone bore hole.

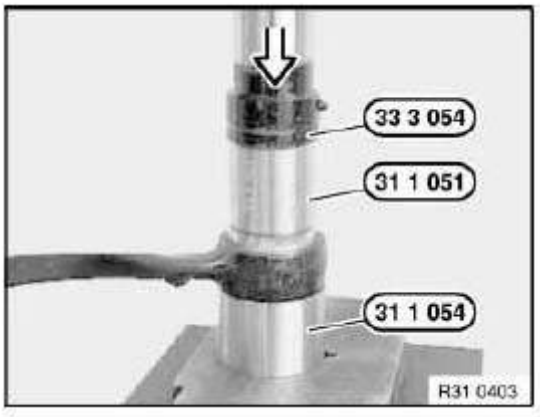


Fig. 37: Pressing Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Protrusion (A) = 5.74 Â± 0.3 mm.

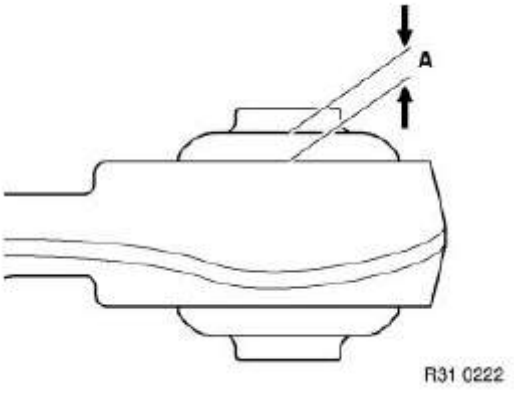


Fig. 38: Identifying Wishbone Bore Hole Dimension
Courtesy of BMW OF NORTH AMERICA, INC.

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After installation:

- Carry out **wheel alignment procedure** . See 32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION or 32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD .

31 12 138 REPLACING RUBBER MOUNT IN LEFT OR RIGHT TRAILING LINK

Special tools required:

- 31 2 261
- 31 2 264

IMPORTANT: The rubber mounts are only permitted to be replaced once.

Carry out check:

There must always be a minimum amount of play in the guide joint.

1. Check guide joint play

   NOTE: **Apply light pressure to the trailing link (in the area of the guide joint) in the horizontal and vertical directions.**

   - Play is OK: Check the screw connection. (see Point 2)
   - Play is not OK: Replace RUBBER MOUNT AND GUIDE JOINT.

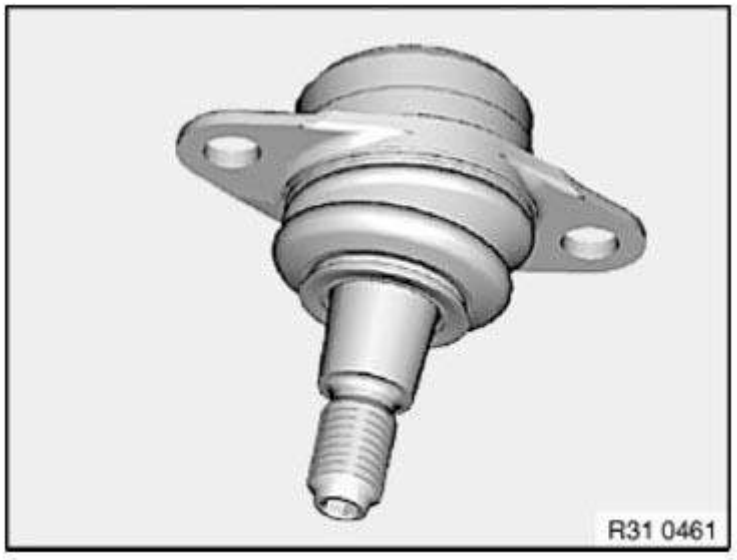


Fig. 39: Identifying Guide Joint
Courtesy of BMW OF NORTH AMERICA, INC.

2. Check screw connection (trailing link to guide joint) by tightening to 60 % of tightening torque 31 12 2AZ and listening for cracking sound.
   - Torque wrench cracking sound: Replace rubber mount
   - Screw connection turns: Replace **trailing link and guide joint** . See 31 12 026 REMOVING AND INSTALLING/REPLACING GUIDE JOINT IN SWIVEL BEARING or 31 12 080 REMOVING AND INSTALLING/REPLACING BOTH TRAILING LINKS.

Replacing rubber mount:

- Remove TRAILING LINK.

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Using a press and special tools 31 2 261 and 31 2 264 , press rubber mount out of tension strut.

NOTE: Special tool 31 2 264 must be exactly flush with rubber mount bush.

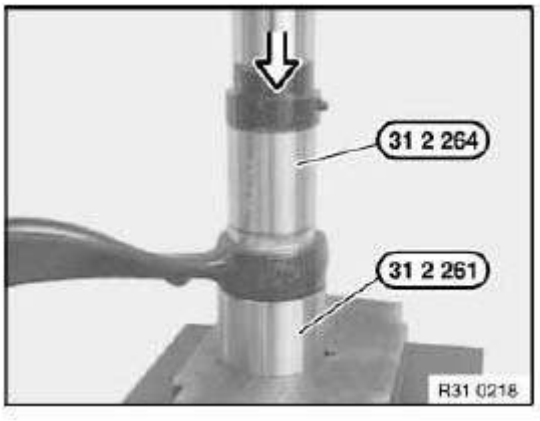


Fig. 40: Pressing Rubber Mount Of Tension Strut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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

Align rubber mount and trailing link with markings (K) and press into place.

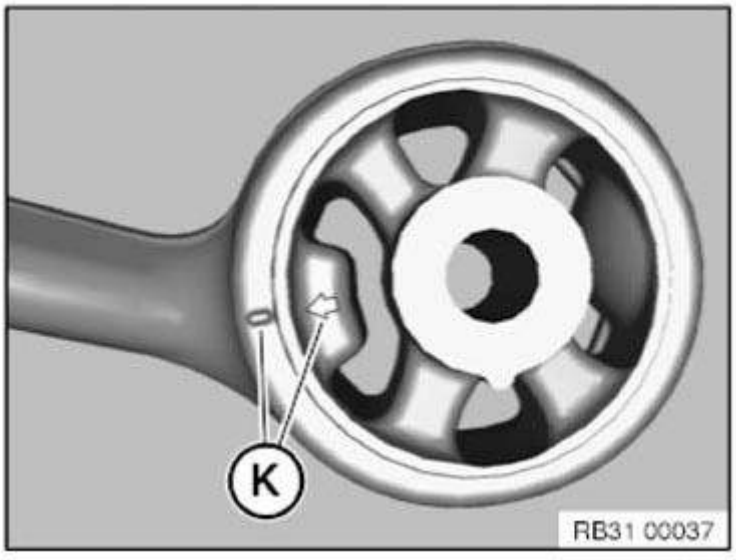


Fig. 41: Aligning Rubber Mount And Trailing Link Mark
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Protrusion (A) equally large.

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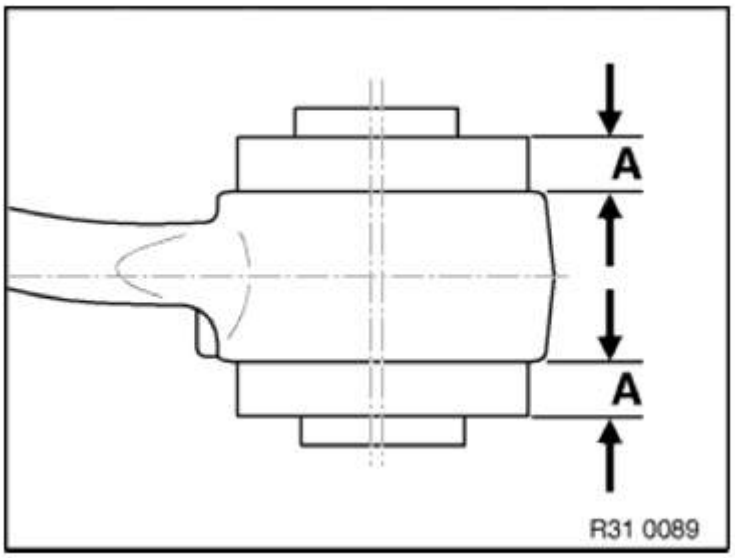


Fig. 42: Identifying Protrusion
Courtesy of BMW OF NORTH AMERICA, INC.

31 12 138 REPLACING RUBBER MOUNTS ON BOTH TRAILING LINKS

NOTE: **Procedure is described in 31 12 138 Replacing rubber mount in left or right trailing link.**

WHEEL BEARINGS AND STUB AXLE

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

Special tools required:

- 31 2 230

Necessary preliminary tasks:

- Remove FRONT WHEEL .
- Detach ANTI-ROLL BAR LINK AT SPRING STRUT.
- Detach PULSE SENSOR ON SWIVEL BEARING set down with the engine support.
- Detach TRACK ROD END FROM SWIVEL BEARING .
- Detach WISHBONE.
- Detach TRAILING LINK FROM GUIDE JOINT.

IMPORTANT: Secure swivel bearing against falling out.

Slacken nut (1).

Tightening torque 31 31 3AZ .

Pull out screw (2) with cable clip (3) toward the rear.

Expand swivel bearing with special tool 31 2 230 .

Remove swivel bearing from spring strut.

Installation note:

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

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Screw head must face opposite to the direction of travel.

Replace screw and nut.

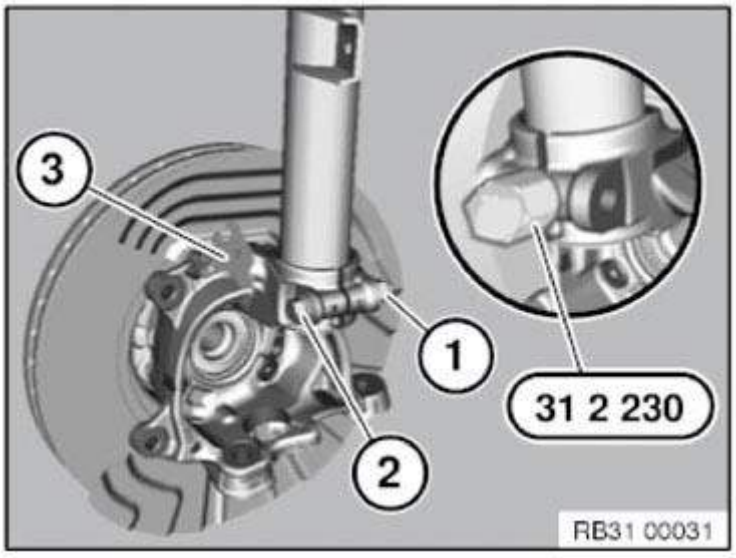


Fig. 43: Removing Swivel Bearing From Spring Strut
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: When replacing spring strut/swivel bearing, the tightening sequence must be adhered to.

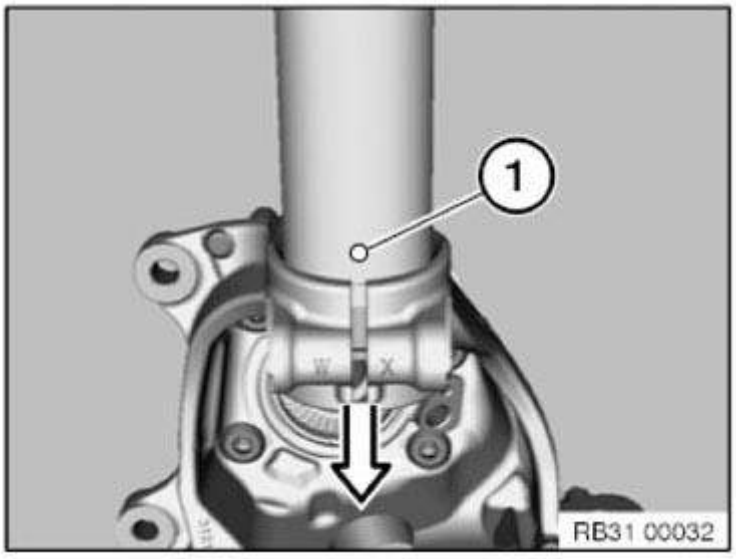
Tightening sequence:

- Tighten using nut.
- Initial torque 40 Nm
- First torque 100 Nm, release nut by 120Â°
- This ensure the setting properties of the new parts.
- Tighten with the final torque.

Tightening torque **31 31 3AZ**

Installation note:

Align positioning pin (1) on spring strut to swivel bearing. Slide spring strut into swivel bearing to the limit position.



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Fig. 44: Positioning Pin On Spring Strut To Swivel Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Modify **WHEEL BEARING** or replace if necessary.
- Modify **GUIDE JOINT** or replace if necessary.
- Modify **BRAKE ANCHOR PLATE/PROTECTIVE PLATE** or replace if necessary.

After installation:

- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

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

Special tools required:

- **31 2 230**

Necessary preliminary tasks:

- Remove **FRONT WHEEL** .

If necessary, remove visual protection cap (1).

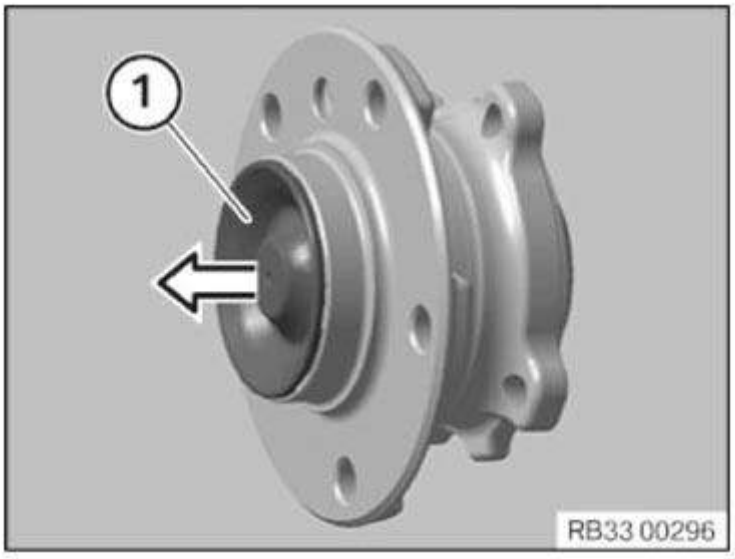


Fig. 45: Removing Visual Protection Cap
Courtesy of BMW OF NORTH AMERICA, INC.

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

Tightening torque **31 60 2AZ** .

Installation note:

- Replace collar bolt and compression spring.
- Note installation position of compression spring.
- Keep collar bolt and spur toothing of bearing/propeller shaft clean and free of grease

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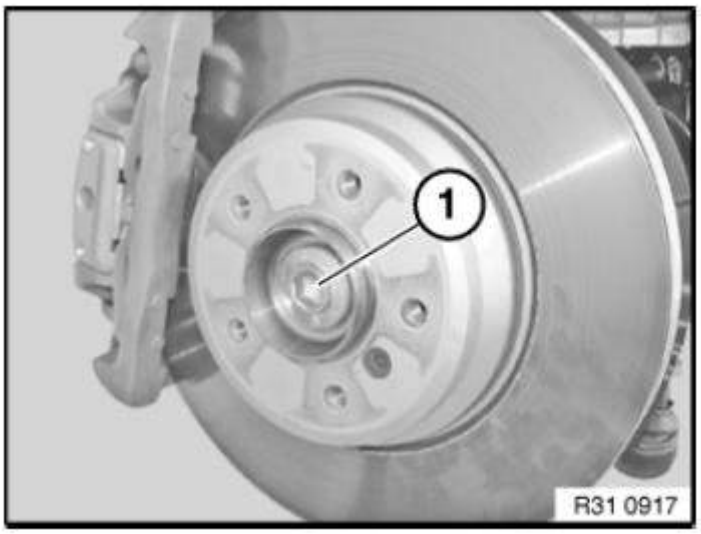


Fig. 46: Identifying Collar Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Note on installation for spur gearing must be observed without fail!

Installation note:

- Spur gearing of bearing (1) and output shaft (2) must be installed form-fit (tooth in tooth)!
- Tighten collar bolt and compression spring by hand.
- Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.
- Once a form-fit has been ensured, tighten to final torque.

  Tightening torque **31 60 2AZ** .

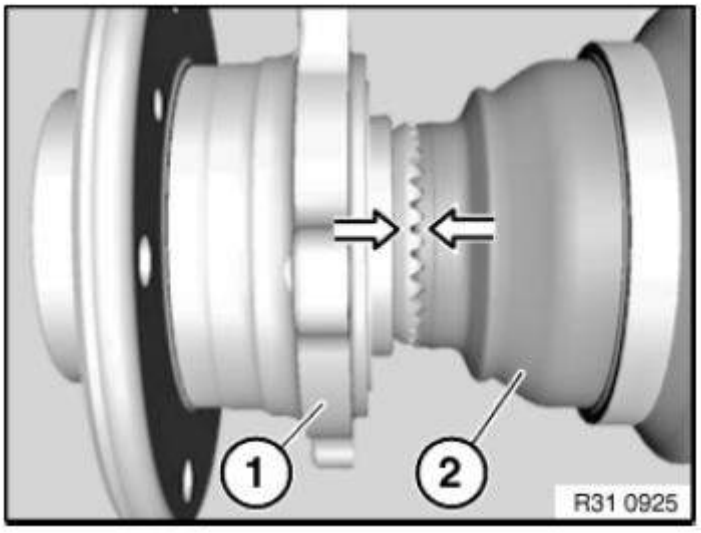


Fig. 47: Checking Spur Gear Of Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

- Detach **ANTI-ROLL BAR LINK AT SPRING STRUT**.
- Detach **PULSE SENSOR ON SWIVEL BEARING** set down with the engine support.
- Detach **TRACK ROD END FROM SWIVEL BEARING** .
- Detach **WISHBONE**.
- Detach **TRAILING LINK FROM GUIDE JOINT**.

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IMPORTANT: Secure swivel bearing against falling out.

Slacken nut (1).

Tightening torque **31 31 3AZ** .

Pull out screw (2) with cable clip (3) toward the rear.

Expand swivel bearing with special tool **31 2 230** .

Remove swivel bearing from spring strut.

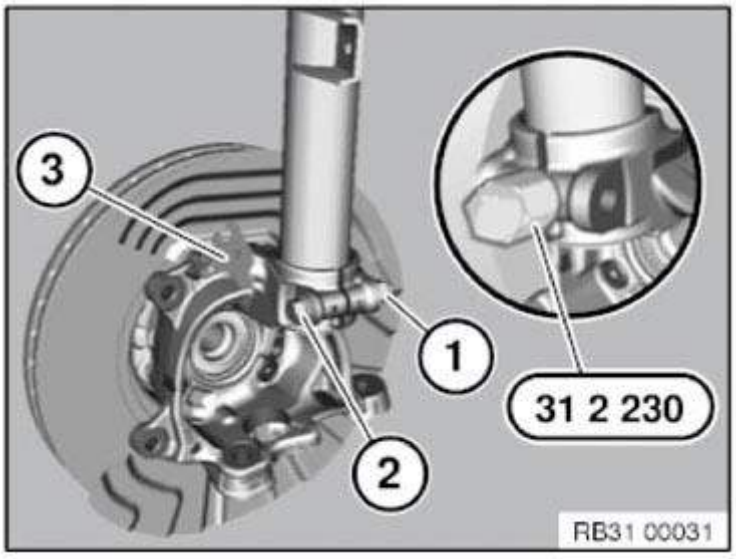


Fig. 48: Removing Swivel Bearing From Spring Strut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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

Screw head must face opposite to the direction of travel.

Replace screw and nut.

IMPORTANT: When replacing spring strut/swivel bearing, the tightening sequence must be adhered to.

Tightening sequence:

- Tighten using nut.
- Initial torque 40 Nm
- First torque 100 Nm, release nut by 120Â°
- This ensure the setting properties of the new parts.
- Tighten with the final torque.

  Tightening torque **31 31 3AZ** .

Installation note:

Align positioning pin (1) on spring strut to swivel bearing. Slide spring strut into swivel bearing to the limit position.

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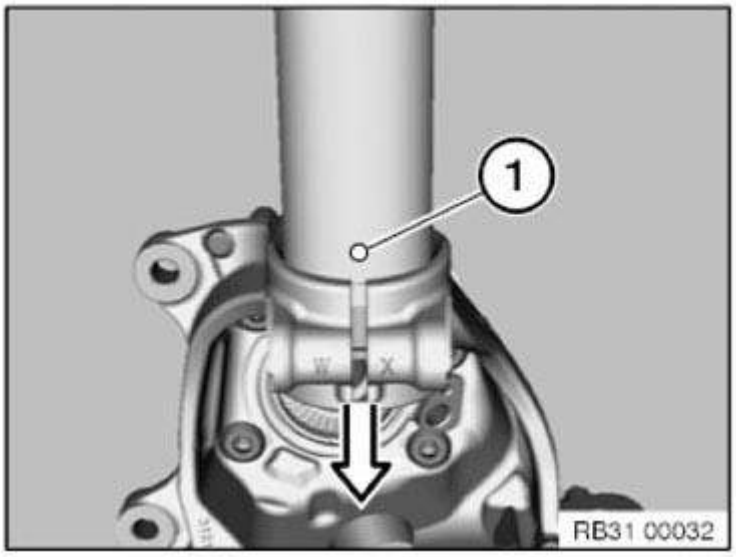


Fig. 49: Positioning Pin On Spring Strut To Swivel Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Modify **WHEEL BEARING** or replace if necessary.
- Modify **GUIDE JOINT** or replace if necessary.
- Modify **BRAKE ANCHOR PLATE/PROTECTIVE PLATE** or replace if necessary.

After installation:

- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

31 21 180 REPLACING BEARING FOR FRONT WHEEL

Necessary preliminary tasks:

- Remove **FRONT WHEEL** .

If necessary, remove visual protection cap (1).

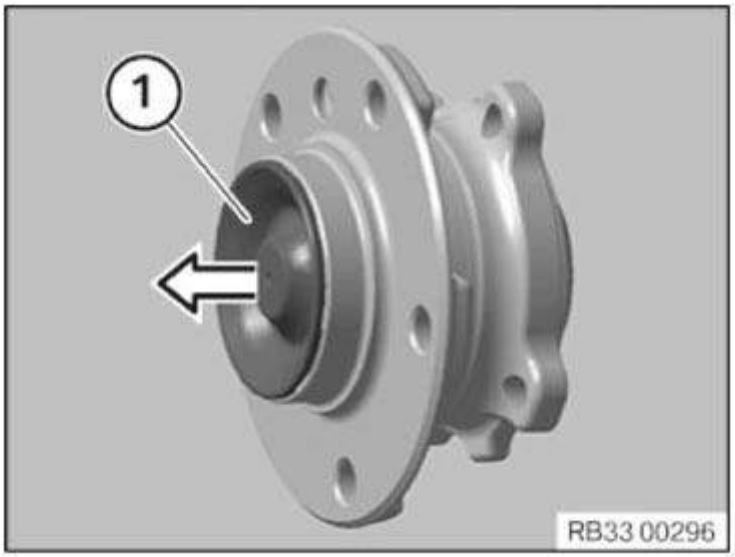


Fig. 50: Removing Visual Protection Cap

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Courtesy of BMW OF NORTH AMERICA, INC.

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

Tightening torque **31 60 2AZ** .

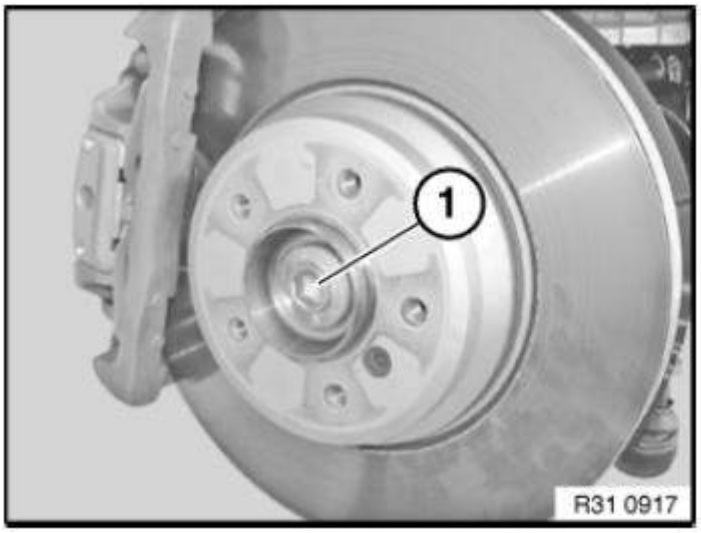


Fig. 51: Identifying Collar Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

- Renew collar bolt (1) and compression spring (2).
- Pay attention to installation position of compression spring (2).
- Keep collar bolt and spur toothing of bearing/propeller shaft clean and free of grease
- **Follow installation note of the spur gearing.**

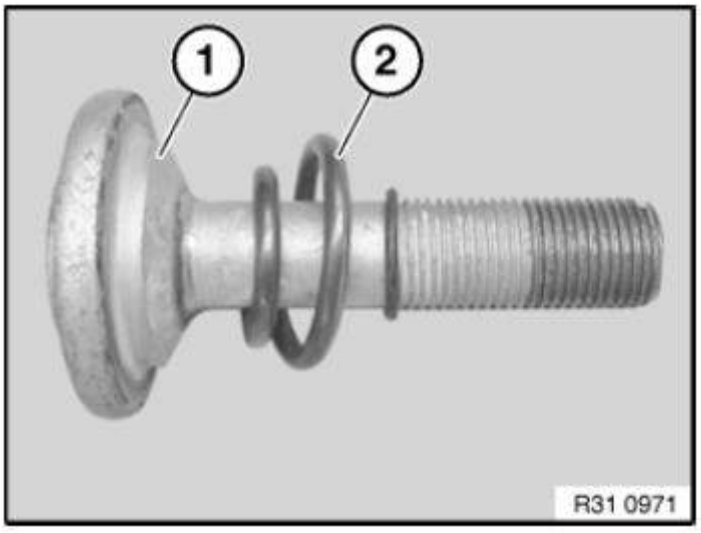


Fig. 52: Identifying Compression Spring And Collar Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Remove **BRAKE DISC** .

NOTE:

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

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Press output shaft on swivel bearing to one side slightly and release screws (1).

Tightening torque **31 21 1AZ** .

Remove bearing.

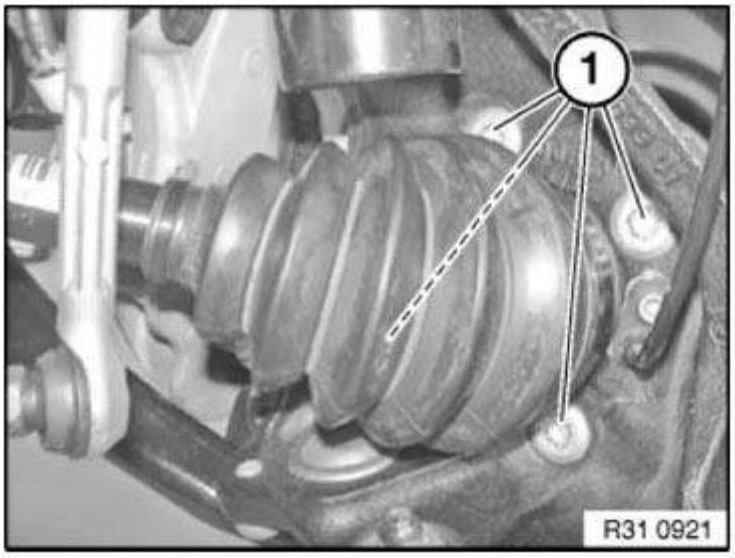


Fig. 53: Identifying Screws Of Output Shaft On Swivel Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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

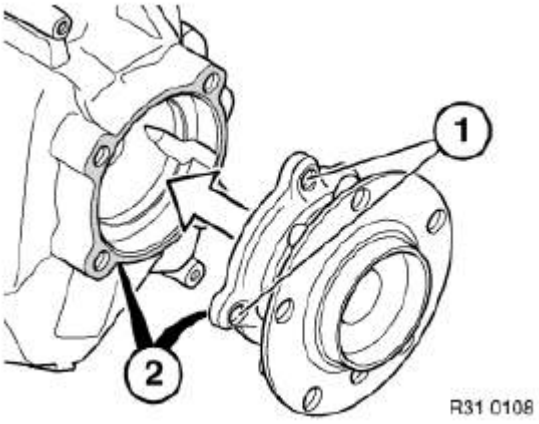


Fig. 54: Identifying Contact Surface Of Wheel And Swivel Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Note on installation for spur gearing must be observed without fail!

Installation note:

- Spur gearing of bearing (1) and output shaft (2) must be installed form-fit (tooth in tooth)!
- Tighten collar bolt and compression spring by hand.
- Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.
- Once a form-fit has been ensured, tighten to final torque.

  Tightening torque **31 60 2AZ** .

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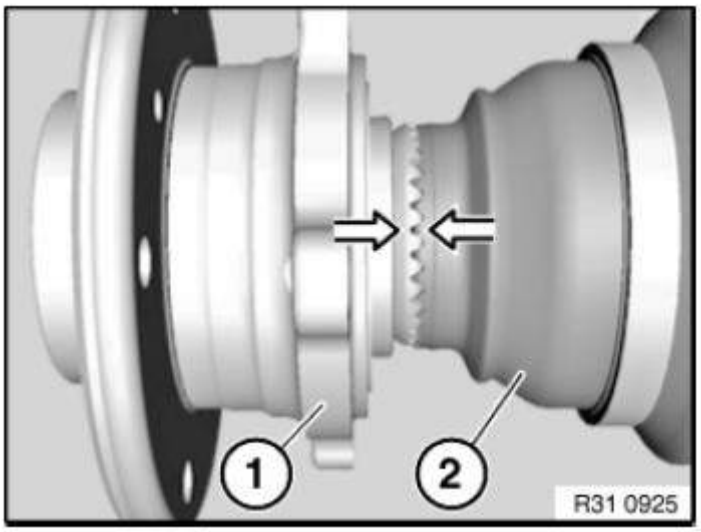


Fig. 55: Checking Spur Gearing Of Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

31 21 180 REPLACING WHEEL BEARING FOR FRONT WHEEL

Necessary preliminary tasks:

- Remove **FRONT WHEEL** .
- Remove **BRAKE DISC** .
  - Check brake pad and replace if necessary!

Release screws (1).

Tightening torque **31 21 1AZ** .

Remove wheel bearing.

Installation note:

Replace screws (1).

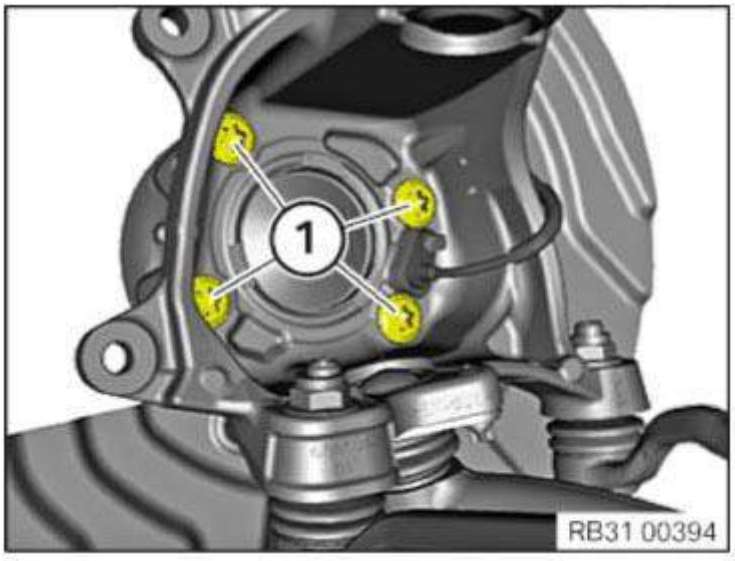


Fig. 56: Identifying Screws Of Wheel Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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

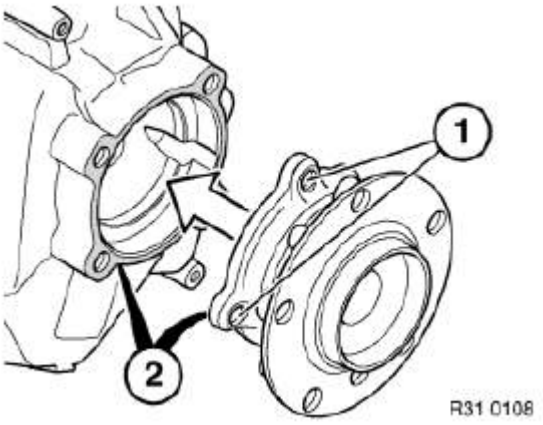


Fig. 57: Identifying Contact Surface Of Wheel And Swivel Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- 31 2 230

Installation note:

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

Necessary preliminary tasks:

- Detach OUTPUT SHAFT from wheel bearing and tie up.
- Remove BRAKE CALIPER and tie back.
- Remove BRAKE DISC .

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- Remove **ANTI-ROLL BAR LINK FROM SPRING STRUT**.
- Remove **TRACK ROD END FROM SWIVEL BEARING** .
- Detach **TRAILING LINK** from swivel bearing.
- Remove **WISHBONE**.
- Detach **WHEEL SPEED SENSOR** from swivel bearing and unclip line from spring strut.

IMPORTANT: Risk of damage!
When the output shaft is removed from the wheel bearing, the tripod (2) can be pulled out of the joint housing (1) and fall into the rubber gaiter (3). In this event, it will be necessary to install a new output shaft because the tripod (2) can jam or a roller of the tripod (2) can slip off the moulding. The roller would then be located in the gaiter (3) or bellows and result in rapid failure.

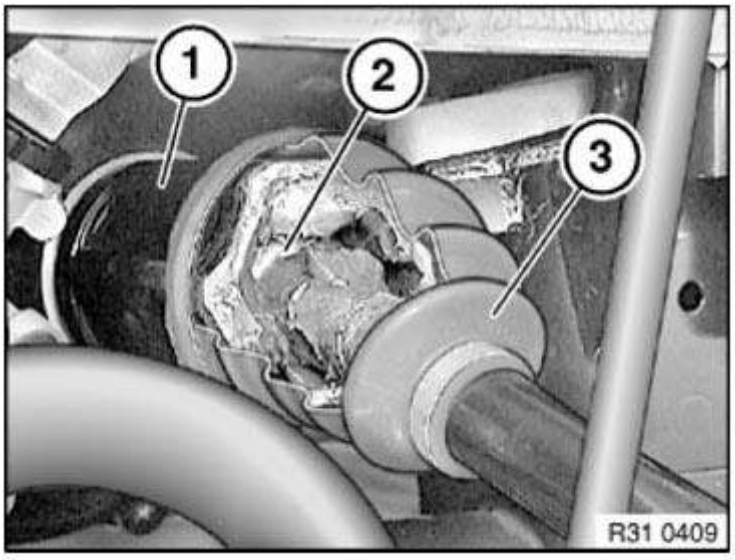


Fig. 58: Identifying Joint Housing, Tripod And Rubber Gaiter
Courtesy of BMW OF NORTH AMERICA, INC.

Secure spring strut against falling out.

Release screw (1) on strut.

Tightening torque **51 61 1AZ** .

Unfasten screws (2).

Installation note:

Replace screws.

For support bearings that have already been installed, do not use self-tapping screws.

Tightening torque **31 31 1AZ** .

If thread in support bearing is damaged, use **Helicoil thread insert** See **31 00... NOTES ON REPAIRING THREADS (B)** or **41 00... NOTES ON REPAIRING THREADS (A)**!

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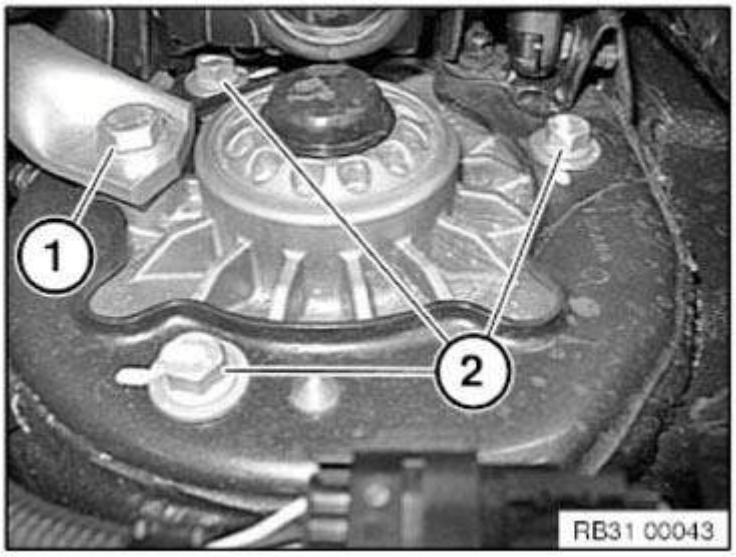


Fig. 59: Identifying Screws On Strut
Courtesy of BMW OF NORTH AMERICA, INC.

Remove spring strut with swivel bearing downwards out of wheel arch.

After installation:

- Perform **CHASSIS/WHEEL ALIGNMENT CHECK** .

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

Special tools required:

- **31 2 230**

Installation note:

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

Necessary preliminary tasks:

- Remove **BRAKE CALIPER** and tie back.
- Remove **BRAKE DISC** .
- Remove **ANTI-ROLL BAR LINK FROM SPRING STRUT**.
- Remove **TRACK ROD END FROM SWIVEL BEARING** .
- Detach **TRAILING LINK** from swivel bearing.
- Remove **WISHBONE**.
- Detach **WHEEL SPEED SENSOR** from swivel bearing and unclip line from spring strut.

Secure spring strut against falling out.

Release screw (1) on strut.

Tightening torque **51 61 1AZ** .

Unfasten screws (2).

Installation note:

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Replace screws.

For support bearings that have already been installed, do not use self-tapping screws.

Tightening torque **31 31 1AZ** .

If thread in support bearing is damaged, use **Helicoil thread insert** See **31 00... NOTES ON REPAIRING THREADS (B)** or **41 00... NOTES ON REPAIRING THREADS (A)**!

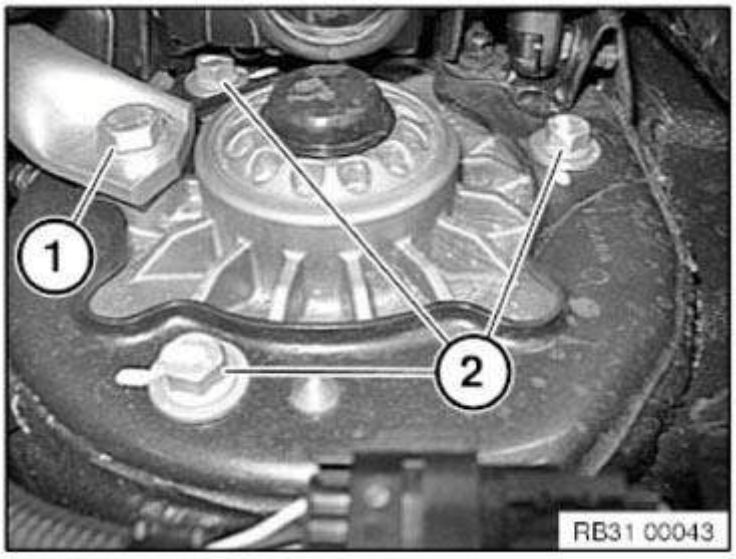


Fig. 60: Identifying Spring Strut And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Remove spring strut with swivel bearing downwards out of wheel arch.

After installation:

- Carry out **wheel alignment procedure** See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

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

Special tools required:

- **00 9 120**

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

Necessary preliminary tasks:

- Remove **COWL PANEL COVER** .

Release screws (1).

Lever out cable clip (2).

Remove cover (3).

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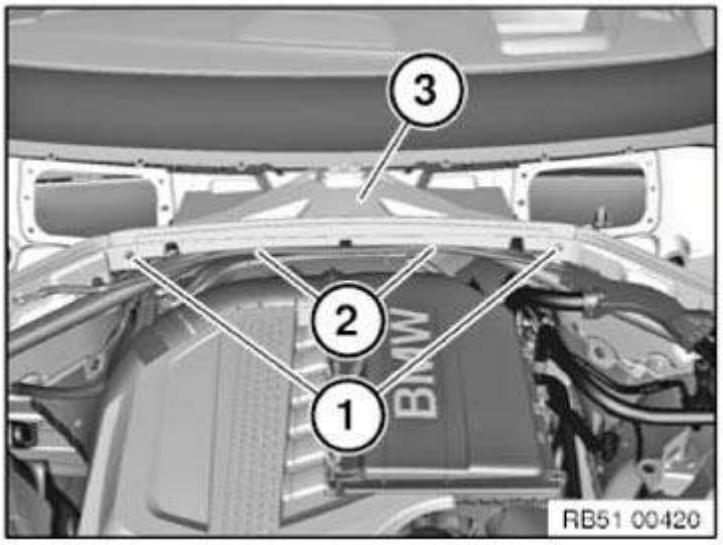


Fig. 61: Identifying Cable Clip, Screws And Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten cable clip (3).

Release screws (1).

Tightening torque **51 61 1AZ** .

Remove trailing link (2).

Installation note:

Replace screws (1), tighten to specified torque and then to angle of rotation.

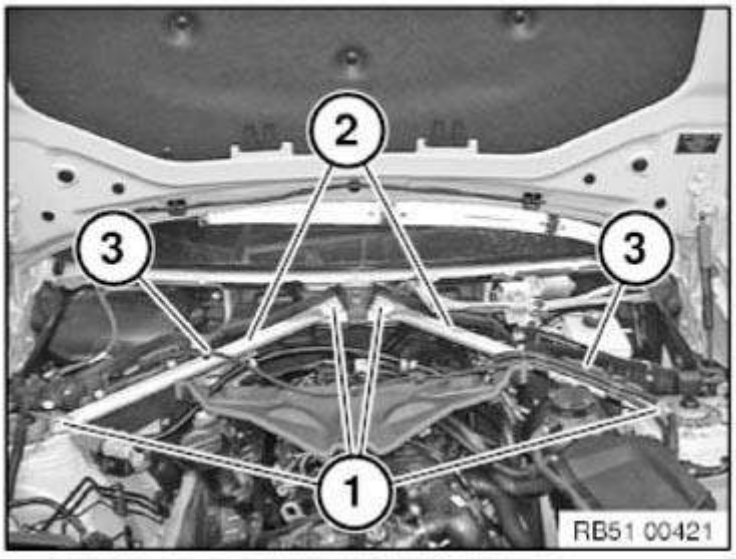


Fig. 62: Identifying Trailing Link, Screws And Cable Clip
Courtesy of BMW OF NORTH AMERICA, INC.

37 11 032 REPLACING FRONT LEFT OR RIGHT SPRING STRUT (EDC)

Special tools required:

- **31 3 340**
- **31 3 341**

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- **31 3 355**
- **33 0 040**
- 31 0 040

WARNING: **Prior to each use of special tool 31 3 340 , it is essential to read the associated operating instructions fully!**
All the safety precautions and instructions contained in the Owner's Handbook must be strictly observed!
Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!

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!

   Risk of damage inside the shock absorber!

7. Do not compress coil spring to full extent.

Necessary preliminary tasks:

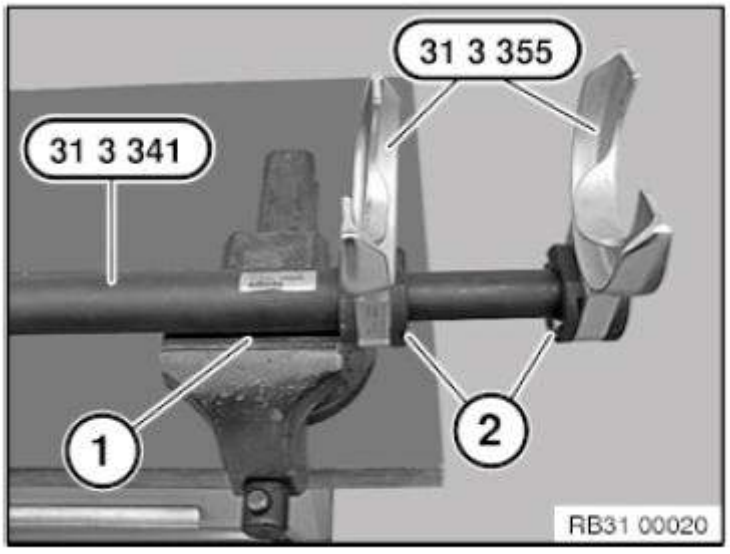
- Remove **FRONT SPRING STRUT** .

Removing:

Clamp special tool **31 3 341** with guide (1) in vice.

Fit special tools 31 3 355 from above on special tool **31 3 341** until retaining bolts (2) can be felt and heard to snap into place.

Check seating of special tools 31 3 355 and, if necessary, correct.



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Fig. 63: Removing Retaining Bolts
Courtesy of BMW OF NORTH AMERICA, INC.

Clean coil spring to remove all coarse dirt and mount on special tools **31 3 355** .

WARNING: **Coils of coil spring must be located completely in recesses of special tools 31 3 355!**

Tension coil spring with special tool **31 3 341** until stress on piston rod is relieved.

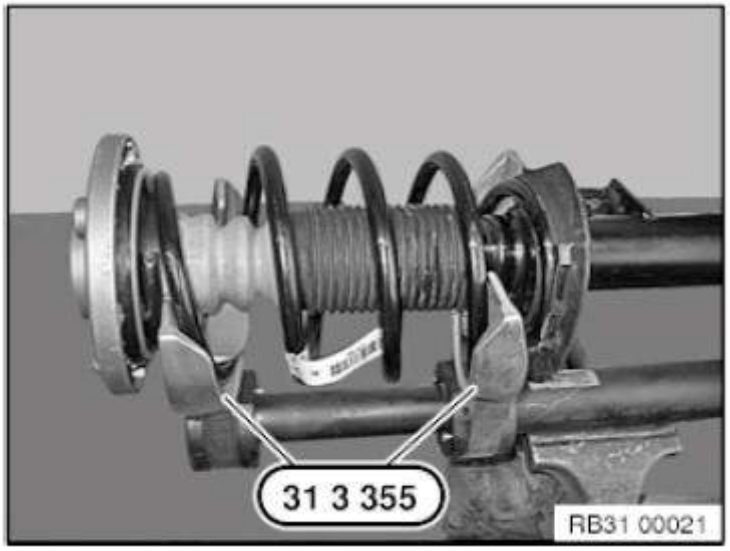


Fig. 64: Identifying Special Tools 31 3 355
Courtesy of BMW OF NORTH AMERICA, INC.

Take off cap.

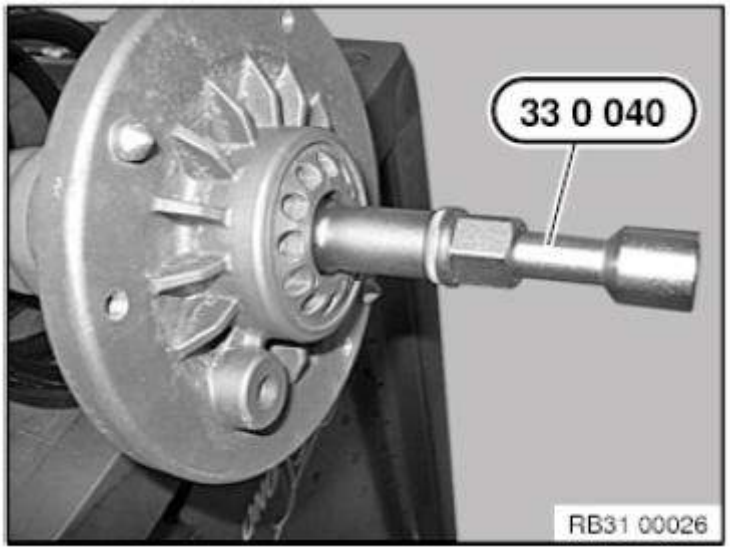
Release nut with special tool **33 0 040** (grip piston rod in the process).

Remove support bearing.

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

Installation note:

When renewing support bearing: Renew screws (self-tapping if necessary).



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Fig. 65: Removing Shock Absorber
Courtesy of BMW OF NORTH AMERICA, INC.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

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

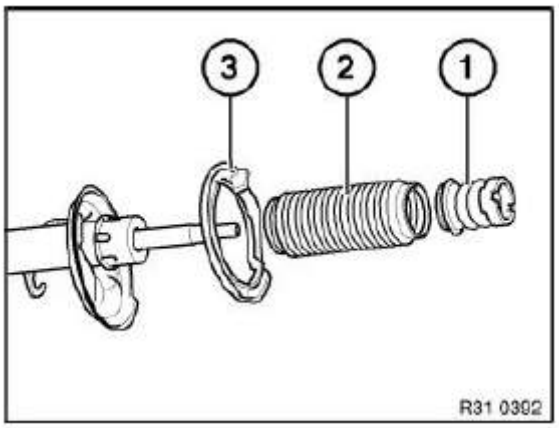


Fig. 66: Identifying Auxiliary Damper, Gaiter And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Remove **swivel bearing** . See **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** or **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** from spring strut.

Installation note:

When renewing spring strut/swivel bearing, follow tightening specifications!

Replace **swivel bearing** . See **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** or **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING**.

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

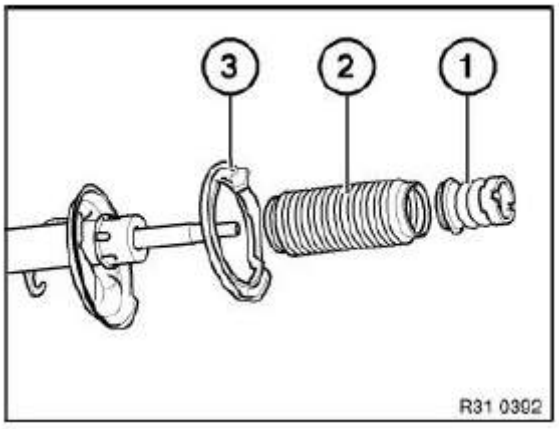


Fig. 67: Identifying Auxiliary Damper, Gaiter And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Align spring pad (3) with spring pad by way of recess (1).

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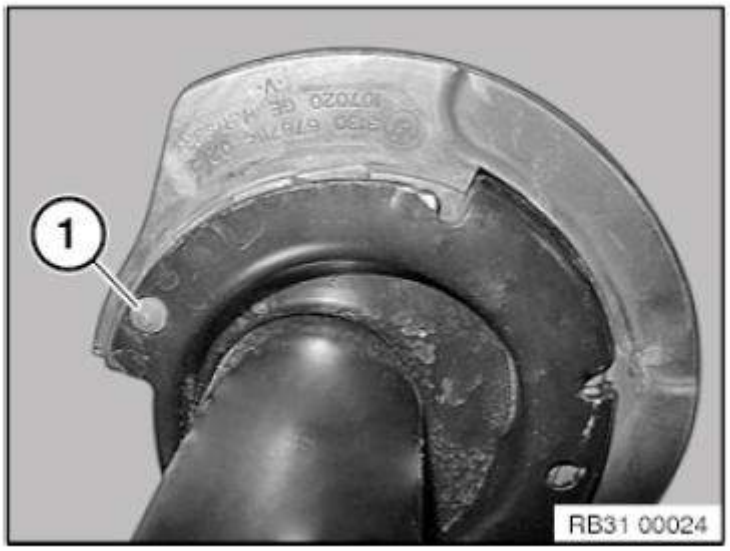


Fig. 68: Identifying Spring Pad Recess
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Align lower end of coil spring (1) flush with spring pad (2) as shown. Upper coil of coil spring must rest positively on spring cup!

Insert shock absorber in tensioned coil spring.

Relieve tension on coil spring.

Check installation position of gaiter, correct fold if necessary.

Fig. 69: Identifying Coil Spring And Pad
Courtesy of BMW OF NORTH AMERICA, INC.

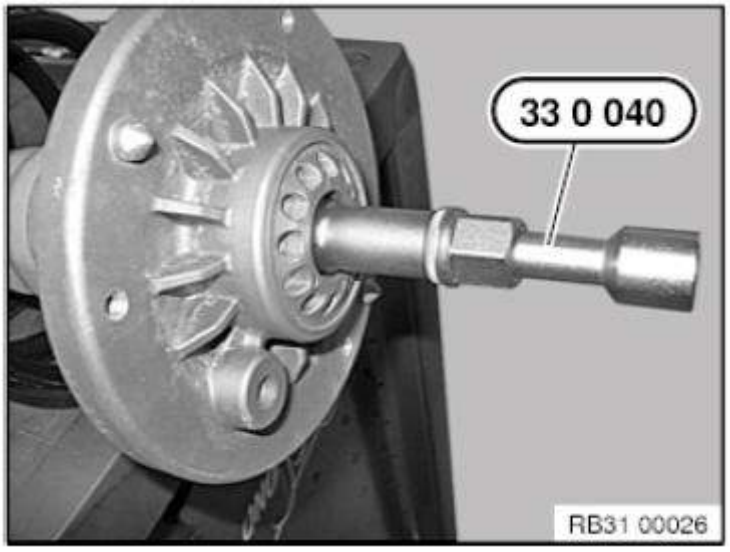
Check support bearing and spring pad for damage, replace if necessary.

Attach support bearing to piston rod.

Replace nut and tighten down with special tool 31 0 040 (grip piston rod in the process).

Tightening torque **31 31 2AZ** .

Fit cover cap.



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Fig. 70: Attaching Support Bearing To Piston Rod
Courtesy of BMW OF NORTH AMERICA, INC.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

After installation:

- Use the diagnosis system to perform the wheel speed accelerator sensor adjustment.

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

Special tools required:

- 31 3 340
- 31 3 341
- 31 3 355
- 33 0 040
- 31 0 040

WARNING: **Prior to each use of special tool 31 3 340, it is essential to read the associated Owner's Handbook fully!**
All the safety precautions and instructions contained in the Owner's Handbook must be strictly observed!
Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!

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!

   Risk of damage inside the shock absorber!

7. Do not compress coil spring to full extent.

Necessary preliminary tasks:

- Remove **front spring strut** See 31 31 000 REMOVING AND INSTALLING COMPLETE LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER or 31 31 000 REMOVING AND INSTALLING COMPLETE LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER.

Removing:

Clamp special tool 31 3 341 with guide (1) in vice.

Fit special tools 31 3 355 from above on special tool 31 3 341 until retaining bolts (2) can be felt and heard to snap into place.

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Check seating of special tools 31 3 355 and, if necessary, correct.

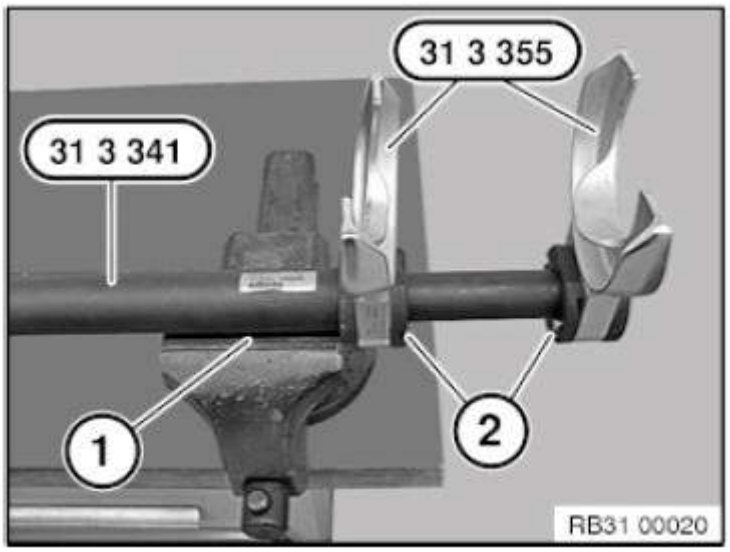


Fig. 71: Identifying Special Tools 31 3 355
Courtesy of BMW OF NORTH AMERICA, INC.

Clean coil spring to remove all coarse dirt and mount on special tools 31 3 355.

WARNING: Coils of coil spring must be located completely in recesses of special tools 31 3 355!

Tension coil spring with special tool **31 3 341** until stress on piston rod is relieved.

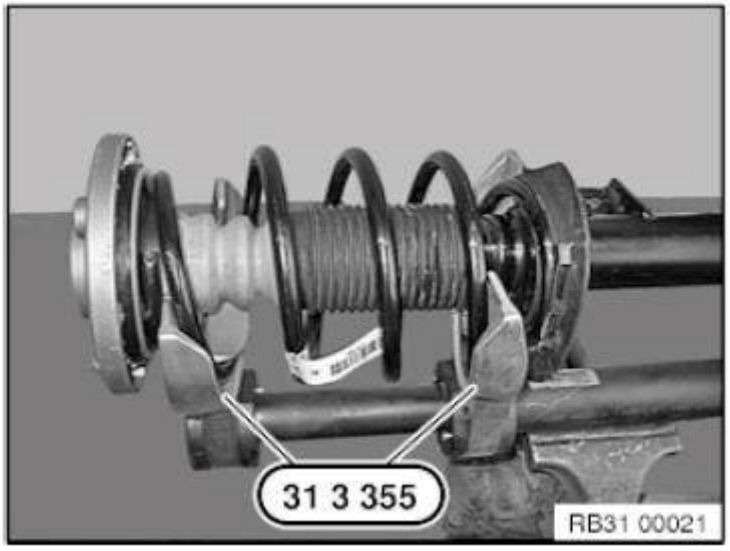


Fig. 72: Removing Tension Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Take off cap.

Release nut with special tool **33 0 040** (grip piston rod in the process).

Remove support bearing.

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

Installation note:

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When renewing support bearing: Renew screws (self-tapping if necessary).

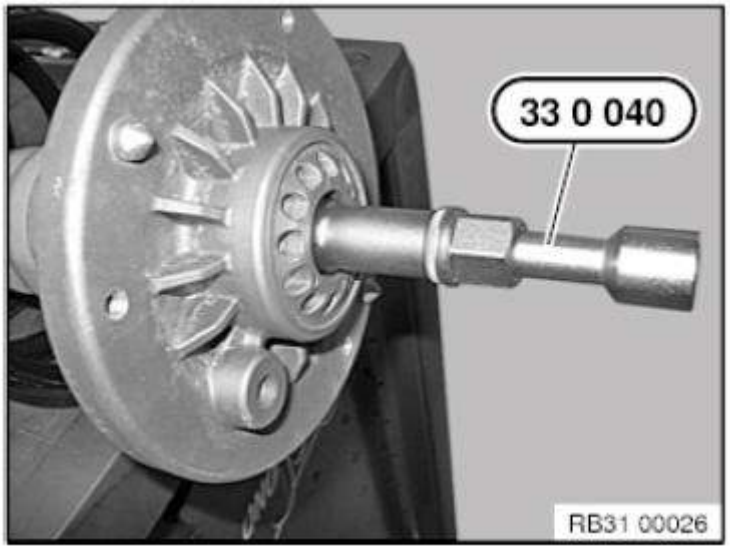


Fig. 73: Removing Support Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

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

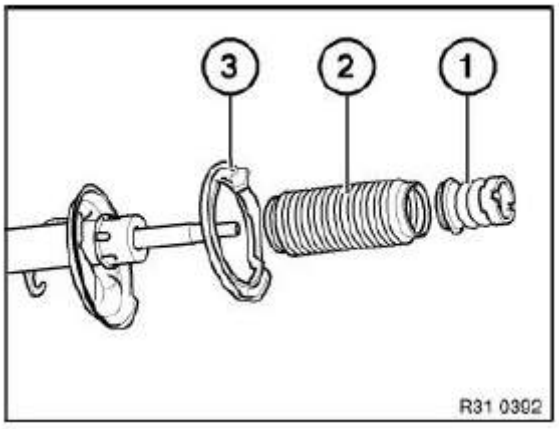


Fig. 74: Identifying Auxiliary Damper, Gaiter And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Relieve tension on coil spring and remove from special tools 31 3 355.

Fig. 75: Removing Tension On Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Remove **swivel bearing** . See **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** or **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING**.

Installation note:

When renewing spring strut/swivel bearing, follow tightening specifications!

Assembly:

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Accommodate coil spring with special tools 31 3 355.

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

WARNING: **Do not compress coil spring to full extent.**
Coils of coil spring must be located completely in recesses of special tools 31 3 355!

Tension coil spring.

Fig. 76: Identifying Special Tools 31 3 355
Courtesy of BMW OF NORTH AMERICA, INC.

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

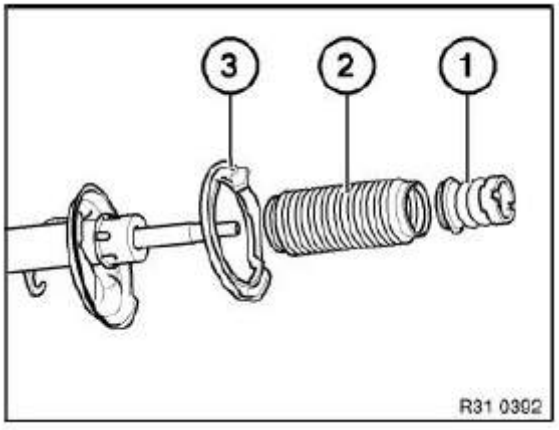


Fig. 77: Identifying Auxiliary Damper, Gaiter And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Align spring pad (3) with spring pad by way of recess (1).**

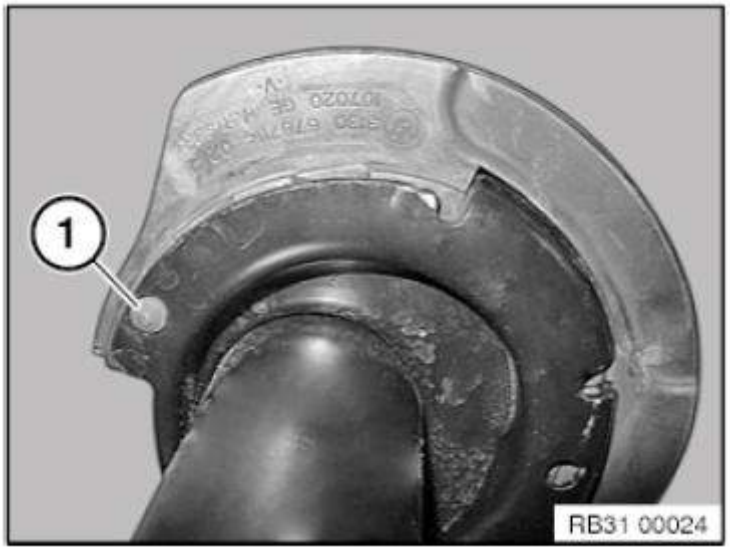


Fig. 78: Identifying Spring Pad Recess
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Align lower end of coil spring (1) flush with spring pad (2) as shown.
Upper coil of coil spring must rest positively on spring cup!

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Insert shock absorber in tensioned coil spring.

Relieve tension on coil spring.

Check installation position of gaiter, correct fold if necessary.

Fig. 79: Identifying Coil Spring And Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Check support bearing and spring pad for damage, replace if necessary.

Attach support bearing to piston rod.

Replace nut and tighten down with special tool 31 0 040 (grip piston rod in the process).

Tightening torque **31 31 2AZ** .

Fit cover cap.

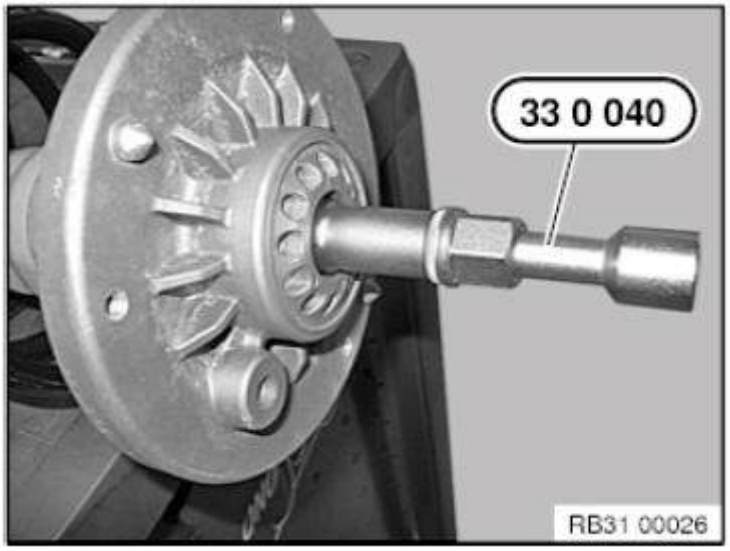


Fig. 80: Attaching Support Bearing To Piston Rod
Courtesy of BMW OF NORTH AMERICA, INC.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

SPRING WITH SUSPENSION

31 33... MEASURING VEHICLE RIDE HEIGHT

Determine actual ride height (A) - to do so, attach tape measure to rim flange (2) at bottom middle and measure to wheel arch lower edge (1).

Fig. 81: Checking Vehicle Ride Height
Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

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- 31 3 340
- **31 3 355**

Installation note:

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

Necessary preliminary tasks:

- Remove **FRONT SPRING STRUT** .

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

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

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.

Relieve tension on coil spring and remove from special tools 31 3 355.

Fig. 82: Removing Tension On Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Assembly:

Accommodate coil spring with special tools 31 3 355.

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

WARNING: **Do not compress coil spring to full extent.**
Coils of coil spring must be located completely in recesses of special tools 31 3 355!

Fig. 83: Twisting Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Tension coil spring.

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Further assembly:

See **REPLACING THE FRONT LEFT OR RIGHT SPRING STRUT**.

After installation:

- Check **HEADLIGHT ADJUSTMENT** , correct if necessary.

31 33 001 REMOVING AND REFITTING/REPLACING FRONT LEFT OR RIGHT SPRING STRUT BEARING

Installation note:

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

NOTE: **Procedure is described in REPLACING THE FRONT LEFT OR RIGHT SPRING STRUT.**

STABILIZER BAR

31 35 005 REMOVING AND INSTALLING ANTI-ROLL BAR LINK FOR LEFT OR RIGHT ANTI-ROLL BAR

Risk of damage!

IMPORTANT:
- Avoid bending the head of the anti-roll bar during assembly!
- An impact screwdriver must not be used!

Detach bracket for brake hose on spring strut.

IMPORTANT: When releasing push rod screw connections (1) and (3), it is essential to counterhold with a Torx tool.

Slacken nut (1).

Tightening torque **31 35 4AZ**

Release nut (3) and remove anti-roll bar link (2).

Tightening torque **31 35 3AZ**

Fig. 84: Identifying Screw Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Replace self-locking nuts.

31 35 000 REMOVING AND INSTALLING/REPLACING FRONT STABILIZER

IMPORTANT: To avoid complaints being made by the customer about noise, set the vehicle on its wheels and tighten down the stabilizer mounting to specified torque.

Necessary preliminary tasks:

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- Remove **fan cowl** . See **17 11 035 REMOVING AND INSTALLING/REPLACING FAN COWL WITH ELECTRIC FAN (N20, N55, N52T)** ,
- Remove N20, N47T, N55, N57: **CHARGE AIR COOLER** ,
- N52T, N55: Drain **COOLANT** ,
- N52T: Unlock and detach coolant hoses on bottom of radiator,
- Remove **ANTI-ROLL BAR LINKS FROM ANTI-ROLL BAR**.

N52T, N55:

Loosen screws on the coolant pipe (1).

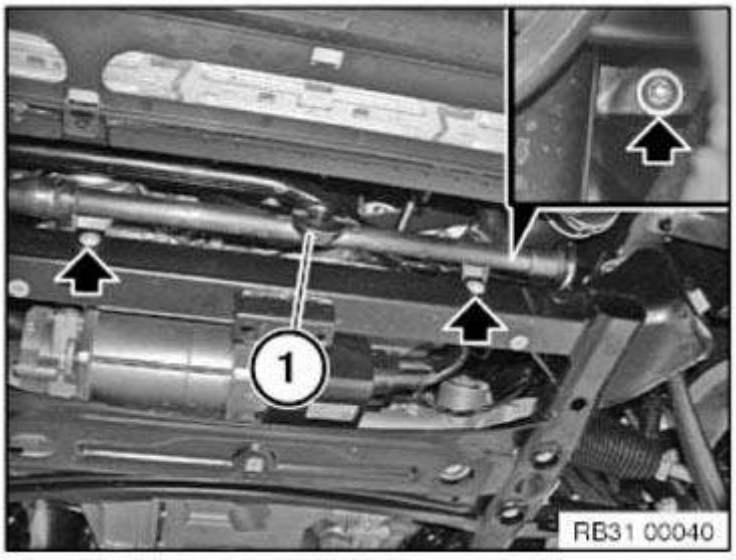


Fig. 85: Locating Screws On Coolant Pipe
Courtesy of BMW OF NORTH AMERICA, INC.

N52T, N55:

Unlock and detach coolant hose (1) from gearbox oil cooler (2).

Fig. 86: Identifying Coolant Hose And Gearbox Oil Cooler
Courtesy of BMW OF NORTH AMERICA, INC.

N52T, N55:

Unlock retaining clip (1). Pull the coolant hose (2) off the coolant thermostat (3).

Fig. 87: Identifying Retaining Clip, Coolant Hose And Thermostat
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque **31 35 1AZ**

Remove both retaining brackets of anti-roll bar (2).

Remove the anti-roll bar toward the bottom front.

Installation note:

Check rubber mount on both sides, replace anti-roll bar if necessary.

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Fig. 88: Identifying Retaining Brackets Of Anti-Roll Bar And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

N52T, N55:

- FILL AND BLEED COOLING SYSTEM .

FRONT AXLE GEARBOX

31 50... CHECK/CHANGE FRONT AXLE DIFFERENTIAL OIL

Special tools required:

- 00 2 080

IMPORTANT:	If oil is filled up to the lower edge of the oil filler opening, the front axle differential would be overfilled and in rare individual cases oil could emerge from the ventilation opening on the front axle differential. After draining front axle differential oil or when carrying out the initial filling of a new replacement front axle differential, the transmission must be filled with **600 ml** oil. Use only the approved front axle oil in the front axle differential. Failure to comply with this requirement will result in serious damage to the front axle differential!

NOTE: **Only change oil when front axle differential is at normal operating temperature.**

Necessary preliminary tasks:

- Remove REINFORCEMENT PLATE.

Checking and correcting the front axle differential oil level:

The front axle differential is subject to oil filling over its lifetime. An oil-level adjustment is not needed during a service. If there is a visible release of oil or after a repair to the front axle differential, follow the instructions in **Front axle differential oil replacement** .

Fig. 89: Identifying Oil Filler Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Changing front differential oil:

Place oil collecting apparatus underneath.

Remove oil drain plug (1).

Tightening torque 31 50 2AZ .

Drain front axle differential oil.

Screw in oil drain plug (1) and tighten.

Undo oil filler plug (2).

Tightening torque 31 50 2AZ .

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Fill **600 ml** of transmission oil. (if necessary, use measuring cup and special tool **00 2 080**)

Fig. 90: Identifying Oil Filler And Drain Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Replace the oil drain plug and oil filler plug.

31 50 001 REMOVING AND INSTALLING/REPLACING FRONT AXLE DIFFERENTIAL

IMPORTANT: For the initial filling of a new replacement front axle differential, the gearbox is filled with **600 ml** oil! If oil is filled up to the lower edge of the oil filler opening, the gearbox would be overfilled and in rare individual cases oil could emerge from the ventilation opening on the front axle differential.

WARNING: **Danger to life!**
SECURE ENGINE IN INSTALLATION POSITION to prevent it from falling down.

Necessary preliminary tasks:

- Secure **ENGINE IN INSTALLATION POSITION** .
- Drain and dispose of **FRONT DIFFERENTIAL OIL**.
- **REMOVE** left output shaft.
- **REMOVE** right output shaft.
- **REMOVE** front propeller shaft.
- Lower **FRONT AXLE SUPPORT**.

IMPORTANT: Grip front axle differential firmly while releasing last bolt in order to avoid damage caused by the differential falling.

Release screws (1, 2).

Remove front axle differential downwards.

Installation note:

During removal and installation: Replace **O-RING**.

Coat O-ring with front axle differential oil.

Make sure screws are installed in correct positions.

- Screws (1) M12x55
- Screw (2) M12x105

Tightening torque **31 50 1AZ** .

Check **OIL LEVEL IN FRONT AXLE DIFFERENTIAL**, correct if necessary.

Fig. 91: Identifying Screws Of Front Axle Differential Oil
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

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- Fill **FRONT AXLE DIFFERENTIAL WITH OIL**.
- Check **OIL LEVEL IN TRANSFER BOX**, correct if necessary.
- Replacement only:
  - Check vent line, replace if necessary.

31 51 060 REPLACING O-RING FOR FRONT AXLE DIFFERENTIAL ON RIGHT

Necessary preliminary work:

- **REMOVE FRONT AXLE DIFFERENTIAL**.

Remove O-ring (1) with a suitable tool from front axle differential.

Installation note:

Insert O-ring (1) in groove and coat with front axle differential oil.

Fig. 92: Identifying O-Ring
Courtesy of BMW OF NORTH AMERICA, INC.

31 51 010 REPLACING RADIAL SEAL FOR DRIVE FLANGE OF FRONT DIFFERENTIAL

Special tools required:

- **23 0 020**
- 31 5 130
- **33 1 150**

Necessary preliminary work:

- Remove **REINFORCEMENT PLATE**.
- Remove **FRONT PROPELLER SHAFT** .

Mark position of nut with respect to shaft with punch marks (arrow).

Lever out retainer (1) with a suitable tool.

Fig. 93: Locating Retainer
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!
Do **not** place special tool on threaded holes of drive flange.

Secure drive flange with special tool **23 0 020** against turning and release nut (1).

Fig. 94: Securing Drive Flange
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!
Mount special tool only with longer screws (M10x30) on drive flange.

Pull drive flange off drive shaft with special tool **33 1 150** .

Fig. 95: Pulling Drive Flange Drive Shaft

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Courtesy of BMW OF NORTH AMERICA, INC.

Lever radial shaft seal (1) out of front differential with a suitable screwdriver (2).

Fig. 96: Removing Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Drive in radial shaft seal with special tool 31 5 130 as far as it will go.

Coat sealing lips of new radial shaft seal (1) with front axle oil.

Fig. 97: Identifying Special Tool 31 5 130
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!
Do not tighten nut beyond punch marks. Otherwise the clamping sleeve will be damaged.

Clean drive flange and attach.

Tighten down nut until punch marks on nut and shaft are aligned.

Install new retainer (1).

Fig. 98: Locating Retainer
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check **FRONT AXLE GEARBOX OIL LEVEL**, correct if necessary.

31 51 015 REPLACING RADIAL SHAFT SEAL FOR OUTPUT SHAFT, LEFT

Special tools required:

- 31 5 130

Necessary preliminary work:

- Remove **LEFT OUTPUT SHAFT**.

Lever radial shaft seal (1) with a screwdriver (2) out of front axle differential (3).

Fig. 99: Removing Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Protective sleeve (1) serves to protect the sealing lips of radial shaft seal (2) from being damaged when the output shaft is inserted into the front axle differential.

Fig. 100: Identifying Protective Sleeve And Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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Drive in radial shaft seal with special tool 31 5 130 as far as it will go.

Fig. 101: Removing/Installing Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check **FRONT AXLE GEARBOX OIL LEVEL**, correct if necessary.

DIFFERENTIAL WITH BEARINGS

31 53 040 REMOVING AND INSTALLING/REPLACING RIGHT OUTPUT SHAFT BEARING BLOCK

Necessary preliminary work:

- Remove **RIGHT OUTPUT SHAFT**.

Release screws (1).

Remove bearing block from oil sump.

Installation note:

Replace **O-RING**.

Tightening torque **31 60 1AZ** .

Fig. 102: Identifying Bearing Block Screws
Courtesy of BMW OF NORTH AMERICA, INC.

31 51 065 REPLACING O-RING FOR BEARING BLOCK

Necessary preliminary work:

- Remove **BEARING SUPPORT**.

Remove O-ring (1) with a suitable tool from bearing block (2).

Installation note:

Insert O-ring (1) in groove and coat with front axle differential oil.

Fig. 103: Identifying O-Ring And Bearing Block
Courtesy of BMW OF NORTH AMERICA, INC.

31 51 020 REPLACING RADIAL SHAFT SEAL FOR OUTPUT SHAFT, RIGHT

Special tools required:

- 31 5 130

Necessary preliminary work:

- Remove **RIGHT OUTPUT SHAFT**.

Lever radial shaft seal (1) with a screwdriver (2) out of bearing block (3).

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Fig. 104: Removing Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Protective sleeve (1) serves to protect the sealing lips of radial shaft seal (2) from being damaged when the output shaft is inserted into the bearing block.

Fig. 105: Identifying Protective Sleeve And Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Drive in radial shaft seal with special tool 31 5 130 as far as it will go.

Fig. 106: Identifying Special Tool 31 5 130
Courtesy of BMW OF NORTH AMERICA, INC.

OUTPUT SHAFT

31 60... NOTES ON REMOVING AND INSTALLING LOW PROFILE BAND CLAMPS

Special tools required:

- 31 5 200

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

Fig. 107: Identifying Low Profile Band Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

Removing:

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

NOTE: Make sure that the movable piece (3) of the special tool is placed on lug (1).

Fig. 108: Identifying Special Tool 31 5 200
Courtesy of BMW OF NORTH AMERICA, INC.

Compress Low Profile band clamp with special tool 31 5 200 until end of band clamp (1) lifts up.

Relieve tension on special tool and remove Low Profile band clamp.

Fig. 109: Compressing Low Profile Band Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

Assembly:

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

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

NOTE: Make sure that the movable piece (3) of the special tool is placed on lug (1).

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Fig. 110: Positioning Low Profile Band Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

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

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

Relieve tension on special tool and remove.

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

Fig. 111: Compressing Low Profile Band Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

31 60 000 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT OUTPUT SHAFT

Special tools required:

- **31 5 110**

NOTE: **If the wishbone is detached from the front axle support, it will be necessary to carry out the wheel alignment procedure.**

Necessary preliminary tasks:

- Remove **FRONT WHEEL** .
- Remove front **UNDERBODY PROTECTION**.
- Remove **ANTI-ROLL BAR LINK FROM ANTI-ROLL BAR**.

IMPORTANT:
- The radial shaft seal for the output shaft should be replaced every time the output shaft is removed and installed.

IMPORTANT: Circlip (1) in the bearing support/front differential must be replaced when fitting the output shaft!

Fig. 112: Identifying Circlip
Courtesy of BMW OF NORTH AMERICA, INC.

If necessary, remove visual protection cap (1).

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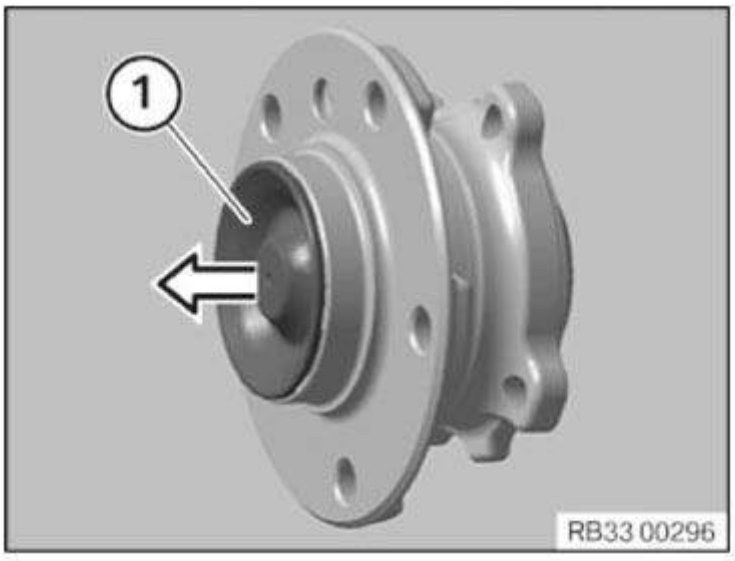


Fig. 113: Removing Visual Protection Cap
Courtesy of BMW OF NORTH AMERICA, INC.

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

Tightening torque **31 60 2AZ** .

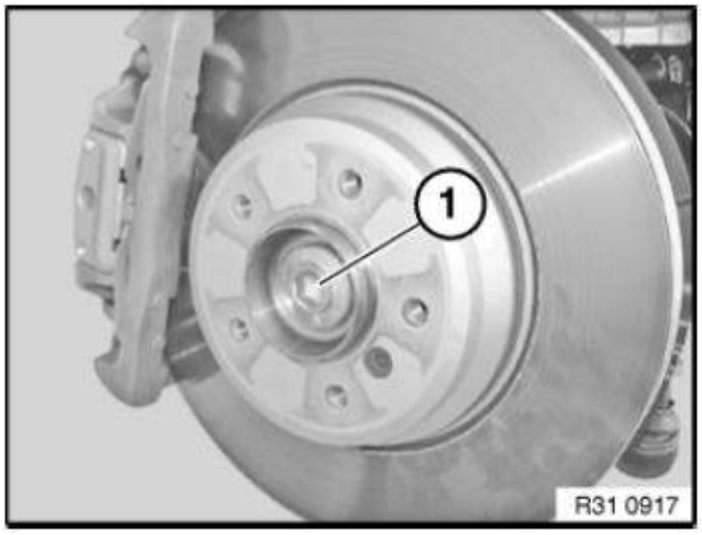


Fig. 114: Identifying Collar Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

- Renew collar bolt (1) and compression spring (2).
- Pay attention to installation position of compression spring (2).
- Keep collar bolt and spur toothing of bearing/propeller shaft clean and free of grease
- **Follow installation note of the spur gearing.**

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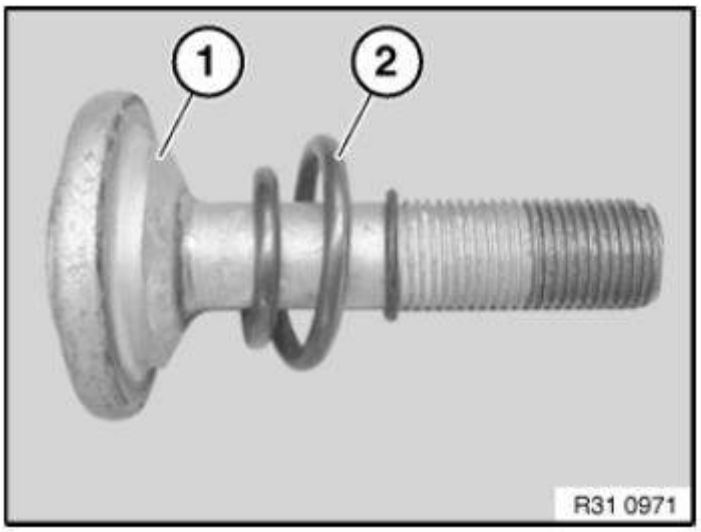


Fig. 115: Identifying Compression Spring And Collar Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Note on installation must be observed without fail!

Installation note:

- Spur gearing of bearing (1) and output shaft (2) must be installed form-fit (tooth in tooth)!
- Tighten collar bolt and compression spring by hand.
- Check whether spur gearing is locked tooth in tooth by reciprocally rotating wheel hub/output shaft.
- Once a form-fit has been ensured, tighten to final torque.

Tightening torque **31 60 2AZ** .

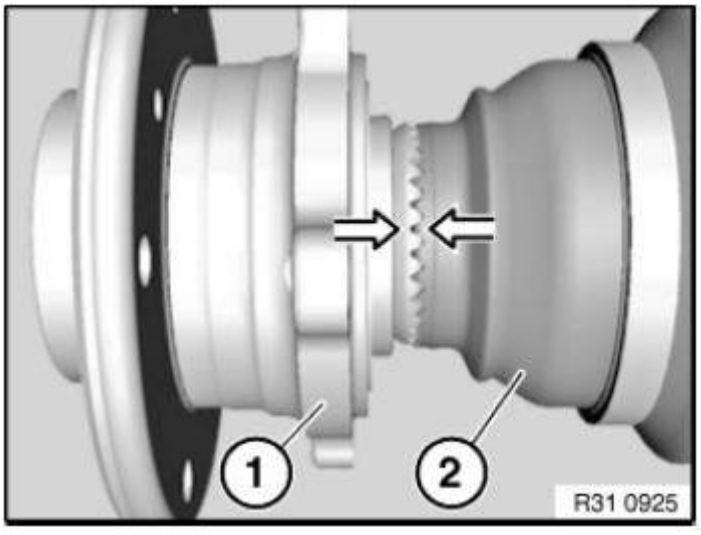


Fig. 116: Checking Spur Gearing Of Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

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

Release **WISHBONE ON FRONT AXLE CARRIER**.

Turn swivel bearing to one side.

Remove output shaft from swivel bearing/wheel bearing.

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Front differential:

Knock out output shaft (2) from the front axle differential with an aluminium drift (1).

Installation note:

Renew **RADIAL SHAFT SEAL IN FRONT AXLE DIFFERENTIAL**.

Coat sealing lips with front differential oil.

Replace circlip and slide in output shaft, overcoming resistance of circlip. Output shaft must snap audibly into place.

IMPORTANT: High installation forces indicate that the gearing on the output shaft/rear axle final drive side gear are damaged/deformed!
Check gearing and replace components if damaged.

Fig. 117: Removing Output Shaft With Aluminium Drift
Courtesy of BMW OF NORTH AMERICA, INC.

bearing support:

Press output shaft with special tool **31 5 110** out of bearing support and remove.

Installation note:

Replace **SHAFT SEAL IN BEARING SUPPORT** and coat sealing lips with front differential oil.

Replace circlip and slide in output shaft, overcoming resistance of circlip. Output shaft must snap audibly into place.

Fig. 118: Pressing Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: High installation forces indicate that the gearing on the output shaft/rear axle final drive side gear are damaged/deformed!
Check gearing and replace components if damaged.

After installation:

- Check **OIL LEVEL IN FRONT AXLE DIFFERENTIAL**, correct if necessary.
- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

31 60 530 REPLACING AN OUTPUT SHAFT GAITER (ON TRANSMISSION SIDE) (OUTPUT SHAFT REMOVED)

NOTE: **Procedure is described in BOTH OUTPUT SHAFT GAITERS.**

31 51 015 REPLACING RADIAL SHAFT SEAL FOR OUTPUT SHAFT, LEFT

Special tools required:

- 31 5 130

Necessary preliminary work:

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- Remove **LEFT OUTPUT SHAFT**.

Lever radial shaft seal (1) with a screwdriver (2) out of front axle differential (3).

Fig. 119: Removing Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Protective sleeve (1) serves to protect the sealing lips of radial shaft seal (2) from being damaged when the output shaft is inserted into the front axle differential.

Fig. 120: Identifying Protective Sleeve And Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Drive in radial shaft seal with special tool 31 5 130 as far as it will go.

Fig. 121: Installing Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check **FRONT AXLE GEARBOX OIL LEVEL**, correct if necessary.

31 51 020 REPLACING RADIAL SHAFT SEAL FOR OUTPUT SHAFT, RIGHT

Special tools required:

- 31 5 130

Necessary preliminary work:

- Remove **RIGHT OUTPUT SHAFT**.

Lever radial shaft seal (1) with a screwdriver (2) out of bearing block (3).

Fig. 122: Removing Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Protective sleeve (1) serves to protect the sealing lips of radial shaft seal (2) from being damaged when the output shaft is inserted into the bearing block.

Fig. 123: Identifying Protective Sleeve And Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Drive in radial shaft seal with special tool 31 5 130 as far as it will go.

Fig. 124: Identifying Special Tool 31 5 130
Courtesy of BMW OF NORTH AMERICA, INC.

31 60 535 REPLACING TWO GAITERS ON OUTPUT SHAFT(S) (OUTPUT SHAFT(S) REMOVED)

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Grip output shaft (1) in vice with aluminium clamping jaws.

NOTE:

2 = Joint, wheel side
3 = Joint, transmission side

Fig. 125: Removing Gaiters On Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Replacing gaiter of joint on wheel side:

Release **LOW PROFILE CLIP** (1) and clip (2).

Pull back rubber gaiter (3).

Installation note:

Feed gaiter (3) into groove of joint.

Fig. 126: Removing Low Profile Clip
Courtesy of BMW OF NORTH AMERICA, INC.

Press off joint (1) via contact pressure of circlip on shaft (2).

Installation note:

Replace circlip.

Push on joint until circlip can be heard to snap into place.

Fig. 127: Identifying Circlip On Shaft And Joint Of Via Contact Pressure
Courtesy of BMW OF NORTH AMERICA, INC.

Lift out circlip (1).

Installation note:

Install retaining ring (1).

Fig. 128: Identifying Circlip
Courtesy of BMW OF NORTH AMERICA, INC.

Pull off gaiter (1) over shaft (2).

Carefully clean all components with a cloth.

NOTE: Re-grease constant velocity joint with the grease from the repair kit.

Fig. 129: Pulling Off Gaiter
Courtesy of BMW OF NORTH AMERICA, INC.

Replacing gaiter of joint on gearbox side:

Release band clamps (1, 2).

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Pull back rubber gaiter (3).

Detach joint housing (4).

Installation note:

Feed gaiter (3) into groove of joint housing (4).

Align band clamp (1) so that hook fastener is as at flat end of joint housing (4).

Fig. 130: Releasing Band Clamps
Courtesy of BMW OF NORTH AMERICA, INC.

Remove circlip (1).

Installation note:

Install retaining ring (1).

Detach tripod element (2) from shaft (3).

Pull off gaiter over shaft (3).

Carefully clean all components with a cloth.

Fig. 131: Identifying Retaining Ring, Circlip And Tripod Element
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Flat side (2) of tripod element (1) must point to circlip.

NOTE: Re-grease constant velocity joint (tripod element) with the grease from the repair kit.

Fig. 132: Identifying Tripod Element And Flat Side
Courtesy of BMW OF NORTH AMERICA, INC.

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FRONT AXLE

2156275 ADAPTER

2156275 Adapter AM

NOTE: **Adapter M4 (Ã˜ 96mm) in connection with adapter kit 2 (BMW), (81642155746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 1: Identifying Adapter (2156275)
Courtesy of BMW OF NORTH AMERICA, INC.

2348434 ADAPTER

2348434 Adapter AM

NOTE: **Adapter R7 (M24/Ã˜ 87/95mm) in connection with adapter kit F03 (81 64 2 348 804) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 02 13 (900)

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Fig. 2: Identifying Adapter (2348434)
Courtesy of BMW OF NORTH AMERICA, INC.

2343999 ADAPTER

2343999 Adapter AM

NOTE: **Adapter P5 (/Ã˜ 45/82.5mm) in connection with wheel bearing adapter kit F30 (84mm, no longer in Catalogue) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 09 12 (873)



Fig. 3: Identifying Adapter (2343999)
Courtesy of BMW OF NORTH AMERICA, INC.

2156280 ADAPTER

2156280 Adapter AM

NOTE: **Adapter N1 (Ã˜ 49mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 06 09 (544)



Fig. 4: Identifying Adapter (2156280)
Courtesy of BMW OF NORTH AMERICA, INC.

2344000 ADAPTER

2344000 Adapter AM

NOTE: **Adapter R6 (M24/Ã˜ 63/75mm) in connection with adapter kit F30 (84mm wheel bearings) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 09 12 (873)



Fig. 5: Identifying Adapter (2344000)
Courtesy of BMW OF NORTH AMERICA, INC.

2156277 ADAPTER

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2156277 Adapter AM

NOTE: **Adapter N4 (Ã˜ 39mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 6: Identifying Adapter (2156277)
Courtesy of BMW OF NORTH AMERICA, INC.

0491982 ADAPTER

0491982 315090 Adapter Mechanical tool

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



Fig. 7: Identifying Adapter (0491982)
Courtesy of BMW OF NORTH AMERICA, INC.

0495821 ADAPTER

0495821 315255 Adapter AM

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

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SI number

01 24 06 (309)

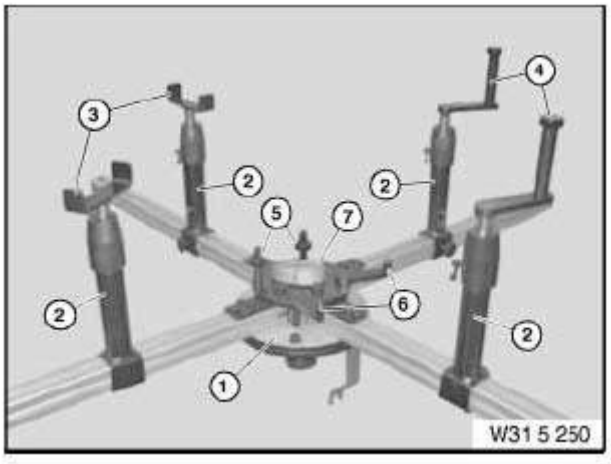


Fig. 8: Identifying Adapter (0495821)
Courtesy of BMW OF NORTH AMERICA, INC.

2159723 ADAPTER

2159723 Adapter AM

NOTE: **Adapter M2 (Ã˜ 88mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 9: Identifying Adapter (2159723)
Courtesy of BMW OF NORTH AMERICA, INC.

2348435 ADAPTER

2348435 Adapter AM

NOTE: **Adapter M8 for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 06 09 (544)

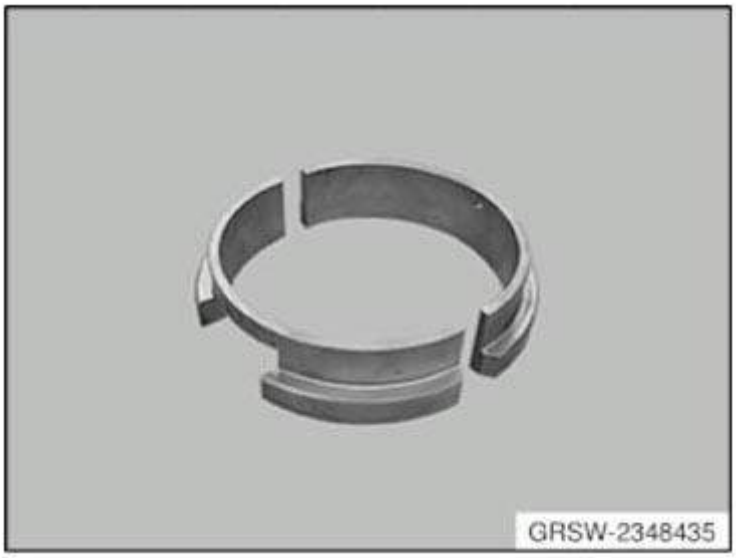


Fig. 10: Identifying Adapter (2348435)
Courtesy of BMW OF NORTH AMERICA, INC.

2156282 ADAPTER

2156282 Adapter AM

NOTE: **Adapter P3 (Ã˜ 39/72mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

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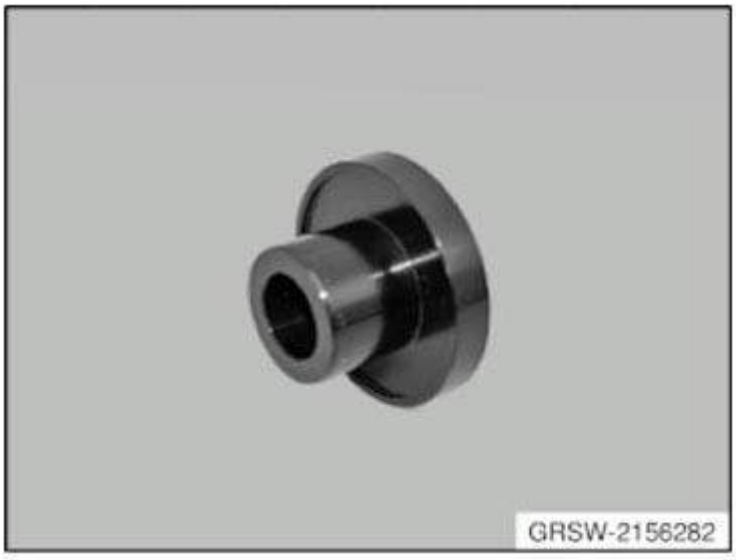


Fig. 11: Identifying Adapter (2156282)
Courtesy of BMW OF NORTH AMERICA, INC.

2156288 ADAPTER

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2156288 Adapter AM

NOTE: **Adapter R3 (M24/Ã˜ 69/79mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

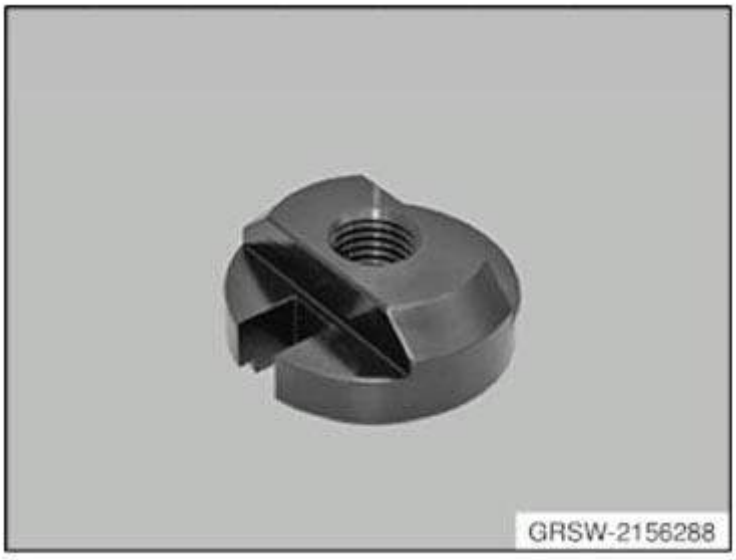


Fig. 12: Identifying Adapter (2156288)
Courtesy of BMW OF NORTH AMERICA, INC.

2348436 ADAPTER

2348436 Adapter AM

NOTE: **Adapter R8 (M24/Ã˜ 74/83mm) in connection with adapter kit F03 (81642348804) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 02 13 (900)



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Fig. 13: Identifying Adapter (2348436)
Courtesy of BMW OF NORTH AMERICA, INC.

2348432 ADAPTER

2348432 Adapter AM

NOTE: **Adapter P6 (/Ã˜ 51/89mm) in connection with adapter kit F03 (81 64 2 348 804) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 02 13 (900)



Fig. 14: Identifying Adapter (2348432)
Courtesy of BMW OF NORTH AMERICA, INC.

2156284 ADAPTER

2156284 Adapter AM

NOTE: **Adapter P1 (Ã˜ 45/85mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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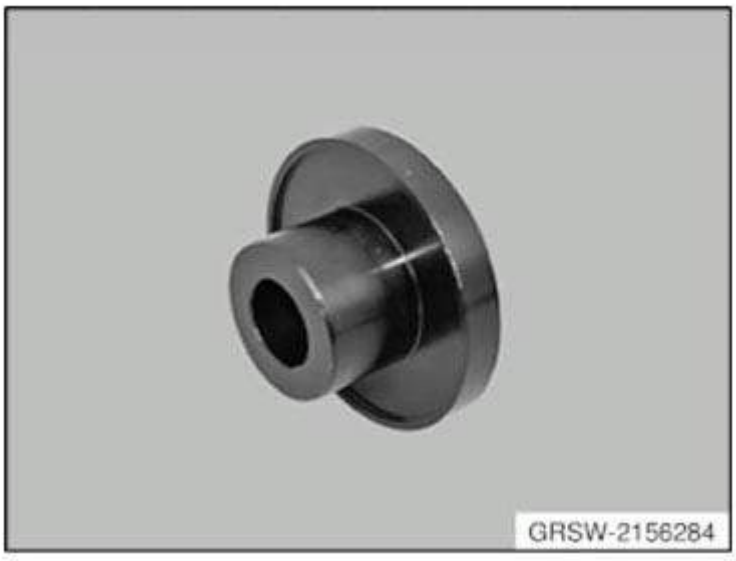


Fig. 15: Identifying Adapter (2156284)
Courtesy of BMW OF NORTH AMERICA, INC.

2156283 ADAPTER

2156283 Adapter AM

NOTE: **Adapter P4 (Ã˜ 42/75 mm) in combination with adapter kit 2 BMW (81 64 2 155 746) for removing and installing wheel bearings, output shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 16: Identifying Adapter (2156283)
Courtesy of BMW OF NORTH AMERICA, INC.

2318661 ADAPTER

2318661 Adapter AM

NOTE: **Adapter Z1 to attach torque wrench. Used in connection with hydraulic cylinder, (81642156246), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 04 12 (797)

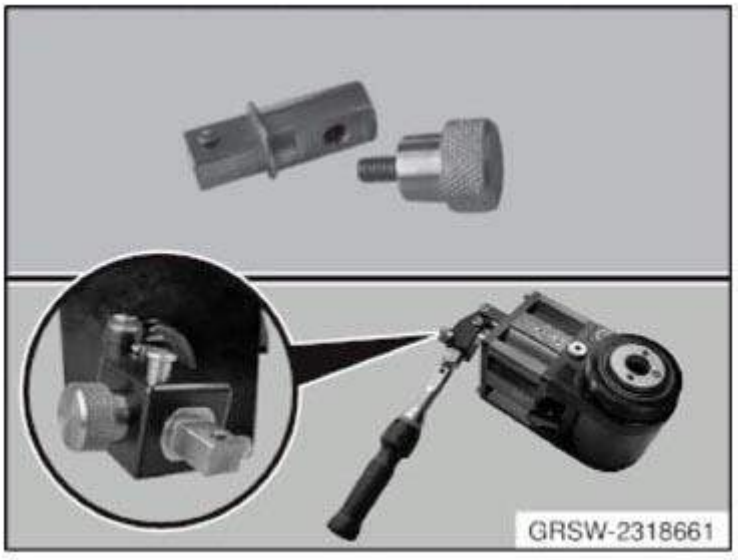


Fig. 17: Identifying Adapter (2318661)
Courtesy of BMW OF NORTH AMERICA, INC.

2348804 ADAPTER

2348804 Adapter AM

NOTE: **Adapter set F03 as a supplement to the hydraulic tool for removal and installation of wheel bearings, output shafts and drive flanges.**

SI number

08 02 13 (900)

Consisting of:

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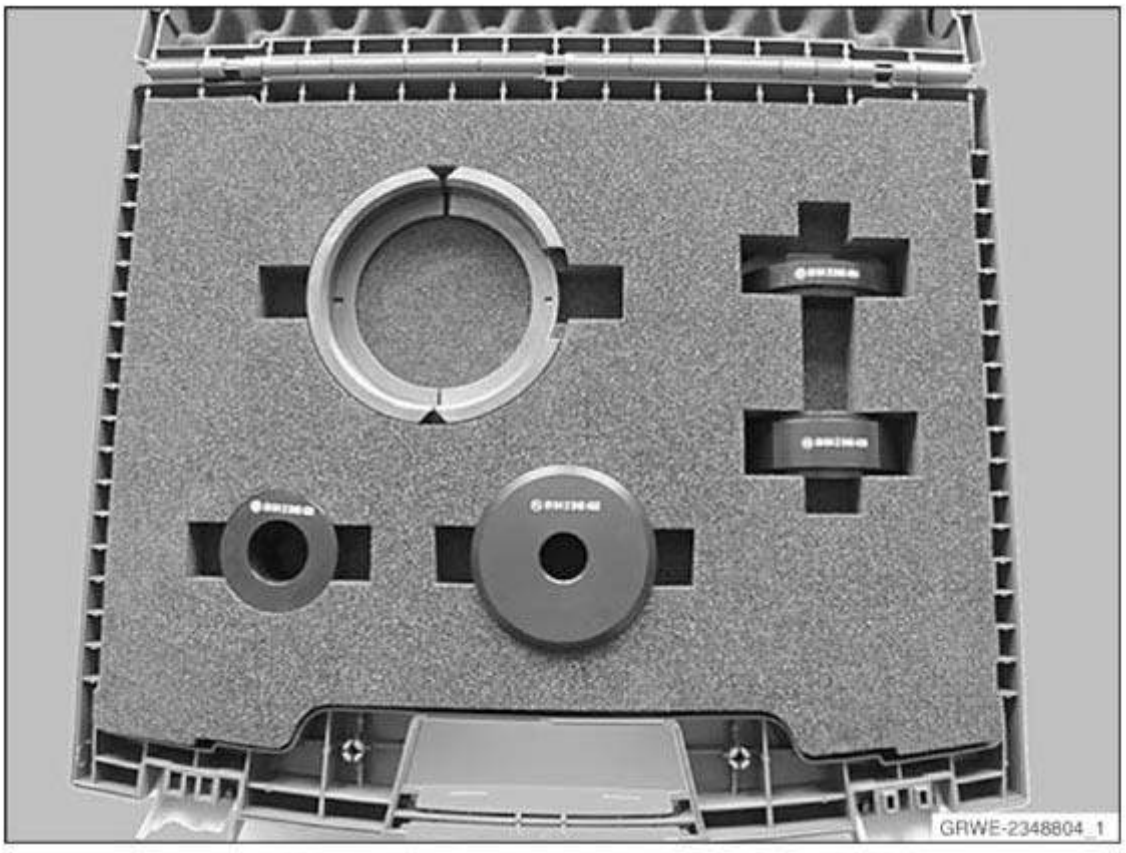


Fig. 18: Identifying Adapter (2348804)
Courtesy of BMW OF NORTH AMERICA, INC.

1 = 2348430
3 = 2348432
5 = 2348434
4 = 2348436
2 = 2348431

2156287 ADAPTER

2156287 Adapter AM

NOTE: **Adapter R4 (M24/Ã˜ 64/75mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 19: Identifying Adapter (2156287)
Courtesy of BMW OF NORTH AMERICA, INC.

2156289 ADAPTER

2156289 Adapter AM

NOTE: **Adapter R2 (M24 tapered) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 20: Identifying Adapter (2156289)
Courtesy of BMW OF NORTH AMERICA, INC.

2159722 ADAPTER

2159722 Adapter AM

NOTE: **Adapter M6 (Ã˜ 102/113mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 06 09 (544)



Fig. 21: Identifying Adapter (2159722)
Courtesy of BMW OF NORTH AMERICA, INC.

0495819 ADAPTER

0495819 315253 Adapter AM

NOTE: **(take-up adapter U-section (2 x))**

SI number

01 24 06 (309)

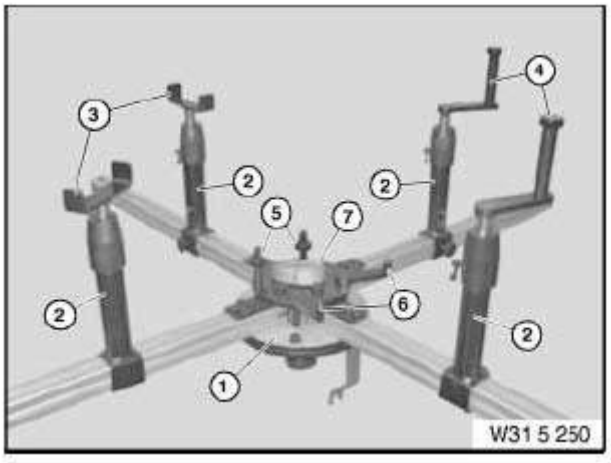


Fig. 22: Identifying Adapter (0495819)
Courtesy of BMW OF NORTH AMERICA, INC.

2348431 ADAPTER

2348431 Adapter AM

NOTE: **Adapter N5 (/Ã˜ 51mm) in connection with adapter kit F03 (81642348804) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

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SI number

08 02 13 (900)



Fig. 23: Identifying Adapter (2348431)
Courtesy of BMW OF NORTH AMERICA, INC.

2159985 ADAPTER

2159985 Adapter AM

NOTE: **Adapter H2 (tooth finder) in combination with adapter kit 1 BMW (81 64 2 155 745) for removal and installation of wheel bearings, output shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 24: Identifying Adapter (2159985)
Courtesy of BMW OF NORTH AMERICA, INC.

2156279 ADAPTER

2156279 Adapter AM

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NOTE: **Adapter N2 (Ã˜ 45mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 25: Identifying Adapter (2156279)
Courtesy of BMW OF NORTH AMERICA, INC.

2156285 ADAPTER

2156285 Adapter AM

NOTE: **Adapter P2 (Ã˜ 49/90mm) in connection with adapter kit 2 (BMW) and adapter kit 3 RR for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 26: Identifying Adapter (2156285)

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Courtesy of BMW OF NORTH AMERICA, INC.

2156253 ADAPTER

2156253 Adapter AM

NOTE: **Adapter B1 in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 27: Identifying Adapter (2156253)
Courtesy of BMW OF NORTH AMERICA, INC.

2156286 ADAPTER

2156286 Adapter AM

NOTE: **Adapter R5 (M24/Ã˜ 59/70mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 28: Identifying Adapter (2156286)
Courtesy of BMW OF NORTH AMERICA, INC.

2156278 ADAPTER

2156278 Adapter AM

NOTE: **Adapter N3 (Ã˜ 42mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 29: Identifying Adapter (2156278)
Courtesy of BMW OF NORTH AMERICA, INC.

2156273 ADAPTER

2156273 Adapter AM

NOTE: **Adapter M5 (Ã˜ 90mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 06 09 (544)



Fig. 30: Identifying Adapter (2156273)
Courtesy of BMW OF NORTH AMERICA, INC.

2159721 ADAPTER

2159721 Adapter AM

NOTE: **Adapter M1 (Ã˜ 100/101mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 31: Identifying Adapter (2159721)
Courtesy of BMW OF NORTH AMERICA, INC.

0495822 ADAPTER

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0495822 315256 Adapter AM

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

SI number

01 24 06 (309)

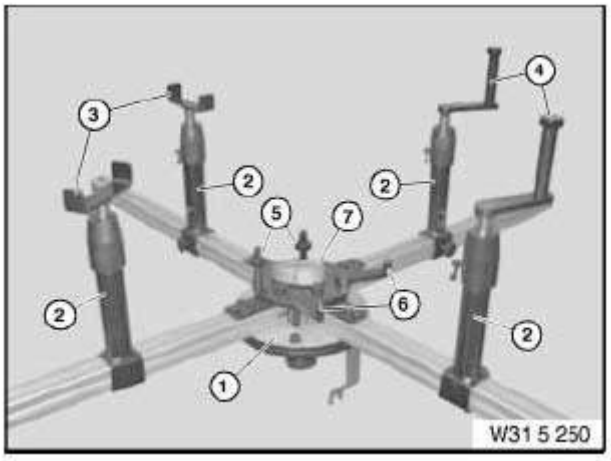


Fig. 32: Identifying Adapter (0495822)
Courtesy of BMW OF NORTH AMERICA, INC.

2156276 ADAPTER

2156276 Adapter AM

NOTE: **Adapter M3 (Ã˜ 102mm) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 06 09 (544)



Fig. 33: Identifying Adapter (2156276)
Courtesy of BMW OF NORTH AMERICA, INC.

2156256 ADAPTER

2156256 Adapter AM

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NOTE: **Adapter G3 (M27x1.5/M20) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 34: Identifying Adapter (2156256)
Courtesy of BMW OF NORTH AMERICA, INC.

0494628 ADAPTER

0494628 312158 Adapter Minimum set: Mechanical tools AM

NOTE: **(Adapter feet) Series: E46**

Storage Location

A7

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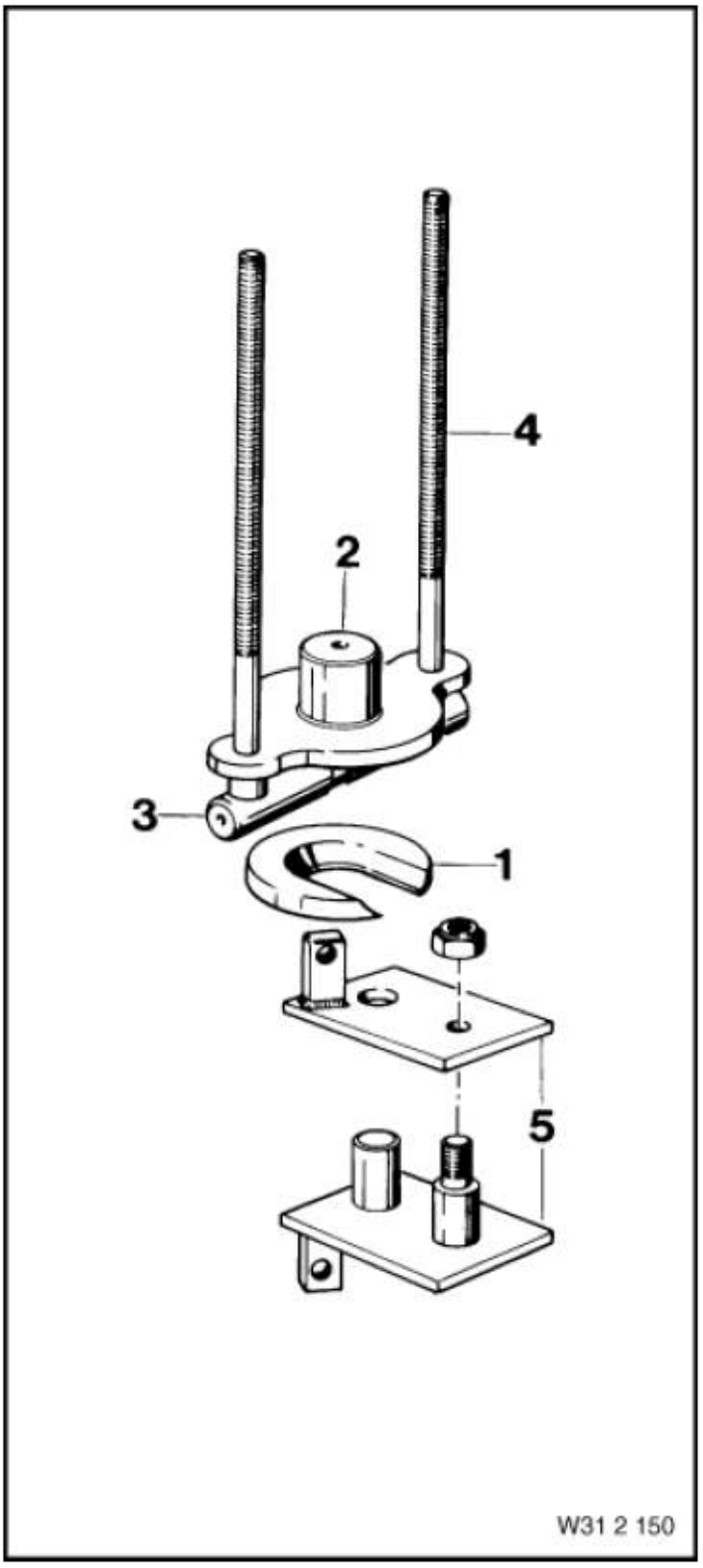


Fig. 35: Identifying Adapter (0494628)
Courtesy of BMW OF NORTH AMERICA, INC.

0495820 ADAPTER

0495820 315254 Adapter AM

NOTE: **(take-up adapter (2 x))**

SI number

01 24 06 (309)

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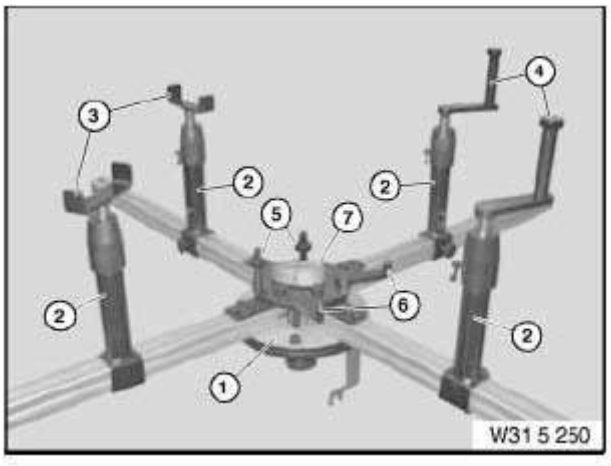


Fig. 36: Identifying Adapter (0495820)
Courtesy of BMW OF NORTH AMERICA, INC.

2156260 ADAPTER

2156260 Adapter AM

NOTE: **Adapter E2 (M24) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 37: Identifying Adapter (2156260)
Courtesy of BMW OF NORTH AMERICA, INC.

2156257 ADAPTER

2156257 Adapter AM

NOTE: **Adapter G2 (M24x1.5/M20) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

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Fig. 38: Identifying Adapter (2156257)
Courtesy of BMW OF NORTH AMERICA, INC.

2358630 ADAPTER

2358630 Adapter AM

NOTE: **Adapter for workshop jack for screwing-on at existing 120 mm hole-circle diameter and new 112 mm hole-circle diameter on wheel hub. Contour-graphic silhouette foil is included in delivery specification.**

Storage Location

B74

A74

SI number

01 21 14 (110)



Fig. 39: Identifying Adapter (2358630)
Courtesy of BMW OF NORTH AMERICA, INC.

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2159724 ADAPTER

2159724 Adapter AM

NOTE: **Adapter R1 (M24/Ã˜ 77/82mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 40: Identifying Adapter (2159724)
Courtesy of BMW OF NORTH AMERICA, INC.

2159720 ADAPTER

2159720 Adapter AM

NOTE: **Adapter G1 (M22x1.5/M20) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 41: Identifying Adapter (2159720)
Courtesy of BMW OF NORTH AMERICA, INC.

0495817 BASIC BODY

0495817 315251 Basic body AM

NOTE: **(Basic body) No longer available separately, only via special tool set 31 5 250 (83 30 0 495 567)**

SI number

01 24 06 (309)

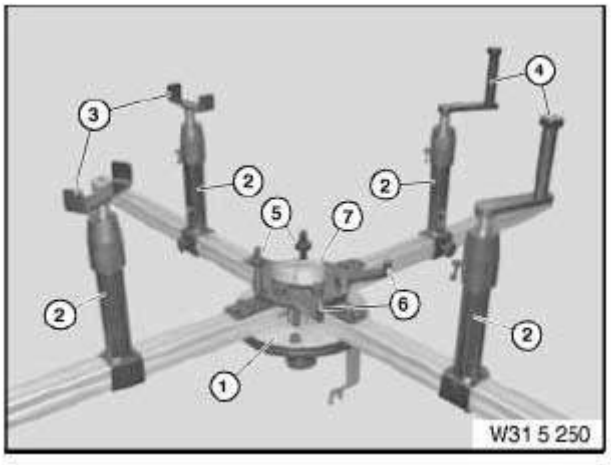


Fig. 42: Identifying Basic Body (0495817)
Courtesy of BMW OF NORTH AMERICA, INC.

0496294 BASIC BODY

0496294 315231 Basic body AM

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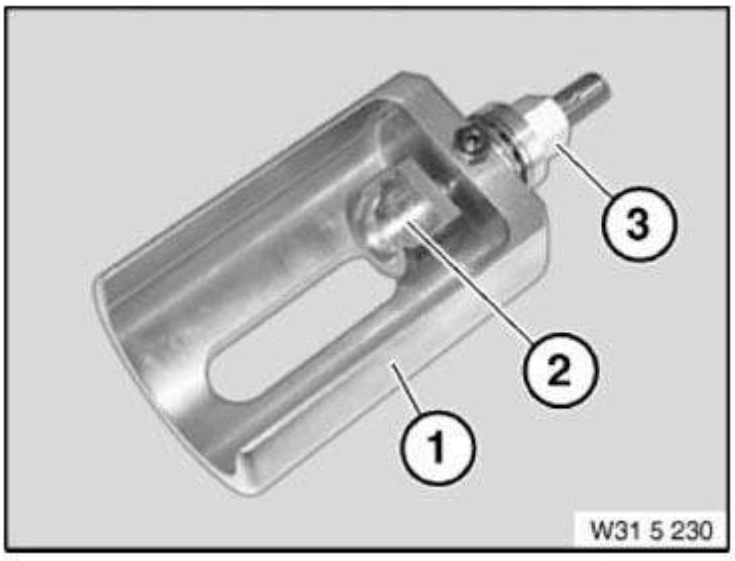


Fig. 43: Identifying Basic Body (0496294)
Courtesy of BMW OF NORTH AMERICA, INC.

0491882 BASIC BODY

0491882 311441 Basic body AM

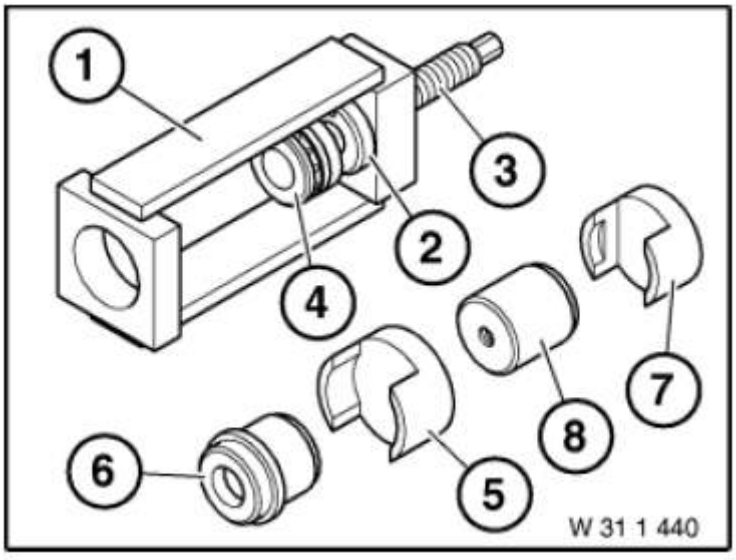


Fig. 44: Identifying Basic Body (0491882)
Courtesy of BMW OF NORTH AMERICA, INC.

0496962 BATTERY

0496962 Battery Minimum set: Mechanical tools AM

NOTE: commercially available battery 3V lithium (CR 123A)

0491885 BEARING

0491885 311444 Bearing AM

NOTE: (Thrust bearing)

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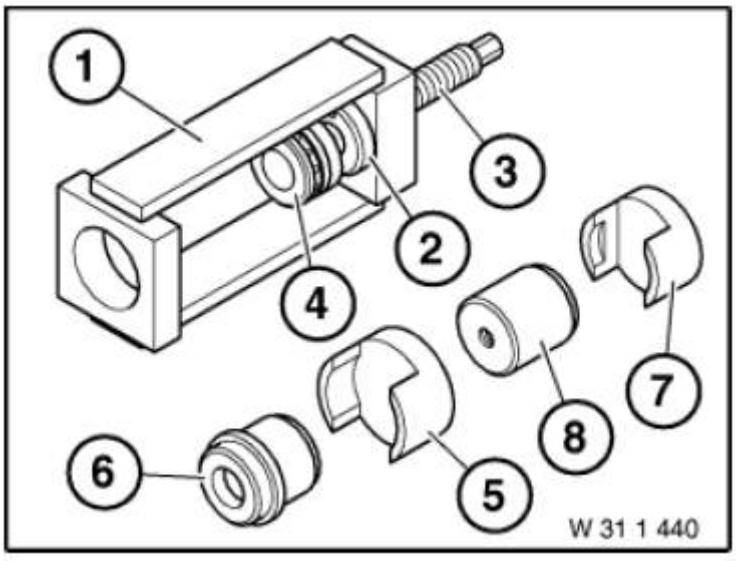


Fig. 45: Identifying Bearing (0491885)
Courtesy of BMW OF NORTH AMERICA, INC.

0495824 BELT

0495824 315257 Belt AM

NOTE: **(Tensioning strap)**

SI number

01 24 06 (309)

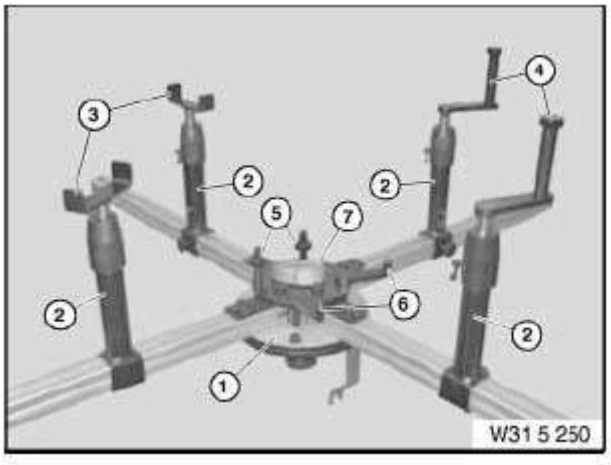


Fig. 46: Identifying Belt (0495824)
Courtesy of BMW OF NORTH AMERICA, INC.

0493261 BOLT

0493261 312162 Bolt AM

Replaced by: 83300492053

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

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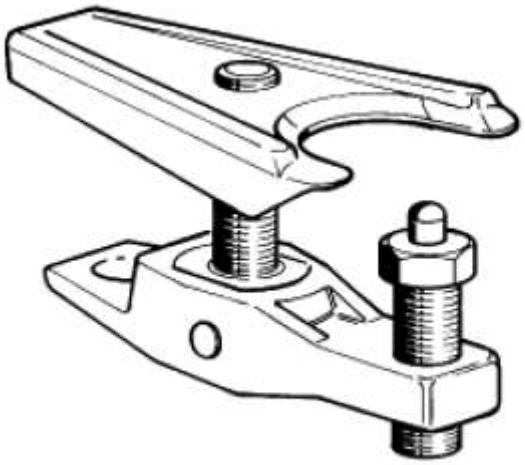


Fig. 47: Identifying Bolt (0493261)
Courtesy of BMW OF NORTH AMERICA, INC.

0491977 BOLT

0491977 315060 Bolt Mechanical tool

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



Fig. 48: Identifying Bolt (0491977)
Courtesy of BMW OF NORTH AMERICA, INC.

0491923 BRIDGE

0491923 312155 Bridge Minimum set: Mechanical tools AM

NOTE: **(Support bridge) All-wheel drive vehicles, series: E30, E36, E46, E85 Discontinued, only available via complete tool**

Storage Location

B7

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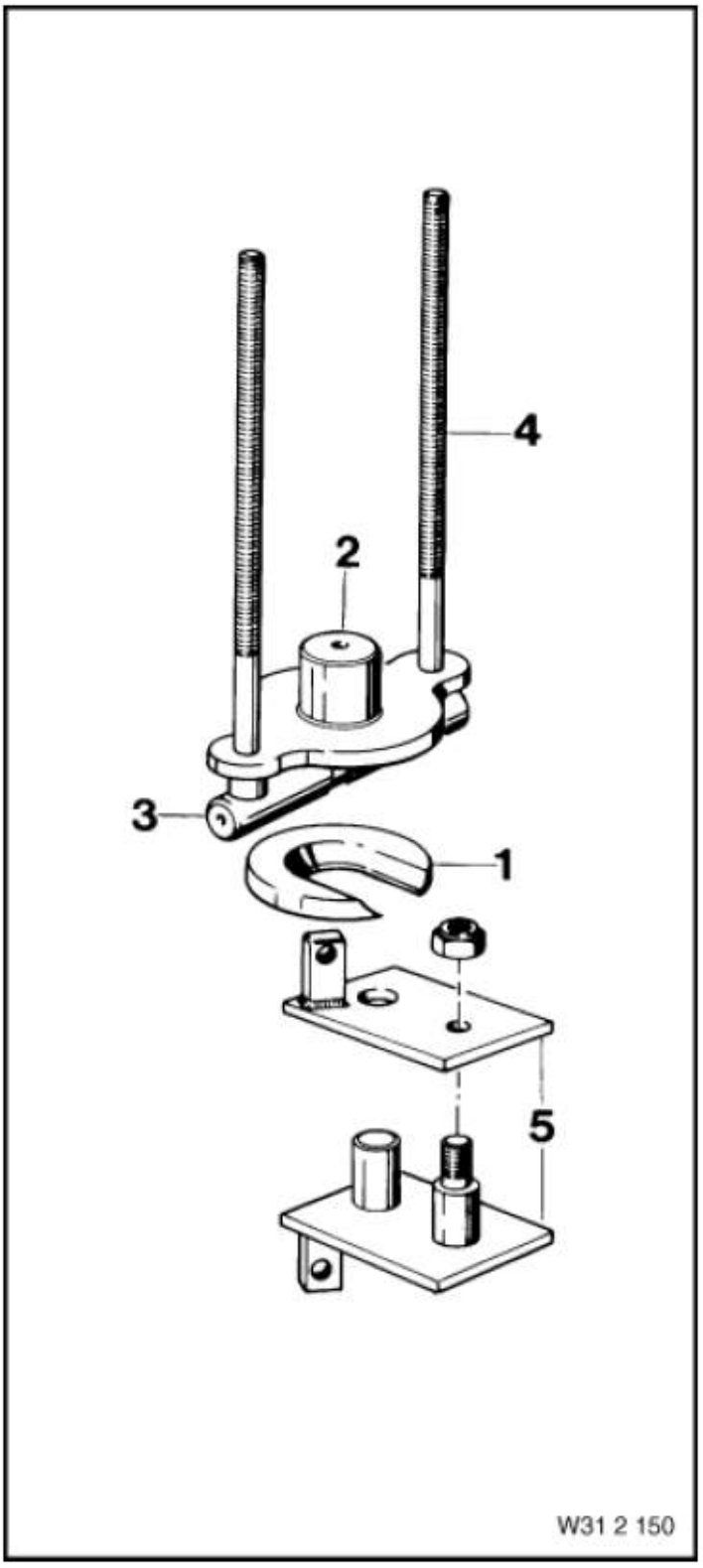


Fig. 49: Identifying Bridge (0491923)
Courtesy of BMW OF NORTH AMERICA, INC.

0491979 BRIDGE

0491979 315071 Bridge AM

NOTE: **(Measuring bridge)**

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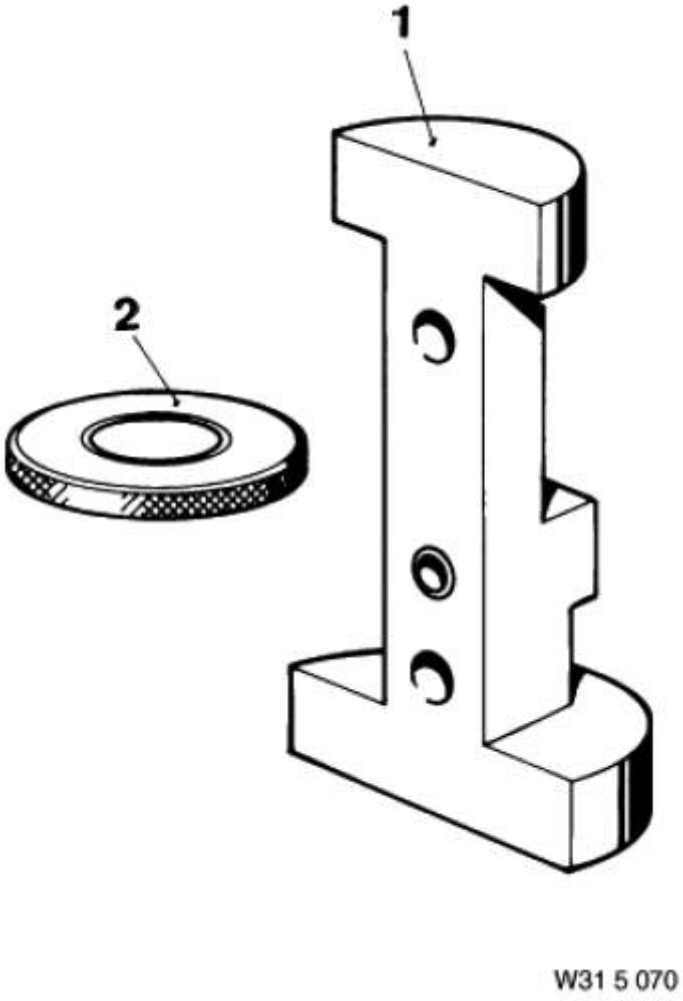


Fig. 50: Identifying Bridge (0491979)
Courtesy of BMW OF NORTH AMERICA, INC.

0491857 BUSH

0491857 311007 Bush AM

NOTE: **For installing the rubber mount in the front axle support - series: E12**

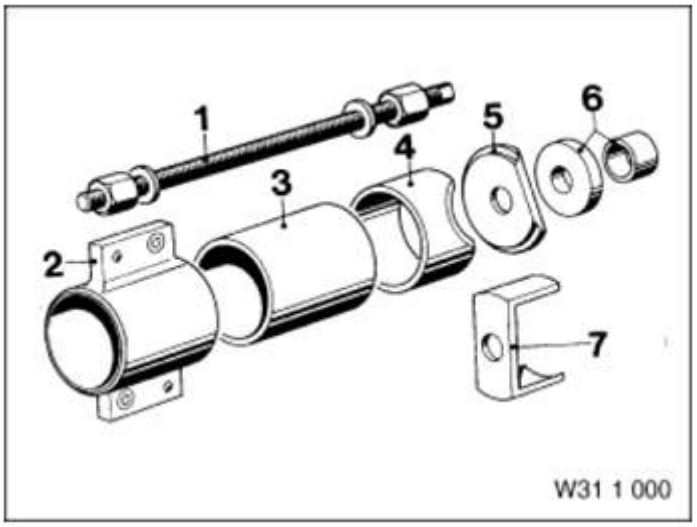


Fig. 51: Identifying Bush (0491857)
Courtesy of BMW OF NORTH AMERICA, INC.

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0491858 BUSH

0491858 311008 Bush AM

NOTE: **(Bush) For installing the rubber mount in the front axle support and thrust piece, for removing and installing the rubber mount in the wishbones**

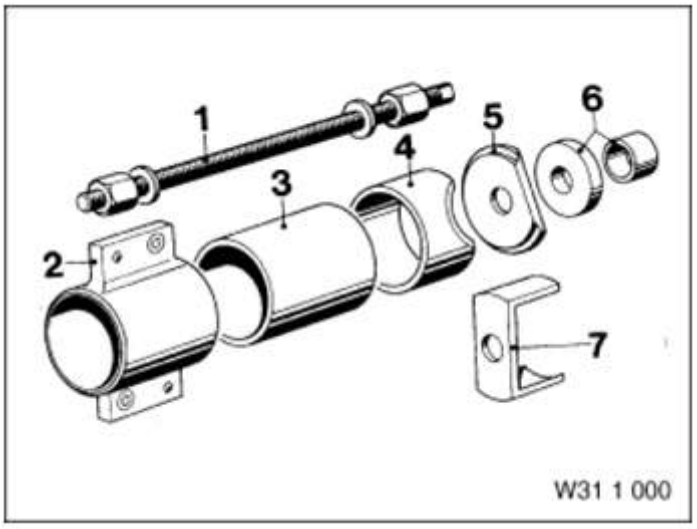


Fig. 52: Identifying Bush (0491858)
Courtesy of BMW OF NORTH AMERICA, INC.

0491985 BUSH

0491985 315120 Bush Mechanical tool

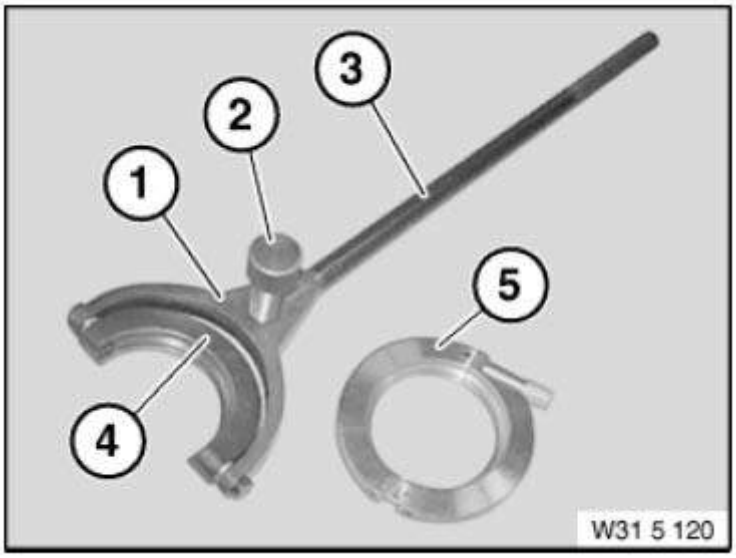
NOTE: **(impact bush) For fitting the radial sealing ring to the drive flange of the front axle differential**

Storage Location

X7

SI number

01 04 93 (664)



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Fig. 53: Identifying Bush (0491985)
Courtesy of BMW OF NORTH AMERICA, INC.

0491859 BUSH

0491859 311009 Bush AM

NOTE: **(Bush) Deletion, only available via tool set**

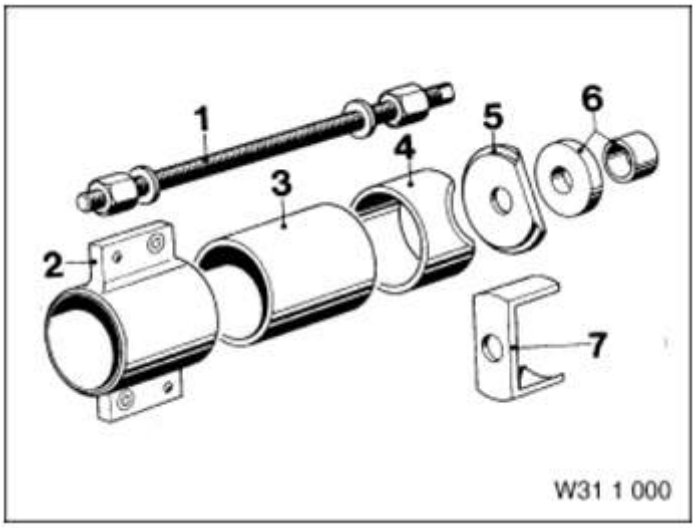


Fig. 54: Identifying Bush (0491859)
Courtesy of BMW OF NORTH AMERICA, INC.

0491853 BUSH

0491853 311003 Bush AM

NOTE: **(Bush) For removing the rubber mount from the front axle support, for removing and installing the rubber mount in the wishbones and for press-fitting the taper roller bearing of the rear axle differential housing**

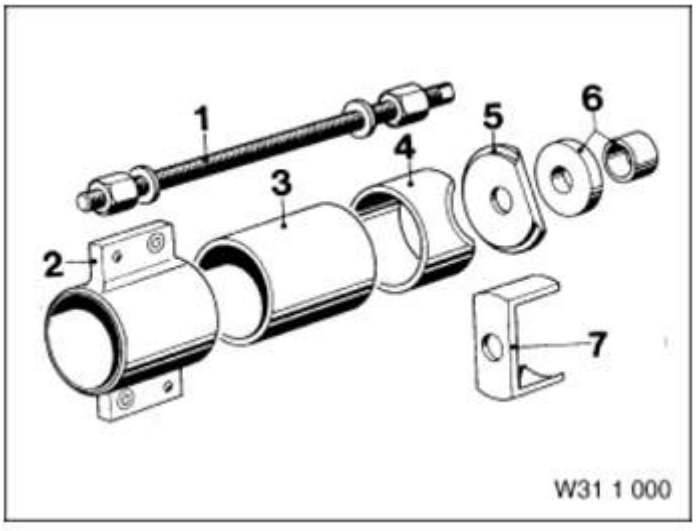


Fig. 55: Identifying Bush (0491853)
Courtesy of BMW OF NORTH AMERICA, INC.

0491852 BUSH

0491852 311002 Bush AM

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NOTE: **(Slip bush) For installing the rubber mount in the front axle support**

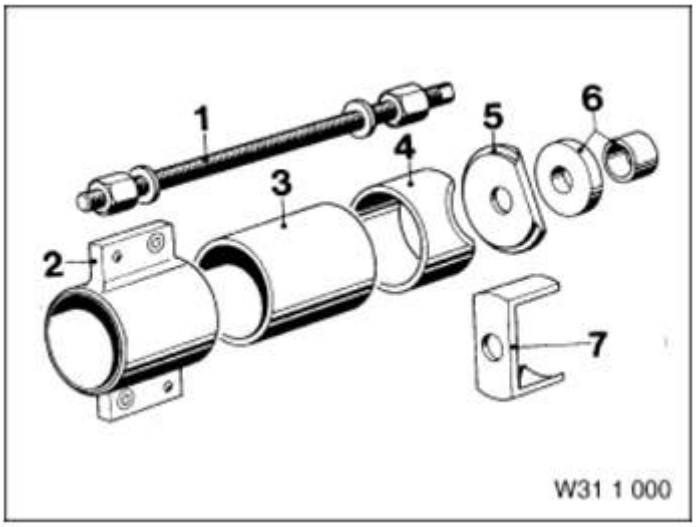


Fig. 56: Identifying Bush (0491852)
Courtesy of BMW OF NORTH AMERICA, INC.

0491911 BUSH

0491911 312122 Bush AM

NOTE: **(Pressure bush)**

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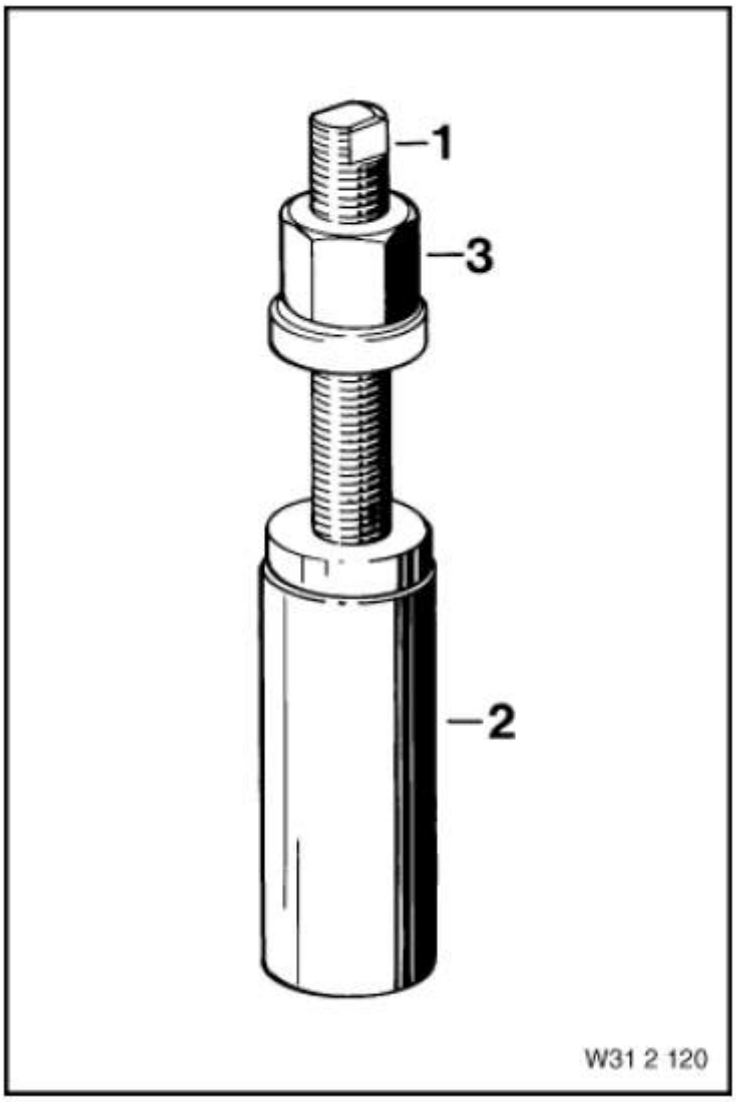
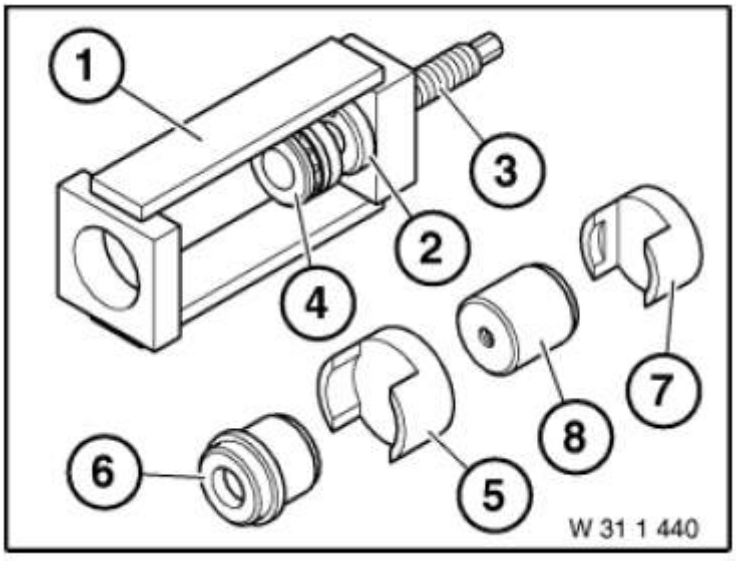


Fig. 57: Identifying Bush (0491911)
Courtesy of BMW OF NORTH AMERICA, INC.

0491883 BUSH

0491883 311442 Bush AM

NOTE: (Threaded bush)



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Fig. 58: Identifying Bush (0491883)
Courtesy of BMW OF NORTH AMERICA, INC.

0491969 CLIP

0491969 315000 Clip Mechanical tool

NOTE: **(mounting fixture) For the front axle differential**

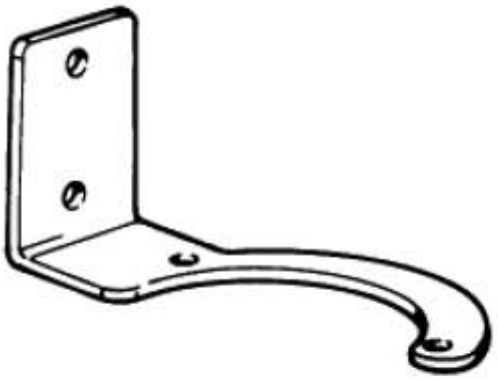


Fig. 59: Identifying Clip (0491969)
Courtesy of BMW OF NORTH AMERICA, INC.

0496293 DEVICE

0496293 315230 Device AM

NOTE: **For drawing spring strut into swivel bearing seat.**

Storage Location

B72

SI number

01 13 07 (387)

Consisting of:

1. 0496294 Basic body

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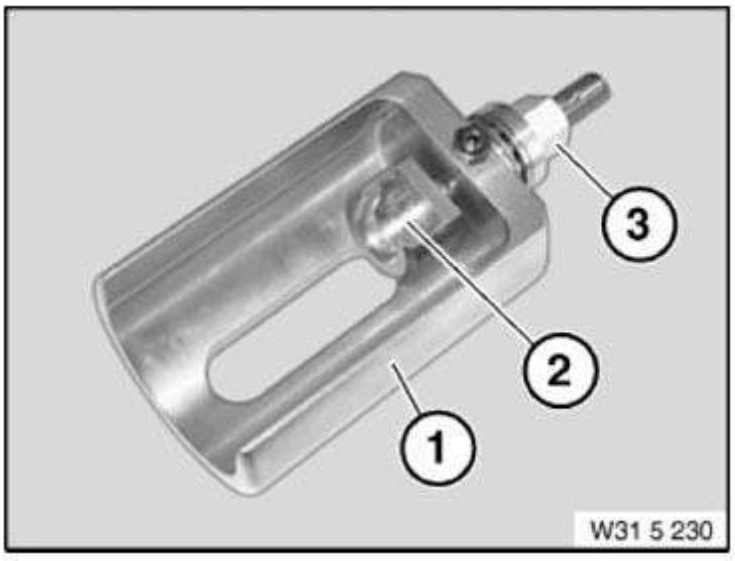


Fig. 60: Identifying Device (0496293)
Courtesy of BMW OF NORTH AMERICA, INC.

2. **0496295** Spindle

NOTE: **(Spindle M10 with fixture) discontinued, available as part of set of special tools only**

3. **0496296** Nut

NOTE: **(Nut with bearing) Can no longer be ordered separately. Only available as part of set 31 2 120 = 83 30 0 491 909.**

0491978 DEVICE

0491978 315070 Device AM

NOTE: **For determining the installation dimension at the bevel drive pinion in the front axle differential**

Consisting of:

1. **0491979** Bridge

NOTE: **(Measuring bridge)**

2. **0491980** Washer

NOTE: **(Measuring disc 7 mm)**

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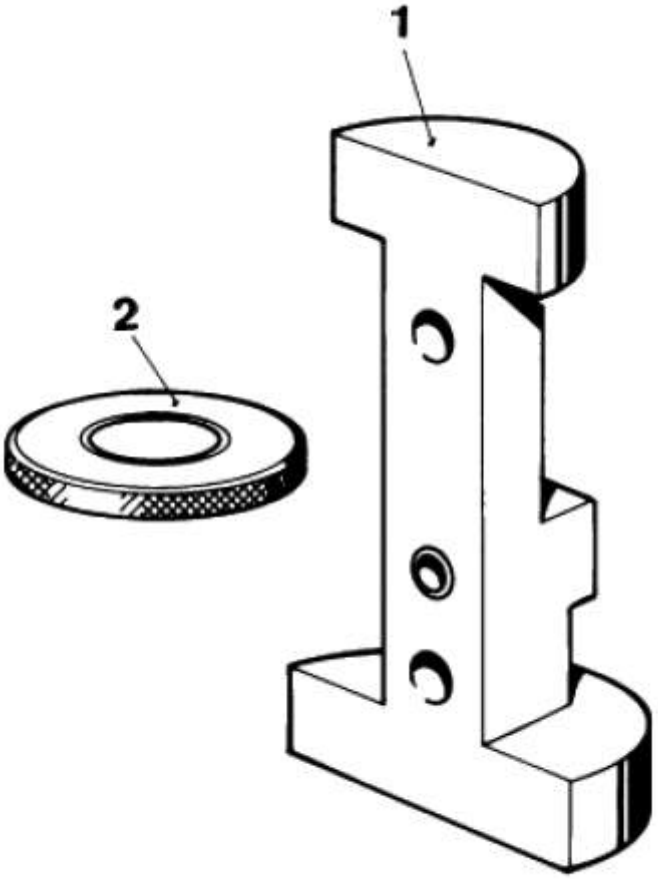


Fig. 61: Identifying Device (0491978)
Courtesy of BMW OF NORTH AMERICA, INC.

0491945 DEVICE

0491945 313000 Device Mechanical tool

NOTE: **(Device) to tension the spring struts when removing and installing - not required for 31 3 120**

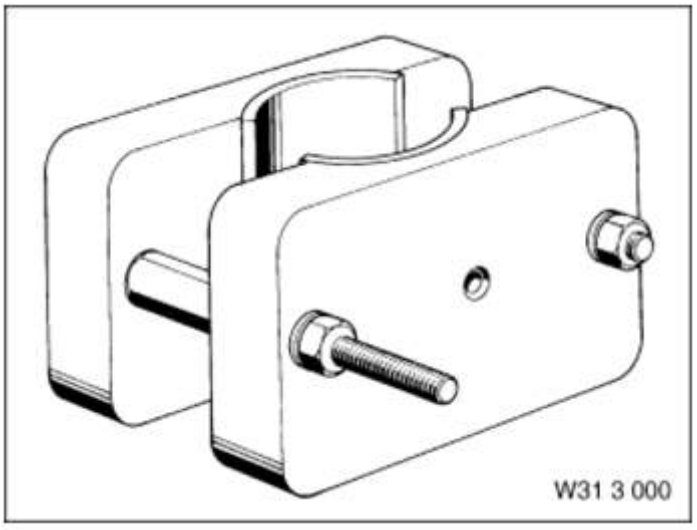


Fig. 62: Identifying Device (0491945)
Courtesy of BMW OF NORTH AMERICA, INC.

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0491872 DEVICE

0491872 311100 Device Mechanical tool

NOTE: **For removing spring strut guide joints from left or right steering stub (interchangeable) (E30/C)**

Storage Location

Y5

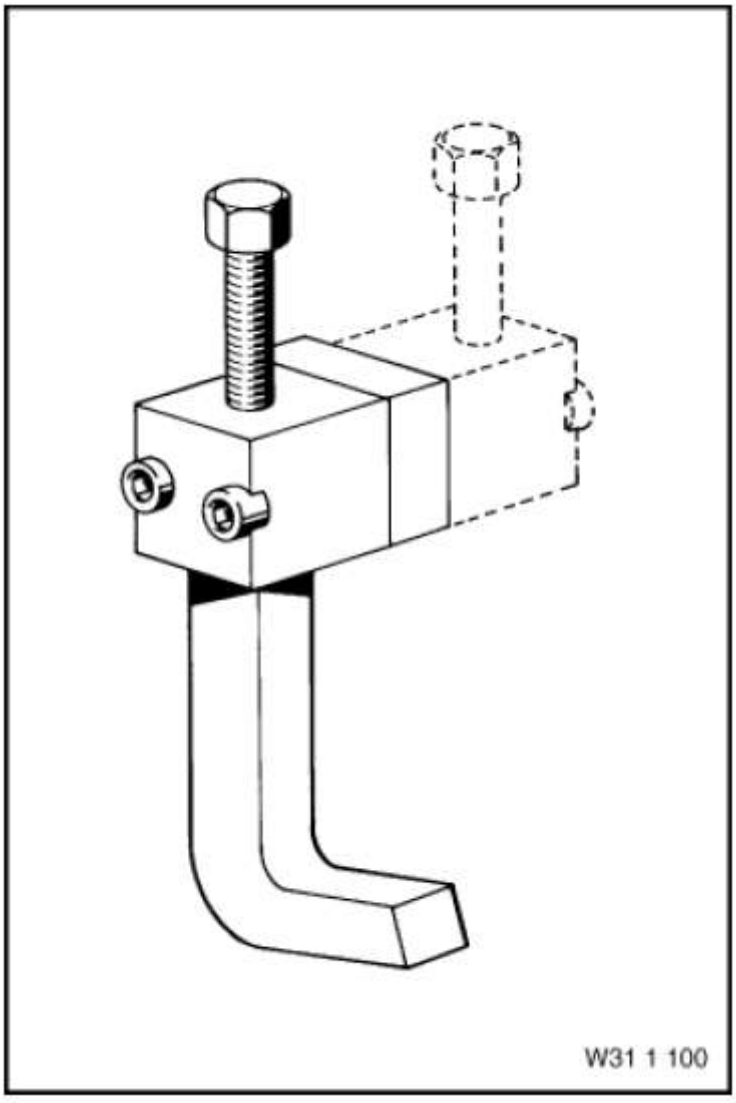


Fig. 63: Identifying Device (0491872)
Courtesy of BMW OF NORTH AMERICA, INC.

0491850 DEVICE

0491850 311000 Device AM

NOTE: **For removing and installing the rubber mount in the front axle support and in the wishbones and for press-fitting the taper roller bearing onto the differential case of the rear axle differential.**

Storage Location

Z5

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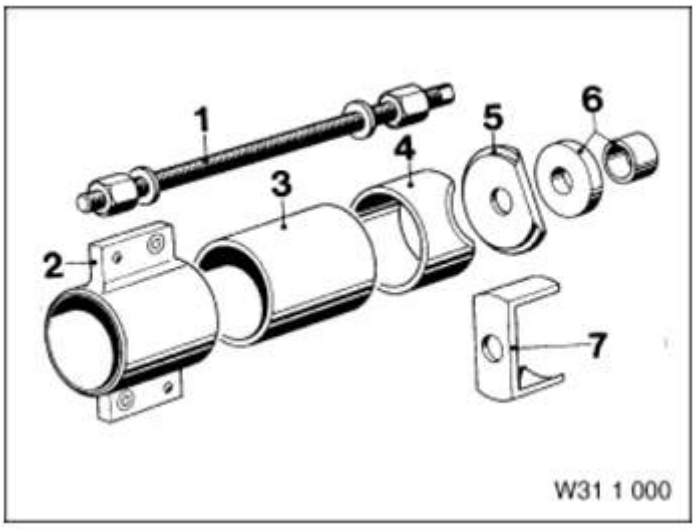


Fig. 64: Identifying Device (0491850)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1. 0491851 Spindle

   NOTE: With 2 nuts and 2 washers

2. 0491852 Bush

   NOTE: (Slip bush) For installing the rubber mount in the front axle support

3. 0491853 Bush

   NOTE: (Bush) For removing the rubber mount from the front axle support, for removing and installing the rubber mount in the wishbones and for press - fitting the taper roller bearing of the rear axle differential housing

4. 0491854 Pipe

   NOTE: (Support tube) For installing the rubber mount in the front axle support - series: E12

5. 0491855 Washer

   NOTE: (Flanged washer) For centring of threaded spindle and as a support disc for removing and installing the rubber mount in the front axle support and in the wishbones - series: E12

6. 0491856 Synchronising key

   NOTE: For removing and installing the rubber mount in the front axle support - series: E12

7. 0491857 Bush

   NOTE: For installing the rubber mount in the front axle support - series: E12

8. 0491858 Bush

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NOTE: **(Bush) For installing the rubber mount in the front axle support and thrust piece, for removing and installing the rubber mount in the wishbones**

9. 0491859 Bush

NOTE: **(Bush) Deletion, only available via tool set**

0491890 DEVICE

0491890 312000 Device Mechanical tool

NOTE: **For pressing off and applying the wheel hub sealing caps - model year: up to 82**

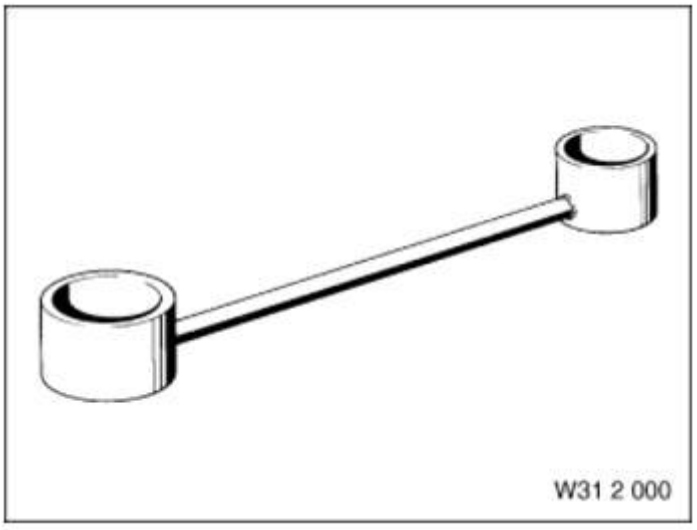


Fig. 65: Identifying Device (0491890)
Courtesy of BMW OF NORTH AMERICA, INC.

0491918 DEVICE

0491918 312150 Device Minimum set: Mechanical tools AM

NOTE: **For removing and installing rubber mount in front wishbone**

Storage Location

A7

Consisting of:

8 = 0494628 Adapter

NOTE: **(Adapter feet) Series: E46**

1 = 0491919 Plate

NOTE: **Series: E30, E36, E46, E85**

2 = 0491920 Synchronising key

NOTE: **Series: E30, E36, E46, E85**

3 = 0491921 Holder

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NOTE: **(Counter support) Series: E30, E36, E46, E85**

4 = **0491922** Spindle

NOTE: **Spindle (1 piece) series: E30, E36, E46, E85**

5 = **0491923** Bridge

NOTE: **(Support bridge) All-wheel drive vehicles, series: E30, E36, E46, E85 Discontinued, only available via complete tool**

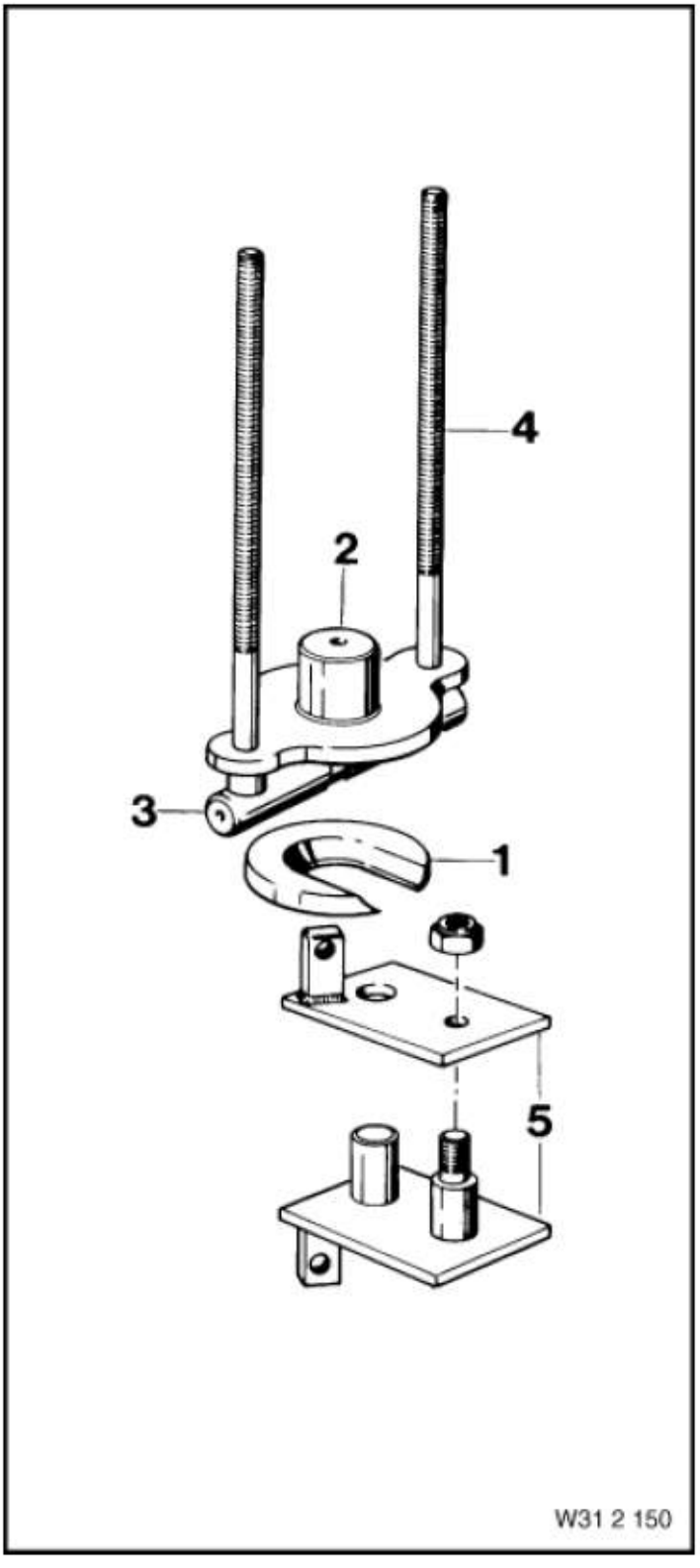


Fig. 66: Identifying Device (0491918)

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Courtesy of BMW OF NORTH AMERICA, INC.

6 = **0493284** Holder

NOTE: **(Counter support, diameter 79 mm) For mounting the rubber mount on the wishbone, series: E46 Discontinued, only available via complete tool 0 491 918.**

7 = **0493327** Synchronising key

NOTE: **(Synchronizing key, diameter 79 mm) For mounting the rubber mount on the wishbone, series: E46**

0491924 DEVICE

0491924 312160 Device AM

Replaced by: 83300492053

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)**

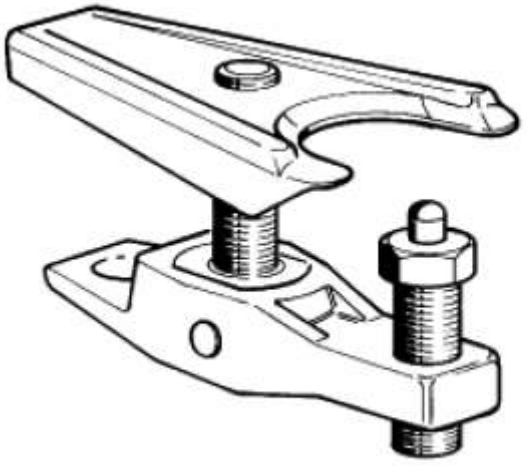


Fig. 67: Identifying Device (0491924)
Courtesy of BMW OF NORTH AMERICA, INC.

0491926 DEVICE

0491926 312190 Device AM

Replaced by: 83300492053

NOTE: **For pressing the drive flange out of the wheel bearing Replaced by 33 4 200. (0 492 053)**

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Consisting of:

1. **0491927** Synchronising key

   NOTE: Discontinuation and replaced by 33 4 200 (0 492 053)

2. **0491928** Plate

   NOTE: Discontinuation and replaced by 33 4 200 (0 492 053)

3. **0491929** Spindle

   NOTE: Discontinuation and replaced by 33 4 200 (0 492 053)

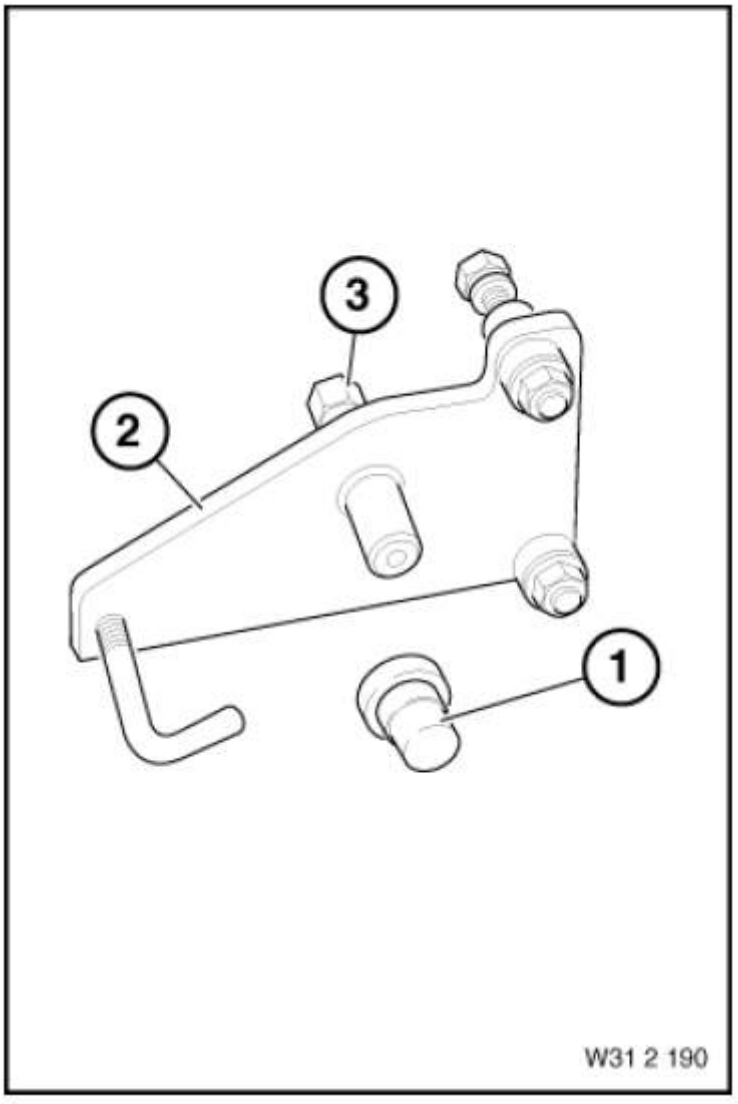


Fig. 68: Identifying Device (0491926)
Courtesy of BMW OF NORTH AMERICA, INC.

0491925 DEVICE

0491925 312180 Device Mechanical tool

NOTE: For pressing off the wishbones from the spring strut

SI number

01 04 92 (487)

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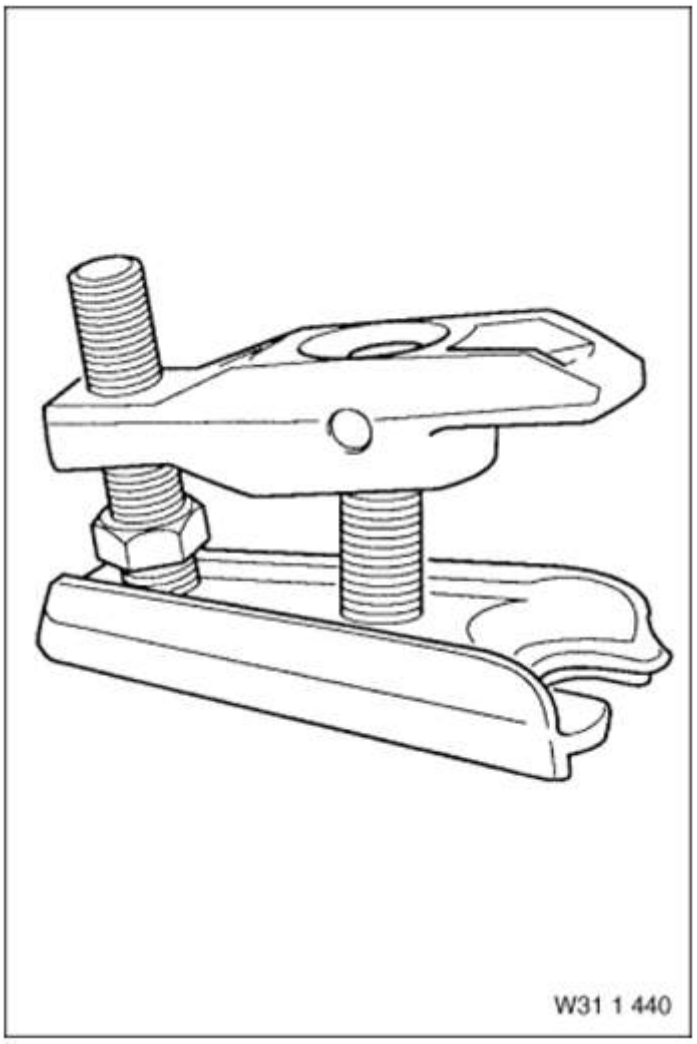


Fig. 69: Identifying Device (0491925)
Courtesy of BMW OF NORTH AMERICA, INC.

0491881 DEVICE

0491881 311440 Device AM

NOTE: **For removing and installing wheel control joints**

SI number

01 09 96 (094)

Consisting of:

1. **0491882** Basic body
2. **0491883** Bush

NOTE: **(Threaded bush)**

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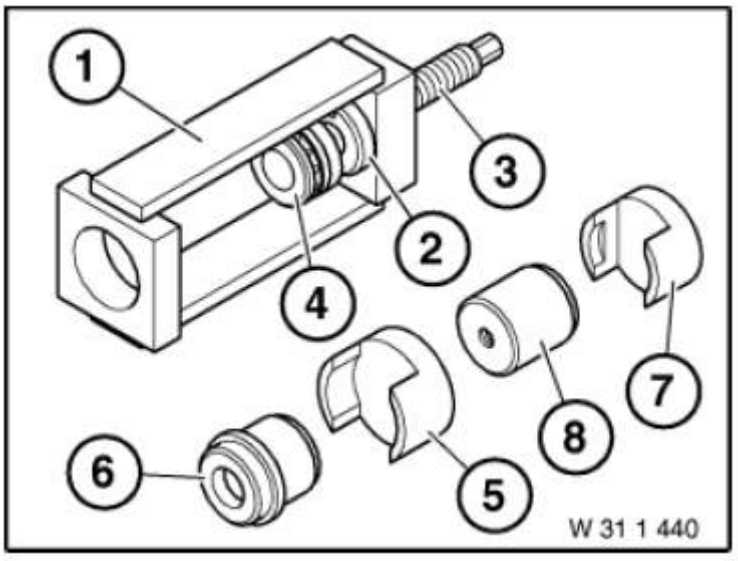


Fig. 70: Identifying Device (0491881)
Courtesy of BMW OF NORTH AMERICA, INC.

3. 0491884 Spindle
4. 0491885 Bearing

   NOTE: (Thrust bearing)

5. 0491886 Synchronising key

   NOTE: (Thrust piece) For removing

6. 0491887 Synchronising key

   NOTE: For removing

7. 0491888 Synchronising key

   NOTE: For installing

8. 0491889 Pipe

   NOTE: (Guide tube) For installing

0491917 DEVICE

0491917 312140 Device Mechanical tool

NOTE: (Extractor tool) For pressing off the leading link from the track rod arm

Storage Location

Y6

SI number

01 06 88 (964)

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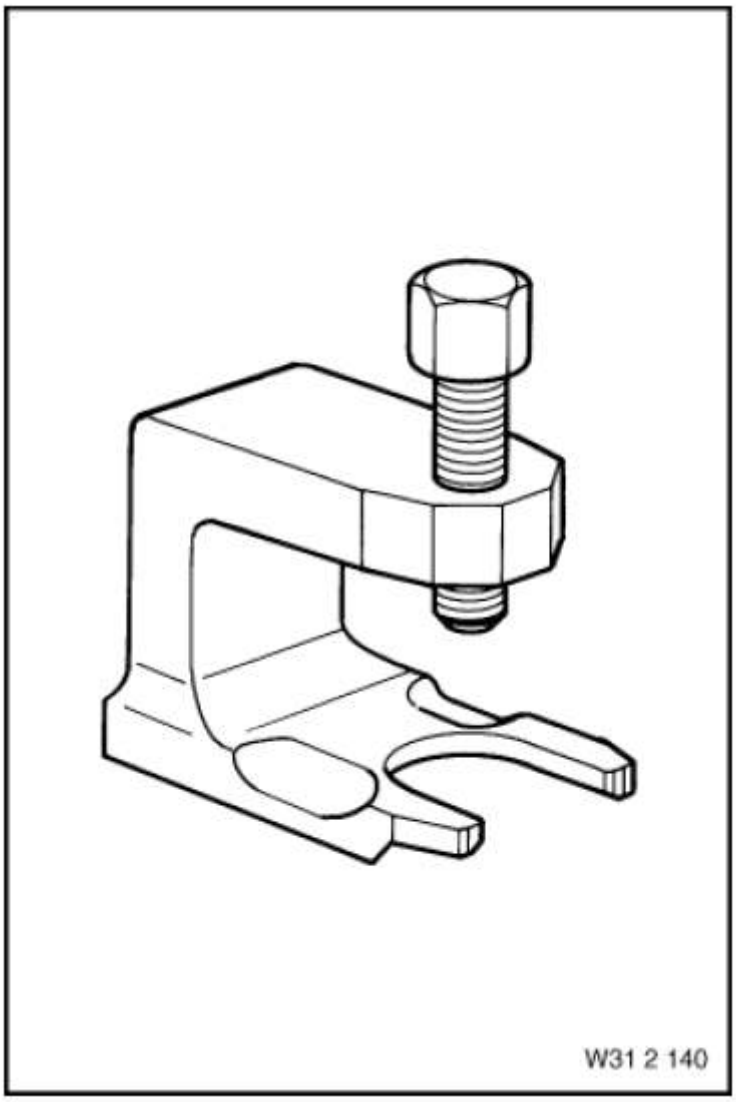


Fig. 71: Identifying Device (0491917)
Courtesy of BMW OF NORTH AMERICA, INC.

0491909 DEVICE

0491909 312120 Device AM

NOTE: **For installing the wheel bearing unit at the front**

Storage Location

Y9

Consisting of:

1. 0491910 Spindle

   NOTE: **With guide sleeve Discontinued, only available via complete tool**

2. 0491911 Bush

   NOTE: **(Pressure bush)**

3. 0491912 Nut

   NOTE: **(Nut with bearing) Can no longer be ordered separately. Only available as**

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part of set 31 2 120 = 83 30 0 491 909.

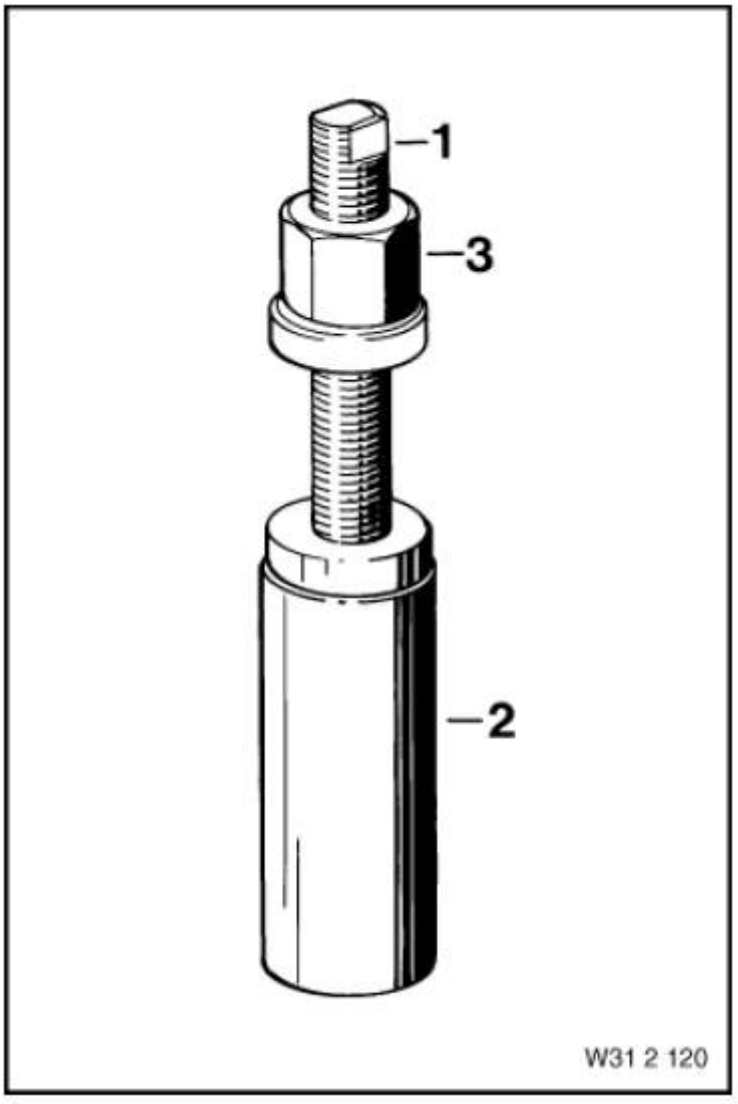


Fig. 72: Identifying Device (0491909)
Courtesy of BMW OF NORTH AMERICA, INC.

2156252 DEVICE

2156252 Device AM

NOTE: **Device A1 in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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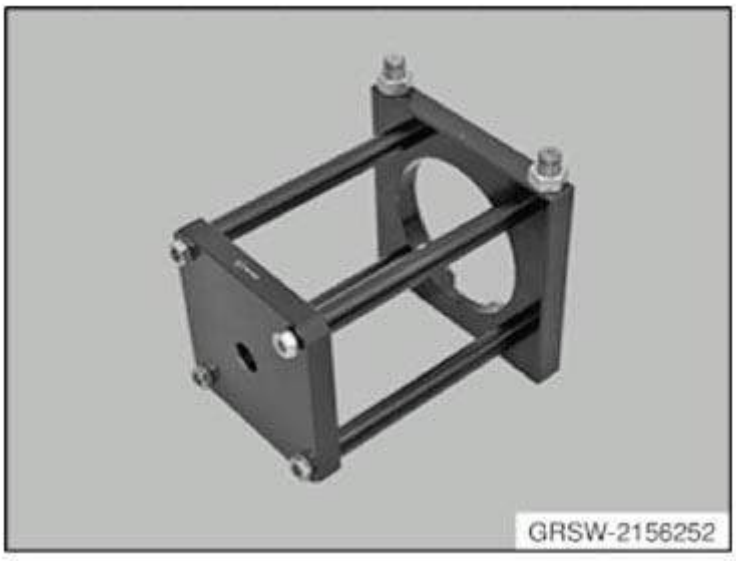


Fig. 73: Identifying Device (2156252)
Courtesy of BMW OF NORTH AMERICA, INC.

0491873 DEVICE

0491873 311110 Device Mechanical tool

NOTE: **For pulling out the trailing links, left and right wishbones and leading links**

Storage Location

X5

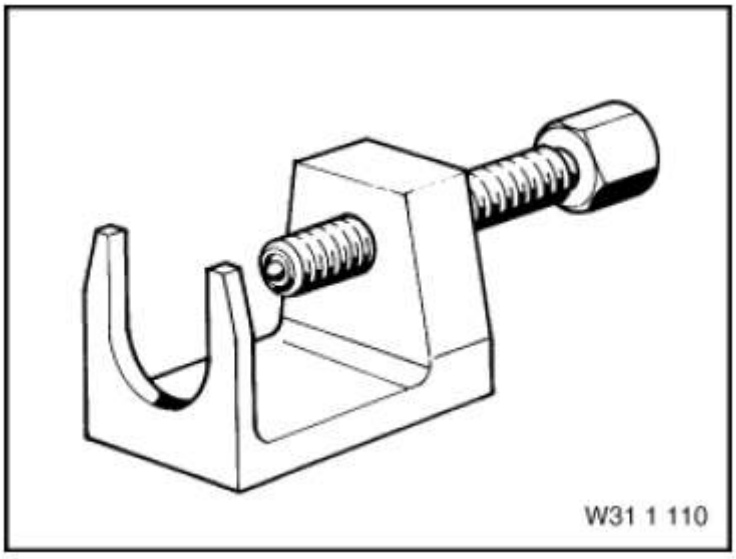


Fig. 74: Identifying Device (0491873)
Courtesy of BMW OF NORTH AMERICA, INC.

0491897 DEVICE

0491897 312090 Device Mechanical tool

Replaced by: 83300492436

NOTE: **For pressing the drive flange out of the front wheel bearing Replaced by 33 4 200. (0 492 436)**

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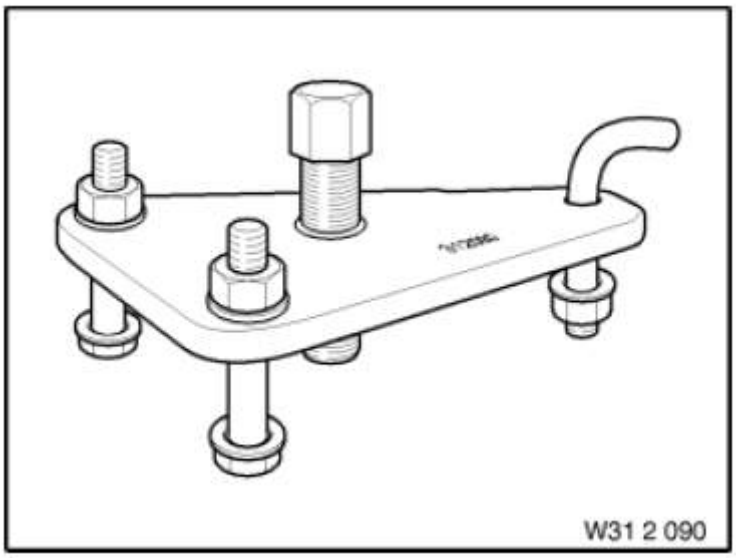


Fig. 75: Identifying Device (0491897)
Courtesy of BMW OF NORTH AMERICA, INC.

2185816 EXTENSION

2185816 Extension AM

NOTE: **Extension lever (extension) to loosen and tighten the screw connections on wishbone and tension strut in conjunction with special tools set 81642185817 (ring spanner).**

SI number

08 04 10 (656)



Fig. 76: Identifying Extension (2185816)
Courtesy of BMW OF NORTH AMERICA, INC.

0493910 EXTRACTOR

0493910 311130 Extractor Mechanical tool

NOTE: **For removing the track rod from the front axle**

Storage Location

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C41

SI number

01 03 00 (554)

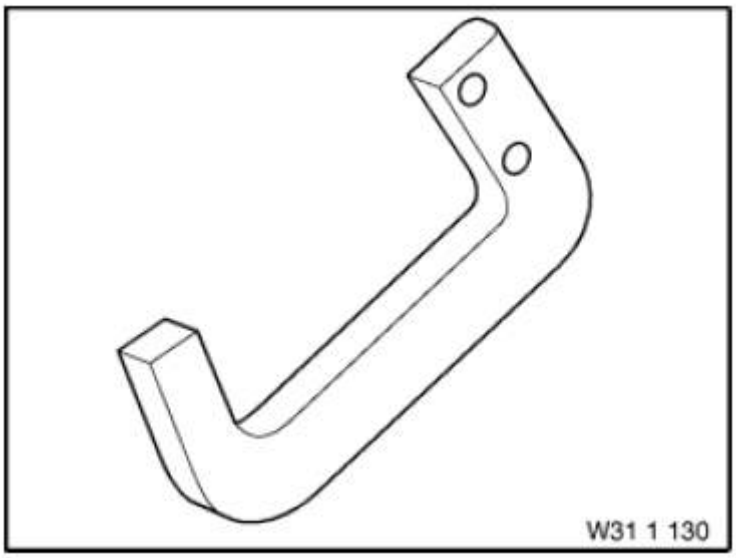


Fig. 77: Identifying Extractor (0493910)
Courtesy of BMW OF NORTH AMERICA, INC.

0493815 EXTRACTOR

0493815 311170 Extractor Minimum set: Mechanical tools AM

NOTE: **For removing the output shafts from the front axle differential --> E46/16**

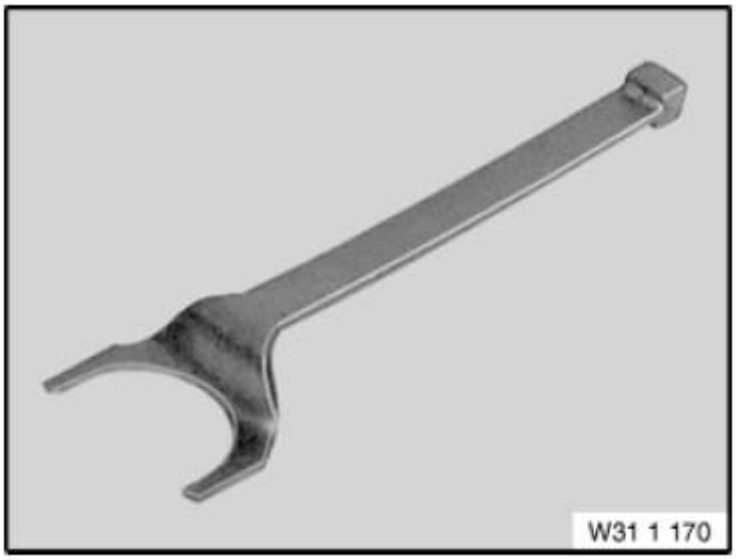
Storage Location

A41

B41

SI number

01 07 00 (576)



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Fig. 78: Identifying Extractor (0493815)
Courtesy of BMW OF NORTH AMERICA, INC.

0495567 FIXTURE

0495567 315250 Fixture AM

In conjunction with: UNIVERSAL HYDRAULIC LIFTING EQUIPMENT 81222219012

NOTE: **(universal axle take-up) For accommodating all front and rear axles when removing and installing.**

SI number

01 24 06 (309)

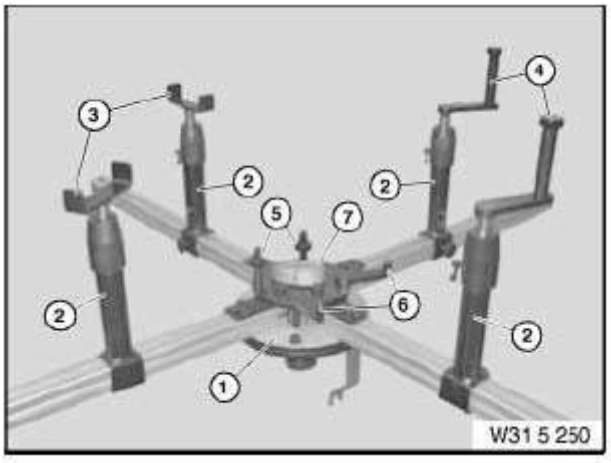


Fig. 79: Identifying Fixture (0495567)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1. 0495817 Basic body

   NOTE: **(Basic body) No longer available separately, only via special tool set 31 5 250 (83 30 0 495 567)**

2. 0495818 Support

   NOTE: **(Telescope supports) 4 pieces, no longer available separately, only via special tool set 31 5 250 (83 30 0 495 567)**

3. 0495819 Adapter

   NOTE: **(take-up adapter U-section (2 x))**

4. 0495820 Adapter

   NOTE: **(take-up adapter (2 x))**

5. 0495821 Adapter

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

6. 0495822 Adapter

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

7. 0495824 Belt

NOTE: **(Tensioning strap)**

0495485 FIXTURE

0495485 315220 Fixture Mechanical tool

NOTE: **For securing wheel hub when removing and installing spring strut.**

Storage Location

A19

SI number

01 23 05 (224)



Fig. 80: Identifying Fixture (0495485)
Courtesy of BMW OF NORTH AMERICA, INC.

0491984 FORK

0491984 315110 Fork Mechanical tool

NOTE: **(Press-off fork) For pressing the output shaft off of the front axle differential (all-wheel drive vehicles)**

SI number

01 17 05 (212)

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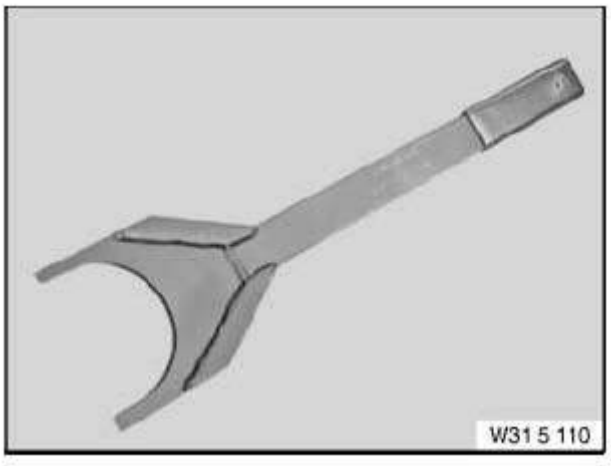


Fig. 81: Identifying Fork (0491984)
Courtesy of BMW OF NORTH AMERICA, INC.

0491879 FORK

0491879 311431 Fork AM

NOTE: **(Separating fork)**

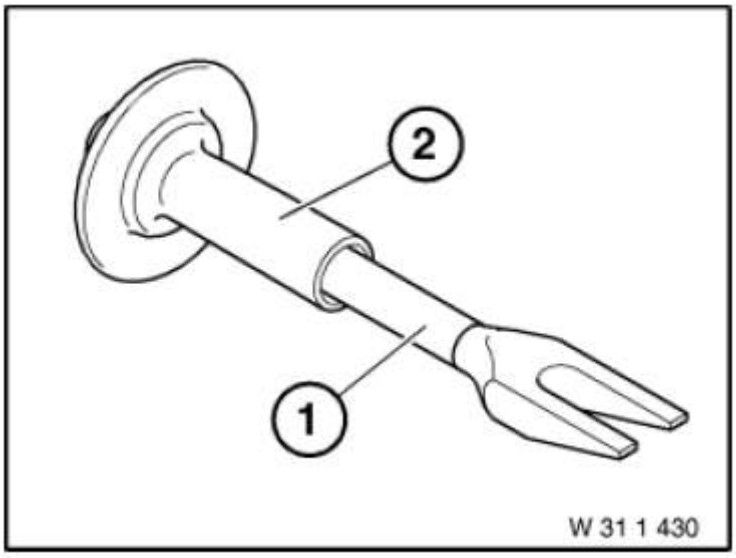


Fig. 82: Identifying Fork (0491879)
Courtesy of BMW OF NORTH AMERICA, INC.

0491878 FORK

0491878 311430 Fork AM

NOTE: **(Separating fork) for separating the conical seat at the wheel guide joint from the wheel carrier - delivered for campaign due to warranty/introduced in 6/96 as set of special tools**

SI number

01 09 96 (094)

Consisting of:

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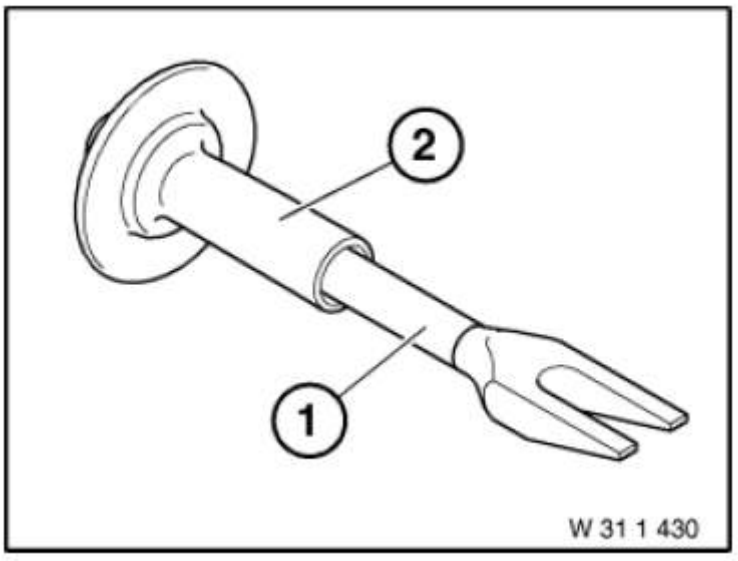


Fig. 83: Identifying Fork (0491878)
Courtesy of BMW OF NORTH AMERICA, INC.

1. **0491879** Fork

   NOTE: (Separating fork)

2. **0491880** Guard

   NOTE: (Protective gloves)

0491875 GAUGE

0491875 311400 Gauge AM

NOTE: (test gauge) For checking the trailing link for distortion when repairing accident damage

SI number

01 23 97 (246)

Consisting of:

1. **0491876** Gauge

   NOTE: (test gauge) For right and left-hand trailing link

2. **0491877** Shaped part

   NOTE: (shaped part) For trailing links without date stamp, up to model year 5/96

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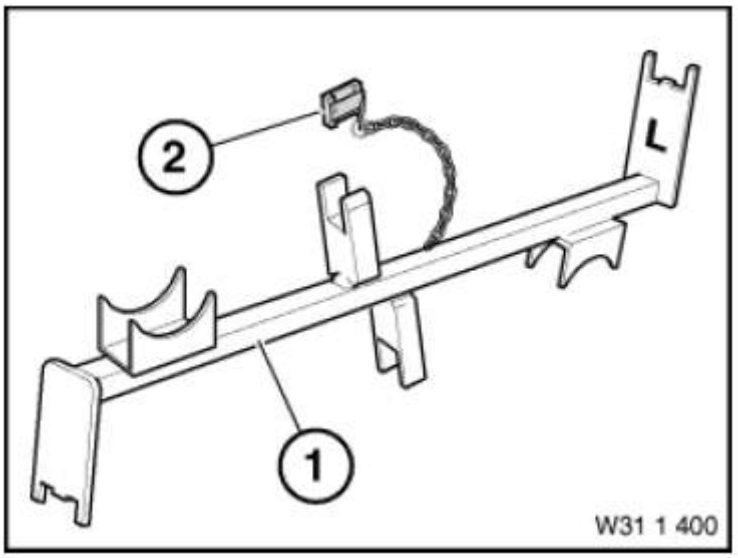


Fig. 84: Identifying Gauge (0491875)
Courtesy of BMW OF NORTH AMERICA, INC.

0491876 GAUGE

0491876 311401 Gauge AM

NOTE: (test gauge) For right and left-hand trailing link

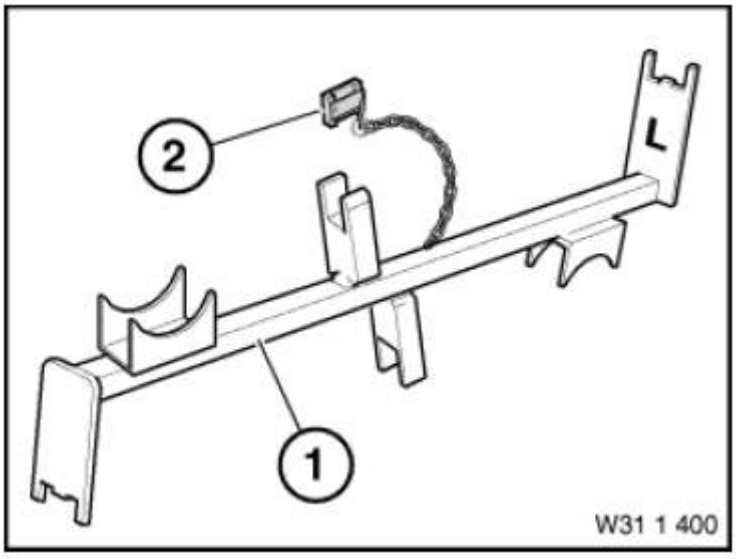


Fig. 85: Identifying Gauge (0491876)
Courtesy of BMW OF NORTH AMERICA, INC.

2210783 GAUGE

2210783 Gauge Minimum set: Mechanical tools AM

NOTE: For positioning the support bearing.

SI number

01 19 10 (674)

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Fig. 86: Identifying Gauge (2210783)
Courtesy of BMW OF NORTH AMERICA, INC.

0491880 GUARD

0491880 311432 Guard AM

NOTE: **(Protective gloves)**

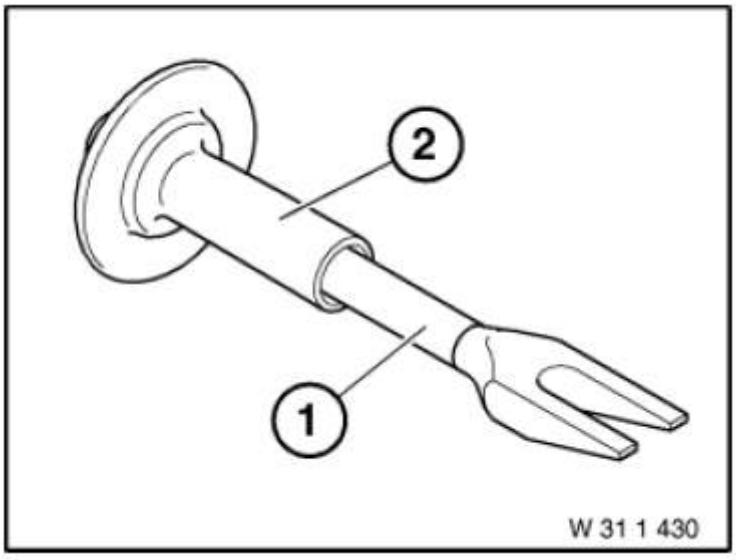


Fig. 87: Identifying Guard (0491880)
Courtesy of BMW OF NORTH AMERICA, INC.

0491921 HOLDER

0491921 312153 Holder Minimum set: Mechanical tools AM

NOTE: **(Counter support) Series: E30, E36, E46, E85**

Storage Location

A7

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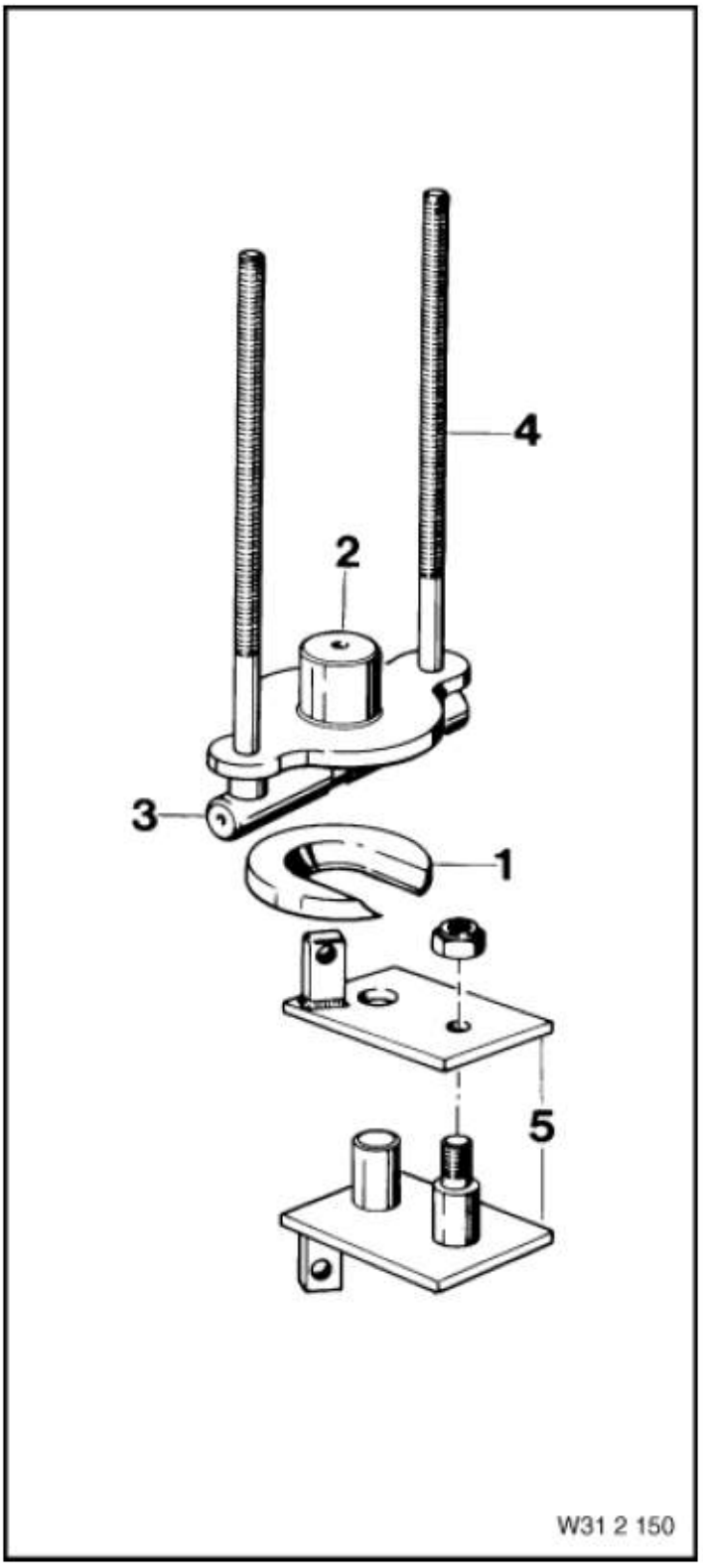


Fig. 88: Identifying Holder (0491921)
Courtesy of BMW OF NORTH AMERICA, INC.

0494804 HOLDER

0494804 313383 Holder AM

Replaced by: 83302213041

NOTE: **(Spring retainer) As of 08/2011, available under new item number 83 30 2 213 041**

SI number

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01 16 11 (738)



Fig. 89: Identifying Holder (0494804)
Courtesy of BMW OF NORTH AMERICA, INC.

0493569 HOLDER

0493569 313355 Holder AM

Replaced by: 83302213034

NOTE: **(Spring retainer) As of 08/2011, available under new item number 83 30 2 213 034**

SI number

01 16 11 (738)



Fig. 90: Identifying Holder (0493569)
Courtesy of BMW OF NORTH AMERICA, INC.

0493356 HOLDER

0493356 313325 Holder AM

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 326 - Series: E38 rear,**

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E39 Saloon rear

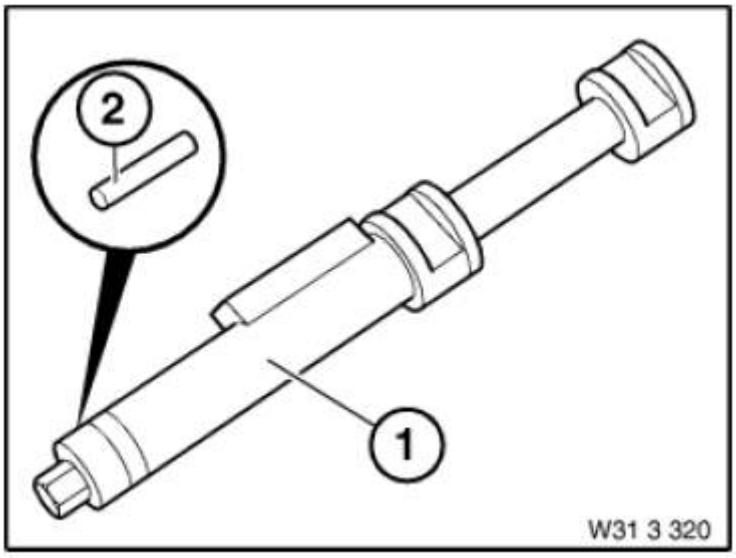


Fig. 91: Identifying Holder (0493356)
Courtesy of BMW OF NORTH AMERICA, INC.

0494625 HOLDER

0494625 313382 Holder AM

Replaced by: 83302213039

NOTE: **(Spring retainer) As of 08/2011, available under new item number 83 30 2 213 039**

SI number

01 16 11 (738)



Fig. 92: Identifying Holder (0494625)
Courtesy of BMW OF NORTH AMERICA, INC.

0491952 HOLDER

0491952 313122 Holder AM

Replaced by: 83300493560

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NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 127 - Model series: E32, E34 Touring, E36 Discontinuation and replaced by 31 3 350. (0 493 560)**

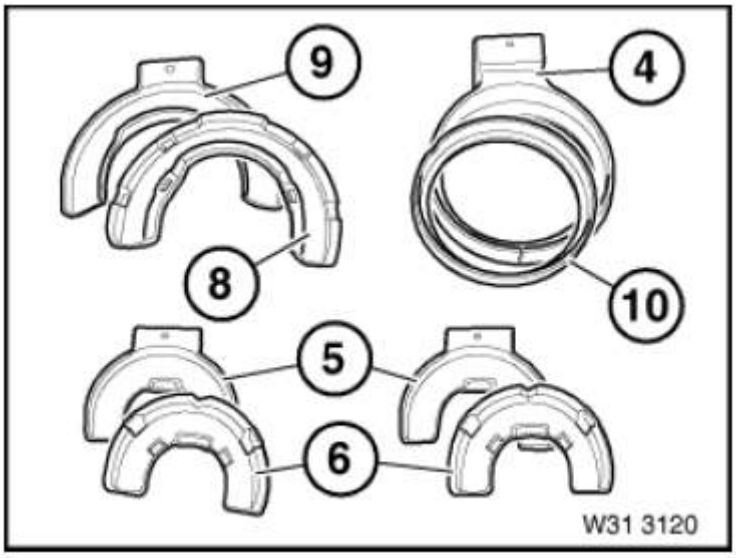


Fig. 93: Identifying Holder (0491952)
Courtesy of BMW OF NORTH AMERICA, INC.

0493289 HOLDER

0493289 313129 Holder AM

Replaced by: 83300493560

NOTE: **(Spring retainer) With protective insert 31 3 128 - model series: E46 Discontinuation and replaced by 31 3 350. (0 493 560)**

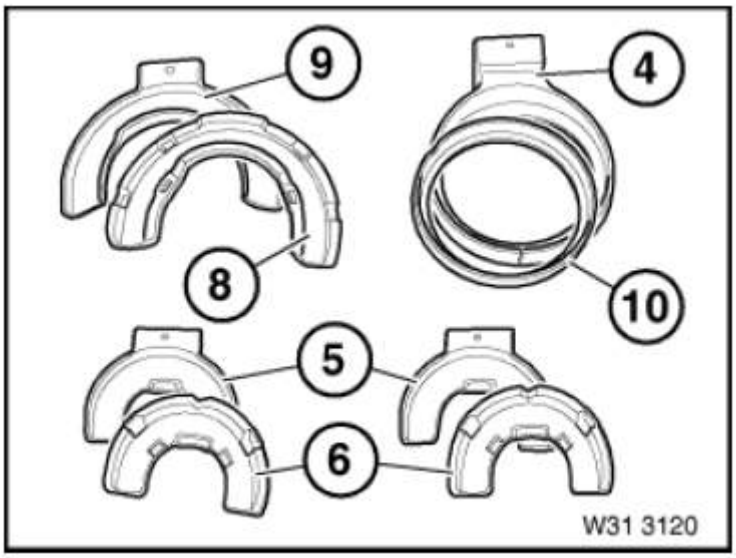


Fig. 94: Identifying Holder (0493289)
Courtesy of BMW OF NORTH AMERICA, INC.

0493284 HOLDER

0493284 312156 Holder Minimum set: Mechanical tools AM

NOTE: **(Counter support, diameter 79 mm) For mounting the rubber mount on the wishbone, series: E46 Discontinued, only available via complete tool 0 491 918.**

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Storage Location

B7

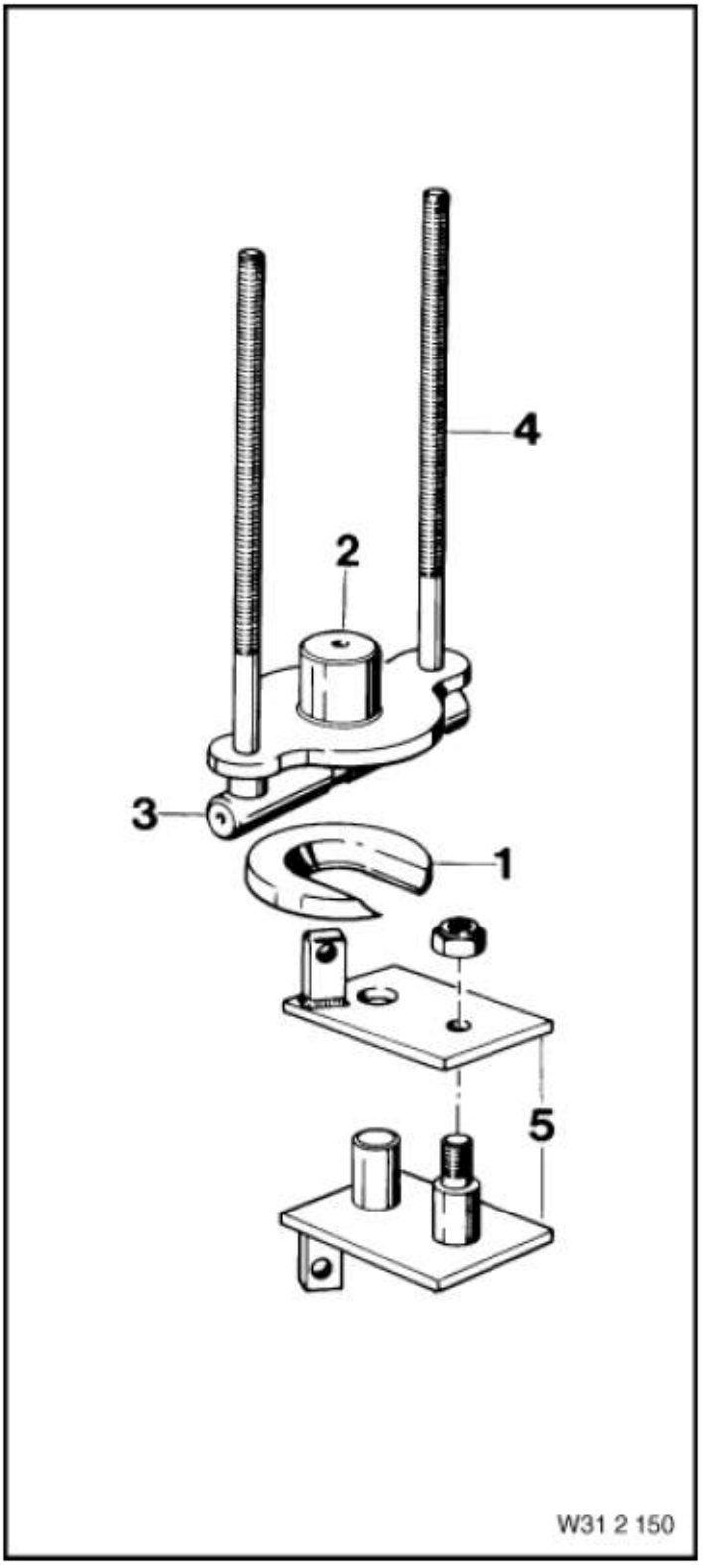


Fig. 95: Identifying Holder (0493284)
Courtesy of BMW OF NORTH AMERICA, INC.

0493566 HOLDER

0493566 313352 Holder AM

Replaced by: 83302213026

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NOTE: **Clamping plate (1 piece), available under new order number 83 30 2 213 026 as of July 2011**

SI number

01 16 11 (738)

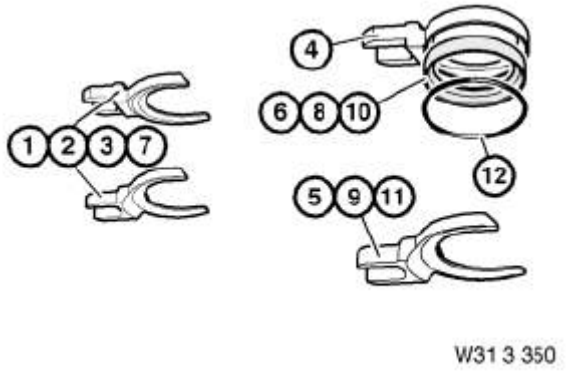


Fig. 96: Identifying Holder (0493566)
Courtesy of BMW OF NORTH AMERICA, INC.

0493561 HOLDER

0493561 313351 Holder AM

Replaced by: 83302213024

NOTE: **Clamping plate (1 piece), available under new order number 83 30 2 213 024 as of July 2011**

SI number

01 16 11 (738)

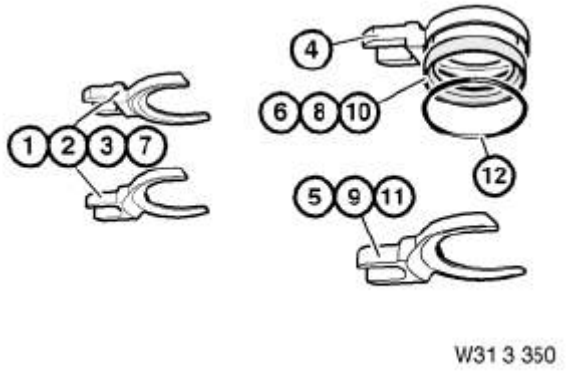


Fig. 97: Identifying Holder (0493561)
Courtesy of BMW OF NORTH AMERICA, INC.

0493360 HOLDER

0493360 313329 Holder AM

NOTE: **(Spring retainer) With protective insert 31 3 332 - Series: E46**

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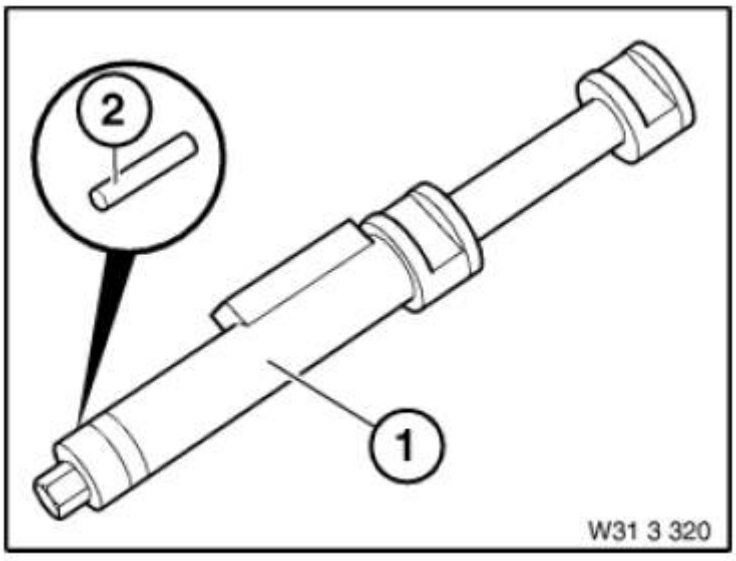


Fig. 98: Identifying Holder (0493360)
Courtesy of BMW OF NORTH AMERICA, INC.

0491955 HOLDER

0491955 313125 Holder AM

Replaced by: 83300493560

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 126 - model series: E38 rear, E39 Saloon rear Discontinuation and replaced by 31 3 350. (0 493 560)**

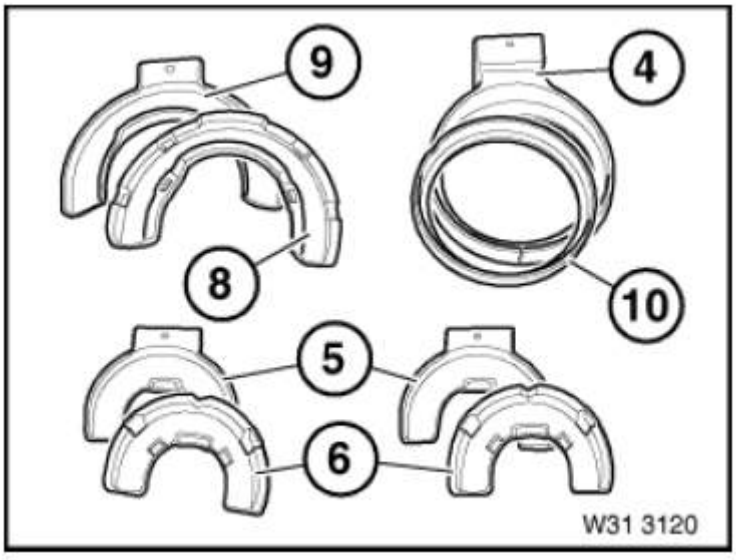


Fig. 99: Identifying Holder (0491955)
Courtesy of BMW OF NORTH AMERICA, INC.

0493567 HOLDER

0493567 313353 Holder AM

Replaced by: 83302213029

NOTE: **Clamping plate (1 piece) As of 08/2011, available under new item number 83 30 2 213 029**

SI number

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Fig. 100: Identifying Holder (0493567)
Courtesy of BMW OF NORTH AMERICA, INC.

0493354 HOLDER

0493354 313323 Holder AM

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 328 - Series: E31, E38, E39 front high (2x) and basis (1x)/model: Z3, Z3coupe**

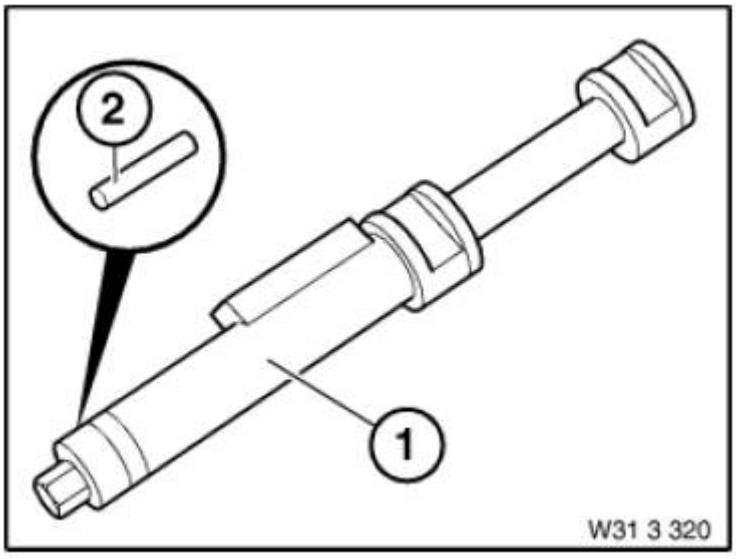


Fig. 101: Identifying Holder (0493354)
Courtesy of BMW OF NORTH AMERICA, INC.

0491953 HOLDER

0491953 313123 Holder AM

Replaced by: 83300493560

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 128 - Model series: E31, E38, E39 front high (2x) and basic version (1x) Discontinuation and replaced by 31 3 350. (0 493 560)**

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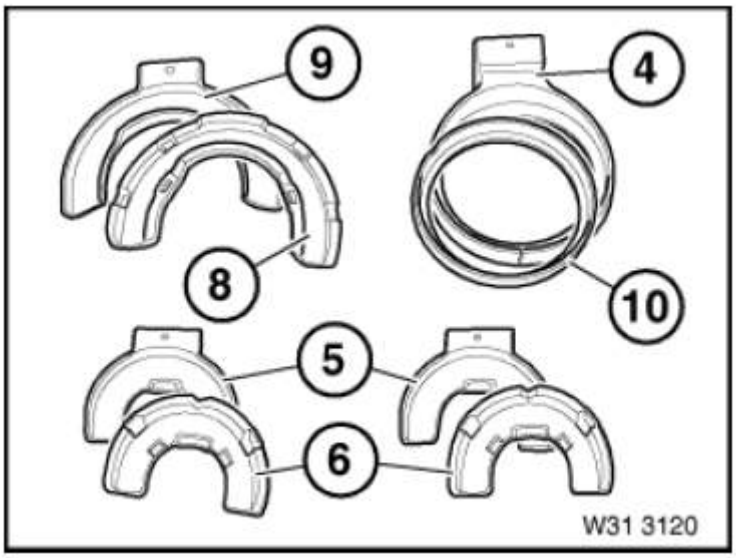


Fig. 102: Identifying Holder (0491953)
Courtesy of BMW OF NORTH AMERICA, INC.

0493353 HOLDER

0493353 313322 Holder AM

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 327 - Series: E32, E34, E36**

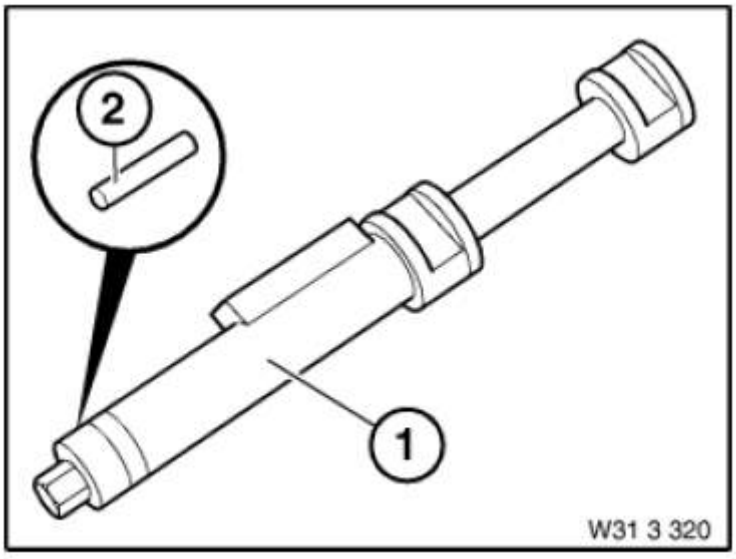


Fig. 103: Identifying Holder (0493353)
Courtesy of BMW OF NORTH AMERICA, INC.

0494053 HOLDER

0494053 313357 Holder AM

Replaced by: 83302213036

NOTE: **(Spring retainer) As of 08/2011, available under new item number 83 30 2 213 036**

SI number

01 16 11 (738)

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Fig. 104: Identifying Holder (0494053)
Courtesy of BMW OF NORTH AMERICA, INC.

0493560 HOLDER

0493560 313350 Holder AM

Replaced by: 83302250167

NOTE: **(Spring retainer) As of 08/2011, delivery under new item number 83 30 2 250167= completely new set with newly defined content**

Storage Location

Individual

SI number

01 16 11 (738)

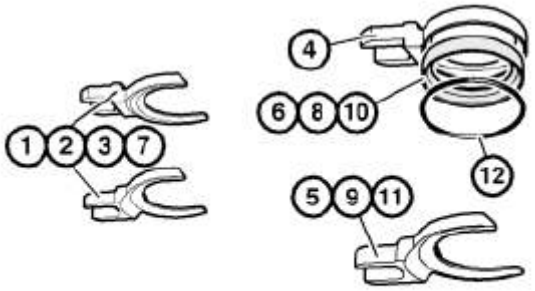


Fig. 105: Identifying Holder (0493560)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

7 = 0494053 Holder

NOTE: **(Spring retainer) As of 08/2011, available under new item number 83 30 2 213 036**

8 = 0494397 Ring

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NOTE: **(Insertion ring) As of 08/2011, available under new item number 83 30 2 213 033**

9 = **0494624** Ring

NOTE: **(Spring retainer ring) As of 08/2011, available under new item number 83 30 2 213 038**

10 = **0494625** Holder

NOTE: **(Spring retainer) As of 08/2011, available under new item number 83 30 2 213 039**

11 = **0494804** Holder

NOTE: **(Spring retainer) As of 08/2011, available under new item number 83 30 2 213 041**

1 = **0493561** Holder

NOTE: **Clamping plate (1 piece), available under new order number 83 30 2 213 024 as of July 2011**

2 = **0493566** Holder

NOTE: **Clamping plate (1 piece), available under new order number 83 30 2 213 026 as of July 2011**

3 = **0493567** Holder

NOTE: **Clamping plate (1 piece) As of 08/2011, available under new item number 83 30 2 213 029**

4 = **0493568** Ring

NOTE: **(Spring retainer ring) As of 08/2011, available under new item number 83 30 2 213 031**

5 = **0493569** Holder

NOTE: **(Spring retainer) As of 08/2011, available under new item number 83 30 2 213 034**

6 = **0493570** Ring

NOTE: **(Centering ring) As of 08/2011, available under new item number 83 30 2 213 032**

0493747 HOLDING SLEEVE

0493747 311054 Holding sleeve AM

NOTE: **(Pressure sleeve) For gripping the wishbones and for removing and installing the silence blocks in the leading link. Discontinued, can only be ordered using complete tool**

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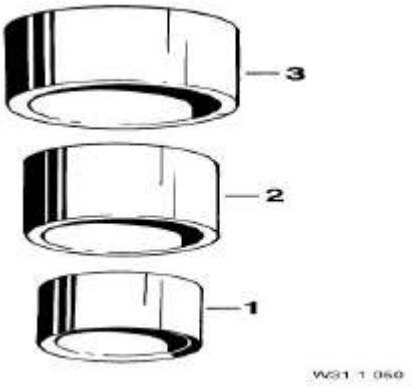


Fig. 106: Identifying Holding Sleeve (0493747)
Courtesy of BMW OF NORTH AMERICA, INC.

0491915 HOLDING SLEEVE

0491915 312132 Holding sleeve Minimum set: Mechanical tools AM

Replaced by: 83300491916

NOTE: **(Pressure sleeve) For counter-holding/model series: E30 Replaced by 31 2 133. (0 491 916)**

Storage Location

B13

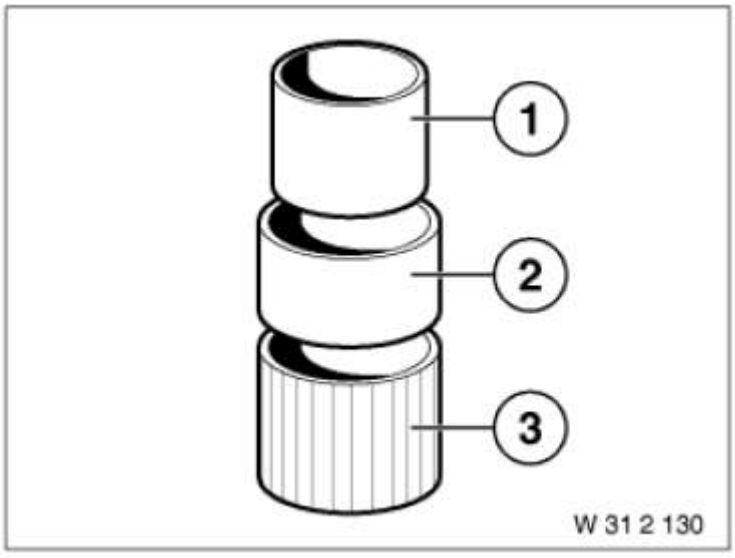


Fig. 107: Identifying Holding Sleeve (0491915)
Courtesy of BMW OF NORTH AMERICA, INC.

0493644 HOLDING SLEEVE

0493644 312264 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(Push sleeve) For removing and installing. Series: E53, E83**

Storage Location

B13

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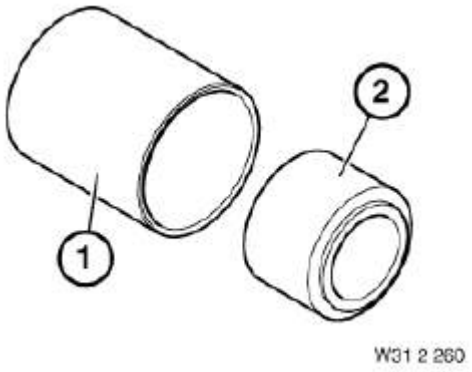


Fig. 108: Identifying Holding Sleeve (0493644)
Courtesy of BMW OF NORTH AMERICA, INC.

0491862 HOLDING SLEEVE

0491862 311012 Holding sleeve AM

NOTE: (Pressure sleeve) for counterholding, discontinued, available as part of set of special tools only

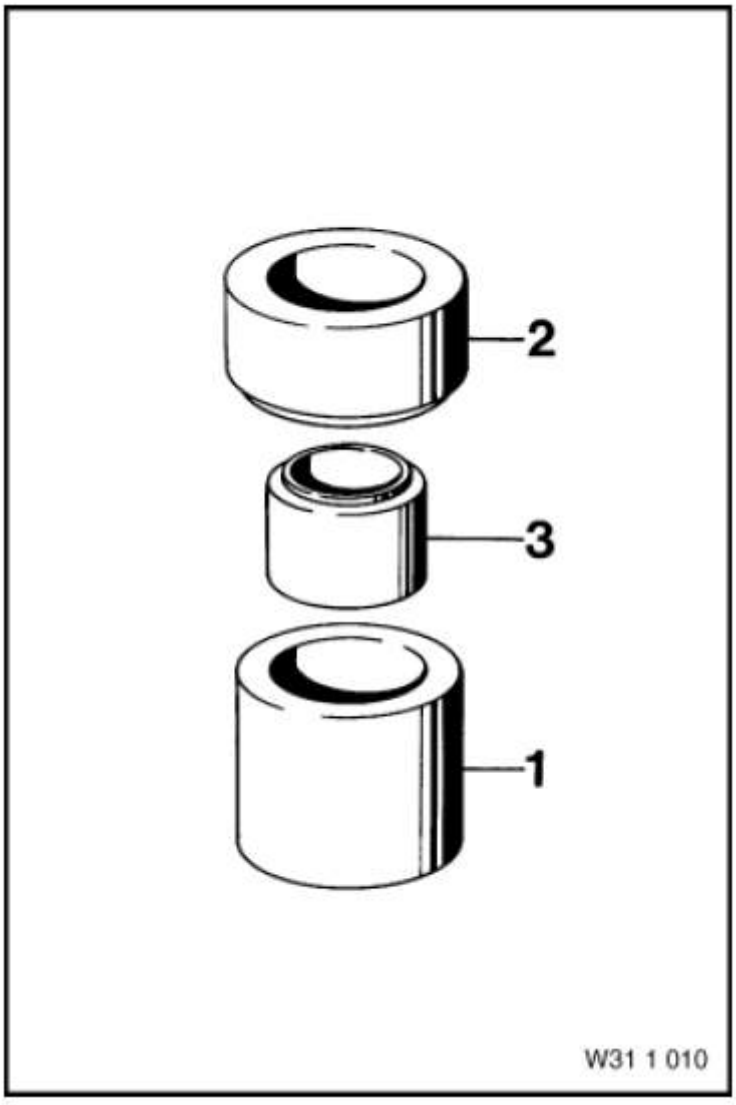


Fig. 109: Identifying Holding Sleeve (0491862)
Courtesy of BMW OF NORTH AMERICA, INC.

0491942 HOLDING SLEEVE

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0491942 312270 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(Pressure sleeves) For removing and installing the rubber mount in the trailing link of the front axle**

Storage Location

B13

SI number

01 12 95 (992)

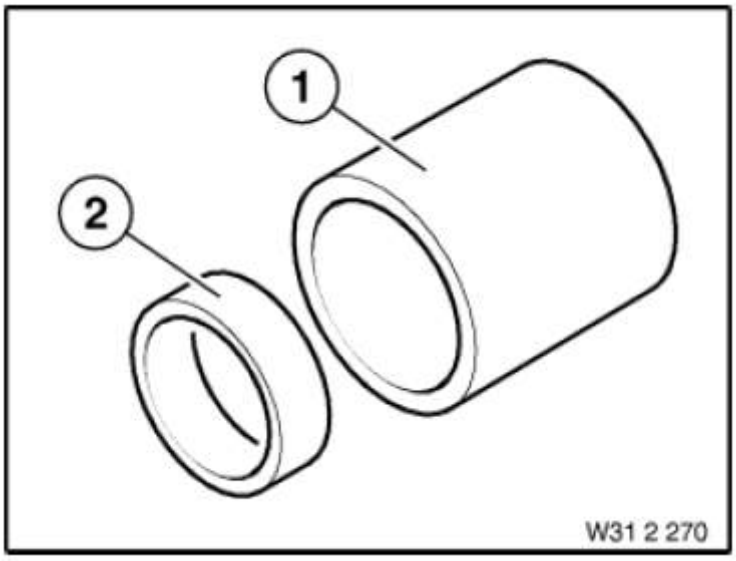


Fig. 110: Identifying Holding Sleeve (0491942)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1. **0491943** Holding sleeve

   NOTE: **(Pressure sleeve) for counterholding, discontinued, available as part of set of special tools only**

2. **0491944** Holding sleeve

   NOTE: **(Pressure sleeve) For removing and installing**

0494442 HOLDING SLEEVE

0494442 313113 Holding sleeve AM

Replaced by: 83300493555

NOTE: **(Centring sleeve) Internal thread M18x1.5 Replaced by 31 3 340 (0 493 555)**

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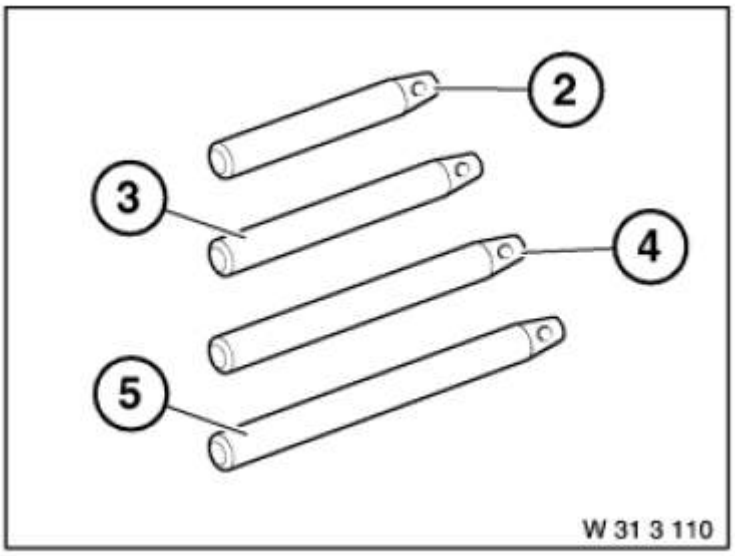


Fig. 111: Identifying Holding Sleeve (0494442)
Courtesy of BMW OF NORTH AMERICA, INC.

0491916 HOLDING SLEEVE

0491916 312133 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(Pressure sleeve) For pulling out and in/model series: E30 All-wheel drive vehicle, E34, E36, E46 Can no longer be ordered separately. Only available as part of set 31 2 130 = 83 30 0 491 913.**

Storage Location

B13

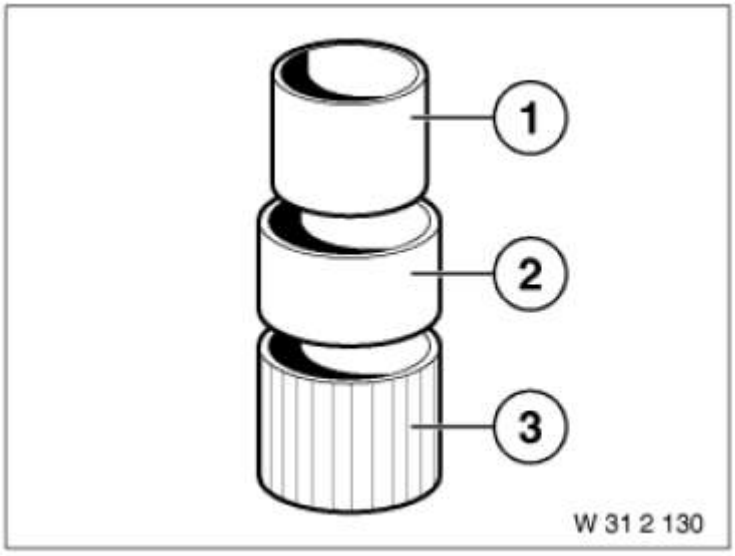


Fig. 112: Identifying Holding Sleeve (0491916)
Courtesy of BMW OF NORTH AMERICA, INC.

0494444 HOLDING SLEEVE

0494444 313115 Holding sleeve AM

Replaced by: 83300493555

NOTE: **(Centring sleeve) Internal thread M12x1.5 Replaced by 31 3 340 (0 493 555)**

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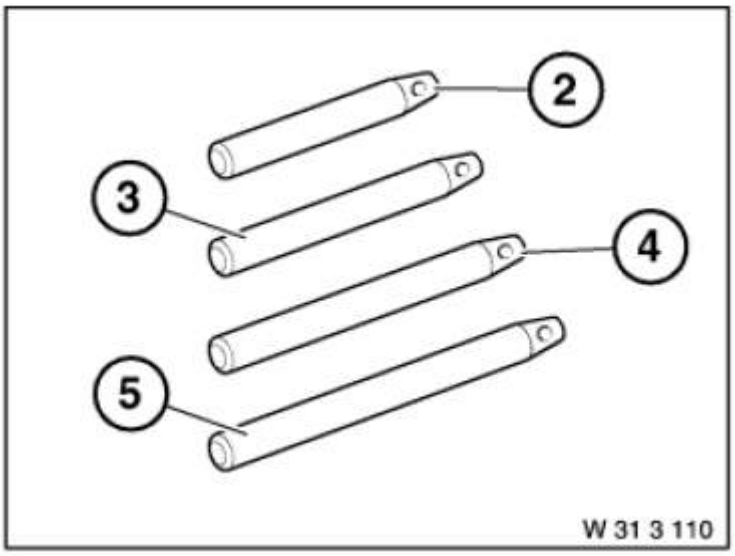


Fig. 113: Identifying Holding Sleeve (0494444)
Courtesy of BMW OF NORTH AMERICA, INC.

0491870 HOLDING SLEEVE

0491870 311052 Holding sleeve AM

Replaced by: 83300493747

NOTE: **(Pressure sleeve) For gripping the wishbones and for removing and installing the silence blocks in the leading link. Replaced by 31 1 054. (0 493 747)**

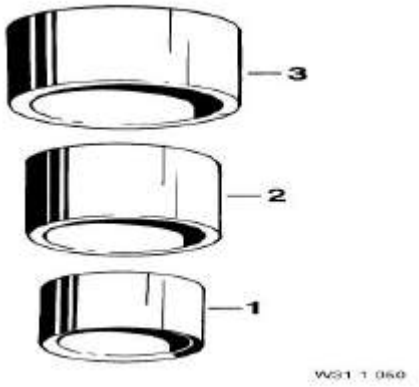


Fig. 114: Identifying Holding Sleeve (0491870)
Courtesy of BMW OF NORTH AMERICA, INC.

2156254 HOLDING SLEEVE

2156254 Holding sleeve AM

NOTE: **Sleeve C1 in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 115: Identifying Holding Sleeve (2156254)
Courtesy of BMW OF NORTH AMERICA, INC.

0491940 HOLDING SLEEVE

0491940 312261 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(Push sleeve) As counter support when removing and installing. Series: E38, E39, E83 For removing and installing rubber mounts in wishbones/Model series: E46/5**

Storage Location

B13

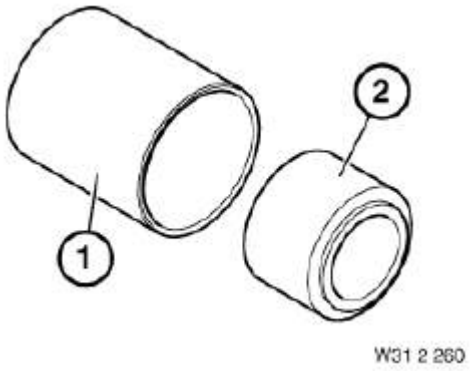


Fig. 116: Identifying Holding Sleeve (0491940)
Courtesy of BMW OF NORTH AMERICA, INC.

0494443 HOLDING SLEEVE

0494443 313114 Holding sleeve AM

Replaced by: 83300493555

NOTE: **(Centring sleeve) Internal thread M10x1 Replaced by 31 3 340 (0 493 555)**

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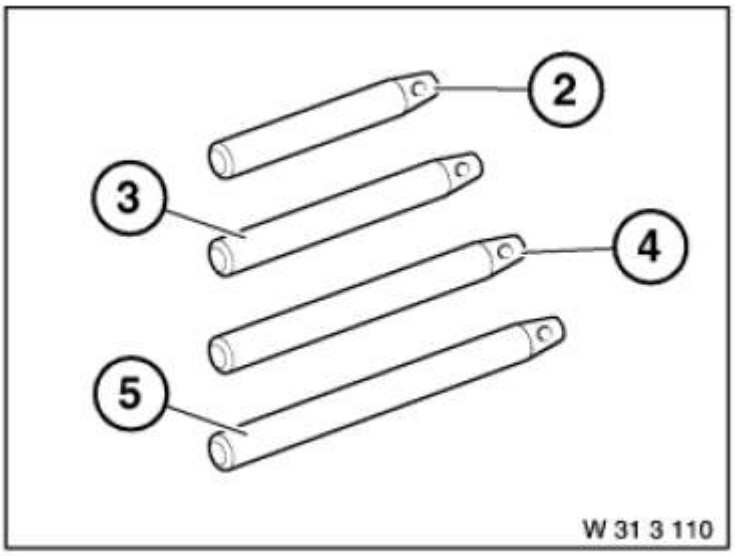


Fig. 117: Identifying Holding Sleeve (0494443)
Courtesy of BMW OF NORTH AMERICA, INC.

0491949 HOLDING SLEEVE

0491949 313110 Holding sleeve AM

Replaced by: 83300493555

NOTE: (Centring sleeve set for piston rod/shock absorber) Spring tensioner 31 3 110/111 for tensioning coil springs/Replaced by 31 3 340 (0 493 555)

Consisting of:

1. **0494440** Spring tensioner

NOTE: Replaced by 31 3 340 (0 493 555)

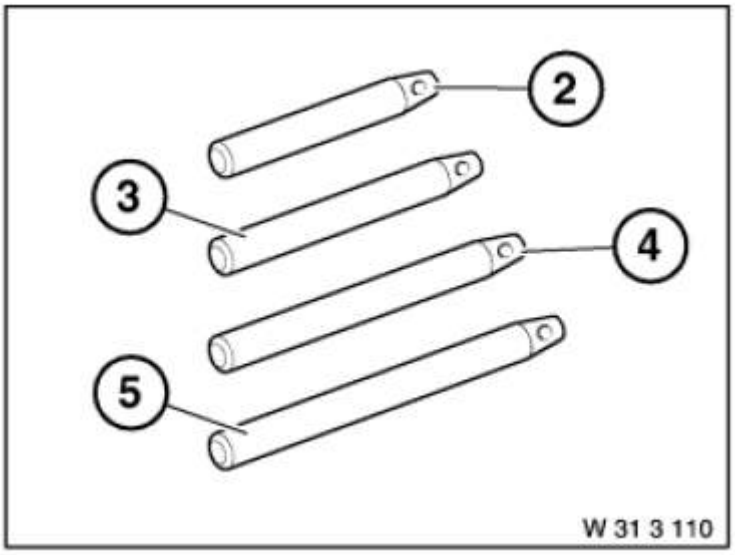


Fig. 118: Identifying Holding Sleeve (0491949)
Courtesy of BMW OF NORTH AMERICA, INC.

2. **0494441** Holding sleeve

NOTE: (Centring sleeve) Replaced by 31 3 340 (0 493 555)

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3. **0494442** Holding sleeve

NOTE: **(Centring sleeve) Internal thread M18x1.5 Replaced by 31 3 340 (0 493 555)**

4. **0494443** Holding sleeve

NOTE: **(Centring sleeve) Internal thread M10x1 Replaced by 31 3 340 (0 493 555)**

5. **0494444** Holding sleeve

NOTE: **(Centring sleeve) Internal thread M12x1.5 Replaced by 31 3 340 (0 493 555)**

0491944 HOLDING SLEEVE

0491944 312272 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(Pressure sleeve) For removing and installing**

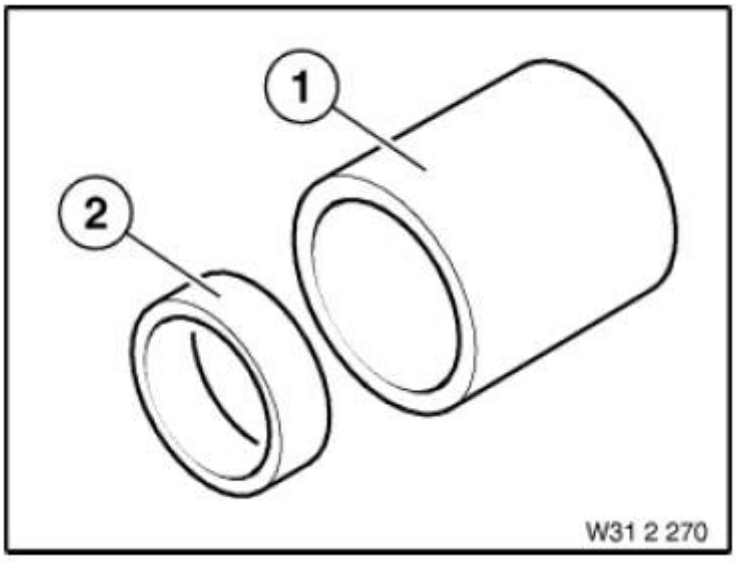


Fig. 119: Identifying Holding Sleeve (0491944)
Courtesy of BMW OF NORTH AMERICA, INC.

0491861 HOLDING SLEEVE

0491861 311011 Holding sleeve AM

NOTE: **(Pressure sleeve) for removal discontinued, available as part of set of special tools only**

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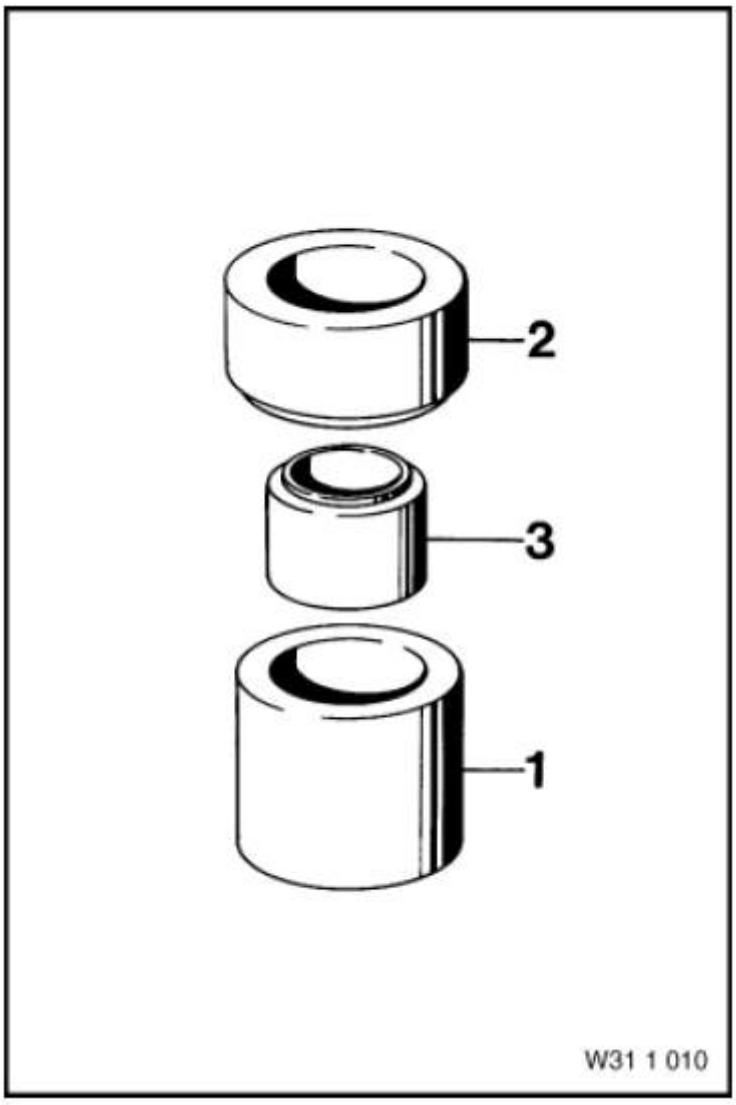


Fig. 120: Identifying Holding Sleeve (0491861)
Courtesy of BMW OF NORTH AMERICA, INC.

0491871 HOLDING SLEEVE

0491871 311053 Holding sleeve AM

NOTE: **(pressure sleeve) For gripping the leading link. Series: E24, E28, E32, E34 Discontinued, only available via complete tool**

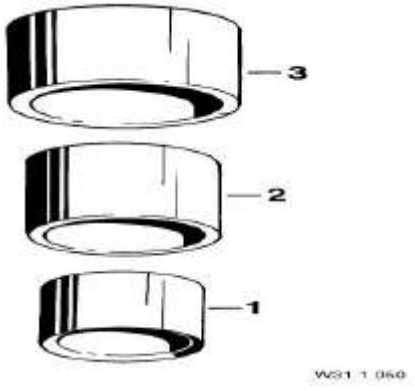


Fig. 121: Identifying Holding Sleeve (0491871)
Courtesy of BMW OF NORTH AMERICA, INC.

2159986 HOLDING SLEEVE

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2159986 Holding sleeve AM

NOTE: **Sleeve H1 (removing gear finding component) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 122: Identifying Holding Sleeve (2159986)
Courtesy of BMW OF NORTH AMERICA, INC.

0491943 HOLDING SLEEVE

0491943 312271 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(Pressure sleeve) for counterholding, discontinued, available as part of set of special tools only**

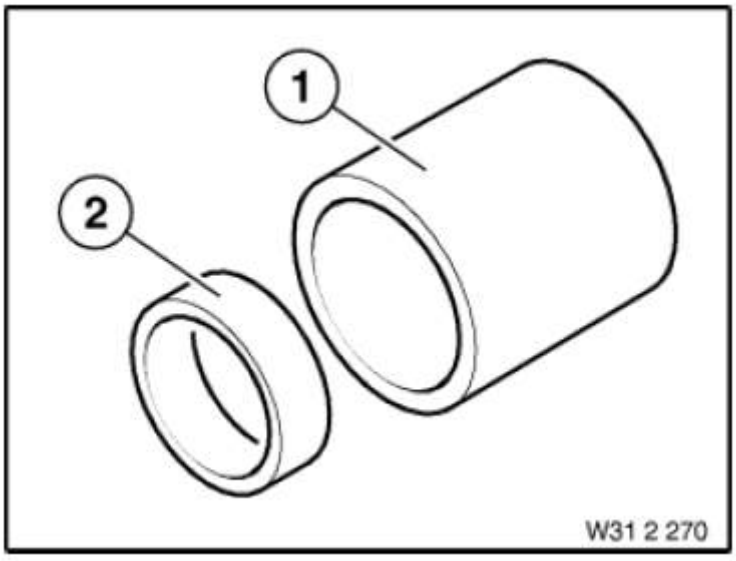


Fig. 123: Identifying Holding Sleeve (0491943)
Courtesy of BMW OF NORTH AMERICA, INC.

0494441 HOLDING SLEEVE

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0494441 313112 Holding sleeve AM

Replaced by: 83300493555

NOTE: **(Centring sleeve) Replaced by 31 3 340 (0 493 555)**

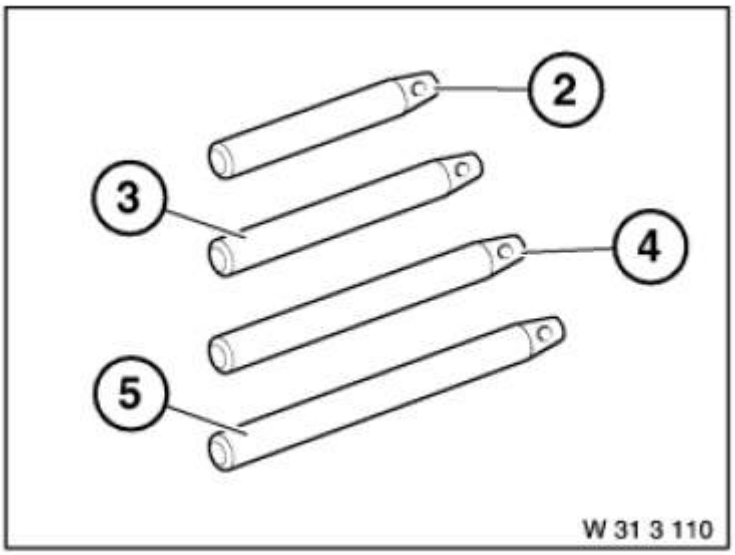


Fig. 124: Identifying Holding Sleeve (0494441)
Courtesy of BMW OF NORTH AMERICA, INC.

0491863 HOLDING SLEEVE

0491863 311013 Holding sleeve AM

NOTE: **(Pressure sleeve) for installing discontinued, available as part of set of special tools only**

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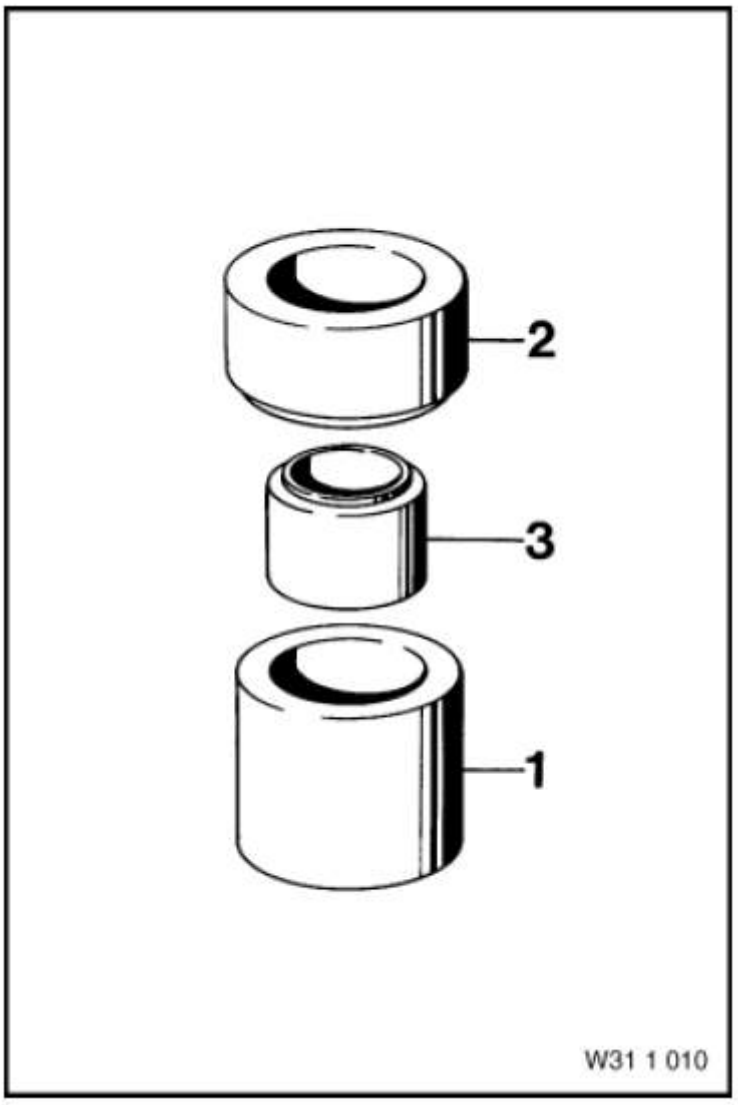


Fig. 125: Identifying Holding Sleeve (0491863)
Courtesy of BMW OF NORTH AMERICA, INC.

0491941 HOLDING SLEEVE

0491941 312262 Holding sleeve Minimum set: Mechanical tools AM

Replaced by: 83300493596

NOTE: **(Pressure sleeve) For pulling out and in/model series: E38 Replaced by 31 2 263. (0 493 596)**

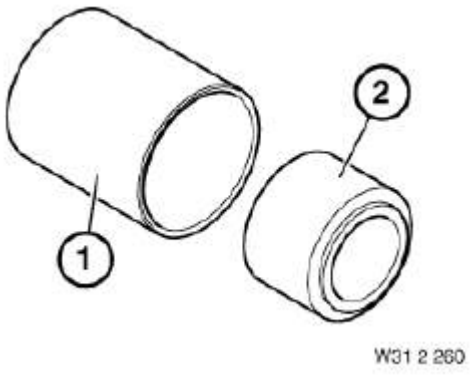


Fig. 126: Identifying Holding Sleeve (0491941)
Courtesy of BMW OF NORTH AMERICA, INC.

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0491914 HOLDING SLEEVE

0491914 312131 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(Pressure sleeve) For pulling out and in/model series: E30, E46. Can no longer be ordered separately. Only available as part of set 31 2 130 = 83 30 0 491 913.**

Storage Location

B13

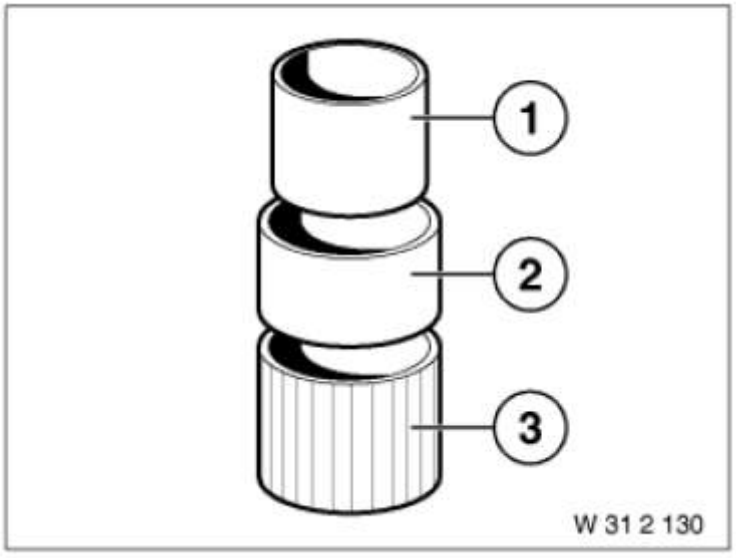


Fig. 127: Identifying Holding Sleeve (0491914)
Courtesy of BMW OF NORTH AMERICA, INC.

2156258 HOLDING SLEEVE

2156258 Holding sleeve AM

NOTE: **Sleeve E1 (M24) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



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Fig. 128: Identifying Holding Sleeve (2156258)
Courtesy of BMW OF NORTH AMERICA, INC.

0491959 HOLDING SLEEVE

0491959 313130 Holding sleeve Mechanical tool

NOTE: For counter support when pressing the knurled bolts into the support bearing (spring strut)

Storage Location

B22

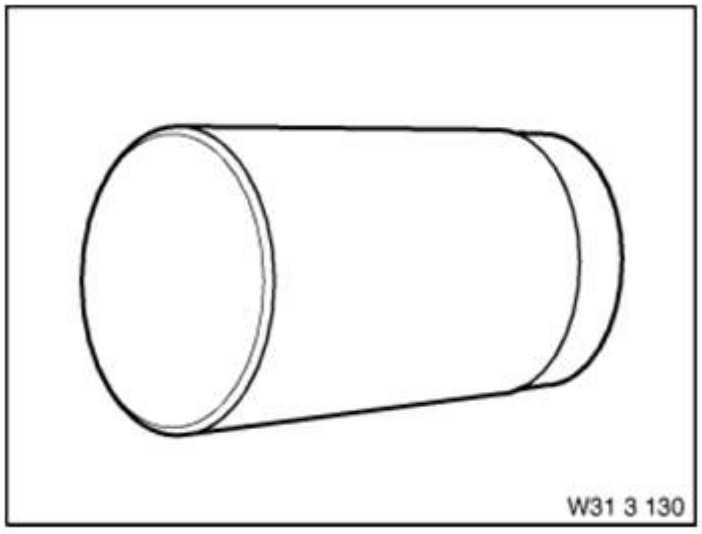


Fig. 129: Identifying Holding Sleeve (0491959)
Courtesy of BMW OF NORTH AMERICA, INC.

0491869 HOLDING SLEEVE

0491869 311051 Holding sleeve AM

NOTE: (Pressure sleeve) For removing and installing the silent blocks in the wishbone. Discontinued, can only be ordered using complete tool

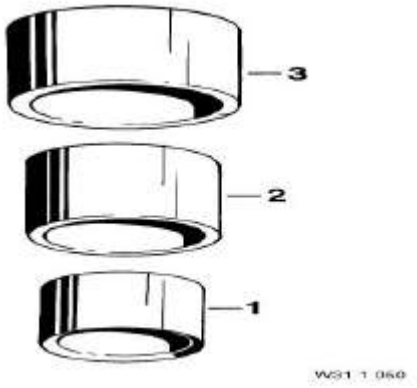


Fig. 130: Identifying Holding Sleeve (0491869)
Courtesy of BMW OF NORTH AMERICA, INC.

0493596 HOLDING SLEEVE

0493596 312263 Holding sleeve Minimum set: Mechanical tools AM

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NOTE: **(Push sleeve) For removing and installing Model series: E38, E39**

Storage Location

B13

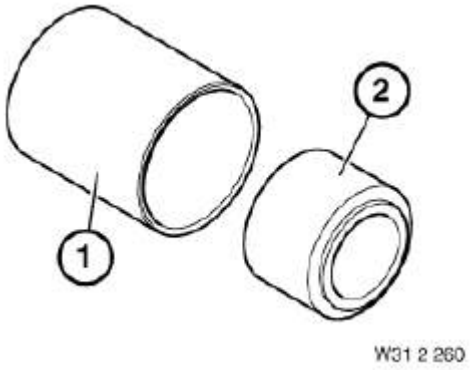


Fig. 131: Identifying Holding Sleeve (0493596)
Courtesy of BMW OF NORTH AMERICA, INC.

2156246 HYDRAULIC CYLINDERS

2156246 Hydraulic cylinders AM

NOTE: **Hydraulic cylinder (hydraulic actuator) in connection with lever, (81 64 2 156 247), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

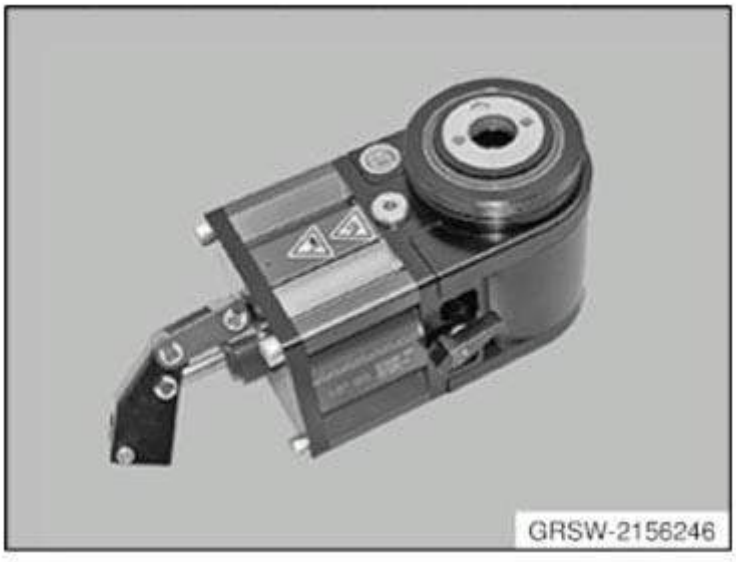


Fig. 132: Identifying Hydraulic Cylinders (2156246)
Courtesy of BMW OF NORTH AMERICA, INC.

31-3365 INSERT

2213035 313365 Insert Mechanical tool

NOTE: **Protective insert As of 08/2011, replaces the previous special tool number 31 3 365**

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SI number

01 16 11 (738)



Fig. 133: Identifying Insert (2213035)
Courtesy of BMW OF NORTH AMERICA, INC.

2213037 INSERT

2213037 313368 Insert Mechanical tool

NOTE: **Protective insert As of 08/2011, replaces the previous special tool number 31 3 368**

SI number

01 16 11 (738)



Fig. 134: Identifying Insert (2213037)
Courtesy of BMW OF NORTH AMERICA, INC.

0491957 INSERT

0491957 313127 Insert AM

Replaced by: 83300493560

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NOTE: **(Protective insert) For spring retainer 31 3 122 Discontinuation and replaced by 31 3 350. (0 493 560)**

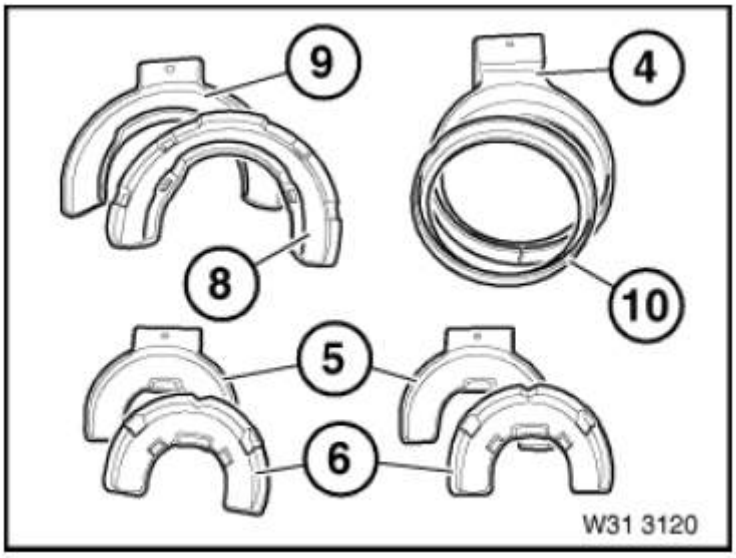


Fig. 135: Identifying Insert (0491957)
Courtesy of BMW OF NORTH AMERICA, INC.

0491958 INSERT

0491958 313128 Insert AM

Replaced by: 83300493560

NOTE: **(Protective insert) For spring retainer 31 3 123 and 31 3 129 Discontinuation and replaced by 31 3 350. (0 493 560)**

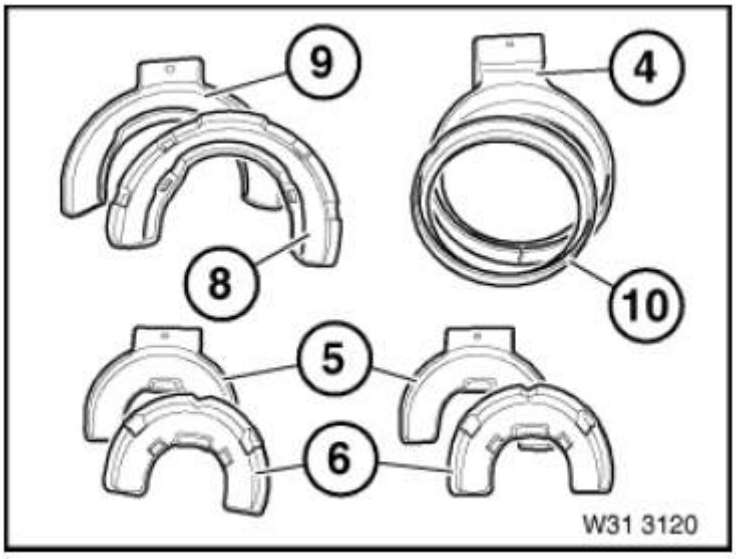


Fig. 136: Identifying Insert (0491958)
Courtesy of BMW OF NORTH AMERICA, INC.

0493357 INSERT

0493357 313326 Insert AM

NOTE: **(Protective insert) For spring retainer 31 3 325**

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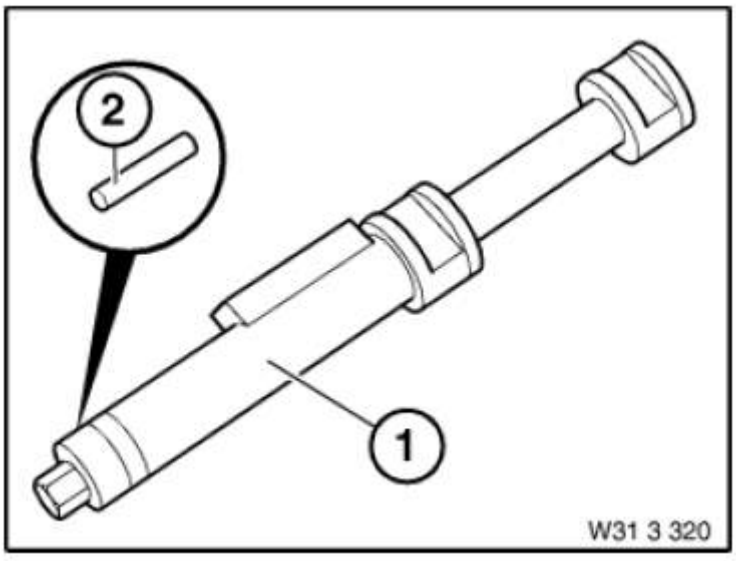


Fig. 137: Identifying Insert (0493357)
Courtesy of BMW OF NORTH AMERICA, INC.

2213040 INSERT

2213040 313364 Insert Mechanical tool

NOTE: **Protective insert As of 08/2011, replaces the previous special tool number 31 3 364. Protective insert suitable for clamping plate 31 3 382 = 83 30 2 213 039.**

SI number

01 16 11 (738)



Fig. 138: Identifying Insert (2213040)
Courtesy of BMW OF NORTH AMERICA, INC.

2213027 INSERT

2213027 313362 Insert AM

In conjunction with: **31 3 352 = 83300493566**

NOTE: **Protective insert for clamping plate As of 08/2011, replaces the previous special tool number 31 3 362. Protective insert suitable for clamping plate 31 3 352 = 83**

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30 2 213 026.

SI number

01 16 11 (738)



Fig. 139: Identifying Insert (2213027)
Courtesy of BMW OF NORTH AMERICA, INC.

2213028 INSERT

2213028 313369 Insert Mechanical tool

NOTE: **Protective insert (blue) As of 08/2011, replaces the previous special tool number 31 3 369. Protective insert suitable for clamping plate 31 3 352 = 83 30 2 213 026.**

SI number

01 16 11 (738)



Fig. 140: Identifying Insert (2213028)
Courtesy of BMW OF NORTH AMERICA, INC.

2213035 INSERT

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2213035 313365 Insert AM

NOTE: **Protective insert As of 08/2011, replaces the previous special tool number 31 3 365. Protective insert suitable for clamping plate 31 3 355 = 83 30 2 213 034.**

SI number

01 16 11 (738)



Fig. 141: Identifying Insert (2213035)
Courtesy of BMW OF NORTH AMERICA, INC.

2213032 INSERT

2213032 313356 Insert Mechanical tool

NOTE: **Protective insert (ring) As of 08/2011, replaces the previous special tool number 31 3 356. Protective insert suitable for clamping plate 31 3 354 = 83 30 2 213 031.**

SI number

01 16 11 (738)



Fig. 142: Identifying Insert (2213032)
Courtesy of BMW OF NORTH AMERICA, INC.

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0493358 INSERT

0493358 313327 Insert AM

NOTE: **(Protective insert) For spring retainer 31 3 322**

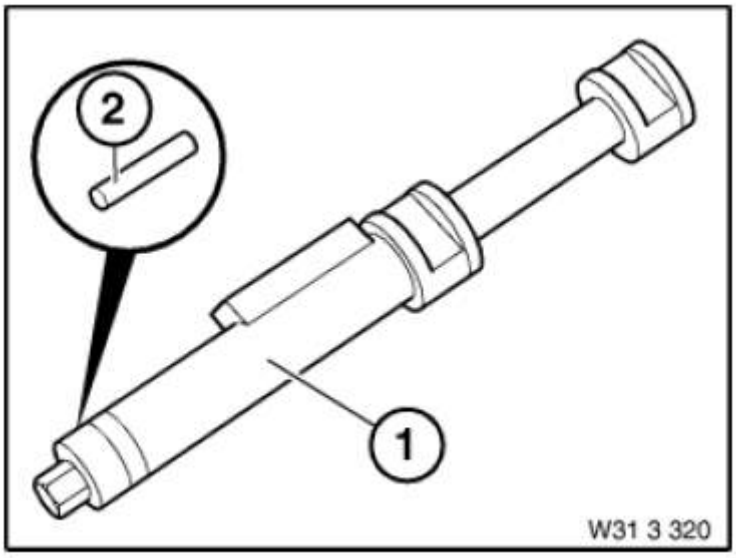


Fig. 143: Identifying Insert (0493358)
Courtesy of BMW OF NORTH AMERICA, INC.

0493359 INSERT

0493359 313328 Insert AM

NOTE: **(Protective insert) For spring retainer 31 3 323**

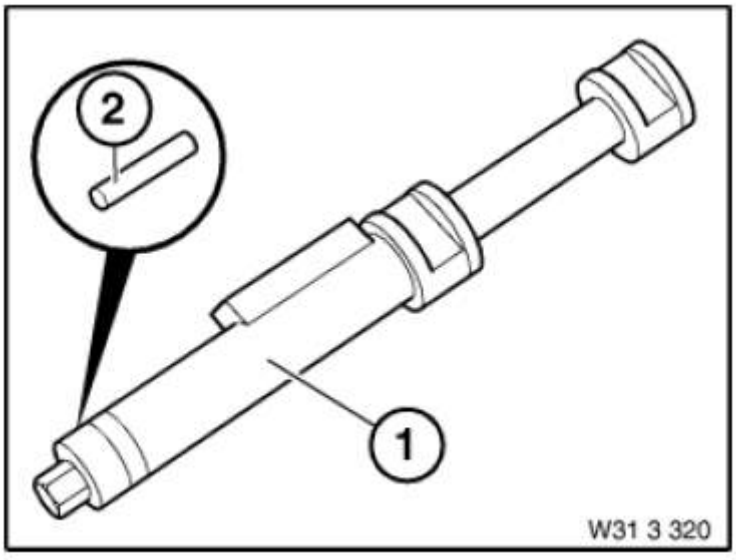


Fig. 144: Identifying Insert (0493359)
Courtesy of BMW OF NORTH AMERICA, INC.

0491956 INSERT

0491956 313126 Insert AM

Replaced by: 83300493560

NOTE: **(Protective insert) For spring retainer 31 3 125 Discontinuation and replaced by**

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31 3 350. (0 493 560)

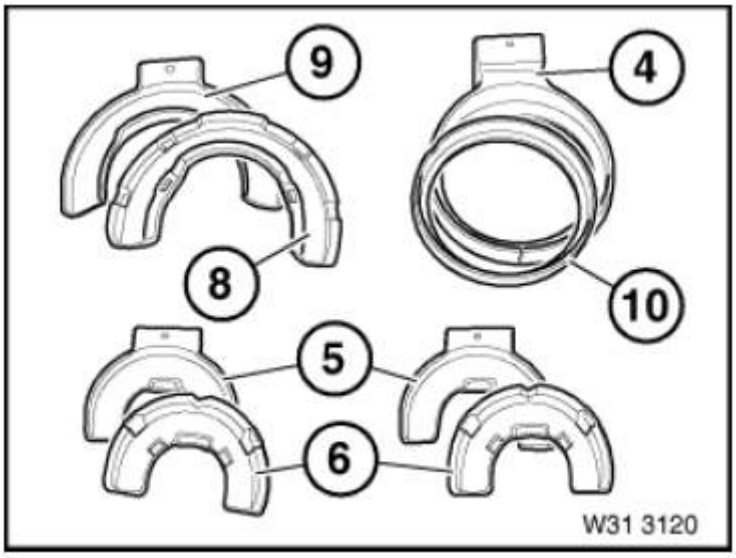


Fig. 145: Identifying Insert (0491956)
Courtesy of BMW OF NORTH AMERICA, INC.

2213030 INSERT

2213030 313363 Insert Mechanical tool

NOTE: **Protective insert As of 08/2011, replaces the previous special tool number 31 3 363. Protective insert suitable for clamping plate 31 3 353 = 83 30 2 213 029.**

SI number

01 16 11 (738)



Fig. 146: Identifying Insert (2213030)
Courtesy of BMW OF NORTH AMERICA, INC.

0493362 INSERT

0493362 313332 Insert AM

NOTE: **(Protective insert) For spring retainer 31 3 329**

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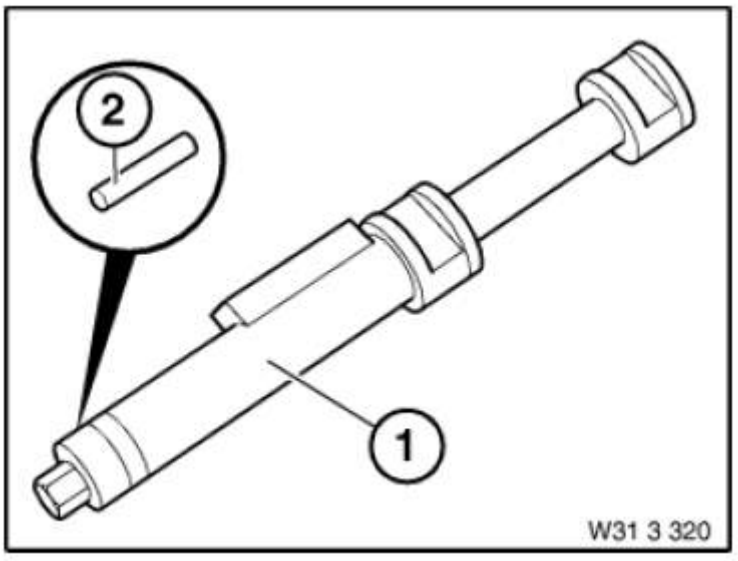


Fig. 147: Identifying Insert (0493362)
Courtesy of BMW OF NORTH AMERICA, INC.

2210779 LASER

2210779 Laser Minimum set: Mechanical tools AM

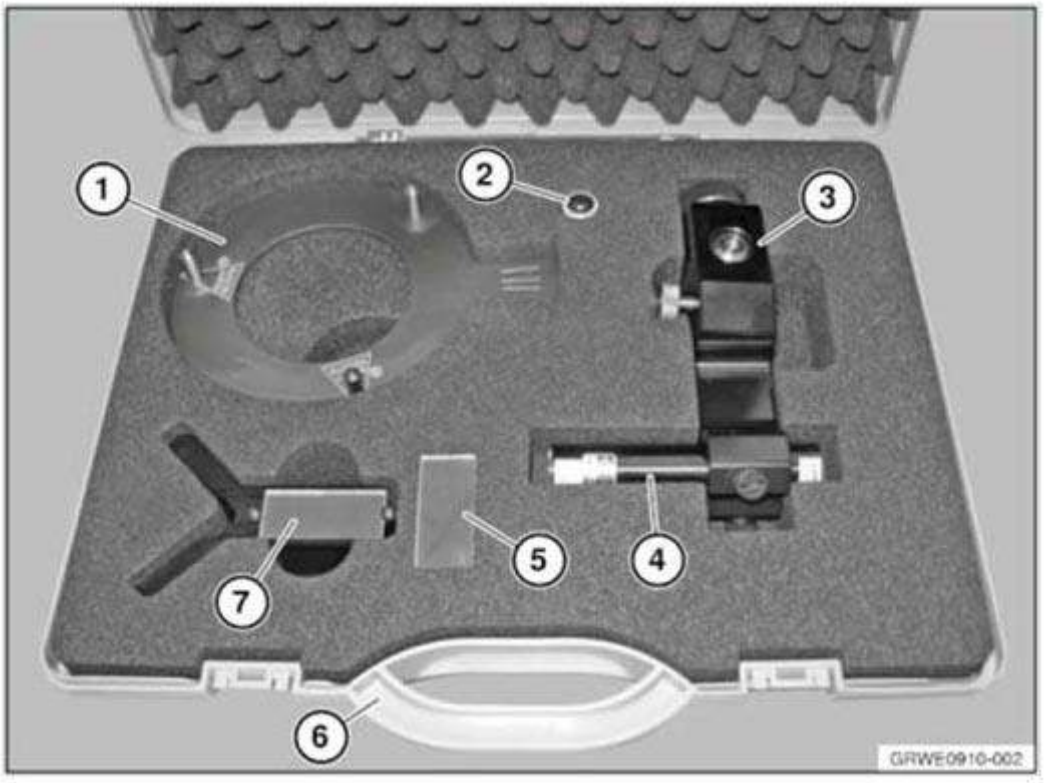


Fig. 148: Identifying Laser (2210779)
Courtesy of BMW OF NORTH AMERICA, INC.

2156247 LEVER

2156247 Lever AM

NOTE: **Lever in connection with hydraulic cylinder (hydraulic actuator), (81 64 2 156 246), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 06 09 (544)



Fig. 149: Identifying Lever (2156247)
Courtesy of BMW OF NORTH AMERICA, INC.

2210785 LOCATING FIXTURE

2210785 Locating fixture Minimum set: Mechanical tools AM

NOTE: **For attaching and aligning the laser on the spring strut.**



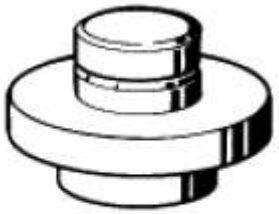
Fig. 150: Identifying Fixture Mechanical Tools (2210785)
Courtesy of BMW OF NORTH AMERICA, INC.

0491974 MANDREL

0491974 315030 Mandrel Mechanical tool

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

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W31 5 030

Fig. 151: Identifying Mandrel (0491974)
Courtesy of BMW OF NORTH AMERICA, INC.

0491891 MANDREL

0491891 312040 Mandrel Mechanical tool

NOTE: **(Drift) For driving the radial shaft seals into the front wheel hubs and the input flange of the rear axle differential**

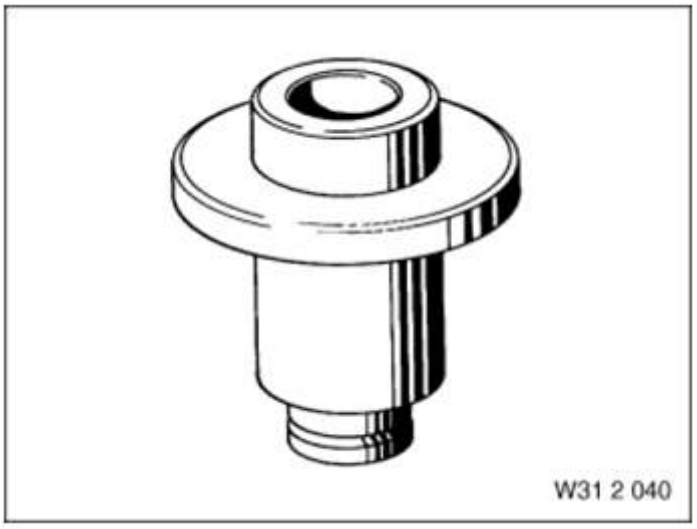


Fig. 152: Identifying Mandrel (0491891)
Courtesy of BMW OF NORTH AMERICA, INC.

0491973 MANDREL

0491973 315020 Mandrel Mechanical tool

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

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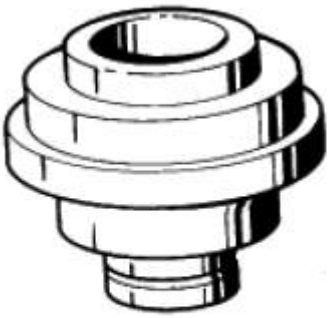


Fig. 153: Identifying Mandrel (0491973)
Courtesy of BMW OF NORTH AMERICA, INC.

0491946 MEASUREMENT AID

0491946 313010 Measurement aid Minimum set: Mechanical tools AM

NOTE: (Measuring aid) 2 units, to determine the vehicle ride height during wheel alignment --> > E36/7 (Z3)

Storage Location

C5

SI number

01 03 96 (042)

Consisting of:

1. 0491947 Measurement aid

NOTE: (Measurement aid)

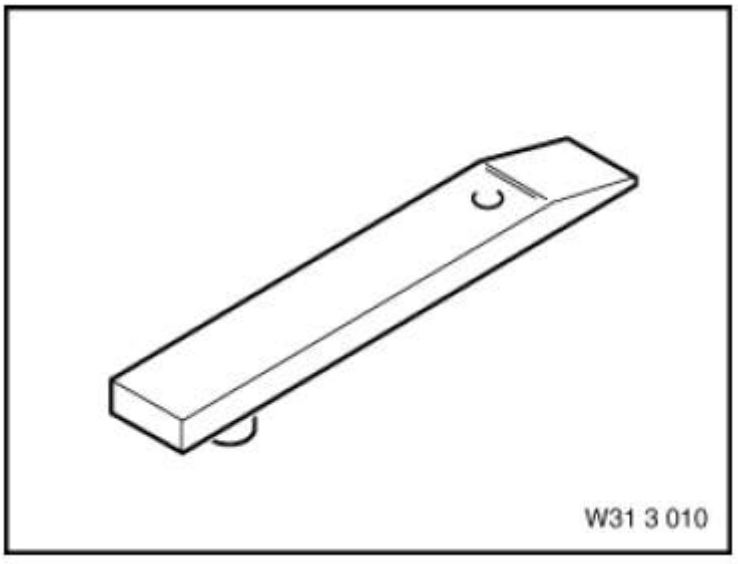


Fig. 154: Identifying Measurement Aid (0491946)
Courtesy of BMW OF NORTH AMERICA, INC.

2210781 MEASUREMENT AID

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2210781 Measurement aid Minimum set: Mechanical tools AM

NOTE: **Prism with mirror, for aligning the laser beam.**



Fig. 155: Identifying Measurement Aid (2210781)
Courtesy of BMW OF NORTH AMERICA, INC.

0491947 MEASUREMENT AID

0491947 313011 Measurement aid Minimum set: Mechanical tools AM

NOTE: **(Measurement aid)**

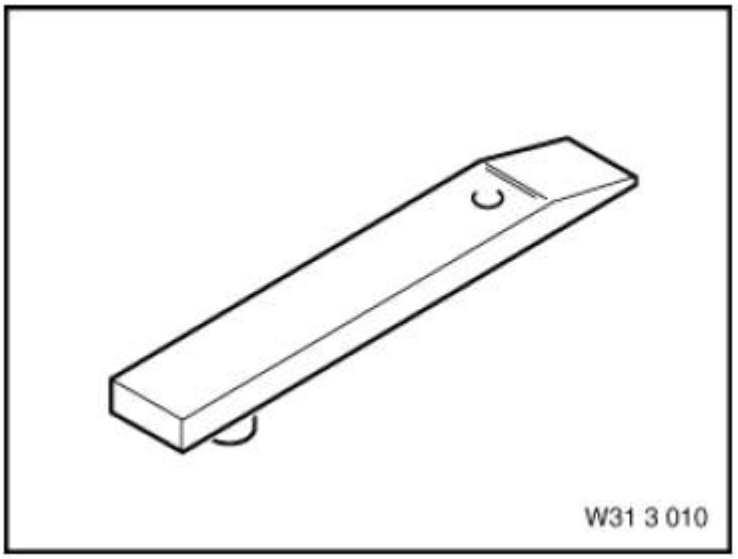


Fig. 156: Identifying Measurement Aid (0491947)
Courtesy of BMW OF NORTH AMERICA, INC.

2210780 MIRRORS

2210780 Mirrors Minimum set: Mechanical tools AM

NOTE: **1 set (2 units) replacement for prism 83 30 2 210 780**

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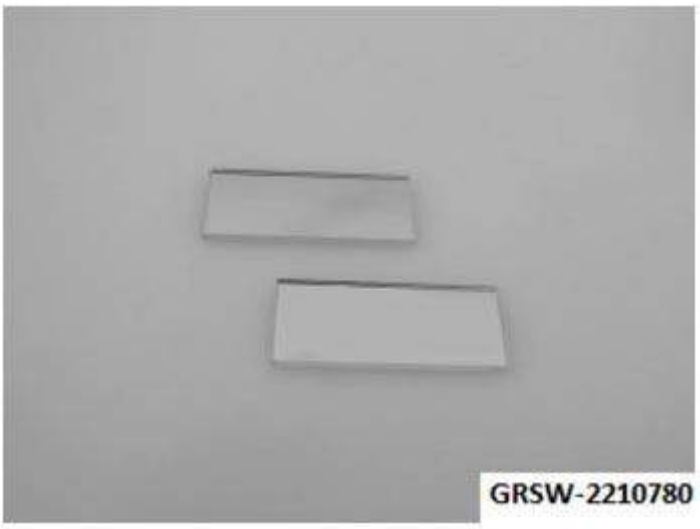
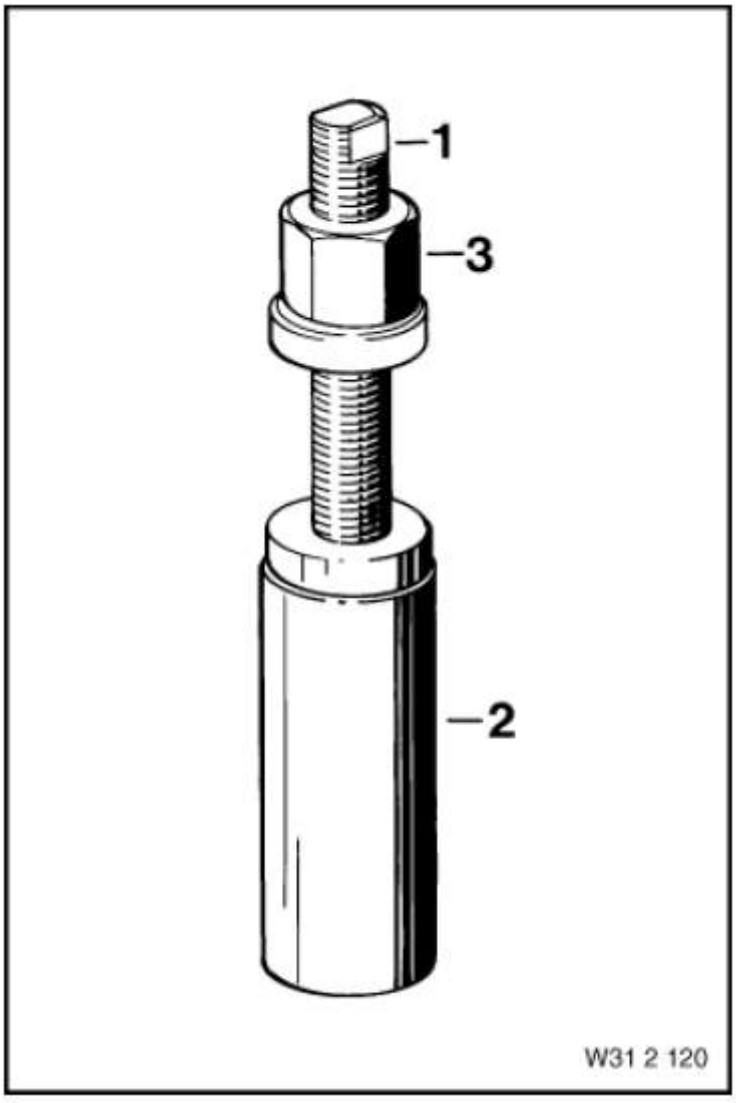


Fig. 157: Identifying Mirrors (2210780)
Courtesy of BMW OF NORTH AMERICA, INC.

0491912 NUT

0491912 312123 Nut AM

NOTE: **(Nut with bearing) Can no longer be ordered separately. Only available as part of set 31 2 120 = 83 30 0 491 909.**



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Fig. 158: Identifying Nut (0491912)
Courtesy of BMW OF NORTH AMERICA, INC.

0496296 NUT

0496296 315233 Nut AM

NOTE: (Nut with bearing) Can no longer be ordered separately. Only available as part of set 31 2 120 = 83 30 0 491 909.

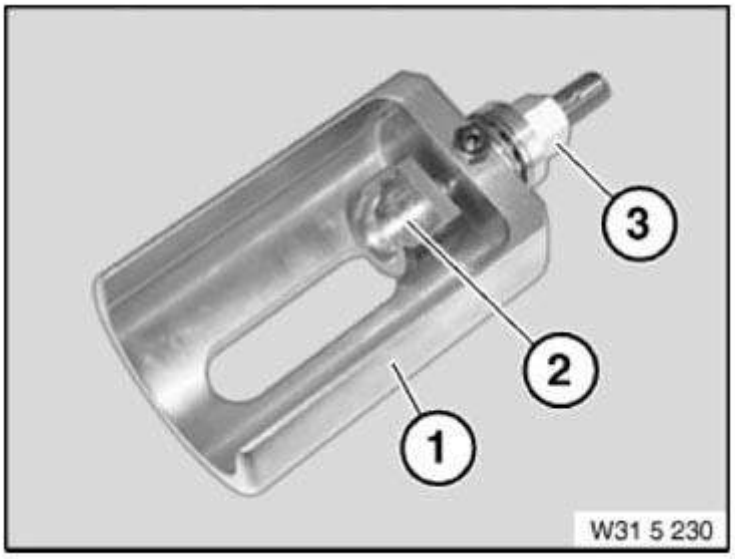


Fig. 159: Identifying Nut (0496296)
Courtesy of BMW OF NORTH AMERICA, INC.

0493262 PIN

0493262 313151 Pin AM

NOTE: (Replacement pins) Deletion, only available via tool set

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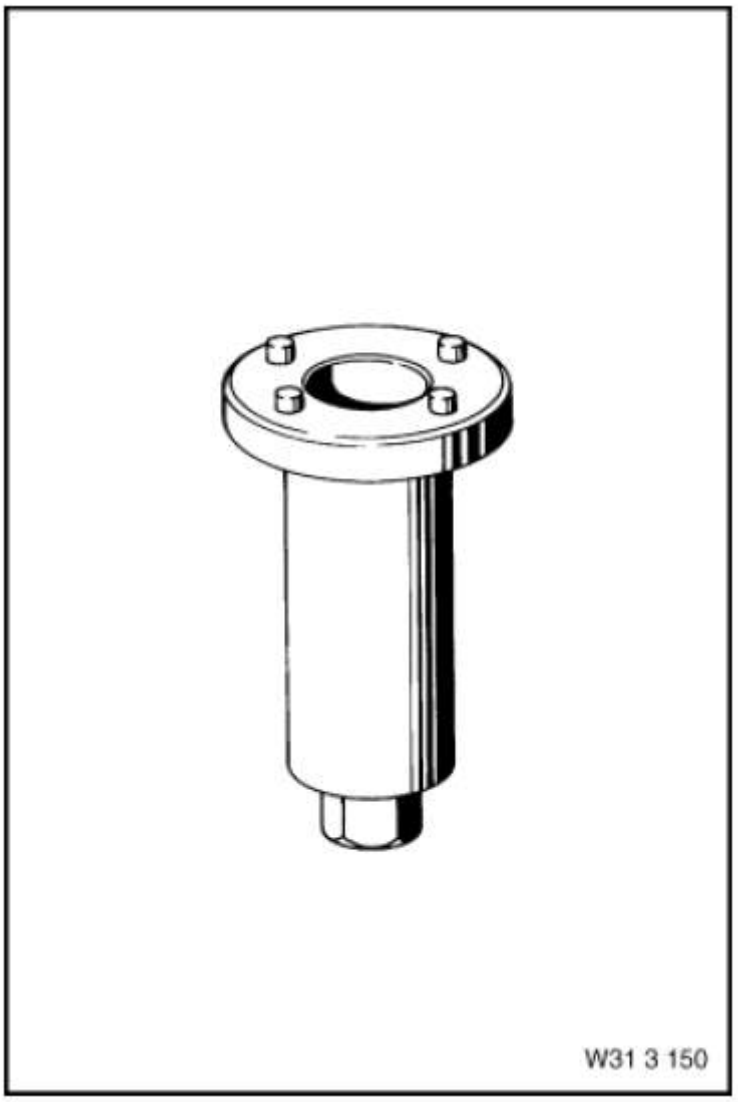


Fig. 160: Identifying Pin (0493262)
Courtesy of BMW OF NORTH AMERICA, INC.

0493557 PIN

0493557 313342 Pin Minimum set: Mechanical tools AM

Replaced by: 83302213023

NOTE: **Spare part set for basic device (2 locking pins and 1 O-ring) will be available under a new order number 83 30 2 213 023 as of July 2011**

SI number

01 16 11 (738)

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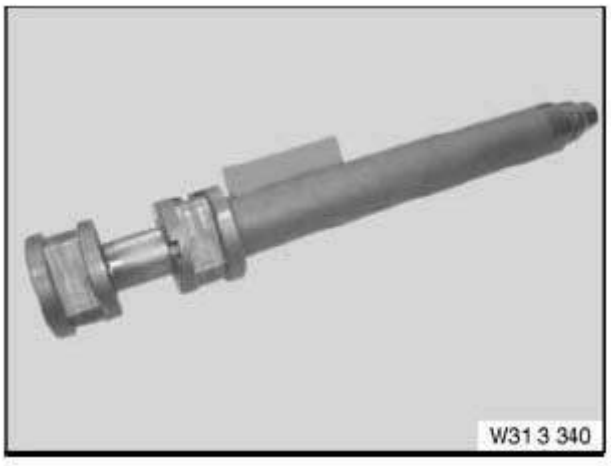


Fig. 161: Identifying Pin (0493557)
Courtesy of BMW OF NORTH AMERICA, INC.

0491938 PIN

0491938 312245 Pin Minimum set: Mechanical tools AM

NOTE: **(Cylindrical pin)**

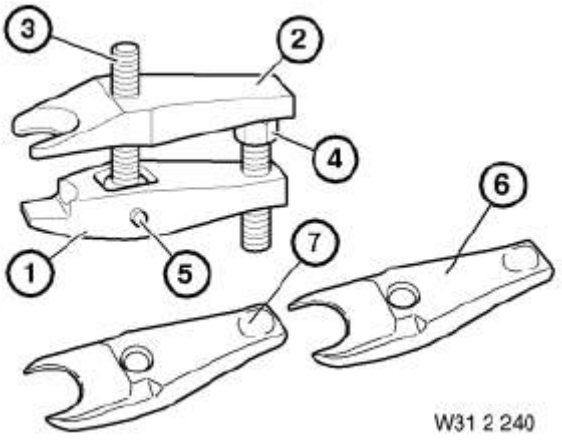


Fig. 162: Identifying Pin (0491938)
Courtesy of BMW OF NORTH AMERICA, INC.

0491961 PIN WRENCH

0491961 313150 Pin wrench AM

NOTE: **For releasing and tightening down the spring strut bolt**

Storage Location

Z1

Consisting of:

2 = 0493262 Pin

NOTE: **(Replacement pins) Deletion, only available via tool set**

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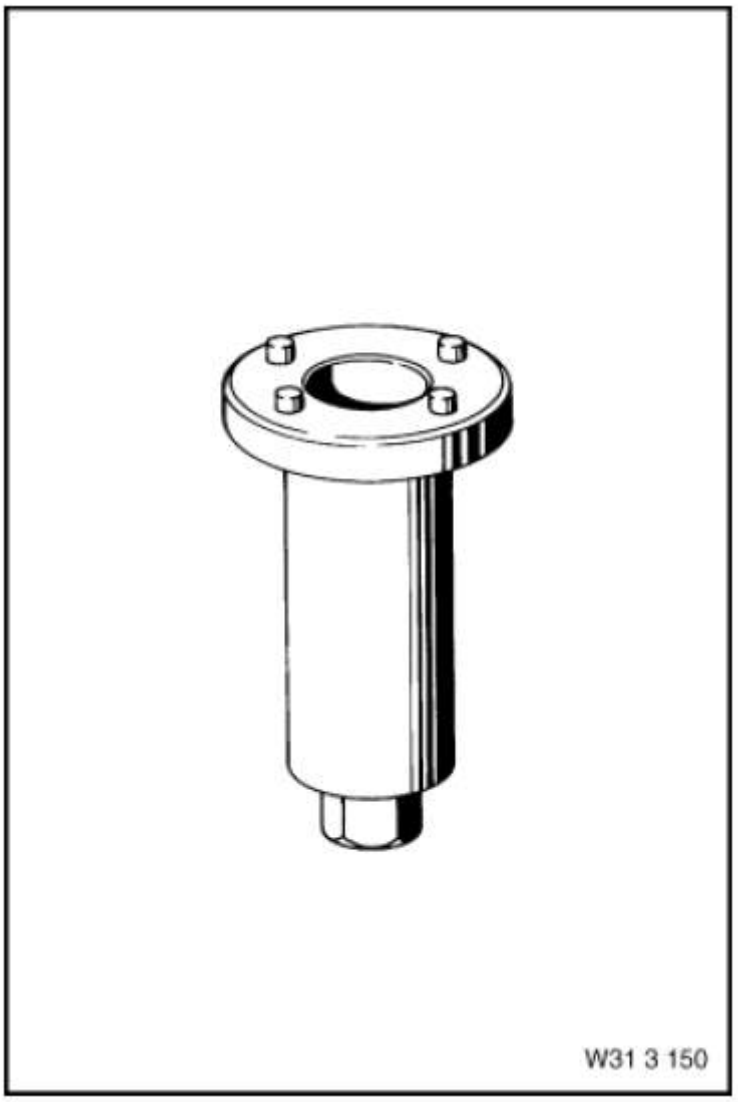


Fig. 163: Identifying Pin Wrench (0491961)
Courtesy of BMW OF NORTH AMERICA, INC.

0491960 PIN WRENCH

0491960 313140 Pin wrench Mechanical tool

NOTE: For unfastening and tightening the spring-strut bolts when replacing the shock absorber

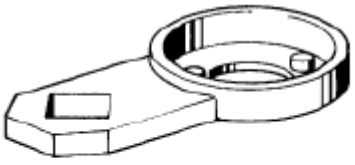


Fig. 164: Identifying Pin Wrench (0491960)
Courtesy of BMW OF NORTH AMERICA, INC.

0491968 PIN WRENCH

0491968 313400 Pin wrench Mechanical tool

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NOTE: **For retightening the shock absorber screw connection in the spring strut without dismantling the spring strut**

Storage Location

X10

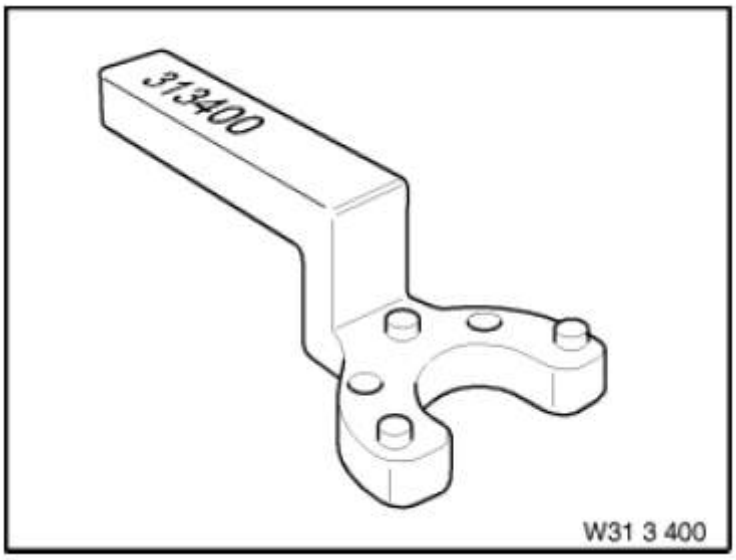


Fig. 165: Identifying Pin Wrench (0491968)
Courtesy of BMW OF NORTH AMERICA, INC.

0491964 PIN WRENCH

0491964 313180 Pin wrench Mechanical tool

NOTE: **For releasing and tightening the spring-strut bolts when replacing the "Bilstein" gas-pressure shock absorber**

Storage Location

X4

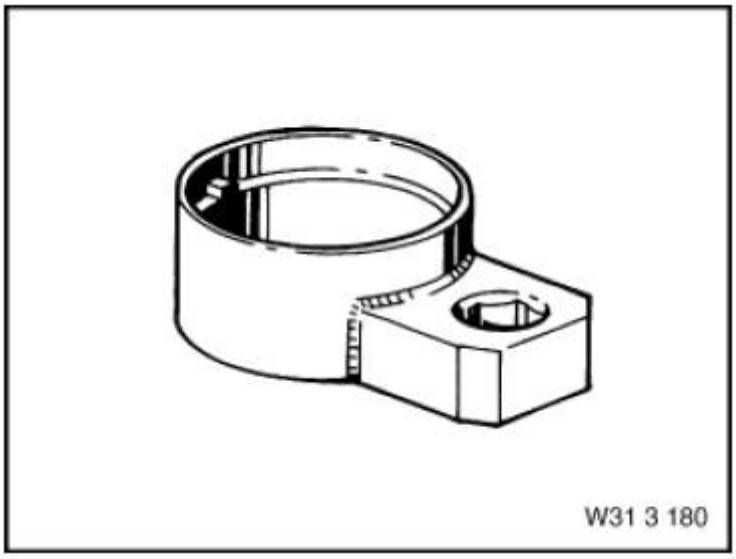


Fig. 166: Identifying Pin Wrench (0491964)
Courtesy of BMW OF NORTH AMERICA, INC.

0491965 PIN WRENCH

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0491965 313190 Pin wrench Mechanical tool

NOTE: **For releasing and tightening the spring strut bolts when replacing the gas pressure shock absorbers**

Storage Location

X4

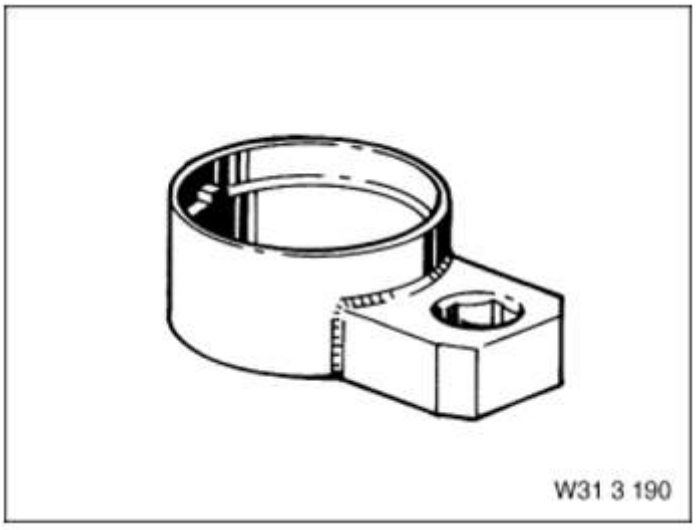


Fig. 167: Identifying Pin Wrench (0491965)
Courtesy of BMW OF NORTH AMERICA, INC.

0491962 PIN WRENCH

0491962 313160 Pin wrench Mechanical tool

NOTE: **For unfastening and tightening the spring-strut bolts when replacing the shock absorber**

Storage Location

X4

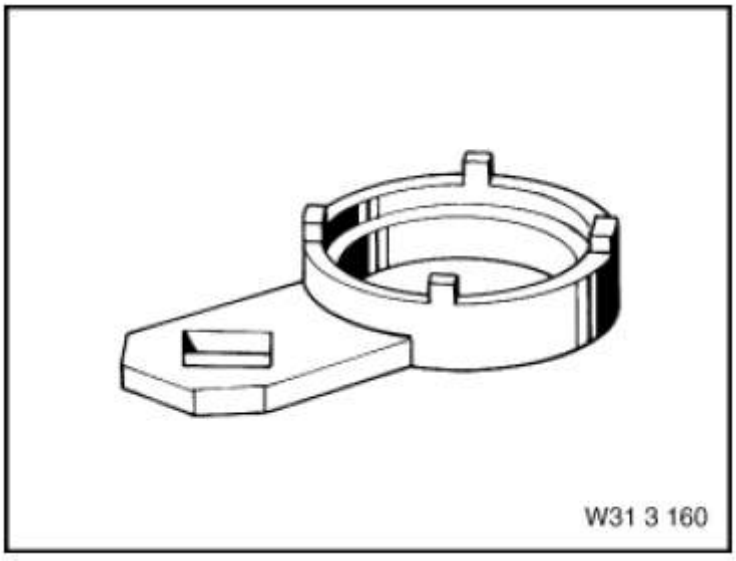


Fig. 168: Identifying Pin Wrench (0491962)
Courtesy of BMW OF NORTH AMERICA, INC.

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0491889 PIPE

0491889 311448 Pipe AM

NOTE: (Guide tube) For installing

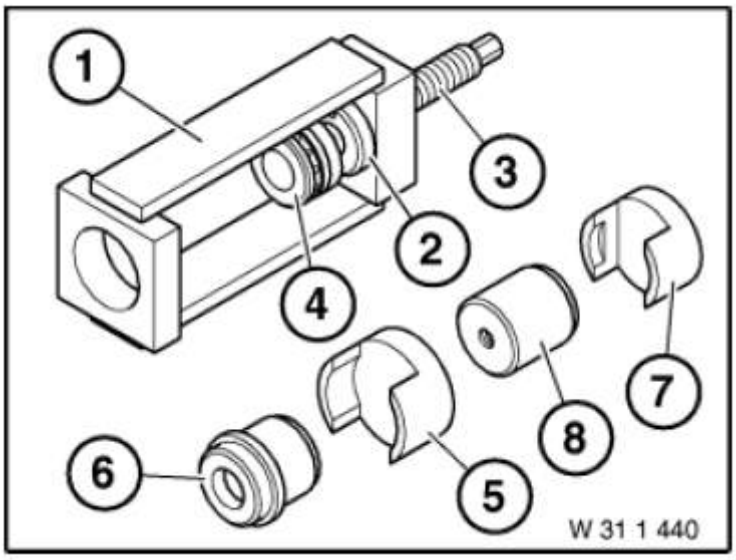


Fig. 169: Identifying Pipe (0491889)
Courtesy of BMW OF NORTH AMERICA, INC.

0491854 PIPE

0491854 311004 Pipe AM

NOTE: (Support tube) For installing the rubber mount in the front axle support - series: E12

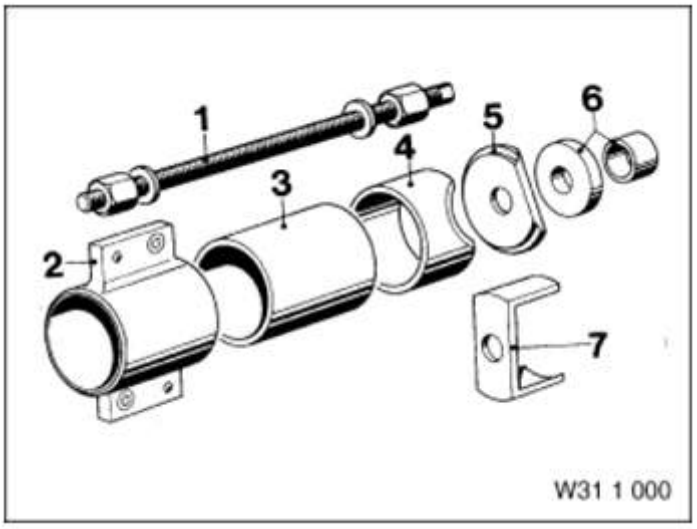


Fig. 170: Identifying Pipe (0491854)
Courtesy of BMW OF NORTH AMERICA, INC.

0491928 PLATE

0491928 312192 Plate AM

Replaced by: 83300492053

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NOTE: **Discontinuation and replaced by 33 4 200 (0 492 053)**

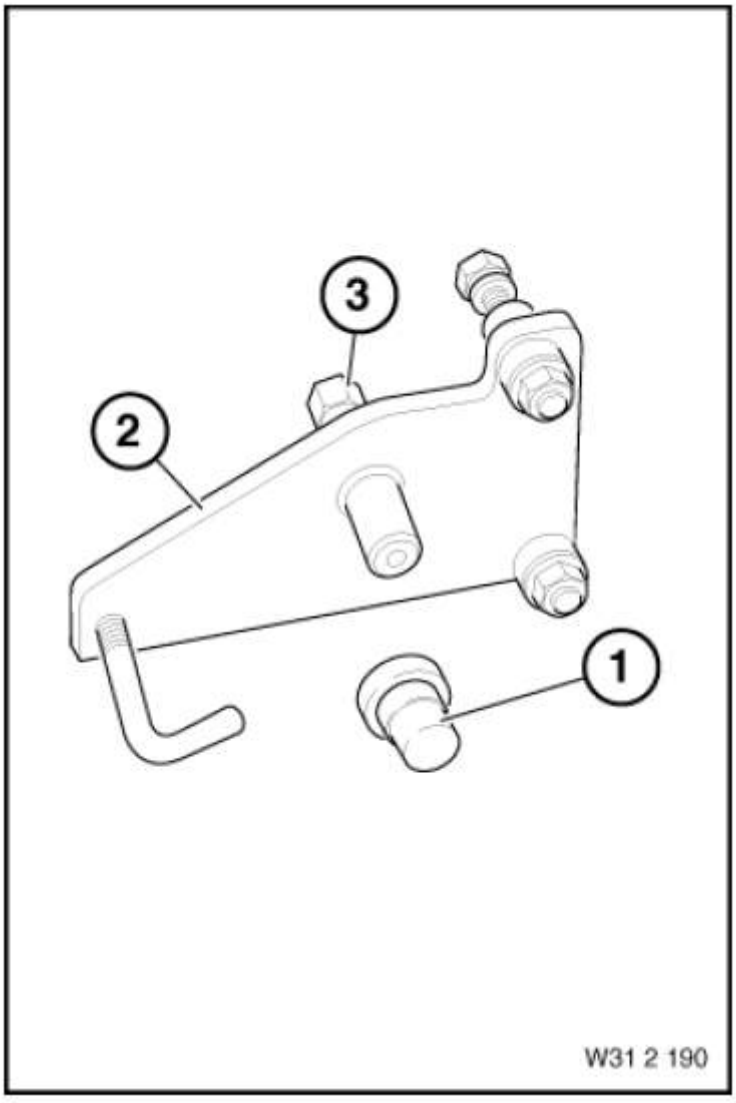


Fig. 171: Identifying Plate (0491928)
Courtesy of BMW OF NORTH AMERICA, INC.

0491919 PLATE

0491919 312151 Plate Minimum set: Mechanical tools AM

NOTE: **Series: E30, E36, E46, E85**

Storage Location

A7

0491954 RING

0491954 313124 Ring AM

Replaced by: 83300493560

NOTE: **(Spring retainer) With insert ring 31 3 101 only for series E46/without insert ring 31 3 101 for series E31, E39 front basic version Discontinuation and replaced by 31 3 350. (0 493 560)**

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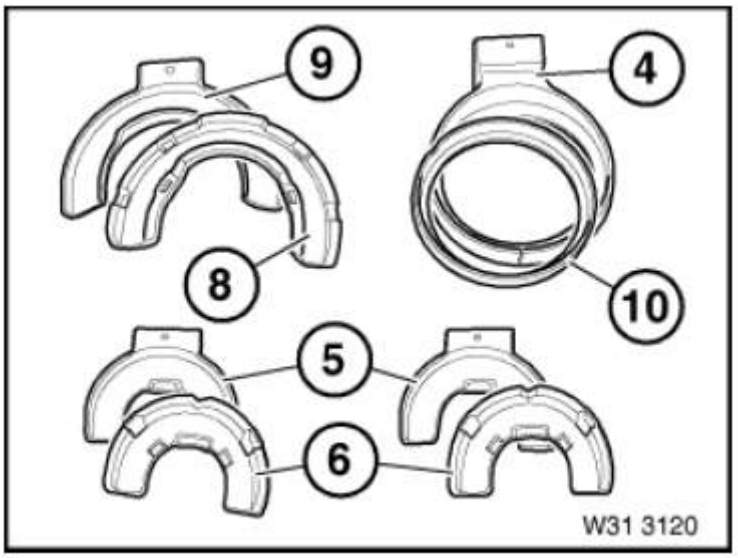


Fig. 172: Identifying Ring (0491954)
Courtesy of BMW OF NORTH AMERICA, INC.

0494624 RING

0494624 313381 Ring AM

Replaced by: 83302213038

NOTE: **(Spring retainer ring) As of 08/2011, available under new item number 83 30 2 213 038.**

SI number

01 16 11 (738)



Fig. 173: Identifying Ring (0494624)
Courtesy of BMW OF NORTH AMERICA, INC.

0493570 RING

0493570 313356 Ring AM

Replaced by: 83302213032

NOTE: **(Centering ring) As of 08/2011, available under new item number 83 30 2 213**

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032.

SI number

01 16 11 (738)



Fig. 174: Identifying Ring (0493570)
Courtesy of BMW OF NORTH AMERICA, INC.

0493361 RING

0493361 313331 Ring AM

NOTE: **(Centering ring) For centering the spring strut in the spring retainer ring 31 3 324 - Series: E46**

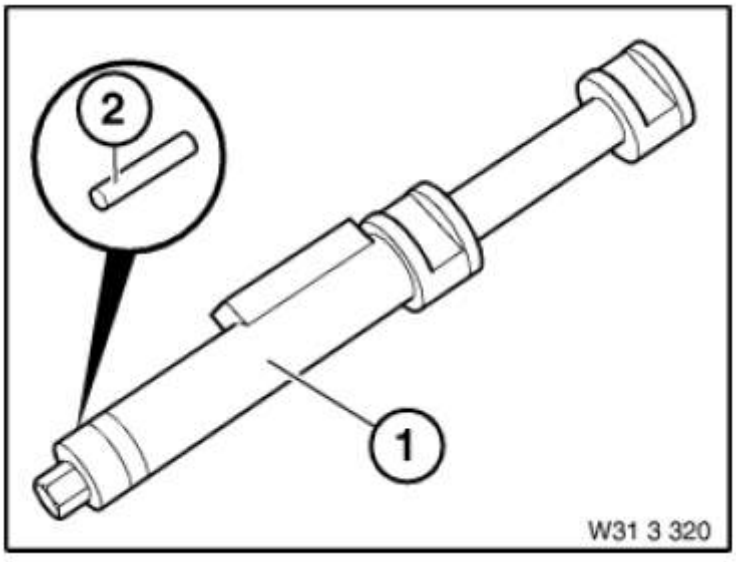


Fig. 175: Identifying Ring (0493361)
Courtesy of BMW OF NORTH AMERICA, INC.

0493290 RING

0493290 313101 Ring AM

NOTE: **(Insert ring) For centring the spring strut in the spring retainer 31 3 124 - model series: E46**

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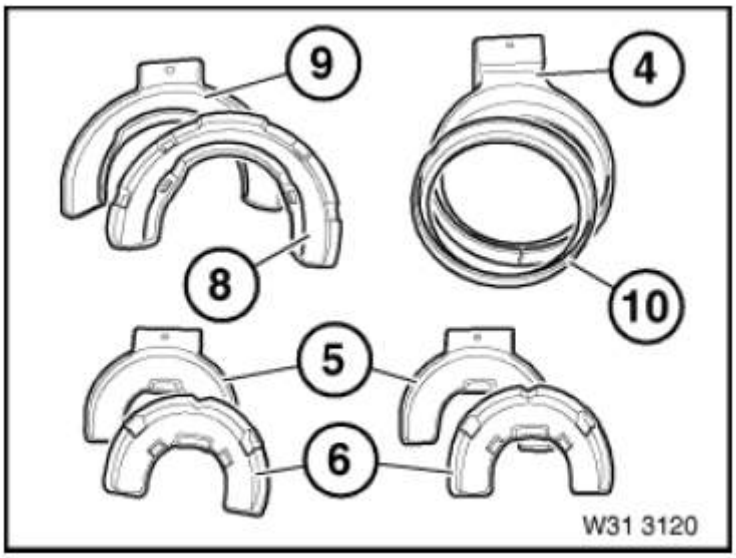


Fig. 176: Identifying Ring (0493290)
Courtesy of BMW OF NORTH AMERICA, INC.

0494397 RING

0494397 313358 Ring AM

Replaced by: 83302213033

NOTE: **(Insertion ring) As of 08/2011, available under new item number 83 30 2 213 033.**

SI number

01 16 11 (738)



Fig. 177: Identifying Ring (0494397)
Courtesy of BMW OF NORTH AMERICA, INC.

0493568 RING

0493568 313354 Ring AM

Replaced by: 83302213031

NOTE: **(Spring retainer ring) As of 08/2011, available under new item number 83 30 2 213 031.**

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SI number

01 16 11 (738)



Fig. 178: Identifying Ring (0493568)
Courtesy of BMW OF NORTH AMERICA, INC.

2213033 RING

2213033 313358 Ring Mechanical tool

NOTE: **Aluminium spacer ring As of 08/2011, the previous special tool 31 3 358 receives this new item number.**

SI number

01 16 11 (738)



Fig. 179: Identifying Ring (2213033)
Courtesy of BMW OF NORTH AMERICA, INC.

0493355 RING

0493355 313324 Ring AM

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NOTE: **(Spring retainer ring) With centering ring 31 3 331 only for series E46/Without centering ring 31 3 331 for series E31, E39 front basis/model: Z3, Z3coupe**

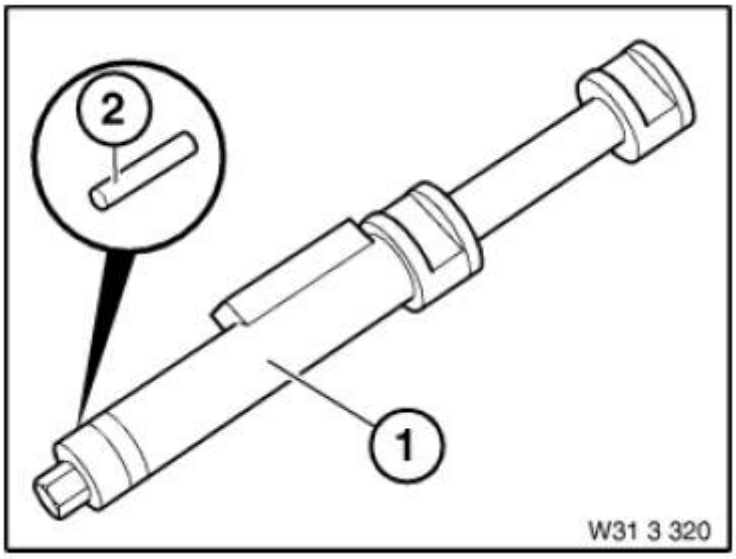


Fig. 180: Identifying Ring (0493355)
Courtesy of BMW OF NORTH AMERICA, INC.

2185817 RING SPANNER

2185817 Ring spanner AM

NOTE: **Ring fitting tool (ring spanner) to loosen and tighten the screw connections on wishbone and tension strut in conjunction with special tools set 81642185816 (extension).**

SI number

08 04 10 (656)



Fig. 181: Identifying Ring Spanner (2185817)
Courtesy of BMW OF NORTH AMERICA, INC.

0491937 SCREW

0491937 312244 Screw Minimum set: Mechanical tools AM

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NOTE: **(Pressure bolt) Replaced by 31 2 311 (0 495 800)**

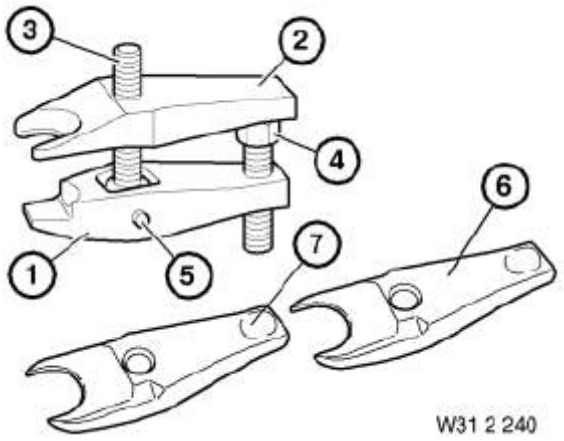


Fig. 182: Identifying Screw (0491937)
Courtesy of BMW OF NORTH AMERICA, INC.

0493671 SCREW

0493671 311150 Screw Mechanical tool

NOTE: **(Hexagon screw M12x1.5x132 (4 units)) for screwing in the front axle support when removing and installing the front axle differential**



Fig. 183: Identifying Screw (0493671)
Courtesy of BMW OF NORTH AMERICA, INC.

2159983 SCREW

2159983 Screw AM

NOTE: **Screws K1 (M12x1.5) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

cardiagn.com



Fig. 184: Identifying Screw (2159983)
Courtesy of BMW OF NORTH AMERICA, INC.

2159984 SCREW

2159984 Screw AM

NOTE: **Screws K2 (M14x1.5) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 185: Identifying Screw (2159984)
Courtesy of BMW OF NORTH AMERICA, INC.

0491877 SHAPED PART

0491877 311402 Shaped part AM

NOTE: **(shaped part) For trailing links without date stamp, up to model year 5/96**

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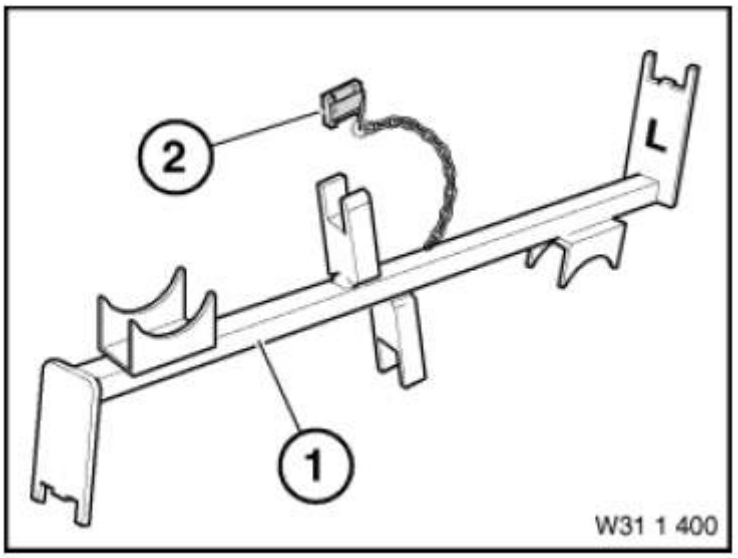


Fig. 186: Identifying Shaped Part (0491877)
Courtesy of BMW OF NORTH AMERICA, INC.

0491935 SHAPED PART

0491935 312242 Shaped part Minimum set: Mechanical tools AM

NOTE: **(Shaped part)**

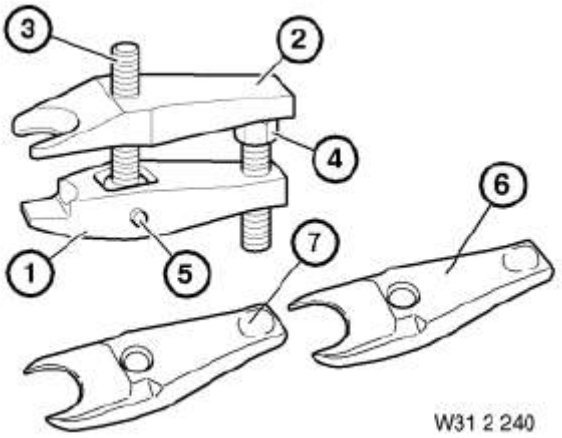


Fig. 187: Identifying Shaped Part (0491935)
Courtesy of BMW OF NORTH AMERICA, INC.

0494805 SHAPED PART

0494805 312246 Shaped part Minimum set: Mechanical tools AM

NOTE: **(Shaped part) Pressing off wishbone from wheel control joint E53, E83**

Storage Location

C12

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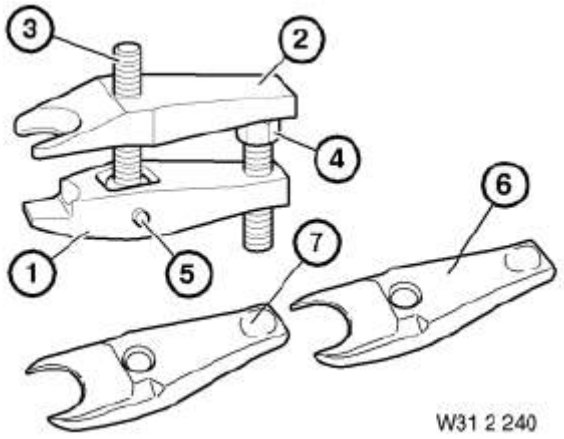


Fig. 188: Identifying Shaped Part (0494805)
Courtesy of BMW OF NORTH AMERICA, INC.

0491934 SHAPED PART

0491934 312241 Shaped part Minimum set: Mechanical tools AM

NOTE: **(Shaped part)**

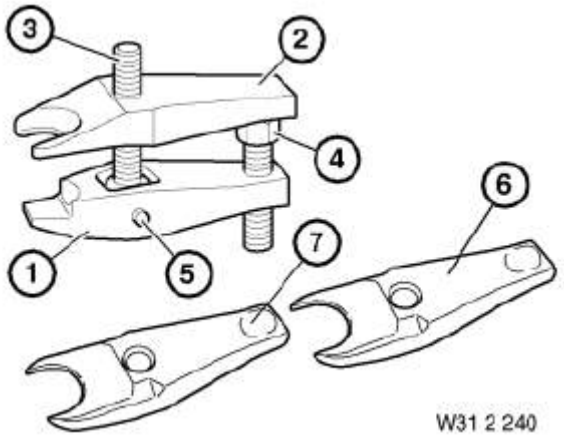


Fig. 189: Identifying Shaped Part (0491934)
Courtesy of BMW OF NORTH AMERICA, INC.

0496006 SHAPED PART

0496006 312247 Shaped part Minimum set: Mechanical tools AM

NOTE: **(Shaped part) Pressing off wishbone from wheel control joint E70. SI 1 01 07 (333)**

Storage Location

B21

C21

SI number

01 01 07 (333)

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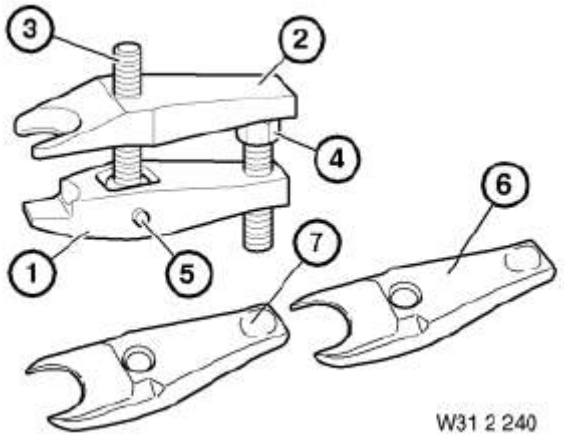


Fig. 190: Identifying Shaped Part (0496006)
Courtesy of BMW OF NORTH AMERICA, INC.

0494541 SOCKET WAF 46

0494541 312230 Socket WAF 46 Minimum set: Mechanical tools Mechanical tool

NOTE: **For expanding steering knuckle during spring strut removal**

Storage Location

C47

SI number

01 05 03 (969)

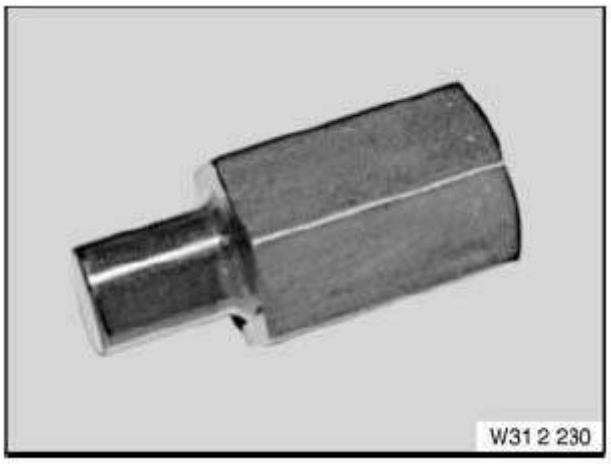


Fig. 191: Identifying Socket WAF 46 (0494541)
Courtesy of BMW OF NORTH AMERICA, INC.

0491966 SOCKET WRENCH

0491966 313200 Socket wrench Mechanical tool

NOTE: **(Socket wrench) for shock absorber support bearing**

Storage Location

X3

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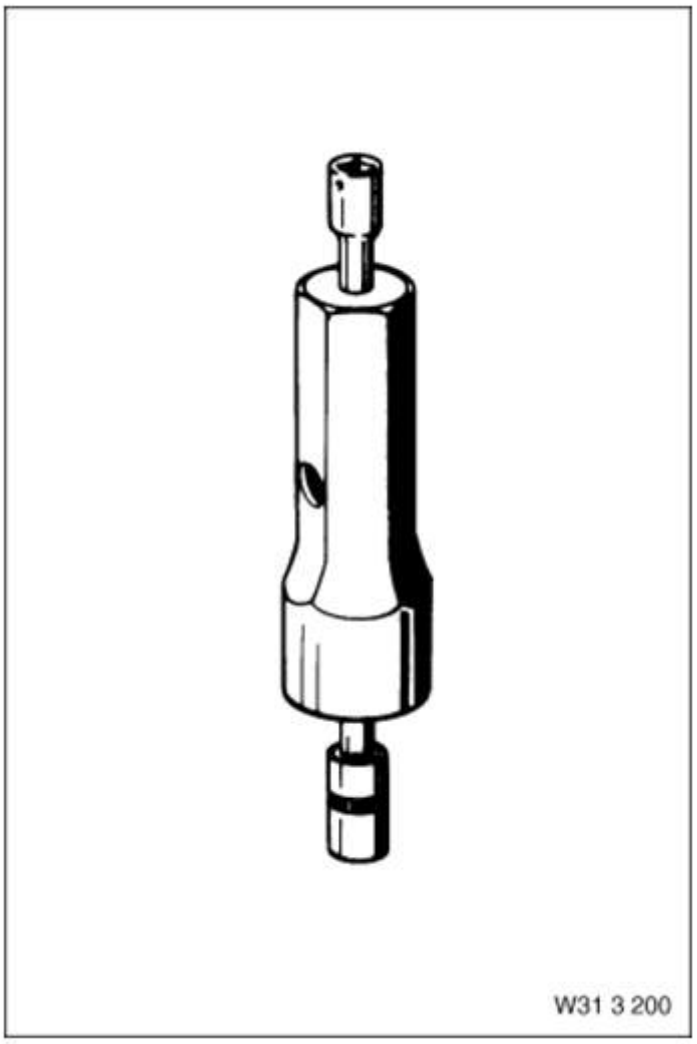


Fig. 192: Identifying Socket Wrench (0491966)
Courtesy of BMW OF NORTH AMERICA, INC.

0491896 SOCKET WRENCH INSERT

0491896 312080 Socket wrench insert Minimum set: Mechanical tools Mechanical tool

NOTE: (Wrench socket 46 mm, 3/4" connection) For loosening and tightening wheel bearing unit

Storage Location

A10



Fig. 193: Identifying Socket Wrench Insert (0491896)
Courtesy of BMW OF NORTH AMERICA, INC.

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0491936 SPINDLE

0491936 312243 Spindle Minimum set: Mechanical tools AM

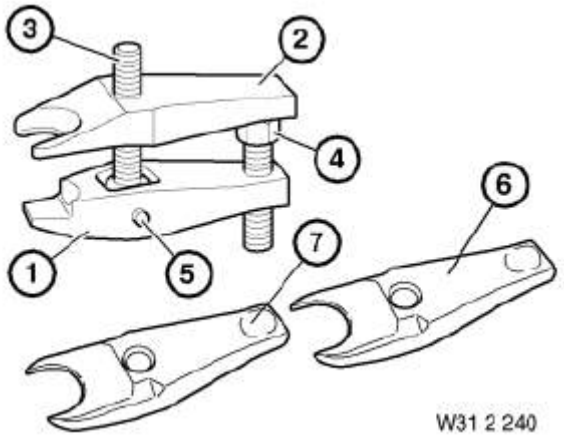


Fig. 194: Identifying Spindle (0491936)
Courtesy of BMW OF NORTH AMERICA, INC.

2156262 SPINDLE

2156262 Spindle AM

NOTE: **Spindle F3 (M24/270mm) in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 195: Identifying Spindle (2156262)
Courtesy of BMW OF NORTH AMERICA, INC.

2156270 SPINDLE

2156270 Spindle AM

NOTE: **Spindle F2 (M20/M24/355mm) in connection with adapter kit 1 (BMW), (81 64 2 155 745), and MINI adapter kit, (81 64 2 294 517), for removal and installation of**

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wheel bearings, propeller shafts and drive flanges.

SI number

08 06 09 (544)



Fig. 196: Identifying Spindle (2156270)
Courtesy of BMW OF NORTH AMERICA, INC.

0491910 SPINDLE

0491910 312121 Spindle AM

NOTE: **With guide sleeve Discontinued, only available via complete tool**

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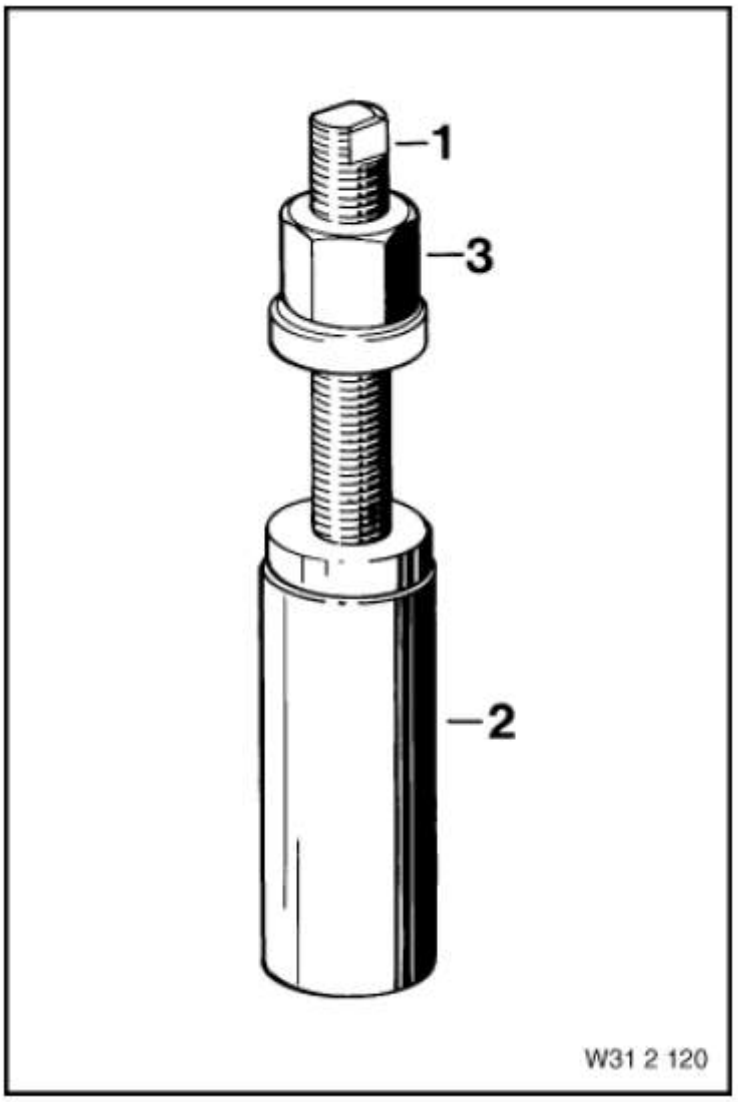


Fig. 197: Identifying Spindle (0491910)
Courtesy of BMW OF NORTH AMERICA, INC.

0491929 SPINDLE

0491929 312193 Spindle AM

Replaced by: 83300492053

NOTE: **Discontinuation and replaced by 33 4 200 (0 492 053)**

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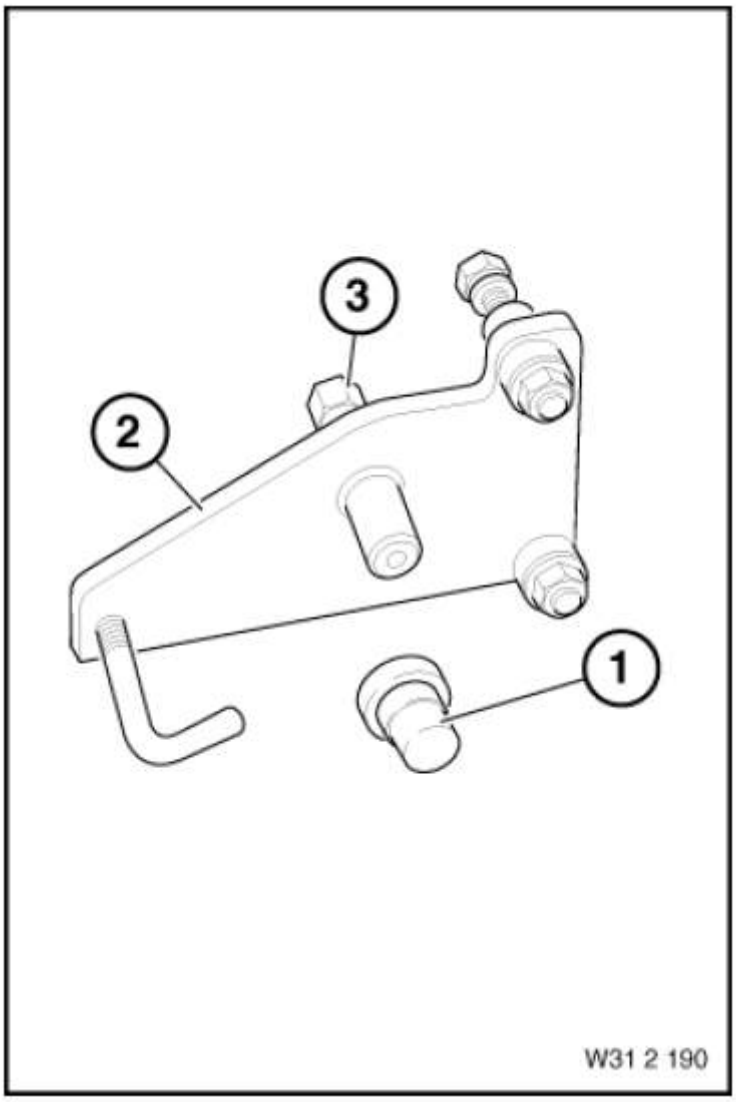


Fig. 198: Identifying Spindle (0491929)
Courtesy of BMW OF NORTH AMERICA, INC.

0491922 SPINDLE

0491922 312154 Spindle Minimum set: Mechanical tools AM

NOTE: **Spindle (1 piece) series: E30, E36, E46, E85**

Storage Location

A7

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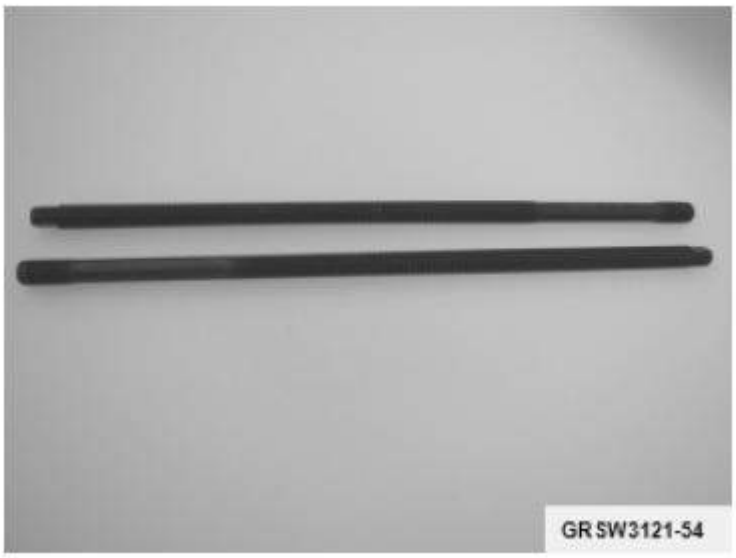


Fig. 199: Identifying Spindle (0491922)
Courtesy of BMW OF NORTH AMERICA, INC.

0493260 SPINDLE

0493260 312161 Spindle AM

Replaced by: 83300492053

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

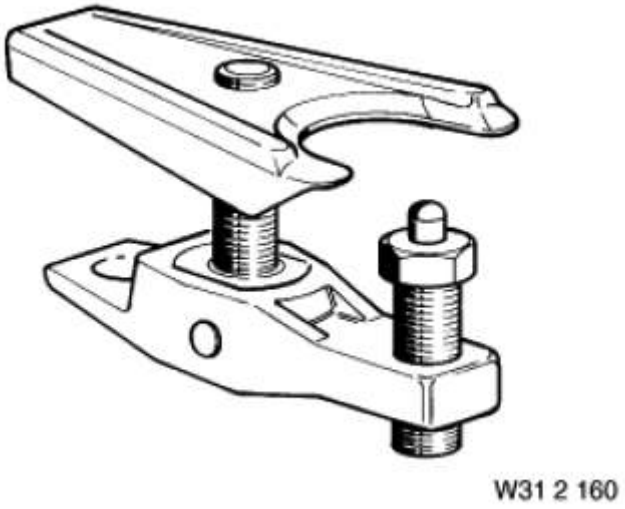


Fig. 200: Identifying Spindle (0493260)
Courtesy of BMW OF NORTH AMERICA, INC.

0496295 SPINDLE

0496295 315232 Spindle AM

NOTE: **(Spindle M10 with fixture) discontinued, available as part of set of special tools only**

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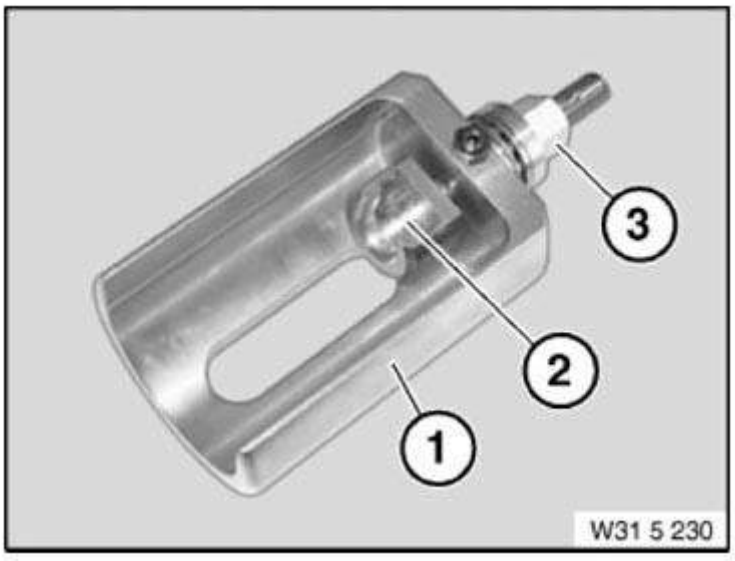


Fig. 201: Identifying Spindle (0496295)
Courtesy of BMW OF NORTH AMERICA, INC.

0491884 SPINDLE

0491884 311443 Spindle AM

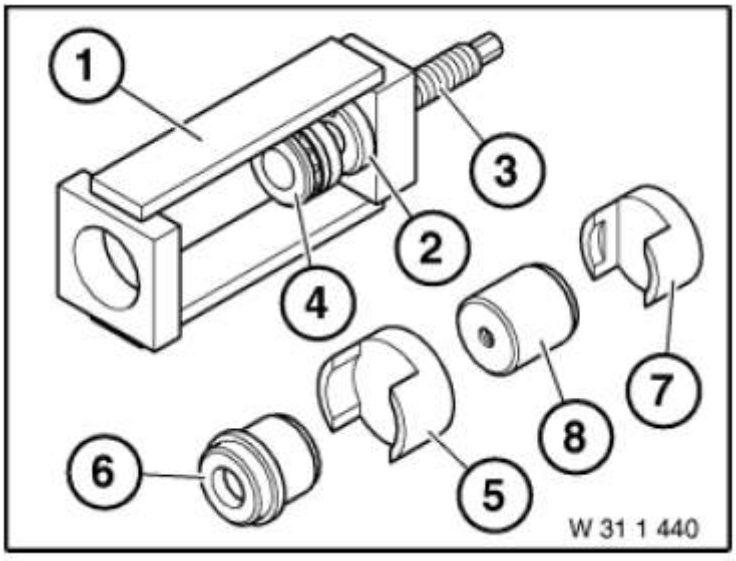


Fig. 202: Identifying Spindle (0491884)
Courtesy of BMW OF NORTH AMERICA, INC.

2156271 SPINDLE

2156271 Spindle AM

NOTE: **Spindle F1 (M24/425 mm) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts drive flanges.**

SI number

08 06 09 (544)

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Fig. 203: Identifying Spindle (2156271)
Courtesy of BMW OF NORTH AMERICA, INC.

0491851 SPINDLE

0491851 311001 Spindle AM

NOTE: **With 2 nuts and 2 washers**

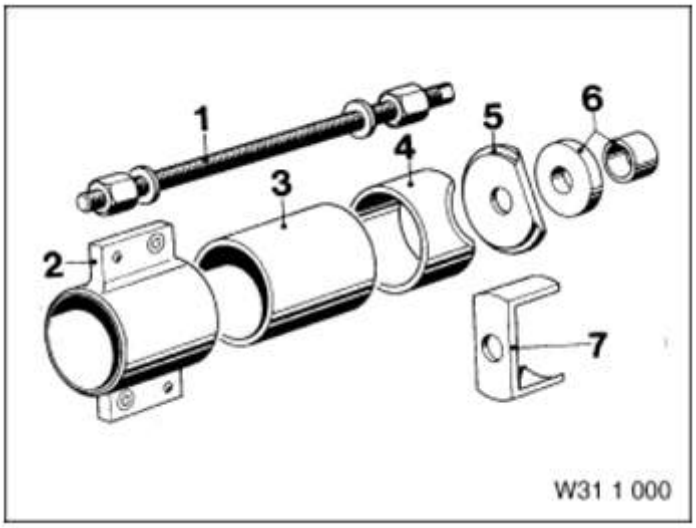


Fig. 204: Identifying Spindle (0491851)
Courtesy of BMW OF NORTH AMERICA, INC.

0493555 SPRING TENSIONER

0493555 313340 Spring tensioner Minimum set: Mechanical tools AM

Replaced by: 83302213022

NOTE: **Basic device will receive a new order number as of July 2011**

Storage Location

Individual

SI number

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Fig. 205: Identifying Spring Tensioner (0493555)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1. 0493556 Spring tensioner

NOTE: **Basic device will be delivered under a new order number 83 30 2 213 022 beginning in July 2011.**

2. 0493557 Pin

NOTE: **Spare part set for basic device (2 locking pins and 1 O-ring) will be available under a new order number 83 30 2 213 023 as of July 2011**

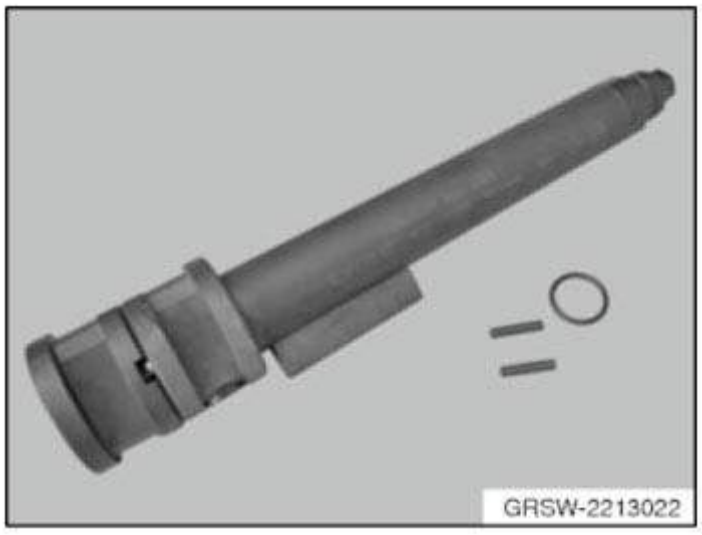
2213022 SPRING TENSIONER

2213022 313340 Spring tensioner Mechanical tool

NOTE: **Basic device incl. 2 locking pins and 1 O-ring, safety information and operating instructions. Corresponds to previous special tool number 31 3 340/31 3 341**

SI number

01 16 11 (738)



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Fig. 206: Identifying Spring Tensioner (2213022)
Courtesy of BMW OF NORTH AMERICA, INC.

0493556 SPRING TENSIONER

0493556 313341 Spring tensioner Minimum set: Mechanical tools AM

NOTE: **Basic device will be delivered under a new order number 83 30 2 213 022 beginning in July 2011. Spare part (2 locking pins and 1 O-ring) is being delivered under a new order number 83 30 2 213 023**

SI number

01 16 11 (738)

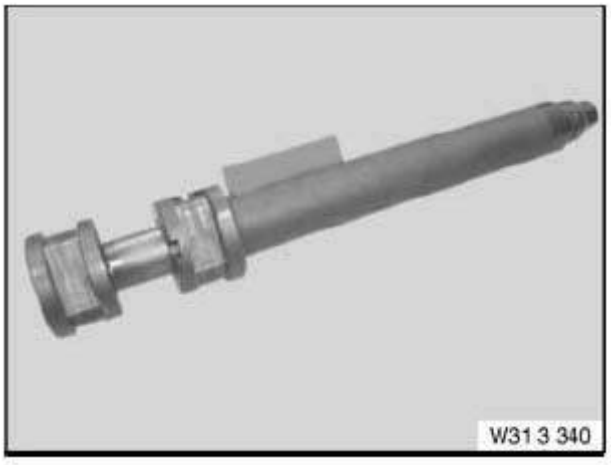


Fig. 207: Identifying Spring Tensioner (0493556)
Courtesy of BMW OF NORTH AMERICA, INC.

0493352 SPRING TENSIONER

0493352 313321 Spring tensioner AM

NOTE: **(Spring tensioner without spring retainer)**

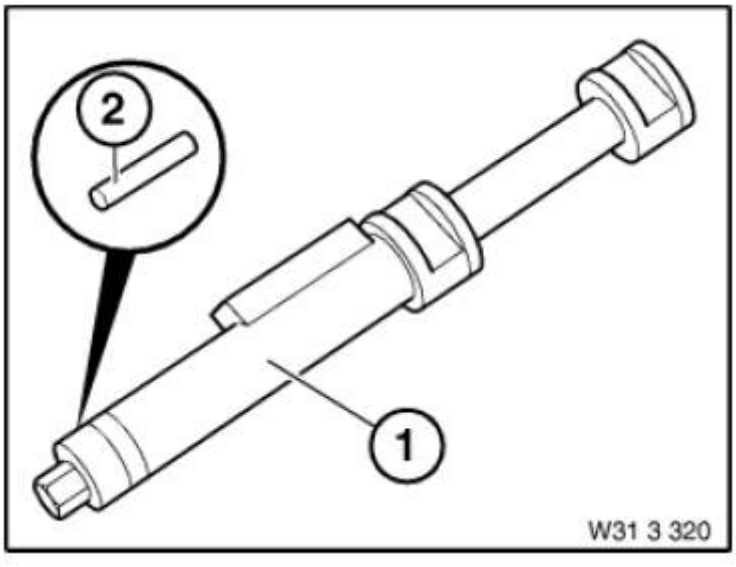


Fig. 208: Identifying Spring Tensioner (0493352)
Courtesy of BMW OF NORTH AMERICA, INC.

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0491950 SPRING TENSIONER

0491950 313120 Spring tensioner AM

Replaced by: 83300493555

NOTE: **(Spring tensioner and spring retainer) For tensioning coil springs when removing and installing spring strut. Use only on the front axle. Exception: On E38 and E39 front and rear axle Replaced by 31 3 340. (0 493 555)**

SI number

01 02 90 (168)

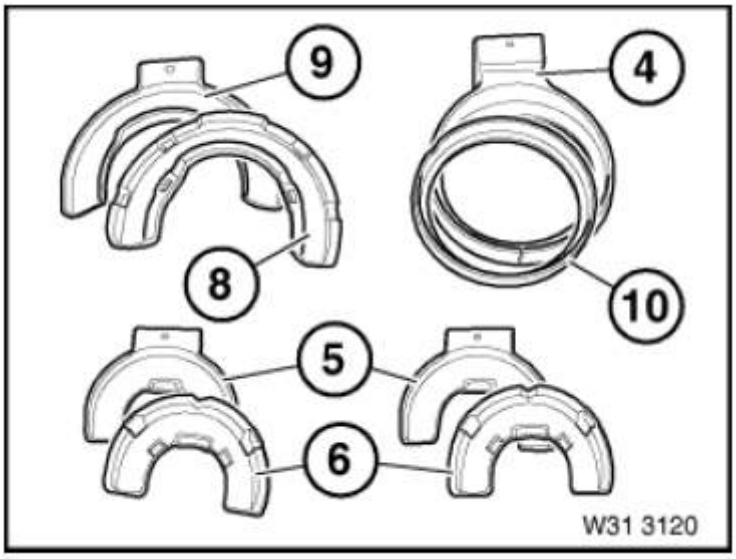


Fig. 209: Identifying Spring Tensioner (0491950)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1 = **0491951** Spring tensioner

NOTE: **(Spring tensioner without spring retainer) Discontinuation and replaced by 31 3 350. (0 493 560)**

2 = **0491952** Holder

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 127 - Model series: E32, E34 Touring, E36 Discontinuation and replaced by 31 3 350. (0 493 560)**

3 = **0491953** Holder

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 128 - Model series: E31, E38, E39 front high (2x) and basic version (1x) Discontinuation and replaced by 31 3 350. (0 493 560)**

4 = **0491954** Ring

NOTE: **(Spring retainer) With insert ring 31 3 101 only for series E46/without insert ring 31 3 101 for series E31, E39 front basic version Discontinuation and replaced by 31 3 350. (0 493 560)**

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5 = 0491955 Holder

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 126 - model series: E38 rear, E39 Saloon rear Discontinuation and replaced by 31 3 350. (0 493 560)**

6 = 0491956 Insert

NOTE: **(Protective insert) For spring retainer 31 3 125 Discontinuation and replaced by 31 3 350. (0 493 560)**

7 = 0491957 Insert

NOTE: **(Protective insert) For spring retainer 31 3 122 Discontinuation and replaced by 31 3 350. (0 493 560)**

8 = 0491958 Insert

NOTE: **(Protective insert) For spring retainer 31 3 123 and 31 3 129 Discontinuation and replaced by 31 3 350. (0 493 560)**

9 = 0493289 Holder

NOTE: **(Spring retainer) With protective insert 31 3 128 - model series: E46 Discontinuation and replaced by 31 3 350. (0 493 560)**

11 = 0493290 Ring

NOTE: **(Insert ring) For centring the spring strut in the spring retainer 31 3 124 - model series: E46**

2250167 SPRING TENSIONER

2250167 Spring tensioner Minimum set: Mechanical tools Mechanical tool

NOTE: **Complete set with newly defined delivery specification. As of 08/2011, replaces set 31 3 350 and 31 3 360.**

SI number

01 16 11 (738)

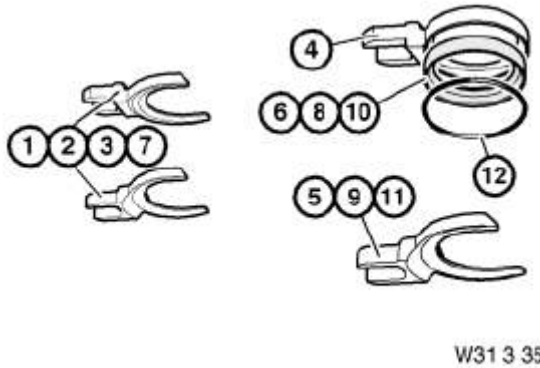


Fig. 210: Identifying Spring Tensioner (2250167)
Courtesy of BMW OF NORTH AMERICA, INC.

0493351 SPRING TENSIONER

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0493351 313320 Spring tensioner AM

NOTE: **(Spring tensioner and spring retainer) For tensioning coil springs when removing and installing spring strut. Use only on the front axle. Exception: On E38 and E39 front and rear axle Replaced by 31 3 340 (0 493 555) 31 3 350 (0 493 560)**

SI number

01 15 98 (344)

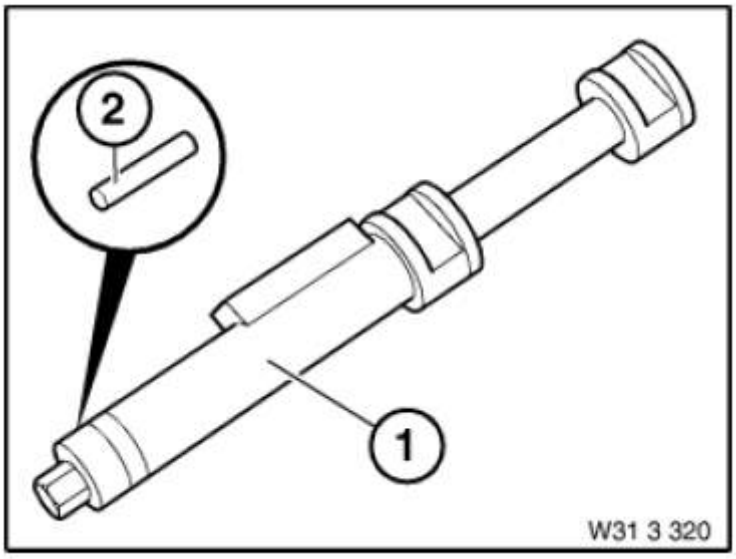


Fig. 211: Identifying Spring Tensioner (0493351)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1 = 0493352 Spring tensioner

NOTE: **(Spring tensioner without spring retainer)**

2 = 0493353 Holder

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 327 - Series: E32, E34, E36**

3 = 0493354 Holder

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 328 - Series: E31, E38, E39 front high (2x) and basis (1x)/model: Z3, Z3coupe**

4 = 0493355 Ring

NOTE: **(Spring retainer ring) With centering ring 31 3 331 only for series E46/Without centering ring 31 3 331 for series E31, E39 front basis/model: Z3, Z3coupe**

5 = 0493356 Holder

NOTE: **(Spring retainer (2 pieces)) With protective insert 31 3 326 - Series: E38 rear, E39 Saloon rear**

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6 = 0493357 Insert

NOTE: **(Protective insert) For spring retainer 31 3 325**

7 = 0493358 Insert

NOTE: **(Protective insert) For spring retainer 31 3 322**

8 = 0493359 Insert

NOTE: **(Protective insert) For spring retainer 31 3 323**

9 = 0493360 Holder

NOTE: **(Spring retainer) With protective insert 31 3 332 - Series: E46**

1 = 0493361 Ring

NOTE: **(Centering ring) For centering the spring strut in the spring retainer ring 31 3 324 - Series: E46**

2 = 0493362 Insert

NOTE: **(Protective insert) For spring retainer 31 3 329**

0491951 SPRING TENSIONER

0491951 313121 Spring tensioner AM

Replaced by: 83300493560

NOTE: **(Spring tensioner without spring retainer) Discontinuation and replaced by 31 3 350. (0 493 560)**

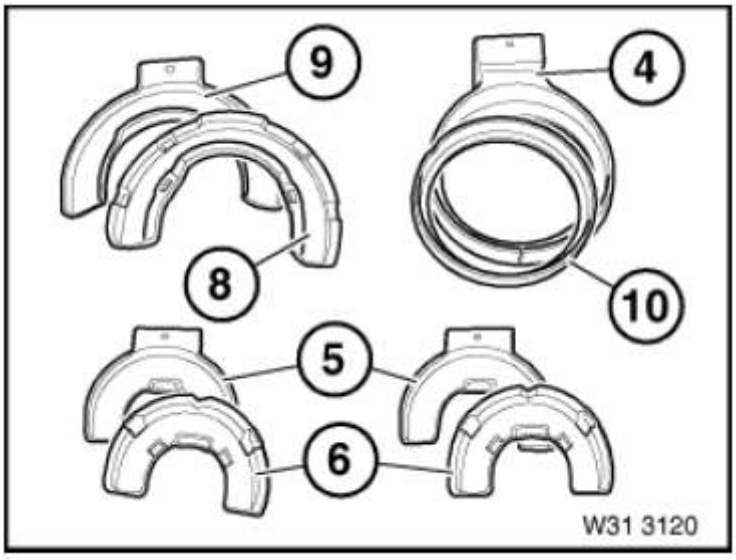


Fig. 212: Identifying Spring Tensioner (0491951)
Courtesy of BMW OF NORTH AMERICA, INC.

0494440 SPRING TENSIONER

0494440 313111 Spring tensioner AM

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Replaced by: 83300493555

NOTE: **Replaced by 31 3 340 (0 493 555)**

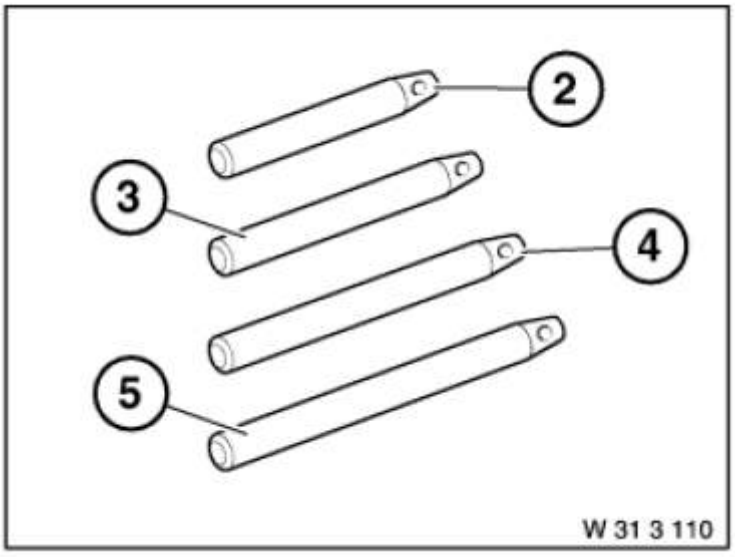


Fig. 213: Identifying Spring Tensioner (0494440)
Courtesy of BMW OF NORTH AMERICA, INC.

0495818 SUPPORT

0495818 315252 Support AM

NOTE: **(Telescope supports) 4 pieces, no longer available separately, only via special tool set 31 5 250 (83 30 0 495 567)**

SI number

01 24 06 (309)

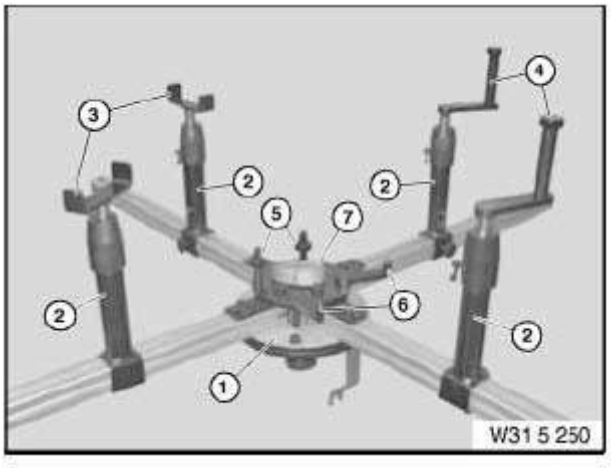


Fig. 214: Identifying Support (0495818)
Courtesy of BMW OF NORTH AMERICA, INC.

0491894 SYNCHRONISING KEY

0491894 312062 Synchronising key AM

NOTE: **For wheel bearing race, outer**

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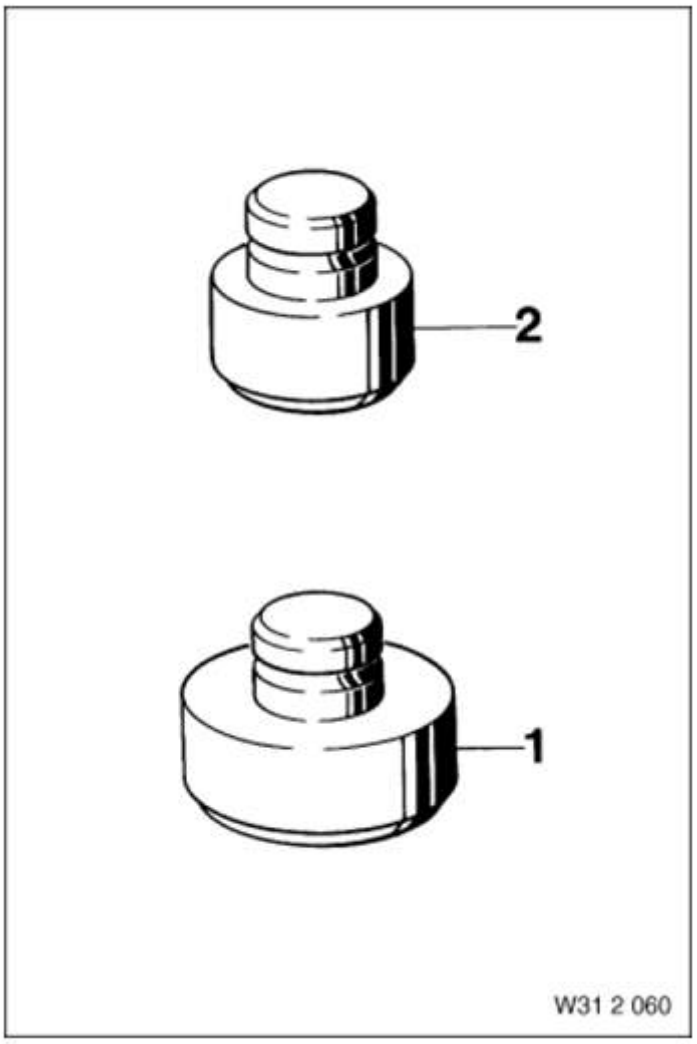


Fig. 215: Identifying Synchronising Key (0491894)
Courtesy of BMW OF NORTH AMERICA, INC.

0491886 SYNCHRONISING KEY

0491886 311445 Synchronising key AM

NOTE: **(Thrust piece) For removing**

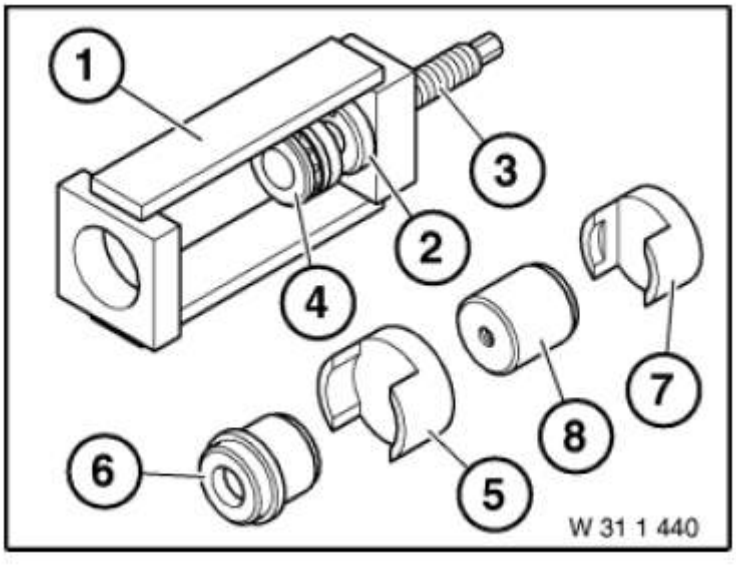


Fig. 216: Identifying Synchronising Key (0491886)

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Courtesy of BMW OF NORTH AMERICA, INC.

0491874 SYNCHRONISING KEY

0491874 311120 Synchronising key Mechanical tool

NOTE: **For pressing the rubber mount out of the connecting pipe on the engine support**

Storage Location

Y10

SI number

01 04 86 (566)

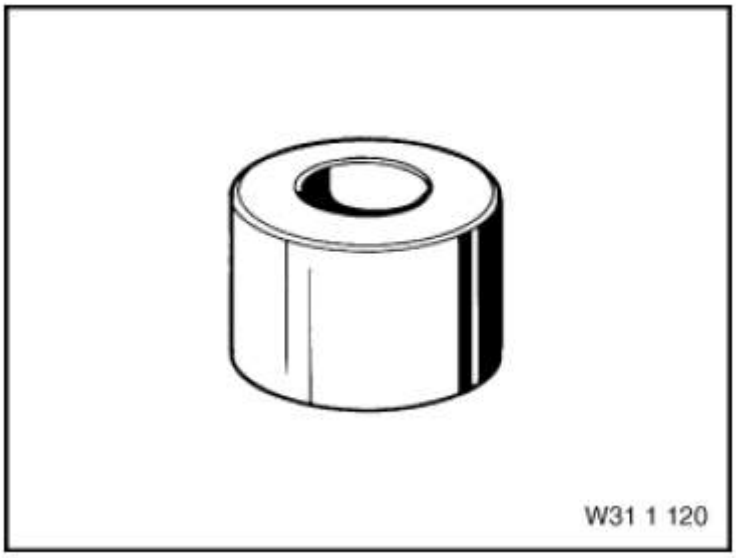


Fig. 217: Identifying Synchronising Key (0491874)
Courtesy of BMW OF NORTH AMERICA, INC.

0491920 SYNCHRONISING KEY

0491920 312152 Synchronising key Minimum set: Mechanical tools AM

NOTE: **Series: E30, E36, E46, E85**

Storage Location

A7

0493327 SYNCHRONISING KEY

0493327 312157 Synchronising key Minimum set: Mechanical tools AM

NOTE: **(Synchronizing key, diameter 79 mm) For mounting the rubber mount on the wishbone, series: E46**

Storage Location

A7

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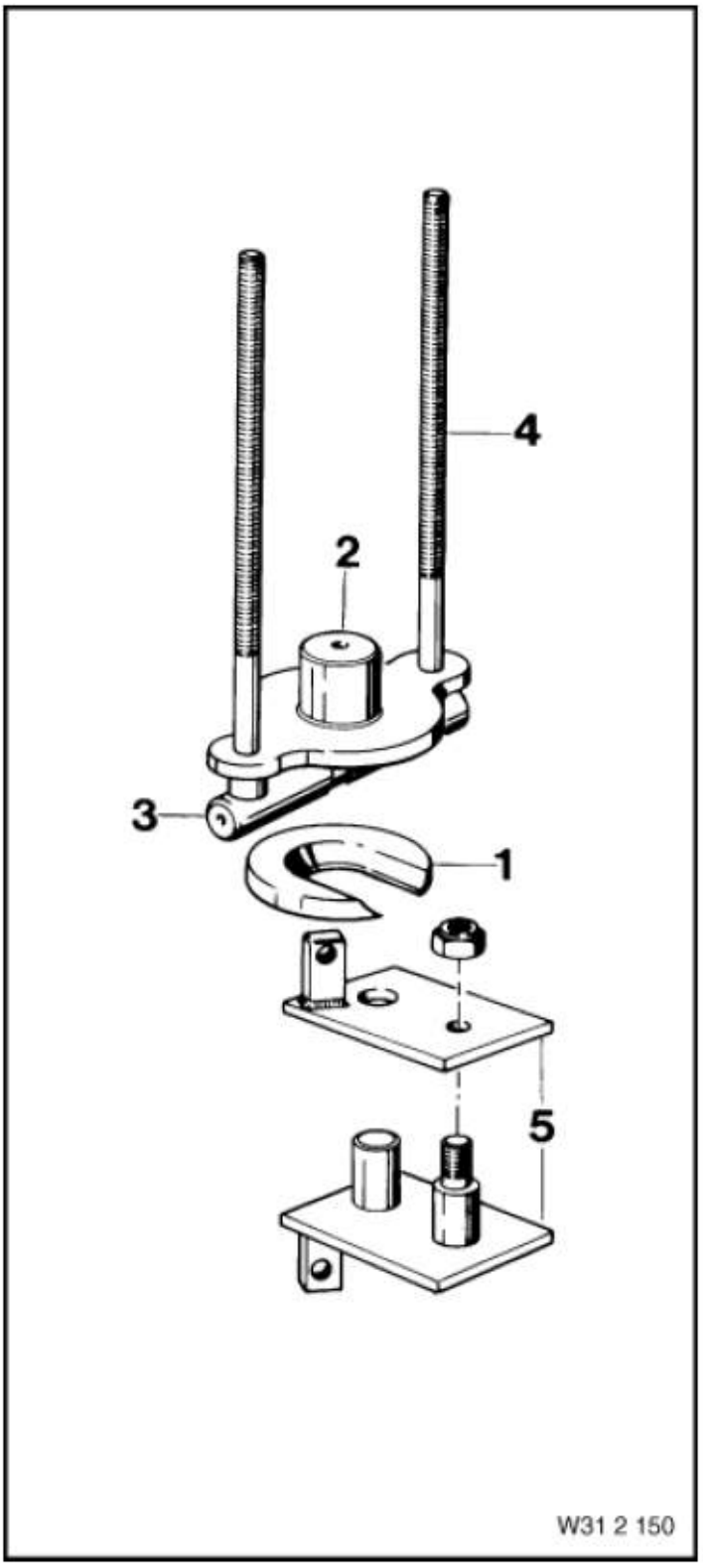


Fig. 218: Identifying Synchronising Key (0493327)
Courtesy of BMW OF NORTH AMERICA, INC.

0491895 SYNCHRONISING KEY

0491895 312070 Synchronising key Mechanical tool

NOTE: **For pressing out the front wheel bearing**

Storage Location

Y5

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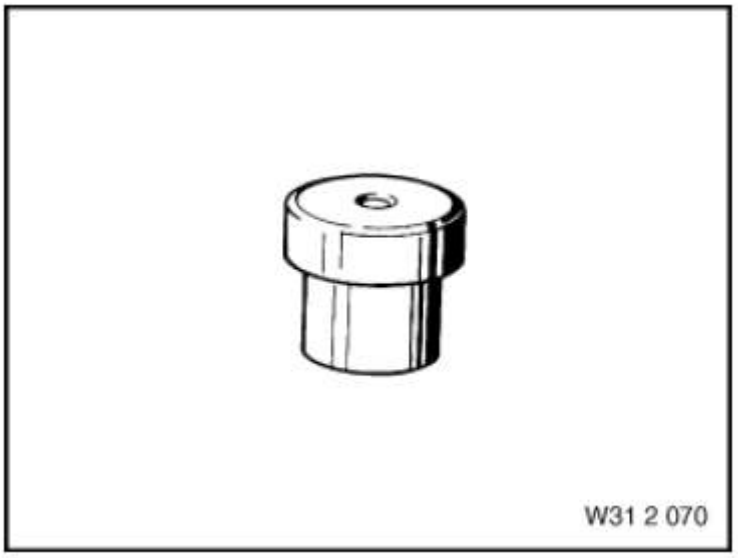


Fig. 219: Identifying Synchronising Key (0491895)
Courtesy of BMW OF NORTH AMERICA, INC.

0491927 SYNCHRONISING KEY

0491927 312191 Synchronising key AM

Replaced by: 83300492053

NOTE: **Discontinuation and replaced by 33 4 200 (0 492 053)**

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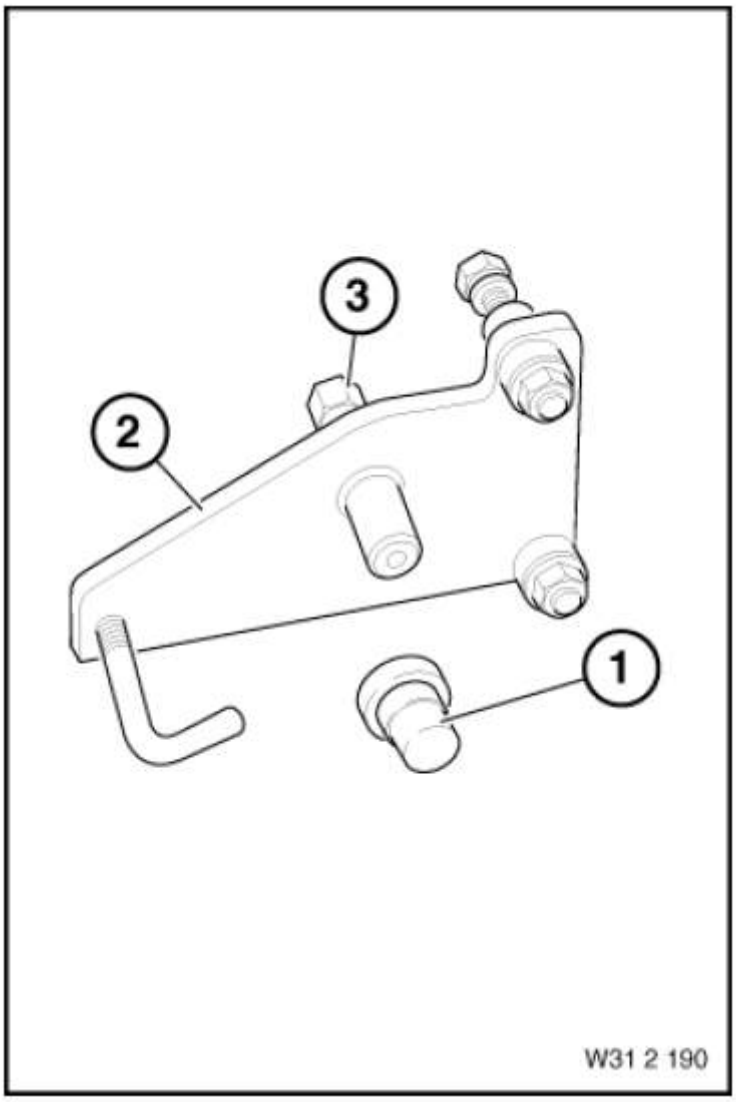
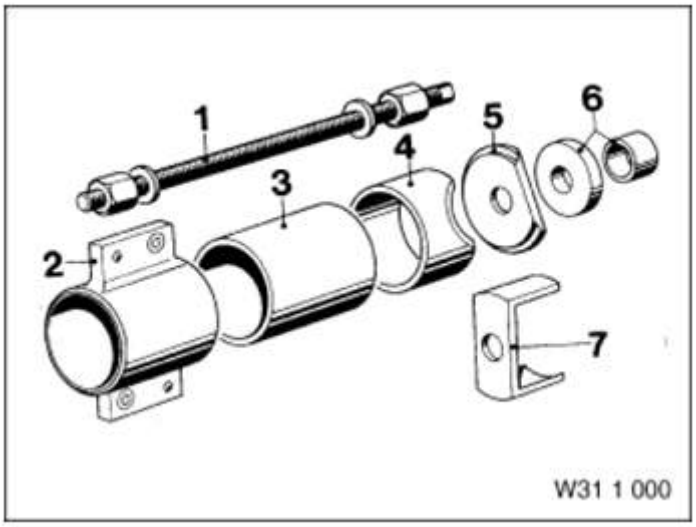


Fig. 220: Identifying Synchronising Key (0491927)
Courtesy of BMW OF NORTH AMERICA, INC.

0491856 SYNCHRONISING KEY

0491856 311006 Synchronising key AM

NOTE: **For removing and installing the rubber mount in the front axle support - series: E12**



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Fig. 221: Identifying Synchronising Key (0491856)
Courtesy of BMW OF NORTH AMERICA, INC.

0491888 SYNCHRONISING KEY

0491888 311447 Synchronising key AM

NOTE: For installing

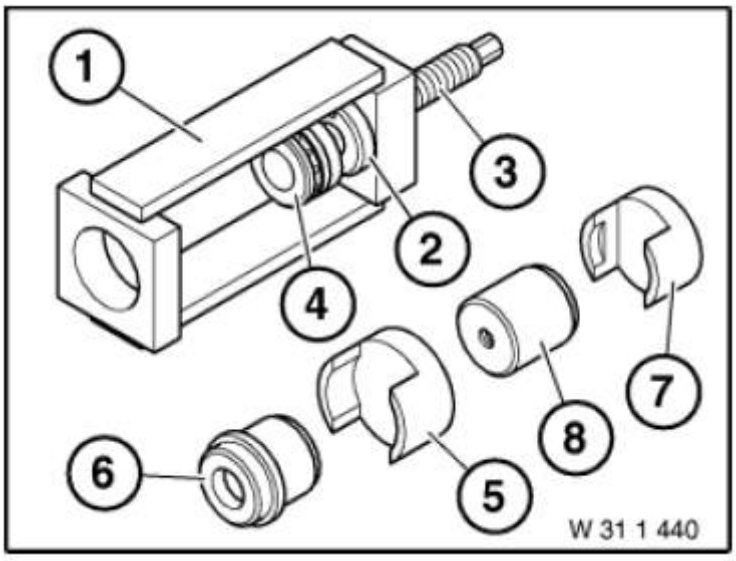


Fig. 222: Identifying Synchronising Key (0491888)
Courtesy of BMW OF NORTH AMERICA, INC.

0491887 SYNCHRONISING KEY

0491887 311446 Synchronising key AM

NOTE: For removing

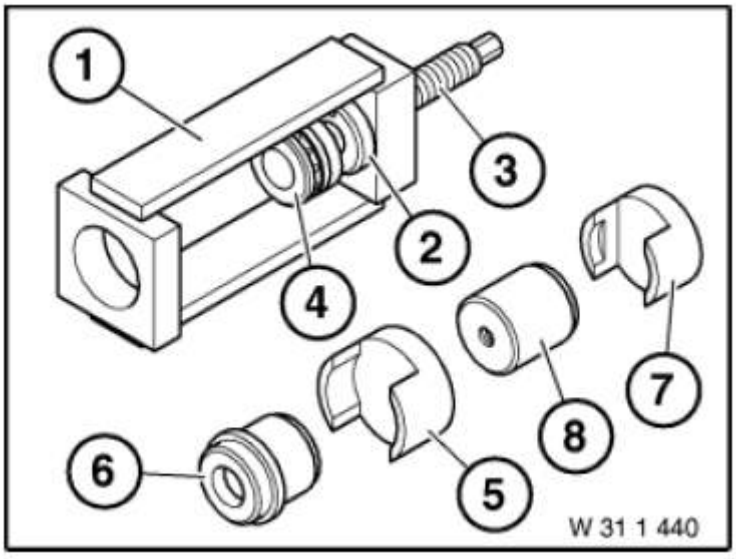


Fig. 223: Identifying Synchronising Key (0491887)
Courtesy of BMW OF NORTH AMERICA, INC.

0491893 SYNCHRONISING KEY

0491893 312061 Synchronising key AM

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NOTE: **For wheel bearing race, inner**

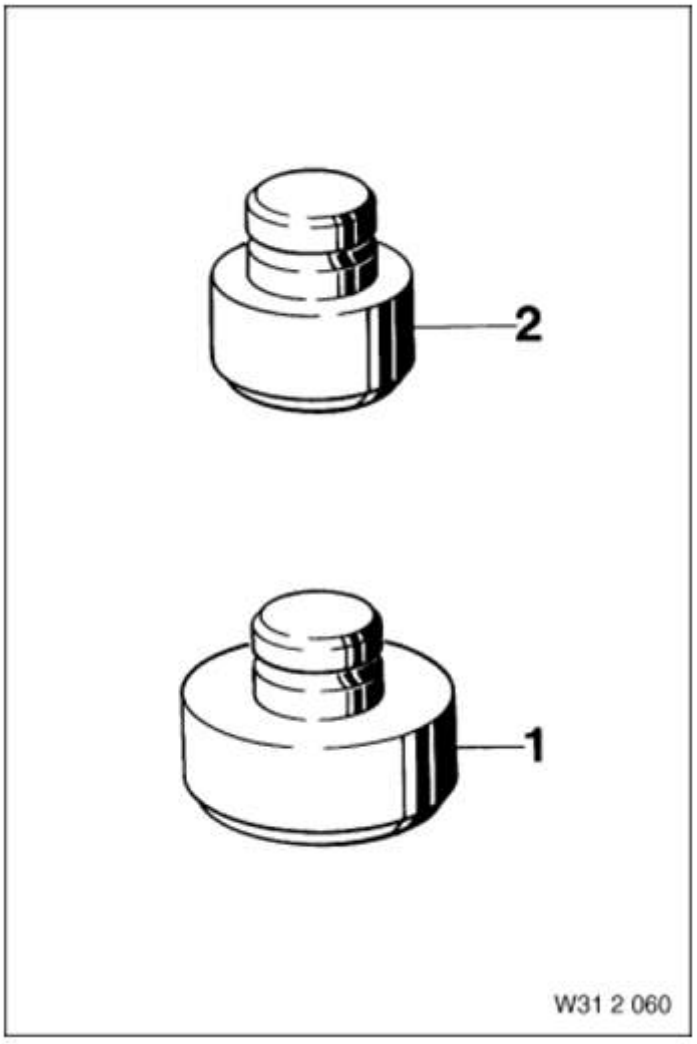
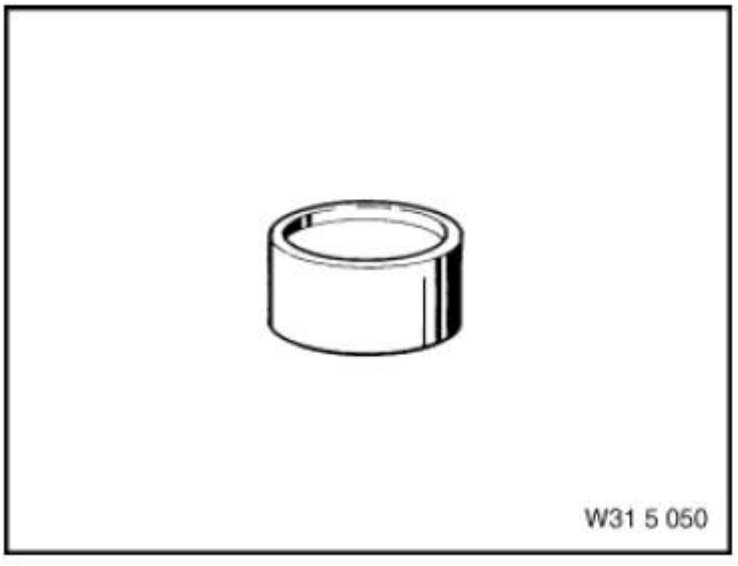


Fig. 224: Identifying Synchronising Key (0491893)
Courtesy of BMW OF NORTH AMERICA, INC.

0491976 SYNCHRONISING KEY

0491976 315050 Synchronising key Mechanical tool

NOTE: **For pressing the roller bearing onto the differential housing**



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Fig. 225: Identifying Synchronising Key (0491976)
Courtesy of BMW OF NORTH AMERICA, INC.

2213029 TOOL

2213029 313353 Tool Mechanical tool

NOTE: **Clamping plate As of 08/2011, the previous special tool 31 3 353 receives this new item number**

SI number

01 16 11 (738)



Fig. 226: Identifying Tool (2213029)
Courtesy of BMW OF NORTH AMERICA, INC.

0491913 TOOL

0491913 312130 Tool Minimum set: Mechanical tools AM

NOTE: **For removing and installing silent blocks in wishbone support brackets**

Storage Location

B13

Consisting of:

1. 0491914 Holding sleeve

NOTE: **(Pressure sleeve) For pulling out and in/model series: E30, E46. Can no longer be ordered separately. Only available as part of set 31 2 130 = 83 30 0 491 913.**

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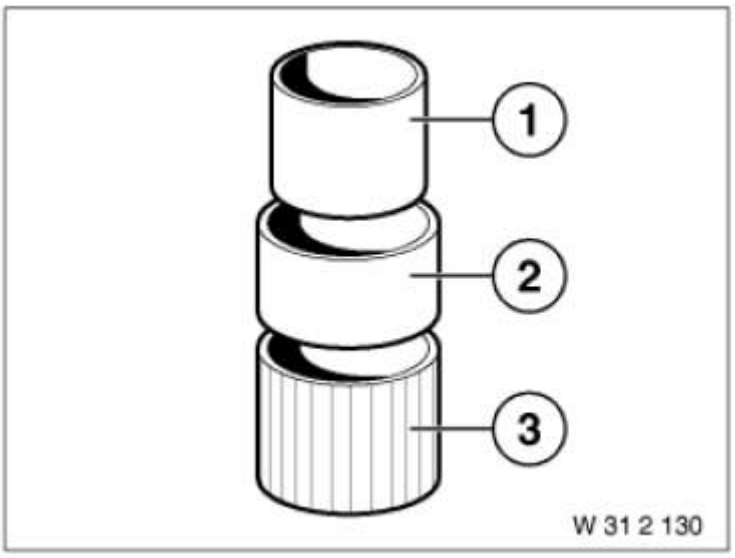


Fig. 227: Identifying Tool (0491913)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0491915 Holding sleeve

NOTE: **(Pressure sleeve) For counter-holding/model series: E30 Replaced by 31 2 133. (0 491 916)**

3. 0491916 Holding sleeve

NOTE: **(Pressure sleeve) For pulling out and in/model series: E30 All-wheel drive vehicle, E34, E36, E46 Can no longer be ordered separately. Only available as part of set 31 2 130 = 83 30 0 491 913.**

0491868 TOOL

0491868 311050 Tool AM

NOTE: **For removing and installing the silent blocks in the wishbones and leading links.**

Storage Location

A13

Consisting of:

5 = 0493747 Holding sleeve

NOTE: **(Pressure sleeve) For gripping the wishbones and for removing and installing the silence blocks in the leading link. Discontinued, can only be ordered using complete tool**

1 = 0491869 Holding sleeve

NOTE: **(Pressure sleeve) For removing and installing the silent blocks in the wishbone. Discontinued, can only be ordered using complete tool**

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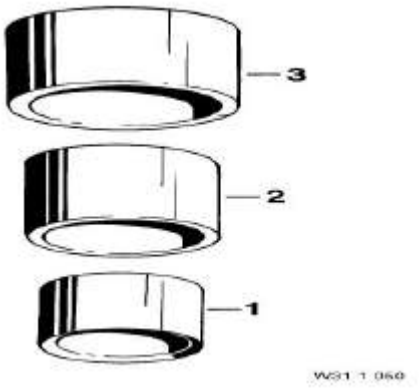


Fig. 228: Identifying Tool (0491868)
Courtesy of BMW OF NORTH AMERICA, INC.

2 = **0491870** Holding sleeve

NOTE: **(Pressure sleeve) For gripping the wishbones and for removing and installing the silence blocks in the leading link. Replaced by 31 1 054. (0 493 747)**

3 = **0491871** Holding sleeve

NOTE: **(pressure sleeve) For gripping the leading link. Series: E24, E28, E32, E34 Discontinued, only available via complete tool**

0491939 TOOL

0491939 312260 Tool Minimum set: Mechanical tools AM

NOTE: **(Pressure bush tool) For removing and installing rubber mounts in trailing and leading links and in wishbones (E46/5)**

Storage Location

B13

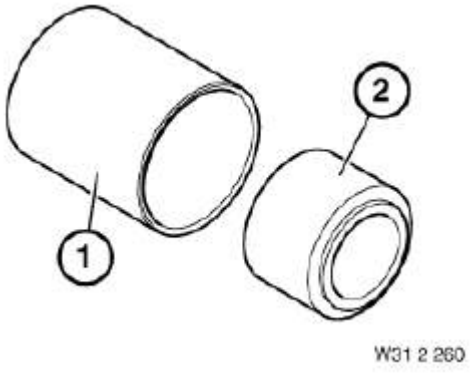
SI number

01 03 99 (418)

Consisting of:

4 = **0493644** Holding sleeve

NOTE: **(Push sleeve) For removing and installing. Series: E53, E83**



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Fig. 229: Identifying Tool (0491939)
Courtesy of BMW OF NORTH AMERICA, INC.

1 = 0491940 Holding sleeve

NOTE: **(Push sleeve) As counter support when removing and installing. Series: E38, E39, E83 For removing and installing rubber mounts in wishbones/Model series: E46/5**

2 = 0491941 Holding sleeve

NOTE: **(Pressure sleeve) For pulling out and in/model series: E38 Replaced by 31 2 263. (0 493 596)**

3 = 0493596 Holding sleeve

NOTE: **(Push sleeve) For removing and installing Model series: E38, E39**

2213023 TOOL

2213023 313342 Tool Mechanical tool

NOTE: **The spare parts set (2 locking pins and 1 O-ring) for reorders corresponds to the previous special tool 31 3 342**

SI number

01 16 11 (738)



Fig. 230: Identifying Tool (2213023)
Courtesy of BMW OF NORTH AMERICA, INC.

0491892 TOOL

0491892 312060 Tool AM

NOTE: **For pressing in the wheel bearing race - model year: up to 82**

Consisting of:

1. 0491893 Synchronising key

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NOTE: **For wheel bearing race, inner**

2. 0491894 Synchronising key

NOTE: **For wheel bearing race, outer**

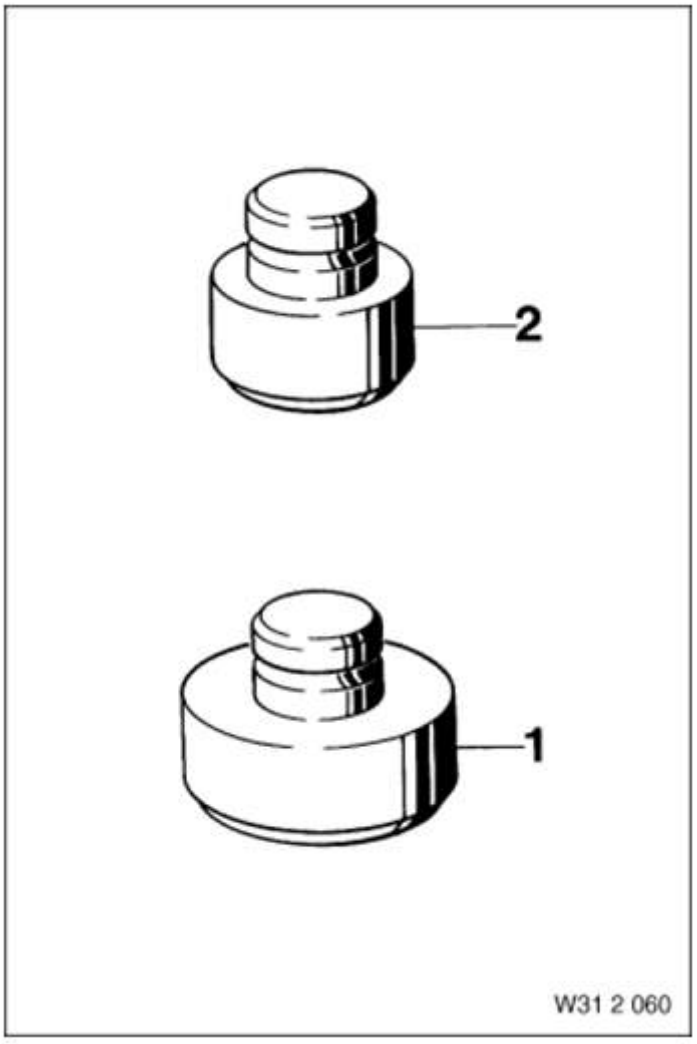


Fig. 231: Identifying Tool (0491892)
Courtesy of BMW OF NORTH AMERICA, INC.

0491933 TOOL

0491933 312240 Tool Minimum set: Mechanical tools AM

NOTE: **(Extractor) For pressing off wishbone from steering stub.**

Storage Location

C12

SI number

01 06 94 (801)

Consisting of:

6 = 0494805 Shaped part

NOTE: **(Shaped part) Pressing off wishbone from wheel control joint E53, E83**

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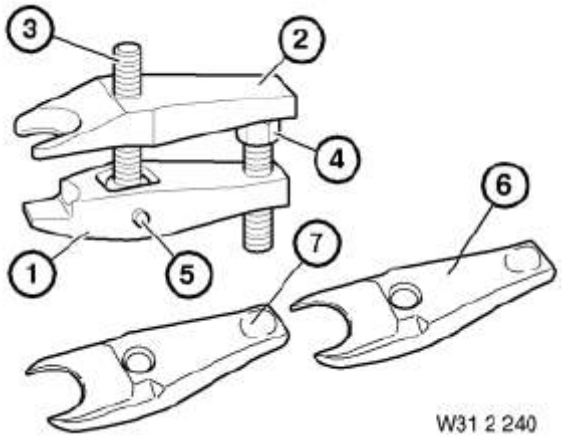


Fig. 232: Identifying Tool (0491933)
Courtesy of BMW OF NORTH AMERICA, INC.

7 = 0496006 Shaped part

NOTE: **(Shaped part) Pressing off wishbone from wheel control joint E70. SI 1 01 07 (333)**

1 = 0491934 Shaped part

NOTE: **(Shaped part)**

2 = 0491935 Shaped part

NOTE: **(Shaped part)**

3 = 0491936 Spindle
4 = 0491937 Screw

NOTE: **(Pressure bolt) Replaced by 31 2 311 (0 495 800)**

5 = 0491938 Pin

NOTE: **(Cylindrical pin)**

2213034 TOOL

2213034 313355 Tool Mechanical tool

NOTE: **Clamping plate As of 08/2011, the previous special tool 31 3 355 receives this new item number**

SI number

01 16 11 (738)

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Fig. 233: Identifying Tool (2213034)
Courtesy of BMW OF NORTH AMERICA, INC.

0491860 TOOL

0491860 311010 Tool AM

NOTE: **For removing and installing the silent blocks in the tension struts and wishbones.**

Storage Location

Y10

Consisting of:

1. **0491861** Holding sleeve

   NOTE: **(Pressure sleeve) for removal discontinued, available as part of set of special tools only**

2. **0491862** Holding sleeve

   NOTE: **(Pressure sleeve) for counterholding, discontinued, available as part of set of special tools only**

3. **0491863** Holding sleeve

   NOTE: **(Pressure sleeve) for installing discontinued, available as part of set of special tools only**

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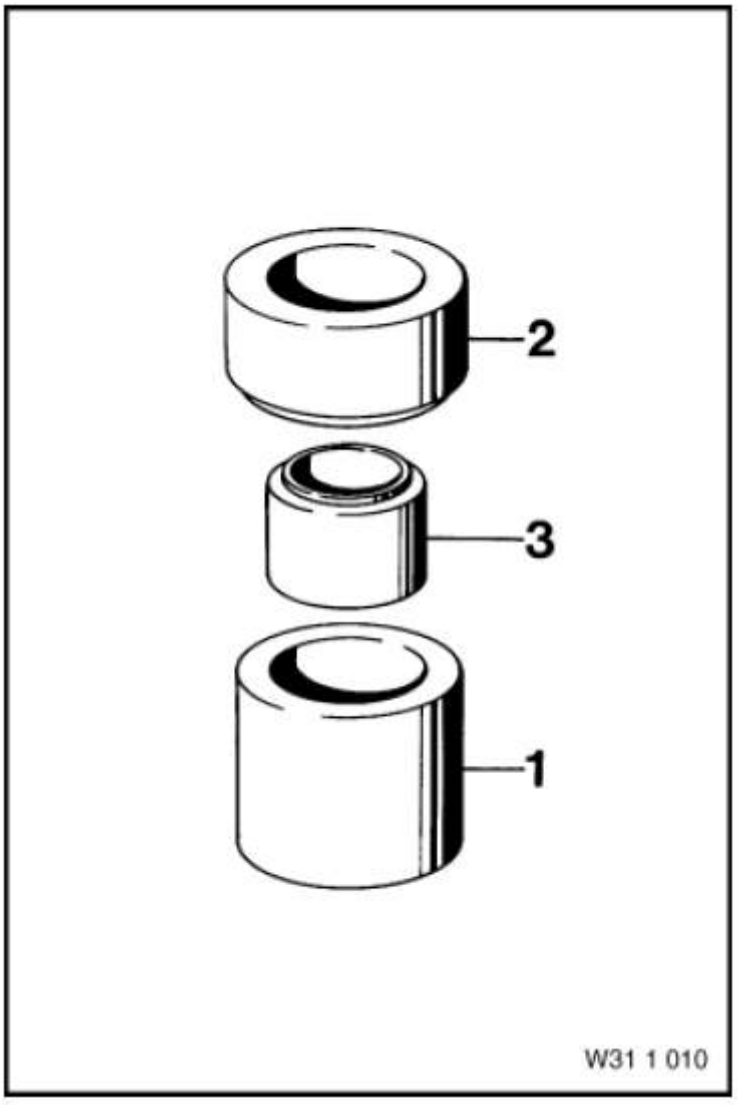


Fig. 234: Identifying Tool (0491860)
Courtesy of BMW OF NORTH AMERICA, INC.

2210777 TOOL SET

2210777 Tool set Mechanical tool

NOTE: **Retrofit - for authorised BMW dealers who have already received the special tool 31 0 000 from SPX**

SI number

01 19 10 (674)

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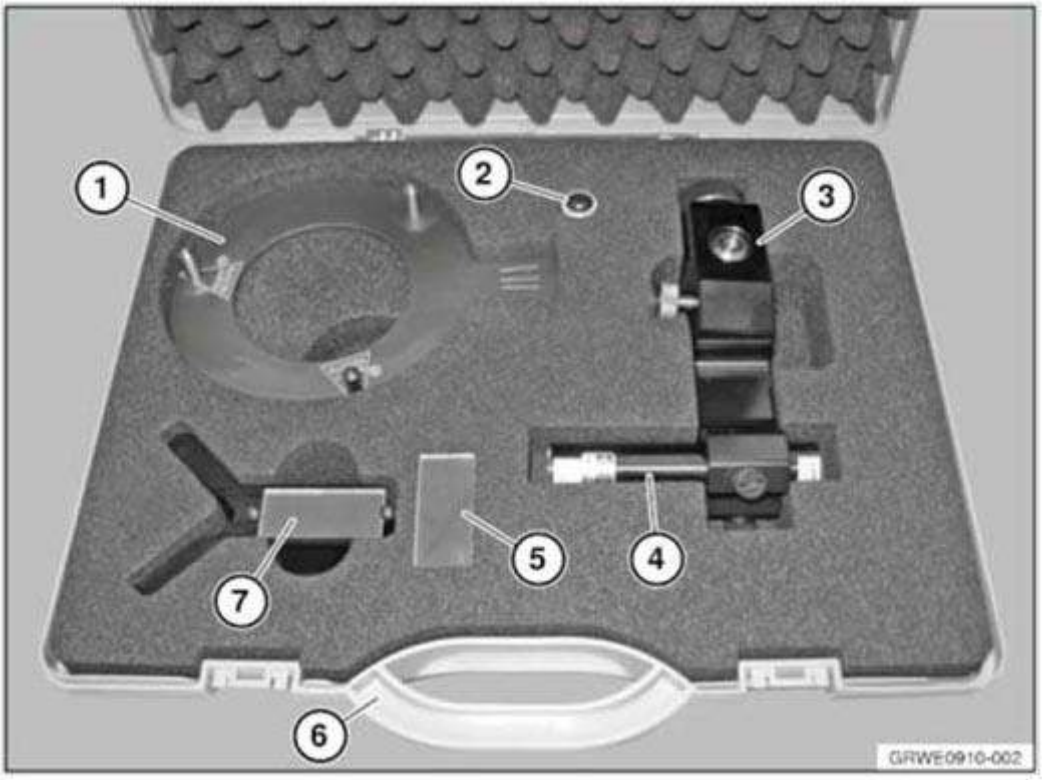


Fig. 235: Identifying Tool Set (2210777)
Courtesy of BMW OF NORTH AMERICA, INC.

2208573 TOOL SET

2208573 Tool set AM

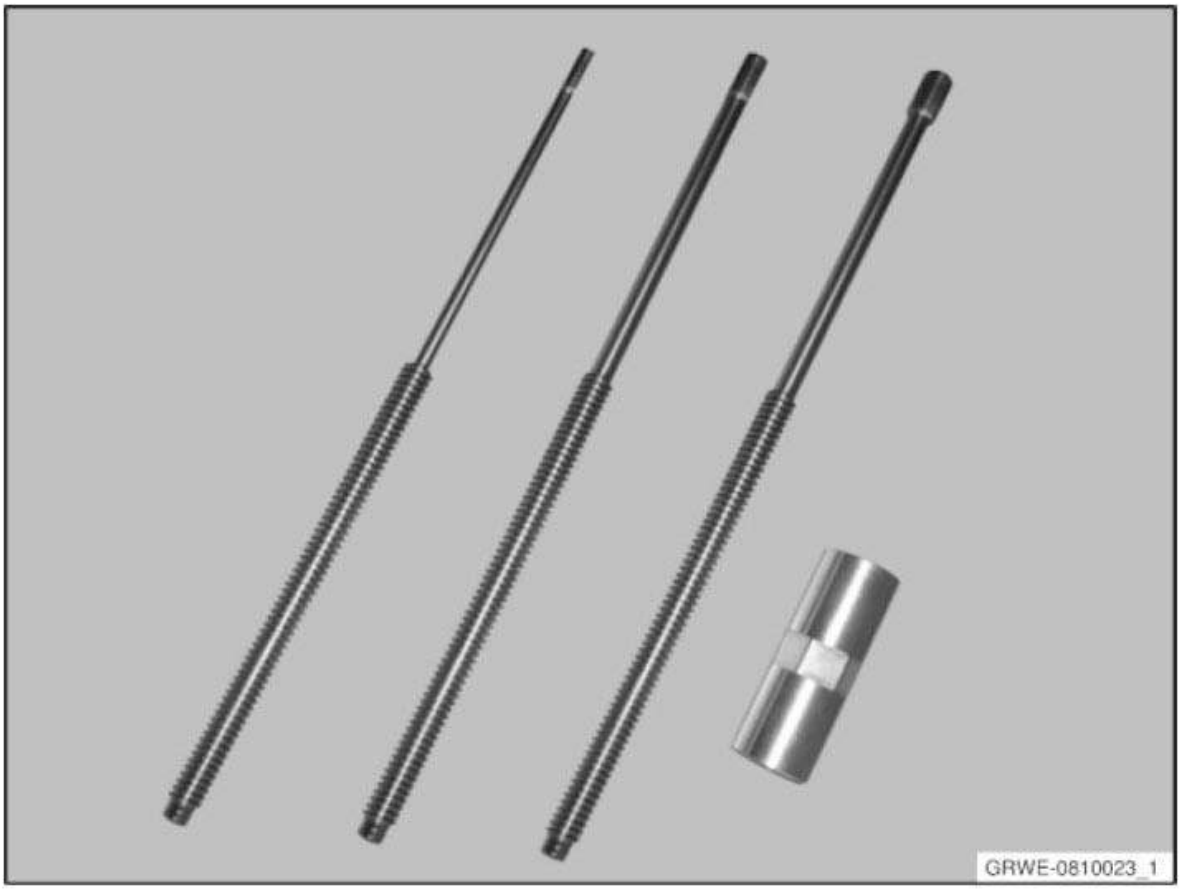


Fig. 236: Identifying Tool Set (2208573)
Courtesy of BMW OF NORTH AMERICA, INC.

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NOTE: **Threaded spindle set for removing and installing the rubber mount on the rear axle support.**

SI number

08 06 10 (658)

Consisting of:

4 = 2208574
3 = 2208575

2155746 TOOL SET

2155746 Tool set AM



Fig. 237: Identifying Tool Set (2155746)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Adapter kit 2 (BMW), (BMW-specific adapters), for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 12 14 (155)

Consisting of:

1 = 2159721
14 = 2159722
18 = 2156282

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17 = 2156283
2 = 2159723
16 = 2156275
15 = 2156273
13 = 2156280
12 = 2156279
11 = 2156278
10 = 2156277

2160009 TOOL SET

2160009 Tool set AM



Fig. 238: Identifying Tool Set (2160009)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **A set of the BMW hydraulic tool system for wheel bearings and output shafts (basic set for BMW, consisting of 81 64 2 155 744, 81 64 2 155 745, 81 64 2 155 746)**

SI number

08 12 14 (155)

2155744 TOOL SET

2155744 Tool set AM

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Fig. 239: Identifying Tool Set (2155744)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Hydraulic unit (basic unit) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 12 14 (155)

Consisting of:

2 = 2156247
1 = 2156246

2210778 TOOL SET

2210778 Tool set Minimum set: Mechanical tools AM

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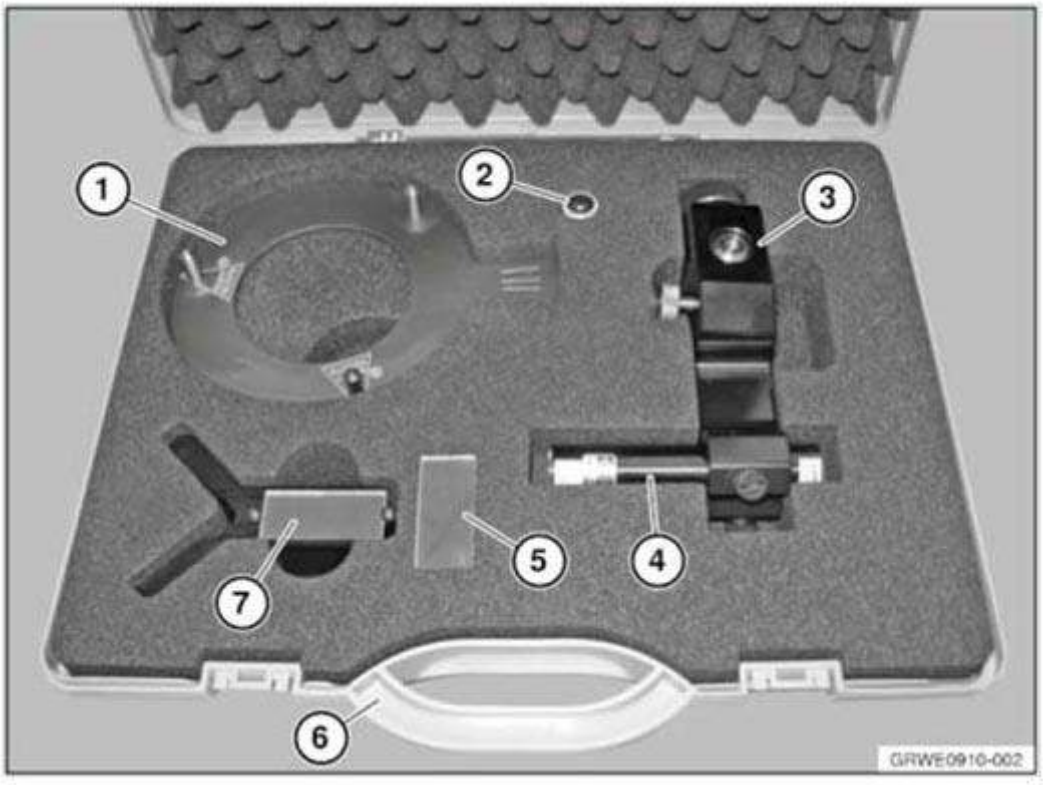


Fig. 240: Identifying Tool Set (2210778)
Courtesy of BMW OF NORTH AMERICA, INC.

In conjunction with: 2357190

NOTE: **For positioning the support bearing on the spring strut of the front axle Fitting aid that replaces (blocked) tool 31 0 000**

SI number

01 19 10 (674)

Consisting of:

1 = **2210783** Gauge

NOTE: **For positioning the support bearing.**

2 = **0496962** Battery

NOTE: **commercially available battery 3V lithium (CR 123A)**

3 = **2210785** Locating fixture

NOTE: **For attaching and aligning the laser on the spring strut.**

4 = **2210779** Laser
5 = **2210780** Mirrors

NOTE: **1 set (2 units) replacement for prism 83 30 2 210 780**

7 = **2210781** Measurement aid

NOTE: **Prism with mirror, for aligning the laser beam.**

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2155745 TOOL SET

2155745 Tool set AM



Fig. 241: Identifying Tool Set (2155745)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Wheel bearing adapter kit 1 (BMW), (spindles and tensioning nuts) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 12 14 (155)

Consisting of:

15 = 2156262
14 = 2159720
13 = 2156257
12 = 2156256
11 = 2318476
10 = 2159986
9 = 2159985
1 = 2156252
2 = 2156253
3 = 2156254
4 = 2156255
5 = 2156258
6 = 2156260

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7 = 2156265

8 = 2156271

16 = 2156270

0491855 WASHER

0491855 311005 Washer AM

NOTE: **(Flanged washer) For centring of threaded spindle and as a support disc for removing and installing the rubber mount in the front axle support and in the wishbones - series: E12**

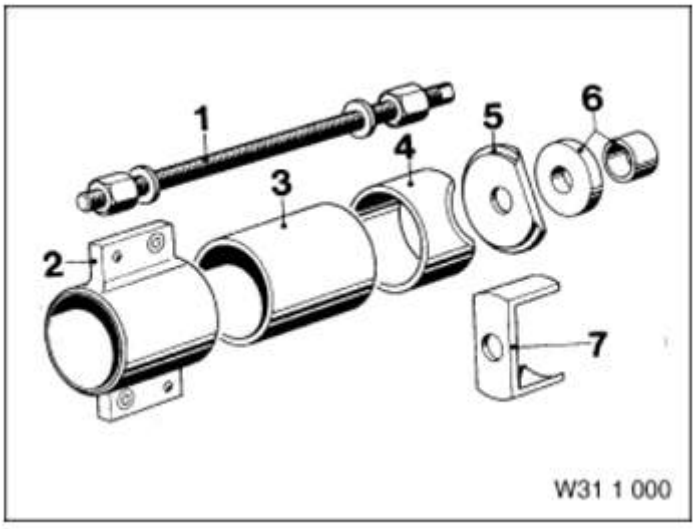


Fig. 242: Identifying Washer (0491855)
Courtesy of BMW OF NORTH AMERICA, INC.

2156255 WASHER

2156255 Washer AM

NOTE: **Contact disc D1 in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 243: Identifying Washer (2156255)
Courtesy of BMW OF NORTH AMERICA, INC.

0491980 WASHER

0491980 315072 Washer AM

NOTE: **(Measuring disc 7 mm)**

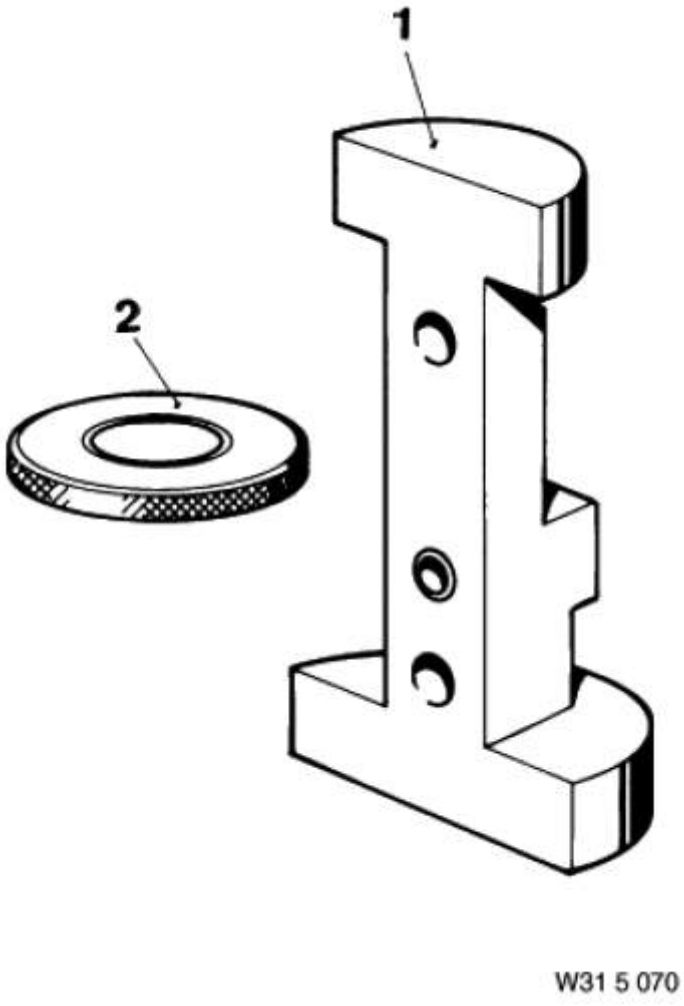


Fig. 244: Identifying Washer (0491980)
Courtesy of BMW OF NORTH AMERICA, INC.

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2156265 WASHER

2156265 Washer AM

NOTE: **Contact disc (M24) E3 in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 245: Identifying Washer (2156265)
Courtesy of BMW OF NORTH AMERICA, INC.

0491975 WASHER

0491975 315040 Washer Mechanical tool

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

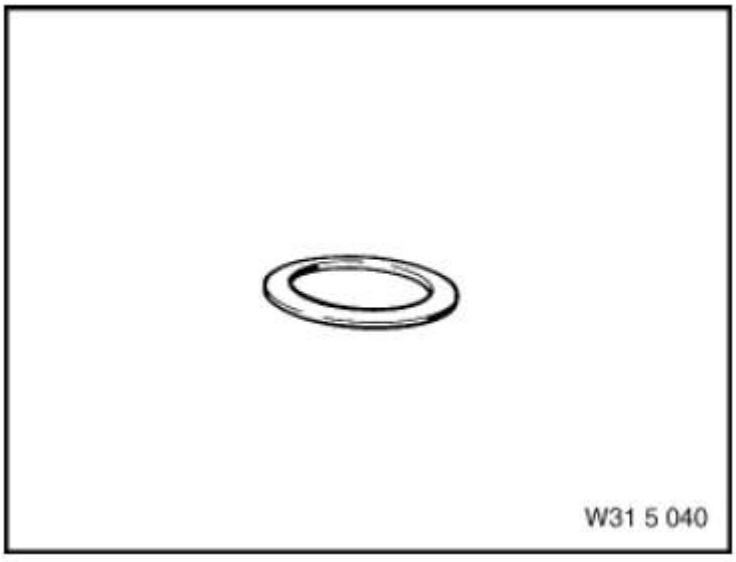


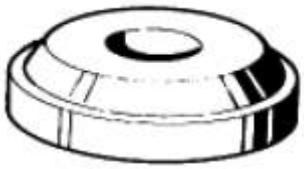
Fig. 246: Identifying Washer (0491975)
Courtesy of BMW OF NORTH AMERICA, INC.

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0491983 WASHER

0491983 315100 Washer Mechanical tool

NOTE: **For installing the outer bearing race in the bearing housing in the front axle differential**



W31 5 100

Fig. 247: Identifying Washer (0491983)
Courtesy of BMW OF NORTH AMERICA, INC.

0491981 WASHER

0491981 315080 Washer Mechanical tool

NOTE: **For determining the installation play of the radial gears in the front axle differential**



W31 5 080

Fig. 248: Identifying Washer (0491981)
Courtesy of BMW OF NORTH AMERICA, INC.

0491963 WRENCH

0491963 313170 Wrench Minimum set: Mechanical tools Mechanical tool

NOTE: **For releasing and tightening the shock absorber support bearing bolt**

Storage Location

A11

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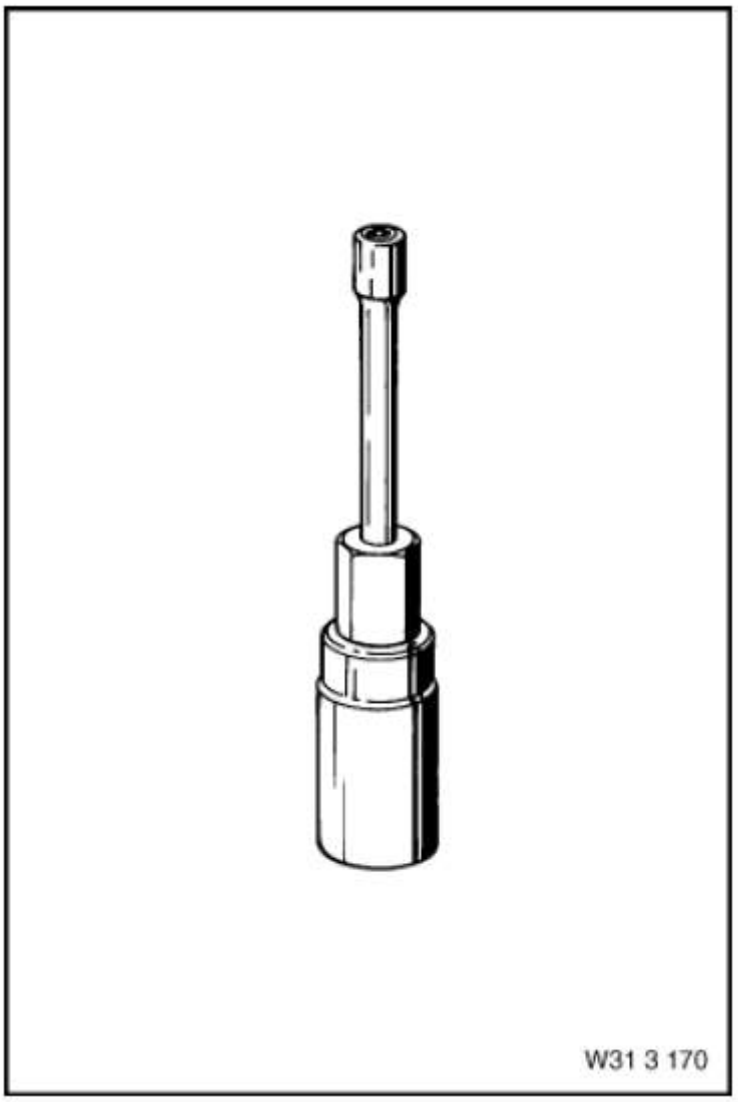


Fig. 249: Identifying Wrench (0491963)
Courtesy of BMW OF NORTH AMERICA, INC.

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Article GUID: A00702123

FRONT AXLE - RIDE HEIGHT

31 00 FRONT AXLE - RIDE HEIGHT

FRONT AXLE - RIDE HEIGHT SPECIFICATION

Ride height in normal position Attach tape measure to bottom middle of rim flange and measure to lower edge of wheel arch Â
Tolerance ride height in • NORMAL POSITION max. 10 mm • DESIGN POSITION max. 2 mm Â
Difference ride height between left/right in • NORMAL POSITION 10 mm • DESIGN POSITION 2 mm Â

Series	Â	Â
17" wheel rim	mm	665
18" wheel rim	mm	677
19" wheel rim	mm	689
20" wheel rim	mm	702
21" wheel rim	mm	715
Sport suspension (not low slung)	Â	Â
17" wheel rim	mm	665
18" wheel rim	mm	677
19" wheel rim	mm	689
20" wheel rim	mm	702
21" wheel rim	mm	715

FRONT AXLE DIFFERENTIAL, 170AL/175AL

31 50 FRONT AXLE DIFFERENTIAL 170AL/175AL

FRONT AXLE DIFFERENTIAL SPECIFICATION

Oil grade: see FRONT AXLE - OPERATING FLUIDS	Â	Â
Refilling oil quantity	litre	0, 60

GENERAL - TRACK WIDTH/WHEELBASE

31 00 GENERAL - TRACK WIDTH/WHEELBASE

GENERAL - TRACK WIDTH/WHEELBASE SPECIFICATION

Track width for normal position and rim offset (ET)	Â	Â
	mm	1616

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• ET32		
• ET38	mm	1604
• ET42	mm	1596
• ET43	mm	1594
Wheelbase	mm	2810

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Article GUID: A00702147

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SUSPENSION

Front Axle - Tightening Torques - X3 Utility

ANTI-ROLL BAR

31 35 ANTI-ROLL BAR

TIGHTENING TORQUE SPECIFICATION - ANTI-ROLL BAR

Â		Type	Thread	Tightening specifications	Dimension
1AZ	Retaining bar for stabiliser to front axle carrier/steering gear	F01/F02/F04/F06/F07/F10/F11/F12/F13/F18	M12	Replace screw. Jointing torque Angle of rotation	Â 100 Nm 105 Â°
		F03	M12	Replace screw. Jointing torque	Â 100 Nm
		F03	M14	Replace screw. Jointing torque	Â 165 Nm
		F25/F26	M10	Â	56 Nm
2AZ	Stabiliser link to stabiliser/damper	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18	M12	Replace nuts. Jointing torque Angle of rotation	Â 45 Nm 45Â°
3AZ	Anti-roll bar link to anti-roll bar	F25/F26	M12	Replace nut.	100 Nm
4AZ	Anti-roll bar link to damper	F25/F26	M12	Replace nut.	108 Nm

FRONT AXLE SUSPENSION

31 10 FRONT AXLE SUSPENSION

TIGHTENING TORQUE SPECIFICATION - FRONT AXLE SUSPENSION

Â		Type	Thread	Tightening specifications	Dimension
1AZ	Front axle support to engine support (screw connection, front, middle, rear)	F01/F02/F03/F04/F06 (without M6)/F07/F10 (without M5)/F11/F12 (without M6)/F13 (without M6)/F18	M12	Observe repair instructions.	100 Nm
		F25/F26	M12	Replace screws. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
		F06 M6/F10 M5/F12 M6/F13 M6	M10	Replace screws. Jointing torque	Â 56 Nm

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				Angle of rotation	90 Â°
2AZ	Thrust zone to front axle support	F01/F02/F04/F06 (without M6)/F07/F10 (without M5)/F11/F12 (without M6)/F13 (without M6)	M8	Replace screws. Jointing torque Angle of rotation	Â 15 Nm 90 Â°
		F06 M6/F10 M5/F12 M6/F13 M6	M10	Replace screws. Jointing torque Angle of rotation	Â 56 Nm 90 Â°
		F25/F26	M12	Â	110 Nm
3AZ	Acoustic strut to front axle support	F01/F02	M8	Â Jointing torque Angle of rotation	Â 15 Nm 90 Â°

FRONT AXLE DIFFERENTIAL

31 50 FRONT AXLE DIFFERENTIAL

TIGHTENING TORQUE SPECIFICATION - FRONT AXLE DIFFERENTIAL

Â		Type	Thread	Tightening specifications	Dimension
1AZ	Front axle final drive to engine oil pan	F01/F02/F06/F07/F10/F11/F12/F13/F25/F26	M12	Â	140 Nm
2AZ	Oil filler/oil drain plugs	F01/F02/F06/F07/F10/F11/F12/F13/F25/F26	M22	Replace oil filler and oil drain plugs.	60 Nm

OUTPUT SHAFT

31 60 OUTPUT SHAFT

TIGHTENING TORQUE SPECIFICATION - OUTPUT SHAFT

Â		Type	Thread	Tightening specifications	Dimension
1AZ	Output shaft console to engine oil sump	F01/F02/F06/F07/F10/F11/F12/F13/F25/F26	M8	Â	19 Nm
2AZ	Output shaft to wheel hub	F01/F02/F06/F07/F10/F11/F12/F13/F25/F26	M16	**Observe instructions in Repair Manual See 31 21 180 REPLACING BEARING FOR FRONT WHEEL or 31 60 000 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT OUTPUT SHAFT .** Replace collar bolt and spring. Jointing torque	Â 210 Nm

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			Angle of rotation	90 Â°

SPRING STRUTS

31 31 SPRING STRUTS

TIGHTENING TORQUE SPECIFICATION - SPRING STRUTS

Â	Type	Thread	Tightening specifications	Dimension
1AZ Support bearing flange to body	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18	M8	Replace screws.	28 Nm
	F25/F26	M8	Replace screws.	33 Nm
2AZ Support bearing flange to spring strut shock absorber	F01/F02/F03/F04/F06 (without M6)/F07/F10 (without M5)/F11/F12 (without M6)/F13 (without M6)/F18	M12	Replace nuts.	34 Nm
	F06 M6/F10 M5/F12 M6/F13 M6	M14	Replace nut.	47 Nm
	F25/F26	M12	Replace nut.	71 Nm
3AZ Spring strut shock absorber to swivel bearing	F25/F26	M12	**Follow repair instruction** See 31 21 180 REPLACING BEARING FOR FRONT WHEEL or 31 60 000 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT OUTPUT SHAFT . Replace screw and nut. Jointing torque Angle of rotation	Â 60 Nm 90 Â°

TRAILING ARMS AND STRUTS

31 12 TRAILING ARMS AND STRUTS

TIGHTENING TORQUE SPECIFICATION - TRAILING ARMS AND STRUTS

Â	Type	Thread	Tightening specifications	Dimension
1AZ Tension strut to front axle support	F25/F26	M12	TIGHTEN DOWN IN NORMAL POSITION . Replace screw and nut. Jointing torque Angle of rotation	Â 165 Nm 90 Â°
2AZ Trailing link to wheel control joint	F25/F26	M14	Replace nut.	130 Nm
3AZ Wishbone to front axle support	F25/F26	M12	TIGHTEN DOWN IN NORMAL POSITION . Replace screw and nut. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
4AZ Wishbone to swivel bearing	F25/F26	M14	Replace nut.	130 Nm
5AZ Wheel guide joint to swivel bearing	F25/F26	M10	Replace screws.	60 Nm

WHEEL BEARINGS AND STEERING KNUCKLE

31 21 WHEEL BEARINGS AND STEERING KNUCKLE

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TIGHTENING TORQUE SPECIFICATION - WHEEL BEARINGS AND STEERING KNUCKLE

Â	Type	Thread	Tightening specifications	Dimension
1AZ Wheel bearing to swivel bearing	F01/F02/F04/F06/F07/F10/F11/F12/F13/F18	M12x1.5x45	Replace screws. It is essential to follow the repair instructions! Jointing torque Angle of rotation	Â 80 Nm 90 Â°
		M12x1.25x45	Replace screws. It is essential to follow the repair instructions! Initial torque Jointing torque Angle of rotation	Â 20 Nm 120 Nm 90 Â°
	F25/F26	M12	Replace screws. Jointing torque Angle of rotation	Â 80 Nm 90 Â°
2AZ Drive flange to front axle shaft end	F03	Â	Â	420 Nm
3AZ Brake caliper stud bolt to swivel bearing	F06 M6/F10 M5/F12 M6/F13 M6	Â	Renew the stud bolt. (microencapsulated)	20 Nm

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SUSPENSION

Front Axle Operating Fluids

TRANSMISSION OIL FOR FRONT AXLE DIFFERENTIAL

FRONT AXLE FINAL DRIVE OILS CHART

Trade Name	Part Number	
Â	China	Rest of the world
BMW Synthetics OSP	Â	33 11 7 695 240
BMW Synthetics OSP	Â	83 22 9 407 768
BMW Synthetics OSP	83 22 2 148 570	Â
Hypoid Axle Oil G1	Â	83 22 2 295 532

GREASE FOR WHEEL BEARING

WHEEL BEARING GREASE CHART

Taper roller bearing	
High-temperature multipurpose grease is used to grease the taper roller bearing. Grease filling in the wheel hub 50 g and in the wheel hub protective cap 20 g per wheel.	
Trade Name	**Part Number**
Shell Retinax EP2	83 23 9 407 845
The wheel hub protective caps must always be replaced and glued into the wheel hubs during installation with the following adhesive.	
Trade Name	Part Number
Loctite No. 638	81 22 9 407 420
Angular-contact ball bearing unit Bearing unit lubricated for life, cannot be dismantled, no re-greasing possible.	
Grooved ball bearing (rear axle) E12, E21, E23, E24 up to mod. 5.82	
Trade Name	Part Number
Shell Retinax EP2	83 23 9 407 845

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 -22Â°F to +302Â°F (-30Â°C to +150Â°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

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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

NOTE:

Approvals are the same as for rear axle final drive oils. Refer to **APPROVED FINAL DRIVE OILS** .

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SUSPENSION

Integrated Suspension Systems - Repair Instructions - X3 Utility

GENERAL

37 12 012 CARRY OUT RIDE HEIGHT ADJUSTMENT

NOTE: **Ride height adjustment must be carried out after the following work:**

- **Removal/replacement of ride height sensor or its control rod (only necessary on vehicles with air suspension)**
- **Replacement of EHC control unit (F01/F02/F04/F07/F11/F15/F16)**
- **Replacement of ICM control unit (Integrated Chassis Management)**

Connect diagnosis system.

Switch the ignition on.

Carry out ride height adjustment (menu item: "Service function").

IMPORTANT:

Following ride height adjustment, for vehicles with:

- Run Flat Indicator:

  initialise **RUN FLAT INDICATOR** .
- Tyre Pressure Monitor: **RESETTING TYRE PRESSURE MONITOR** .

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.

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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.

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 safety 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.**

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

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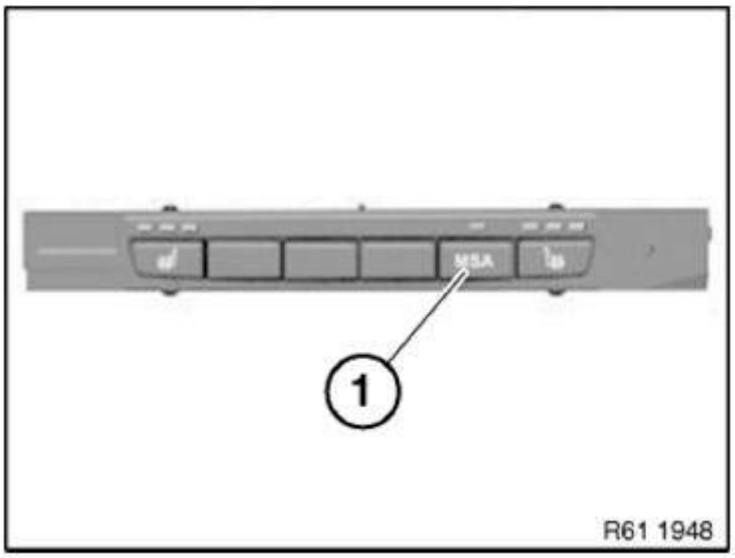


Fig. 1: Identifying MSA Button In Passenger Compartment
Courtesy of BMW OF NORTH AMERICA, INC.

- 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.

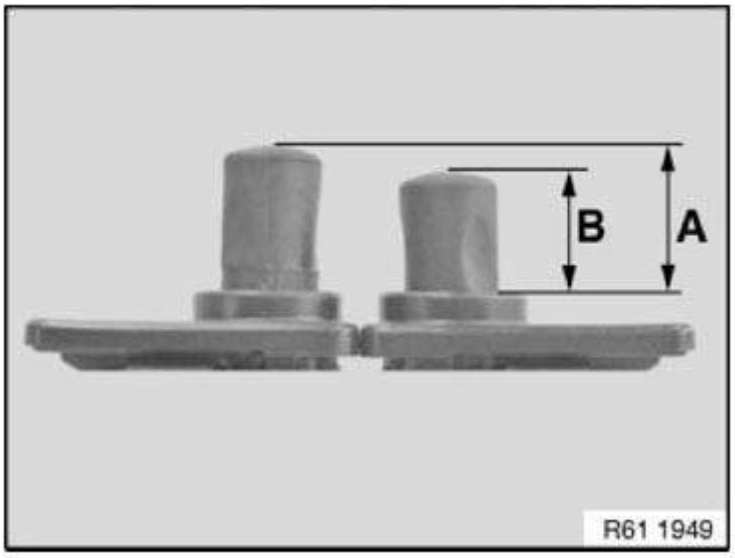


Fig. 2: Identifying Engine Bonnet/Hood Dimensions
Courtesy of BMW OF NORTH AMERICA, INC.

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:

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Observe country-specific waste disposal regulations.

Measures if oil is unintentionally released:

- **Personal precautionary measures:** Danger of slipping! Keep noninvolved 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.**

FRONT CONTROL AND SUSPENSION ELEMENTS

37 11 030 REMOVING AND INSTALLING COMPLETE LEFT OR RIGHT SPRING STRUT (EDC)

NOTE: **Work is identical to Removing and installing front spring strut . See 31 31 000 REMOVING AND INSTALLING COMPLETE LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER or 31 31 000 REMOVING AND INSTALLING COMPLETE LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER !**

37 11 032 REPLACING FRONT LEFT OR RIGHT SPRING STRUT (EDC)

Special tools required:

- 31 3 340
- 31 3 341
- 31 3 355
- 33 0 040
- 31 0 040

WARNING: **Prior to each use of special tool 31 3 340, it is essential to read the associated operating instructions fully!**
All the safety precautions and instructions contained in the Owner's Handbook must be strictly observed!
Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!

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!

   Risk of damage inside the shock absorber!

7. Do not compress coil spring to full extent.

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Necessary preliminary tasks:

- Remove **FRONT SPRING STRUT**.

Removing:

Clamp special tool **31 3 341** with guide (1) in vice.

Fit special tools 31 3 355 from above on special tool **31 3 341** until retaining bolts (2) can be felt and heard to snap into place.

Check seating of special tools 31 3 355 and, if necessary, correct.

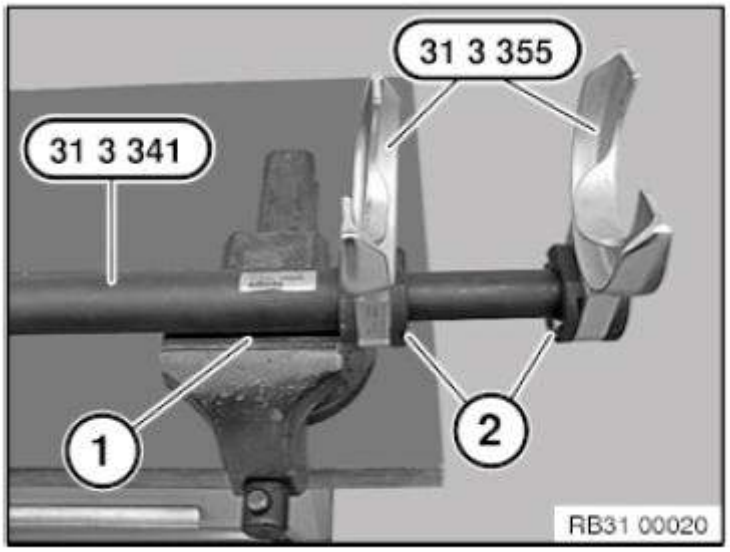


Fig. 3: Clamping Special Tool 31 3 341 With Guide
Courtesy of BMW OF NORTH AMERICA, INC.

Clean coil spring to remove all coarse dirt and mount on special tools 31 3 355.

WARNING: Coils of coil spring must be located completely in recesses of special tools 31 3 355!

Tension coil spring with special tool **31 3 341** until stress on piston rod is relieved.

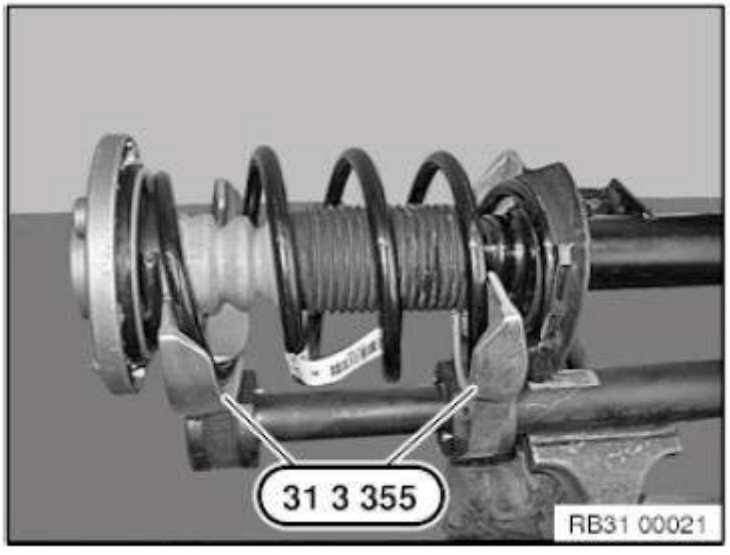


Fig. 4: Tensioning Coil Spring Using Special Tool 31 3 341

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Courtesy of BMW OF NORTH AMERICA, INC.

Take off cap.

Release nut with special tool **33 0 040** (grip piston rod in the process).

Remove support bearing.

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

Installation note:

When renewing support bearing: Renew screws (self-tapping if necessary).

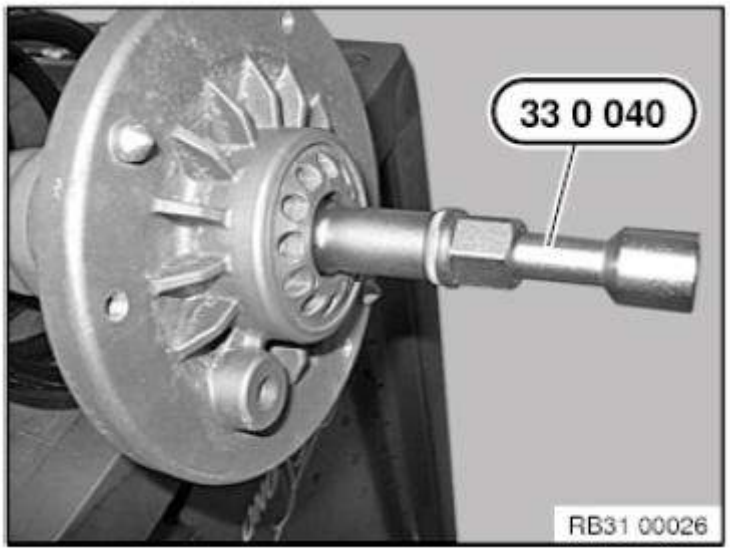


Fig. 5: Removing Support Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

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

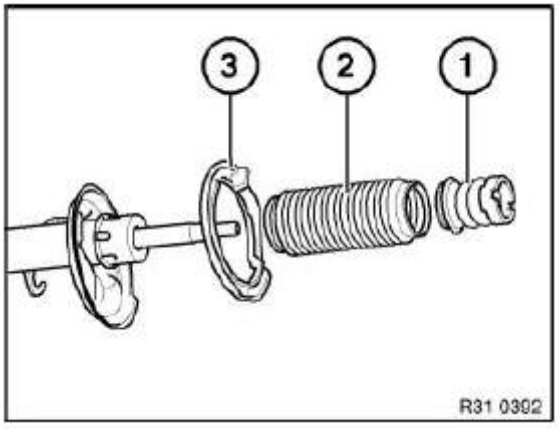


Fig. 6: Identifying Auxiliary Damper With Gaiter And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Remove **swivel bearing** . See **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** or **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** from spring strut.

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Installation note:

When renewing spring strut/swivel bearing, follow tightening specifications!

See: Replace **swivel bearing** . See **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** or **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** .

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

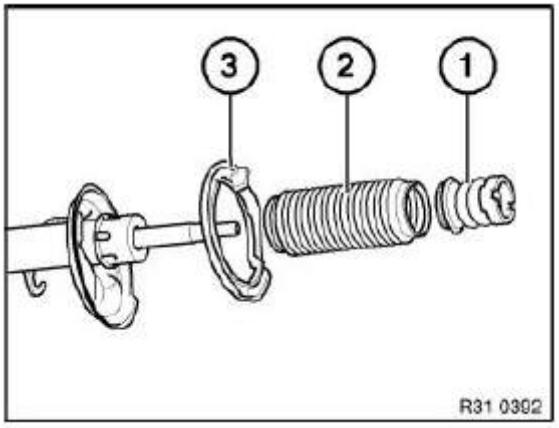


Fig. 7: Identifying Auxiliary Damper With Gaiter And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Align spring pad (3) with spring pad by way of recess (1).

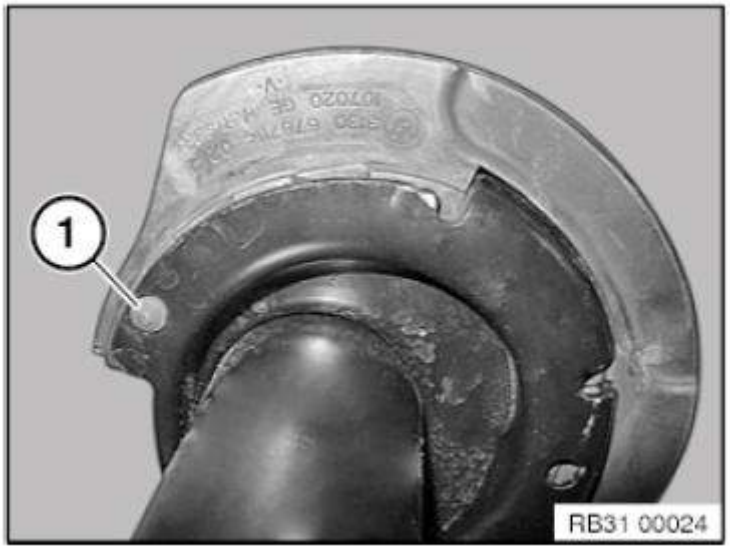


Fig. 8: Identifying Spring Pad With Spring Pad Recess
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Align lower end of coil spring (1) flush with spring pad (2) as shown. Upper coil of coil spring must rest positively on spring cup!

Insert shock absorber in tensioned coil spring.

Relieve tension on coil spring.

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Check installation position of gaiter, correct fold if necessary.

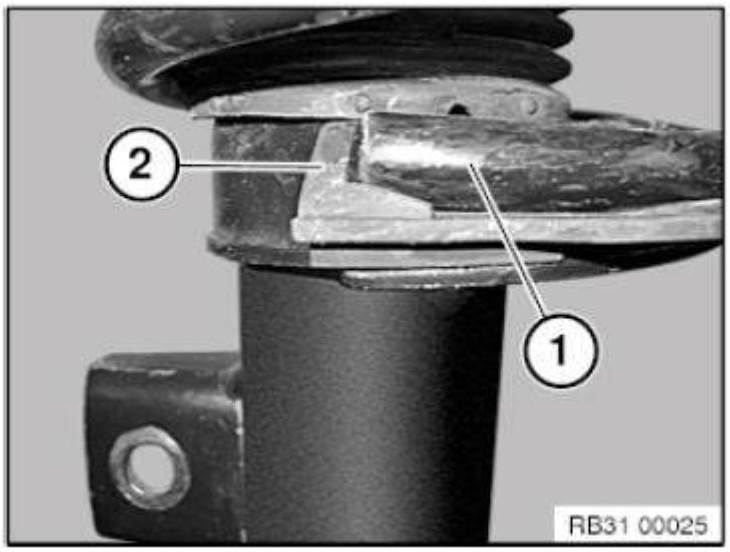


Fig. 9: Identifying Lower End Of Coil Spring Flush With Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Check support bearing and spring pad for damage, replace if necessary.

Attach support bearing to piston rod.

Replace nut and tighten down with special tool 31 0 040 (grip piston rod in the process).

Tightening torque **31 31 2AZ** .

Fit cover cap.

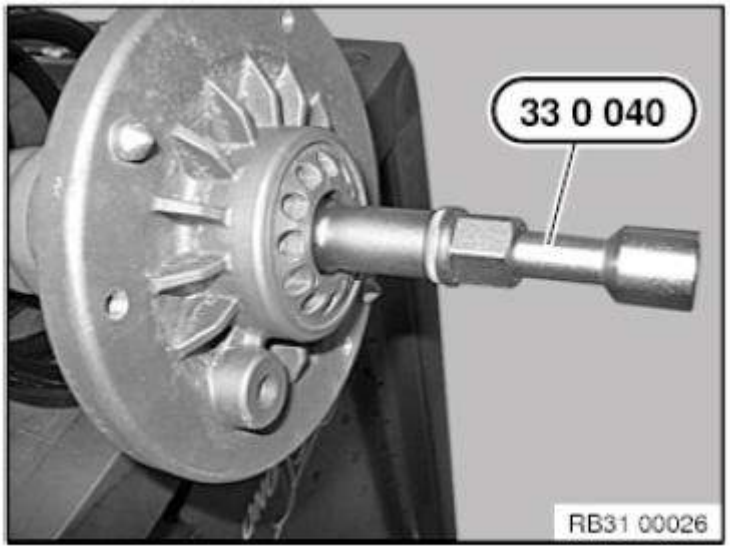


Fig. 10: Removing Support Bearing
Courtesy of BMW OF NORTH AMERICA, INC.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

After installation:

- Use the diagnosis system to perform the wheel speed accelerator sensor adjustment.

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-> see service functions/start-up VDM

REAR CONTROL AND SUSPENSION ELEMENTS

37 12 012 CARRY OUT RIDE HEIGHT ADJUSTMENT

NOTE: **Ride height adjustment must be carried out after the following work:**

- **Removal/replacement of ride height sensor or its control rod (only necessary on vehicles with air suspension).**
- **Replacement of EHC control unit (F01/F02/F04/F07/F11/F15/F16).**
- **Replacement of ICM control unit (Integrated Chassis Management).**

Connect diagnosis system.

Switch the ignition on.

Carry out ride height adjustment (menu item: "Service function").

IMPORTANT:

Following ride height adjustment, for vehicles with:

- Run Flat Indicator:

  initialise **RUN FLAT INDICATOR** .

- Tyre Pressure Monitor: **RESETTING TYRE PRESSURE MONITOR** .

37 12 090 REMOVING AND INSTALLING REAR LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER (EDC)

NOTE: **With full spring deflection, the coil spring may touch the gaiter, depending on the design.**

This is not a fault!

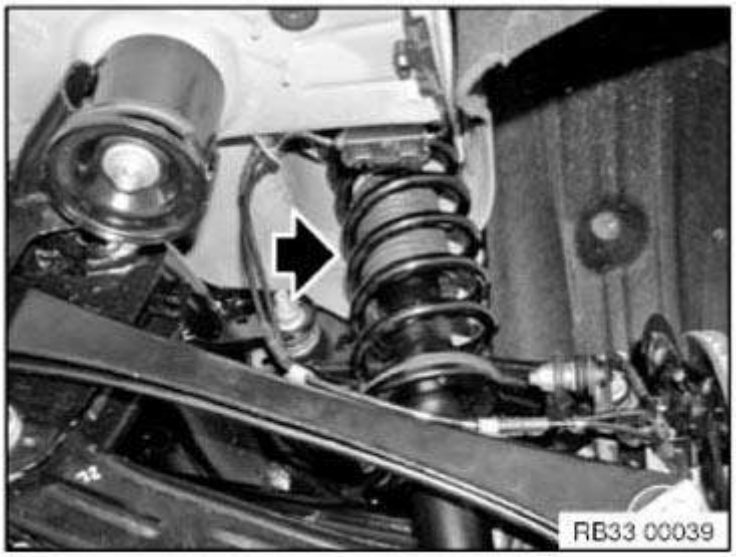


Fig. 11: Locating Rear Left/Right Spring Strut Shock Absorber
Courtesy of BMW OF NORTH AMERICA, INC.

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NOTE: **Work is identical to REMOVING AND INSTALLING SPRING STRUT !**

37 12 092 REPLACING REAR LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER

Special tools required:

- 31 3 340
- **31 3 341**
- **31 3 353** . See **0493567 313353 HOLDER** or **2213029 313353 TOOL MECHANICAL TOOL**
- **33 0 040**

WARNING: **Completely read the respective operating instructions before using special tools 31 3 340 !**
Strictly adhere to all safety information and instructions in the operating instructions!
Failure to observe these safety precautions and instructions increases the risk of serious physical injury, damage to your health and damage to property and equipment!

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.

IMPORTANT:

- When replacing the spring strut, replace the auxiliary damper as well!

Necessary preliminary tasks:

- Remove **REAR SPRING STRUT SHOCK ABSORBER UNIT** .

Removing:

Clamp special tool **31 3 341** in vice.

Place special tools **31 3 353** See **0493567 313353 HOLDER** or **2213029 313353 TOOL MECHANICAL TOOL** from top on special tool **31 3 341** . Retaining bolts (1) must be felt and heard snapping into place.

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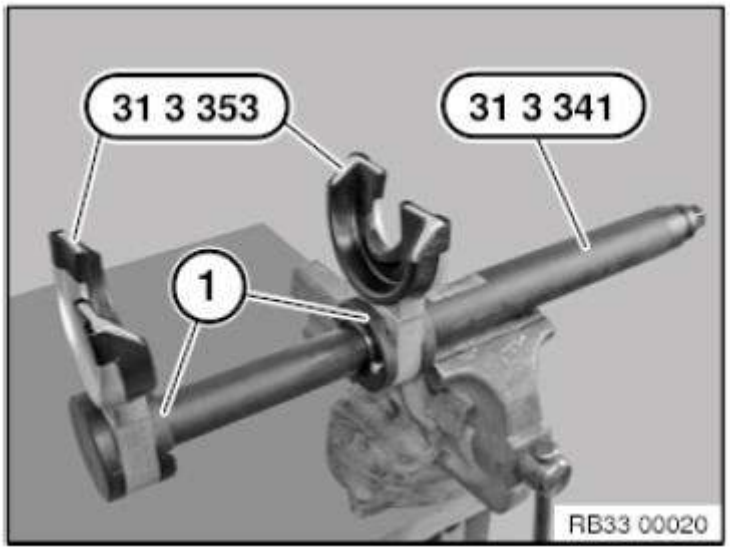


Fig. 12: Clamping Special Tool 31 3 341 In Vice
Courtesy of BMW OF NORTH AMERICA, INC.

Clean coil spring to remove all coarse dirt and mount on special tools **31 3 353** . See **0493567 313353 HOLDER** or **2213029 313353 TOOL MECHANICAL TOOL** .

WARNING: **Coils of coil spring must be located completely in recesses of special tools 31 3 353 . See 0493567 313353 HOLDER or 2213029 313353 TOOL MECHANICAL TOOL !**
Compress coil spring until stress on piston rod is relieved.

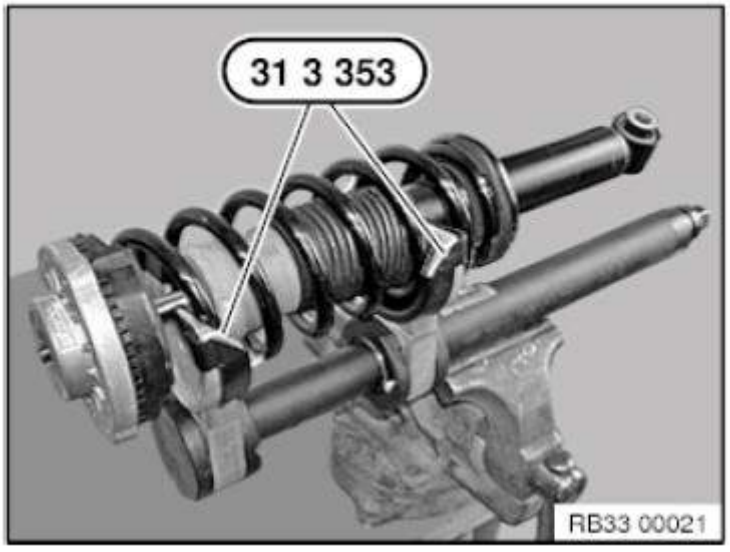


Fig. 13: Compressing Coil Spring Until Stress On Piston Rod
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut with special tool **33 0 040** .

Remove spring pad with dust boot.

Remove shock absorber with auxiliary damper, protective tube and spring pad from tensioned coil spring.

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Fig. 14: Removing Spring Pad With Dust Boot
Courtesy of BMW OF NORTH AMERICA, INC.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

If necessary, remove auxiliary damper (1) with protective tube and spring pad (2) from spring strut.

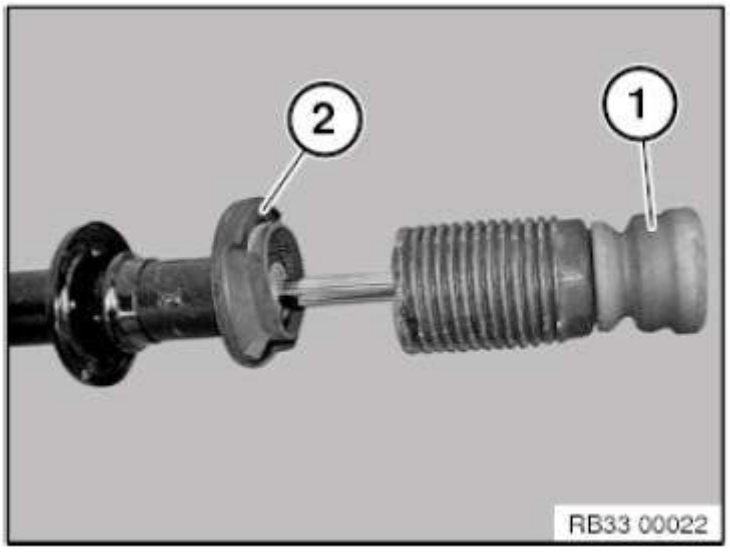


Fig. 15: Identifying Auxiliary Damper With Protective Tube And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Relieve tension on coil spring and remove from special tools **31 3 353** . See **0493567 313353 HOLDER** or **2213029 313353 TOOL MECHANICAL TOOL** .

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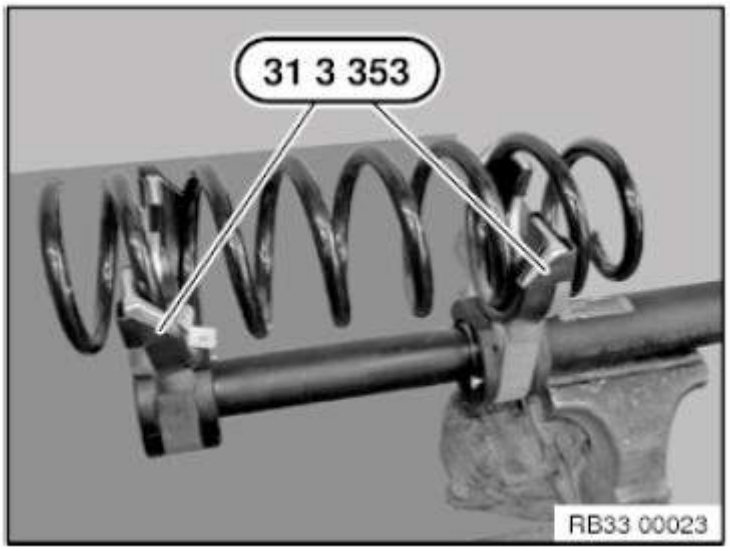


Fig. 16: Removing Coil Spring Tension
Courtesy of BMW OF NORTH AMERICA, INC.

Assembly:

WARNING: **Do not compress coil spring to full extent.**
Coils of coil spring must be located completely in recesses of special tools 31 3 353 ! See 0493567 313353 HOLDER or 2213029 313353 TOOL MECHANICAL TOOL
Tension coil spring.

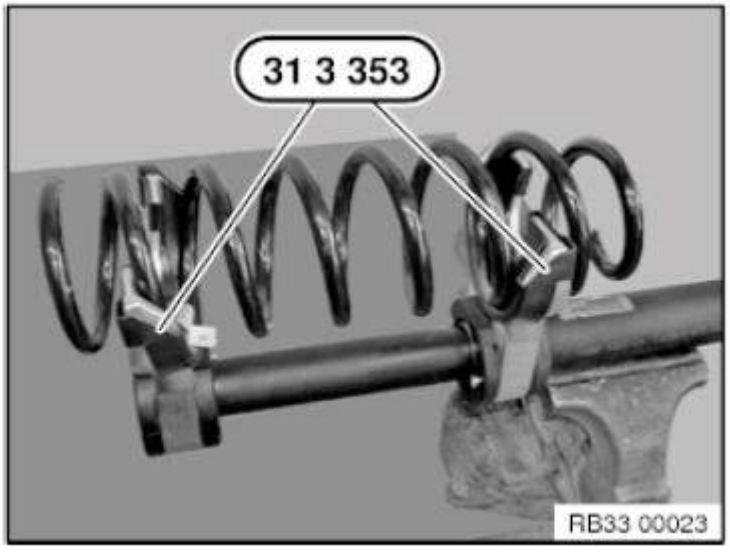


Fig. 17: Compressing Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Check auxiliary spring (1) with protective tube and spring pad (2) for damage, replace if necessary.

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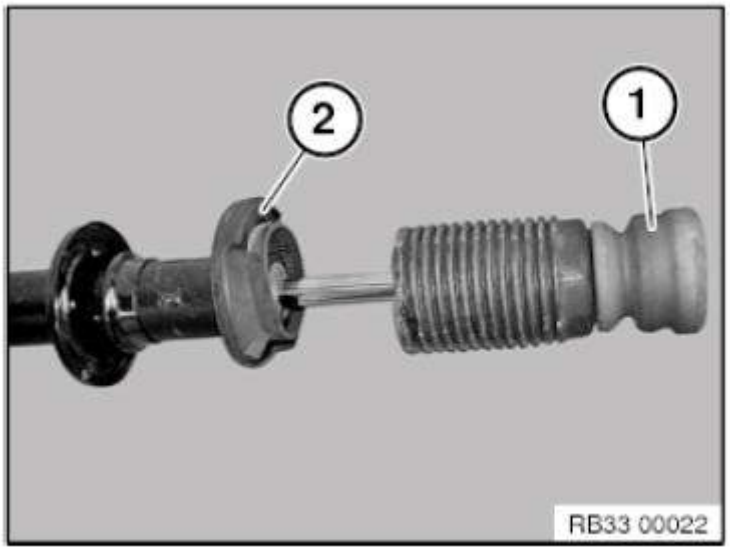


Fig. 18: Identifying Auxiliary Damper With Protective Tube And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Insert spring strut into tensioned coil spring.

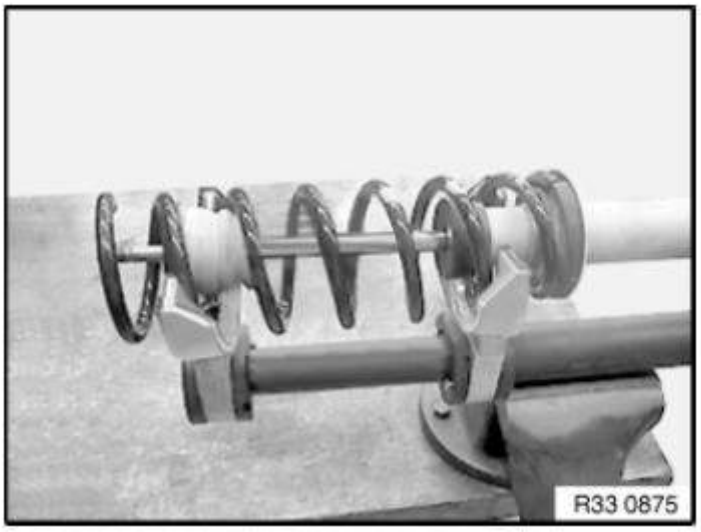


Fig. 19: Identifying Spring Strut And Tensioned Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Lower end of coil spring must rest on stop of spring pad!

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Fig. 20: Identifying Lower End Of Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

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

IMPORTANT: The arrows on support bearing (1) and spring pad (2) must be aligned.



Fig. 21: Aligning Support Bearing And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Mount support bearing and spring pad on piston rod.

IMPORTANT: Align support bearing and spring pad to end of coil spring.

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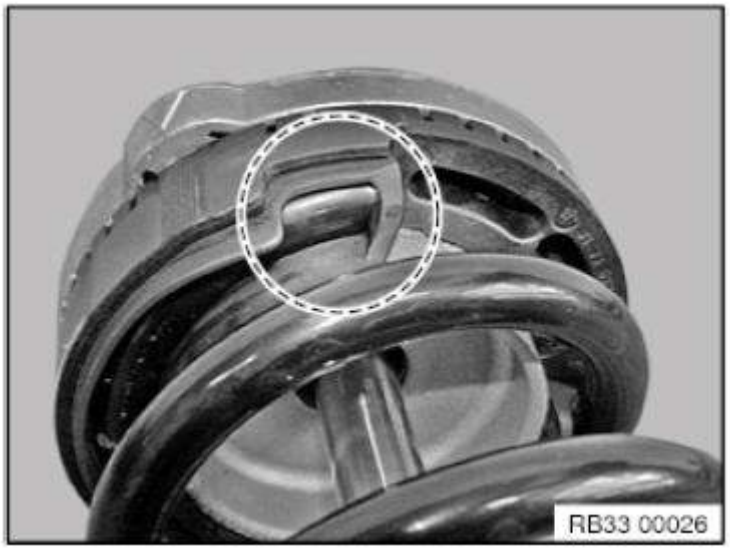


Fig. 22: Identifying Support Bearing And Spring Pad On Piston Rod
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The marks (1) must be aligned with the hole in rubber mount (2).

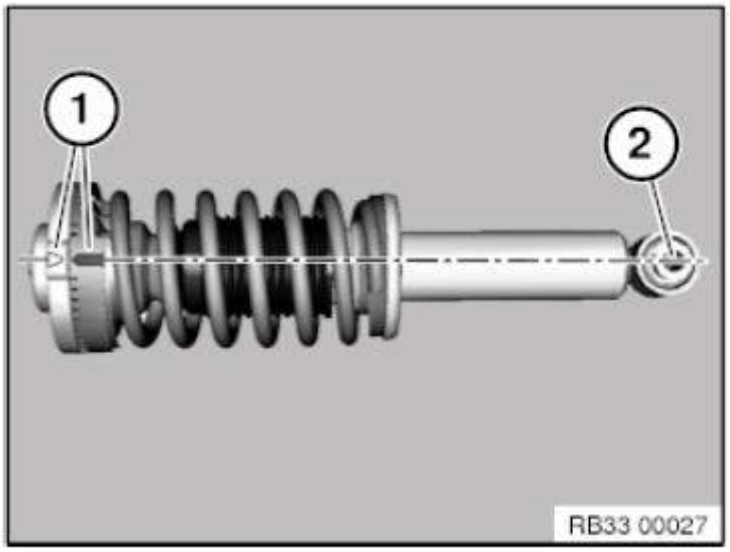


Fig. 23: Identifying Marks With Hole In Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

Replace nut and tighten down with special tool **33 0 040** .

Tightening torque **33 52 2AZ** .

Relieve tension on coil spring.

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Fig. 24: Relieving Tension On Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

ELECTRICAL COMPONENTS

37 14 566 REMOVING AND INSTALLING/REPLACING CONTROL UNIT FOR VERTICAL DYNAMIC CONTROL

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DISCHARGE (ESD PROTECTION)** .

Necessary preliminary tasks:

- Remove ignition key.
- Disconnect **BATTERY NEGATIVE CABLE** .
- Remove **FLAP IN LUGGAGE COMPARTMENT TRIM PANEL ON RIGHT** .

Undo screw (1), release expanding rivets (2) and remove storage compartment.

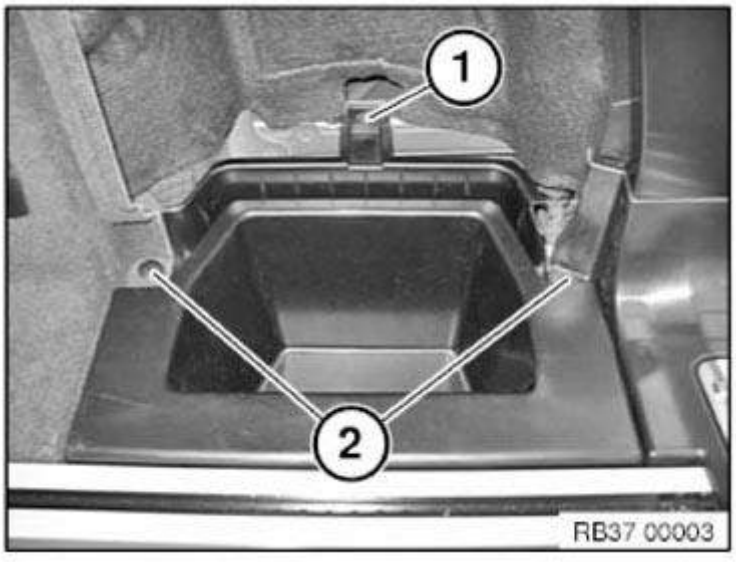


Fig. 25: Identifying Storage Compartment Expanding Rivets With Screws

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Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nuts (1).

Unlock connector (2) and remove.

Remove control unit.

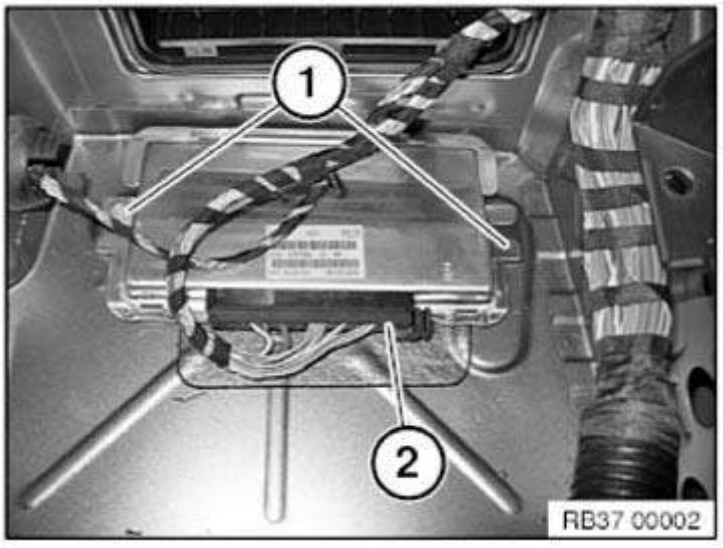


Fig. 26: Identifying Control Unit Connector And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Replacement only: Carry out **PROGRAMMING/ENCODING** .
- Start up the VDM with the aid of the diagnosis system.
- Replacement only: Carry out **RIDE HEIGHT ADJUSTMENT**.

37 14 511 REPLACING FRONT RIDE-HEIGHT SENSOR

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)** .

Release nut (1) and disconnect jointed rod (2).

Tightening torque **37 14 4AZ** .

Unfasten screws (2).

Tightening torque **37 14 3AZ** .

Remove ride-height sensor and disconnect plug connection.

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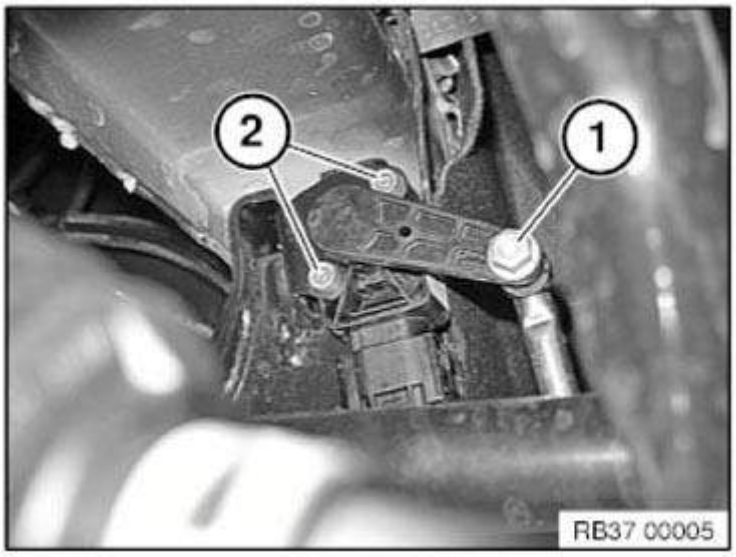


Fig. 27: Identifying Ride-Height Sensor With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Carry out **RIDE-HEIGHT ADJUSTMENT** (on vehicles with VDC).
- Check **HEADLIGHT SETTING** , correct if necessary.

37 14 605 REPLACING LEFT OR RIGHT WHEEL SPEED ACCELERATOR SENSOR

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DISCHARGE (ESD PROTECTION)** .

Disconnect plug connection (1) from acceleration sensor on the spring strut.

Release screw (1) and remove sensor.

Tightening torque **37 14 8AZ** .

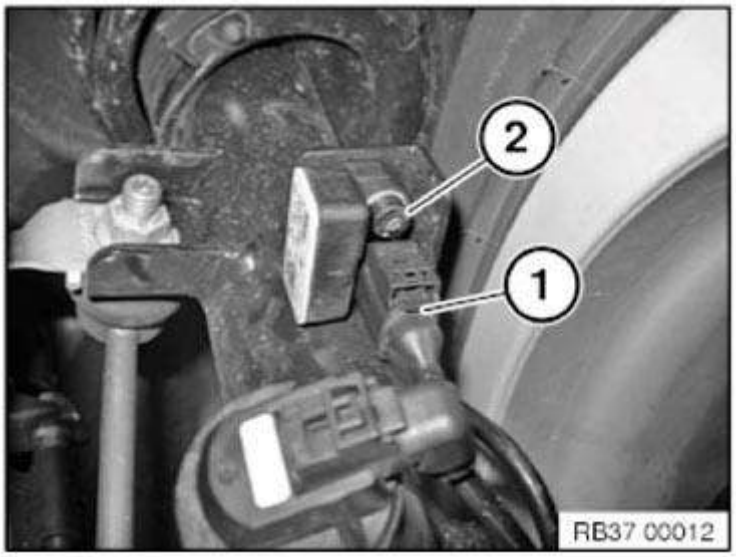


Fig. 28: Identifying Plug Connection From Acceleration Sensor On Spring Strut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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Check installation position.

Fit wheel speed acceleration sensor with retaining pin (1) into bore hole on the spring strut holder!



Fig. 29: Identifying Wheel Speed Acceleration Sensor With Retaining Pin Into Bore Hole
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Use the diagnosis system to perform the wheel speed accelerator sensor adjustment.

  -> see service function/start-up VDM

37 14 512 REPLACING REAR RIDE-HEIGHT SENSOR

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)** .

Disconnect connector connection.

Release nut (1) and disconnect jointed rod.

Tightening torque **37 14 4AZ** .

Release screws (2) and remove ride-height sensor.

Tightening torque **37 14 3AZ** .

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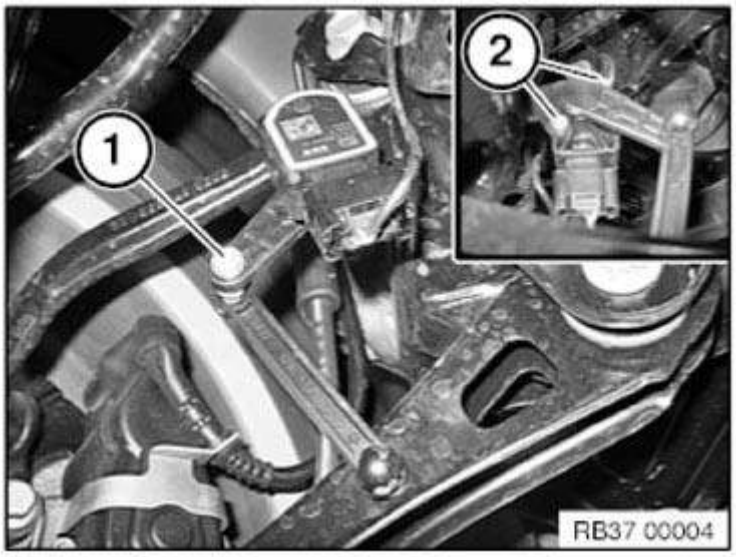


Fig. 30: Identifying Ride-Height Sensor With Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check **HEADLIGHT SETTING** , correct if necessary.
- Carry out **RIDE-HEIGHT ADJUSTMENT** (on vehicles with VDC).

ELECTRONIC DAMPING FORCE ADJUSTMENT

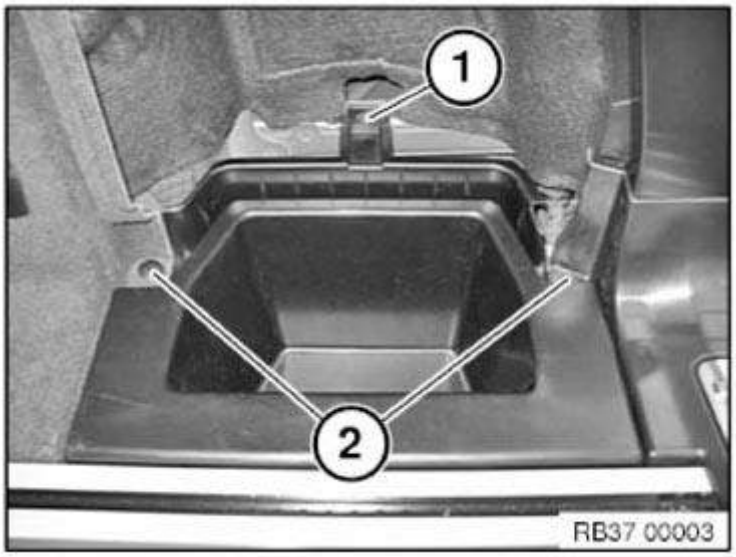
37 14 566 REMOVING AND INSTALLING/REPLACING CONTROL UNIT FOR VERTICAL DYNAMIC CONTROL

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DISCHARGE (ESD PROTECTION)** .

Necessary preliminary tasks:

- Remove ignition key.
- Disconnect **BATTERY NEGATIVE CABLE** .
- Remove **FLAP IN LUGGAGE COMPARTMENT TRIM PANEL ON RIGHT** .

Undo screw (1), release expanding rivets (2) and remove storage compartment.



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Fig. 31: Identifying Storage Compartment Expanding Rivets With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nuts (1).

Unlock connector (2) and remove.

Remove control unit.

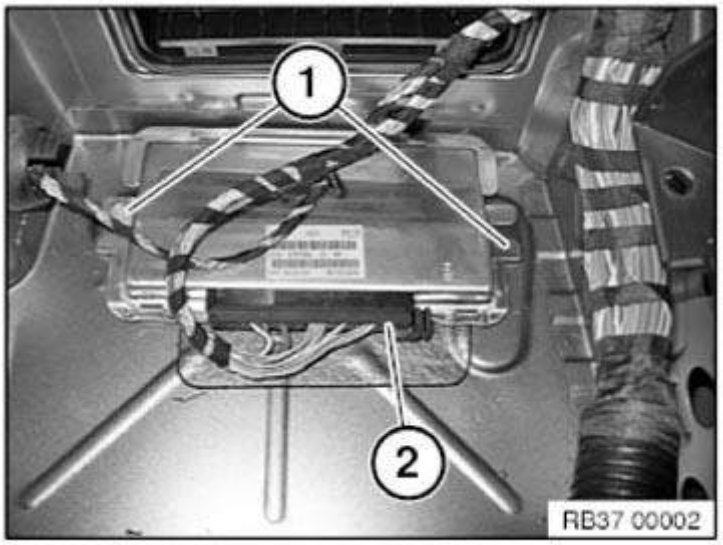


Fig. 32: Identifying Control Unit Connector And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Replacement only: Carry out **PROGRAMMING/ENCODING** .
- Start up the VDM with the aid of the diagnosis system.
- Replacement only: Carry out **RIDE HEIGHT ADJUSTMENT**.

37 14 605 REPLACING LEFT OR RIGHT WHEEL SPEED ACCELERATOR SENSOR

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DISCHARGE (ESD PROTECTION)** .

Disconnect plug connection (1) from acceleration sensor on the spring strut.

Release screw (1) and remove sensor.

Tightening torque **37 14 8AZ** .

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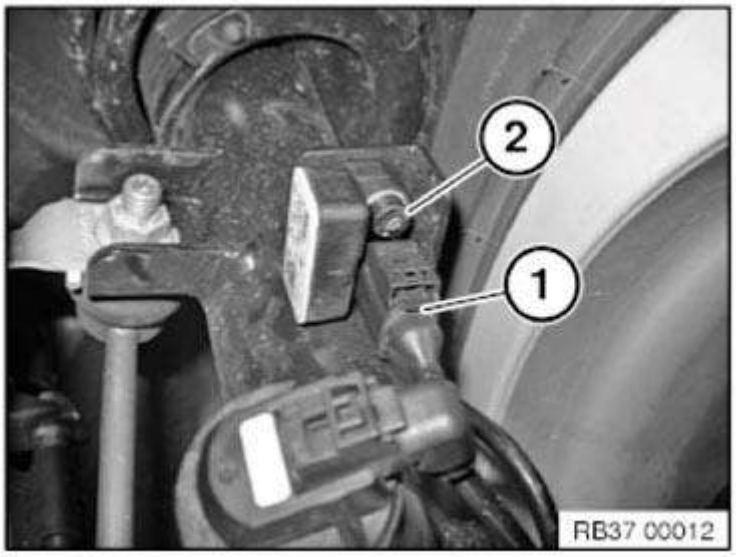


Fig. 33: Identifying Plug Connection From Acceleration Sensor On Spring Strut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Check installation position.

Fit wheel speed acceleration sensor with retaining pin (1) into bore hole on the spring strut holder!



Fig. 34: Identifying Wheel Speed Acceleration Sensor With Retaining Pin Into Bore Hole
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Use the diagnosis system to perform the wheel speed accelerator sensor adjustment.

  -> see service function/start-up VDM.

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INTEGRATED SUSPENSION SYSTEMS

0492547 ADAPTER

0492547 372022 Adapter AM

NOTE: For tester, vehicle line Only available as part of complete set

0492545 ADAPTER

0492545 372020 Adapter AM

NOTE: For checking the pump pressure, self-levelling suspension

Storage Location

B3

SI number

01 02 87 (721)

Consisting of:

1. 0492546 Adapter

   NOTE: For pump Only available as part of complete set

2. 0492547 Adapter

   NOTE: For tester, vehicle line Only available as part of complete set

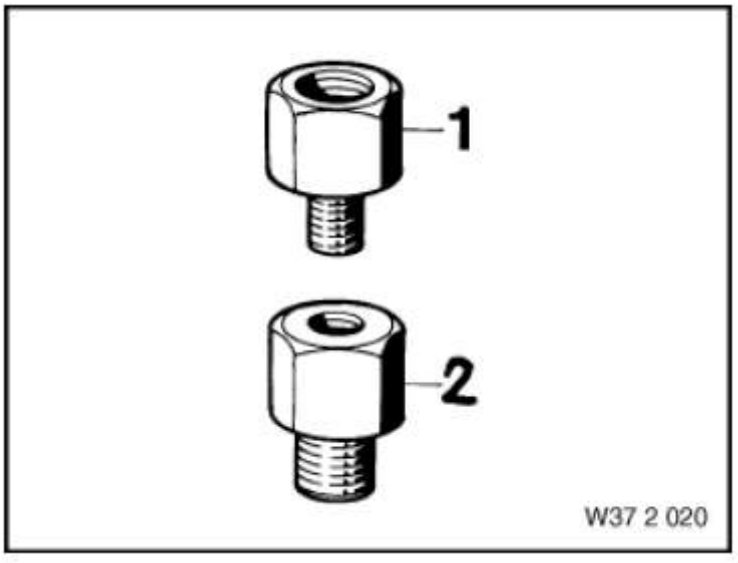


Fig. 1: Identifying Adapter (0492545)
Courtesy of BMW OF NORTH AMERICA, INC.

0492546 ADAPTER

0492546 372021 Adapter AM

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NOTE: For pump Only available as part of complete set

0409688 ADAPTER CABLE

0409688 Adapter cable Minimum set: Measuring and testing equipment MP

NOTE: 12-pin V adapter cable. This cable replaces the 37 2 040 cable (0493956). Application: For troubleshooting for Dynamic Drive valve block.

Storage Location

P212

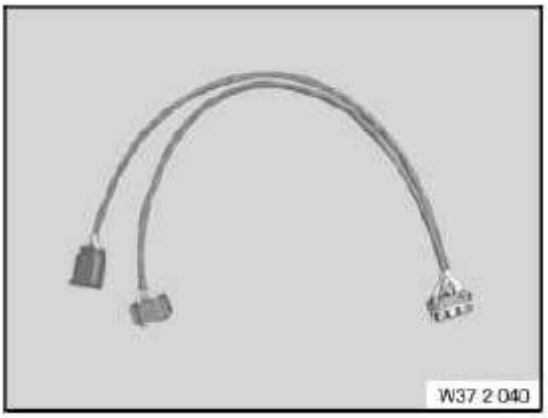


Fig. 2: Identifying Adapter Cable (0409688)
Courtesy of BMW OF NORTH AMERICA, INC.

0493111 CONNECTION

0493111 371000 Connection Mechanical tool

NOTE: (test connection) For leakage check on the air suspension strut in water bath

SI number

01 14 98 (343)

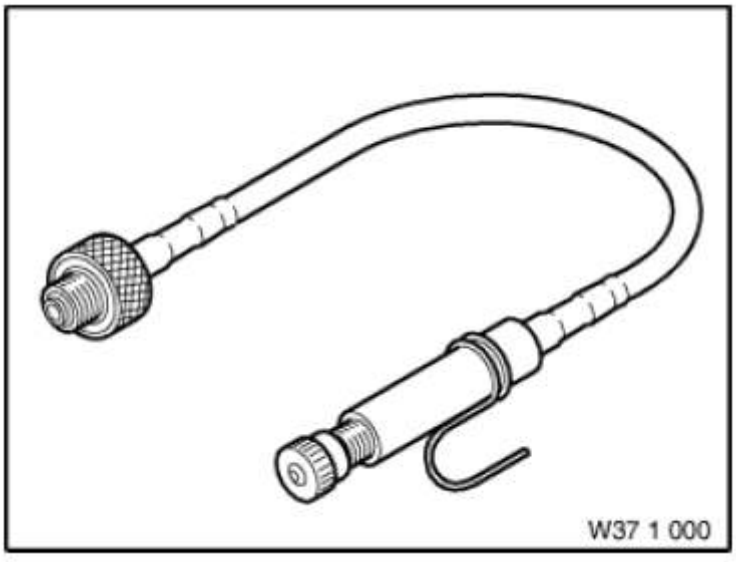


Fig. 3: Identifying Connection (0493111)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492544 CONNECTOR

0492544 372010 Connector Mechanical tool

NOTE: **(Connection piece with 300 mm hose) For checking tyre pressure of pressure accumulator in self-levelling suspension**

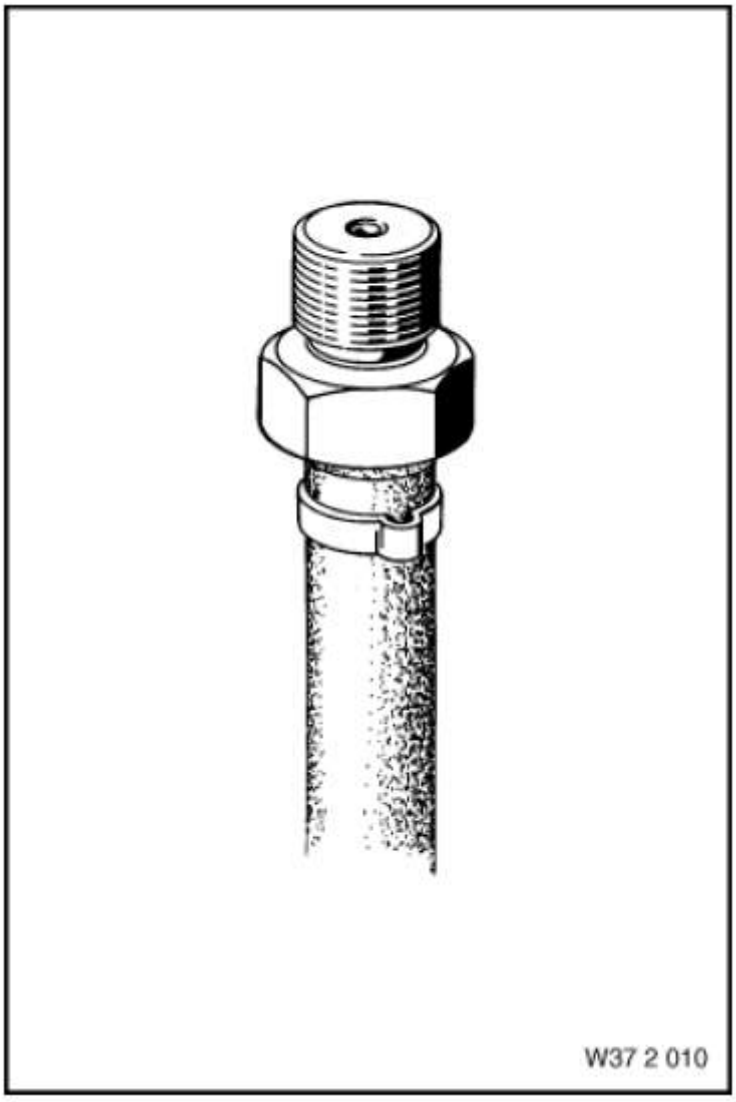


Fig. 4: Identifying Connector (0492544)
Courtesy of BMW OF NORTH AMERICA, INC.

0495908 SOCKET WRENCH

0495908 371150 Socket wrench Minimum set: Mechanical tools AM

NOTE: **For releasing and tightening down screw connection of hydraulic lines on valve block (Dynamic Drive).**

Storage Location

A22

SI number

01 01 07 (333)

Consisting of:

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1. 0495909 Socket wrench

   NOTE: **(Socket wrench) SW14**

2. 0495910 Socket wrench

   NOTE: **(Socket wrench) SW19**

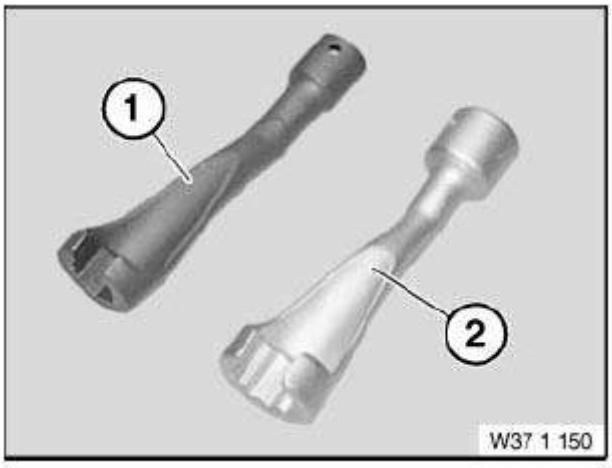


Fig. 5: Identifying Socket Wrench (0495908)
Courtesy of BMW OF NORTH AMERICA, INC.

0495909 SOCKET WRENCH

0495909 371151 Socket wrench Minimum set: Mechanical tools AM

NOTE: **(Socket wrench) SW14**

Storage Location

A22

SI number

01 01 07 (333)



Fig. 6: Identifying Socket Wrench (0495909)
Courtesy of BMW OF NORTH AMERICA, INC.

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0495910 SOCKET WRENCH

0495910 371152 Socket wrench Minimum set: Mechanical tools AM

NOTE: **(Socket wrench) SW19**

Storage Location

A22

SI number

01 01 07 (333)



Fig. 7: Identifying Socket Wrench (0495910)
Courtesy of BMW OF NORTH AMERICA, INC.

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ELECTRIC COMPONENTS

37 14 ELECTRIC COMPONENTS

TIGHTENING TORQUE SPECIFICATION - ELECTRIC COMPONENTS

Â	Type	Thread	Tightening specifications	Dimension
1AZ Bracket, ride height sensor, to body	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18	M6	Â	8 Nm
2AZ Ride height sensor holder to rear axle support	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M6	Â	8 Nm
3AZ Ride height sensor to holder	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M5	Â	5 Nm
4AZ Sensor lever, ride height sensor to jointed rod	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M6	Replace nut	8 Nm
5AZ Jointed rod to wishbone/trailing arm	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M6	Replace nut	8 Nm
6AZ Control unit, Dynamic Drive/VDM, to A-pillar (inner)	F01/F02/F06/F07/F10/F11/F12/F13/F18	Â	Replace nut	3 Nm
7AZ Valve block to body	F01/F02/F06/F07/F10/F11/F12/F13/F18	M6	Â	8 Nm
8AZ Acceleration sensor to spring strut	F25/F26	Â	Â	8 Nm

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APPROVED HYDRAULIC FLUIDS

ZF RACK-AND-PINION STEERING

NOTE: The hydraulic fluid reservoirs are marked on the rim of the reservoir and/or the reservoir cap to show which type of oil can be used: ATF oil or Pentosin CHF oil.

The ZF rack-and-pinion steering has lifetime lubrication and is thus maintenance-free.

For topping up/filling hydraulic system:

POWER STEERING OIL

Trade name	BMW part number	Container size	Oil color
BMW automatic transmission fluid (ATF)	81 22 9 400 272	1-liter	Red
Pentosin CHF 11S	83 29 0 429 576	1-liter	Green

NOTE: Vehicles with AFS/ARS (Dynamic Drive / Active Steering / Active Roll Stabilization) are filled as standard with Pentosin CHF 11S.

In case of repair, the affected steering components must be lubricated with the following grease:

COMPONENT GREASE

Trade name	BMW part number	Container size
Calypsol SF-3-131-TMM 3	83 23 9 407 857	100 g tube

NOTE: Calypsol D 4024-OK is a sodium-saponified, cold-resistant grease whose lubricity ranges from -30 Â°C to +75 Â°C.

E24, E28, E32, E34, AND E38

E24, E28 produced prior to 9/87

Pentosin CHF 4548 was used for initial factory filling.

For filling up and replacement the following oil is to be used:

Pentosin CHF 7.1 BMW Part No. 81 22 1 468 879

Pentosin CHF 4548 and CHF 7.1 can be mixed in these cars.

For complete system oil replacement:

Reputable brand name LHM oils (green color) can also be used (Shell, Castrol, Exxon, etc.)

NOTE: Mixing of CHF and LHM oils is not permitted.

E24, E28 produced since 9/87

Pentosin CHF 7.1 is used for initial factory filling.

For filling up and replacement use only Pentosin CHF 7.1

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BMW Part No. 81 22 1 468 879

For complete oil replacement:

Reputable brand name LHM oils (green color) can also be used.

NOTE: Mixing of CHF 7.1 and LHM oils is not permitted.

E32 produced prior to 9/91

Use only Pentosin CHF 7.1.

Mixing with other oils is not permitted.

E32, E34 produced since 9/91

Use only Pentosin CHF 11S

NOTE: All cars have a label indicating the respective type on the hydraulic fluid reservoir. Since both Pentosin CHF 11S and CHF 7.1 are green in color, the reservoir label must be carefully checked prior to adding fluid.

Mixing CHF 11S and CHF 7.1 is not permitted.

Pentosin CHF 11S BMW Part No. 82 11 1 468 041

E38 produced since 1/94

Use only Pentosin CHF 11S

NOTE: All cars have a label indicating the respective type on the hydraulic fluid reservoir. Since both Pentosin CHF 11S and CHF 7.1 are green in color, the reservoir label must be carefully checked prior to adding fluid.

Mixing CHF 11S and CHF 7.1 is not permitted.

Pentosin CHF 11S BMW Part No. 82 11 1 468 041

LHM HYDRAULIC FLUID

LHM hydraulic fluid has a favorable viscosity range and permits problem-free operation of the self-leveling rear suspension at very low and very high temperatures. The solidification point is -78Â°F/-61Â°C.

CHECKING HYDRAULIC FLUID LEVELS

The hydraulic fluid level must be checked on an unloaded car and at every Inspection I or, for cars without a Service Indicator, at 10, 000 mi/15, 000 km intervals.

NOTE: Not required as of 1993 model year vehicles.

Special checking instructions apply to the E32 - always refer to the latest edition of the Repair Instructions.

NOTE: Never fill above the "max" mark. There are no replacement intervals for hydraulic fluid.

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SUSPENSION

Rear Axle - Repair Instructions - X3 Utility

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.

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

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replace both shock absorbers on the relevant axle.

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

Due to the chemical and corrosion characteristics of aluminium, always comply with the following points when handling aluminium 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 Â°C, even for brief periods! Temperatures in paint facilities do not have the same impact

00..... LIFTING THE VEHICLE USING A VEHICLE HOIST

WARNING: **Danger to life!**
Read and follow operating instructions for vehicle hoist.
Do not exceed approved load-carrying capacity and load distribution of vehicle hoist.
Weight compensation may be necessary due to the loading situation of the vehicle.
This also applies in the event of considerable removal of parts or conversions on the vehicle.

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

IMPORTANT: Risk of damage!
Before driving onto a vehicle hoist, make sure there is sufficient ground clearance between the vehicle hoist and the vehicle.
The vehicle may only be raised with the vehicle hoist at the four jacking points.

Necessary preliminary work:

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

IMPORTANT: All four jacking points (1) must be available!
Never raise the vehicle without the jacking points (1)!

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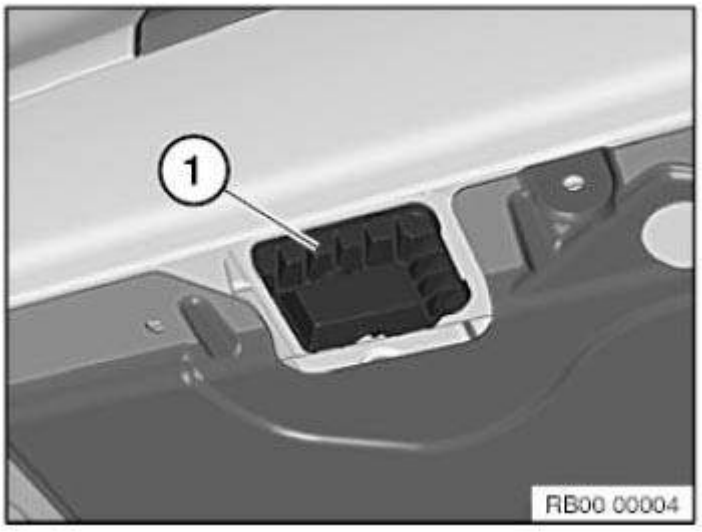


Fig. 1: Identifying Vehicle Jacking Points
Courtesy of BMW OF NORTH AMERICA, INC.

Risk of damage!
Align support plates (2) of lifting platform arms to jacking points (1) in such a way that no
IMPORTANT: adjoining components are touched and thereby damaged.
In hybrid cars there is a risk of damage to the high-voltage component behind the underbody panelling!

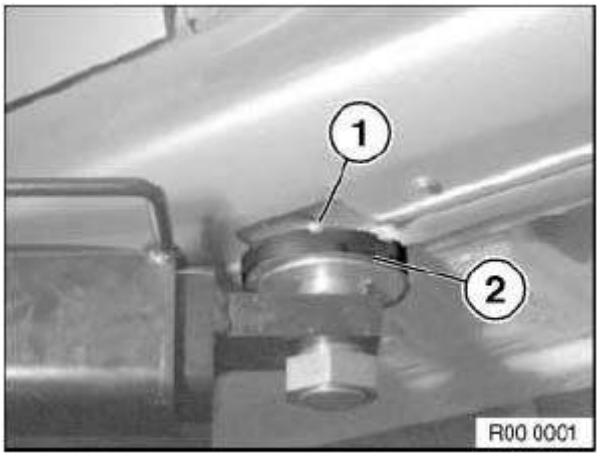


Fig. 2: Identifying Support Plates And Jacking Points
Courtesy of BMW OF NORTH AMERICA, INC.

Risk of damage!
Align the rubber block (2) with the jacking points (1) in such a way that no adjoining components are touched and thereby damaged.
IMPORTANT: **Never raise the vehicle without rubber blocks (or rigid foam blocks)!**
There is a major risk of damage to the vehicle underbody!
In hybrid cars there is a risk of damage to the high-voltage component behind the underbody panelling!

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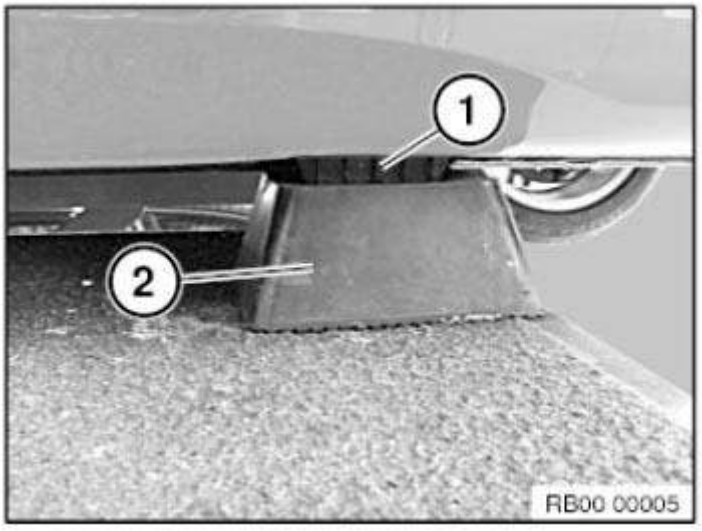


Fig. 3: Aligning Rubber Block With Jacking Points
Courtesy of BMW OF NORTH AMERICA, INC.

31 33... MEASURING VEHICLE RIDE HEIGHT

Determine actual ride height (A) - to do so, attach tape measure to rim flange (2) at bottom middle and measure to wheel arch lower edge (1).

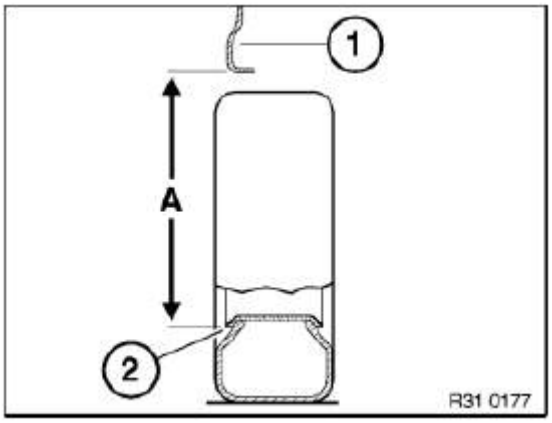


Fig. 4: Identifying Vehicle Actual Ride Height
Courtesy of BMW OF NORTH AMERICA, INC.

41 00... NOTES ON REPAIRING THREADS

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

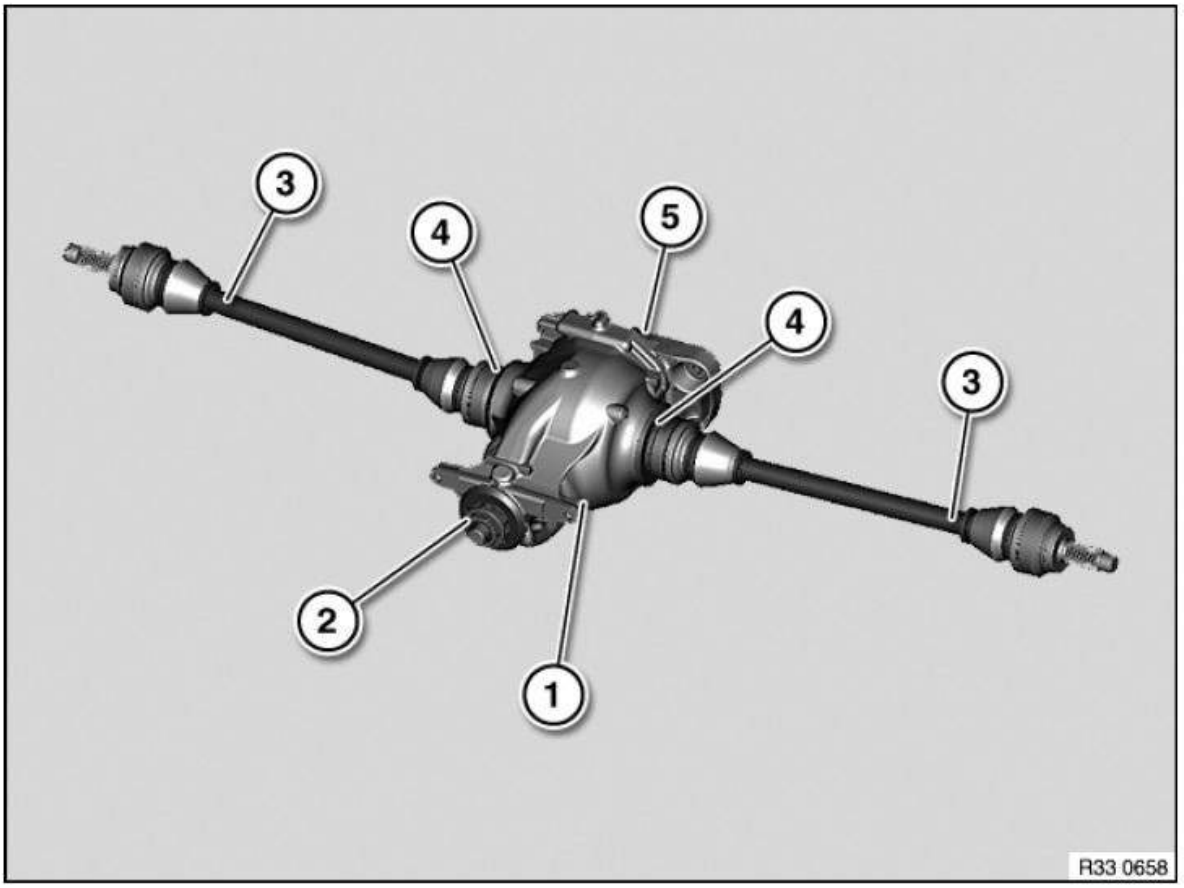
NOTE: **Damaged threads may be repaired with Helicoil thread inserts. Observe the PROCEDURE described in the example.**

Screw connection	Vehicle	Screw/bolt fastening point(s)	Helicoil thread insert
Front axle support to engine support	F01, F02, F03, F04, F07, F10, F11, F12, F13, F18	M12	M12x1.5x24
	F25	M14	M14x1.5x28
Rear axle support to side member	F01, F02, F03, F04, F07, F10, F11, F12, F13, F18	Â	M14x1.5x28
	F25	Â	M12x1.5x24
Support bearing screw	F25	Â	M8x1, 25x16

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connection, front axle			

33..... OVERVIEW OF REAR AXLE FINAL DRIVE/OUTPUT SHAFTS

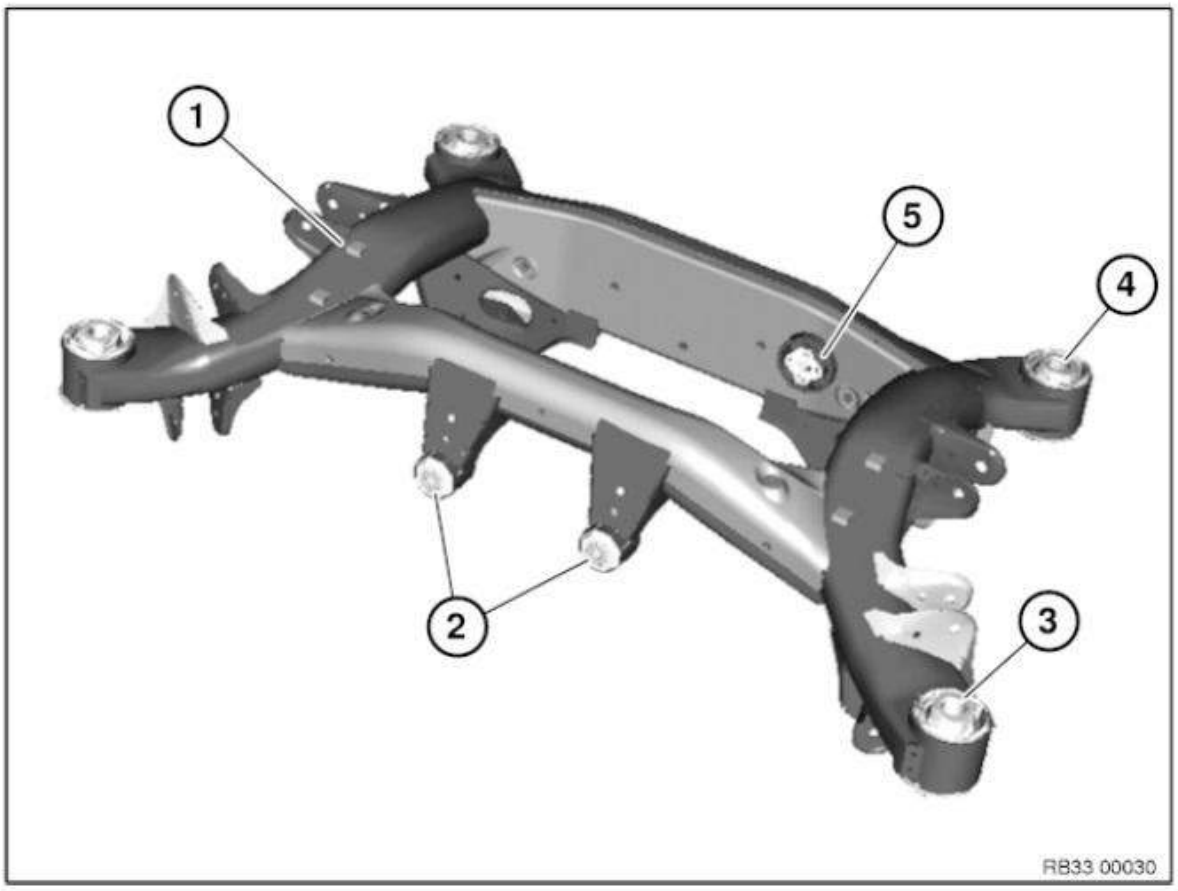


1 Rear axle final drive
2 Shaft seal
3 Output shaft (left/right)
4 Shaft seal
5 Cover (incl. cover gasket)

Fig. 5: Overview Of Rear Axle Final Drive/Output Shafts
Courtesy of BMW OF NORTH AMERICA, INC.

33..... OVERVIEW OF REAR AXLE SUPPORT WITH RUBBER MOUNTS

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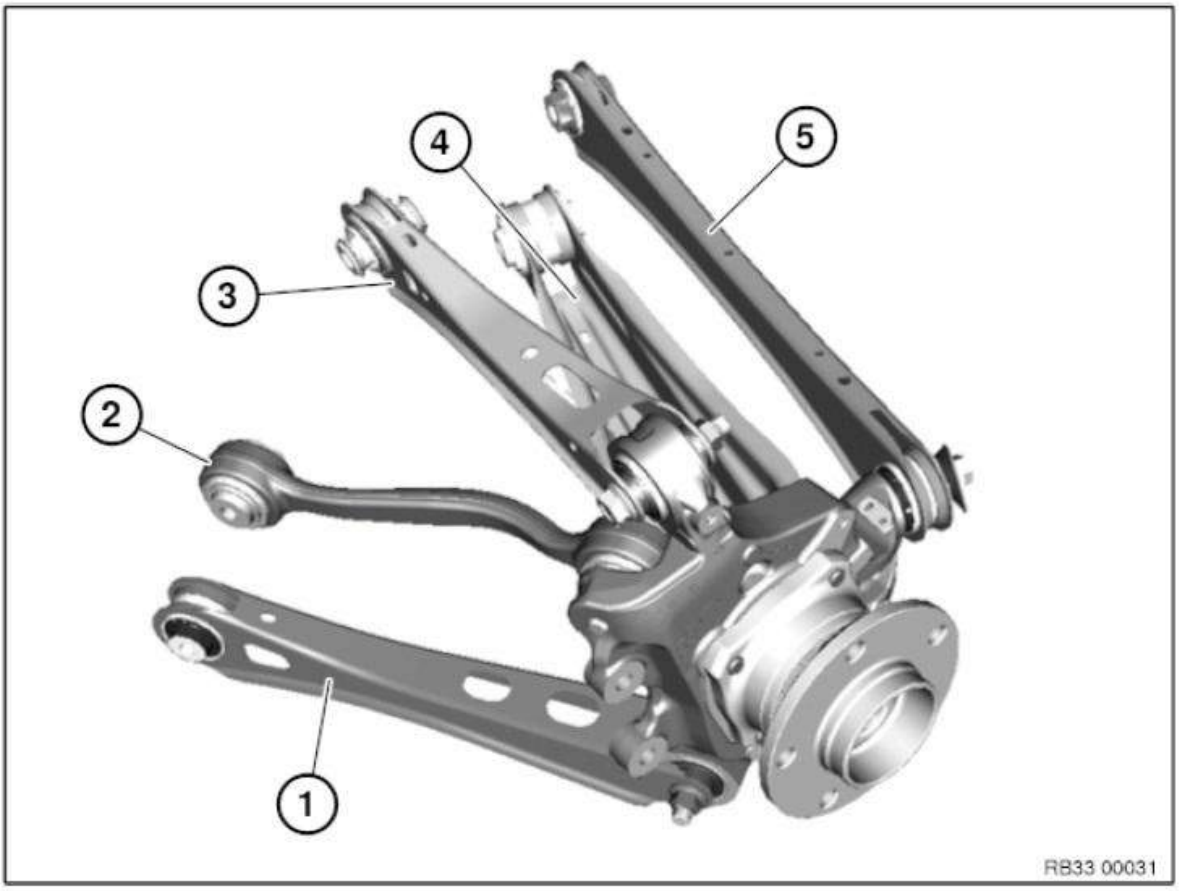


1 Rear axle support
2 Rear differential rubber mount, front
3 Rear axle support rubber mount, front
4 Rear axle support rubber mount, rear
5 Rear differential rubber mount, rear

Fig. 6: Overview Of Rear Axle Support With Rubber Mounts
Courtesy of BMW OF NORTH AMERICA, INC.

33 32... OVERVIEW OF STEERING LINKS

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1 Trailing arm
2 Traction strut
3 Wishbone
4 Camber arm
5 Toe arm

Fig. 7: Overview Of Steering Links
Courtesy of BMW OF NORTH AMERICA, INC.

00..... RAISING VEHICLE WITH TROLLEY JACK

Observe the following trolley-jack-related instructions:

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

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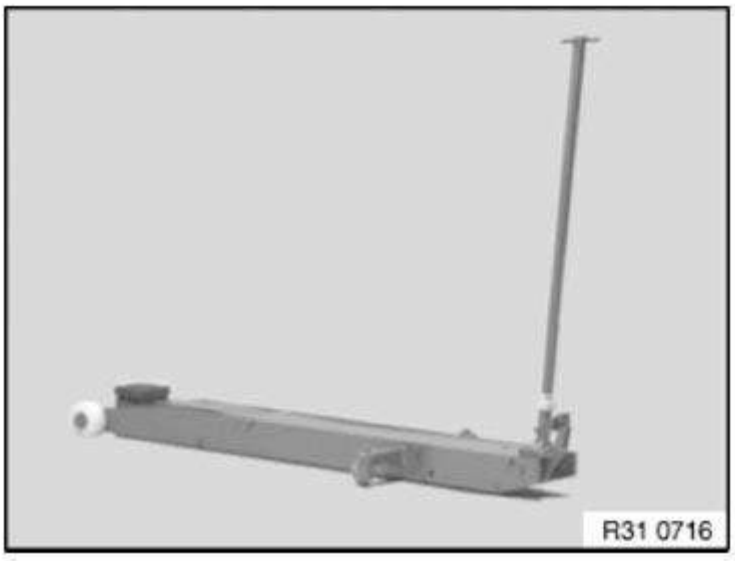


Fig. 8: Identifying Trolley Jacks
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: All-wheel drive vehicles may only be raised with the stiffening plate fitted on the front axle! Raising directly on the front axle support without stiffening plate is not permissible!

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

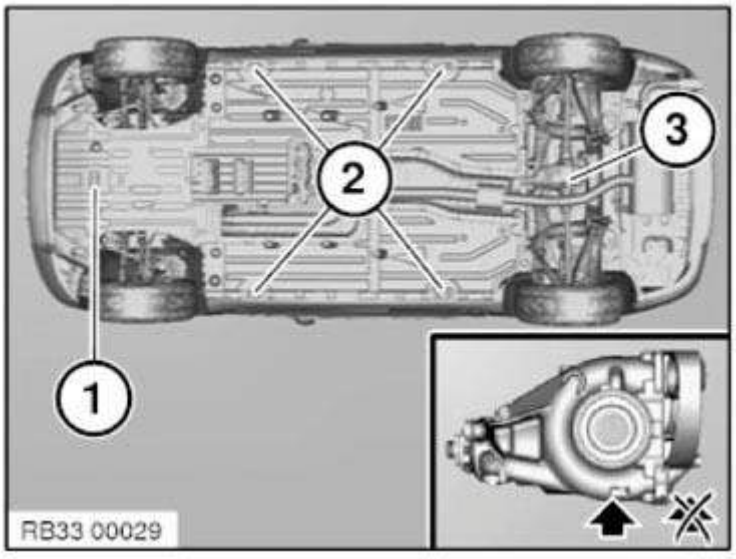


Fig. 9: Identifying Car Jacking Point, Side Car Jacking Points, Rear Axle Final Drive
Courtesy of BMW OF NORTH AMERICA, INC.

1. Car jacking point
2. Side car jacking points
3. Rear axle final drive

NOTE: **It is not permitted to raise the vehicle at the rear differential cover!**

Risk of damage!

Jacking point (1) must be present!

Align the rubber plate on the trolley jack to the jacking point (1) in such a way that there is no contact to

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adjacent components and that they are therefore not damaged.

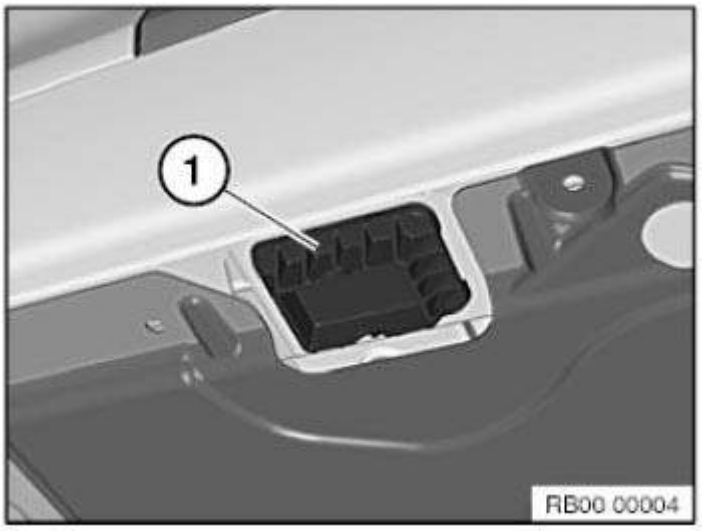
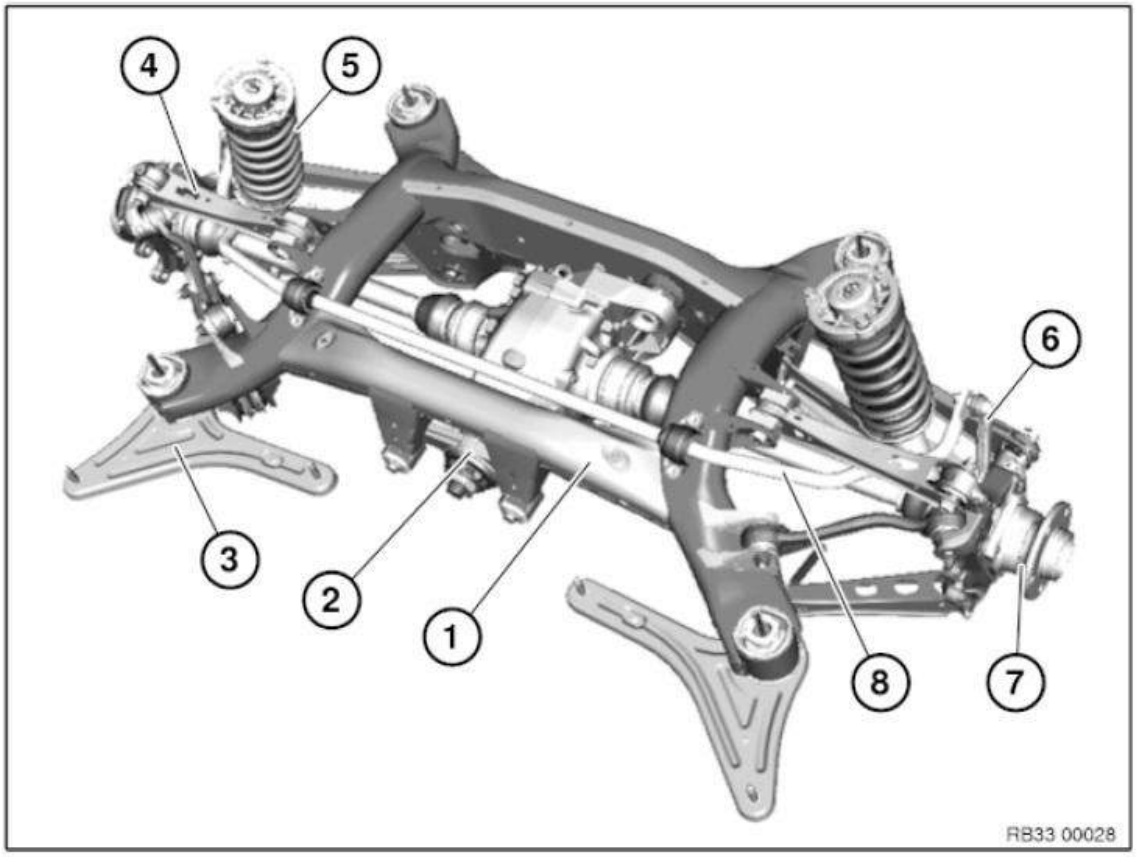


Fig. 10: Identifying Jacking Point
Courtesy of BMW OF NORTH AMERICA, INC.

33..... REAR AXLE LAYOUT

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1 Overview, rear axle support with rubber mount
2 Overview of rear axle final drive/output shafts
3 Compression strut, front
4 Overview of steering links
5 Spring strut / shock absorber
6 Anti-roll bar link
7 Wheel carrier / wheel bearing / drive flange
8 Anti-roll bar / rubber mount

Fig. 11: Identifying Rear Axle Layout Components
Courtesy of BMW OF NORTH AMERICA, INC.

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

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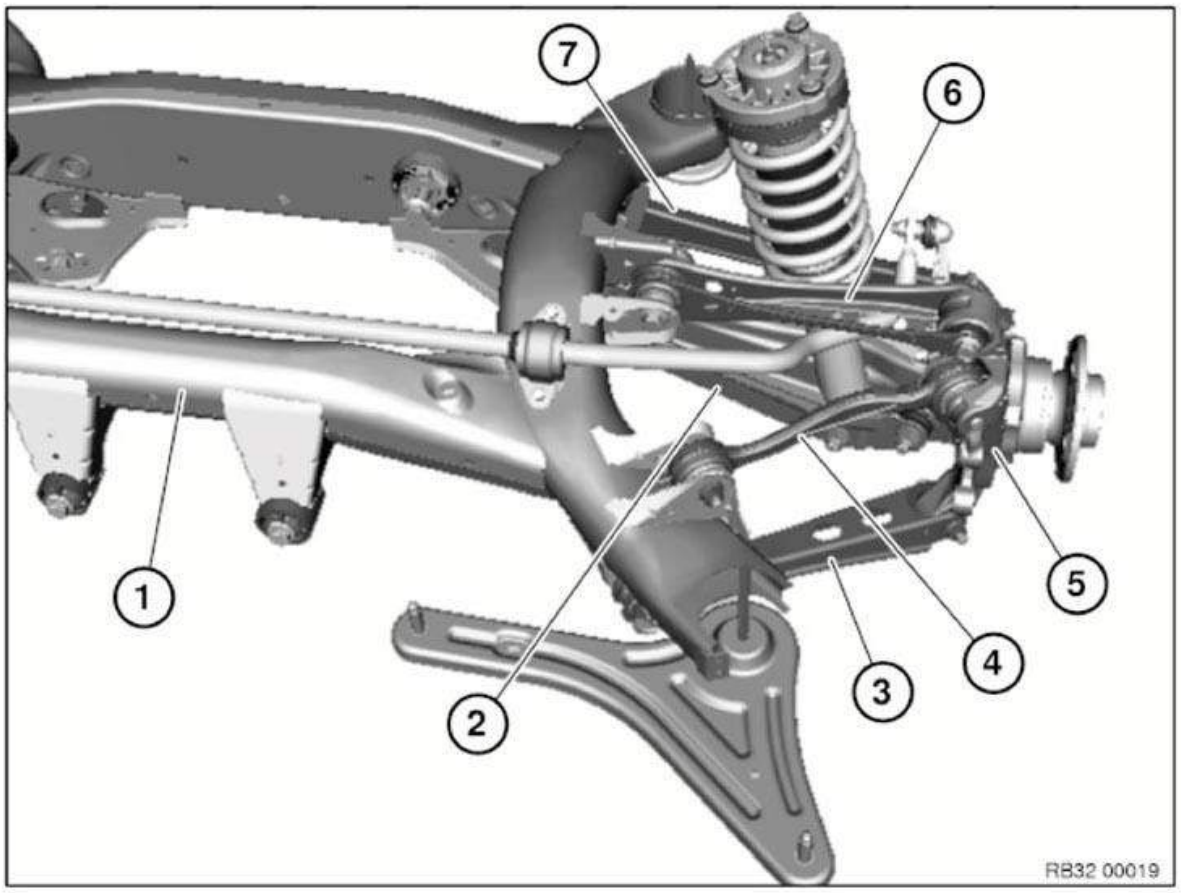


Fig. 12: Checking Rear Axle Alignment
Courtesy of BMW OF NORTH AMERICA, INC.

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

- **Release of following screw connections:**
  - Camber arm on rear axle support (2)
  - Toe arm on rear axle support (7)
- **Replacement of following parts:**
  - Rear axle support (1)
  - Toe arm (2)
  - Wheel carrier (5)
  - Wishbone (6)
  - Toe arm (7)

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:

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- Wear safety 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.**

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.**

FINAL DRIVE

33 10... REAR AXLE FINAL DRIVE: ASSIGNMENT TO MODEL SERIES

Model series	Engine	Rear axle final drive
F01/F02	N52	205AL
	N54	205AL
	N57	225AL
	N63	225AL
	N74	235L
F04	N63	235L
F06	N55	205AL
	N57	225AL
	S63	220M with controlled lock
F07	N55	205AL
	N57	225AL
	N63	225AL
F10/F11/F18	N47	205AL
	N52	205AL
	N53	205AL
	N55	205AL/225AL

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	N57	205AL/225AL
	N63	225AL
	S63	220M with controlled lock
F12/F13	N55	205AL
	N63/N57	225AL
	S63	220M with controlled lock
F25/F26	N20/N47/N52/N55	188LW
	N57	215LW

33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL

Special tools required:

- 33 5 206
- 33 5 200
- 33 5 120
- 33 5 125
- 33 5 123
- 33 5 121
- 33 5 124
- 33 5 126
- 33 5 122
- 33 5 127

WARNING: **Danger of injury!**
Rear axle differential must be lashed with tensioning strap 33 5 206 to prevent it from dropping down when pressing the output shafts off.

IMPORTANT: When removing/reinstalling the rear axle final drive, both OUTPUT SHAFT RADIAL SHAFT SEALS and the circlip on both output shafts must be replaced.
After completing repair work, CHECK GEARBOX OIL LEVEL.

Necessary preliminary work:

- Remove PROPELLER SHAFT ON REAR AXLE FINAL DRIVE .
  - Disconnect propeller shaft at rear axle differential.
  - Release center mount.
  - Tie up propeller shaft to underbody.

NOTE: **Bending the propeller shaft by an excessive angle can cause premature damage to the joint/propeller shaft!**

Position special tool 33 5 200 on workshop jack.

Support rear axle final drive 33 5 200 with special tool.

Lash rear axle final drive with tensioning strap 33 5 206 to special tool 33 5 200 .

IMPORTANT: Tensioning strap 33 5 206 must be pass through between output shafts and rear axle final drive cover!

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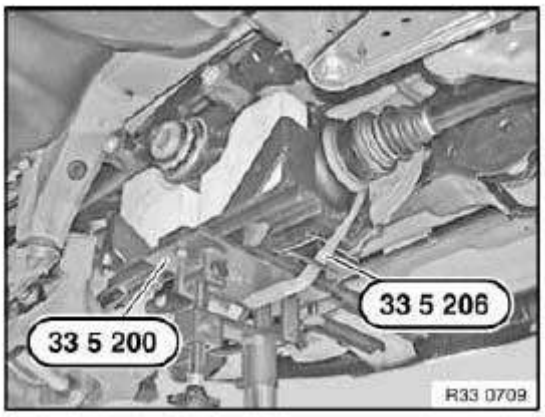


Fig. 13: Positioning Special Tool (33 5 200) On Workshop Jack
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Special tools **33 5 120** and **33 5 125** must be inserted in all-round slot (1) on output shaft!

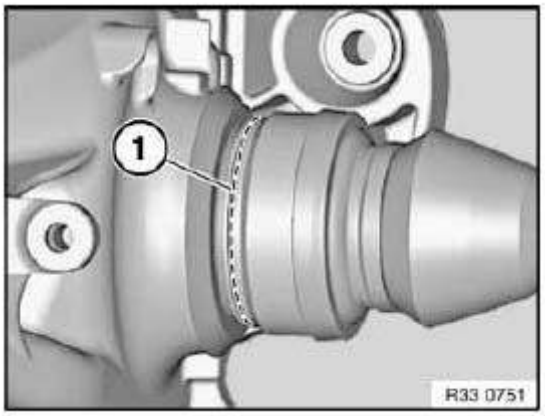


Fig. 14: Identifying Round Slot On Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Press **only left output shaft** out of rear axle final drive with jerking and jolting motions using special tool **33 5 123** , **33 5 121** , **33 5 124** /**33 5 126** .

Here, synchronising key of bolt **33 5 122** must rest on rear axle final drive.

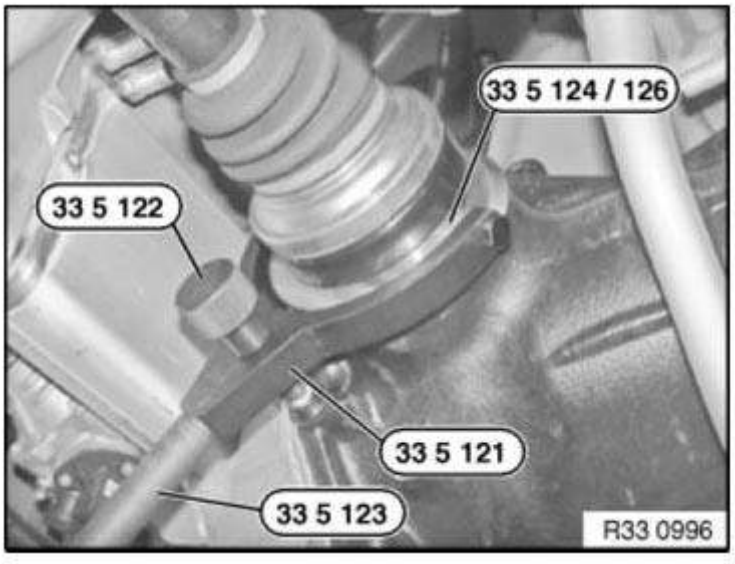


Fig. 15: Identifying Special Tool (33 5 123)
Courtesy of BMW OF NORTH AMERICA, INC.

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Release screws (1).

Tightening torque **33 17 1AZ** .

Installation note:

Adhere to the installation sequence at the end of the document in order to prevent distortion of the rear axle final drive during installation and thereby avoid potential complaints about noise.

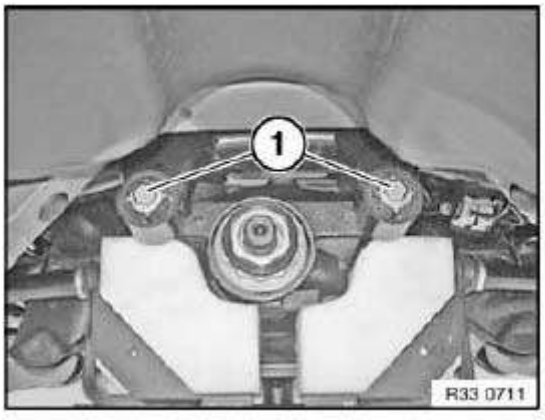


Fig. 16: Identifying Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

Tightening torque **33 17 2AZ** .

N47 only: Remove vibration absorber (2) with holder.

Installation note:

Adhere to the installation sequence at the end of the document in order to prevent distortion of the rear axle final drive during installation and thereby avoid potential complaints about noise.

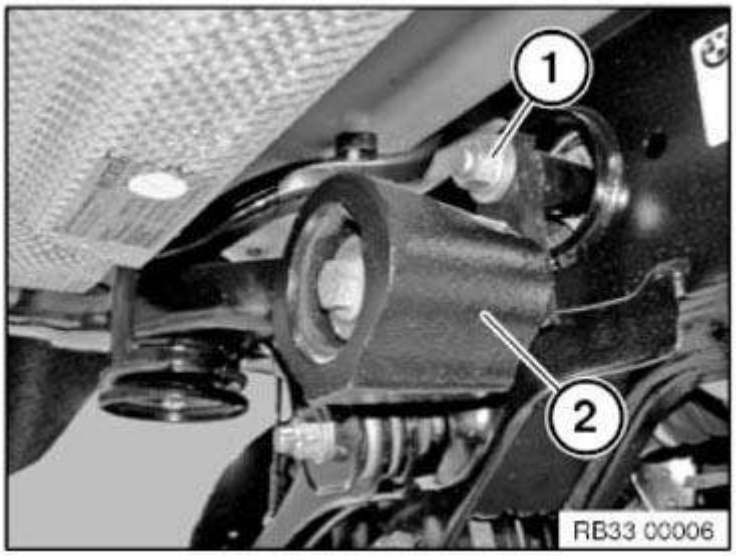


Fig. 17: Identifying Vibration Absorber With Holder, Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Lower rear axle final drive with special tool **33 5 200** .

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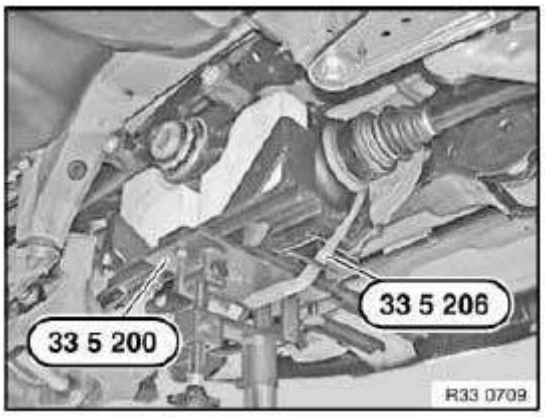


Fig. 18: Identifying Lower Rear Axle Final Drive With Special Tool (33 5 200)
Courtesy of BMW OF NORTH AMERICA, INC.

Press (tilt) rear axle final drive on right upwards.

Feed out left output shaft in downward direction and tie up.

Swing rear axle final drive towards left side.

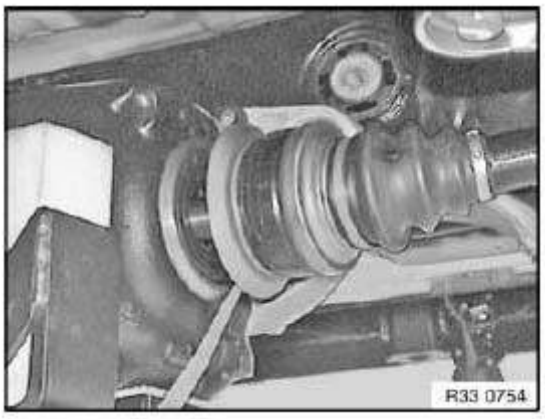


Fig. 19: Identifying Rear Axle Final Drive
Courtesy of BMW OF NORTH AMERICA, INC.

Press **right output shaft** out of rear axle final drive with jerking and jolting motions using special tool **33 5 123** , **33 5 121** , **33 5 124** /**33 5 126** . Here, synchronising key of bolt **33 5 122** must rest on rear axle final drive.

Feed out output shaft and tie up.

Remove rear axle final drive.

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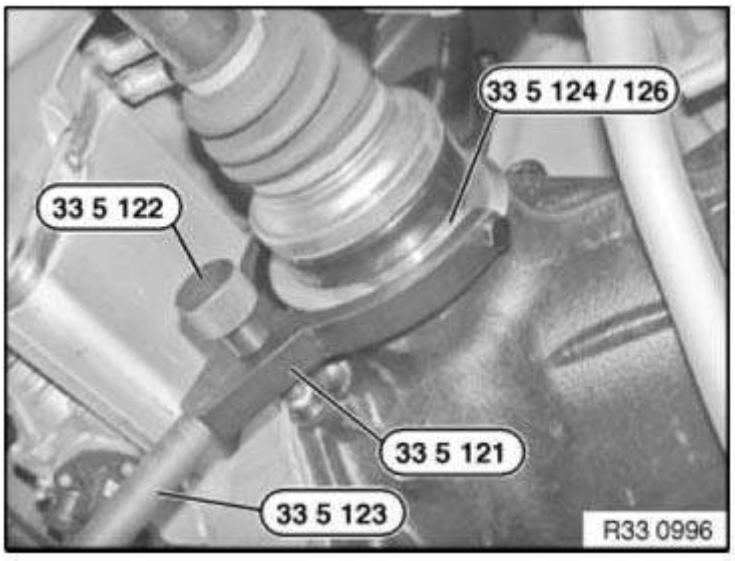


Fig. 20: Removing Rear Axle Final Drive
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: High installation forces indicate that the output shaft spline teeth are damaged or deformed!

Check gearing and replace components if damaged.

Check dust plate (1) for damage, renew if necessary.

Circlip (2) must be replaced.

Coat highlighted contact surface (3) of output shaft with approved final drive oil. See **REAR AXLE - OPERATING FLUIDS** .

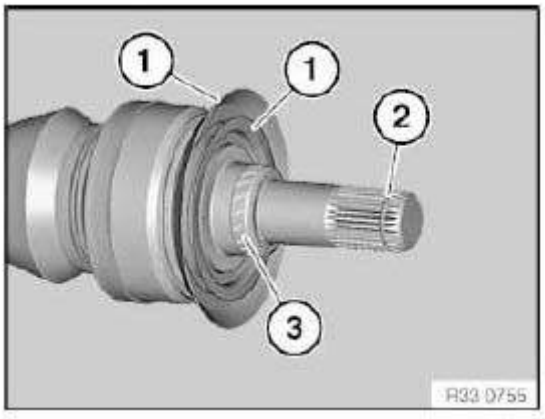


Fig. 21: Identifying Dust Plate, Circlip And Contact Surface
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Insert output shaft into rear axle final drive.

Pull out assembly protection ring at lug (1) until one of the two predetermined breaking points gives.

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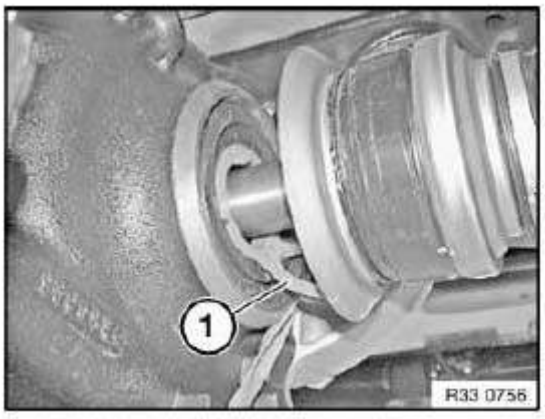


Fig. 22: Identifying Protection Ring At Lug
Courtesy of BMW OF NORTH AMERICA, INC.

Drive output shaft into rear axle final drive using special tool 33 5 125 33 5 127 and a rubber mallet.

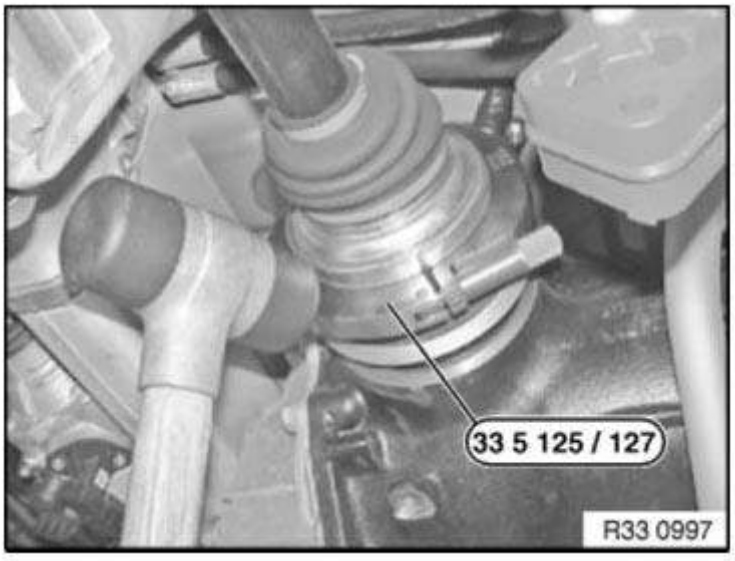


Fig. 23: Removing Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Assembly sequence:

1. Install rear axle final drive with workshop jack and special tool 33 5 200 in rear axle support
2. Insert bolts (1) (do not tighten down)
3. Insert bolt from rear and replace nut (2) (do not tighten down)
4. Release tensioning strap, lower special tool 33 5 200 and move away
5. Tighten down screws (1)

   Tightening torque 33 17 1AZ .

6. Tighten nut (2)

   Tightening torque 33 17 2AZ .

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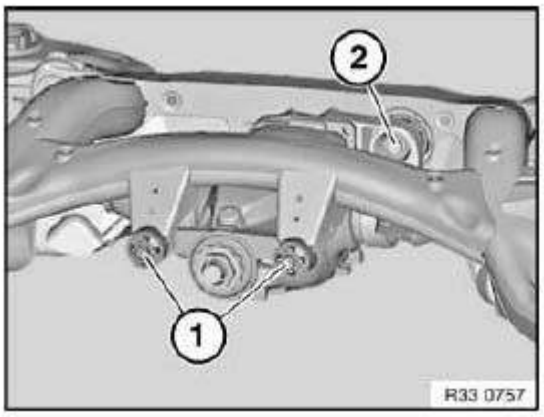


Fig. 24: Identifying Rear Axle Support Screws And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check **TRANSMISSION OIL LEVEL**, correct if necessary.

33 10 021 REPLACING SHAFT SEAL(S) FOR OUTPUT SHAFT(S) IN REAR AXLE FINAL DRIVE

Special tools required:

- **00 5 010**
- **32 1 060**
- **33 1 308**
- **33 5 130**
- **33 5 140**

Necessary preliminary work:

- Remove **REAR AXLE FINAL DRIVE**.

Use special tools **00 5 010** and **32 1 060** /**33 1 308** to remove radial shaft seal

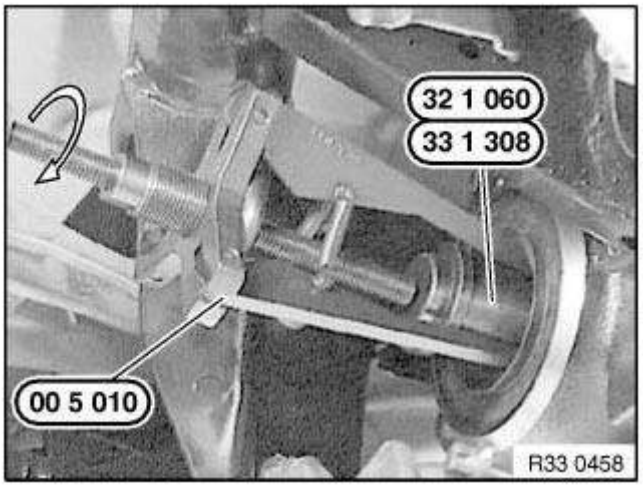


Fig. 25: Removing Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Installing new shaft seal:

NOTE: **The installation protective ring (1) serves to protect the sealing lips of the radial**

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shaft seal (2) when installing the output shaft.

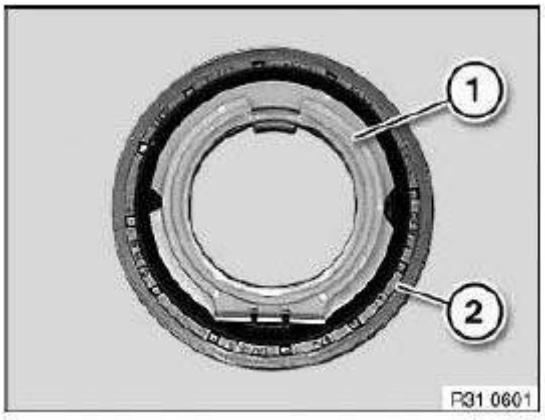


Fig. 26: Identifying Protective Ring And Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Installation protective ring (1) must not slip out of radial shaft seal!

Coat housing plate flange of new shaft seal with approved rear differential oil. See **REAR AXLE - OPERATING FLUIDS** .

Drive in radial shaft seal as far as it will go with following special tools (depending on rear axle final drive/outer diameter).

33 5 130

33 5 140

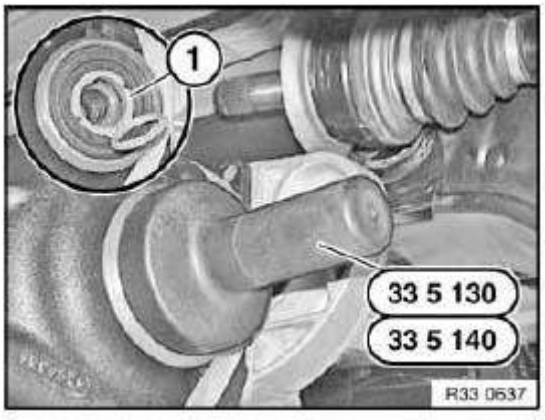


Fig. 27: Driving Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Remove special tool.

Open installation protective ring (1).

IMPORTANT:
High installation forces indicate that the output shaft spline teeth are damaged or deformed! Check gearing, replace damaged components if necessary.
Check dust plate (1) for damage, renew if necessary.
Replace circlip (2).
Coat highlighted contact surface (3) of output shaft with approved final drive oil. See **REAR AXLE - OPERATING FLUIDS** .

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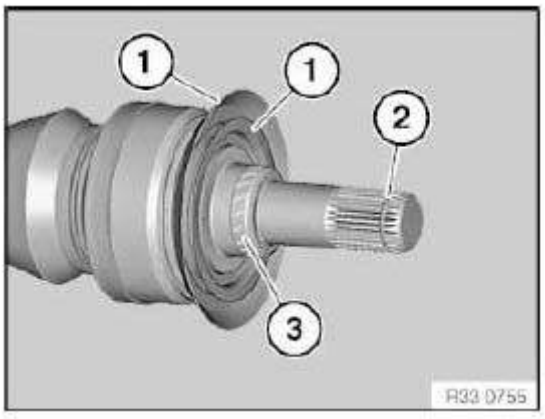


Fig. 28: Identifying Contact Surface, Dust Plate And Circlip
Courtesy of BMW OF NORTH AMERICA, INC.

Insert output shaft into rear axle final drive.

Pull out assembly protection ring at lug (1) until one of the two predetermined breaking points gives.

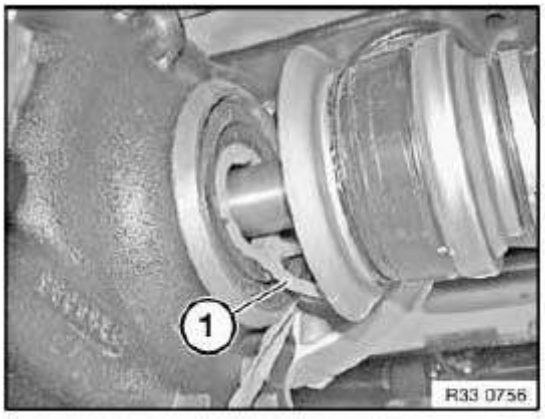


Fig. 29: Identifying Protection Ring At Lug
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check **FINAL DRIVE OIL LEVEL**, correct if necessary.

FINAL DRIVE WITH COVER

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!

Risk of damage!
IMPORTANT: To avoid serious damage to the rear axle differential, it is essential to use only approved transmission oils in the rear axle differential. See **REAR AXLE - OPERATING FLUIDS** .

Undo oil filler plug (1).

Check oil level.

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

Installation:

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

Tightening torque **33 11 2AZ** .

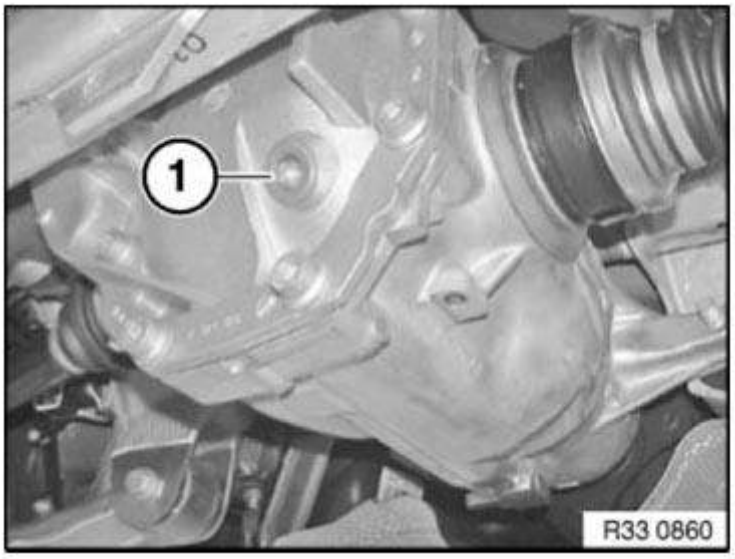


Fig. 30: Identifying Oil Filler Plug
Courtesy of BMW OF NORTH AMERICA, INC.

33 11 021 REPLACING RADIAL SHAFT SEAL FOR INPUT FLANGE OF REAR AXLE DIFFERENTIAL

Special tools required:

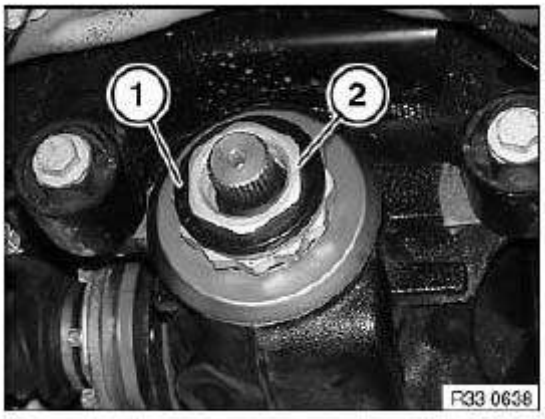
- **33 5 050**
- **33 5 070**
- **33 5 060**
- **00 5 010**
- **33 5 080**
- **33 0 150**

IMPORTANT: Use only approved gearbox oils. See **REAR AXLE - OPERATING FLUIDS** .
Failure to comply with this instruction will result in serious damage to the rear axle final drive!

Necessary preliminary tasks:

- Remove **PROPELLER SHAFT AT FINAL DRIVE** .

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



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Fig. 31: Identifying Retaining Clip And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

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

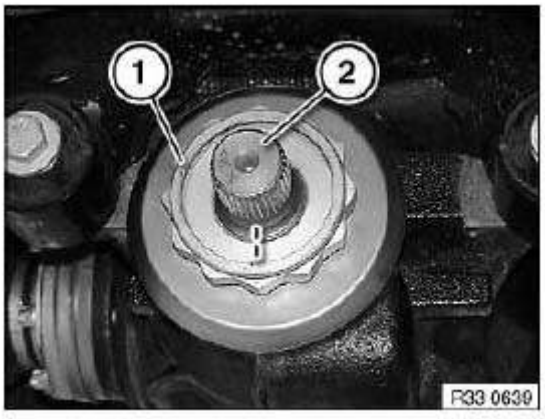


Fig. 32: Identifying Flange Nut And Bevel Pinion
Courtesy of BMW OF NORTH AMERICA, INC.

Release flange nut anticlockwise with special tools **33 5 050** and **33 5 070** by gripping the bevel pinion with special tools **33 5 060** and **33 5 070** .

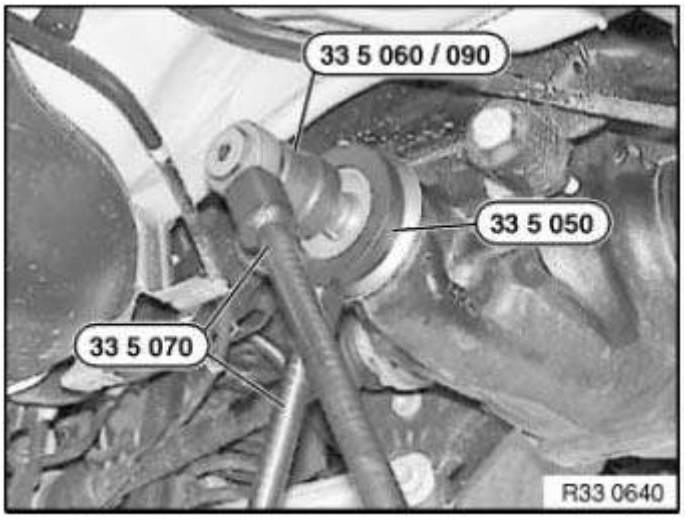
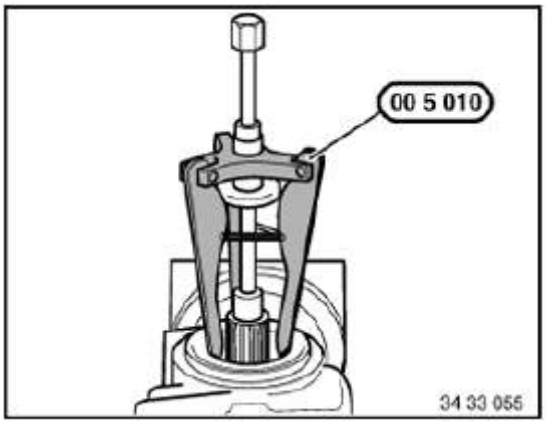


Fig. 33: Releasing Flange Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out radial shaft seal with special tool **00 5 010** .



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Fig. 34: Pulling Out Radial Shaft Seal
Courtesy of BMW OF NORTH AMERICA, INC.

Coat sealing lips of new radial shaft seal and sealing surface of bevel pinion with final drive oil.

Drive in radial shaft seal with special tool **33 5 080** or **33 0 150** .



Fig. 35: Driving Radial Shaft Seal With Special Tool 33 5 080/33 0 150
Courtesy of BMW OF NORTH AMERICA, INC.

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



Fig. 36: Identifying Bevel Pinion
Courtesy of BMW OF NORTH AMERICA, INC.

Check dust plate 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".

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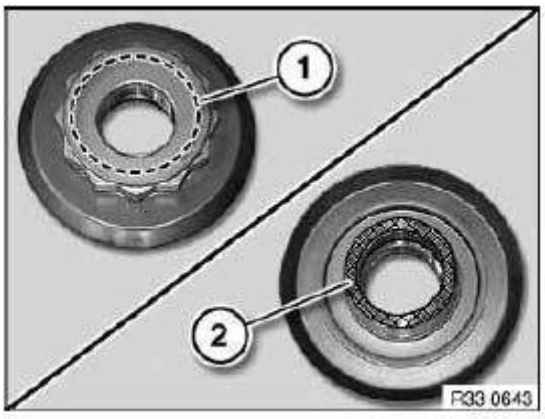


Fig. 37: Identifying Collar And Shaded Area
Courtesy of BMW OF NORTH AMERICA, INC.

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

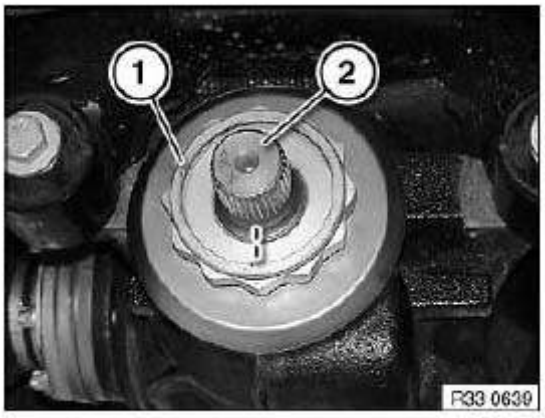


Fig. 38: Identifying Bevel Pinion And Flange Nut
Courtesy of BMW OF NORTH AMERICA, INC.

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

Introduce retaining clip (1).

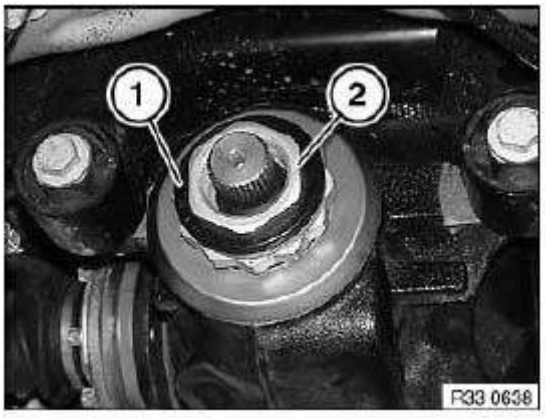


Fig. 39: Identifying Retaining Clip And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check **OIL LEVEL IN REAR AXLE DIFFERENTIAL** and correct if necessary.

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33 11 271 REPLACING REAR COVER GASKET ON REAR AXLE FINAL DRIVE

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

Necessary preliminary tasks:

- Remove **REAR AXLE FINAL DRIVE**.

NOTE: **Read and comply with REAR AXLE FINAL DRIVE: ASSIGNMENT TO MODEL SERIES.**

Select rear axle final drive:

- **188LW**
- **215LW**
- 205AL/225AL
- 235L

After installation:

- Add **FINAL DRIVE OIL**.

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

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: In event of oil loss, always check rear differential for traces of wear and damage.
To avoid leaks from the rear differential cover, do not use a paper gasket in cars with liquid sealing compounds!
To prevent the final drive oil from foaming over, make sure that no remnants of the liquid sealing compound are pressed into the rear axle final drive housing.

Necessary preliminary tasks:

- Catch or draw off final drive oil.
- Remove **REAR AXLE FINAL DRIVE**.

Release screws (1).

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

Unfasten screws (2).

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

Remove cover.

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

Clean sealing face on cover and rear differential.

Installation note:

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

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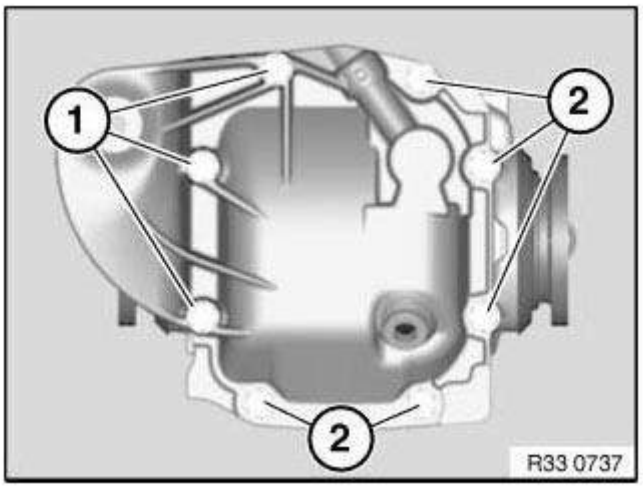


Fig. 40: Identifying Rear Cover Gasket On Rear Differential Screws
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Add **FINAL DRIVE OIL**.

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

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: In event of oil loss, always check rear differential for traces of wear and damage.
To avoid leaks from the rear differential cover, do not use a paper gasket in cars with liquid sealing compounds!
To prevent the final drive oil from foaming over, make sure that no remnants of the liquid sealing compound are pressed into the rear axle final drive housing.

Necessary preliminary tasks:

- Catch or draw off final drive oil.
- Remove **REAR AXLE FINAL DRIVE**.

NOTE: **Read and comply with REAR AXLE FINAL DRIVE: ASSIGNMENT TO MODEL SERIES.**

Release screws (1).

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

Remove cover.

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

Clean sealing face on cover and rear differential.

Installation note:

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

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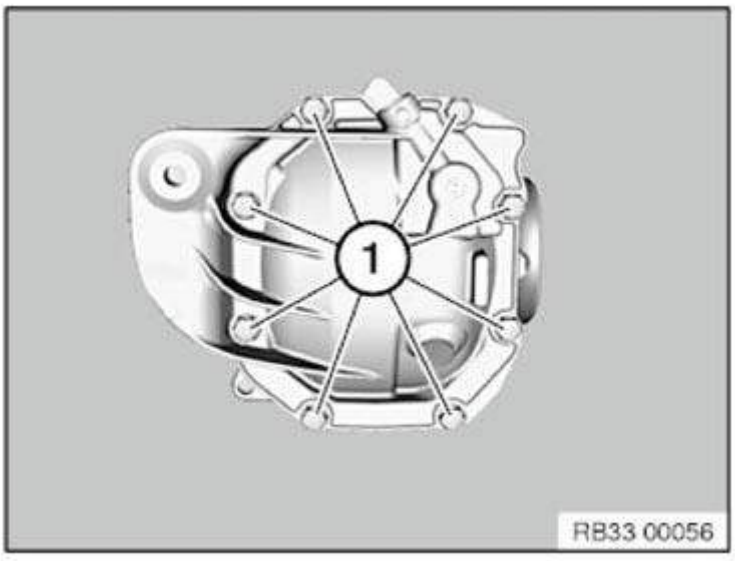


Fig. 41: Identifying Rear Differential Cover Screws
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Add **FINAL DRIVE OIL**.

FINAL DRIVE MOUNTING

33 17 004 REPLACE THE RUBBER MOUNTS FOR THE FRONT OF THE REAR AXLE FINAL DRIVE SUSPENSION

Special tools required:

- **33 5 200**
- **33 5 206**
- **33 5 166**
- **33 5 163**
- **33 5 162**
- **33 5 161**
- **33 4 466**
- **33 4 465**
- **33 5 105**
- **33 5 164**
- **33 5 165**

Necessary preliminary tasks:

- Remove **exhaust system** . See **18 00 020 REMOVING AND INSTALLING COMPLETE EXHAUST SYSTEM (N47 D20 O1)** , **18 00 020 REMOVING AND INSTALLING COMPLETE EXHAUST SYSTEM (N55)** or **18 00 020 REMOVING AND INSTALLING COMPLETE EXHAUST SYSTEM (N52T)** .
- Remove **PROPELLER SHAFT AT FINAL DRIVE** .

Position special tool **33 5 200** on workshop jack.

Support rear axle final drive unit with special tool **33 5 200** .

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Lash rear axle final drive unit with tightening strap **33 5 206** to special tool **33 5 200** .

IMPORTANT: Tensioning strap **33 5 206** must be pass through between output shafts and rear axle final drive cover!

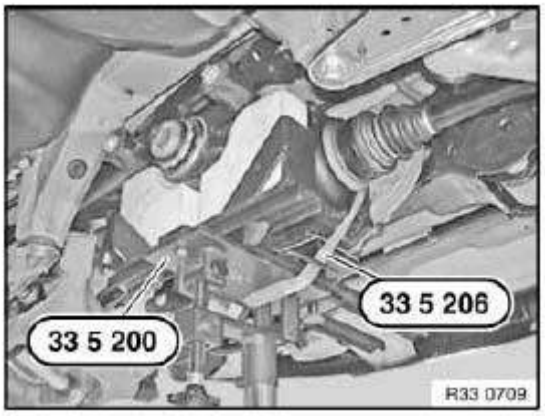


Fig. 42: Positioning Special Tool (33 5 200) On Workshop Jack
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque **33 17 1AZ** .

Installation note:

Adhere to the installation sequence at the end of the document in order to prevent distortion of the rear axle final drive during installation and thereby avoid potential complaints about noise.

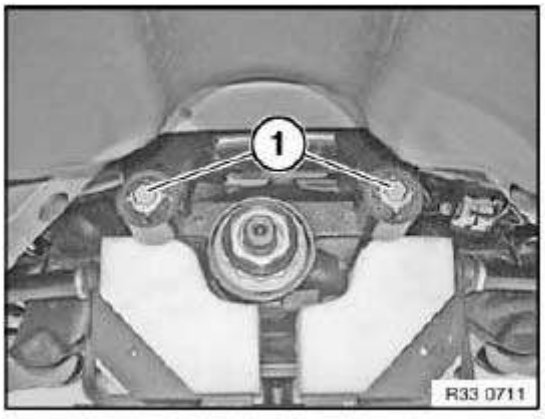


Fig. 43: Identifying Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

Tightening torque **33 17 2AZ** .

Only N47: Remove vibration absorber (2) with holder.

Installation note:

Replace nut.

Adhere to the installation sequence at the end of the document in order to prevent distortion of the rear axle final drive during installation and thereby avoid potential complaints about noise.

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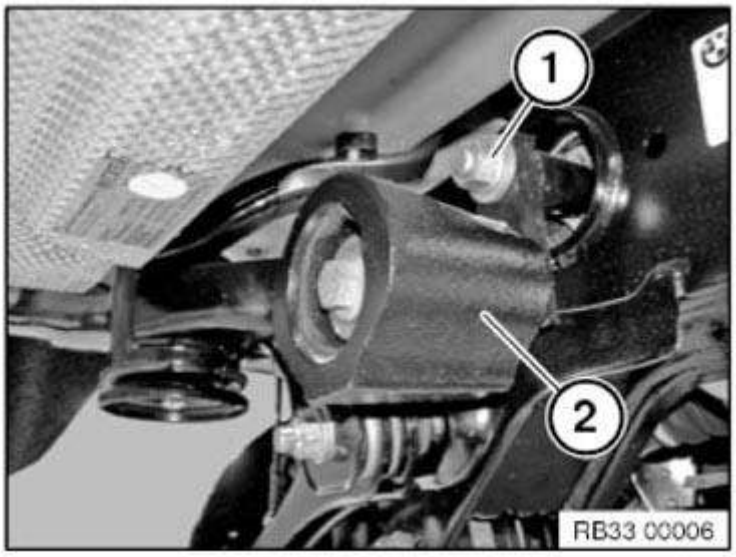


Fig. 44: Identifying Vibration Absorber With Holder, Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Lower rear axle final drive with special tool **33 5 200** .

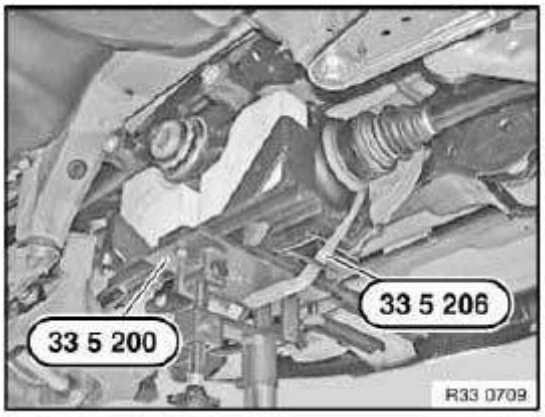
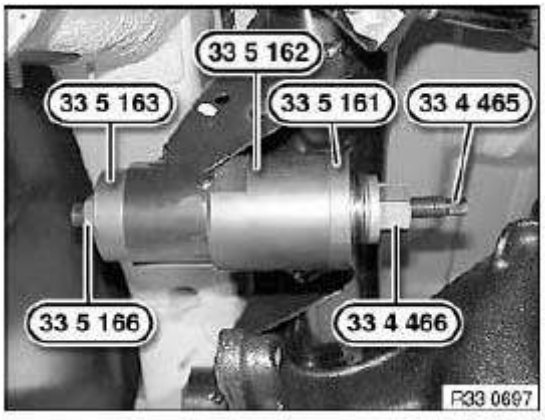


Fig. 45: Identifying Lower Rear Axle Final Drive And Special Tool (33 5 200)
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out rubber mount with special tools **33 5 166** , **33 5 163** , **33 5 162** , **33 5 161** , **33 4 466** and **33 4 465** .

NOTE: **The milled recess of special tool 33 5 162 must point outward toward the rear axle support.**

Use ratchet ring spanner **33 5 105** .



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Fig. 46: Pulling Out Rubber Mount With Special Tools 33 5 166
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Coat the bearing bush on the rear axle support and the new rubber mount with Circo Light.

Align rubber mount horizontally by way of slots (1).

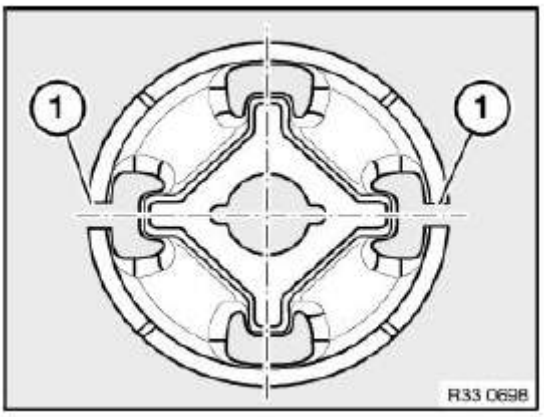


Fig. 47: Identifying Rubber Mount Slots
Courtesy of BMW OF NORTH AMERICA, INC.

Insert rubber mount (1) in special tool 33 5 164 .

Draw in rubber mount (1) with special tools 33 5 165 , 33 5 164 , 33 5 163 , 33 4 466 and 33 4 465 as far as it will go.

NOTE: Use ratchet ring spanner 33 5 105 .

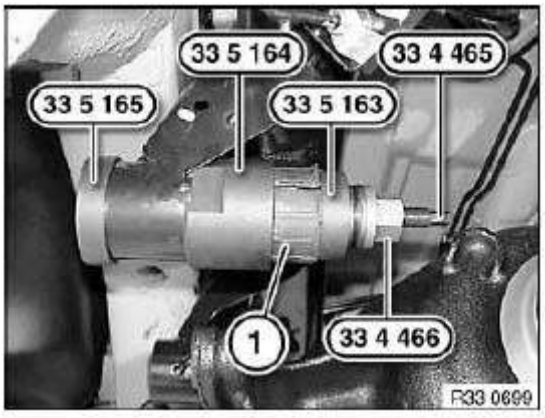


Fig. 48: Drawing In Rubber Mount With Special Tools 33 5 165
Courtesy of BMW OF NORTH AMERICA, INC.

Assembly sequence:

1. Insert the rear axle final drive into the rear axle support using the workshop jack and special tool 33 5 200 .
2. Insert screws (1) (do not tighten).
3. Insert bolt from rear and replace nut (2) (do not tighten down).
4. Release tensioning strap, lower special tool 33 5 200 and move away.
5. Tighten down screws (1).

   Tightening torque 33 17 1AZ .

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6. Tighten nut (2).

   Tightening torque **33 17 2AZ** .

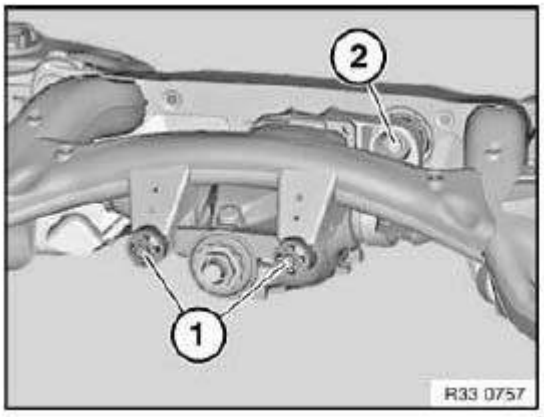


Fig. 49: Identifying Rear Axle Support Screws And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

33 17 005 REPLACING THE RUBBER MOUNTS FOR THE REAR AXLE FINAL DRIVE SUSPENSION AT REAR

Special tools required:

- **33 5 200**
- **33 5 206**
- 33 5 153
- 33 5 152
- 33 5 151
- **33 3 103**
- **33 3 104**
- **33 5 105**
- 33 5 154
- 33 5 155
- 33 5 156

Necessary preliminary tasks:

- Remove **exhaust system** . See **18 00 020 REMOVING AND INSTALLING COMPLETE EXHAUST SYSTEM (N47 D20 O1)** , **18 00 020 REMOVING AND INSTALLING COMPLETE EXHAUST SYSTEM (N55)** or **18 00 020 REMOVING AND INSTALLING COMPLETE EXHAUST SYSTEM (N52T)** .
- Remove **PROPELLER SHAFT AT FINAL DRIVE** .

Position special tool **33 5 200** on workshop jack.

33 5 200 Support rear axle final drive unit with special tool.

Lash rear axle final drive unit with tightening strap **33 5 206** to special tool **33 5 200** .

IMPORTANT: Tensioning strap **33 5 206** must be pass through between output shafts and rear axle final drive cover!

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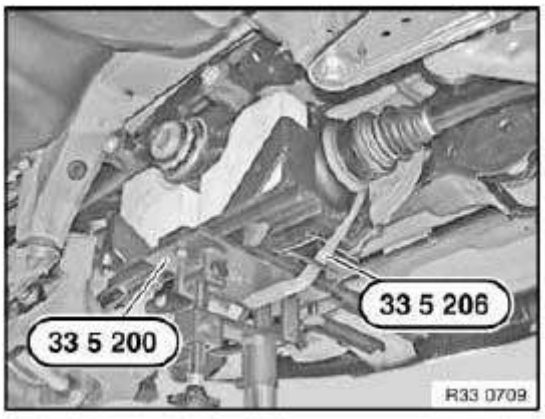


Fig. 50: Positioning Special Tool (33 5 200) On Workshop Jack
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque **33 17 1AZ** .

Installation note:

Adhere to the installation sequence at the end of the document in order to prevent distortion of the rear axle final drive during installation and thereby avoid potential complaints about noise.

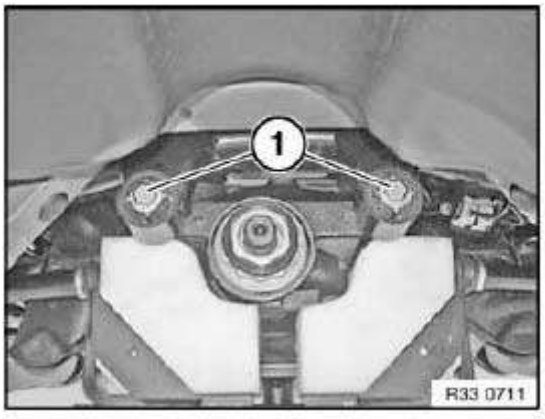


Fig. 51: Identifying Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

Tightening torque **33 17 2AZ** .

Only N47: Remove vibration absorber (2) with holder.

Installation note:

Replace nut.

Adhere to the installation sequence at the end of the document in order to prevent distortion of the rear axle final drive during installation and thereby avoid potential complaints about noise.

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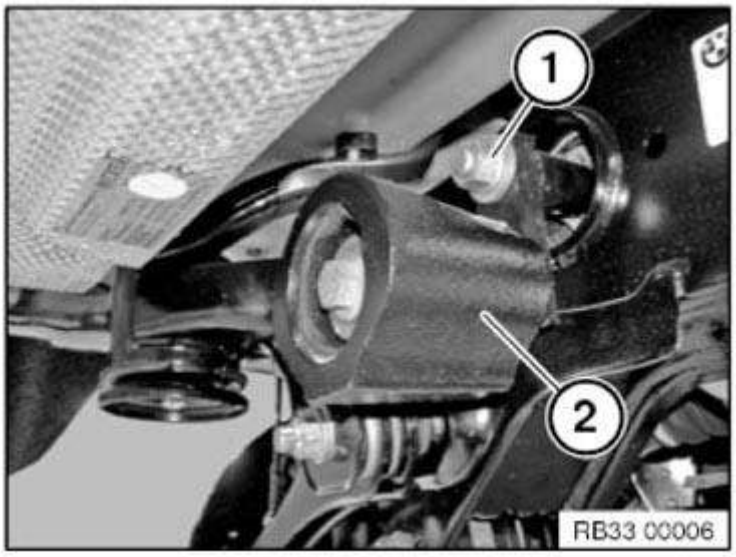


Fig. 52: Identifying Vibration Absorber With Holder, Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Lower rear axle final drive with special tool **33 5 200** .

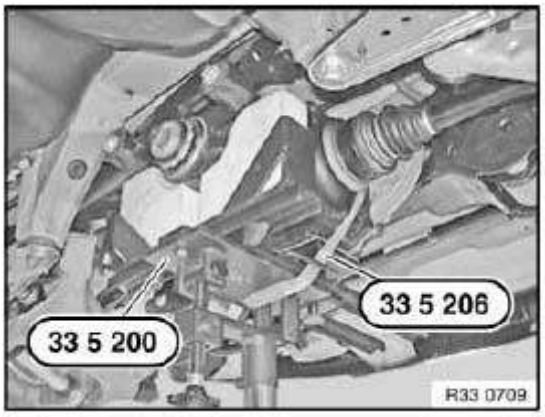
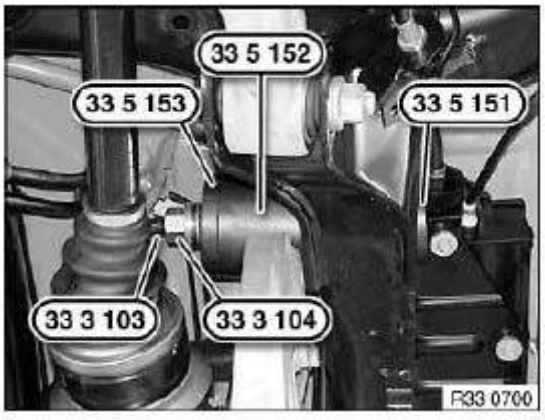


Fig. 53: Identifying Lower Rear Axle Final Drive And Special Tool (33 5 200)
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out rubber mount with special tools 33 5 153, 33 5 152, 33 5 151, **33 3 103** and **33 3 104** .

NOTE: **Ensure that the 33 5 152 special tool is correctly seated on the rear axle support.**

Use ratchet ring wrench **33 5 105** .



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Fig. 54: Pulling Out Rubber Mount With Special Tools 33 5 153
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Coat the bearing bush on the rear axle support and the new rubber mount with Circo Light (note BMW Parts Department).

Align rubber mount horizontally by way of elongated hole (1).

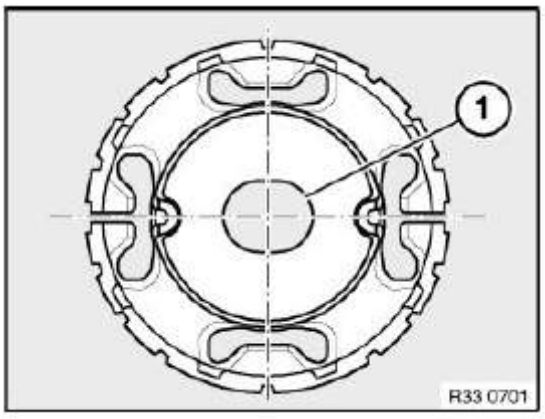


Fig. 55: Identifying Rubber Mount Elongated Hole
Courtesy of BMW OF NORTH AMERICA, INC.

Insert rubber mount (1) in special tool 33 5 154.

Draw in rubber mount (1) with special tools 33 5 155, 33 5 154, 33 5 156, 33 3 103 and 33 3 104 as far as it will go.

NOTE: Make sure special tools 33 5 154 and 33 5 156 contact rear axle support correctly.

Use ratchet ring spanner 33 5 105 .

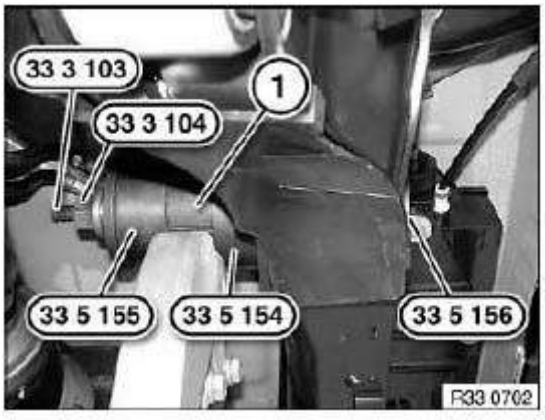


Fig. 56: Inserting Rubber Mount In Special Tool 33 5 154
Courtesy of BMW OF NORTH AMERICA, INC.

Assembly sequence:

1. Insert the rear axle final drive into the rear axle support using the workshop jack and special tool 33 5 200 .
2. Insert screws (1) (do not tighten).
3. Insert bolt from rear and replace nut (2) (do not tighten down).
4. Release tensioning strap and lower special tool 33 5 200 and move away.

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5. Tighten down screws (1).

   Tightening torque **33 17 1AZ** .

6. Tighten nut (2).

   Tightening torque **33 17 2AZ** .

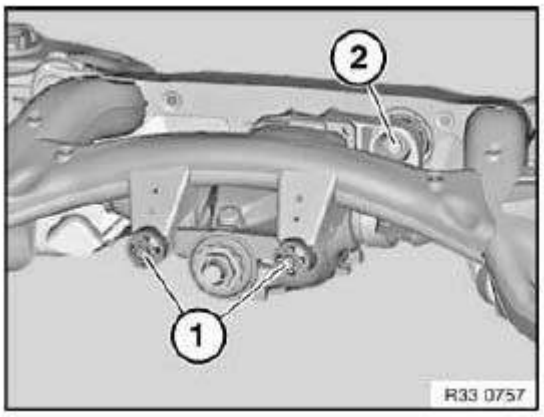


Fig. 57: Identifying Rear Axle Screws And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

OUTPUT SHAFTS

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

Necessary preliminary tasks:

- Remove **REAR WHEEL** .
- Remove **REAR AXLE FINAL DRIVE**.

IMPORTANT: Always place a new circlip on the output shaft reinstalling!

If necessary, remove visual protection cap (1).

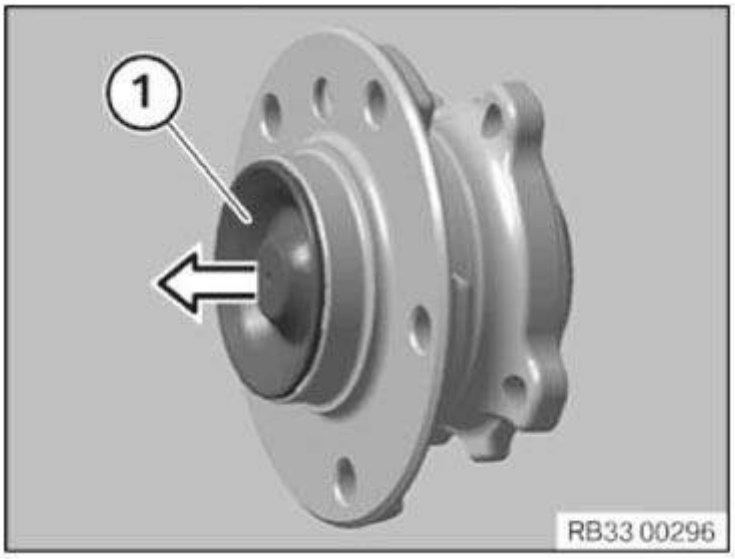


Fig. 58: Removing Visual Protection Cap
Courtesy of BMW OF NORTH AMERICA, INC.

Expand anti-twist lock sufficiently to avoid damaging thread when releasing collar nut (1).

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IMPORTANT:

Activate parking brake and release collar nut (1).

Tightening torque **33 41 1AZ** .

Installation note:

Lightly oil the gearing at the shaft journal.

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

Replace collar nut (1) by positive peening at flat areas of output shaft.

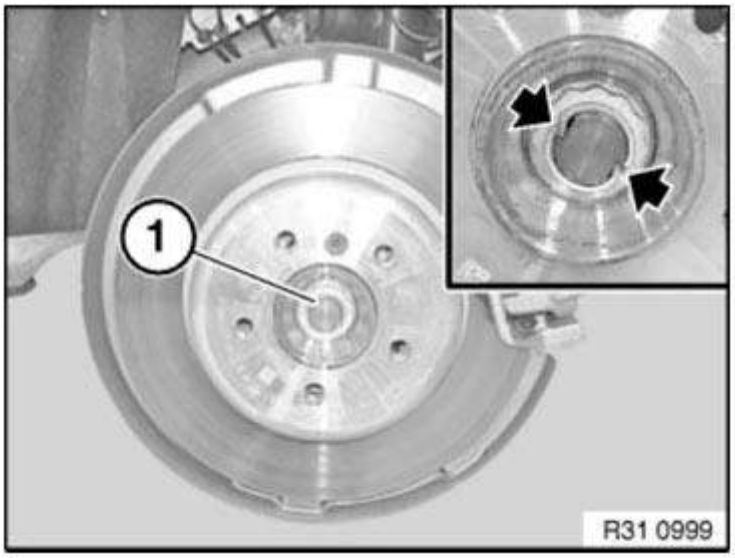


Fig. 59: Locating Collar Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Special Tools:

- Hydraulic unit - 81 64 2 155 744
- Adapter kit 1 - 81 64 2 155 745
- Adapter kit 2 - 81 64 2 155 746

The following work steps describe pressing out the output shaft:

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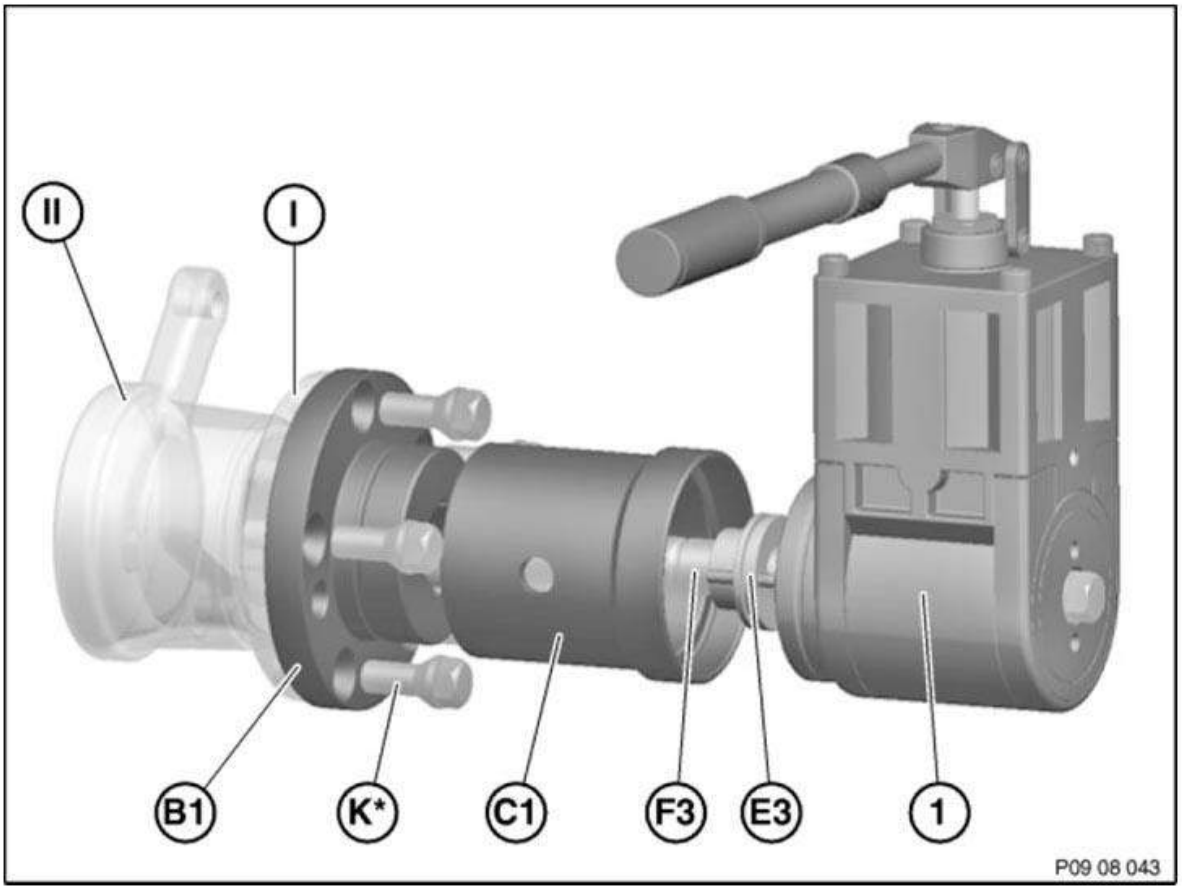


Fig. 60: Identifying Hydraulic Unit And Adapter Kit 1 And 2
Courtesy of BMW OF NORTH AMERICA, INC.

The following tools are required to press out the output shaft from the drive flange, see **Fig. 60** for arrangement:

Vehicle components:

I	Drive flange hub
II	Wheel carrier/swivel bearing

Required components for all models and types:

1	Hydraulic unit
E3	Washer M24
F3	Spindle M24 (length 270 mm)
C1	Holding sleeve
K1	Screws M12 x 1.5
K2	Screws M14 x 1.5
B1	Adapter

- Secure output shaft against falling out.
- Press out output shaft with hydraulic unit.

The following work steps describe drawing in the output shaft:

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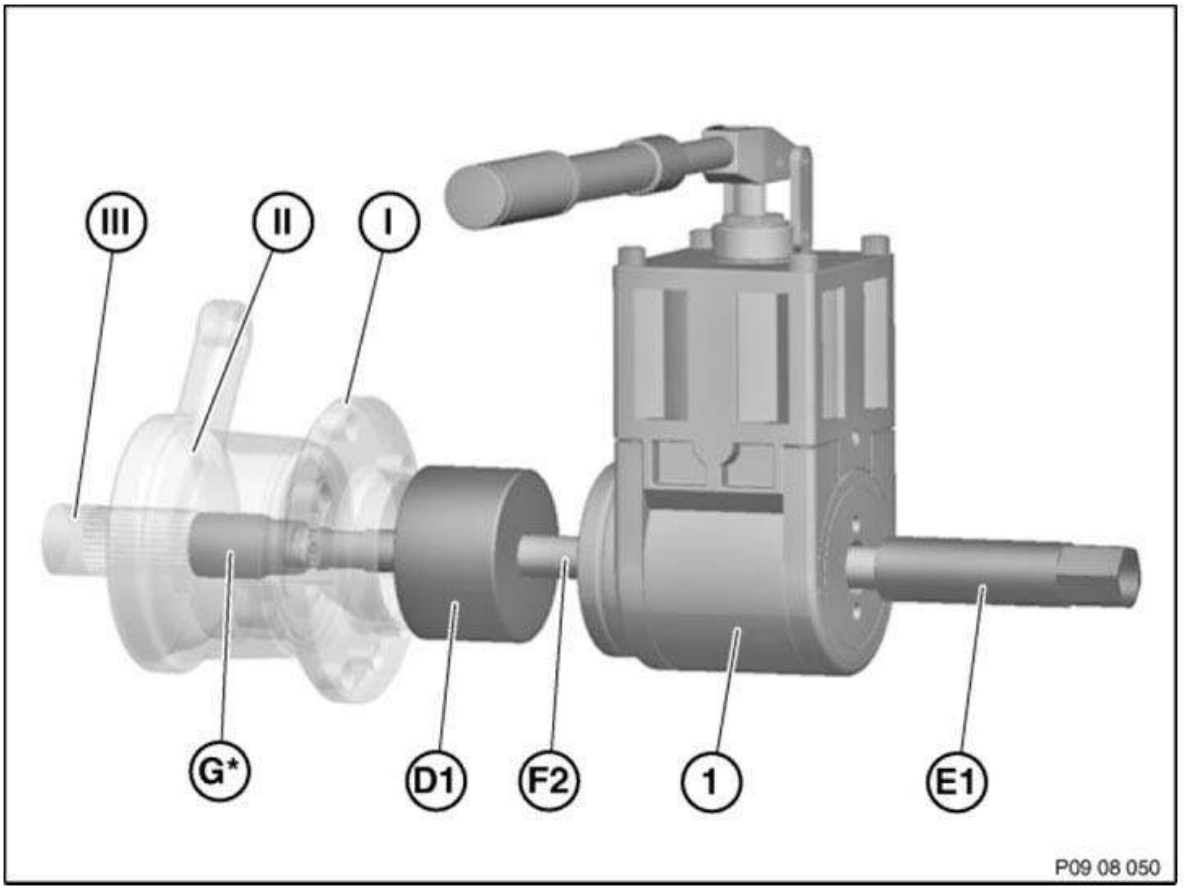


Fig. 61: Drawing-In/Out Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

The following tools are required to fit the output shaft in the drive flange, see **Fig. 61** for arrangement:

Vehicle components:

I	Drive flange hub
II	Wheel carrier/swivel bearing
III	Output shaft

Required components for all models and types:

1	Hydraulic unit
E1	Holding sleeveM24
D1	Washer
F2	Spindle M24/M20 (length 335 mm)

Components specific to model and type (thread diameter, output shaft):

G1	Adapter M22 x 1.5 to M20
G2	Adapter M24 x 1.5 to M20
G3	Adapter M27 x 1.5 to M20

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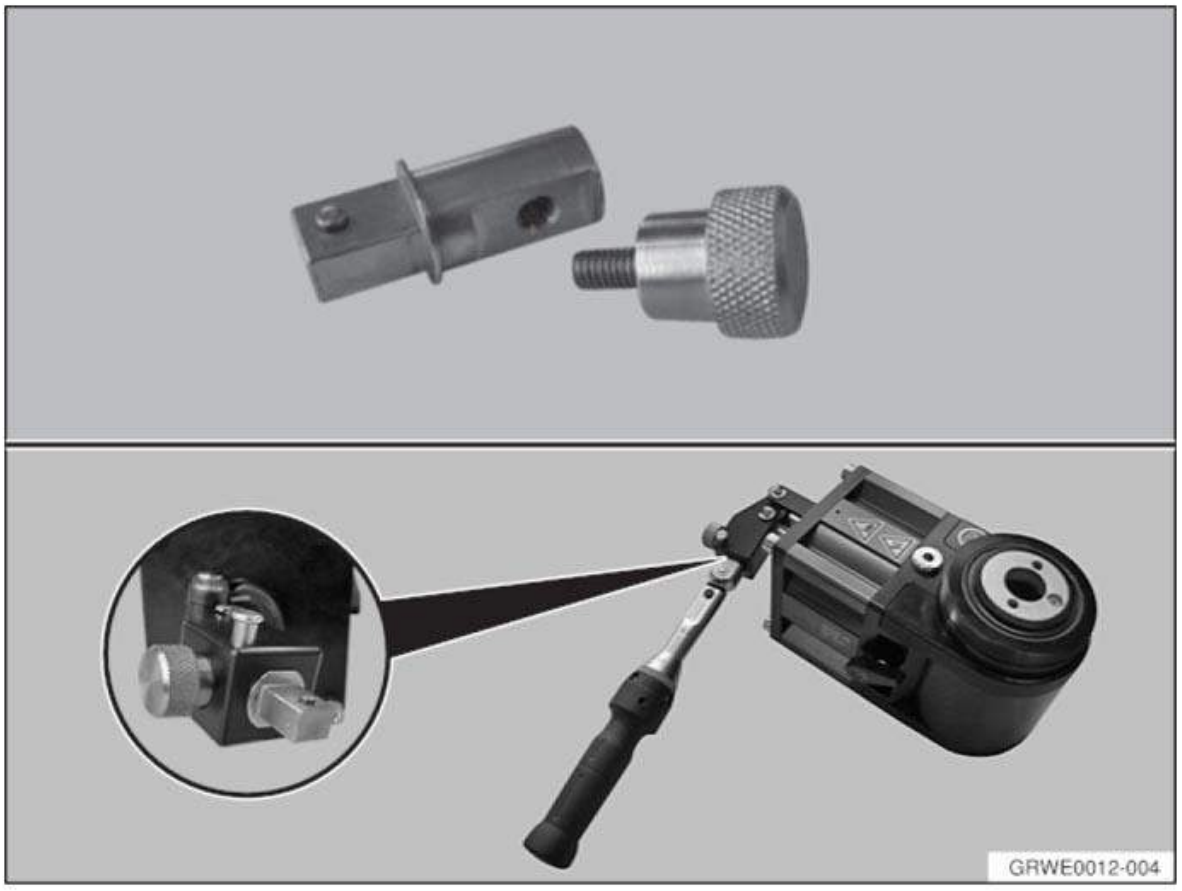


Fig. 62: Fitting Adapter With Torque Wrench To Hydraulic Unit
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

Due to the technical requirements, the special tool used, sleeve G, is relatively thin-walled. To ensure that the load limit of the tensioning sleeve is not exceeded when drawing in the output shaft, it is **essential** to use adapter **81 64 2 318 661** in combination with a torque wrench.

Fit adapter with torque wrench to hydraulic unit (see **Fig. 62**).

Set torque wrench to 20 Nm.

Draw in output shaft with hydraulic tool until the torque wrench is activated.

Tighten collar nut (1), activate parking brake for this purpose.

Tightening torque **33 41 1AZ** .

Installation note:

Renew collar nut (1), apply a light coating of oil to collar nut contact surface and tighten.

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

Secure collar nut (1) by positive peening at flat areas of output shaft.

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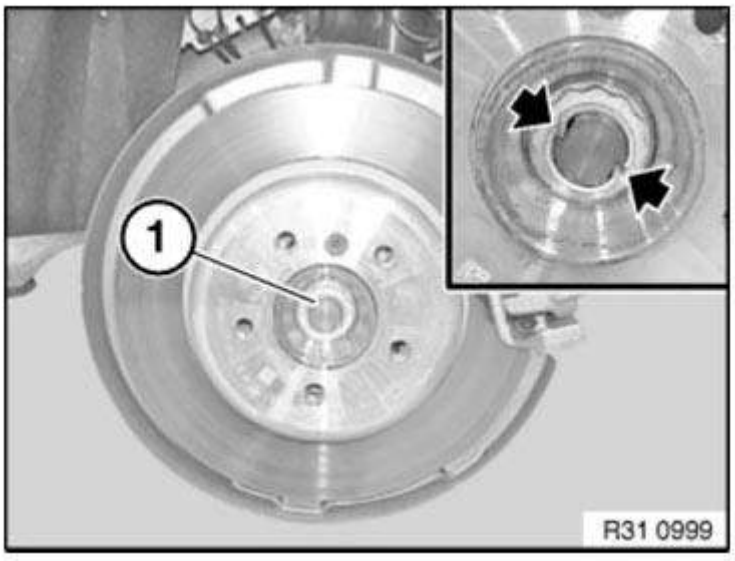


Fig. 63: Locating Collar Nut
Courtesy of BMW OF NORTH AMERICA, INC.

33 21 020 REMOVING AND INSTALLING/REPLACING BOTH OUTPUT SHAFTS

IMPORTANT:

- The **RADIAL SHAFT SEAL FOR THE OUTPUT SHAFT** should be renewed every time the output shaft is removed and installed.
- The circlip of the output shaft must be replaced after re-installation.

NOTE: **The procedure is described in PRESSING OUTPUT SHAFT OUT OF DRIVE FLANGE AND DRAWING IN.**

After installation:

- Check **FINAL DRIVE OIL LEVEL**, correct if necessary.

33 21 000 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT OUTPUT SHAFT

IMPORTANT:

- The **RADIAL SHAFT SEAL FOR THE OUTPUT SHAFT** should be renewed every time the output shaft is removed and installed.
- The circlip of the output shaft must be replaced after re-installation.

NOTE: **The procedure is described in REMOVING AND INSTALLING STEERING STUB/WHEEL CARRIER.**

After installation:

- Check **FINAL DRIVE OIL LEVEL**, correct if necessary.

REAR SUB-FRAME

33 31 503 LOWERING/RAISING REAR AXLE SUPPORT

Special tools required:

- **31 5 251**

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- 00 2 030
- 31 5 255
- 31 5 253
- 33 5 206

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.
Load the luggage compartment with a minimum of 100 kg before lowering/removing the rear axle support. This prevents the vehicle from tilting or sliding off the vehicle hoist!
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.**

Before lowering/removing rear axle support:
IMPORTANT: Observe SAFETY INFORMATION for raising the vehicle
In order to avoid damage to vehicle hoist, perform weight compensation on vehicle.

Necessary preliminary tasks:

- Remove REAR WHEELS .
- Detach BOTH SPRING STRUTS ON CAMBER LINK.
- Release PROPELLER SHAFT ON REAR AXLE DIFFERENTIAL and tie up.
- Detach BOTH BRAKE-CALIPER SUPPORTS and tie up.

Unlock plug connection on ride height sensor and disconnect.

Unclip cable for pulse sensor and ride height sensor/brake pad wear sensor on camber link/wheel carrier.

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

Insert special tools 31 5 255 in telescopic supports of a profile rail pair.

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

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

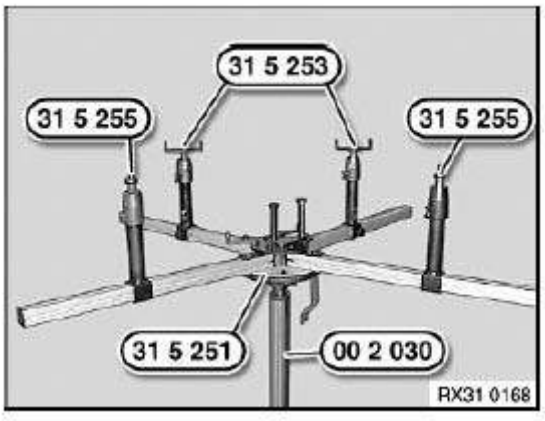


Fig. 64: Inserting Special Tools 31 5 253 In Telescopic Supports Of Profile Rail Pair
Courtesy of BMW OF NORTH AMERICA, INC.

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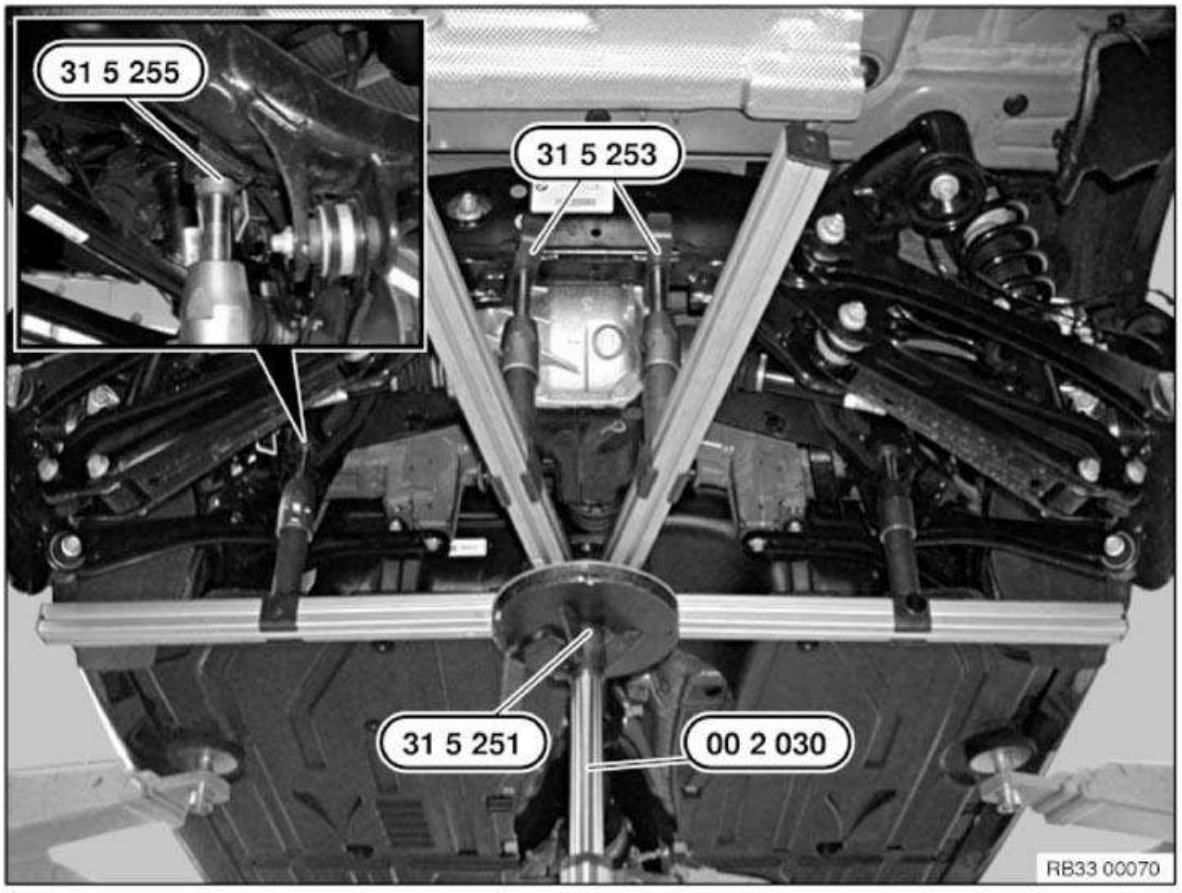


Fig. 65: Aligning Special Tools 31 5 251, 31 5 253 And 31 5 255 To Rear Axle Support
Courtesy of BMW OF NORTH AMERICA, INC.

The jacking points on the left side are shown.

Align special tools **31 5 251** , **31 5 253** and **31 5 255** to rear axle support.

Support rear axle support by operating workshop jack **00 2 030** .

IMPORTANT: The center of gravity of the rear axle must be positioned centrally over the workshop jack.

Use tensioning strap **33 5 206** to lash rear axle support to special tool **31 5 251** !

Release screws (1).

Tightening torque **33 33 2AZ** .

Release screws (2) and remove stop plate and compression strut.

Tightening torque **33 33 1AZ** .

Lower rear axle support.

Installation note:

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

Replace screws (2).

Turn in all screws, first tightening screws (2) and then tightening screws (1).

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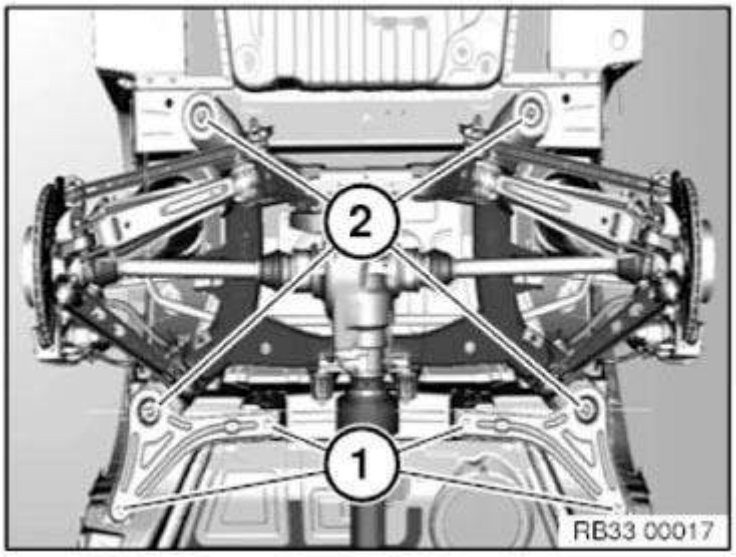


Fig. 66: Identifying Lower Rear Axle Support Screws
Courtesy of BMW OF NORTH AMERICA, INC.

33 31 000 REMOVING AND INSTALLING COMPLETE REAR AXLE SUPPORT

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.
Load the luggage compartment with a minimum of 100 kg before lowering/removing the rear axle support.
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.**

IMPORTANT: Observe **SAFETY INFORMATION** for raising the vehicle
In order to avoid damage to vehicle hoist, perform weight compensation on vehicle.

Necessary preliminary tasks:

- Remove **PULSE GENERATOR** .

NOTE: **The subsequent procedure is described in 33 31 011 Replacing rear axle support.**

IMPORTANT:
- Prior to installation, check sensor head and cable on pulse sensor and renew if necessary.

33 31 011 REPLACING REAR AXLE SUPPORT

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.
Load the luggage compartment with a minimum of 100 kg before lowering/removing the rear axle support. This prevents the vehicle from tilting or sliding off the vehicle hoist!
When supporting components, make sure that:

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

Before lowering/removing rear axle support:
IMPORTANT: Observe **SAFETY INFORMATION** for raising the vehicle
In order to avoid damage to vehicle hoist, perform weight compensation on vehicle.

Necessary preliminary work:

- Remove **REAR AXLE FINAL DRIVE**.
- Remove **COMPLETE REAR AXLE CARRIER**.

Release **RIDE HEIGHT SENSOR WITH JOINTED ROD ON REAR AXLE SUPPORT** .

Release both **ANTI-ROLL BAR LINKS AT ANTI-ROLL BAR**.

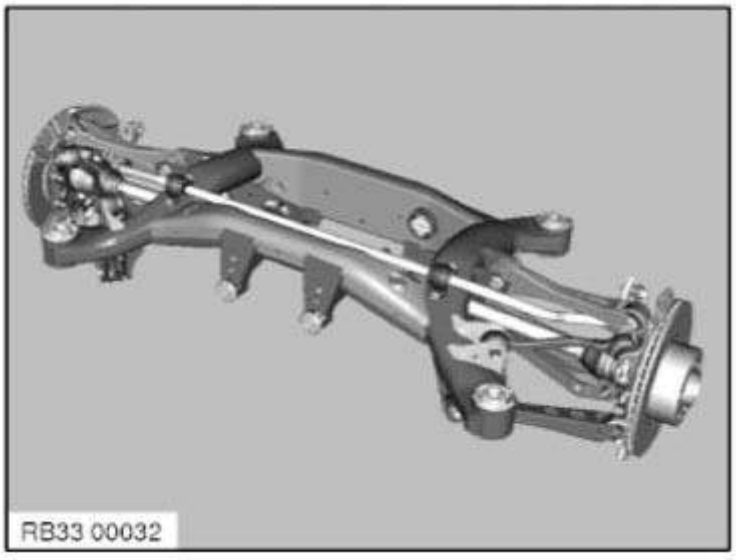


Fig. 67: Identifying Anti-Roll Bar Links At Anti-Roll Bar
Courtesy of BMW OF NORTH AMERICA, INC.

Release both **CAMBER ARMS ON REAR AXLE CARRIER**.

Release both **TOE LINKS ON REAR AXLE CARRIER**.

Release both **TRAILING ARMS ON REAR AXLE CARRIER**.

Release both **CONTROL ARMS ON REAR AXLE CARRIER**.

Release both **WISHBONES ON REAR AXLE CARRIER**.

Remove both wheel carriers with output shaft, all arms, anti-roll bar link and brake disc.

Release **ANTI-ROLL BAR**.

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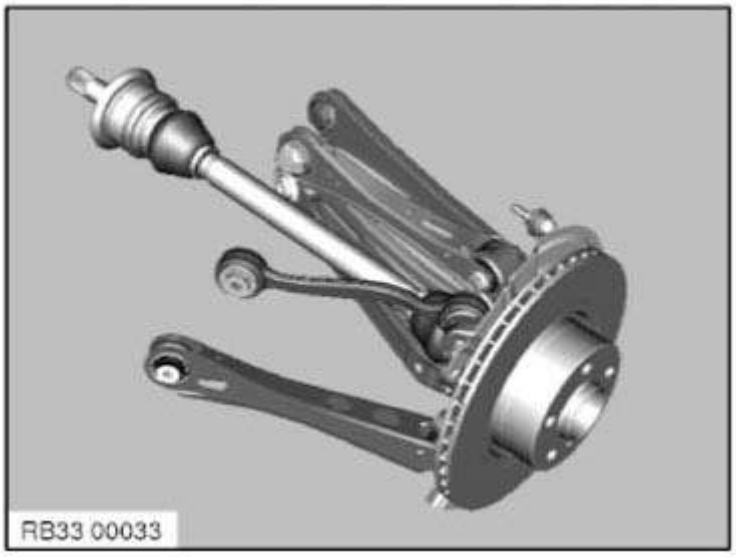


Fig. 68: Removing Wheel Carriers With Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Take rear axle support down from special tool with assistance of a 2nd person and set down on a suitable surface.

Installation note:

Use previous rear axle support as a template for modifying or replacing small parts.

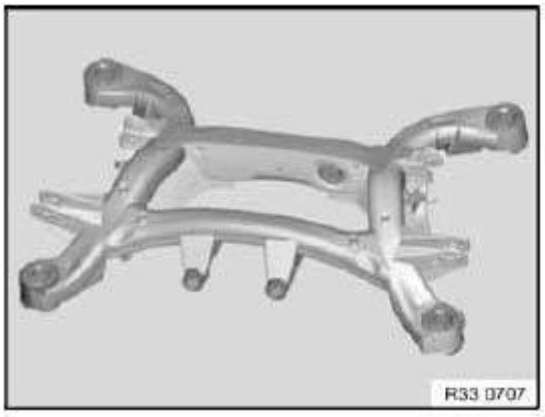


Fig. 69: Identifying Rear Axle Support
Courtesy of BMW OF NORTH AMERICA, INC.

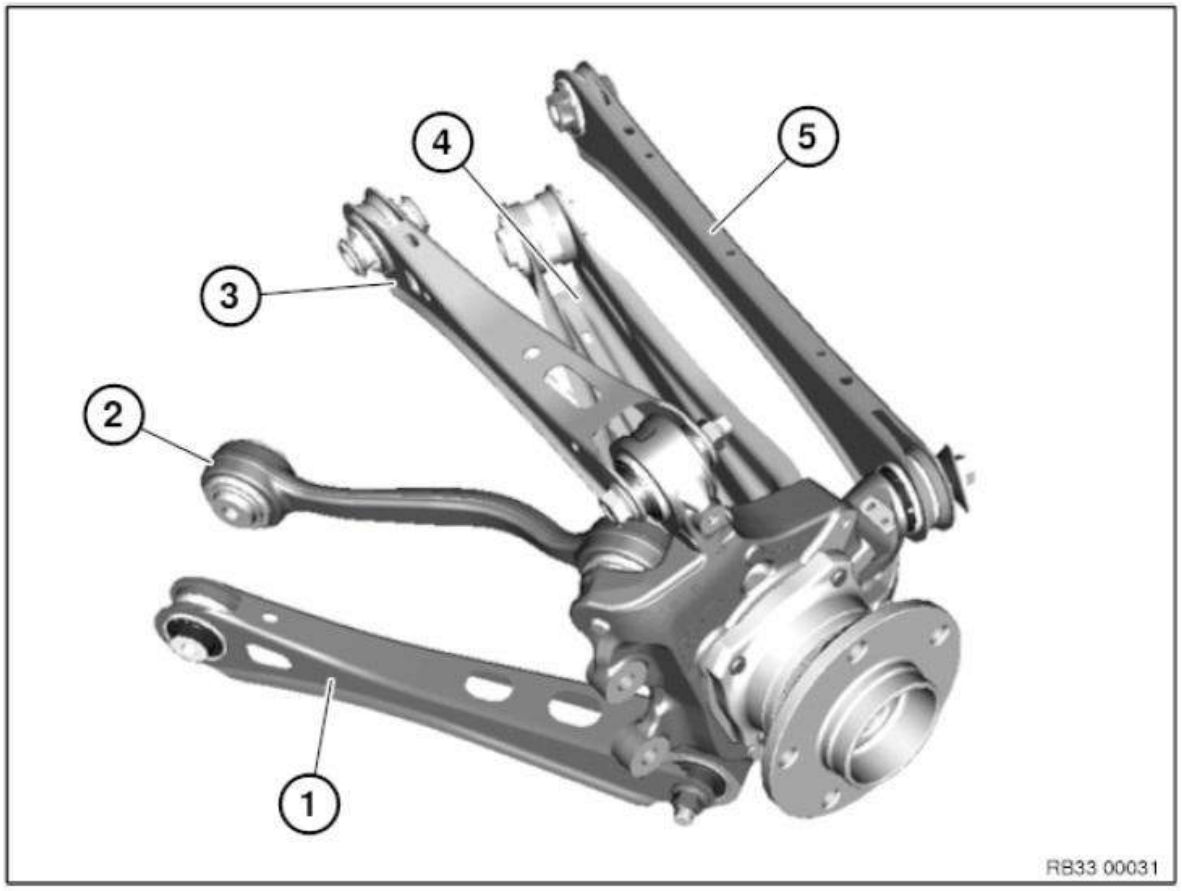
After installation:

- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

CONTROL ARMS AND STRUTS

33 32... OVERVIEW OF STEERING LINKS

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1 Trailing arm
2 Traction strut
3 Wishbone
4 Camber arm
5 Toe arm

Fig. 70: Overview Of Steering Links
Courtesy of BMW OF NORTH AMERICA, INC.

33 32 131 REMOVING AND INSTALLING/REPLACING A STEERING STUB/WHEEL CARRIER

Special tools required:

- 33 5 120
- 33 5 125
- 33 5 123
- 33 5 121
- 33 5 124
- 33 5 126
- 33 5 122

Necessary preliminary work:

- Remove **REAR WHEEL** .

IMPORTANT: Expand anti-twist lock sufficiently to avoid damaging thread when releasing collar nut (1).

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Activate parking brake and release collar nut (1).

Tightening torque **33 41 1AZ** .

Installation note:

Lightly oil the gearing on the shaft journal.

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

Replace collar nut (1) by positive peening at flat areas of output shaft.

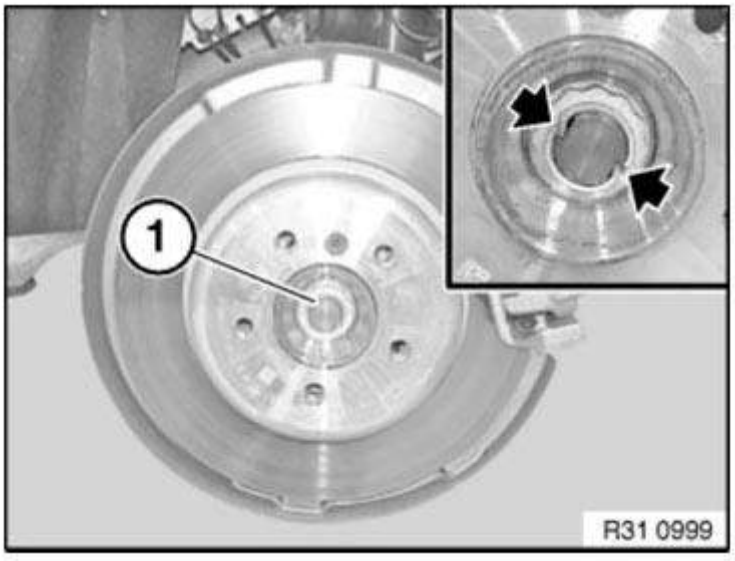


Fig. 71: Locating Collar Nut
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Special tools **33 5 120** and **33 5 125** must be inserted in all-round slot (1) on output shaft!

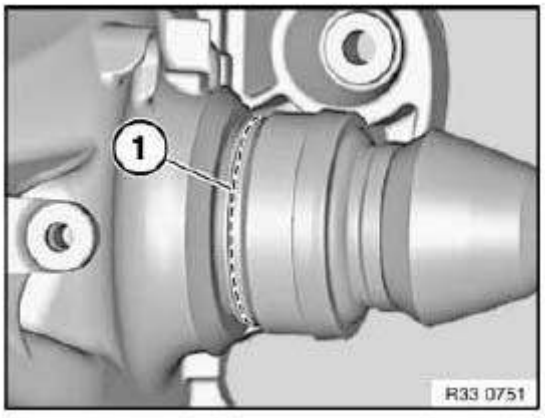


Fig. 72: Identifying Round Slot On Output Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Use special tools **33 5 123** , **33 5 121** , **33 5 124** /**33 5 126** to push the output shaft out of the rear axle final drive by jerking.

Here, synchronising key of bolt **33 5 122** must rest on rear axle final drive.

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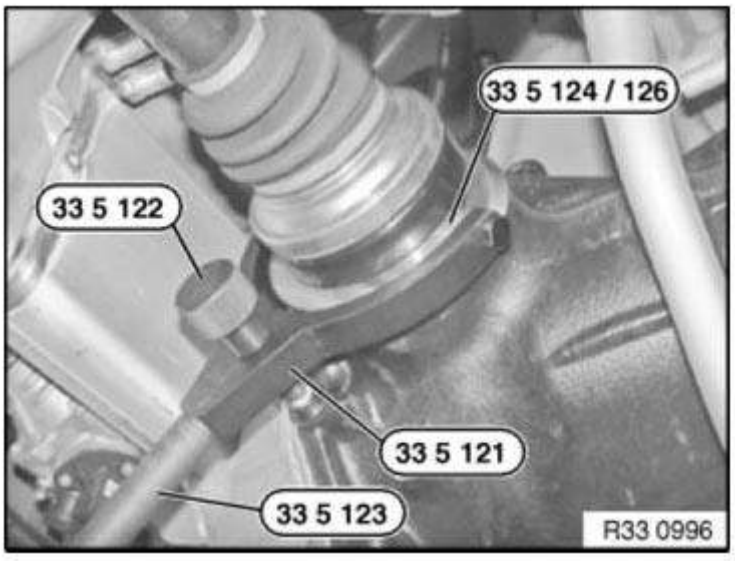


Fig. 73: Identifying Special Tool (33 5 123)
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

High installation forces indicate that the output shaft spline teeth are damaged or deformed!

Check gearing, replace damaged components.

Check dust plate (1) for damage, renew if necessary.

Circlip (2) must be replaced.

Coat contact surface (3) of output shaft with approved final drive oil. See **REAR AXLE - OPERATING FLUIDS** .

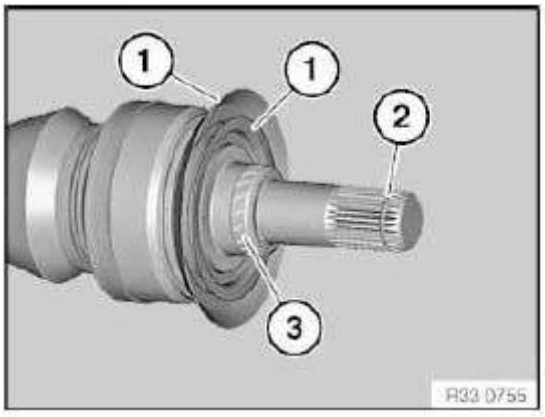


Fig. 74: Identifying Dust Plate, Circlip And Contact Surface
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT:

- The **RADIAL SHAFT SEAL FOR THE OUTPUT SHAFT** should be replaced every time the output shaft is removed and installed.
- The circlip of the output shaft must be replaced after re-installation.

IMPORTANT: Secure wheel carrier against falling out.

- Loosen the **PULSE SENSOR ON THE WHEEL CARRIER** .

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- Loosen the **BRAKE DISC** .
- Loosen the **ANTI-ROLL BAR LINK ON THE WHEEL CARRIER**.
- Loosen **SHOCK ABSORBER ON CAMBER ARM**.
- Loosen **CAMBER ARM ON WHEEL CARRIER**.
- Loosen **STEERING ARM ON WHEEL CARRIER**.
- Loosen **UPPER WISHBONE ON WHEEL CARRIER**.
- Loosen **CONTROL ARM ON WHEEL CARRIER**.
- Loosen **TRAILING ARM ON WHEEL CARRIER**.

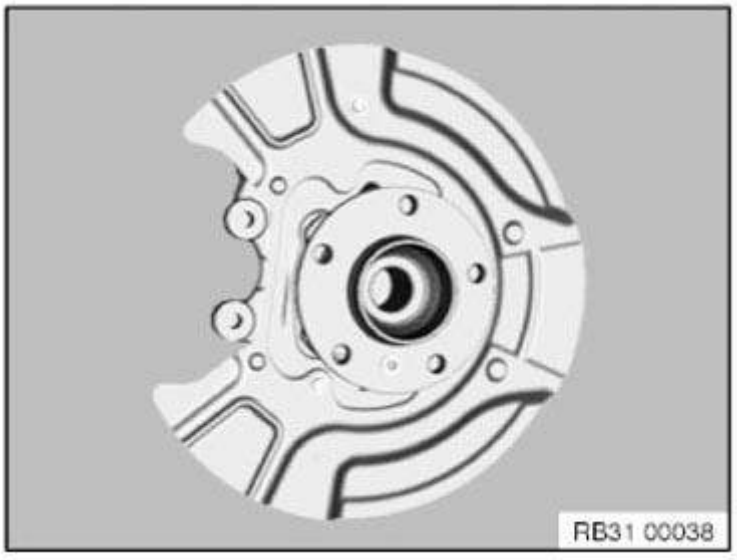


Fig. 75: Identifying Wheel Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

Remove wheel carrier including output shaft.

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

Replacement:

- Press **OUTPUT SHAFT** out of drive flange.
- Modify **BRAKE ANCHOR PLATE/BRAKE GUARD PLATE** . Replace if necessary.
- Modify **WHEEL BEARING** with drive flange. Replace if necessary.

After installation:

- Replacement: Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

33 32 190 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT CAMBER ARM

IMPORTANT:
- If the camber arm is bent, the control arm/wheel carrier screw connection must be renewed.

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NOTE: **If the camber arm is renewed, the wheel alignment . See 32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION or 32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD must be checked after assembly.**

Necessary preliminary work:

- Remove **REAR WHEEL** .

Support wheel carrier with workshop jack!

Mark position of eccentric adjustment washer to rear axle support to simplify subsequent adjustment of rear axle.

Release nut (1) and remove eccentric bolt.

Tightening torque **33 32 10AZ** .

Installation note:

Note insertion direction of eccentric screw.

Renew nut, eccentric bolt.

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

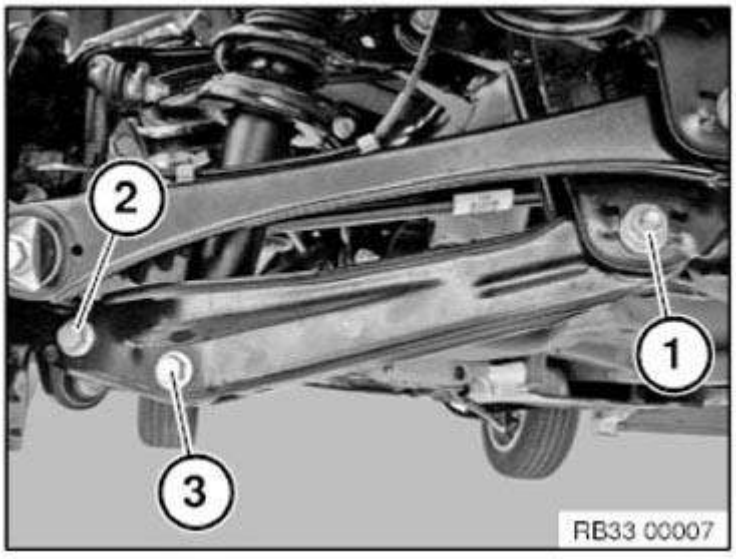


Fig. 76: Supporting Wheel Carrier With Workshop Jack
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (2) and remove screw.

Tightening torque **33 32 9AZ** .

Installation note:

Note direction of insertion of screw.

Replace screw and nut.

Release nut (3) and remove screw.

Tightening torque **33 52 5AZ** .

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Installation note:

Note direction of insertion of bolts.

Replace screw and nut.

After installation:

- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

33 32 180 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT TOE ARM

IMPORTANT:

- The toe link must be installed with the opening (U-section) facing downward!
- If the toe link is bent, the control arm/wheel carrier screw connection must be renewed.

NOTE: **If the toe link is detached from the rear axle support, it will be necessary to carry out the wheel alignment procedure . See 32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION or 32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD .**

Necessary preliminary work:

- Remove **REAR WHEEL** .

Open clips and remove cable for pulse generator.

Installation note:

Replace defective clamps.

Release screw (1).

Tightening torque **33 32 8AZ** .

Installation note:

Replace screw.

The toe link must be installed with the opening (U-section) facing downward!

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

Mark position of eccentric adjustment washer to rear axle support to simplify subsequent adjustment of rear axle.

Release nut (2) and remove screw.

Tightening torque **33 32 7AZ** .

Installation note:

Replace nut.

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

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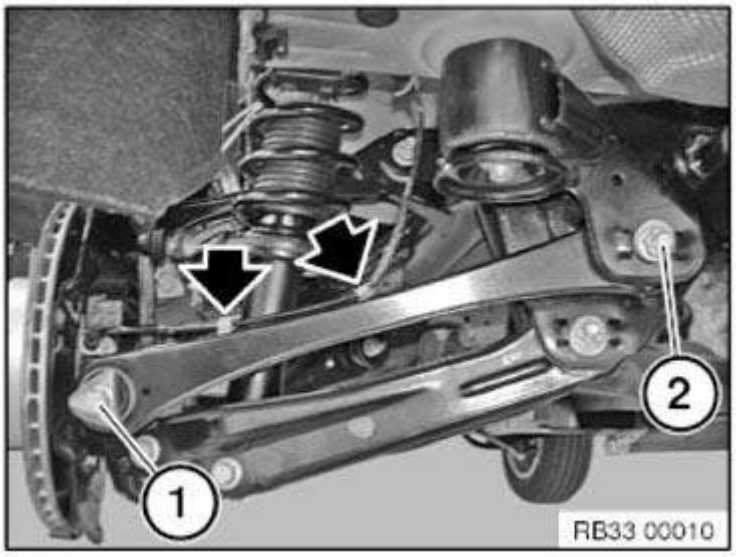


Fig. 77: Identifying Rear Axle Support Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

When installing, ensure that the tapered side of the bearing bush is connected first toward the wheel carrier.

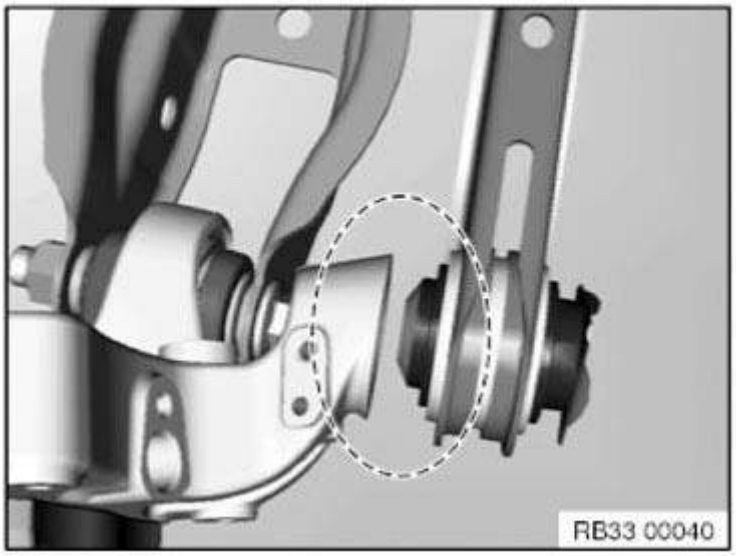


Fig. 78: Identifying Bearing Bush Tapered Side
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

51 71 015 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING

Graphic is only an example. There may be differences in specific details depending on engine version.

Unscrew all bolts.

Tightening torque **51 75 1AZ** .

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Remove underbody panelling (1).

Installation note:

Make sure underbody panelling (1) is correctly seated.

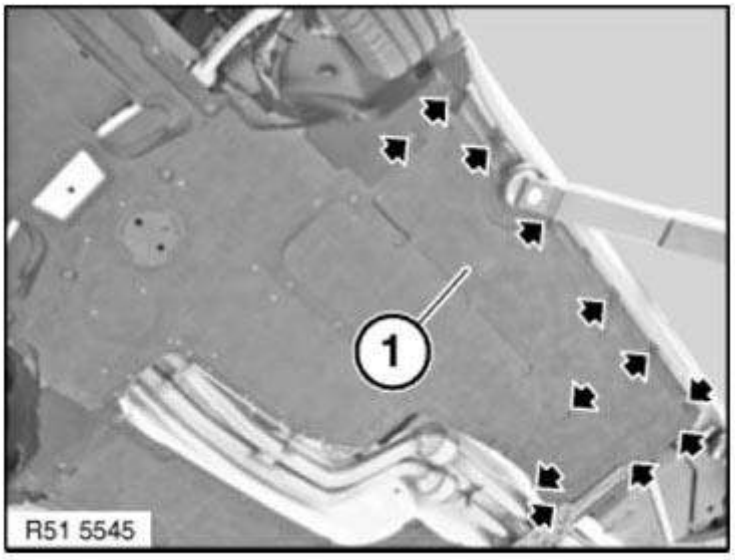


Fig. 79: Removing Underbody Panelling
Courtesy of BMW OF NORTH AMERICA, INC.

33 32 125 REPLACING A BALL JOINT IN LOWER STEERING STUB/WHEEL CARRIER

Special tools required:

- 0 496 553
- 2 293 777
- 2 293 775
- 2 293 776
- 0 496 554

Necessary preliminary tasks:

- Remove CAMBER ARM.
- Remove TRAILING ARM.

Pull out ball joint:

Pull out ball joint with special tools 0 496 553, 2 293 777 , 2 293 775 and 0 496 553 in direction of travel (F).

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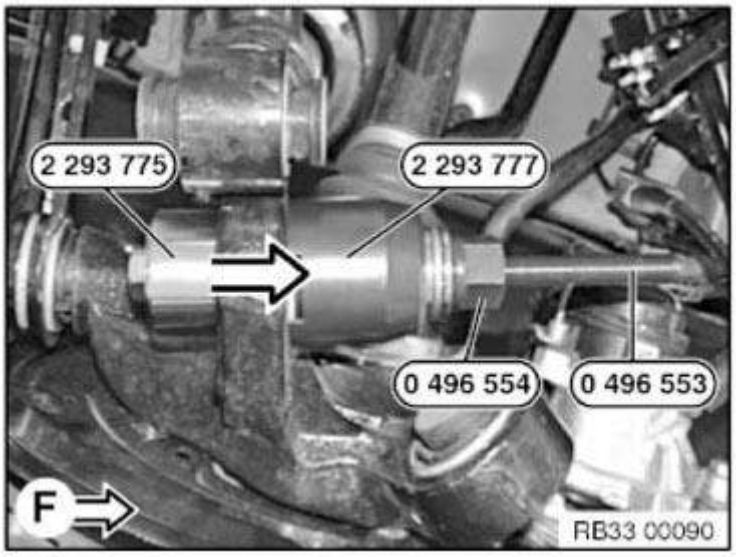


Fig. 80: Pulling Out Ball Joint With Special Tools 0 496 553
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out ball joint:

Pull in ball joint (1) with special tools in direction of travel 0 496 553, **2 293 777** , **2 293 776** and 0 496 554 until limit position.

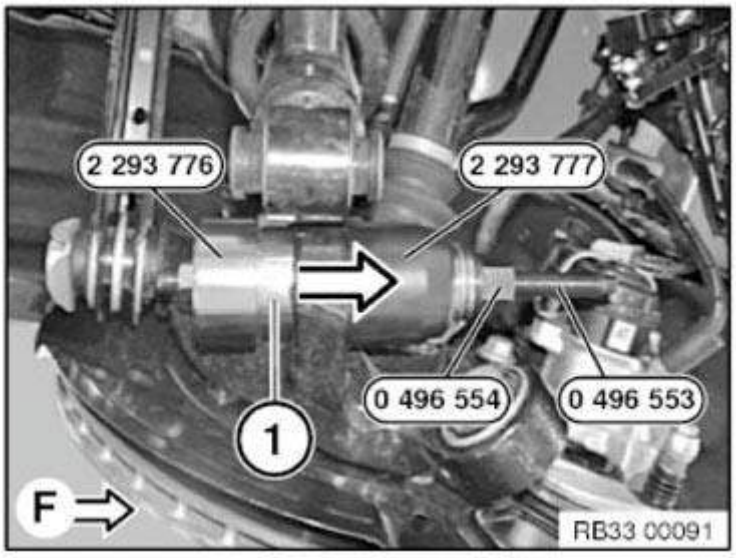


Fig. 81: Pulling Ball Joint With Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

33 32 091 REPLACING A CONTROL ARM

Release screw.

Tightening torque **33 32 4AZ** .

Installation note:

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Replace screw.

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

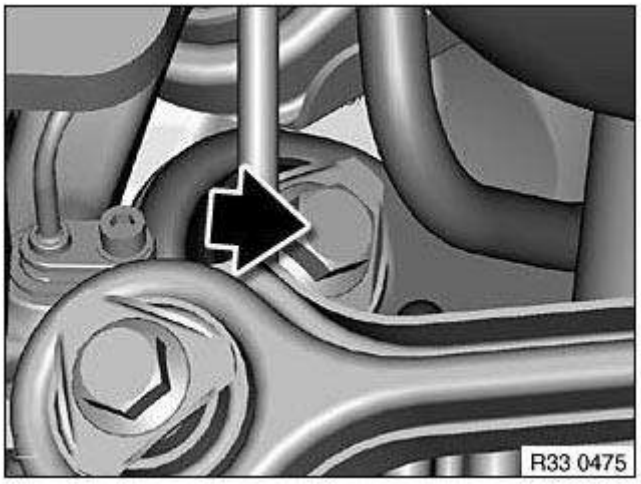


Fig. 82: Locating Control Arm Screw
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: When installing, ensure that the tapered side of the bearing bush is connected first toward the wheel carrier.

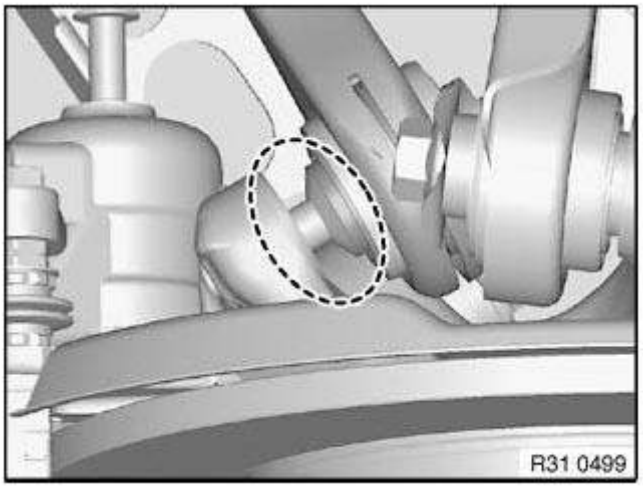


Fig. 83: Identifying Bearing Bush
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

Tightening torque **33 32 3AZ** .

Unscrew bolt towards rear and remove control arm (2).

Installation note:

Bolt head must point to rear.

Replace screw and nut.

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

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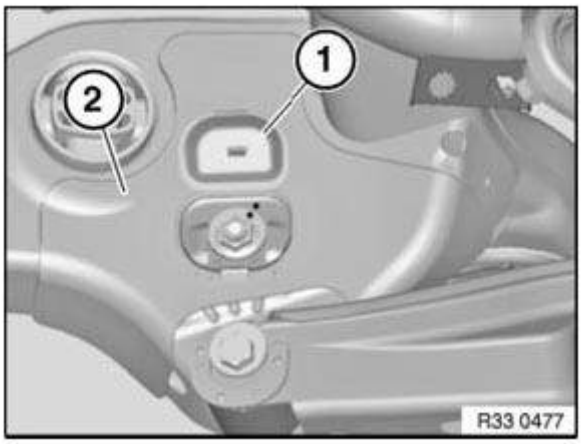


Fig. 84: Locating Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

33 32 071 REPLACING AN UPPER WISHBONE

IMPORTANT:

- The wishbone must be installed with the opening (U-section) facing downward!
- If the wishbone is bent, the screw connection between the control arm and wheel carrier must be replaced.

Necessary preliminary work:

- Remove **REAR WHEEL** .

Release left and right screws (1). Slide anti-roll bar (2) forward.

Tightening torque **33 55 1AZ** .

Installation note:

Replace screws.

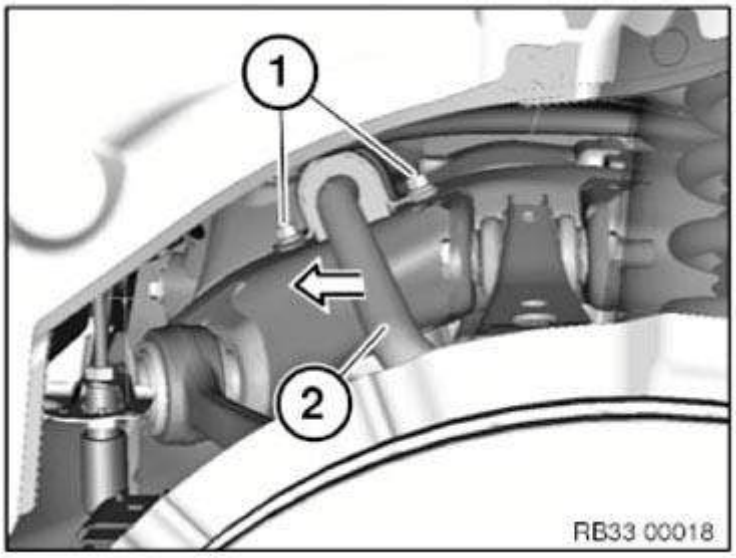


Fig. 85: Releasing Left And Right Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) and remove screw towards front.

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Tightening torque **33 32 6AZ**

Installation note:

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

Replace screw and nut.

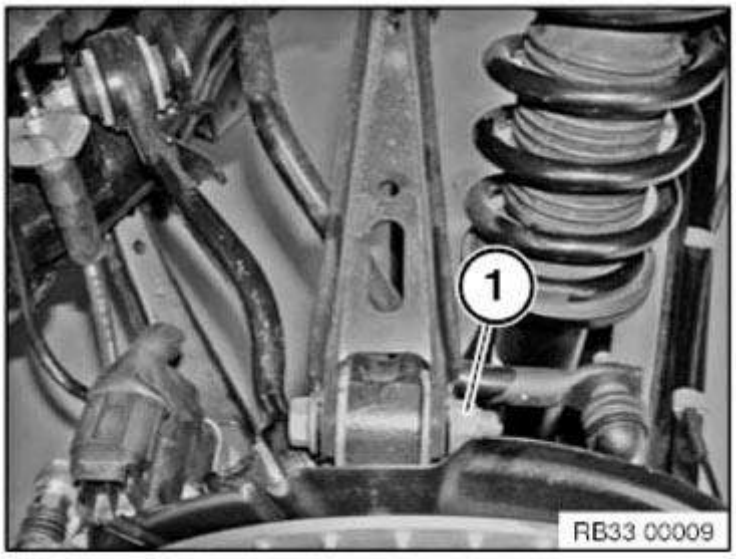


Fig. 86: Identifying Upper Wishbone Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) and remove screw towards front.

Tightening torque **33 32 5AZ**

Remove wishbone (2).

Installation note:

The wishbone must be installed with the opening (U-section) facing downward!

Raise wheel carrier using workshop jack.

Bolt heads face in forward direction.

Replace screw and nut.

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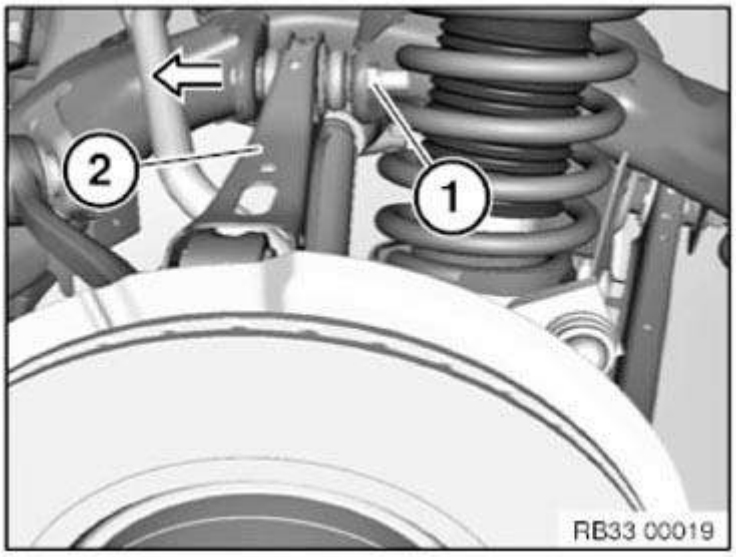


Fig. 87: Removing Wishbone
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Carry out **wheel alignment procedure** . See **32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION** or **32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD** .

33 32 021 REPLACING LEFT OR RIGHT TRAILING ARM

IMPORTANT:

- The trailing arm must be installed with the opening (U-section) facing downward!
- If the trailing arm is bent, the control arm/wheel carrier screw connection must be renewed.

Necessary preliminary work:

- Only on left side at ride height sensor: Release **JOINTED ROD AT TRAILING ARM** .

Unscrew nuts (1).

Tightening torque **33 32 1AZ** .

Pull out bolt towards front.

Installation note:

Note direction of insertion of bolts.

Replace screw and nut.

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

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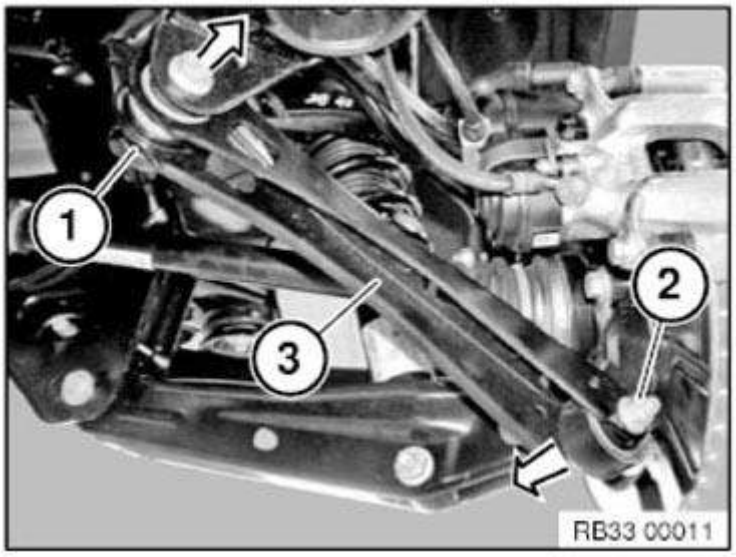


Fig. 88: Pulling Out Bolt Towards Front
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (2).

Tightening torque **33 32 2AZ** .

Move screws toward the rear.

Remove trailing arm (3) downward.

Installation note:

The trailing arm must be installed with the opening (U-section) facing downward!

Note direction of insertion of screw.

Replace screw and nut.

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

33 32 031 REPLACING RUBBER MOUNT FOR TRAILING ARM IN WHEEL CARRIER

Special tools required:

- 0 496 553
- 0 496 554
- **2 293 777**
- **2 293 768**
- **2 293 772**

Necessary preliminary tasks:

- Remove **REAR WHEEL** .
- Remove **TRAILING ARM**.
- Remove **CAMBER ARM FROM WHEEL CARRIER**.

Withdrawing rubber mount:

Pull out rubber mount with special tools 0 496 553, 0 496 554, **2 293 777** and **2 293 768** against direction of travel (F).

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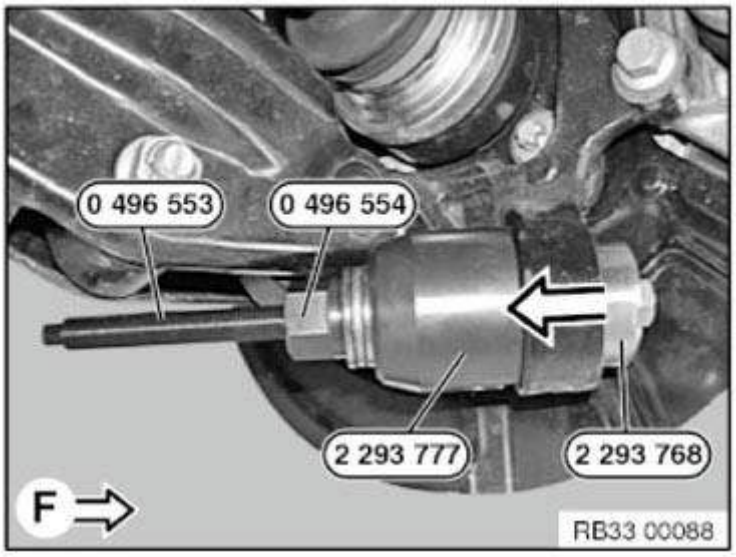


Fig. 89: Pulling Out Rubber Mount With Special Tools 0 496 553, 0 496 554
Courtesy of BMW OF NORTH AMERICA, INC.

Installing rubber mount:

Pull in rubber mount (1) against direction of travel (F) with special tools 0 496 553, 0 496 554, 2 293 777 and 2 293 772 up to limit position.

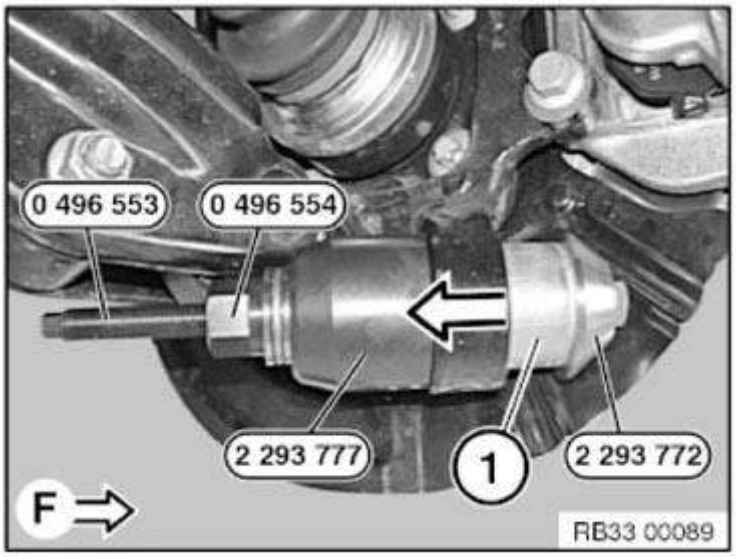


Fig. 90: Installing Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

33 32 029 REPLACING RUBBER MOUNT FOR WISHBONE IN WHEEL CARRIER

Special tools required:

- 0 496 553
- 0 496 554
- 2 293 768
- 2 293 777
- 2 293 770

Necessary preliminary tasks:

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- Release **WISHBONE ON WHEEL CARRIER**.

Withdrawing rubber mount:

Pull out rubber mount with special tools 0 496 553, 0 496 554, **2 293 768** and **2 293 777** out of wheel carrier against direction of travel (F).

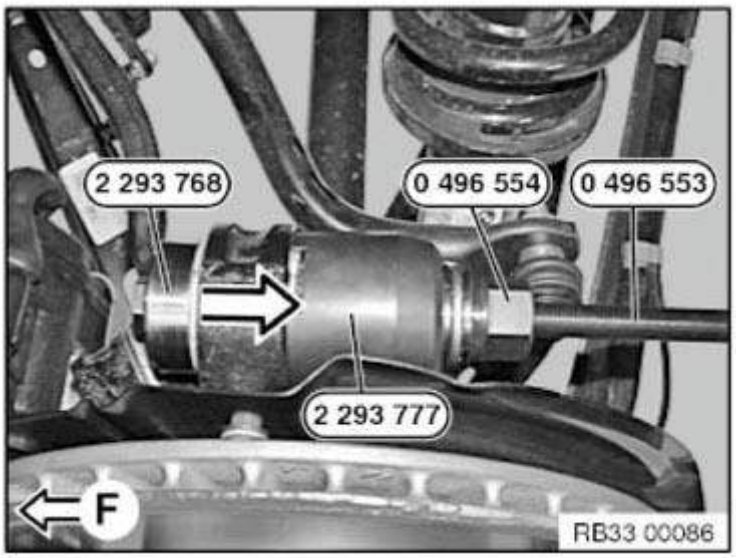


Fig. 91: Pulling Out Rubber Mount With Special Tools 0 496 553, 0 496 554 Out Of Wheel Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

Installing rubber mount:

IMPORTANT: Alight slot (1) of rubber mount parallel to wheel carrier.

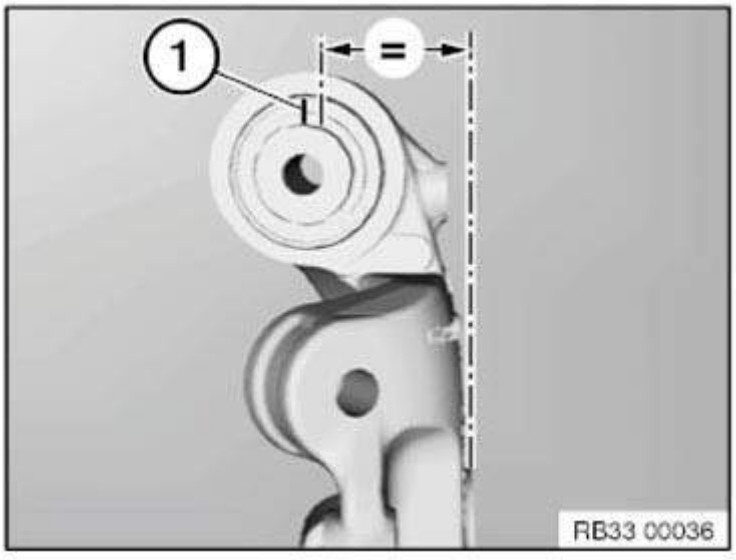


Fig. 92: Aligning Slot Of Rubber Mount Parallel To Wheel Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

Pull in rubber mount (1) against direction of travel (F) with special tools 0 496 553, 0 496 554, **2 293 770** and **2 293 777** up to limit position.

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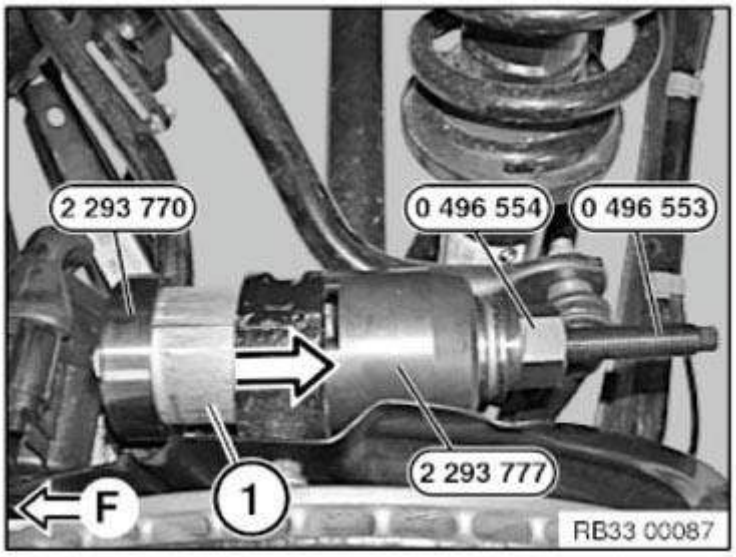


Fig. 93: Pulling Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Perform **WHEEL ALIGNMENT** .

AXLE MOUNTING

33 33 001 REPLACING LEFT OR RIGHT REAR AXLE SUPPORT COMPRESSION STRUT

Observe safety information for raising the vehicle
Driving **without** compression struts is not permitted!
IMPORTANT: Risk of damage!
The rear axle support must be supported at the front if both compression struts need to be replaced.

Release screws (1).

Tightening torque **33 33 2AZ**

Release screw (2).

Tightening torque **33 33 1AZ**

Installation note:

Replace screw.

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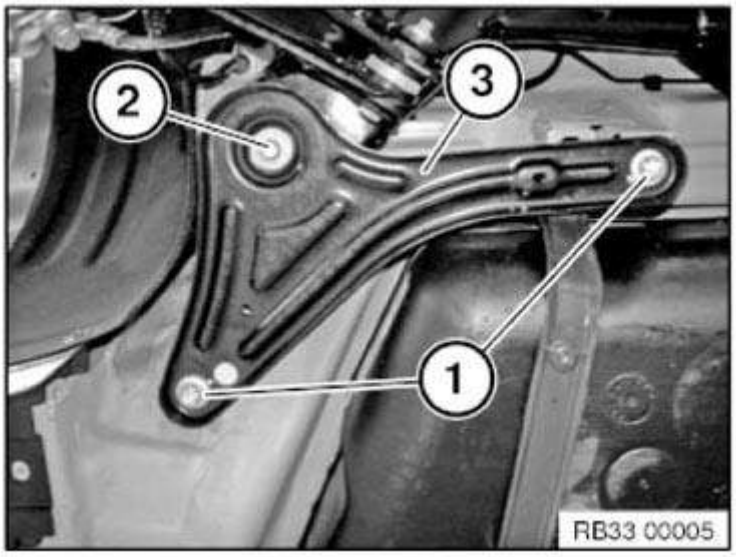


Fig. 94: Identifying Left/Right Rear Axle Support Compression Strut Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Remove compression strut (3).

Installation note:

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

Turn in all screws, first tightening screws (2) and then tightening screws (1).

33 33 101 REPLACING TWO RUBBER MOUNTS FOR REAR AXLE CARRIER

Special tools required:

- **33 4 140**
- 33 0 012
- **33 4 149**
- **2 293 791**
- **2 293 785**
- 2 208 576
- **2 155 744**
- 2 208 574
- **2 293 788**
- **2 293 790**

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.
Before lowering/removing the rear axle support, it is essential to place a minimum load of 100 kg in the luggage compartment to prevent the vehicle from toppling/slipping off the vehicle hoist!
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.**

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IMPORTANT: Before lowering/removing rear axle support:
Observe **SAFETY INSTRUCTIONS** for raising the vehicle
In order to avoid damage to vehicle hoist, perform weight compensation on vehicle.

Necessary preliminary tasks:

- Lower **REAR AXLE SUPPORT**.

Risk of damage!

To ensure that rear axle rubber mounts are securely seated in rear axle support, observe a waiting period of 2 hours after pressing in rubber mounts.

NOTE: Removal and installation are described on the rear rubber mount.

Complete special tool **33 4 140** using 33 0 012 and **33 4 149** , as shown.

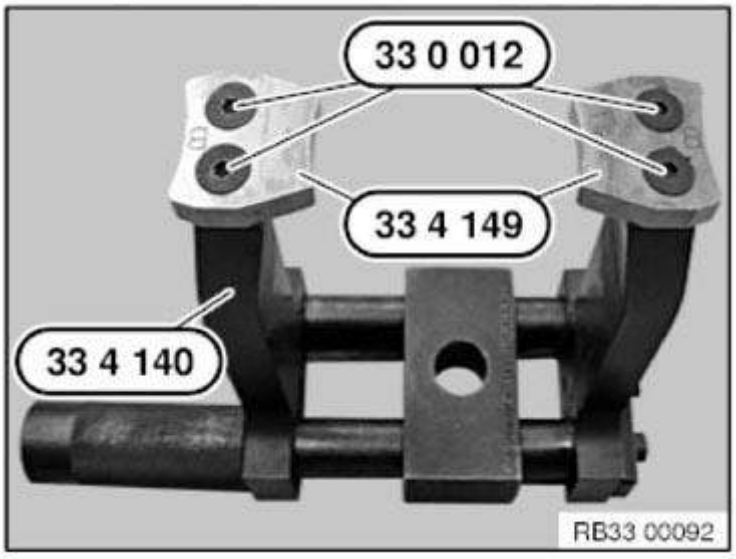


Fig. 95: Removing Rear Axle Support Special Tool 33 4 140
Courtesy of BMW OF NORTH AMERICA, INC.

Coat top edge of rubber mount with Circo Light (sourcing reference BMW Parts Department).

Fit special tool **2 293 791** on rubber mount in such a way that edge of rubber mount disappears in special tool.

Set special tool **2 293 785** on bearing bush as guide.

Align special tool **33 4 140** by way of openings in rubber mount.

NOTE: Ensure correct support at bearing bush of rear axle support.

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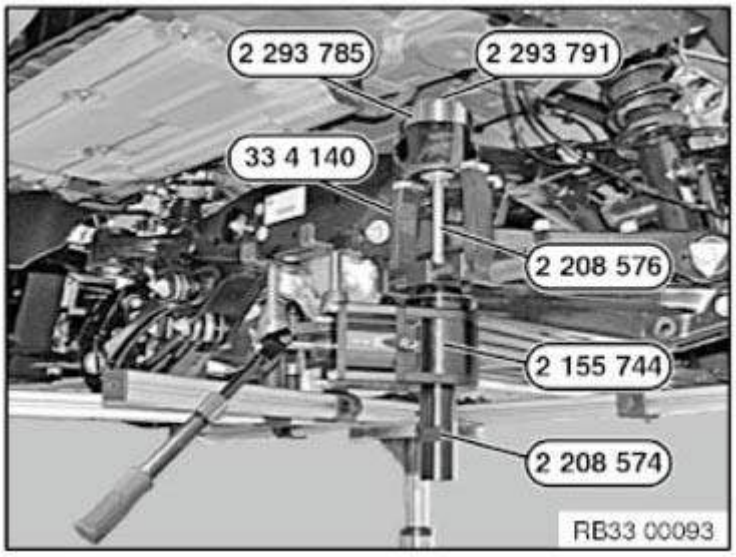


Fig. 96: Fitting Special Tool 2 293 791 On Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

Together with the other special tools 2 208 576, **2 155 744** and 2 208 574, pull rubber mount out of bearing bush.

Rubber mounts differ: (General view of rubber mount from bottom)
The installation depth (E) of the rubber mount core is greater for the front rubber mount (A) than for the rear rubber mount (B)

IMPORTANT:
A. Front rubber mount
B. Rear rubber mount

Arrows and notches (1) must point in direction of travel when installed.

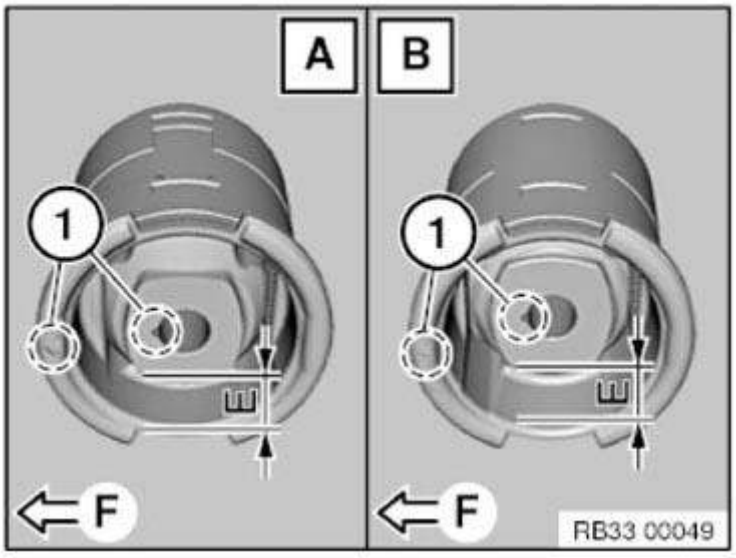


Fig. 97: Identifying Front And Rear Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

Coat new rubber mount (1) with Circo Light (sourcing reference BMW Parts Department).

Draw in rubber mount (1) in the rear axle support with special tools **2 293 788** , **2 293 790** , 2 208 574, 2 208 576 and **2 155 744** as far as it will go.

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NOTE: **When the maximum piston stroke has reached the pump, open the valve and turn special tool 2 208 574 to press back the piston.**

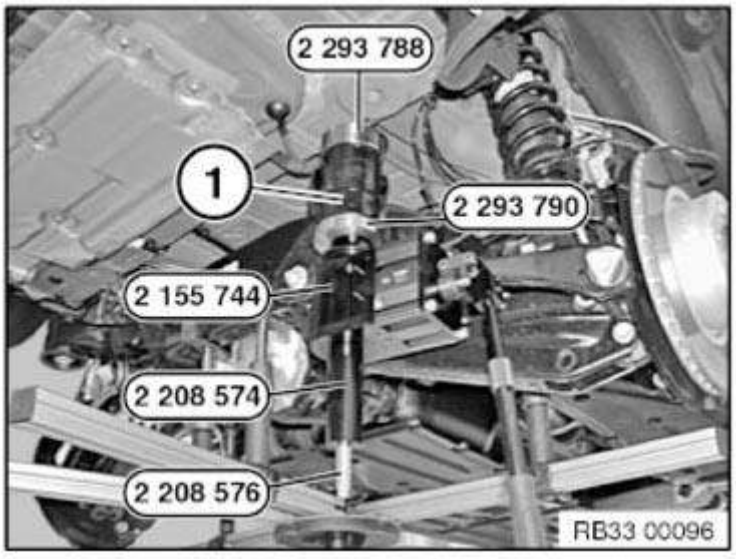


Fig. 98: Drawing In Rubber Mount From Rear Axle Support With Special Tools 2 293 788
Courtesy of BMW OF NORTH AMERICA, INC.

WHEEL BEARINGS

33 41... DETACHING WHEEL BEARING INNER RING FROM DRIVE FLANGE (DRIVE FLANGE REMOVED)

Special tools required:

- 33 4 401
- 33 4 403
- 33 4 404
- 33 4 408
- 33 4 409
- 33 4 407
- 2 230 163
- 33 4 402
- 33 4 400

IMPORTANT: Special tool 33 4 409 must not be removed!

Insert special tool 33 4 407 into special tool 33 4 401 .

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Fig. 99: Inserting Special Tool 33 4 407 Into Special Tool 33 4 401
Courtesy of BMW OF NORTH AMERICA, INC.

Fit special tool **2 230 163** and tension until it lies firmly against wheel bearing inner ring.

Fit special tool **33 4 401** in conjunction with **33 4 407** .



Fig. 100: Fitting Special Tool 33 4 401 In Conjunction With 33 4 407
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew spindle **33 4 402** as far as is possible.

Tighten special tool **33 4 400** until it lies against special tool **2 230 163** .

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Fig. 101: Tightening Special Tool 33 4 400
Courtesy of BMW OF NORTH AMERICA, INC.

- Hydraulic unit - 81 64 2 155 744
- Adapter kit 1 - 81 64 2 155 745
- Adapter kit 2 - 81 64 2 155 746

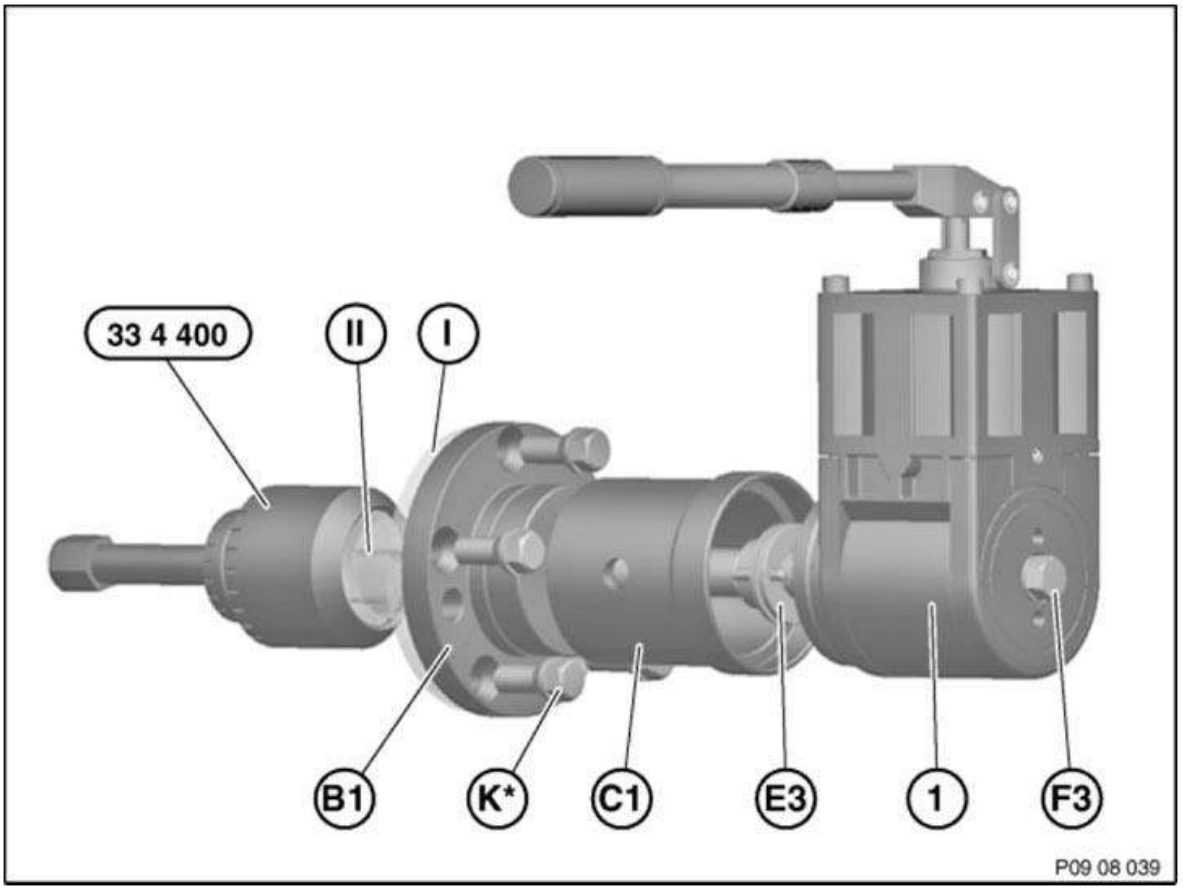


Fig. 102: Identifying Hydraulic Unit, Adapter Kit 1 And 2
Courtesy of BMW OF NORTH AMERICA, INC.

- Pressure cylinder of hydraulic unit (1) must be in the initial position.
- Spindle F3 must terminate flush with hydraulic unit (1).
- Assemble special tool as shown in graphic

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- Turn spindle of special tool **33 4 400** up to limit position.

The following tools are required for detachment, consult graphic for arrangement:

Vehicle components:

I	Drive flange hub
II	Wheel bearing inner ring

Required components for all models and types:

1	Hydraulic unit
F3	Spindle M24 (length 270 mm)
E3	Washer M24
C1	Holding sleeve
K1	Screws M12 x 1.5
K2	Screws M14 x 1.5
B1	Adapter
33 4 400	Special tool

Components specific to model and type:

K1	Screws M12 x 1.5
K2	Screws M14 x 1.5

Detach wheel bearing inner ring from drive flange.

33 41 000 REPLACING DRIVE FLANGE ON LEFT/RIGHT REAR AXLE SHAFT

Special tools required:

- 34 4 000

Necessary preliminary tasks:

- Remove **REAR WHEEL** .

If necessary, remove visual protection cap (1).

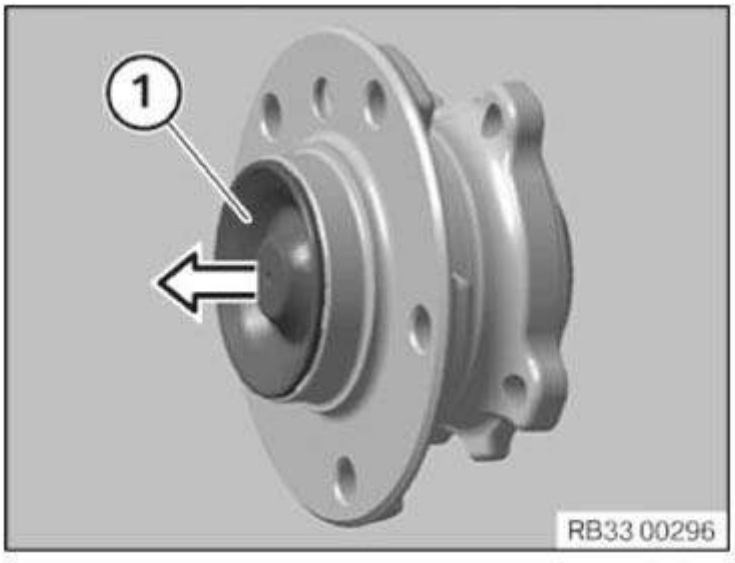


Fig. 103: Removing Visual Protection Cap

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Courtesy of BMW OF NORTH AMERICA, INC.

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

Activate parking brake and release collar nut.

Tightening torque **33 41 1AZ** .

Installation note:

Lightly oil the gearing at the shaft journal.

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

Replace the collar nut and secure it by positive peening on flat areas of output shaft.

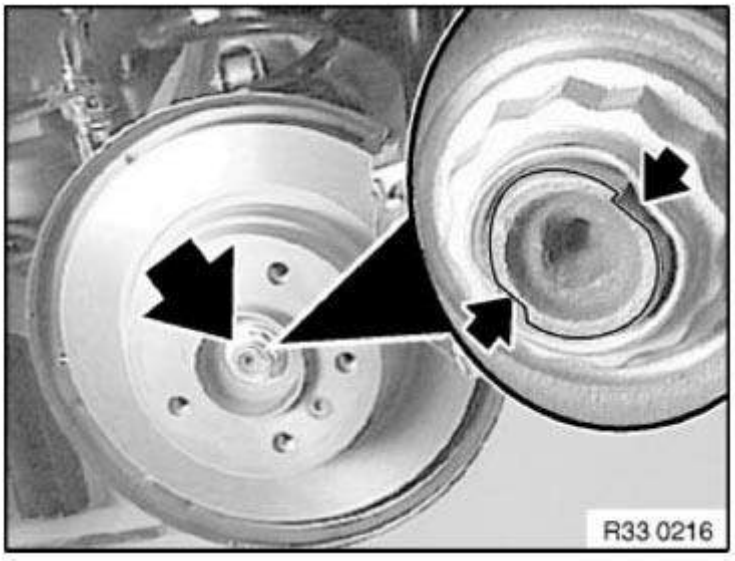


Fig. 104: Locating Collar Nut
Courtesy of BMW OF NORTH AMERICA, INC.

- Remove **BRAKE DISC** .

only: F01, F02, F04, F07:

Twist roll pins (1) 90Â° with special tool 34 4 000 and detach.

Only disconnect return spring (2) with brake spring pliers.

Remove brake pads (3).

NOTE: the fitted position of the adjusting screw must not be changed or turned.

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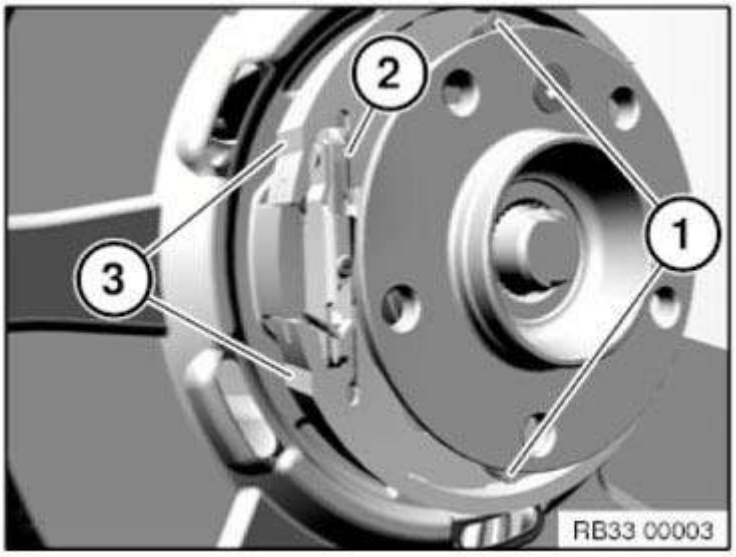


Fig. 105: Identifying Return Spring, Brake Pads And Roll Pins
Courtesy of BMW OF NORTH AMERICA, INC.

Use the special tool from the BMW workshop catalogue.

- Hydraulic unit - 81 64 2 155 744
- Adapter kit 1 - 81 64 2 155 745
- Adapter kit 2 - 81 64 2 155 746

The following work steps describe detachment of the drive flange:

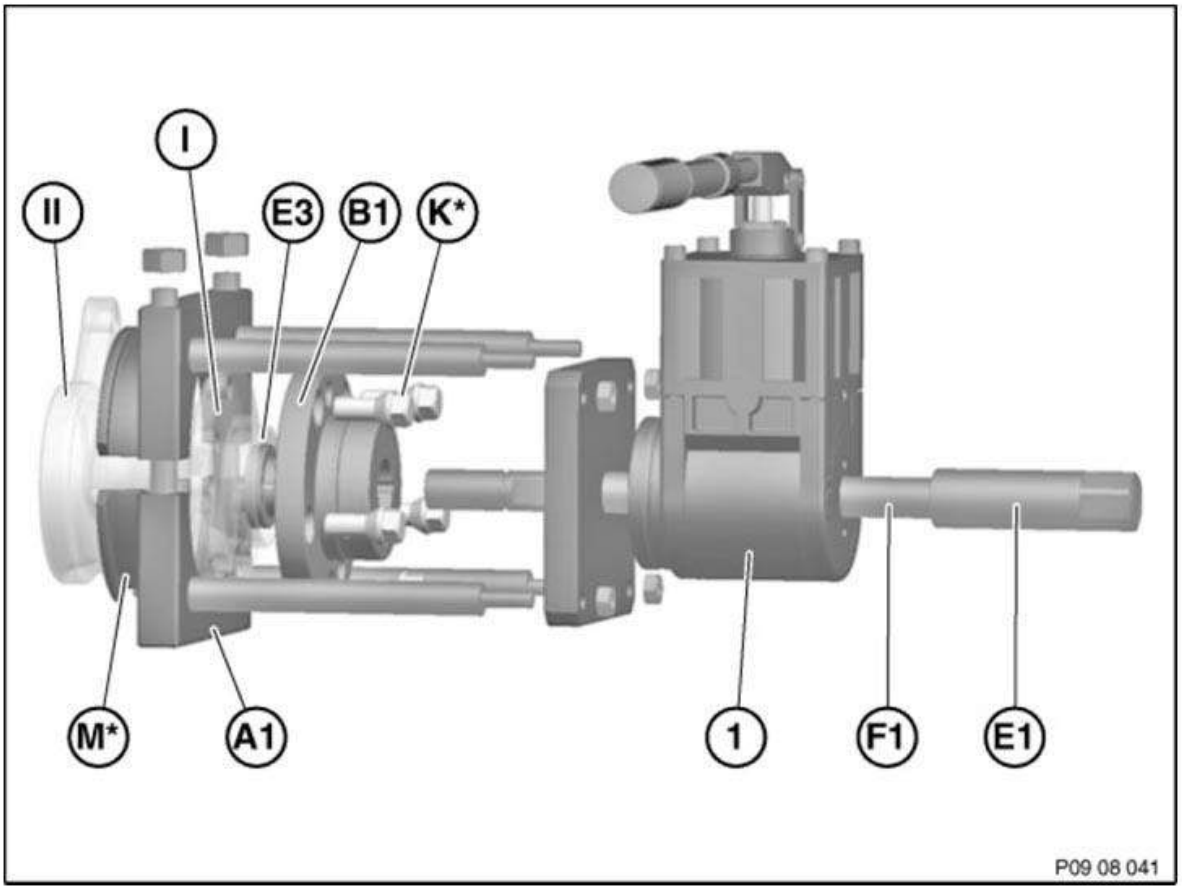


Fig. 106: Identifying Drive Flange, Wheel Carrier And Hydraulic Unit Components
Courtesy of BMW OF NORTH AMERICA, INC.

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The following tools are required to pull the drive flange out of the wheel bearing. For arrangement, see **Fig. 106**:

Vehicle components:

I	Drive flange
II	Wheel carrier/swivel bearing

Required components for all models and types:

E3	Washer
B1	Adapter
E1	Holding sleeve M24
F1	Spindle M24 (length 425 mm)
1	Hydraulic unit
A1	Device

Components specific to model and type:

M1	Adapter diameter 100/101 mm
M2	Adapter diameter 88 mm
M3	Adapter diameter 102 mm
M4	Adapter diameter 96 mm
M5	Adapter diameter 90 mm
M6	Adapter diameter 102/113 mm
K1	Screws M12 x 1.5
K2	Screws M14 x 1.5

- Pull out drive flange using the hydraulic tool.

IMPORTANT: Wheel bearing will be destroyed by being pulled out of the drive flange and must be renewed!

The following work steps pulling in the drive flange:

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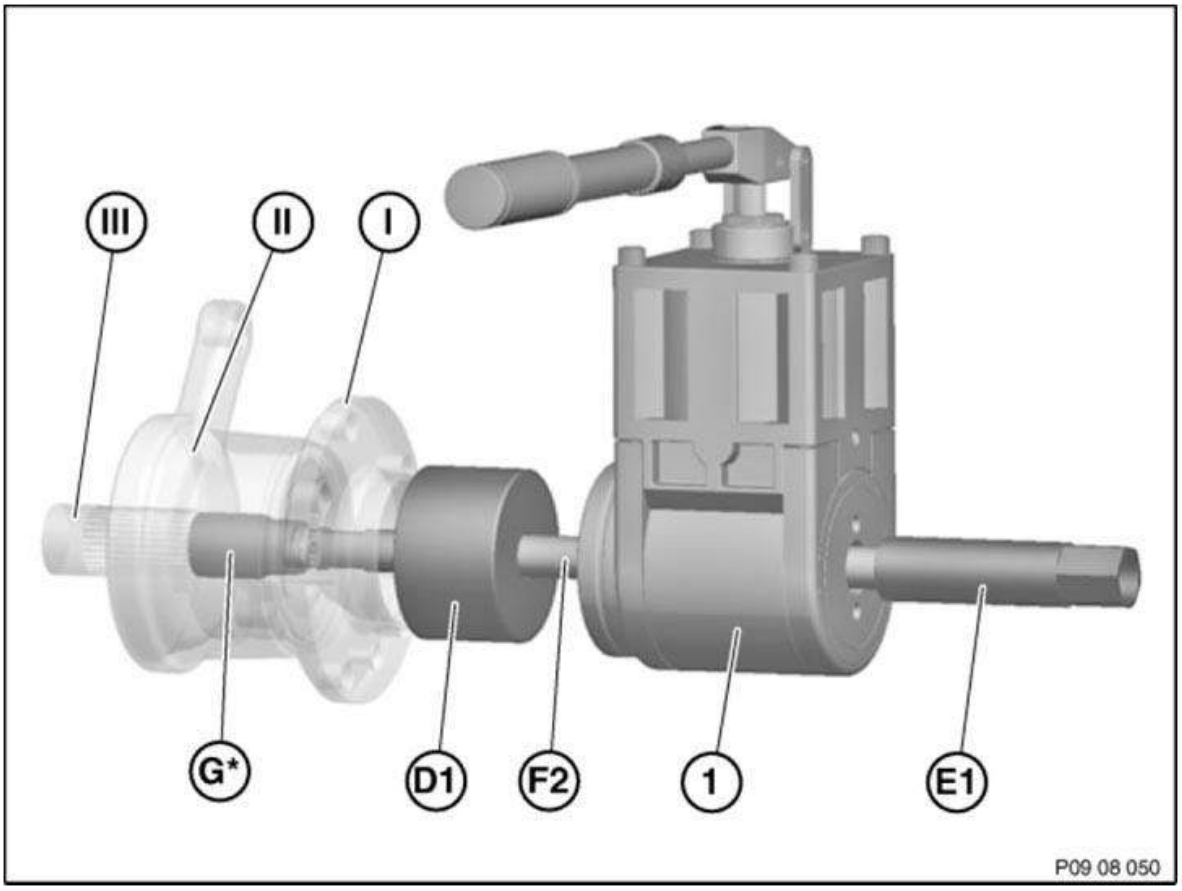


Fig. 107: Identifying Drive Flange Hub, Wheel Carrier And Output Shaft Components
Courtesy of BMW OF NORTH AMERICA, INC.

The following tools are required to pull the drive flange in. For arrangement, see **Fig. 107**:

Installation note:

The drive flange and output shaft can be installed in the wheel bearing in one operation.

Vehicle components:

I	Drive flange hub
II	Wheel carrier/swivel bearing
III	Output shaft

Required components for all models and types:

1	Hydraulic unit
E1	Holding sleeveM24
D1	Washer
F2	Spindle M24/M20 (length 335 mm)

Components specific to model and type:

G1	Adapter M22 x 1.5 to M20
G2	Adapter M24 x 1.5 to M20
G3	Adapter M27 x 1.5 to M20

IMPORTANT: Risk of damage!
Due to the technical requirements, the special tool used, sleeve G,* is relatively thin-walled. So

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that the load limits of the clamping sleeve are not exceeded, you **must** use the adapter 81 64 2 318 661 together with a torque wrench.

Fit adapter with torque wrench to hydraulic unit (see **Fig. 108**).

Set torque wrench to 20 Nm.

Oil drive flange lightly and attach to the output shaft gearing.

Pull in drive flange with hydraulic tool until torque wrench triggers.

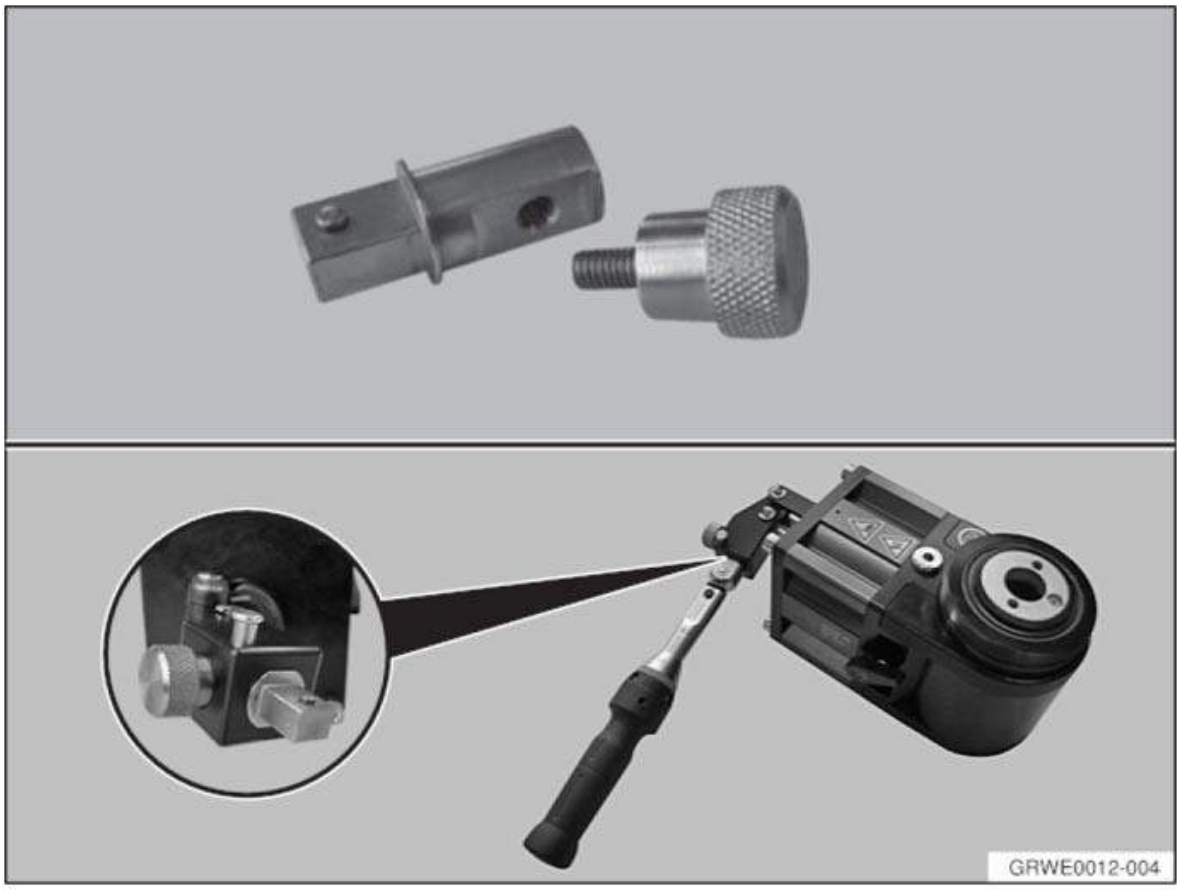


Fig. 108: Pulling Drive Flange Using Tool
Courtesy of BMW OF NORTH AMERICA, INC.

Installing parking brake shoes. (Only for F01, F02, F04, F07)

Install **BRAKE DISC** .

Activate parking brake and tighten collar nut.

Tightening torque **33 41 1AZ** .

Installation note:

Replace collar nut.

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

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

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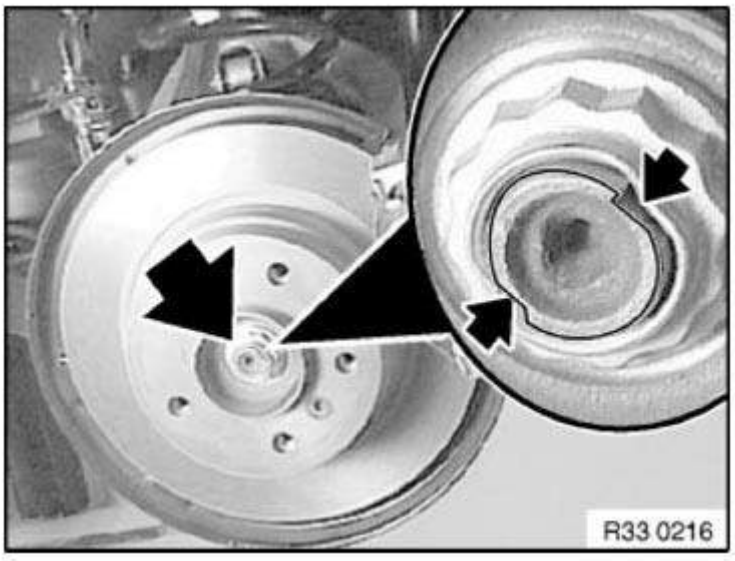


Fig. 109: Locating Collar Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

Only for F01, F02, F04, F07:

- Adjust parking brake.

33 41 151 REPLACING LEFT OR RIGHT WHEEL BEARING ON REAR AXLE SHAFT

Necessary preliminary work:

- Remove **DRIVE FLANGE FOR OUTPUT SHAFT**.

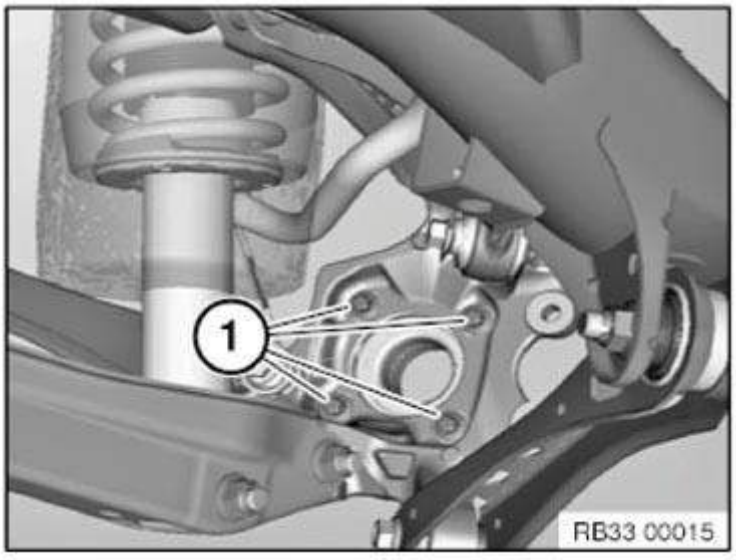
Release screws (1).

Tightening torque **33 41 2AZ** .

Remove wheel bearing.

Installation note:

Replace screws.



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Fig. 110: Identifying Wheel Bearing Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Keep contact surface (2) of wheel bearing/wheel carrier clean and free from oil and grease.

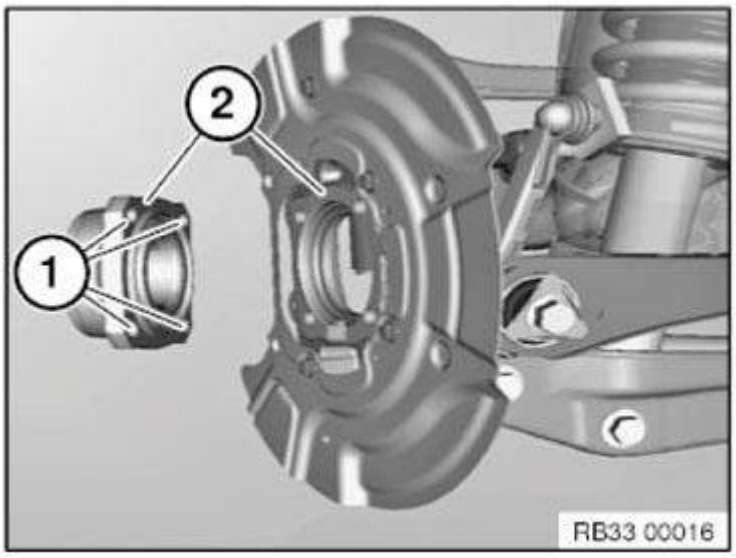


Fig. 111: Identifying Contact Surface Of Wheel Bearing/Wheel Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

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 52 100 REMOVING AND INSTALLING REAR LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER

NOTE: **With full spring deflection, the coil spring may touch the gaiter, depending on the design.**

This is not a fault!

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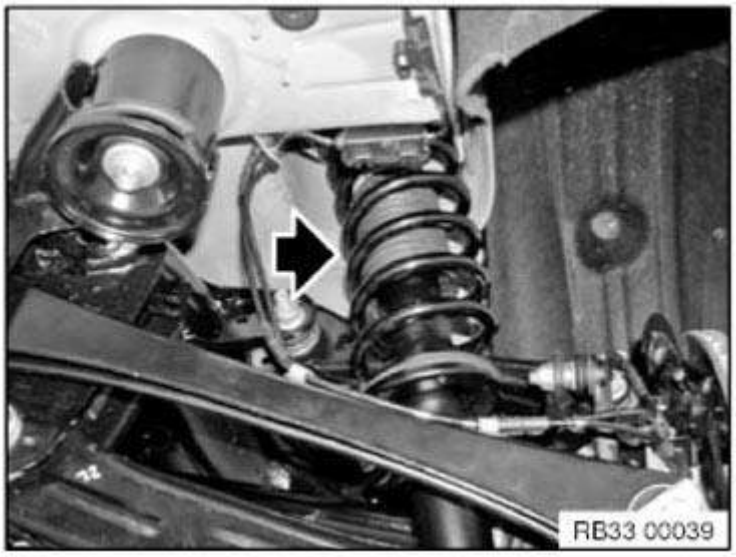


Fig. 112: Identifying Rear Spring Strut Shock Absorber
Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks:

- Remove **luggage compartment trim panels** . See **51 47 151 REMOVING AND INSTALLING/REPLACING LEFT LUGGAGE COMPARTMENT WHEEL ARCH PANEL** or **51 47 161 REMOVING AND INSTALLING/REPLACING RIGHT LUGGAGE COMPARTMENT WHEEL ARCH PANEL** .
- Secure spring strut against dropping.
- Remove **CAMBER ARM**.

Release screw (1).

Tightening torque **33 52 1AZ** .

Installation note:

Replace screws.

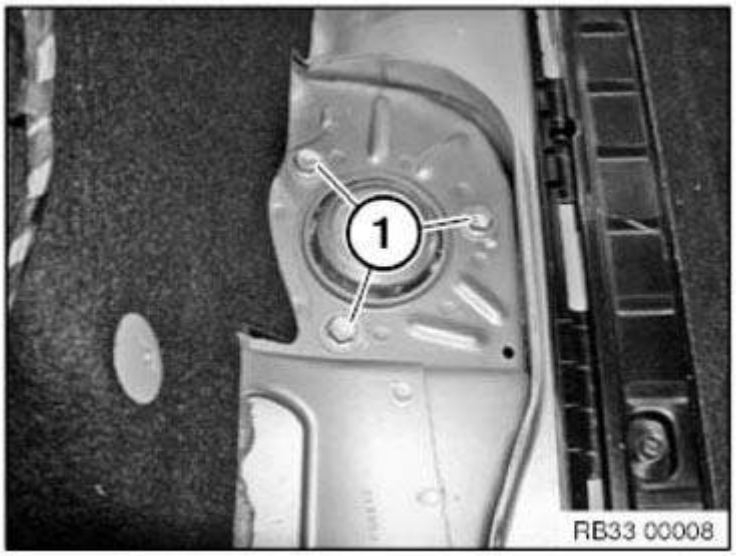


Fig. 113: Identifying Rear Spring Strut Shock Absorber Screws
Courtesy of BMW OF NORTH AMERICA, INC.

After completing work:

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- Perform **WHEEL ALIGNMENT CHECK** .

33 52 131 REPLACING REAR LEFT OR RIGHT SPRING STRUT SHOCK ABSORBER

Special tools required:

- 31 3 340
- **31 3 341**
- 31 3 353
- **33 0 040**

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

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.

IMPORTANT:

- When replacing the spring strut, replace the auxiliary damper as well!

Necessary preliminary tasks:

- Remove **REAR SPRING STRUT SHOCK ABSORBER UNIT**.

Removing:

Clamp special tool **31 3 341** in vice.

Place special tools **31 3 353** . See **0493567 313353 HOLDER** or **2213029 313353 TOOL MECHANICAL TOOL** from top on special tool **31 3 341** . Retaining bolts (1) must be felt and heard snapping into place.

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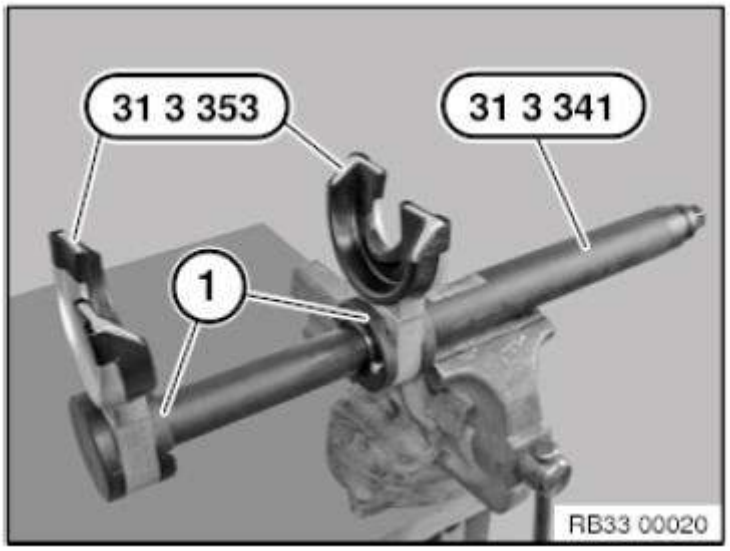


Fig. 114: Placing Special Tools 31 3 353 From Top On Special Tool 31 3 341
Courtesy of BMW OF NORTH AMERICA, INC.

Clean coil spring to remove all coarse dirt and mount on special tools **31 3 353** . See **0493567 313353 HOLDER** or **2213029 313353 TOOL MECHANICAL TOOL** .

WARNING: **Coils of coil spring must be located completely in recesses of special tools 31 3 353!**
Compress coil spring until stress on piston rod is relieved.

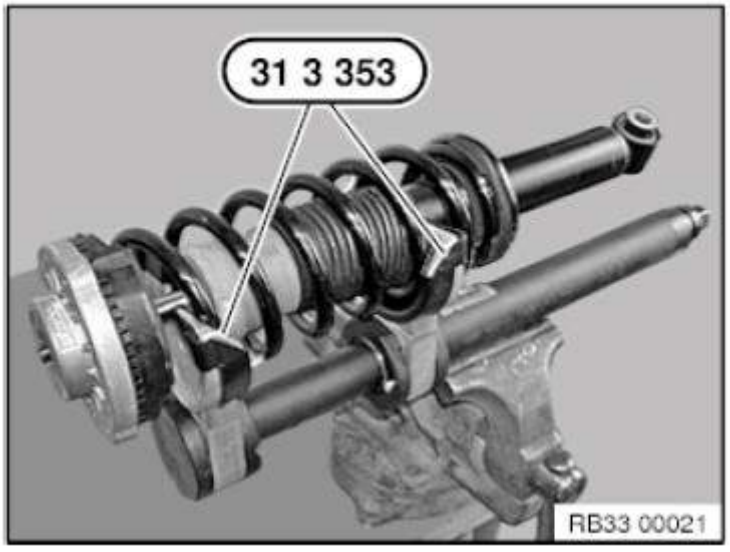


Fig. 115: Compressing Coil Spring Using Special Tools 31 3 353
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut with special tool 33 0 040.

Remove spring pad with dust boot.

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

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

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Fig. 116: Removing Nut Using Special Tool (33 0 040)
Courtesy of BMW OF NORTH AMERICA, INC.

If necessary, remove auxiliary damper (1) with protective tube and spring pad (2) from spring strut.

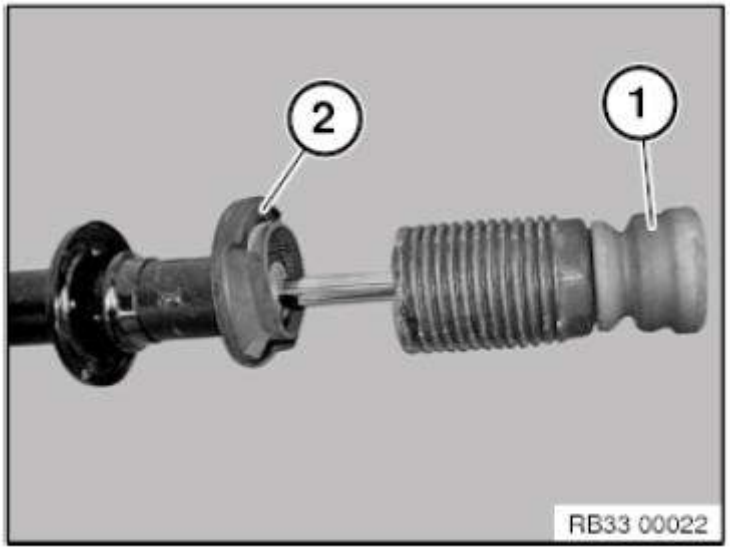


Fig. 117: Identifying Auxiliary Damper With Protective Tube And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Relieve tension on coil spring and remove from special tools 31 3 353.

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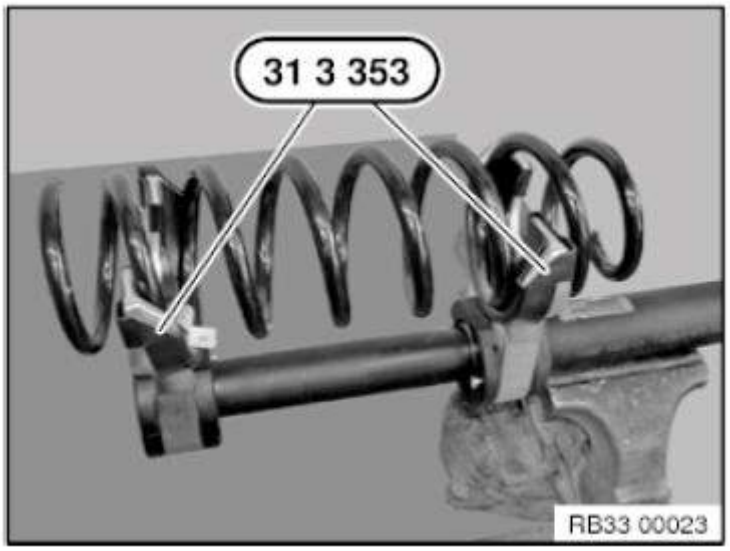


Fig. 118: Relieving Tension On Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Assembly:

WARNING: **Do not compress coil spring to full extent.**
Coils of coil spring must be located completely in recesses of special tools 31 3 353!
Tension coil spring.

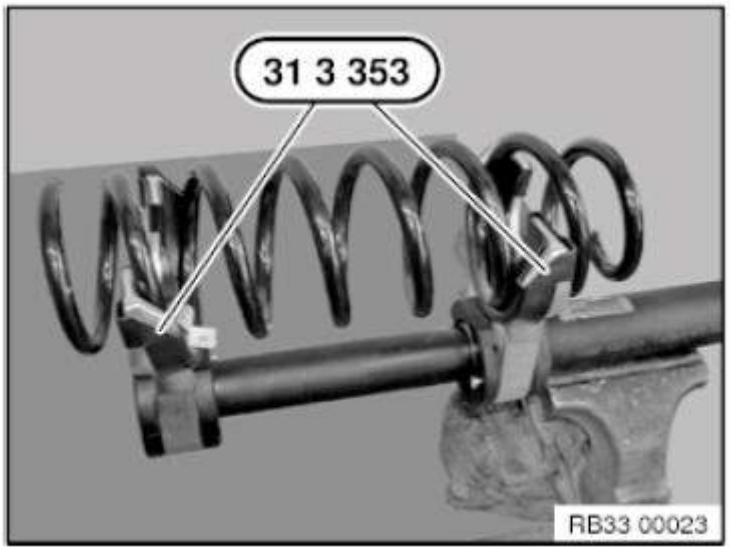


Fig. 119: Compressing Coil Spring Using Special Tools 31 3 353
Courtesy of BMW OF NORTH AMERICA, INC.

Check auxiliary spring (1) with protective tube and spring pad (2) for damage, replace if necessary.

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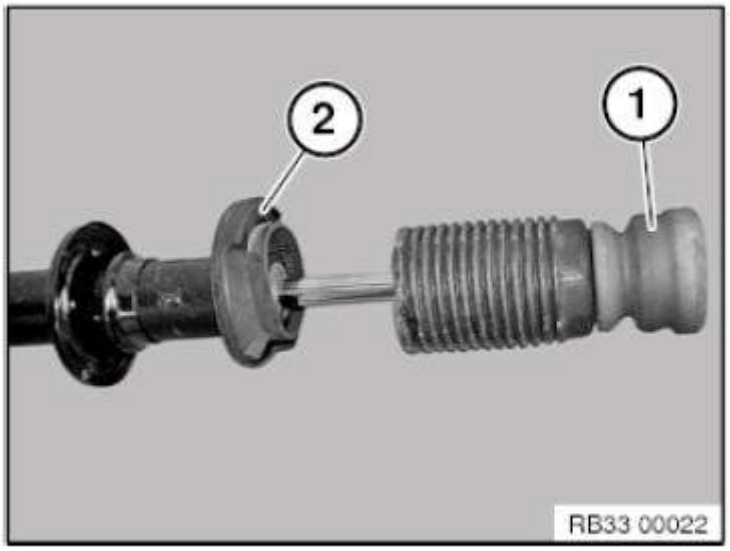


Fig. 120: Identifying Auxiliary Spring With Protective Tube And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Insert spring strut into tensioned coil spring.

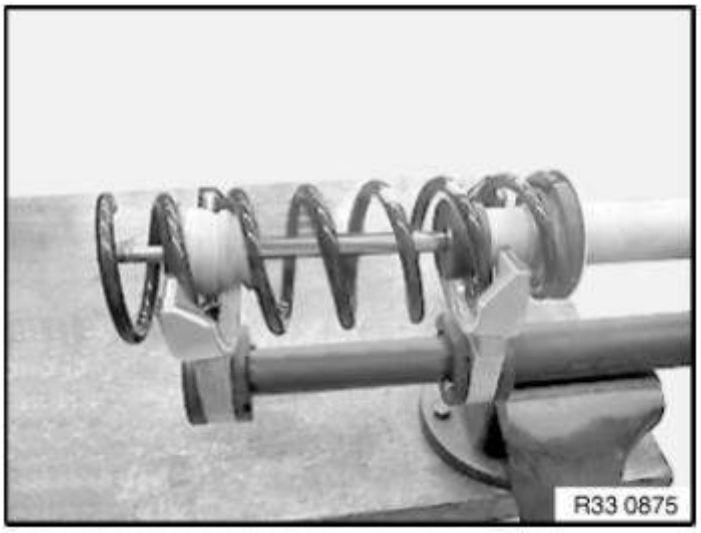


Fig. 121: Inserting Shock Absorber In Tensioned Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Lower end of coil spring must rest on stop of spring pad!

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Fig. 122: Identifying Lower End Of Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

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

IMPORTANT: The arrows on support bearing (1) and spring pad (2) must be aligned.



Fig. 123: Identifying Support Bearing And Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

Mount support bearing and spring pad on piston rod.

IMPORTANT: Align support bearing and spring pad to end of coil spring.

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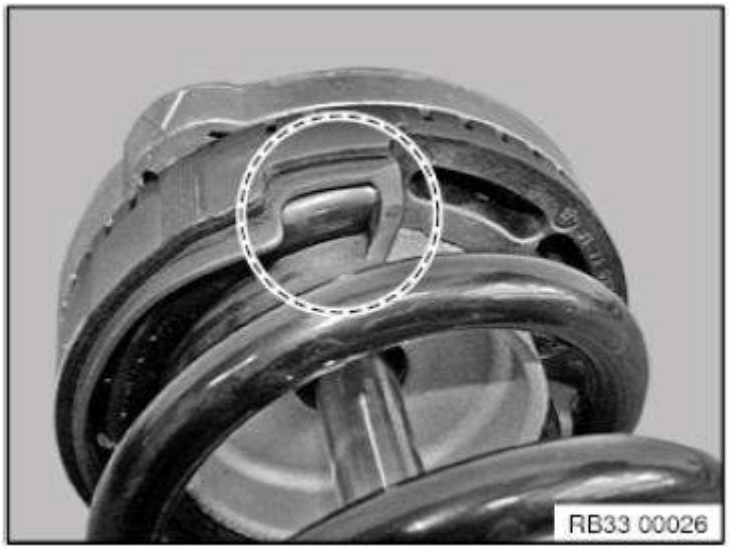


Fig. 124: Aligning Support Bearing And Spring Pad To End Of Coil Spring
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The marks (1) must be aligned with the hole in rubber mount (2).

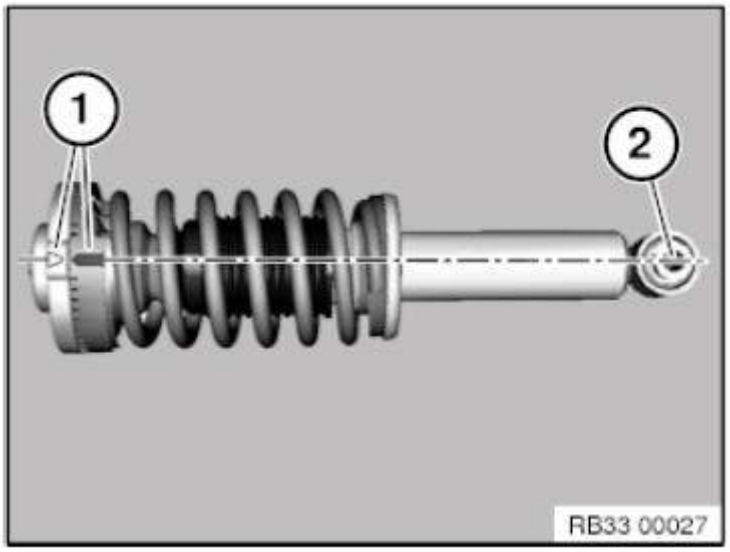


Fig. 125: Identifying Marks With Hole In Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

Replace nut and tighten down with special tool **33 0 040** .

Tightening torque **33 52 2AZ** .

Relieve tension on coil spring.

Impact screwdrivers are prohibited!

Risk of damage inside the shock absorber!

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Fig. 126: Tightening Nut With Special Tool 33 0 040
Courtesy of BMW OF NORTH AMERICA, INC.

33 52 161 REPLACING REAR LEFT OR RIGHT THRUST BEARING FOR SPRING STRUT/SHOCK ABSORBER

Installation note:

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

NOTE: **Procedure is described in Replacing rear left or right spring strut shock absorber.**

SPRINGS WITH SUSPENSION

33 53 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT COIL SPRING

Installation note:

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

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 process is described in THE REAR LEFT OR RIGHT SPRING STRUT.**

After installation:

- Check headlight adjustment, correct if necessary.

STABILIZER BAR

33 55 000 REMOVING AND INSTALLING/REPLACING REAR ANTI-ROLL BAR

Necessary preliminary work:

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- Remove **BOTH ANTI-ROLL BAR LINKS FROM ANTI-ROLL BAR**.
- Lower **REAR AXLE SUPPORT**.

NOTE: **To simplify the graphic, anti-roll bar removal is shown on the removed rear axle.**

Release screws (1).

Tightening torque **33 55 1AZ** .

Remove both **RUBBER MOUNTS FROM ANTI-ROLL BAR**.

Turn anti-roll bar (2) and remove from the side.

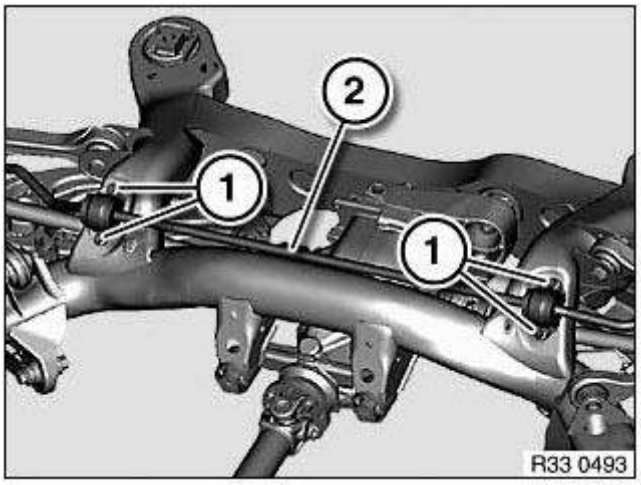


Fig. 127: Identifying Anti-Roll Bar And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Check both rubber mounts for damage and replace if necessary.

Keep retaining bracket, rubber mount and stabilizer clean and free from oil and grease.

33 55 041 REPLACING ANTI-ROLL BAR LINK FOR ANTI-ROLL BAR ON LEFT OR RIGHT

Release nuts (1); if necessary, grip at inner Torx socket.

Tightening torque **33 55 2AZ** .

Release screw (2).

Tightening torque **33 55 4AZ** .

Remove anti-roll bar link (3).

Installation note:

Replace self-locking nut and screw.

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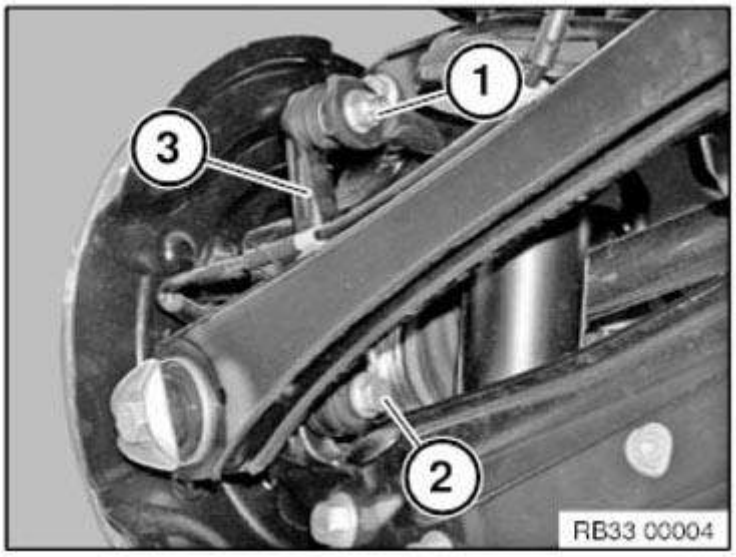


Fig. 128: Identifying Anti-Roll Bar Link, Screws, Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

33 55 021 REPLACING BOTH RUBBER MOUNTS FOR ANTI-ROLL BAR MOUNTING

Necessary preliminary work:

- Remove **REAR WHEELS** .

Release screws (1).

Tightening torque, **33 55 1AZ** .

Pull off retaining bracket (2), open rubber mount (3) at slot and remove.

Installation note:

Keep retaining bracket (2), rubber mount (3) and anti-roll bar clean and free from oil and grease.

Clean rear anti-roll bar on both sides.

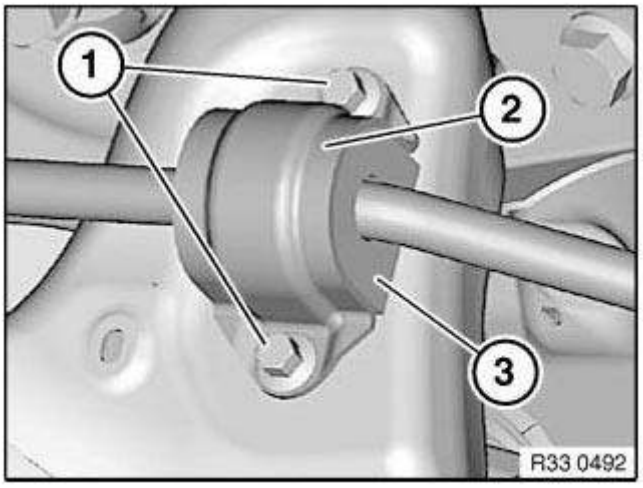


Fig. 129: Identifying Retaining Bracket, Rubber Mount And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Position rubber mount on rear anti-roll bar.

Mount retaining bracket (2) on rubber mount (3).

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Push rubber mount with retaining bracket on rear anti-roll bar to installation position and screw tight.

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REAR AXLE

2156275 ADAPTER

2156275 Adapter AM

NOTE: **Adapter M4 (Ã˜ 96mm) in connection with adapter kit 2 (BMW), (81642155746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 1: Identifying Adapter (2156275)
Courtesy of BMW OF NORTH AMERICA, INC.

2348434 ADAPTER

2348434 Adapter AM

NOTE: **Adapter R7 (M24/Ã˜ 87/95mm) in connection with adapter kit F03 (81 64 2 348 804) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 02 13 (900)

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Fig. 2: Identifying Adapter (2348434)
Courtesy of BMW OF NORTH AMERICA, INC.

2343999 ADAPTER

2343999 Adapter AM

NOTE: **Adapter P5 (/Ã˜ 45/82.5mm) in connection with wheel bearing adapter kit F30 (84mm, no longer in Catalogue) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 09 12 (873)



Fig. 3: Identifying Adapter (2343999)
Courtesy of BMW OF NORTH AMERICA, INC.

2156280 ADAPTER

2156280 Adapter AM

NOTE: **Adapter N1 (Ã˜ 49mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 06 09 (544)



Fig. 4: Identifying Adapter (2156280)
Courtesy of BMW OF NORTH AMERICA, INC.

2344000 ADAPTER

2344000 Adapter AM

NOTE: **Adapter R6 (M24/Ã˜ 63/75mm) in connection with adapter kit F30 (84mm wheel bearings) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 09 12 (873)



Fig. 5: Identifying Adapter (2344000)
Courtesy of BMW OF NORTH AMERICA, INC.

2156277 ADAPTER

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2156277 Adapter AM

NOTE: **Adapter N4 (Ã˜ 39mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 6: Identifying Adapter (2156277)
Courtesy of BMW OF NORTH AMERICA, INC.

0492371 ADAPTER

0492371 334070 Adapter Mechanical tool

NOTE: **For installing the rear axle shaft**

Storage Location

X4

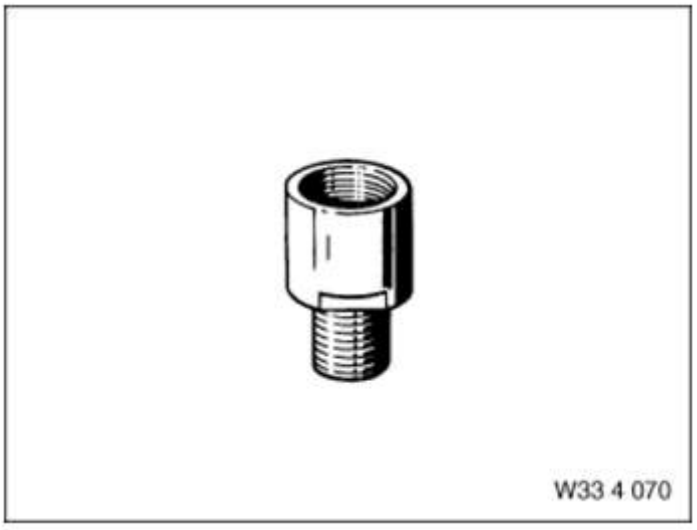


Fig. 7: Identifying Adapter (0492371)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492372 ADAPTER

0492372 334080 Adapter Mechanical tool

NOTE: **For installing the rear axle shaft**

Storage Location

X4

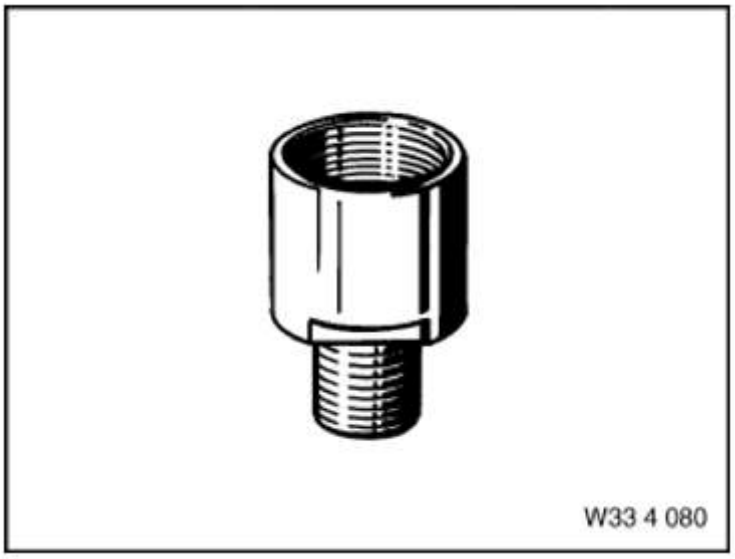


Fig. 8: Identifying Adapter (0492372)
Courtesy of BMW OF NORTH AMERICA, INC.

2159723 ADAPTER

2159723 Adapter AM

NOTE: **Adapter M2 (Ã˜ 88mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



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Fig. 9: Identifying Adapter (2159723)
Courtesy of BMW OF NORTH AMERICA, INC.

2348435 ADAPTER

2348435 Adapter AM

NOTE: **Adapter M8 for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

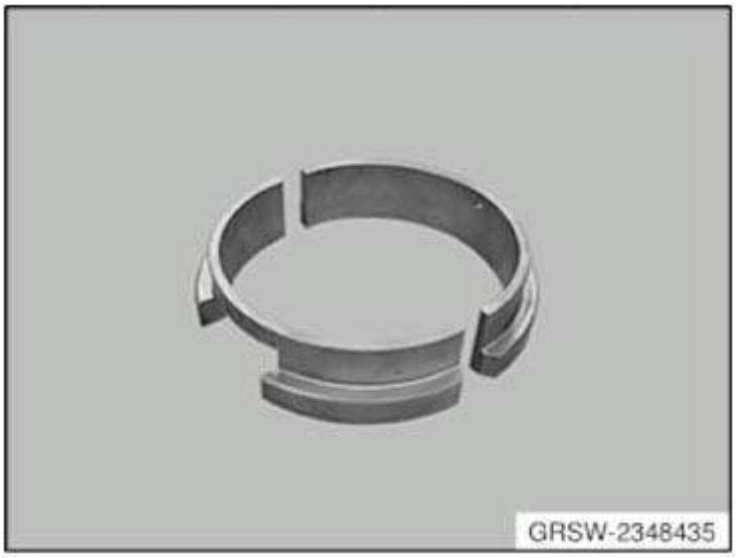


Fig. 10: Identifying Adapter (2348435)
Courtesy of BMW OF NORTH AMERICA, INC.

2156282 ADAPTER

2156282 Adapter AM

NOTE: **Adapter P3 (Ã˜ 39/72mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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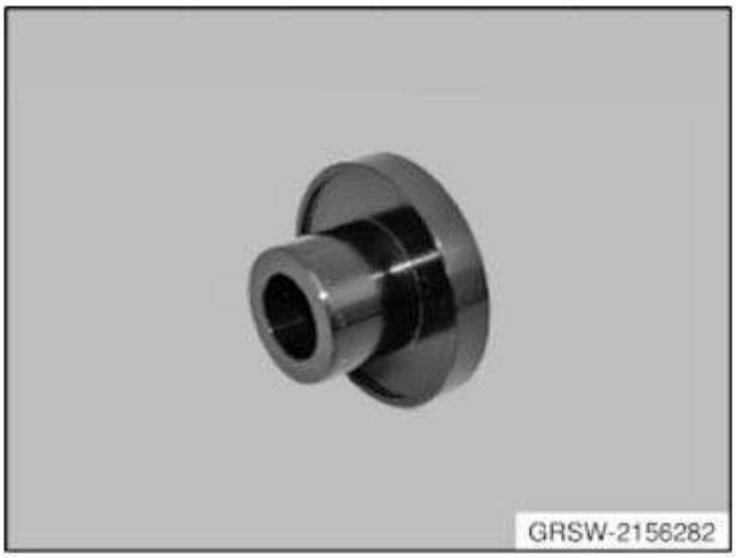


Fig. 11: Identifying Adapter (2156282)
Courtesy of BMW OF NORTH AMERICA, INC.

2156288 ADAPTER

2156288 Adapter AM

NOTE: **Adapter R3 (M24/Ã˜ 69/79mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

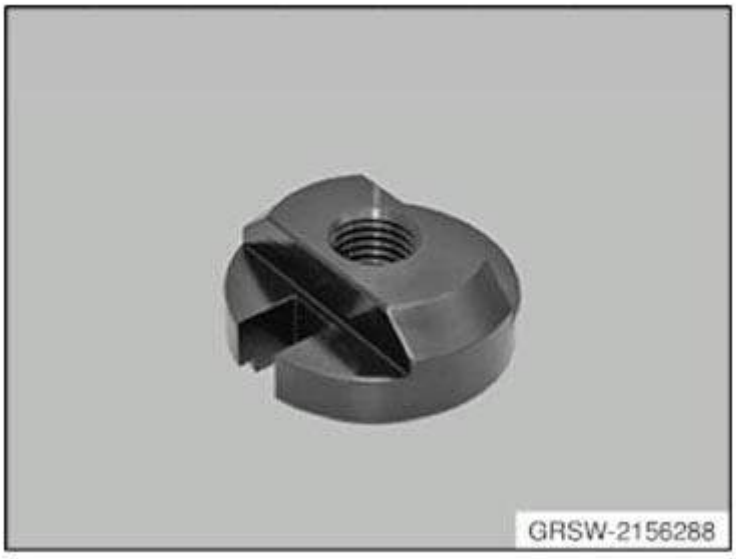


Fig. 12: Identifying Adapter (2156288)
Courtesy of BMW OF NORTH AMERICA, INC.

2348436 ADAPTER

2348436 Adapter AM

NOTE: **Adapter R8 (M24/Ã˜ 74/83mm) in connection with adapter kit F03 (81642348804) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

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08 02 13 (900)



Fig. 13: Identifying Adapter (2348436)
Courtesy of BMW OF NORTH AMERICA, INC.

2348432 ADAPTER

2348432 Adapter AM

NOTE: **Adapter P6 (/Ã˜ 51/89mm) in connection with adapter kit F03 (81 64 2 348 804) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 02 13 (900)



Fig. 14: Identifying Adapter (2348432)
Courtesy of BMW OF NORTH AMERICA, INC.

2156284 ADAPTER

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2156284 Adapter AM

NOTE: **Adapter P1 (Ã˜ 45/85mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

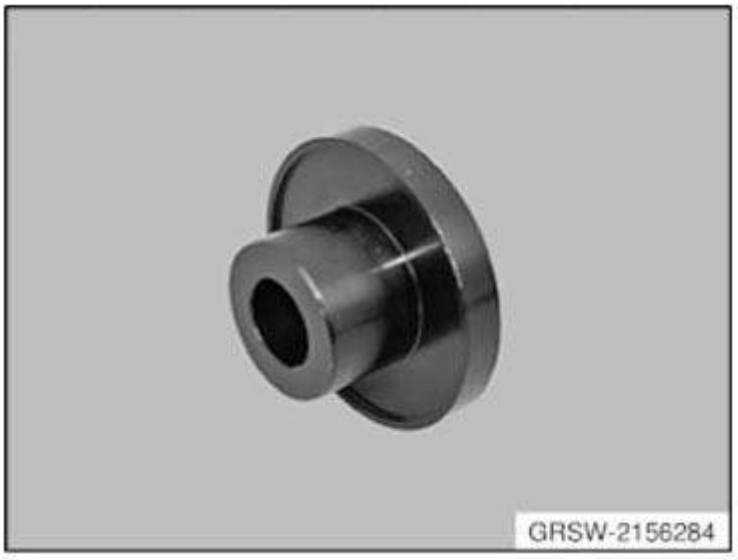


Fig. 15: Identifying Adapter (2156284)
Courtesy of BMW OF NORTH AMERICA, INC.

2156283 ADAPTER

2156283 Adapter AM

NOTE: **Adapter P4 (Ã˜ 42/75 mm) in combination with adapter kit 2 BMW (81 64 2 155 746) for removing and installing wheel bearings, output shafts and drive flanges.**

SI number

08 06 09 (544)



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Fig. 16: Identifying Adapter (2156283)
Courtesy of BMW OF NORTH AMERICA, INC.

2318661 ADAPTER

2318661 Adapter AM

NOTE: **Adapter Z1 to attach torque wrench. Used in connection with hydraulic cylinder, (81642156246), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 04 12 (797)

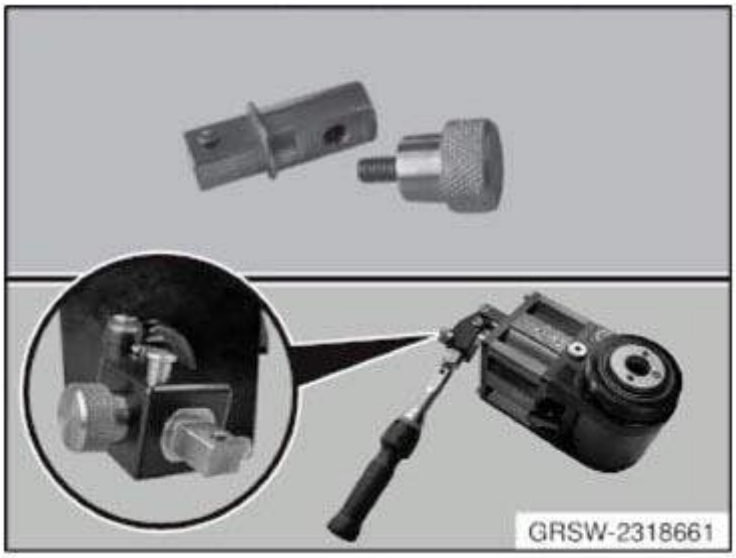


Fig. 17: Identifying Adapter (2318661)
Courtesy of BMW OF NORTH AMERICA, INC.

2348804 ADAPTER

2348804 Adapter AM

NOTE: **Adapter set F03 as a supplement to the hydraulic tool for removal and installation of wheel bearings, output shafts and drive flanges.**

SI number

08 02 13 (900)

Consisting of:

1 = 2348430

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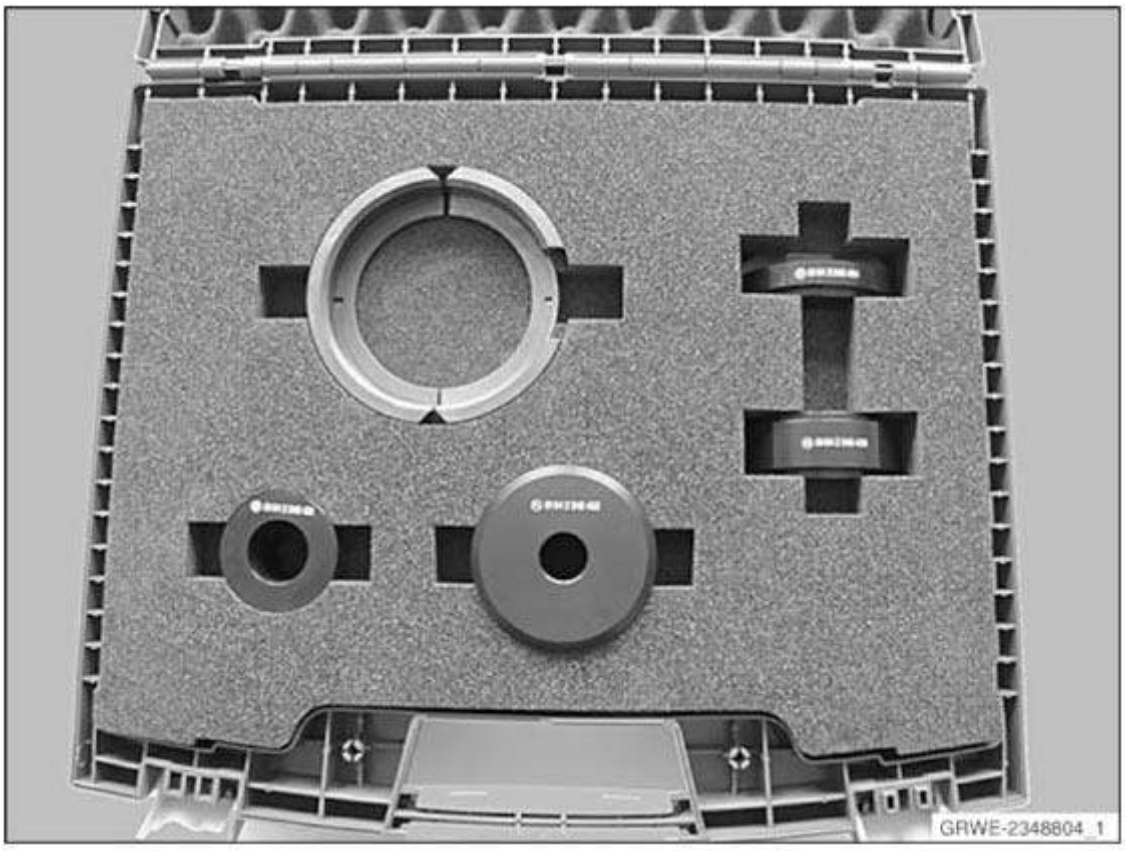


Fig. 18: Identifying Adapter (2348804)
Courtesy of BMW OF NORTH AMERICA, INC.

3 = 2348432
5 = 2348434
4 = 2348436
2 = 2348431

2156287 ADAPTER

2156287 Adapter AM

NOTE: **Adapter R4 (M24/Ã˜ 64/75mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 19: Identifying Adapter (2156287)
Courtesy of BMW OF NORTH AMERICA, INC.

2156289 ADAPTER

2156289 Adapter AM

NOTE: **Adapter R2 (M24 tapered) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 20: Identifying Adapter (2156289)
Courtesy of BMW OF NORTH AMERICA, INC.

2159722 ADAPTER

2159722 Adapter AM

NOTE: **Adapter M6 (Ã˜ 102/113mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 06 09 (544)



Fig. 21: Identifying Adapter (2159722)
Courtesy of BMW OF NORTH AMERICA, INC.

2348431 ADAPTER

2348431 Adapter AM

NOTE: **Adapter N5 (/Ã˜ 51mm) in connection with adapter kit F03 (81642348804) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 02 13 (900)



Fig. 22: Identifying Adapter (2348431)
Courtesy of BMW OF NORTH AMERICA, INC.

2159985 ADAPTER

2159985 Adapter AM

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NOTE: **Adapter H2 (tooth finder) in combination with adapter kit 1 BMW (81 64 2 155 745) for removal and installation of wheel bearings, output shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 23: Identifying Adapter (2159985)
Courtesy of BMW OF NORTH AMERICA, INC.

2156279 ADAPTER

2156279 Adapter AM

NOTE: **Adapter N2 (Ã˜ 45mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 24: Identifying Adapter (2156279)

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Courtesy of BMW OF NORTH AMERICA, INC.

2156285 ADAPTER

2156285 Adapter AM

NOTE: **Adapter P2 (Ã˜ 49/90mm) in connection with adapter kit 2 (BMW) and adapter kit 3 RR for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 25: Identifying Adapter (2156285)
Courtesy of BMW OF NORTH AMERICA, INC.

2156253 ADAPTER

2156253 Adapter AM

NOTE: **Adapter B1 in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 26: Identifying Adapter (2156253)
Courtesy of BMW OF NORTH AMERICA, INC.

2156286 ADAPTER

2156286 Adapter AM

NOTE: **Adapter R5 (M24/Ã˜ 59/70mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 27: Identifying Adapter (2156286)
Courtesy of BMW OF NORTH AMERICA, INC.

0492148 ADAPTER

0492148 331422 Adapter AM

NOTE: **(adapter with nut and washer)**

Storage Location: Z3

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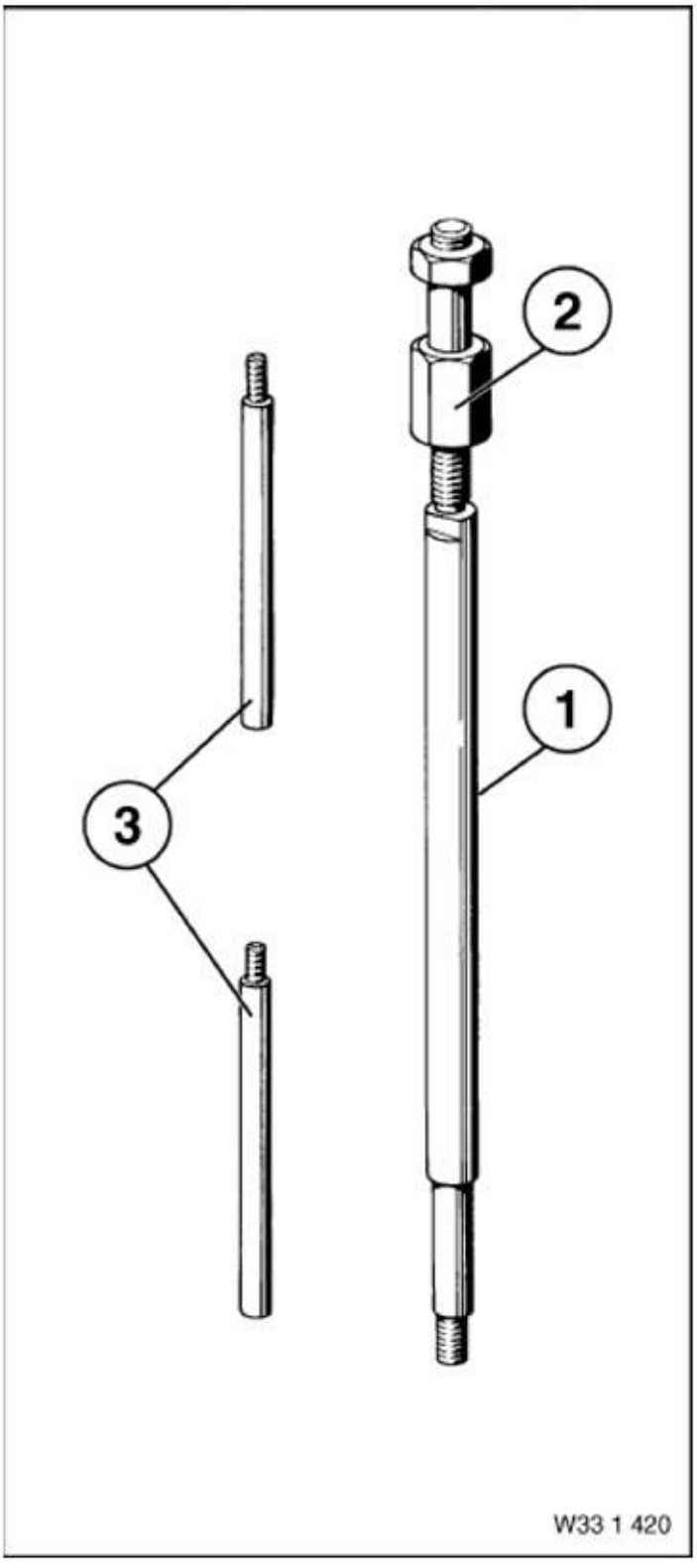


Fig. 28: Identifying Adapter (0492148)
Courtesy of BMW OF NORTH AMERICA, INC.

2156278 ADAPTER

2156278 Adapter AM

NOTE: **Adapter N3 (Ã˜ 42mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

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SI number

08 06 09 (544)



Fig. 29: Identifying Adapter (2156278)
Courtesy of BMW OF NORTH AMERICA, INC.

2156273 ADAPTER

2156273 Adapter AM

NOTE: **Adapter M5 (Ã˜ 90mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 30: Identifying Adapter (2156273)
Courtesy of BMW OF NORTH AMERICA, INC.

2159721 ADAPTER

2159721 Adapter AM

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NOTE: **Adapter M1 (Ã˜ 100/101mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 31: Identifying Adapter (2159721)
Courtesy of BMW OF NORTH AMERICA, INC.

2156276 ADAPTER

2156276 Adapter AM

NOTE: **Adapter M3 (Ã˜ 102mm) for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 06 09 (544)



Fig. 32: Identifying Adapter (2156276)
Courtesy of BMW OF NORTH AMERICA, INC.

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2156256 ADAPTER

2156256 Adapter AM

NOTE: **Adapter G3 (M27x1.5/M20) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 33: Identifying Adapter (2156256)
Courtesy of BMW OF NORTH AMERICA, INC.

2156260 ADAPTER

2156260 Adapter AM

NOTE: **Adapter E2 (M24) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



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Fig. 34: Identifying Adapter (2156260)
Courtesy of BMW OF NORTH AMERICA, INC.

2156257 ADAPTER

2156257 Adapter AM

NOTE: **Adapter G2 (M24x1.5/M20) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 35: Identifying Adapter (2156257)
Courtesy of BMW OF NORTH AMERICA, INC.

2159724 ADAPTER

2159724 Adapter AM

NOTE: **Adapter R1 (M24/Ã˜ 77/82mm) in connection with adapter kit 2 (BMW), (81 64 2 155 746), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 36: Identifying Adapter (2159724)
Courtesy of BMW OF NORTH AMERICA, INC.

2159720 ADAPTER

2159720 Adapter AM

NOTE: **Adapter G1 (M22x1.5/M20) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 37: Identifying Adapter (2159720)
Courtesy of BMW OF NORTH AMERICA, INC.

0493816 BASIC BODY

0493816 334401 Basic body AM

NOTE: **No longer available separately, only available as part of complete tool set 0493416 = 33 4 400.**

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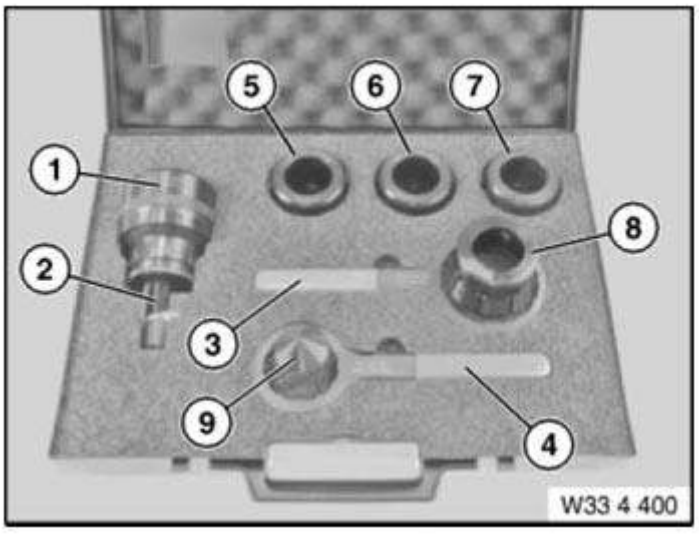


Fig. 38: Identifying Basic Body (0493816)
Courtesy of BMW OF NORTH AMERICA, INC.

0495853 BASIC BODY

0495853 335121 Basic body Minimum set: Mechanical tools AM

NOTE: **Only available via complete tool set 33 5 120 -> (83 30 0 495 851).**

SI number

01 22 06 (307)

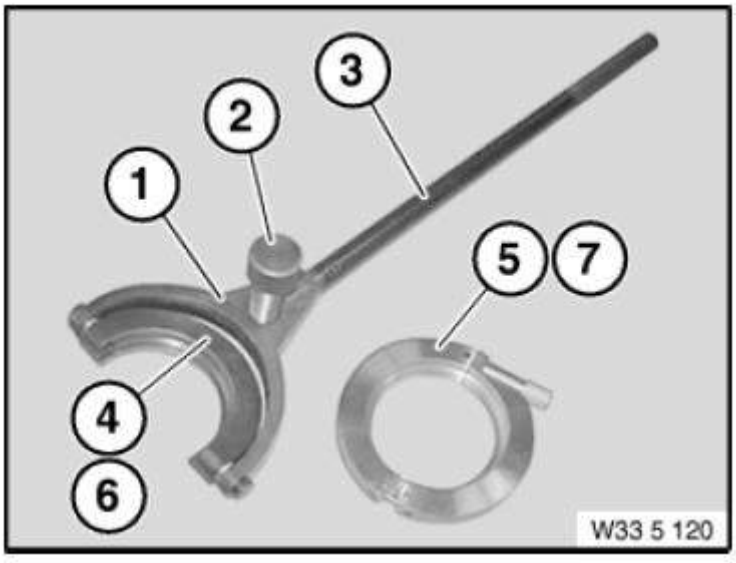


Fig. 39: Identifying Basic Body (0495853)
Courtesy of BMW OF NORTH AMERICA, INC.

0492286 BASIC UNIT

0492286 333252 Basic unit AM

Replaced by: 83300492436

NOTE: **Discontinuation and replaced by 33 4 200. (0 492 436)**

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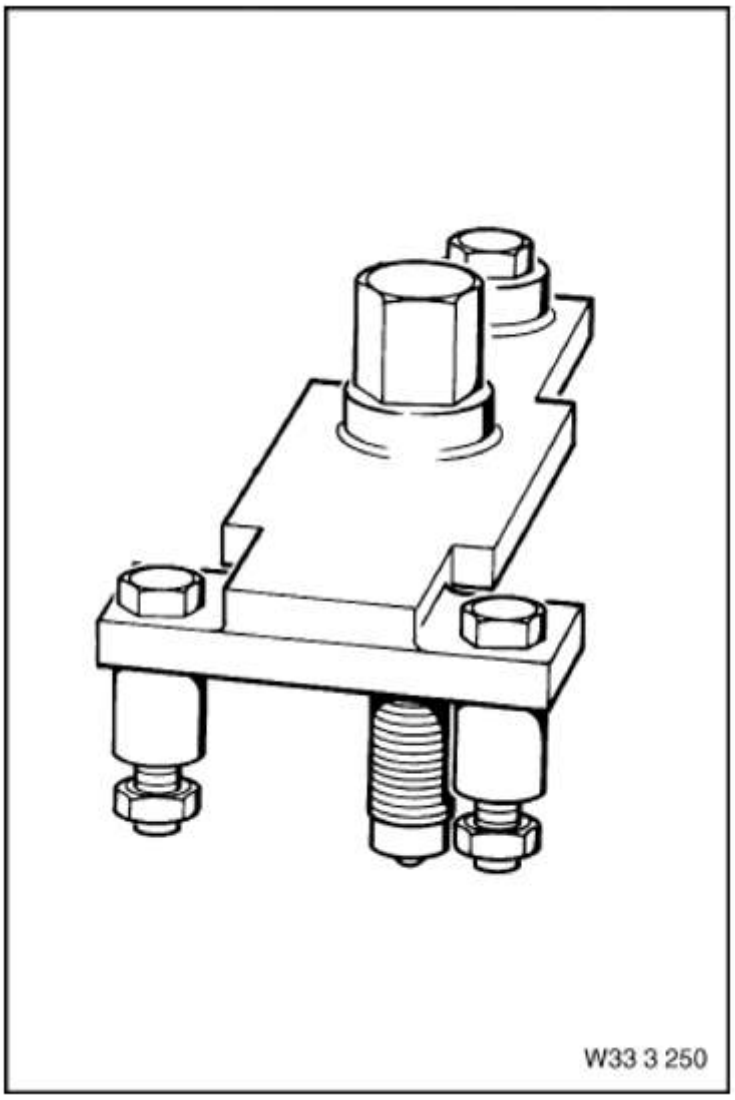


Fig. 40: Identifying Basic Unit (0492286)
Courtesy of BMW OF NORTH AMERICA, INC.

0496080 BELT

0496080 335206 Belt AM

NOTE: (Tensioning strap)

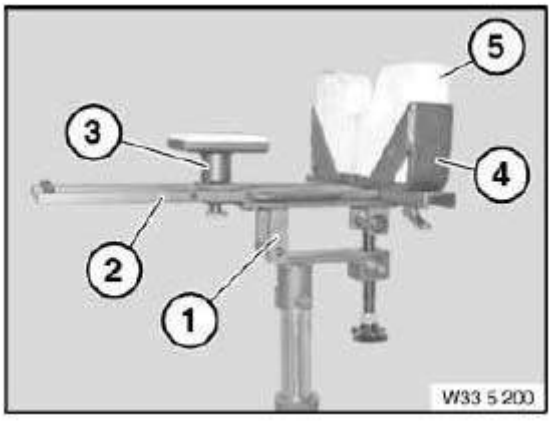


Fig. 41: Identifying Belt (0496080)
Courtesy of BMW OF NORTH AMERICA, INC.

2355626 BRACE

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2355626 Minimum set: Mechanical tools Brace AM

NOTE: **Applies to: BMW i Aftersales Basic contour-graphic silhouette foil is included in the delivery specification.**

Storage Location

B36

SI number

01 13 13 (968)



Fig. 42: Identifying Brace (2355626)
Courtesy of BMW OF NORTH AMERICA, INC.

0492118 BRIDGE

0492118 331356 Bridge AM

NOTE: **(Support bridge)**

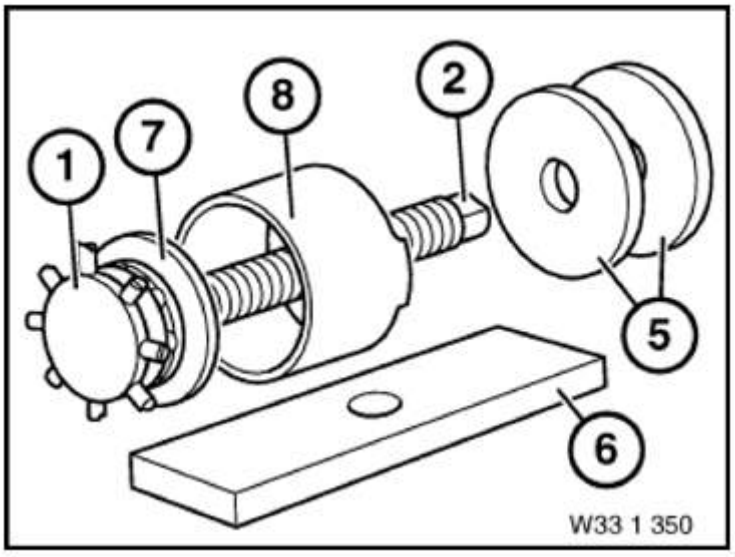


Fig. 43: Identifying Bridge (0492118)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492087 BUSH

0492087 331200 Bush Mechanical tool

Replaced by: 83300492341

NOTE: **(Impact bush) For radial seal on output flange - Replaced by 33 3 450. (0 492 341)**

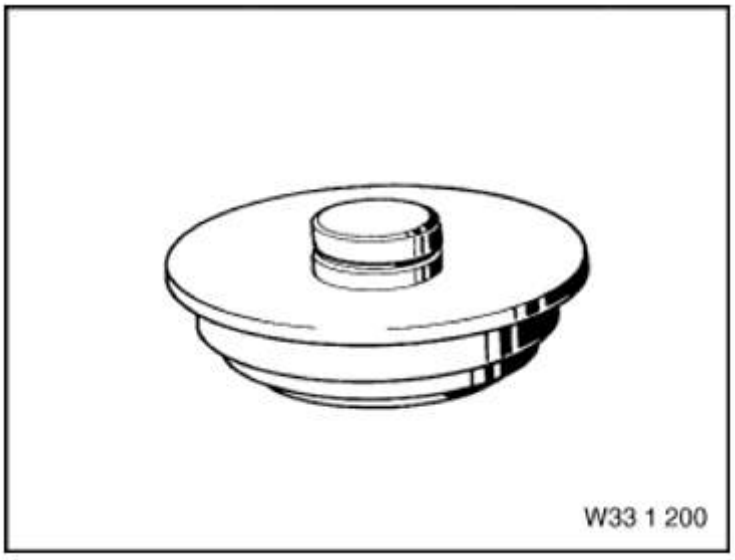


Fig. 44: Identifying Bush (0492087)
Courtesy of BMW OF NORTH AMERICA, INC.

0492279 BUSH

0492279 333243 Bush AM

Replaced by: 83300493416

NOTE: **(Clamping bush) Discontinuation and replaced by 33 4 400. (0 493 416)**

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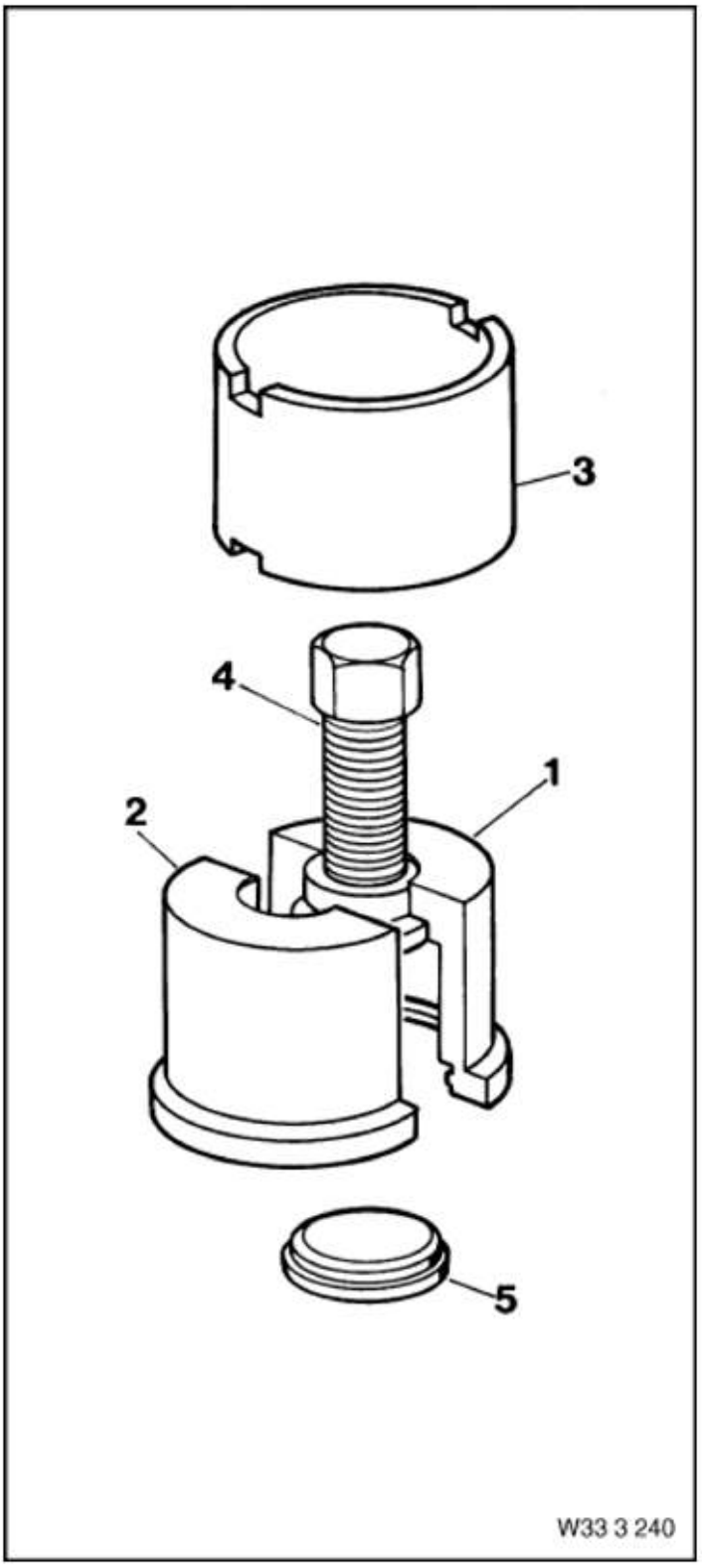


Fig. 45: Identifying Bush (0492279)
Courtesy of BMW OF NORTH AMERICA, INC.

0494195 BUSH

0494195 333181 Bush AM

NOTE: **Series: E31, E46**

Storage Location

C14

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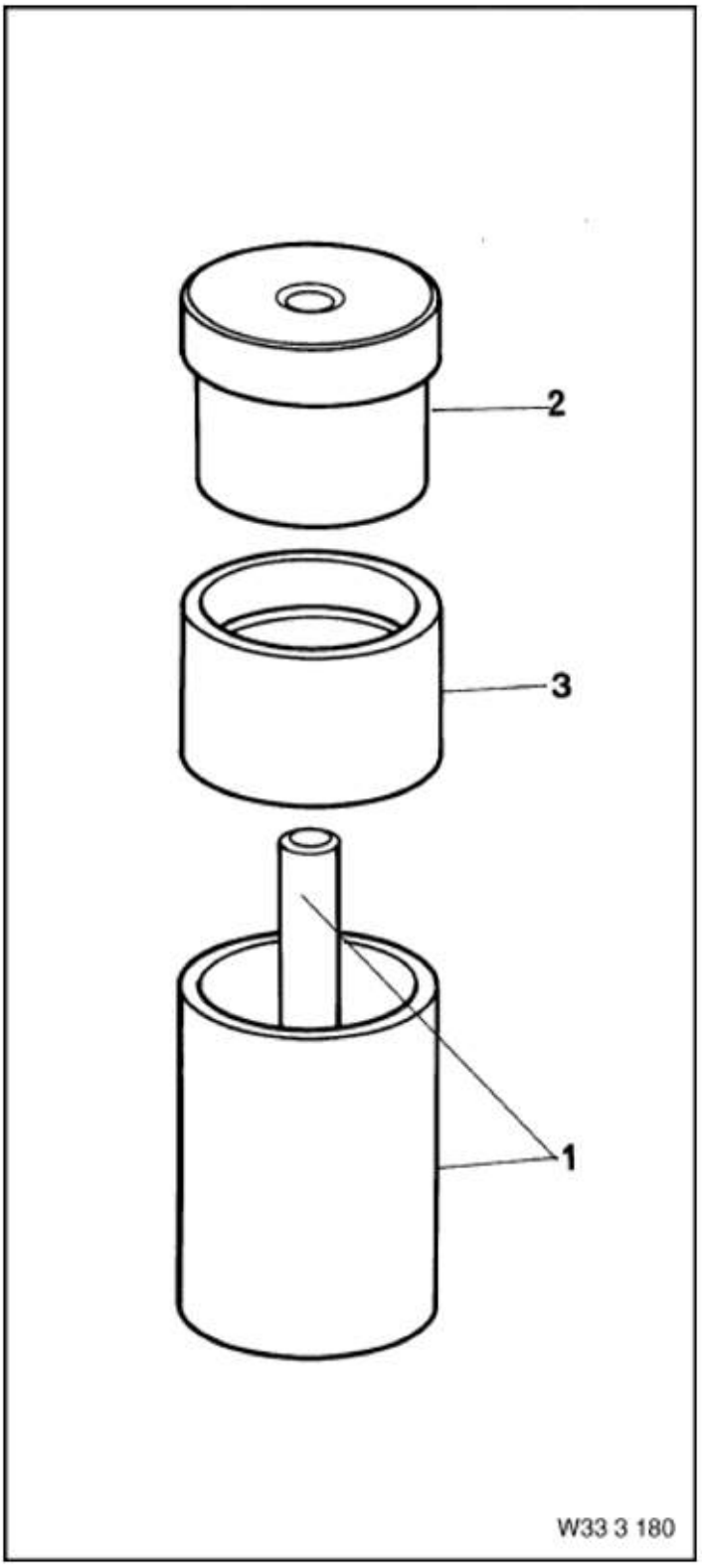


Fig. 46: Identifying Bush (0494195)
Courtesy of BMW OF NORTH AMERICA, INC.

0492249 BUSH

0492249 333171 Bush AM

NOTE: For accommodating the trailing arm when pressing out

Storage Location

X5

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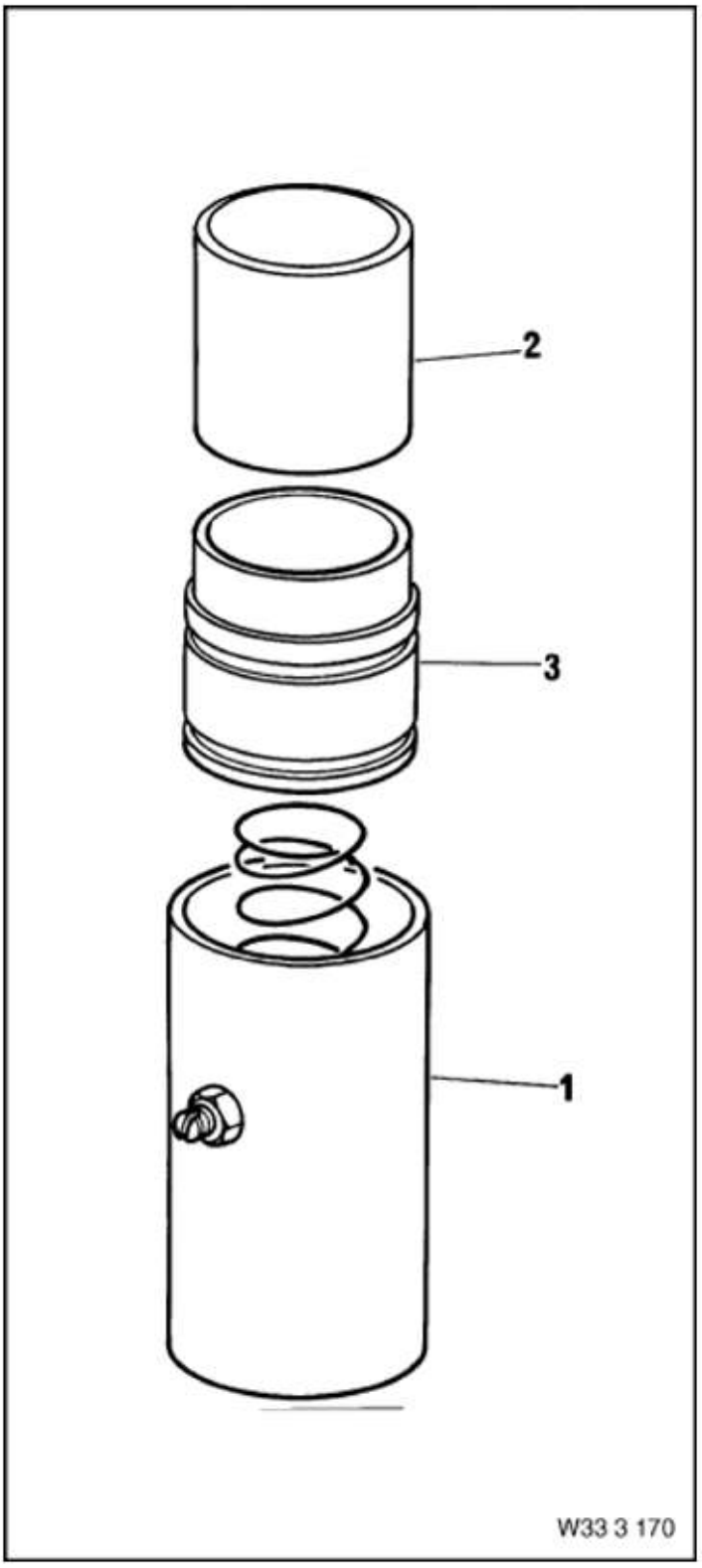


Fig. 47: Identifying Bush (0492249)
Courtesy of BMW OF NORTH AMERICA, INC.

0492392 BUSH

0492392 334124 Bush AM

NOTE: (Pressure bushing) For pressing the ball joint into the wishbone

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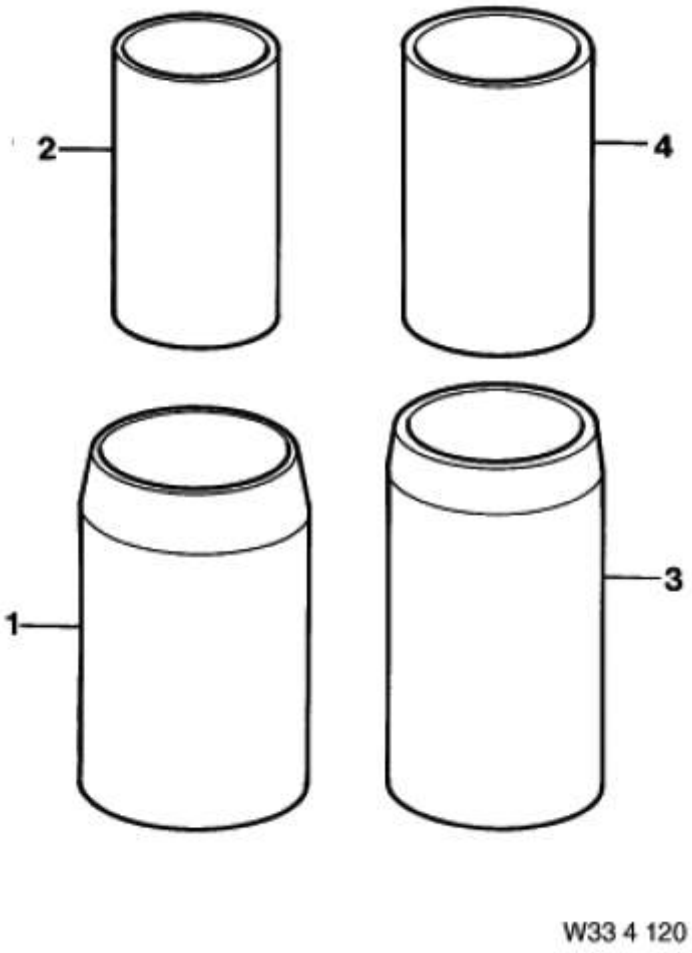


Fig. 48: Identifying Bush (0492392)
Courtesy of BMW OF NORTH AMERICA, INC.

0492265 BUSH

0492265 333211 Bush AM

NOTE: **For accommodating the engine support arm or wheel carrier when pressing out the ball joint**

Storage Location

X5

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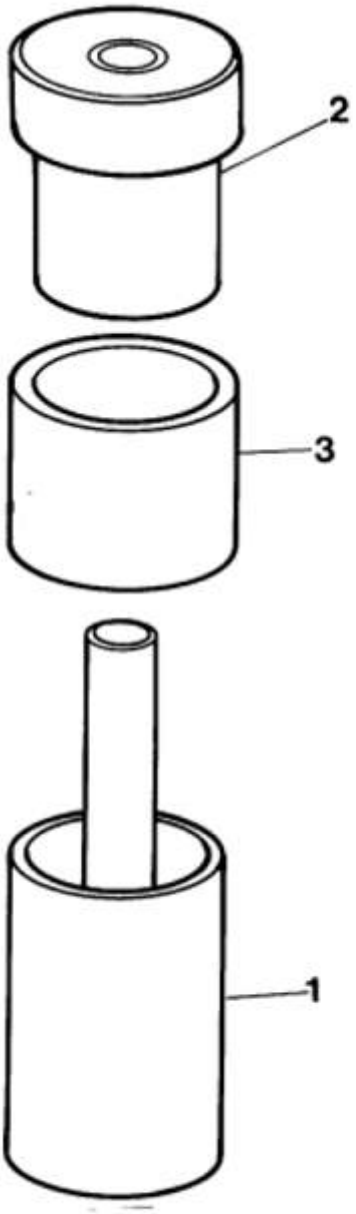


Fig. 49: Identifying Bush (0492265)
Courtesy of BMW OF NORTH AMERICA, INC.

0492390 BUSH

0492390 334122 Bush AM

NOTE: **(Pressure bushing) For pressing the ball joint out of the wishbone**

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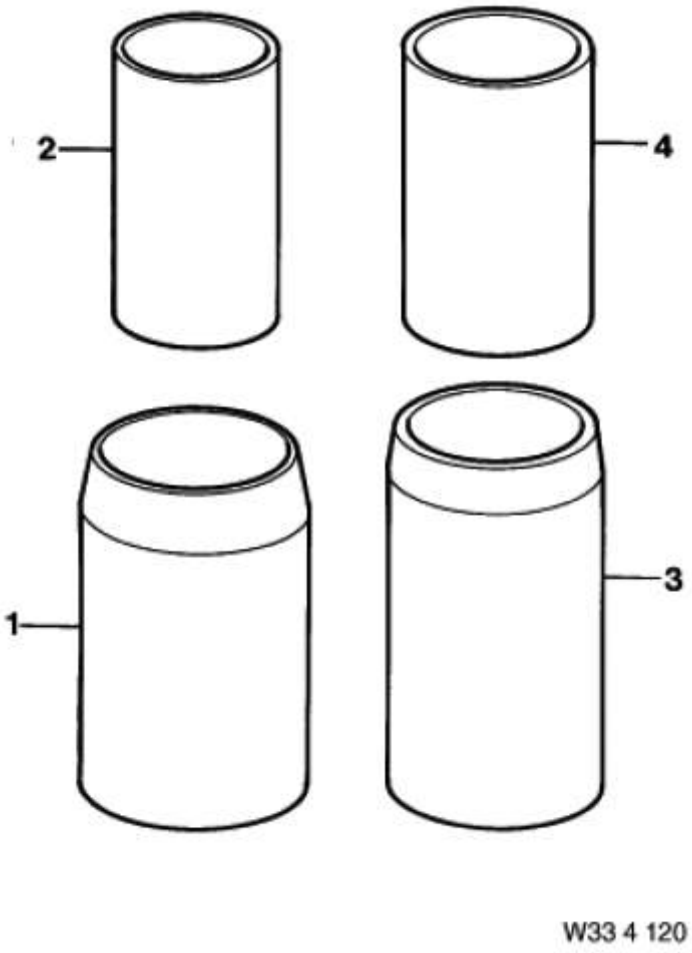


Fig. 50: Identifying Bush (0492390)
Courtesy of BMW OF NORTH AMERICA, INC.

0495418 BUSH

0495418 332192 Bush AM

NOTE: **(Bush (for removal and installation)) Deletion, only available via tool set**

Storage Location

C53

SI number

01 18 05 (214)

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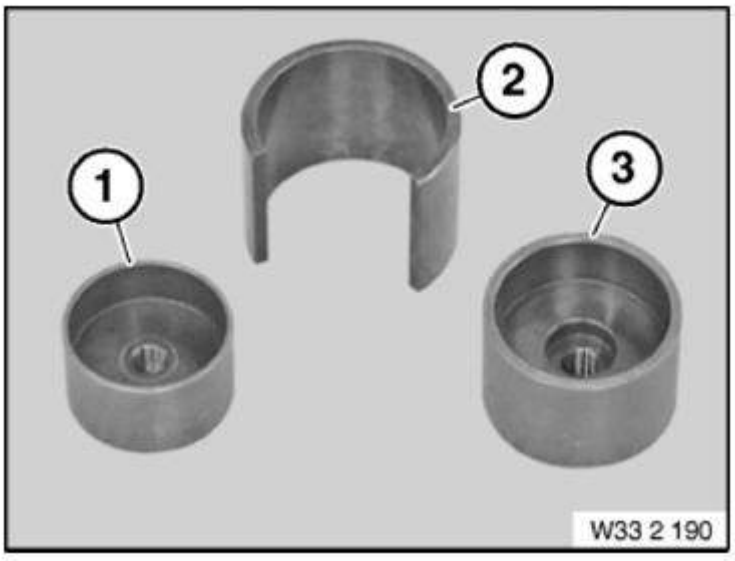


Fig. 51: Identifying Bush (0495418)
Courtesy of BMW OF NORTH AMERICA, INC.

0492239 BUSH

0492239 333151 Bush AM

NOTE: **For accommodating the leading link when pressing out**

Storage Location

Z8

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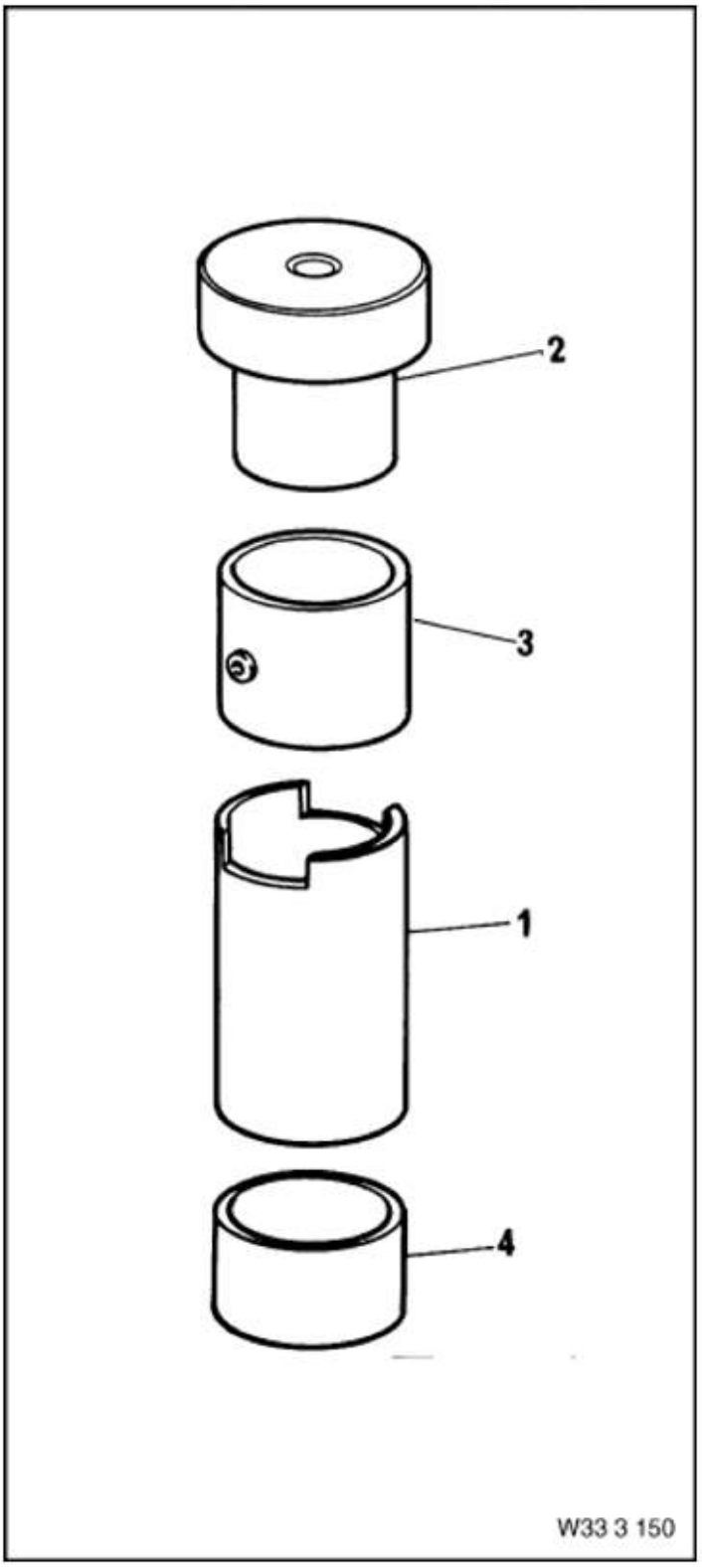


Fig. 52: Identifying Bush (0492239)
Courtesy of BMW OF NORTH AMERICA, INC.

0492090 BUSH

0492090 331230 Bush Mechanical tool

NOTE: (Impact bush) For driving in the radial seal on the drive flange

Storage Location

X7

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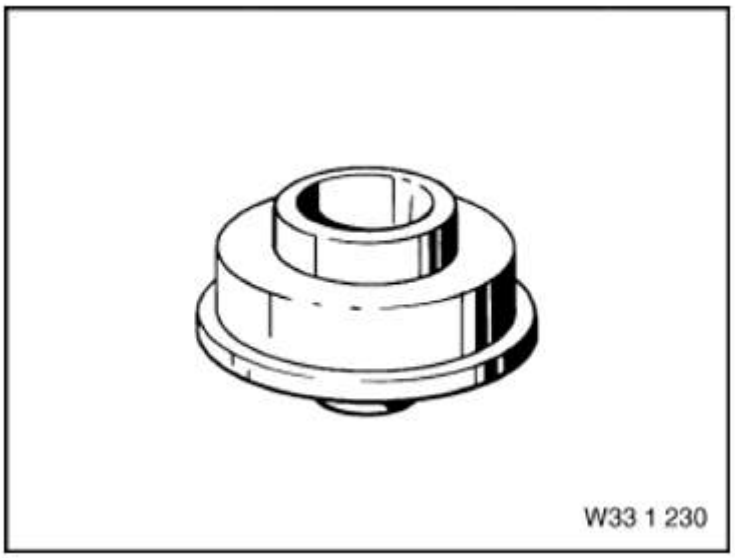


Fig. 53: Identifying Bush (0492090)
Courtesy of BMW OF NORTH AMERICA, INC.

0492257 BUSH

0492257 333191 Bush AM

NOTE: **For holding the wishbone when pressing out the rubber mount**

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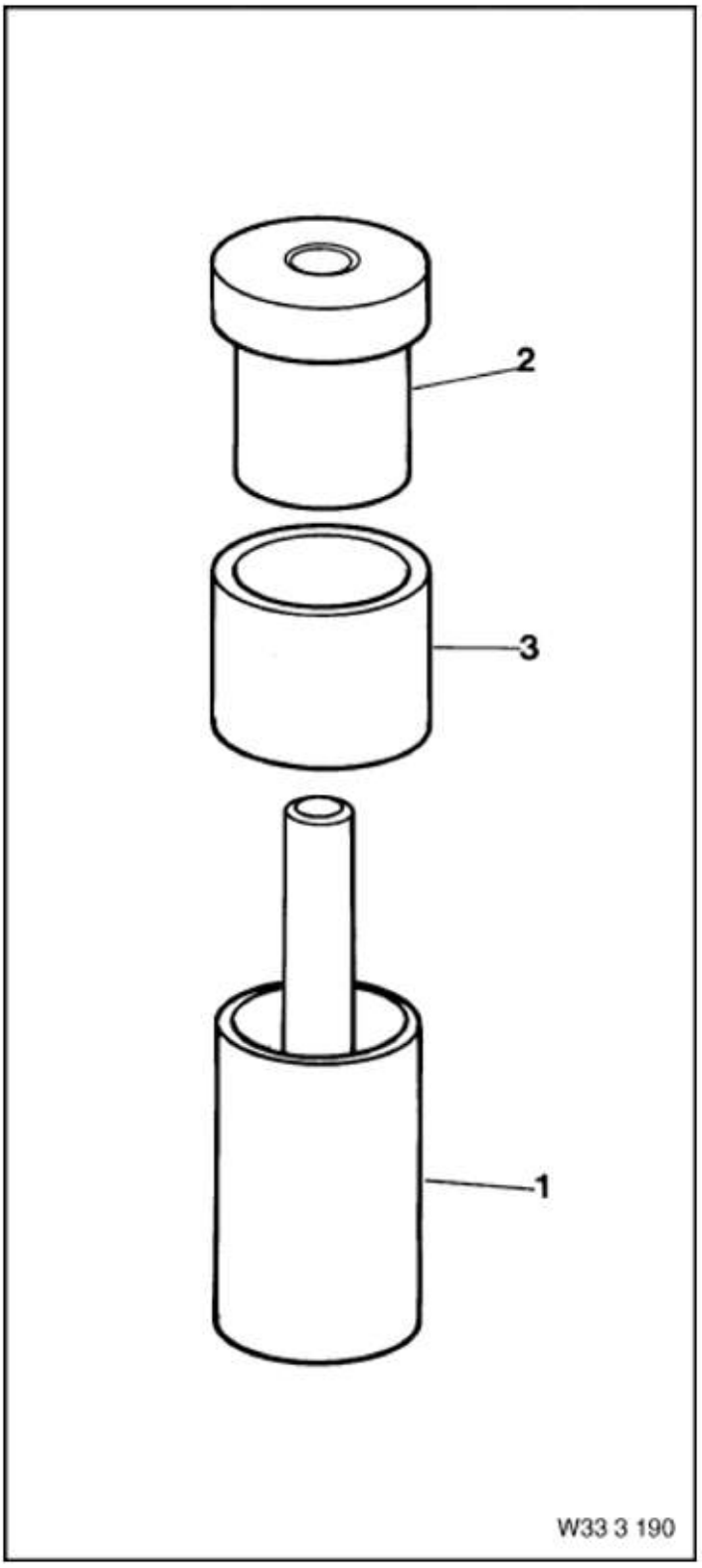


Fig. 54: Identifying Bush (0492257)
Courtesy of BMW OF NORTH AMERICA, INC.

0492094 BUSH

0492094 331270 Bush Mechanical tool

Replaced by: 83300492339

NOTE: **(Impact bush) For fitting the radial sealing rings in the rear axle final drive on the drive flange - Replaced by 33 3 430. (0 492 339)**

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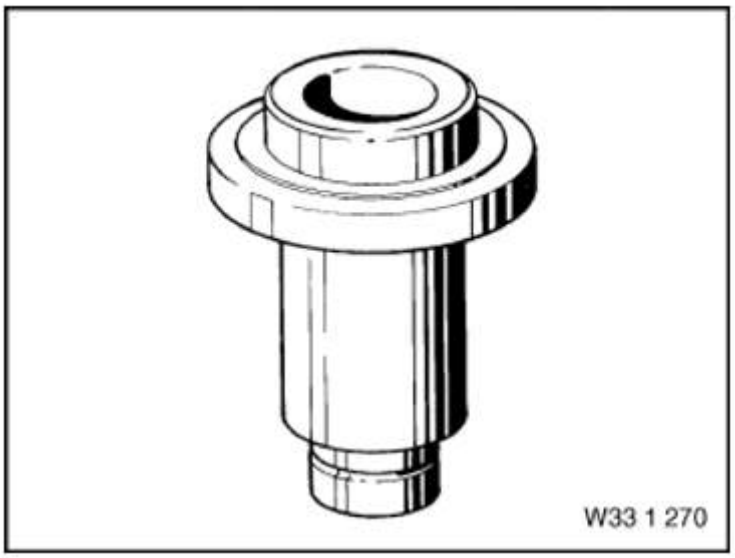


Fig. 55: Identifying Bush (0492094)
Courtesy of BMW OF NORTH AMERICA, INC.

0492086 BUSH

0492086 331190 Bush Mechanical tool

Replaced by: 83300492340

NOTE: **(Impact bush) For radial sealing ring on the drive flange without axial sealing lip (final drive type G) and for fitting the radial sealing ring of the camshaft (M40) - Replaced by 33 3 440. (0 492 340)**

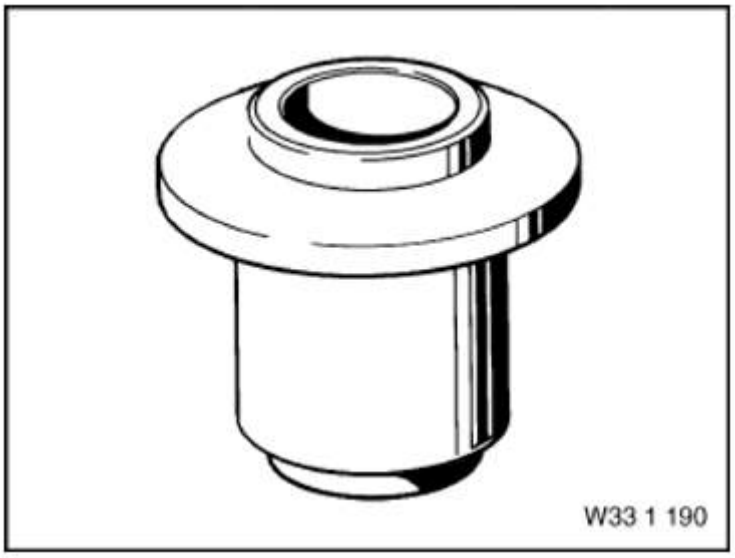


Fig. 56: Identifying Bush (0492086)
Courtesy of BMW OF NORTH AMERICA, INC.

0494798 CASE

0494798 331111 Case AM

NOTE: **(Case) with label.**

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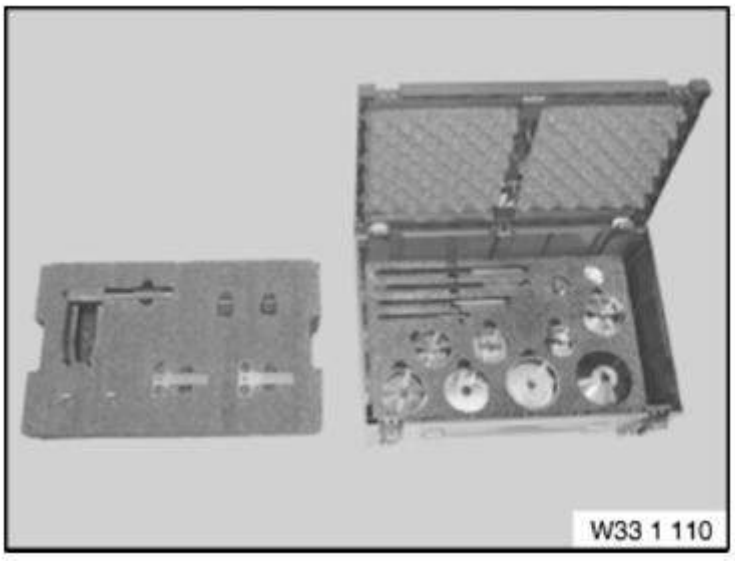


Fig. 57: Identifying Case (0494798)
Courtesy of BMW OF NORTH AMERICA, INC.

0495816 CASE

0495816 335109 Case Minimum set: Mechanical tools AM

NOTE: **(Case) Case with insert discontinued, can only be ordered using complete tool**

SI number

01 22 06 (307)

0492076 CLIP

0492076 331040 Clip Mechanical tool

NOTE: **(Mounting bracket) For short neck rear axle differential**

0492077 CLIP

0492077 331050 Clip Mechanical tool

NOTE: **(Mounting bracket) For short neck rear axle differential - model year: from 79**

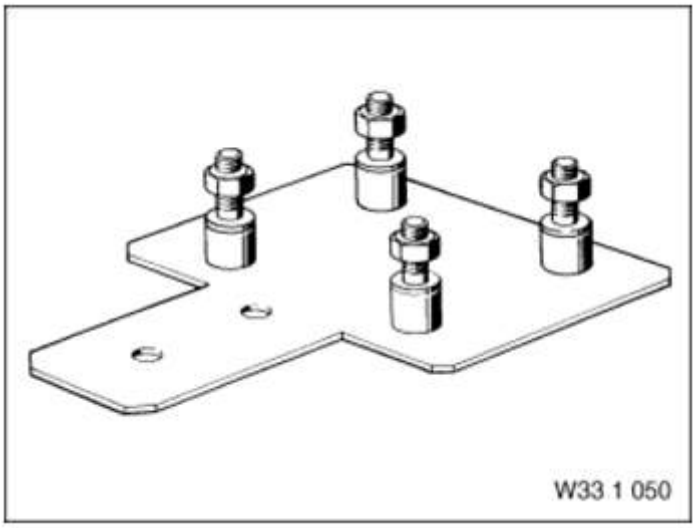


Fig. 58: Identifying Clip (0492077)

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Courtesy of BMW OF NORTH AMERICA, INC.

0492078 CLIP

0492078 331060 Clip Mechanical tool

NOTE: **(Mounting clip) For rear axle differential unit - model: 1800 - 2000CA, 2500 - 3.3L, 525, 3.0CS - 3.0CSi-L**



Fig. 59: Identifying Clip (0492078)
Courtesy of BMW OF NORTH AMERICA, INC.

0492097 CONNECTOR

0492097 331301 Connector AM

NOTE: **(Basic body) For transmissions S5D 260Z, S5D 310Z and S5D 320Z;Discontinued, only available via complete tool**

Storage Location

Y4

Z4

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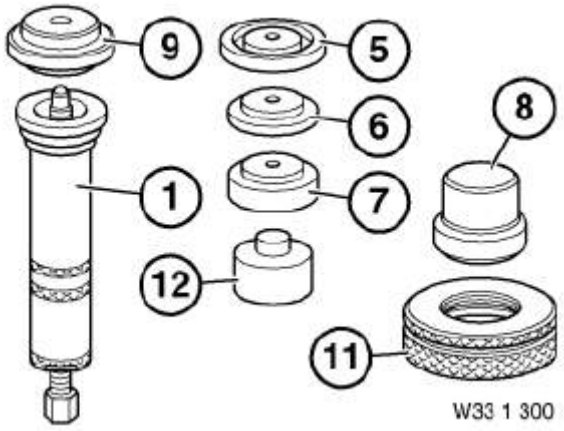


Fig. 60: Identifying Connector (0492097)
Courtesy of BMW OF NORTH AMERICA, INC.

0492161 DEVICE

0492161 331480 Device AM

NOTE: **For determining the installation size of the bevel drive pinion in the rear axle final drive**

Consisting of:

1. **0492162** Holder

   NOTE: **(Dial gauge holder)**

2. **0492163** Washer

   NOTE: **(Measuring disc)**

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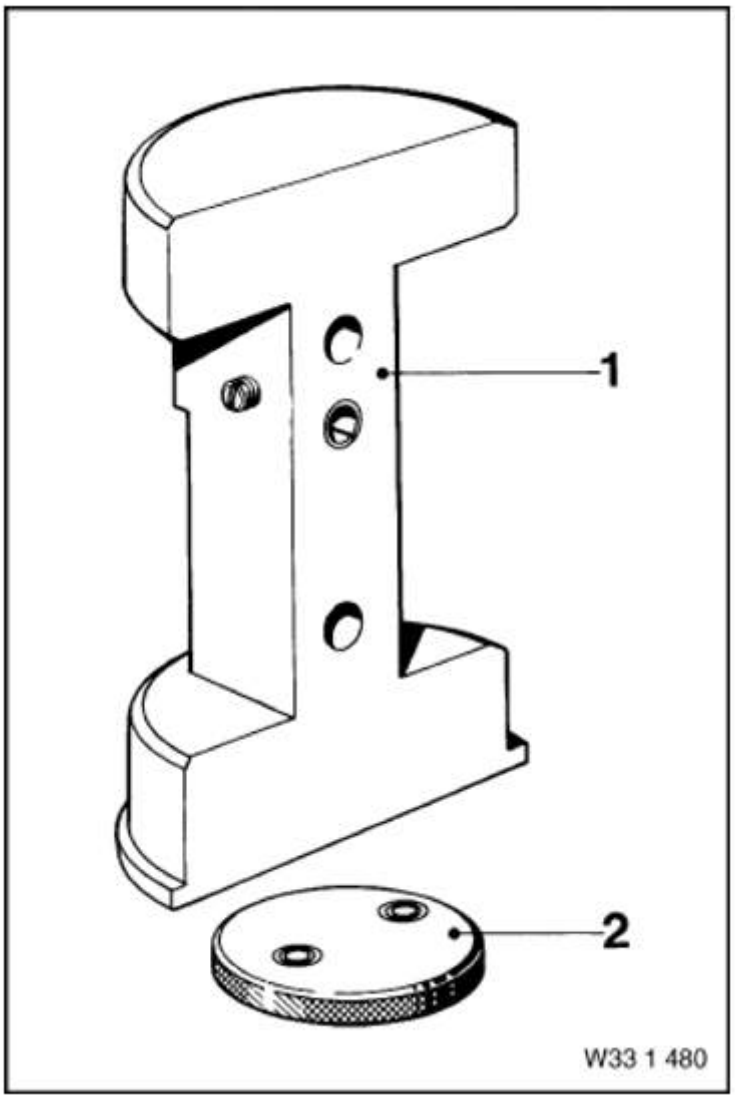


Fig. 61: Identifying Device (0492161)
Courtesy of BMW OF NORTH AMERICA, INC.

0492139 DEVICE

0492139 331390 Device AM

NOTE: **For determining the installation size of the bevel drive pinion in the rear axle final drive**

Consisting of:

1. 0492140 Holder

   NOTE: **(Dial gauge holder)**

2. 0492141 Washer

   NOTE: **(Measuring disc)**

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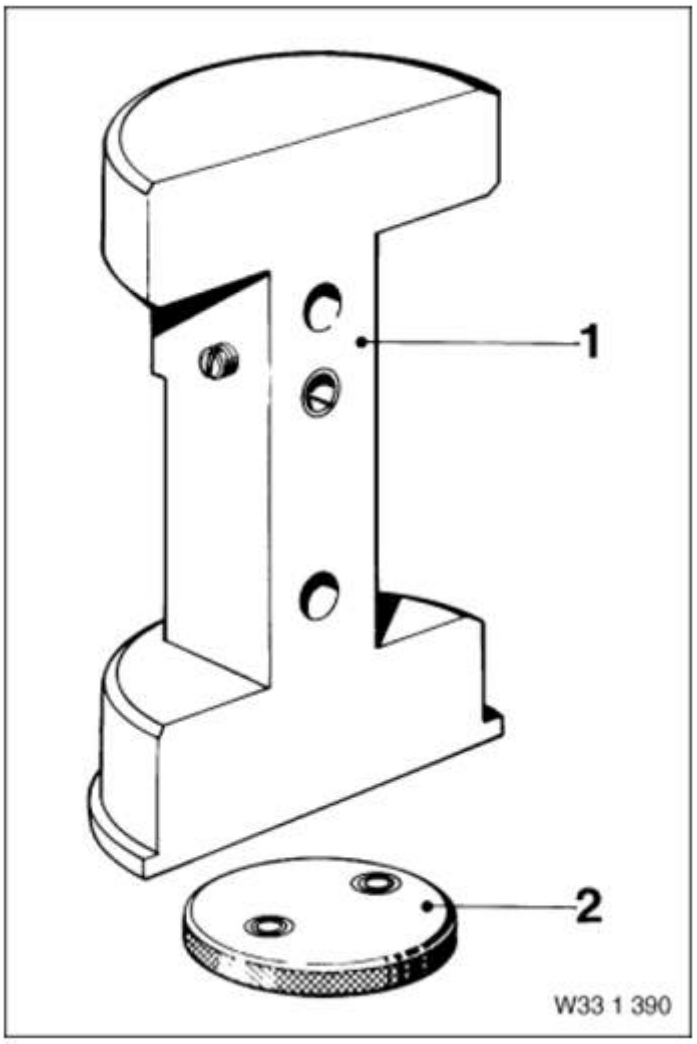


Fig. 62: Identifying Device (0492139)
Courtesy of BMW OF NORTH AMERICA, INC.

0492179 DEVICE

0492179 332120 Device AM

NOTE: **(Pulling device) For pulling out the rubber mount in the final drive**

Storage Location

A14

B14

Consisting of:

1. 0492180 Spindle

   NOTE: **(Threaded spindle, long) Series: E36/5 sale of existing inventory and then available as part of set of special tools 33 2 120 = 83 30 0 492 179 only - as of 09.12.2011**

2. 0492181 Nut

   NOTE: **Liquidation of existing inventory and then available only as a complete tool set 33 2 120 = 83 30 0 492 179 - as of 09.12.2011**

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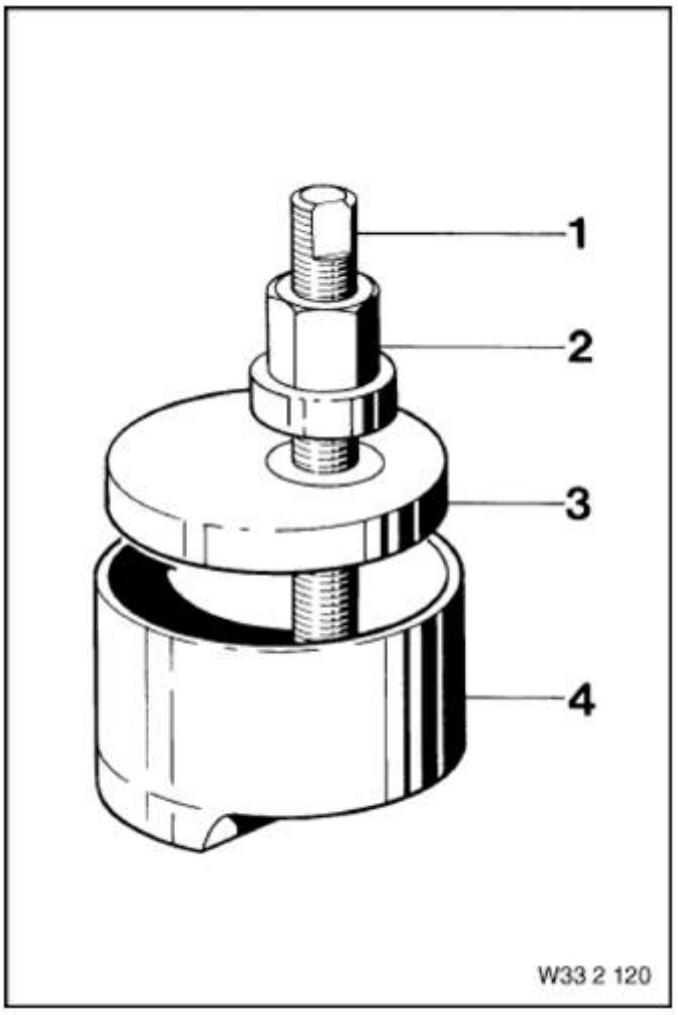


Fig. 63: Identifying Device (0492179)
Courtesy of BMW OF NORTH AMERICA, INC.

3. 0492182 Synchronising key
4. 0492183 Holder

NOTE: **(Countersupport) 0496208 =119850**

0492143 DEVICE

0492143 331410 Device AM

NOTE: **For determining the installation size of the bevel drive pinion in the rear axle final drive**

Consisting of:

1. 0492144 Holder

NOTE: **(Dial gauge holder)**

2. 0492145 Washer

NOTE: **(Measuring disc)**

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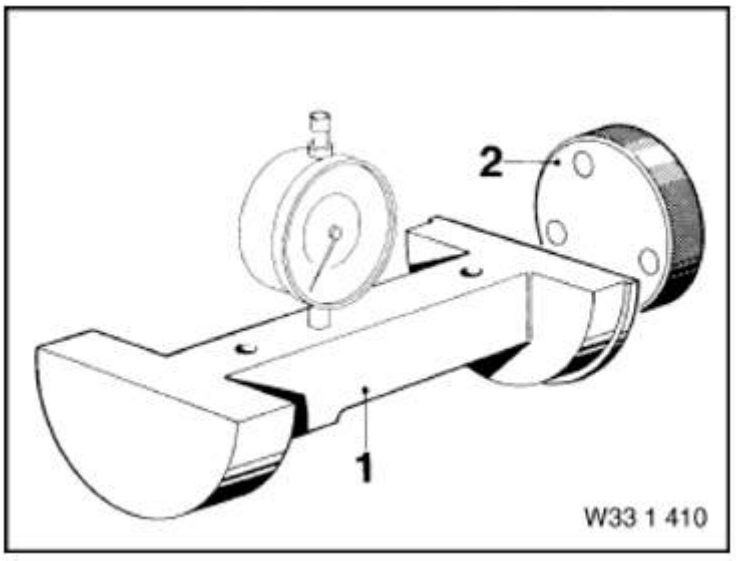


Fig. 64: Identifying Device (0492143)
Courtesy of BMW OF NORTH AMERICA, INC.

0492203 DEVICE

0492203 333050 Device AM

NOTE: **For removing and installing the rubber mount in the 20Â° trailing arm**

Storage Location

B10

C10

Consisting of:

1. **0492204** Nut

NOTE: **(Nut with bearing) Model series: E28, E30, E83**

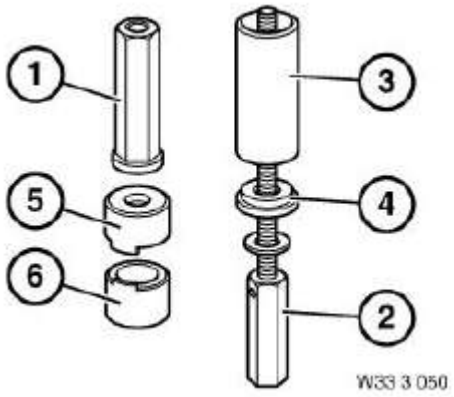


Fig. 65: Identifying Device (0492203)
Courtesy of BMW OF NORTH AMERICA, INC.

2. **0492205** Spindle

NOTE: **Series: E28, E30, E83**

3. **0492206** Holding sleeve

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NOTE: **Series: E28, E30 discontinued, available as part of set of special tools only**

4. **0492207** Synchronising key
5. **0492208** Synchronising key

NOTE: **(Synchronising key) Model series: E28, E30 Model: 518 - 735i discontinued, available as part of set of special tools only**

6. **0492209** Synchronising key

NOTE: **Series: E28, E30 Model: 316 - 323i discontinued, available as part of set of special tools only**

0492388 DEVICE

0492388 334120 Device AM

NOTE: **For removing and installing the ball joint in the wishbone**

SI number

01 01 89 (989)

Consisting of:

1. **0492389** Shaped element

NOTE: **For positioning 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 positioning the wishbone when pressing in the ball joint**

4. **0492392** Bush

NOTE: **(Pressure bushing) For pressing the ball joint into the wishbone**

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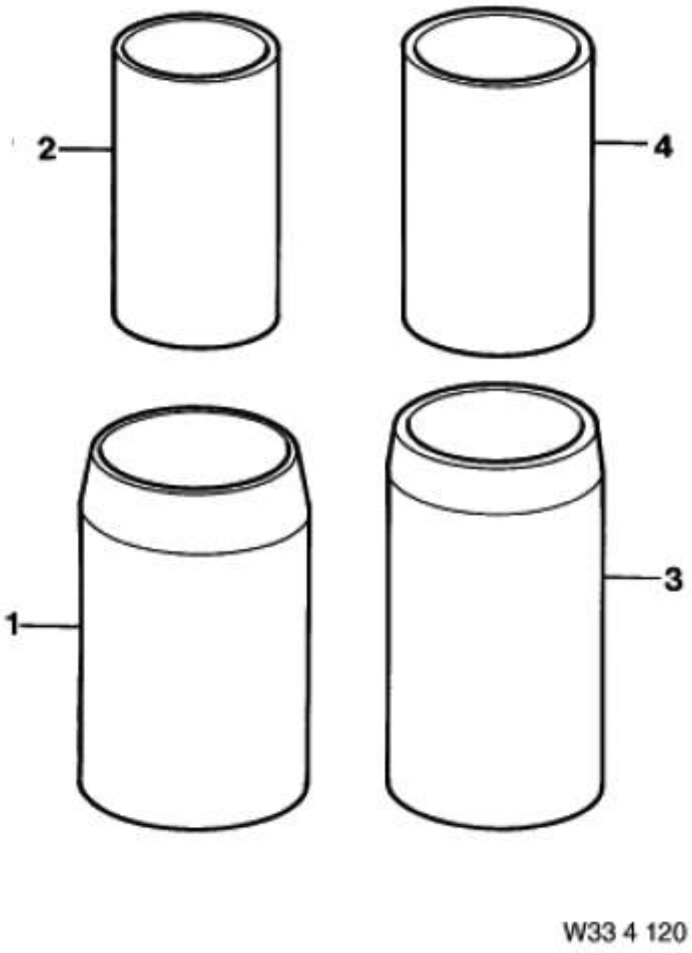


Fig. 66: Identifying Device (0492388)
Courtesy of BMW OF NORTH AMERICA, INC.

0492073 DEVICE

0492073 331010 Device Mechanical tool

NOTE: (mounting fixture) For rear axle final drive with modified bore hole - Model: from 83

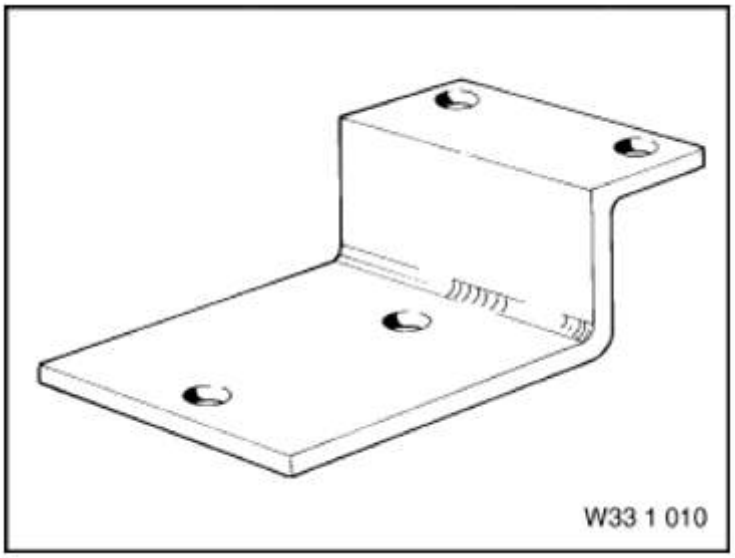


Fig. 67: Identifying Device (0492073)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492156 DEVICE

0492156 331450 Device Mechanical tool

NOTE: **(Device) For function check of the mechanical limited slip differential**

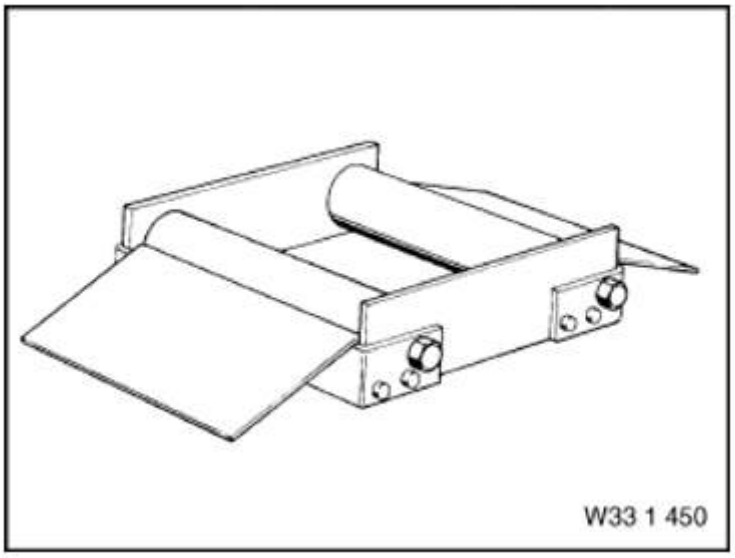


Fig. 68: Identifying Device (0492156)
Courtesy of BMW OF NORTH AMERICA, INC.

0492153 DEVICE

0492153 331440 Device AM

NOTE: **For determining the side clearance of the differential side gears**

Storage Location

Y4

Consisting of:

1. 0492154 Washer

   NOTE: **(Washer with thread)**

2. 0492155 Washer

   NOTE: **(Washer without thread)**

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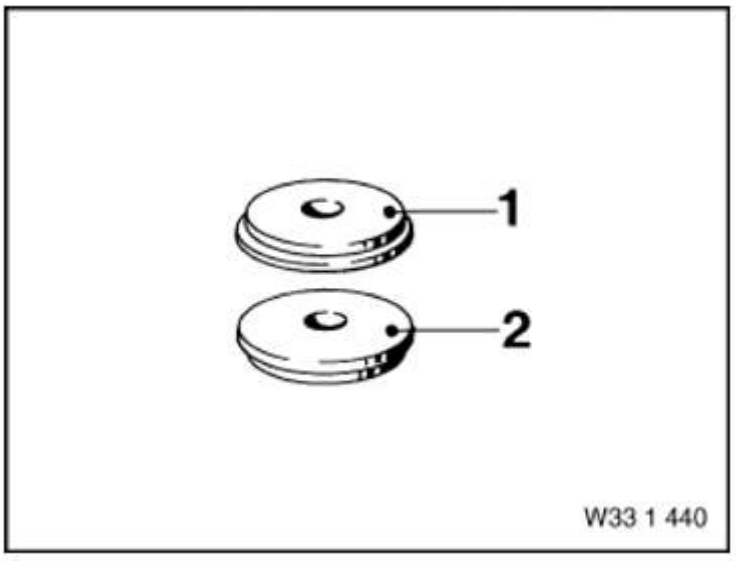


Fig. 69: Identifying Device (0492153)
Courtesy of BMW OF NORTH AMERICA, INC.

0492378 DEVICE

0492378 334100 Device AM

NOTE: **For removing and installing the rubber mount in the trailing arm**

SI number

01 01 89 (989)

Consisting of:

1. 0492379 Holding sleeve

   NOTE: **(support sleeve) During extraction**

2. 0492380 Holding sleeve

   NOTE: **(Press-out sleeve)**

3. 0492381 Holding sleeve

   NOTE: **(Press-in sleeve)**

4. 0492382 Shaped element

   NOTE: **For pressing in**

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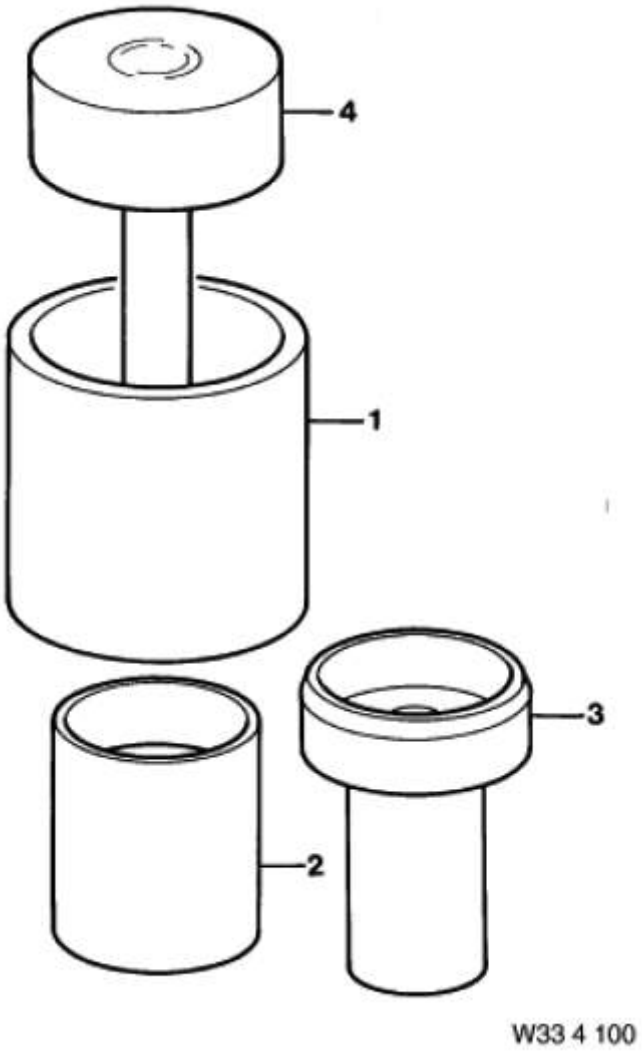


Fig. 70: Identifying Device (0492378)
Courtesy of BMW OF NORTH AMERICA, INC.

0492157 DEVICE

0492157 331460 Device AM

NOTE: **For determining the installation size of the bevel drive pinion in the rear axle final drive**

Consisting of:

1. 0492158 Holder

   NOTE: **(Dial gauge holder)**

2. 0492159 Washer

   NOTE: **(Measuring disc)**

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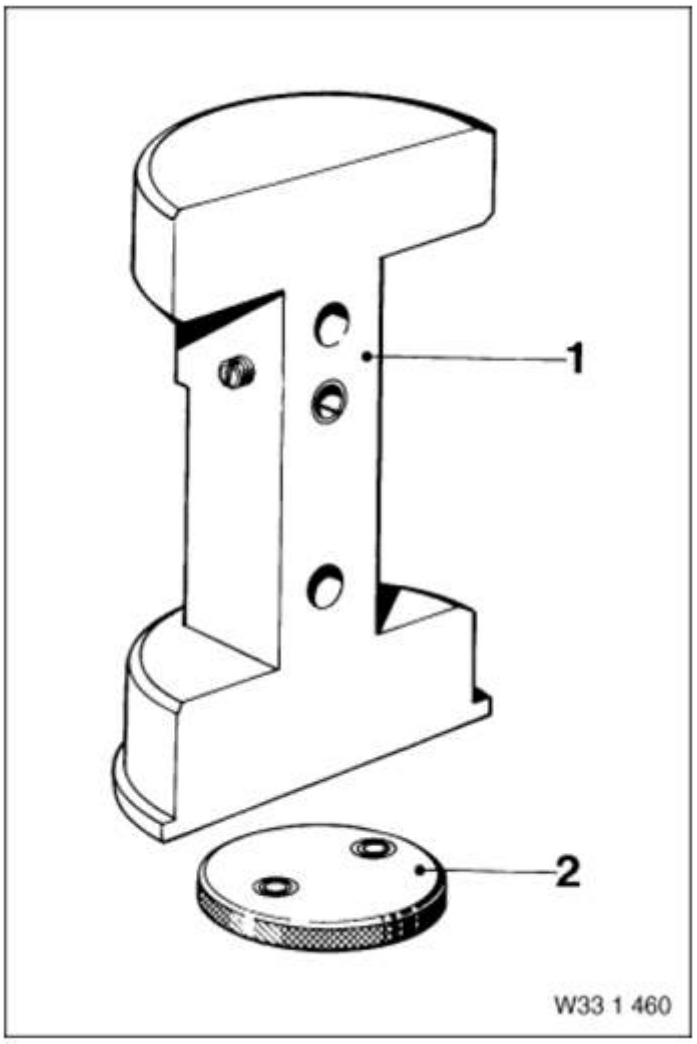


Fig. 71: Identifying Device (0492157)
Courtesy of BMW OF NORTH AMERICA, INC.

0495416 DEVICE

0495416 332190 Device AM

NOTE: **For removing and installing ball joint in wheel carrier.**

Storage Location

C53

SI number

01 18 05 (214)

Consisting of:

1. 0495417 Synchronising key

NOTE: **(Thrust piece (for removing)) Deletion, only available via tool set**

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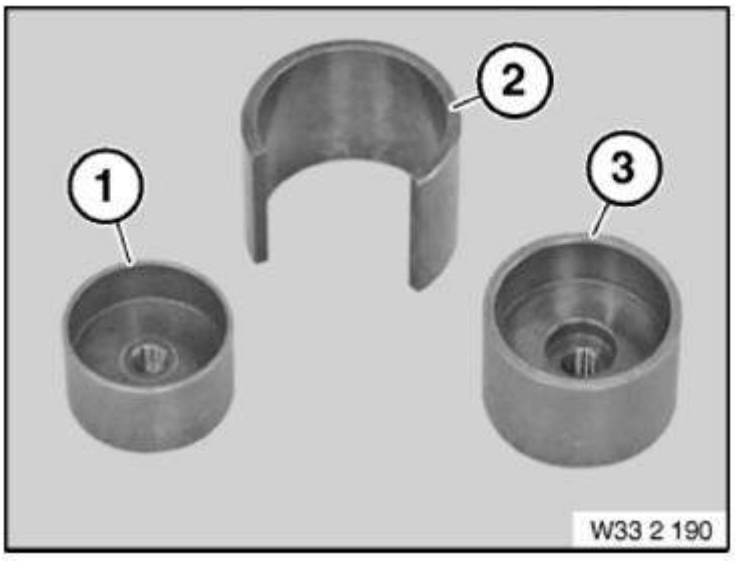


Fig. 72: Identifying Device (0495416)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0495418 Bush

NOTE: **(Bush (for removal and installation)) Deletion, only available via tool set**

3. 0495419 Synchronising key

NOTE: **(Thrust piece (for installing)) Deletion, only available via tool set**

0492146 DEVICE

0492146 331420 Device AM

NOTE: **For determining the side clearance of the differential side gears in the differential housing**

Storage Location

Z3

Z4

Consisting of:

1. 0492147 Holder

NOTE: **(Dial gauge holder)**

2. 0492148 Adapter

NOTE: **(adapter with nut and washer)**

3. 0492149 Extension

NOTE: **(extension (2 x))**

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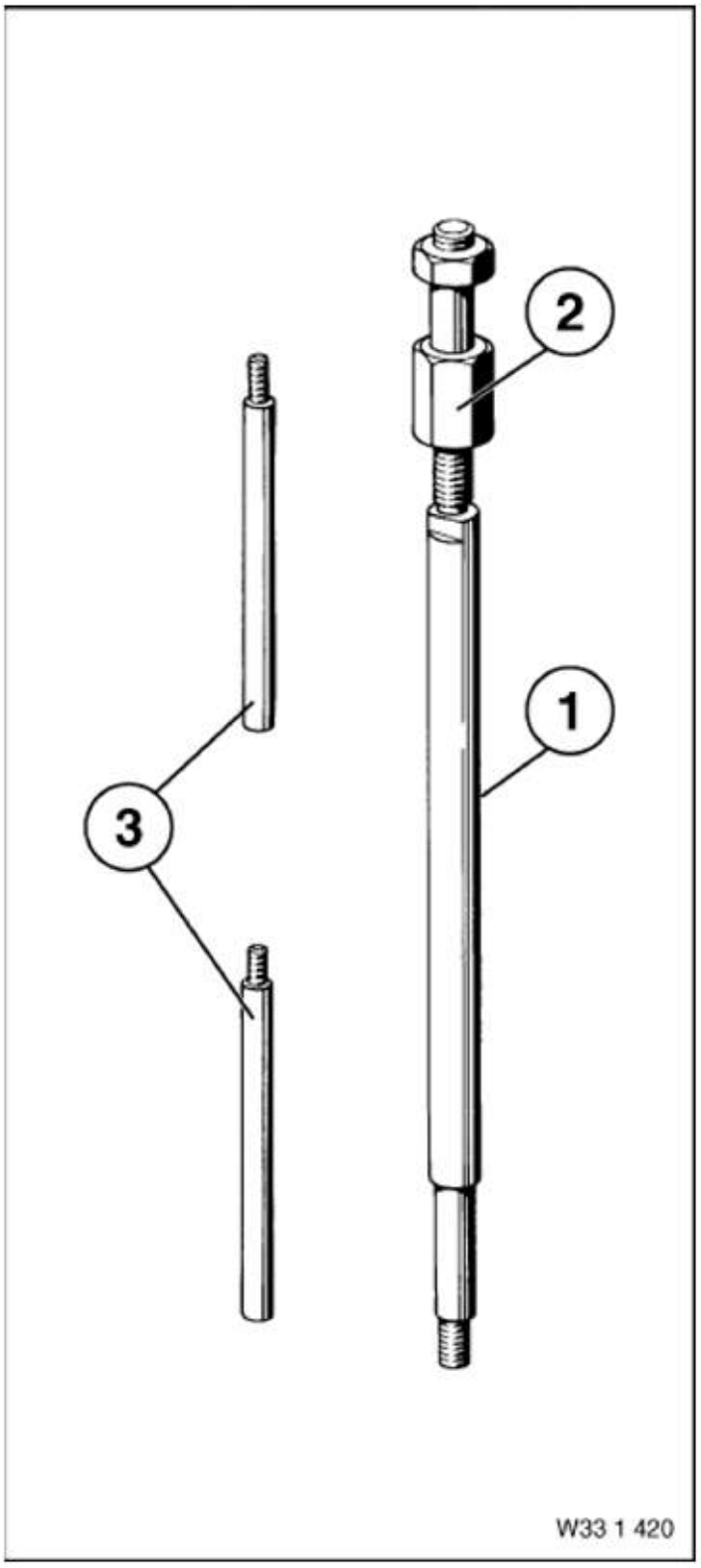


Fig. 73: Identifying Device (0492146)
Courtesy of BMW OF NORTH AMERICA, INC.

0492150 DEVICE

0492150 331430 Device AM

NOTE: For determining the side clearance of the differential side gears

Storage Location

Y3

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Consisting of:

1. 0492151 Screw
2. 0492152 Washer

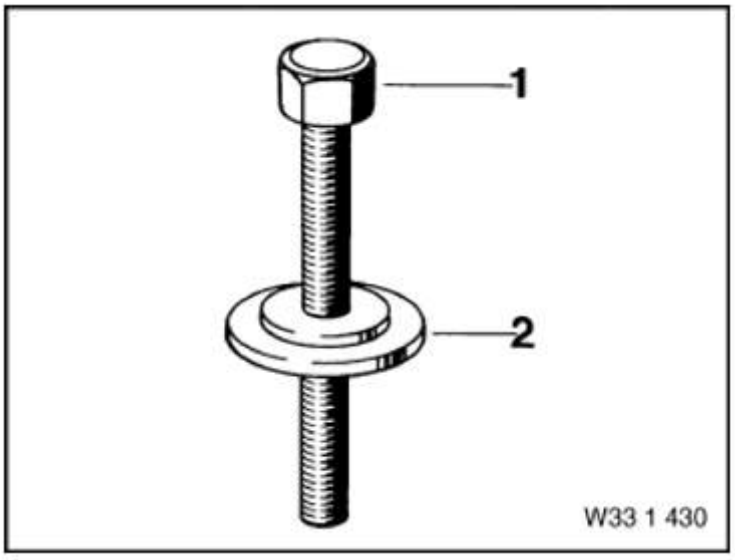


Fig. 74: Identifying Device (0492150)
Courtesy of BMW OF NORTH AMERICA, INC.

0492383 DEVICE

0492383 334110 Device AM

NOTE: **For removing and installing the rubber mount in the wishbone**

SI number

01 01 89 (989)

Consisting of:

1. 0492384 Holding sleeve

   NOTE: **(Support sleeve) For pressing out**

2. 0492385 Holding sleeve

   NOTE: **(Press-out sleeve)**

3. 0492386 Holding sleeve

   NOTE: **(Press-in sleeve)**

4. 0492387 Shaped element

   NOTE: **For pressing in**

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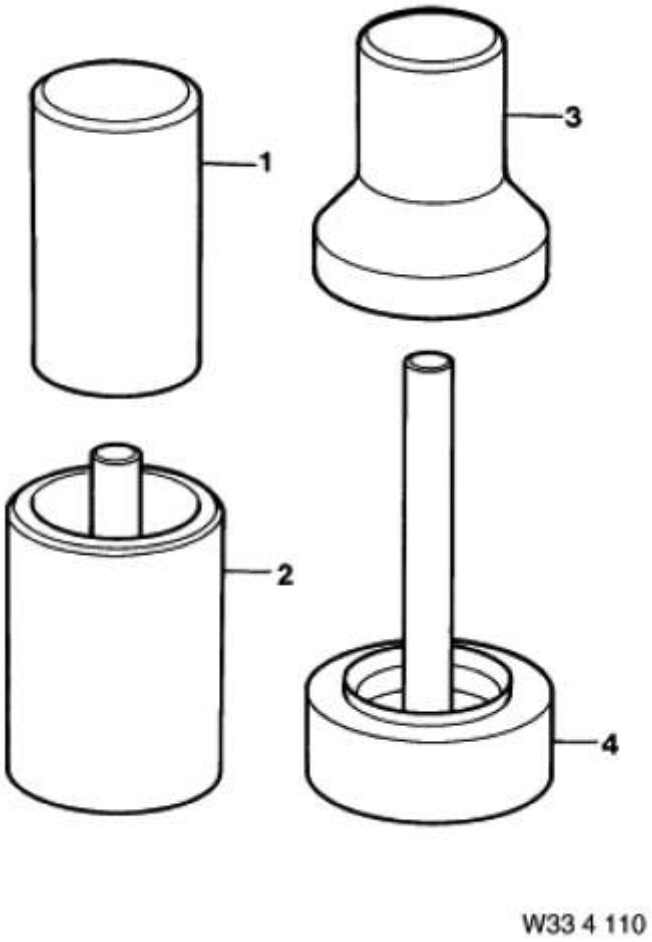


Fig. 75: Identifying Device (0492383)
Courtesy of BMW OF NORTH AMERICA, INC.

0492142 DEVICE

0492142 331400 Device Mechanical tool

NOTE: For determining the installation dimension of the drive bevel gear in the rear axle differential (also E36/3 and E36/7)

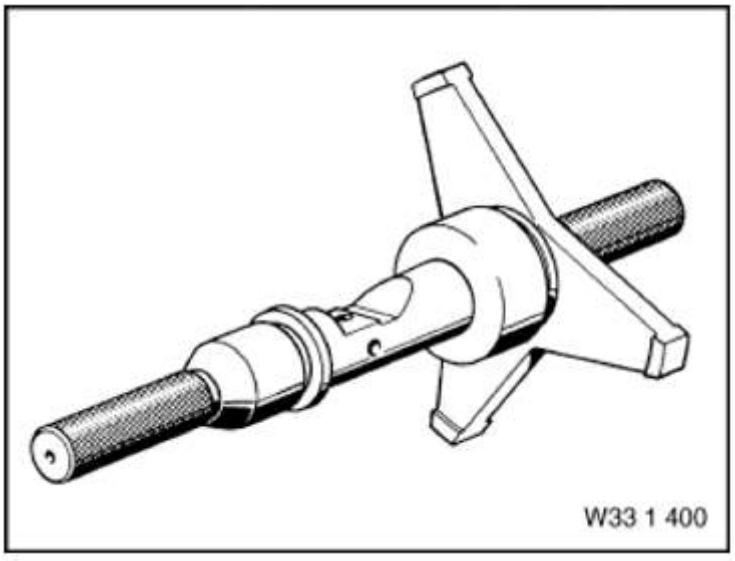


Fig. 76: Identifying Device (0492142)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492079 DEVICE

0492079 331070 Device AM

NOTE: **(Holding device) For fixing the final drive on the assembly stand**

SI number

01 05 95 (932)

Consisting of:

1. **0492080** Frame

   NOTE: **(Main frame)**

2. **0492081** Screw

   NOTE: **(Knurled screws (M16 2 x))**

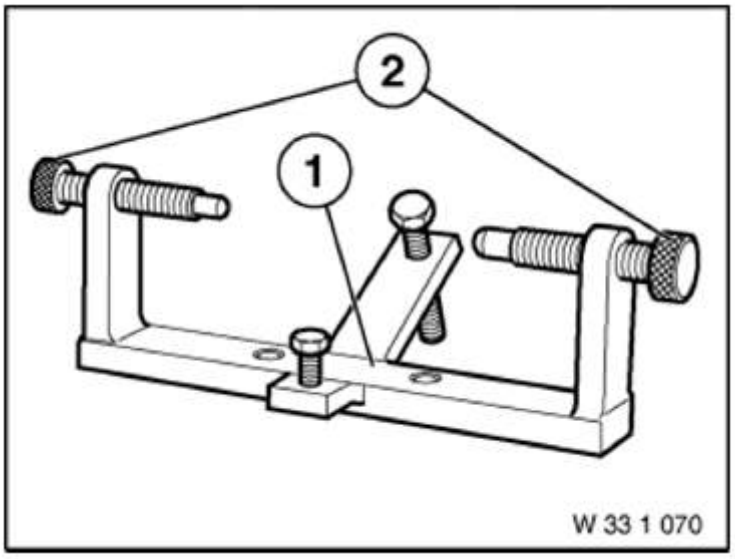


Fig. 77: Identifying Device (0492079)
Courtesy of BMW OF NORTH AMERICA, INC.

0492449 DEVICE

0492449 334390 Device Mechanical tool

Replaced by: 83300494611

NOTE: **For removing the rear axle final drive/Replaced by 33 4 420. (0 494 611)**

SI number

01 10 90 (288)

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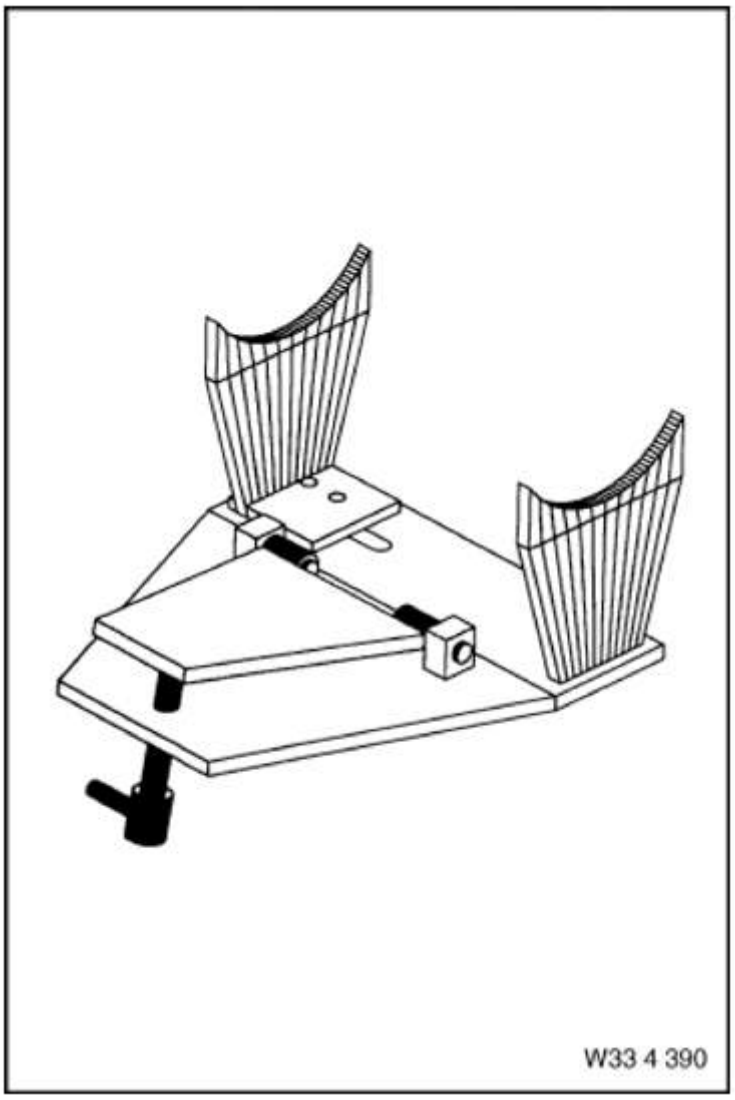


Fig. 78: Identifying Device (0492449)
Courtesy of BMW OF NORTH AMERICA, INC.

0492136 DEVICE

0492136 331380 Device AM

NOTE: **For determining the installation size of the bevel drive pinion in the rear axle final drive**

Consisting of:

1. 0492137 Holder

   NOTE: **(Dial gauge holder)**

2. 0492138 Washer

   NOTE: **(Measuring disc)**

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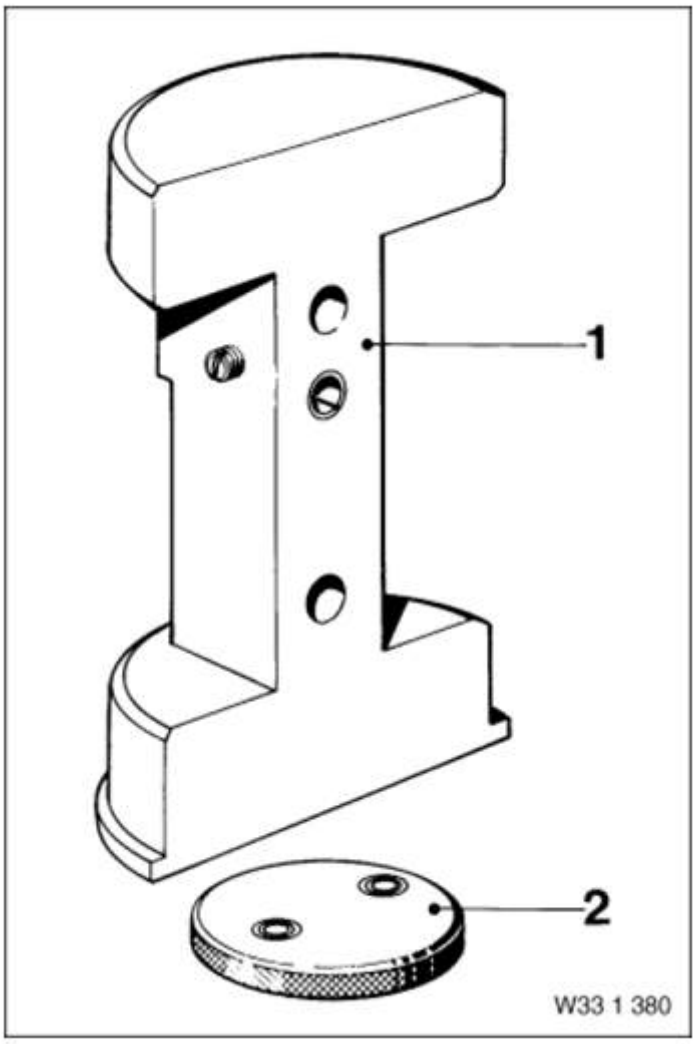


Fig. 79: Identifying Device (0492136)
Courtesy of BMW OF NORTH AMERICA, INC.

0493416 DEVICE

0493416 334400 Device AM

NOTE: **For removing inner wheel bearing races on rear axle**

SI number

08 12 14 (155)

Consisting of:

1. 0493816 Basic body

NOTE: **No longer available separately, only available as part of complete tool set 0493416 = 33 4 400.**

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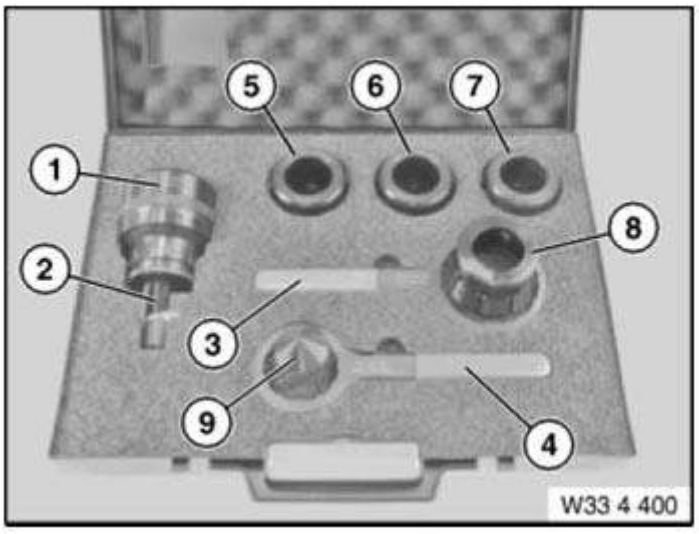


Fig. 80: Identifying Device (0493416)
Courtesy of BMW OF NORTH AMERICA, INC.

2. **0493817** Spindle

NOTE: **No longer available separately, only available as part of complete tool set 0493416 = 33 4 400.**

3. **0493818** Wrench

NOTE: **(Ignition key) Discontinued, only available via complete tool**

4. **0493819** Wrench

NOTE: **(Ignition key) Discontinued, only available via complete tool**

5. **0493820** Pliers

NOTE: **(Clamping ring (45 to 51 mm)) No longer available separately, only available as part of complete tool set 0493416 = 33 4 400.**

6. **0493821** Pliers

NOTE: **(Clamping ring (50 to 55 mm)) No longer available separately, only available as part of complete tool set 0493416 = 33 4 400.**

7. **0494617** Pliers

NOTE: **(clamping ring (55...61 mm)) Model series: E67 No longer available separately, only via complete tool set 0493416 = 33 4 400.**

8. **0496538** Ring

NOTE: **(Clamping ring) Model series: F01, F02. Available only as complete special tool set 33 4 400.**

9. **0496539** Synchronising key

NOTE: **Series: F01, F02. Remaining inventories will be sold off and then it will no longer be available separately, only available as part of complete tool set 0493416 = 33 4 400.**

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0492397 DEVICE

0492397 334140 Device Minimum set: Mechanical tools AM

NOTE: **For removing rubber mount in rear axle support.**

Storage Location

A8

B8

SI number

01 02 99 (417)

Consisting of:

1. 0492398 Pipe

   NOTE: **(Threaded tube) Deletion, only available via tool set**

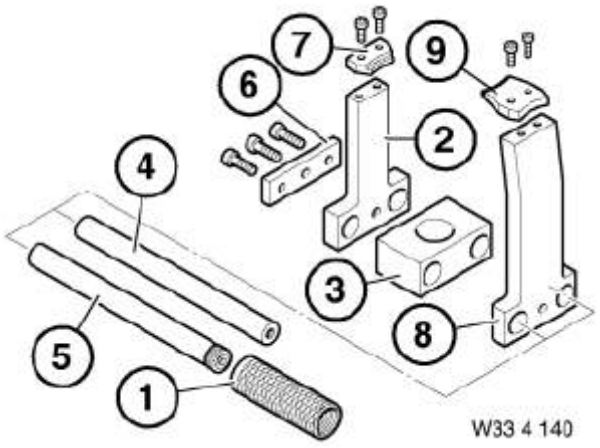


Fig. 81: Identifying Device (0492397)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0492399 Shaped part

   NOTE: **(Shaped part) 2 pieces Model series: E38, E39, E46 Deletion, only available via tool set**

3. 0492400 Shaped part

   NOTE: **(Shaped part)**

4. 0492401 Rod

   NOTE: **(Guide rod)**

5. 0492402 Rod

   NOTE: **(Guide rod) With thread dog point**

6. 0492403 Plate

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NOTE: **(Fixing plate) With screws Deletion, only available via tool set**

7. 0492404 Synchronising key

NOTE: **(Synchronising key (2 x)) With screws - model series: E38, E39, E46 Deletion, only available via tool set**

8. 0492405 Shaped part

NOTE: **(Shaped part) 2 pieces Model series: E39/2, E65, E67, RR1**

9. 0492406 Synchronising key

NOTE: **(Synchronising key (2 x)) With countersunk screw - model series: E39/2, E65, E67, E87**

0495864 DEVICE

0495864 335160 Device Minimum set: Mechanical tools AM

NOTE: **For removing and installing rubber mount in rear axle final drive at front.**

Storage Location

A22

SI number

01 22 06 (307)

Consisting of:

1. 0495873 Washer

NOTE: **Discontinued, can only be ordered using complete tool**

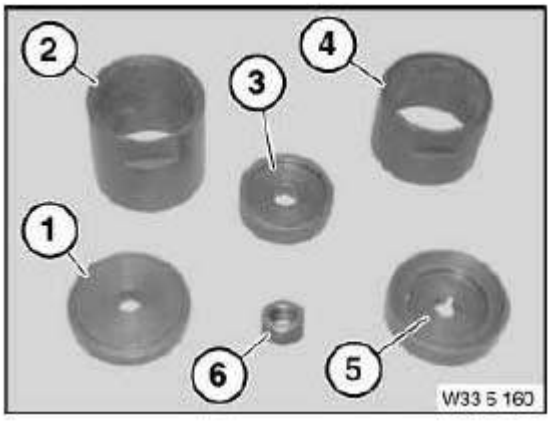


Fig. 82: Identifying Device (0495864)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0495874 Holding sleeve

NOTE: **Discontinued, can only be ordered using complete tool**

3. 0495875 Washer

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NOTE: **Discontinued, can only be ordered using complete tool**

4. **0495876** Holding sleeve

NOTE: **Discontinued, can only be ordered using complete tool**

5. **0495877** Washer

NOTE: **Discontinued, can only be ordered using complete tool**

6. **0495903** Nut

NOTE: **(Nut M12x1.5) discontinued, can only be ordered using complete tool**

0492393 DEVICE

0492393 334130 Device AM

NOTE: **For removing and installing the rubber mount in the support tube of the 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**

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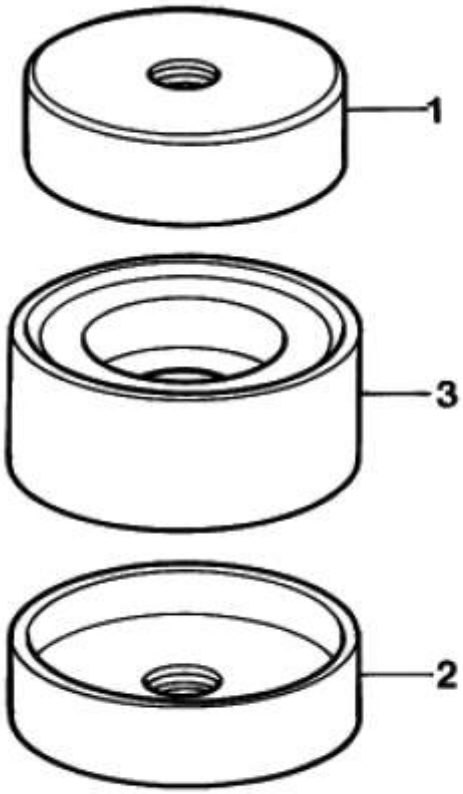


Fig. 83: Identifying Device (0492393)
Courtesy of BMW OF NORTH AMERICA, INC.

0492075 DEVICE

0492075 331030 Device Mechanical tool

Replaced by: 83300492079

NOTE: **(Fixture) For all rear axle final drives - model year: From 88 - Replaced by 33 1 070. (0 492 079)**

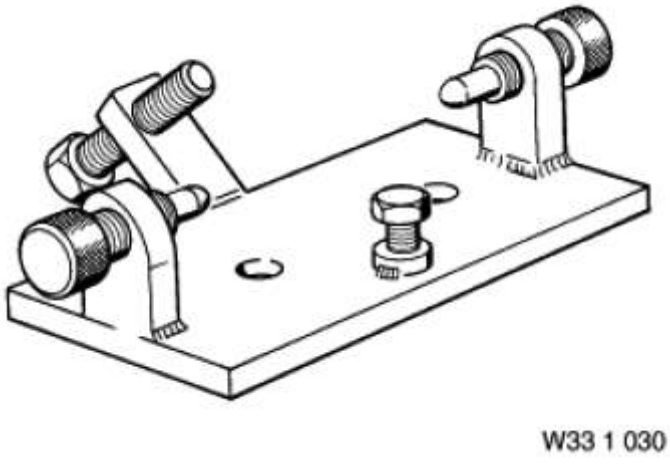


Fig. 84: Identifying Device (0492075)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492083 DEVICE

0492083 331150 Device AM

NOTE: **For pulling off drive flanges (also E46/16).**

Storage Location

C17

C18

Consisting of:

3 = 0494631 Washer
4 = 0494872 Plate

NOTE: **(adapter plate) Transmission: GS6-57DZ, GS6-53BZ (G transmission) GS6-51DZ, GS6-51BZ (H transmission) Deletion, only available via tool set**

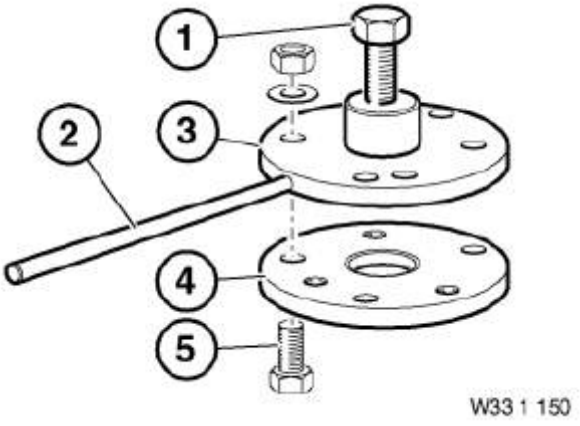


Fig. 85: Identifying Device (0492083)
Courtesy of BMW OF NORTH AMERICA, INC.

5 = 0494873 Screw

NOTE: **(countersunk screws M10x30 (3 x)) Transmission: GS6-57DZ, GS6-53BZ (G transmission) GS6-51DZ, GS6-51BZ (H transmission) Deletion, only available via tool set**

1 = 0493265 Spindle

NOTE: **Discontinued, can only be ordered using complete tool**

2 = 0493266 Mandrel

NOTE: **Discontinued, can only be ordered using complete tool**

2156252 DEVICE

2156252 Device AM

NOTE: **Device A1 in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

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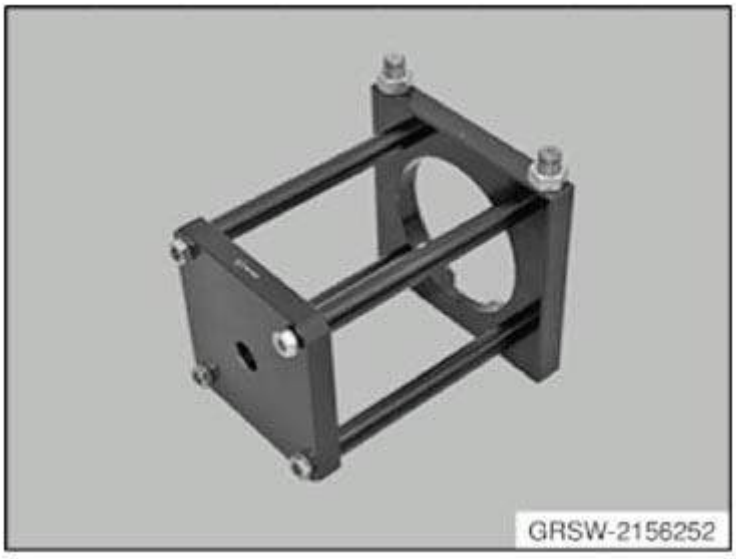


Fig. 86: Identifying Device (2156252)
Courtesy of BMW OF NORTH AMERICA, INC.

0492113 DEVICE

0492113 331350 Device AM

NOTE: For removing and installing outer rings of taper roller bearings

Consisting of:

1 = 0492114 Shaped part

NOTE: (Shaped part)

2 = 0492115 Spindle

NOTE: (Spindle, short)

4 = 0492116 Nut

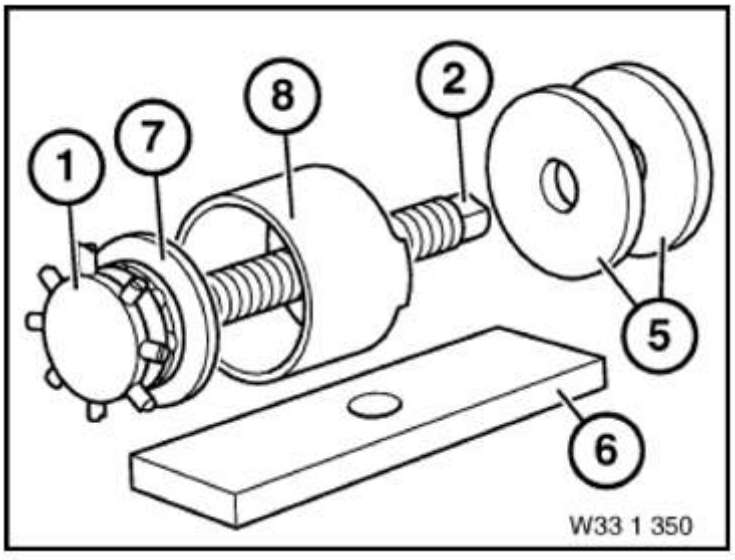


Fig. 87: Identifying Device (0492113)

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Courtesy of BMW OF NORTH AMERICA, INC.

5 = **0492117** Washer

NOTE: **(Installation washer (2 pieces))**

6 = **0492118** Bridge

NOTE: **(Support bridge)**

7 = **0492119** Washer

NOTE: **(Thrust washer)**

8 = **0492120** Holding sleeve

NOTE: **(Pressure sleeve) Can no longer be ordered separately. Only available as part of set 11 5 330 = 83 30 0 495 127.**

0495851 DEVICE

0495851 335120 Device Minimum set: Mechanical tools AM

NOTE: **For removing and installing output shaft in rear axle final drive.**

Storage Location

A22

B22

C22

SI number

01 01 07 (333)

Consisting of:

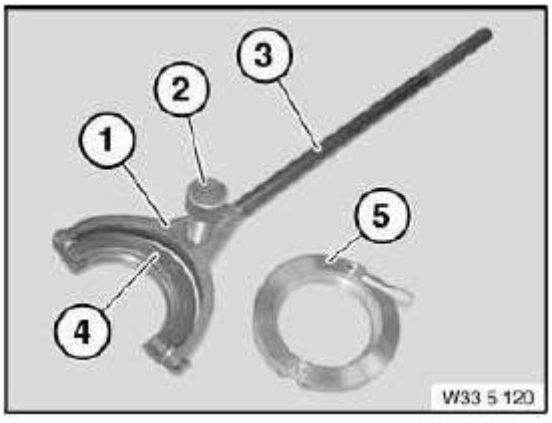


Fig. 88: Identifying Device (0495851)
Courtesy of BMW OF NORTH AMERICA, INC.

1 = **0495853** Basic body

NOTE: **Only available via complete tool set 33 5 120 - > (83 30 0 495 851).**

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2 = 0495854 Screw

NOTE: **(Knurled screw with thrust piece) available as part of set of special tools 33 5 120 -> (83 30 0 495 851) only.**

3 = 0495855 Rod

NOTE: **Only available via complete tool set 33 5 120 - > (83 30 0 495 851).**

4 = 0495856 Shaped element

NOTE: **(Shaped element) shaped element (bearing shell) available as part of set of special tools 33 5 120 -> (83 30 0 495 851) only.**

5 = 0495857 Shaped element

NOTE: **Sale of existing inventory then available as part of set of tools 33 5 120 -> (83 30 0 495 851) only.**

7 = 0496795 Shaped part

NOTE: **For driving output shaft into rear axle final drive.**

6 = 0496765 Shaped part

NOTE: **For pressing output shaft out of rear axle final drive.**

In conjunction with: 33 5 120 = 0495851

0495592 EXTENSION

0495592 335071 Extension Minimum set: Mechanical tools AM

NOTE: **(Extension (1 item)) discontinued, can only be ordered using complete tool**

SI number

01 21 06 (300)



Fig. 89: Identifying Extension (0495592)
Courtesy of BMW OF NORTH AMERICA, INC.

0495554 EXTENSION

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0495554 335070 Extension Minimum set: Mechanical tools AM

NOTE: **(2 pieces) Pull-out 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 item)) discontinued, can only be ordered using complete tool**



Fig. 90: Identifying Extension (0495554)
Courtesy of BMW OF NORTH AMERICA, INC.

0492149 EXTENSION

0492149 331423 Extension AM

NOTE: **(extension (2 x))**

Storage Location

Z3

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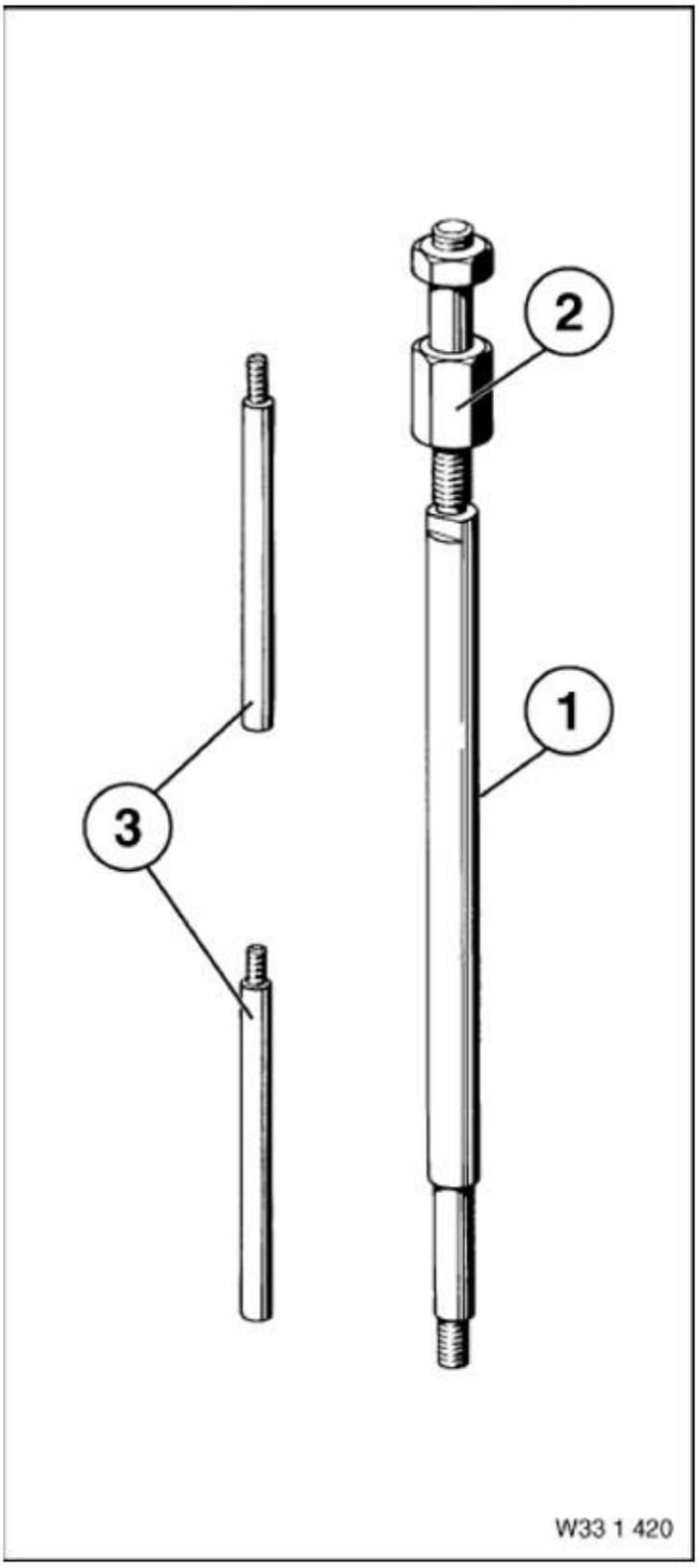


Fig. 91: Identifying Extension (0492149)
Courtesy of BMW OF NORTH AMERICA, INC.

0492096 EXTRACTOR

0492096 331300 Extractor AM

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

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Y4

Z4

Consisting of:

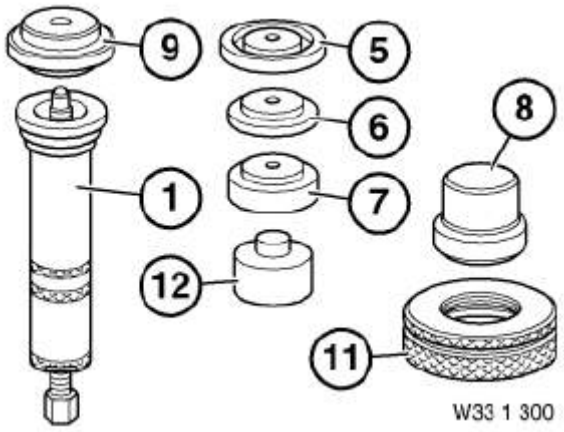


Fig. 92: Identifying Extractor (0492096)
Courtesy of BMW OF NORTH AMERICA, INC.

1 = **0492097** Connector

NOTE: **(Basic body) For transmissions S5D 260Z, S5D 310Z and S5D 320Z;Discontinued, only available via complete tool**

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)**

5 = **0492101** Synchronising key

NOTE: **(Thrust piece (old)) Discontinued, only available via complete tool**

6 = **0492102** Synchronising key
7 = **0492103** Synchronising key

NOTE: **Not available individually. Only via complete tool set**

8 = **0492104** Synchronising key
9 = **0492105** Synchronising key

NOTE: **For rear axle differential and for installing the camshaft sprocket on the crankshaft (M70) Discontinued, only available via complete tool**

1 = **0492107** Washer

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NOTE: **(Disc) Discontinued, only available via complete tool**

2 = **0492108** Synchronising key

NOTE: **For pulling the bearing inner race off the drive flange - Series: E36/5 Discontinued, only available via complete tool**

0492164 FITTING AID

0492164 332000 Fitting aid Mechanical tool

NOTE: **(Installation spoon) For installing the gaiter on the output shafts with sliding joints**

0492305 FIXTURE

0492305 333293 Fixture AM

NOTE: **(Fixture no. 5 and 6)**

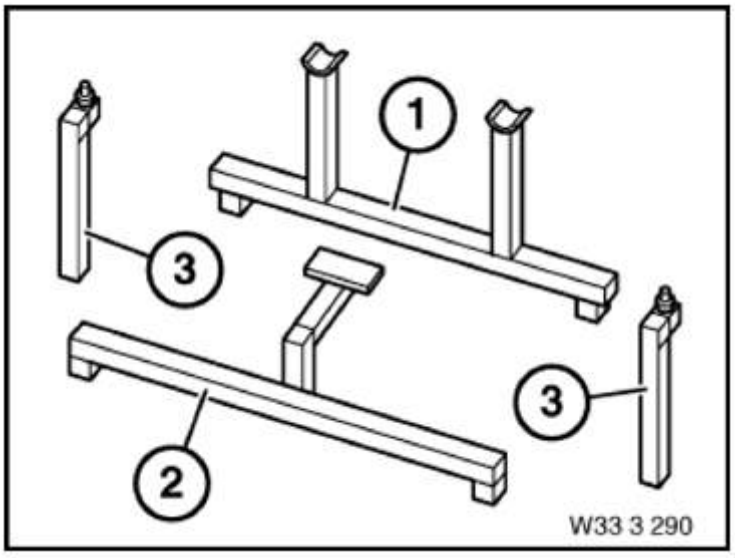


Fig. 93: Identifying Fixture (0492305)
Courtesy of BMW OF NORTH AMERICA, INC.

0496009 FIXTURE

0496009 335200 Fixture AM

NOTE: **For holding rear axle final drive during removal and installation. This mounting replaces mounting 33 4 420**

SI number

01 01 07 (333)

Consisting of:

1 = **0496019** Joint
2 = **0496020** Frame

NOTE: **(Main frame)**

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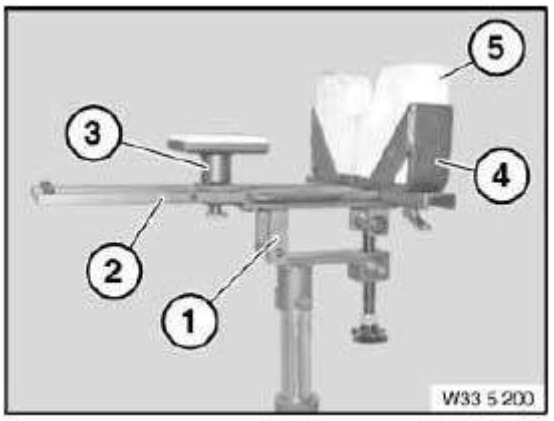


Fig. 94: Identifying Fixture (0496009)
Courtesy of BMW OF NORTH AMERICA, INC.

3 = **0496077** Upholstery
4 = **0496078** Fixture

NOTE: **(Fixture for foam material insert) Discontinued, only available via complete tool**

5 = **0496079** Insert

NOTE: **(Insert) Foam material insert (1 set = 2 pieces)**

5 = **0496080** Belt

NOTE: **(Tensioning strap)**

0492309 FIXTURE

0492309 333303 Fixture AM

NOTE: **(Fixture no. 5 and 6)**

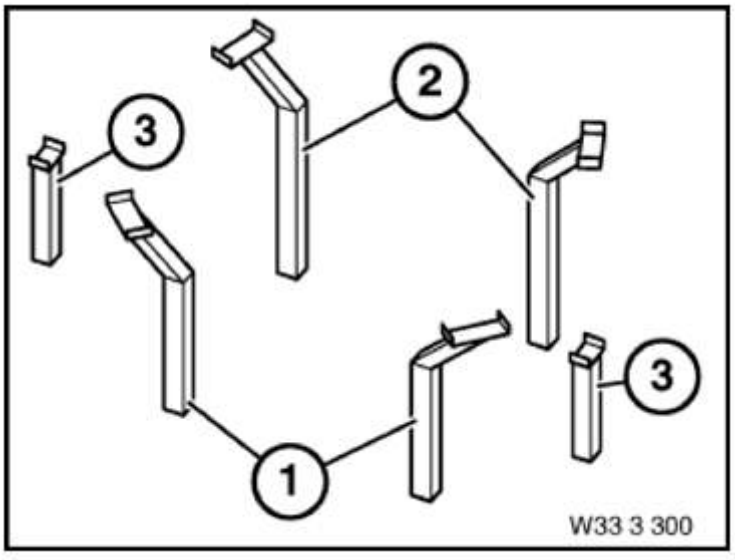


Fig. 95: Identifying Fixture (0492309)
Courtesy of BMW OF NORTH AMERICA, INC.

0496078 FIXTURE

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0496078 335204 Fixture AM

NOTE: **(Fixture for foam material insert) Discontinued, only available via complete tool**

SI number

01 01 07 (333)

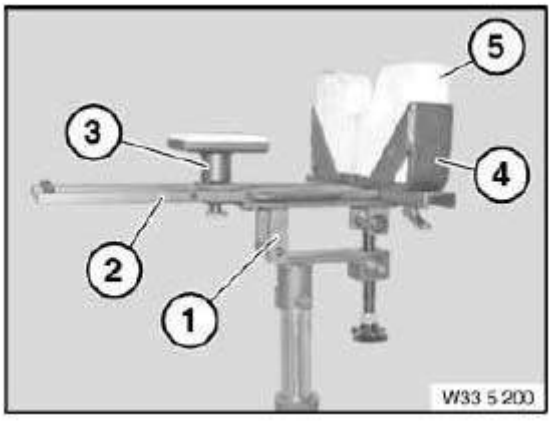


Fig. 96: Identifying Fixture (0496078)
Courtesy of BMW OF NORTH AMERICA, INC.

0492308 FIXTURE

0492308 333302 Fixture AM

NOTE: **(Fixture no. 3 and 4)**

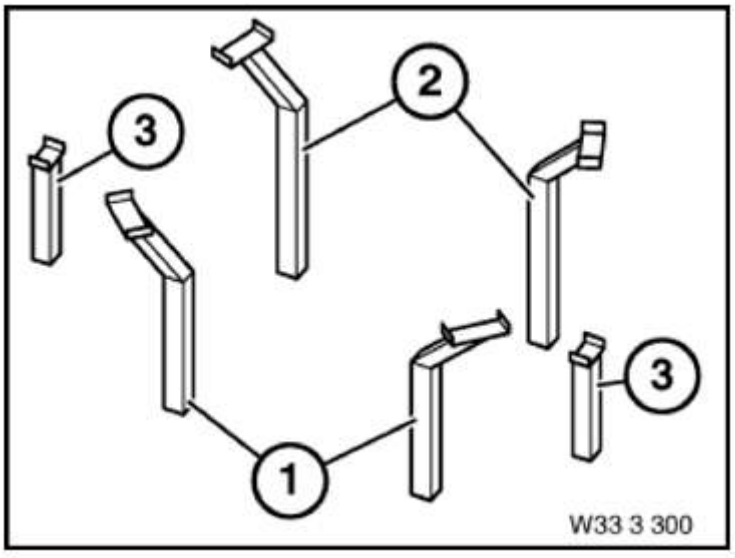


Fig. 97: Identifying Fixture (0492308)
Courtesy of BMW OF NORTH AMERICA, INC.

0492304 FIXTURE

0492304 333292 Fixture AM

NOTE: **(Fixture no. 1)**

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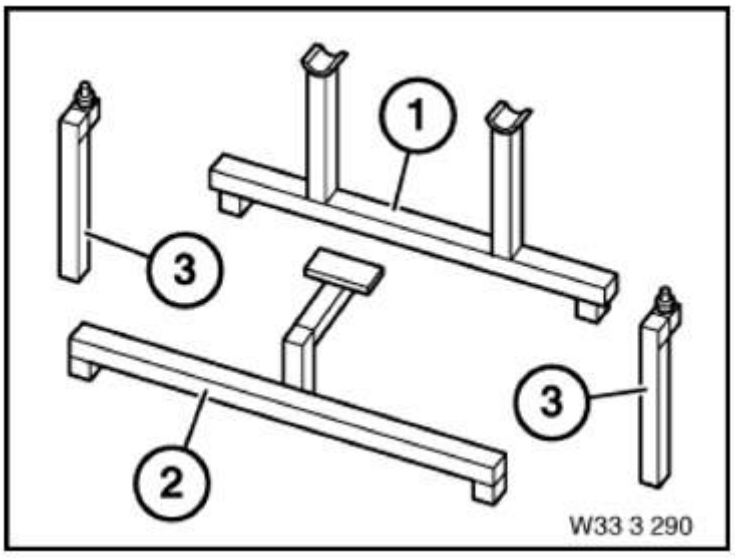


Fig. 98: Identifying Fixture (0492304)
Courtesy of BMW OF NORTH AMERICA, INC.

0492306 FIXTURE

0492306 333300 Fixture AM

Replaced by: 83300495567

NOTE: **(Mounting set) With gearbox cage for removing and fitting the rear axle. Replaced by 31 5 250. (0 495 567)**

SI number

01 05 90 (207)

Consisting of:

1. 0492307 Fixture

NOTE: **(Fixture no. 1 and 2)**

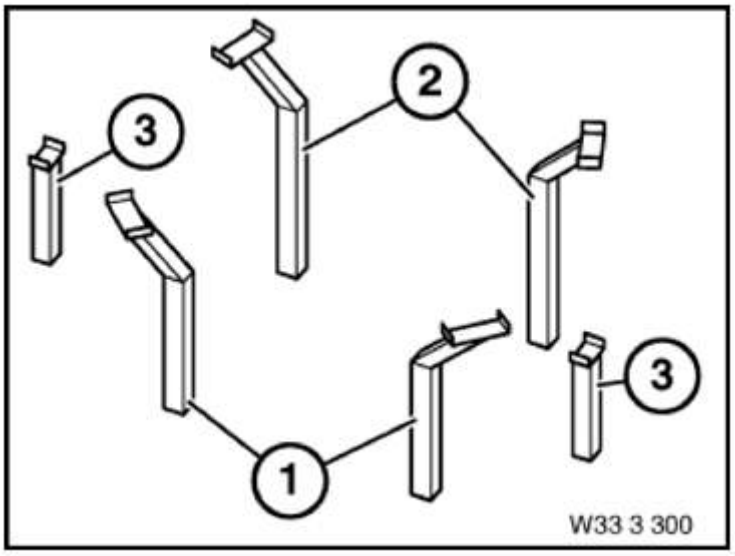


Fig. 99: Identifying Fixture (0492306)
Courtesy of BMW OF NORTH AMERICA, INC.

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2. 0492308 Fixture

NOTE: **(Fixture no. 3 and 4)**

3. 0492309 Fixture

NOTE: **(Fixture no. 5 and 6)**

0492302 FIXTURE

0492302 333290 Fixture AM

Replaced by: 83300495567

NOTE: **(Mounting set) For removing and installing the rear axle. Replaced by 31 5 250. (0 495 567)**

SI number

01 10 90 (288)

Consisting of:

1. 0492303 Fixture

NOTE: **(Fixture no. 3)**

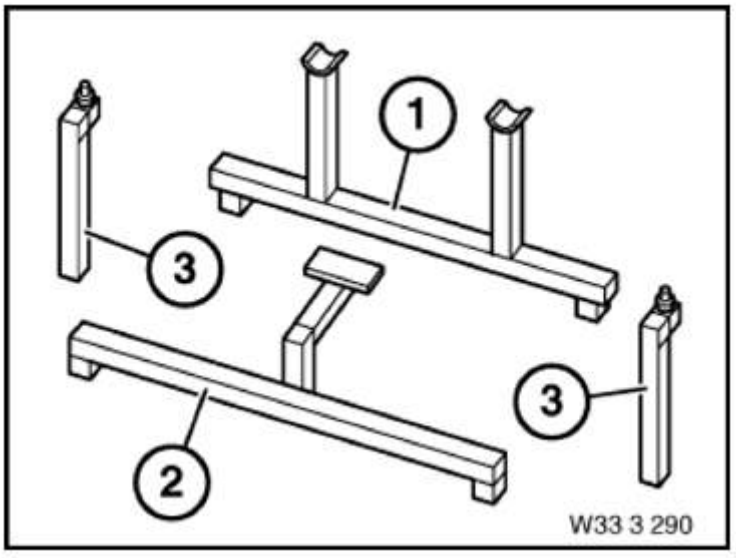


Fig. 100: Identifying Fixture (0492302)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0492304 Fixture

NOTE: **(Fixture no. 1)**

3. 0492305 Fixture

NOTE: **(Fixture no. 5 and 6)**

0492303 FIXTURE

0492303 333291 Fixture AM

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NOTE: (Fixture no. 3)

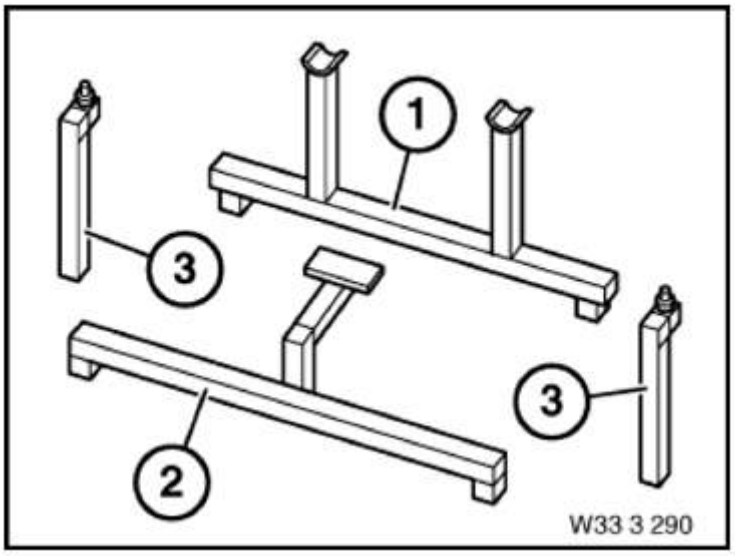


Fig. 101: Identifying Fixture (0492303)
Courtesy of BMW OF NORTH AMERICA, INC.

0492307 FIXTURE

0492307 333301 Fixture AM

NOTE: (Fixture no. 1 and 2)

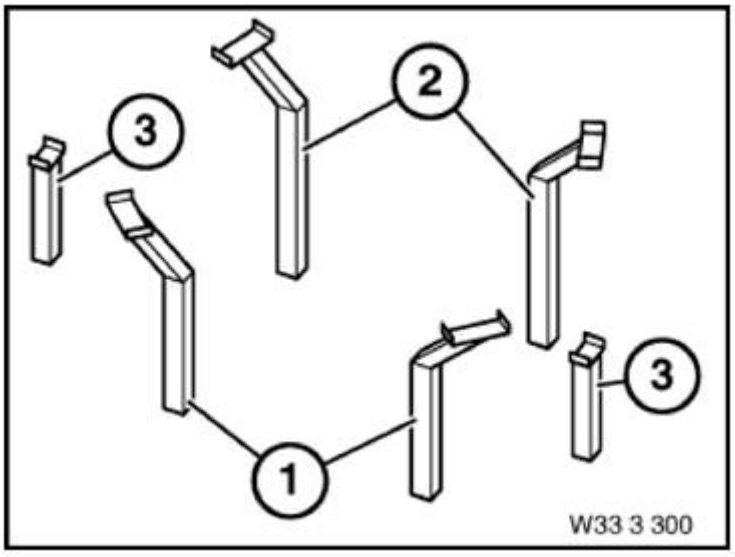


Fig. 102: Identifying Fixture (0492307)
Courtesy of BMW OF NORTH AMERICA, INC.

0492080 FRAME

0492080 331071 Frame AM

NOTE: (Main frame)

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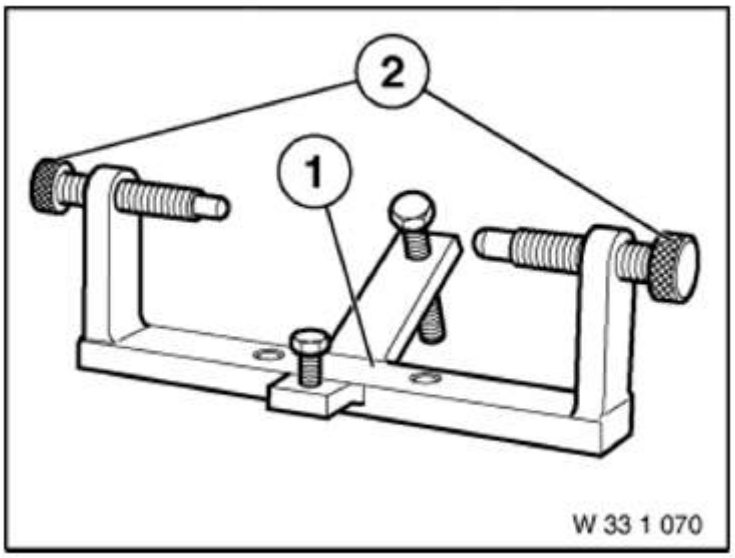


Fig. 103: Identifying Frame (0492080)
Courtesy of BMW OF NORTH AMERICA, INC.

0496020 FRAME

0496020 335202 Frame AM

NOTE: **(Main frame)**

SI number

01 01 07 (333)

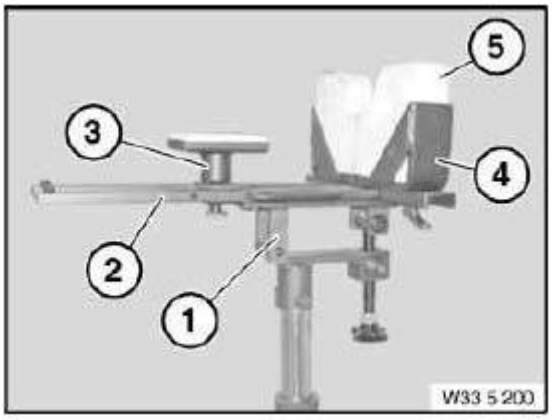


Fig. 104: Identifying Frame (0496020)
Courtesy of BMW OF NORTH AMERICA, INC.

0492200 GAUGE

0492200 333000 Gauge Mechanical tool

NOTE: **(Trailing arm gauge)**

2293785 GUIDE

2293785 Guide Minimum set: Mechanical tools Mechanical tool

NOTE: **For pulling out rubber mounts in rear axle support mounting.**

Storage Location

cardiagn.com

C30

SI number

01 22 11 (753)



Fig. 105: Identifying Guide (2293785)
Courtesy of BMW OF NORTH AMERICA, INC.

0492144 HOLDER

0492144 331411 Holder AM

NOTE: (Dial gauge holder)

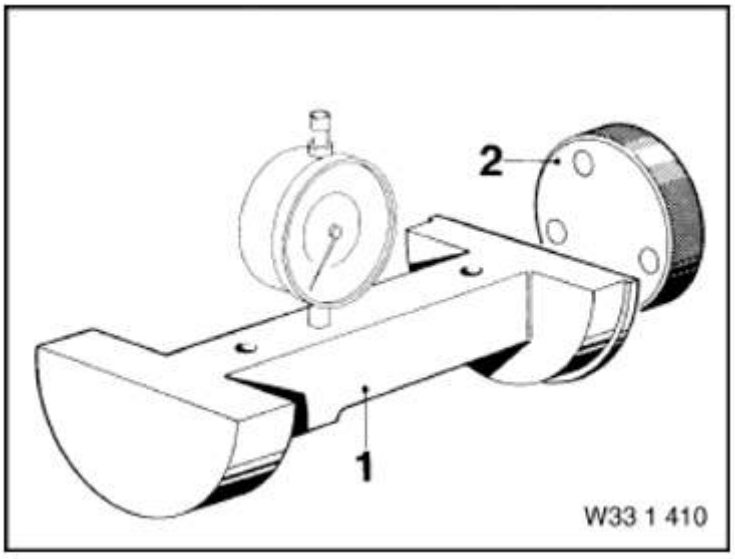


Fig. 106: Identifying Holder (0492144)
Courtesy of BMW OF NORTH AMERICA, INC.

0492158 HOLDER

0492158 331461 Holder AM

NOTE: (Dial gauge holder)

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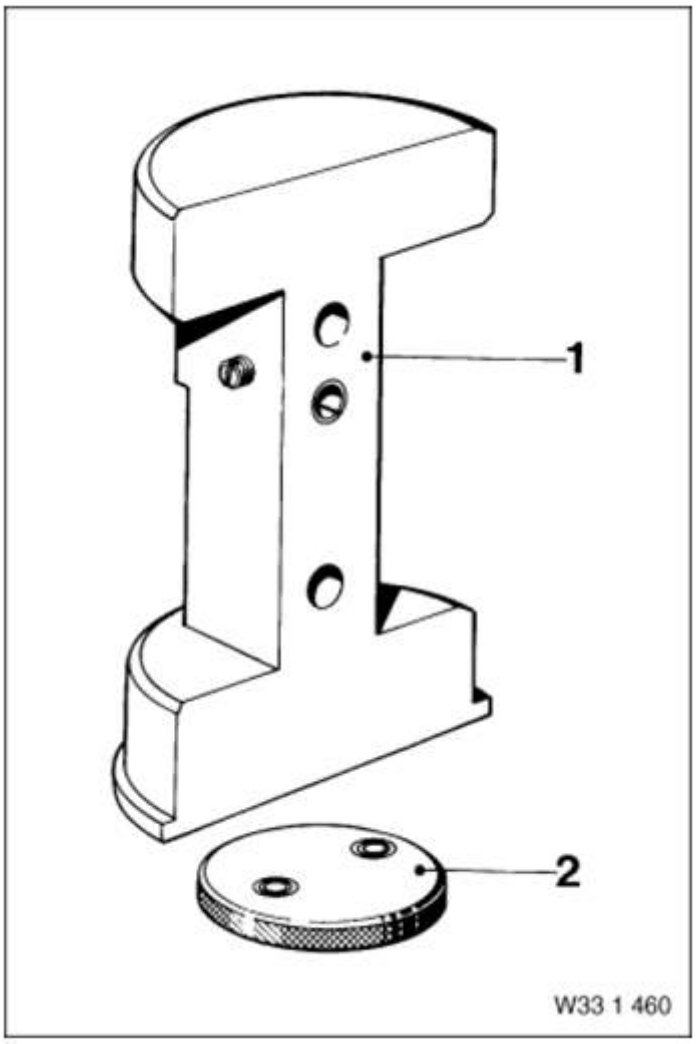


Fig. 107: Identifying Holder (0492158)
Courtesy of BMW OF NORTH AMERICA, INC.

0492137 HOLDER

0492137 331381 Holder AM

NOTE: **(Dial gauge holder)**

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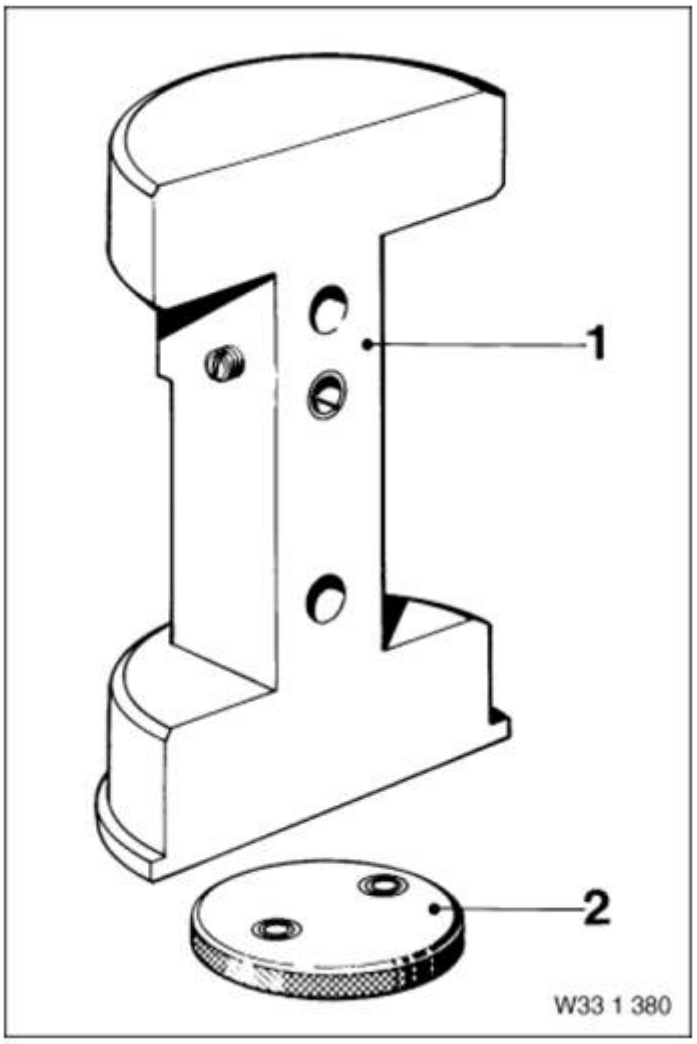


Fig. 108: Identifying Holder (0492137)
Courtesy of BMW OF NORTH AMERICA, INC.

0494987 HOLDER

0494987 334475 Holder Minimum set: Mechanical tools AM

NOTE: **(Countersupport) 0496208 =119850**

Storage Location

B49

cardiagn.com



Fig. 109: Identifying Holder (0494987)
Courtesy of BMW OF NORTH AMERICA, INC.

0492147 HOLDER

0492147 331421 Holder AM

NOTE: **(Dial gauge holder)**

Storage Location

Z3

Z4

cardiagn.com

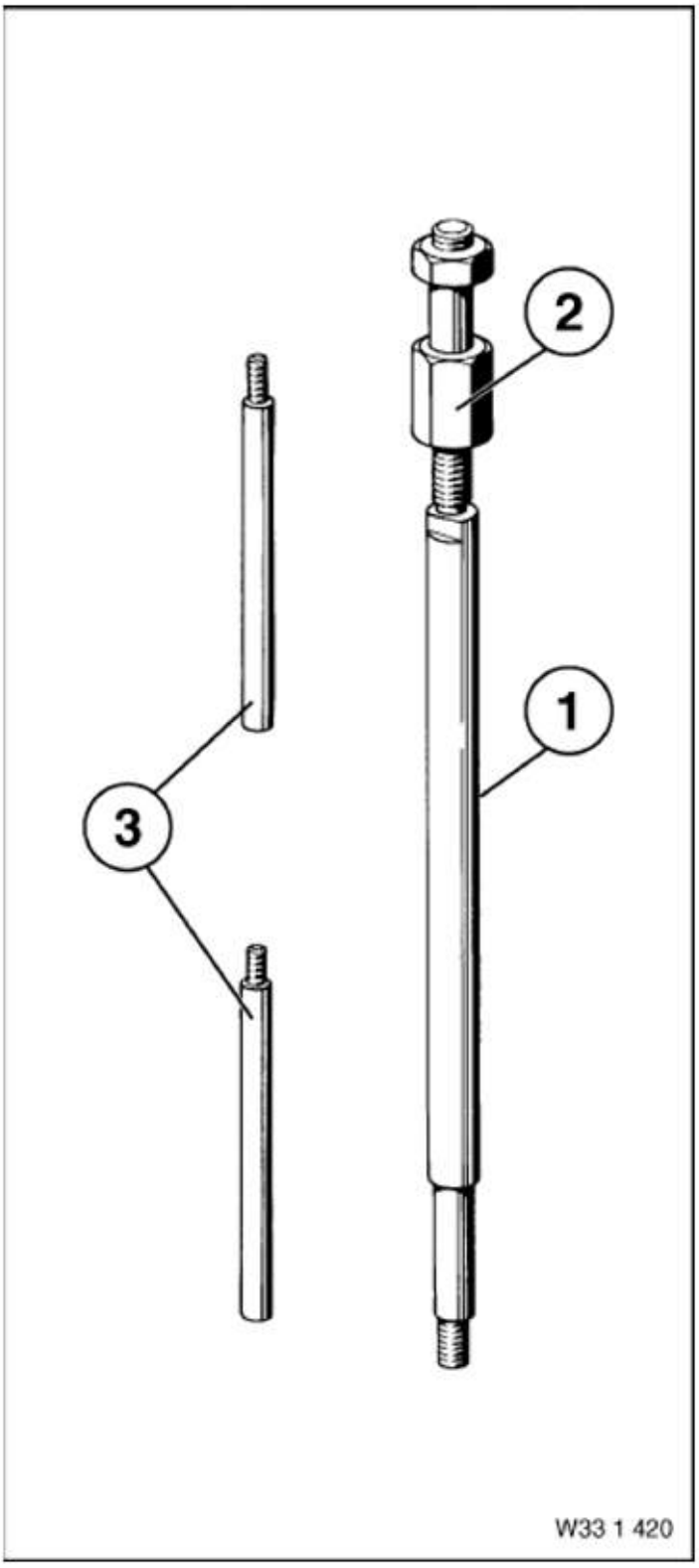


Fig. 110: Identifying Holder (0492147)
Courtesy of BMW OF NORTH AMERICA, INC.

0492162 HOLDER

0492162 331481 Holder AM

NOTE: **(Dial gauge holder)**

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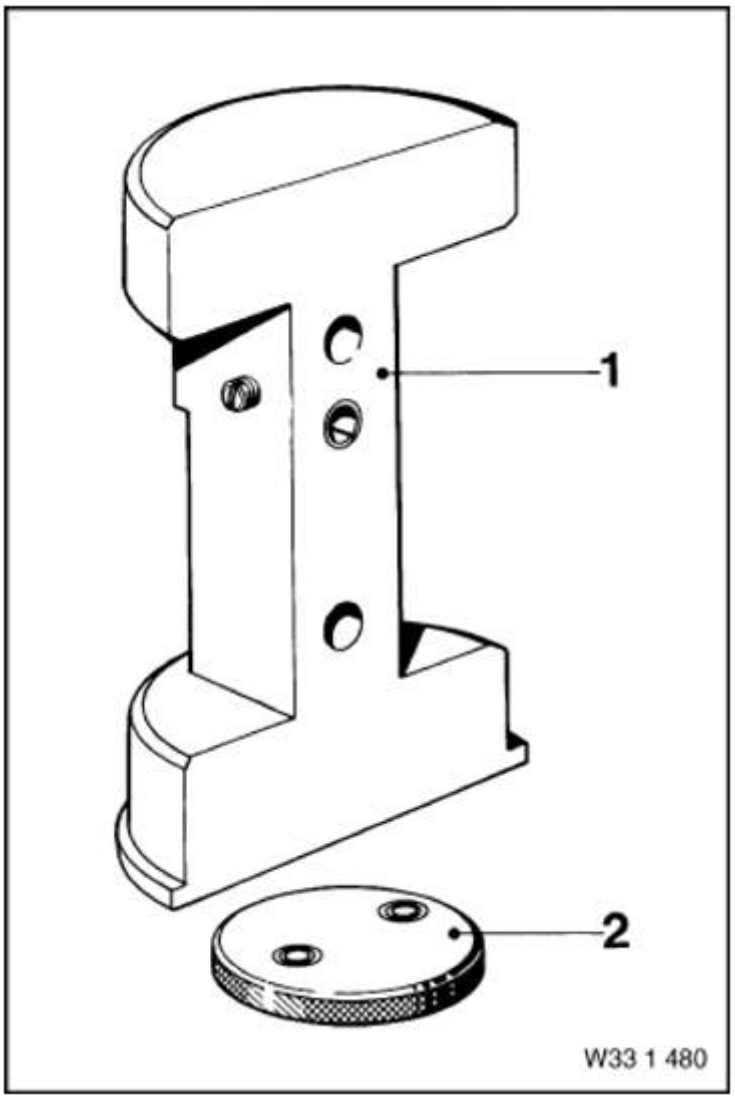


Fig. 111: Identifying Holder (0492162)
Courtesy of BMW OF NORTH AMERICA, INC.

0494979 HOLDER

0494979 334463 Holder Minimum set: Mechanical tools AM

NOTE: **(Countersupport) 0496208 =119850**

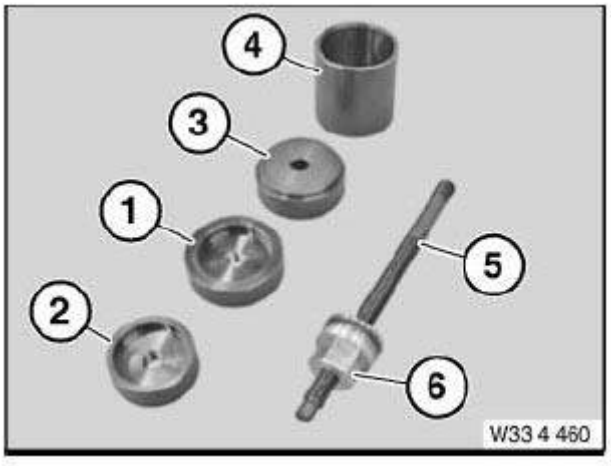


Fig. 112: Identifying Holder (0494979)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492346 HOLDER

0492346 334000 Holder Mechanical tool

NOTE: (Counter support) For flange on rear axle shaft

Storage Location

Z7

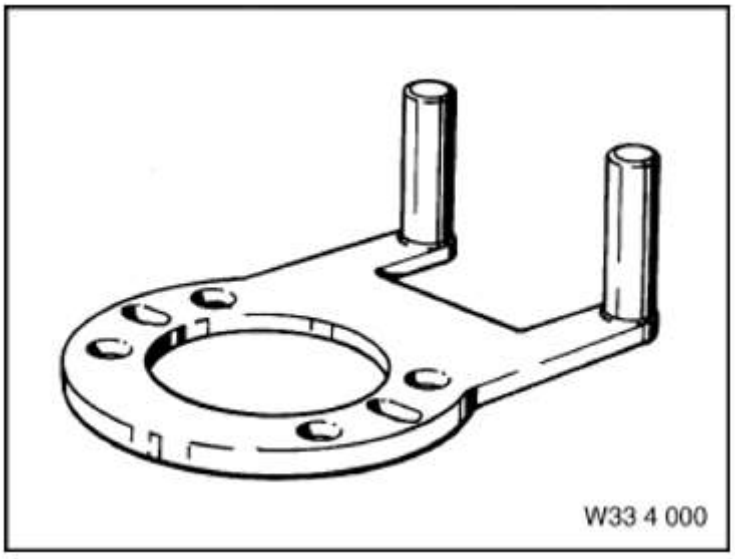


Fig. 113: Identifying Holder (0492346)
Courtesy of BMW OF NORTH AMERICA, INC.

0492140 HOLDER

0492140 331391 Holder AM

NOTE: (Dial gauge holder)

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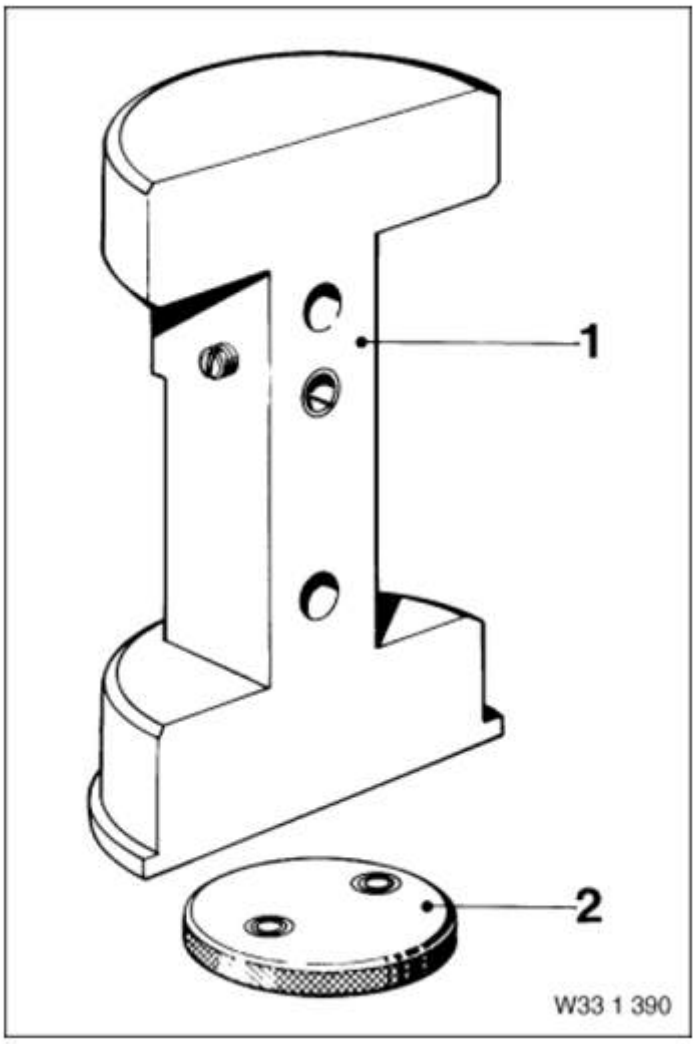


Fig. 114: Identifying Holder (0492140)
Courtesy of BMW OF NORTH AMERICA, INC.

0492183 HOLDER

0492183 332124 Holder AM

NOTE: **(Countersupport) 0496208 =119850**

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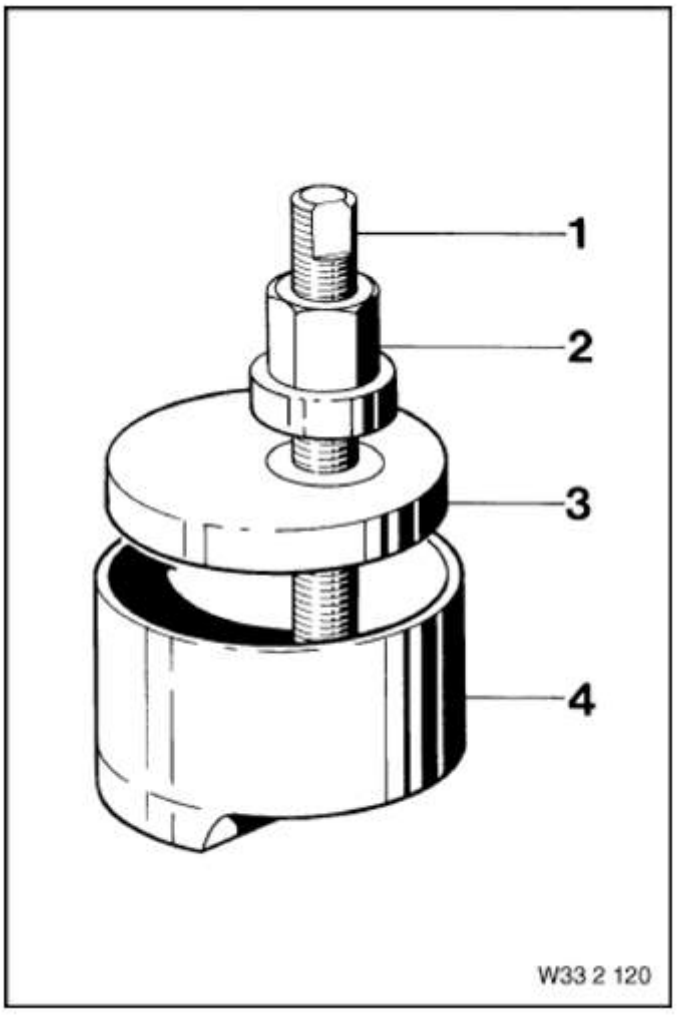


Fig. 115: Identifying Holder (0492183)
Courtesy of BMW OF NORTH AMERICA, INC.

0495874 HOLDING SLEEVE

0495874 335162 Holding sleeve Minimum set: Mechanical tools AM

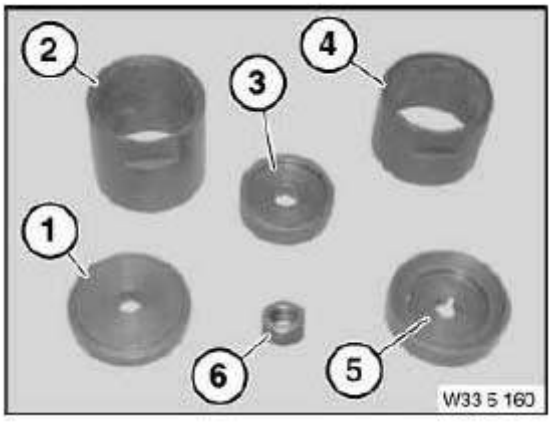
NOTE: **Discontinued, can only be ordered using complete tool**

Storage Location

B22

SI number

01 01 07 (333)



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Fig. 116: Identifying Holding Sleeve (0495874)
Courtesy of BMW OF NORTH AMERICA, INC.

0492386 HOLDING SLEEVE

0492386 334113 Holding sleeve AM

NOTE: (Press-in sleeve)

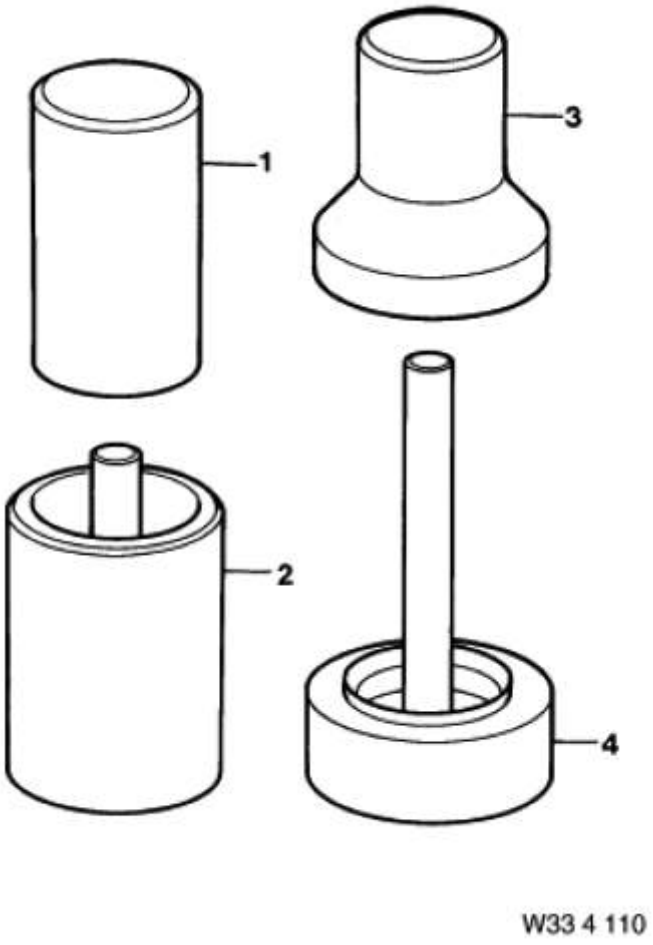


Fig. 117: Identifying Holding Sleeve (0492386)
Courtesy of BMW OF NORTH AMERICA, INC.

0492376 HOLDING SLEEVE

0492376 334093 Holding sleeve AM

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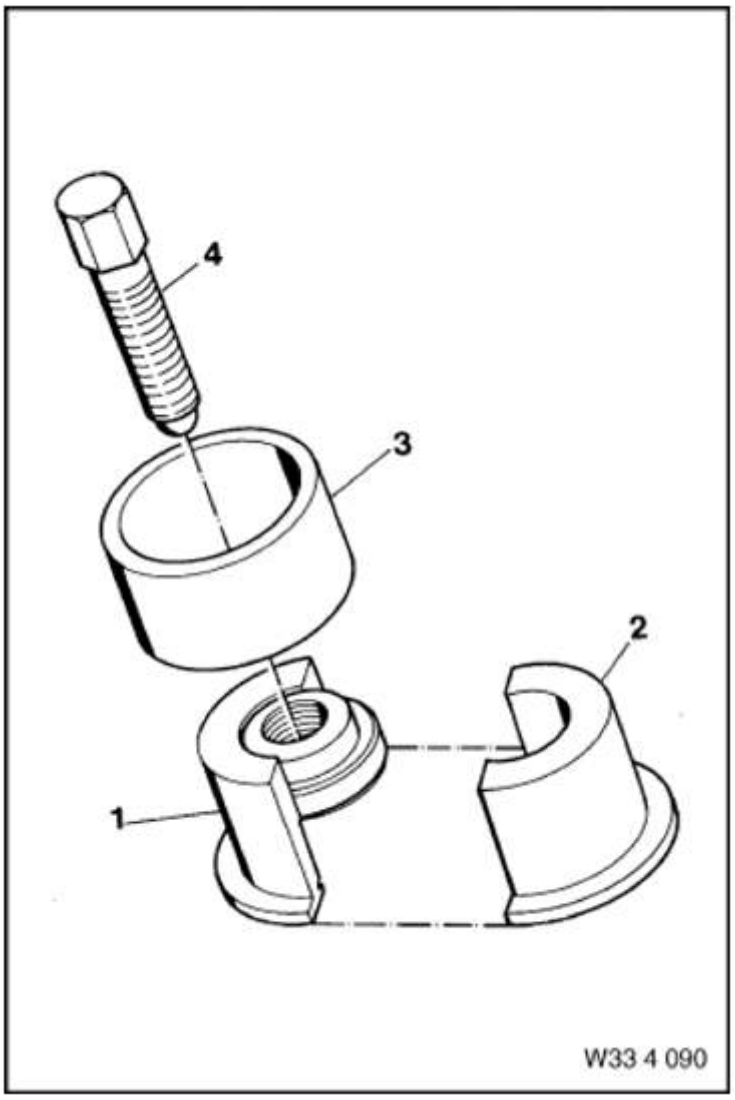


Fig. 118: Identifying Holding Sleeve (0492376)
Courtesy of BMW OF NORTH AMERICA, INC.

2293777 HOLDING SLEEVE

2293777 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **For removing and installing rubber mounts and ball joints in rear wheel carriers**

Storage Location

C29

C30

SI number

01 22 11 (753)

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Fig. 119: Identifying Holding Sleeve (2293777)
Courtesy of BMW OF NORTH AMERICA, INC.

0494980 HOLDING SLEEVE

0494980 334464 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(support sleeve)**

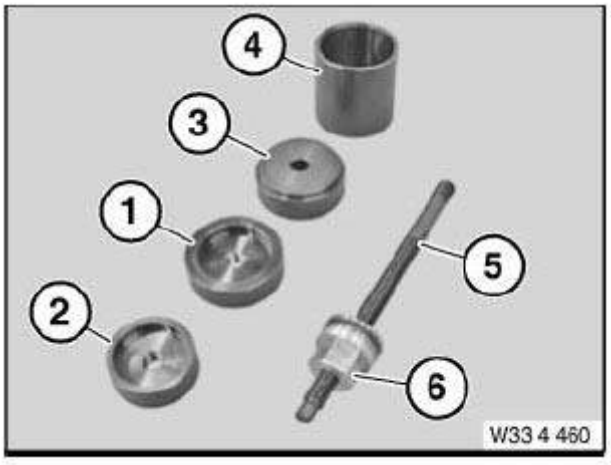


Fig. 120: Identifying Holding Sleeve (0494980)
Courtesy of BMW OF NORTH AMERICA, INC.

0492268 HOLDING SLEEVE

0492268 333214 Holding sleeve AM

NOTE: **(Spacer sleeve) For pressing the ball joint into the wheel carrier**

Storage Location

X5

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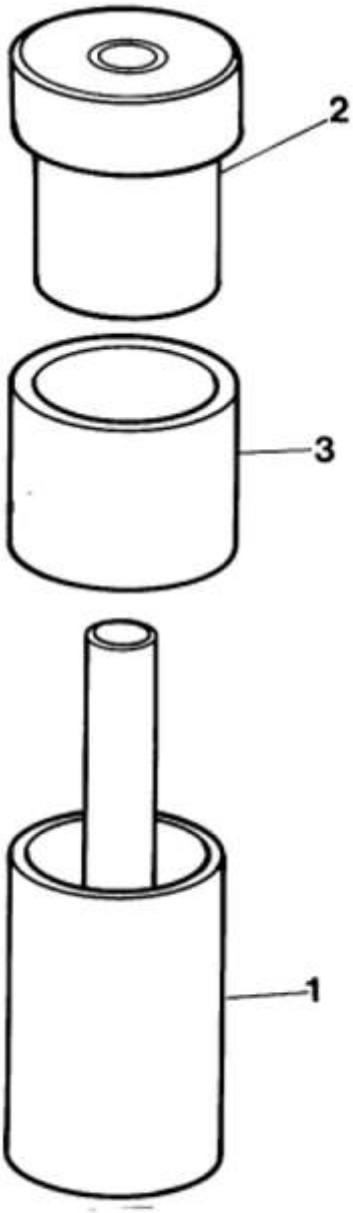


Fig. 121: Identifying Holding Sleeve (0492268)
Courtesy of BMW OF NORTH AMERICA, INC.

0495876 HOLDING SLEEVE

0495876 335164 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **Discontinued, can only be ordered using complete tool**

Storage Location

B22

SI number

01 01 07 (333)

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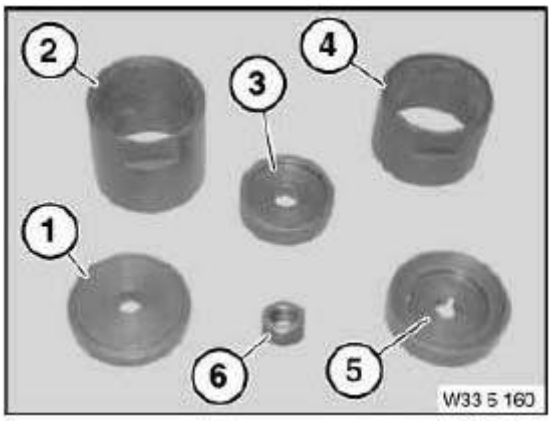


Fig. 122: Identifying Holding Sleeve (0495876)
Courtesy of BMW OF NORTH AMERICA, INC.

0492255 HOLDING SLEEVE

0492255 333183 Holding sleeve AM

NOTE: **(spacer sleeve) For pressing the rubber mount into the differential carrier - Series: E31**

Storage Location

C14

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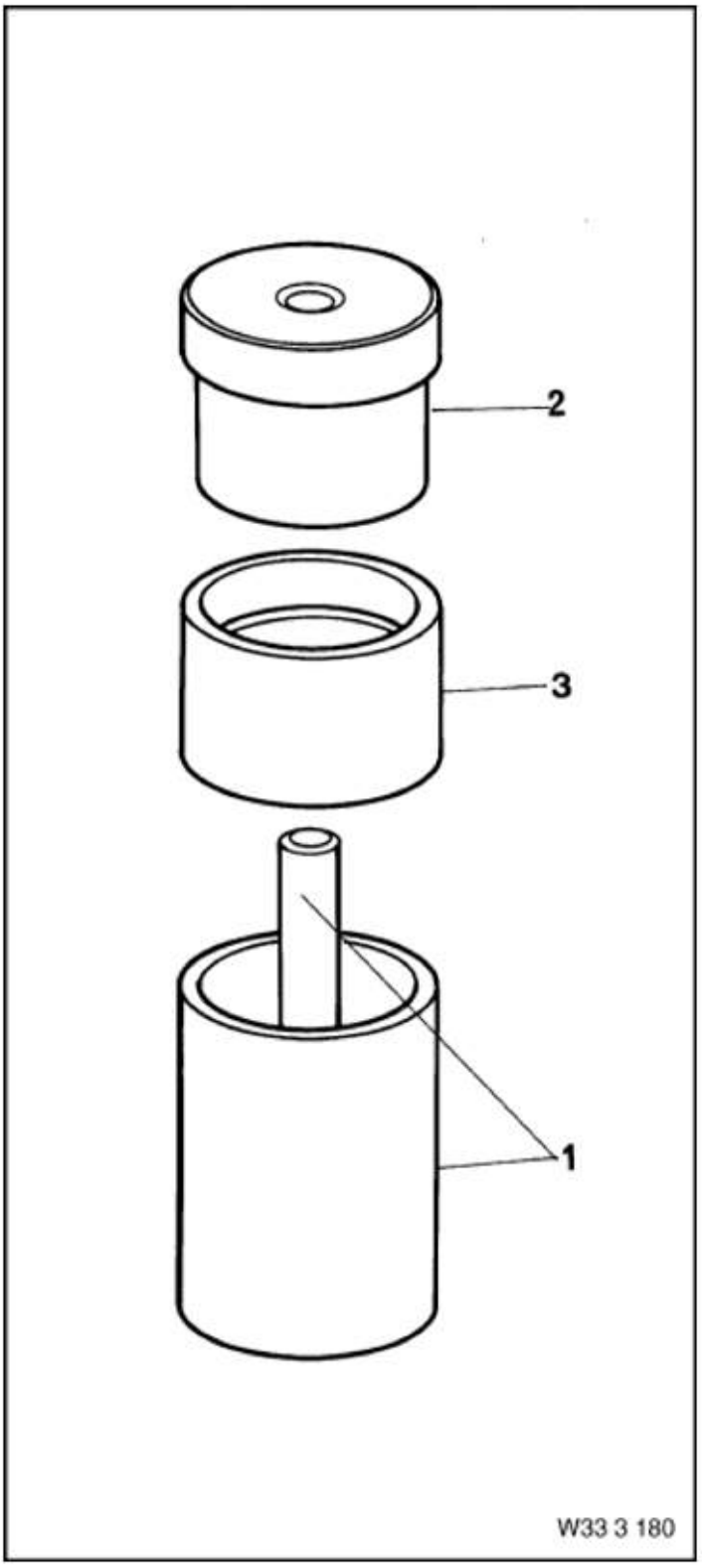


Fig. 123: Identifying Holding Sleeve (0492255)
Courtesy of BMW OF NORTH AMERICA, INC.

0492385 HOLDING SLEEVE

0492385 334112 Holding sleeve AM

NOTE: **(Press-out sleeve)**

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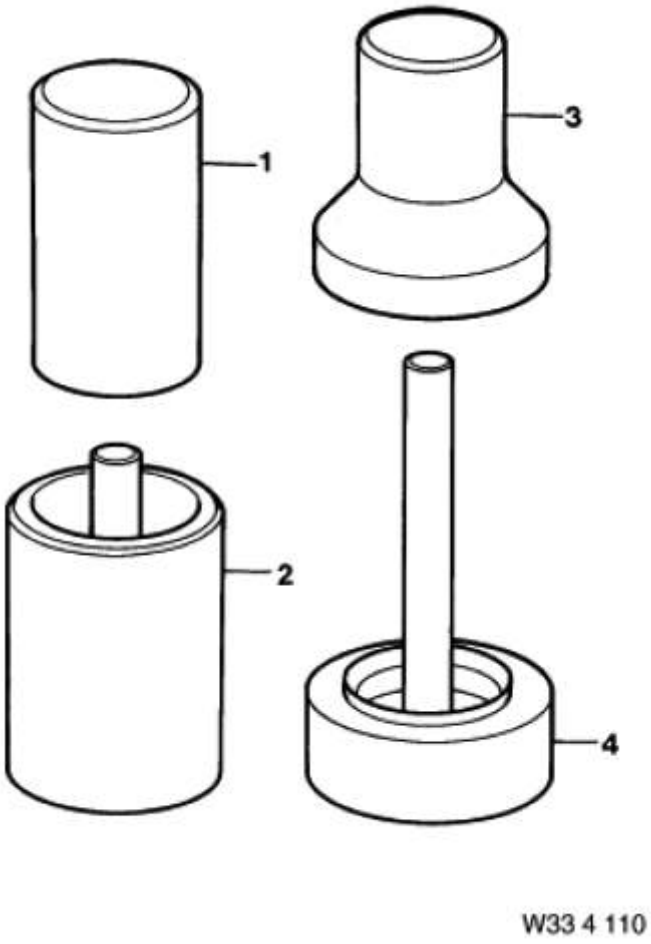


Fig. 124: Identifying Holding Sleeve (0492385)
Courtesy of BMW OF NORTH AMERICA, INC.

0492379 HOLDING SLEEVE

0492379 334101 Holding sleeve AM

NOTE: **(support sleeve) During extraction**

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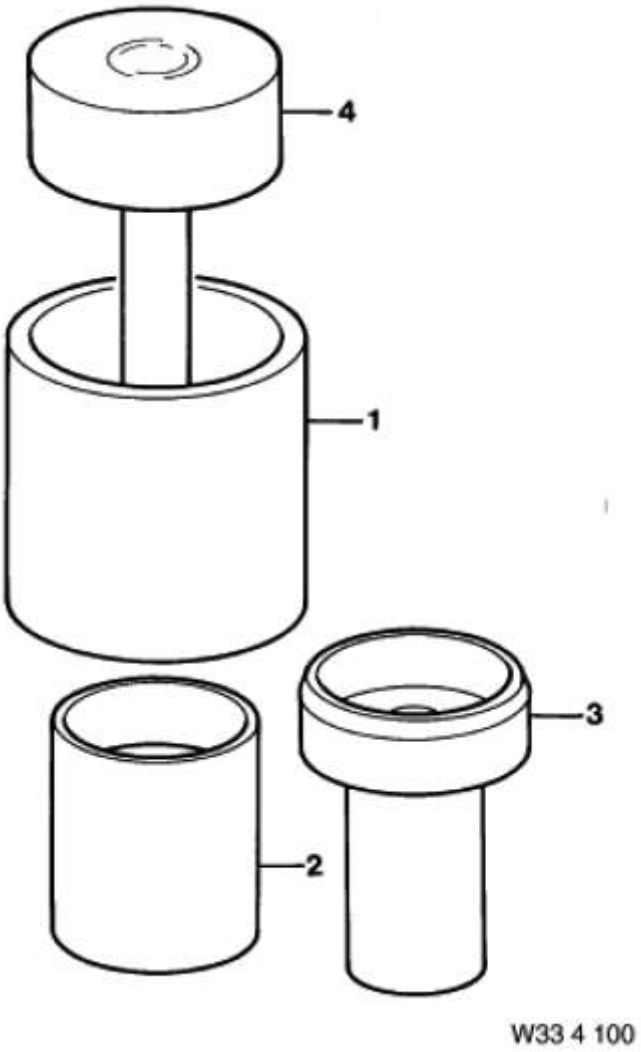


Fig. 125: Identifying Holding Sleeve (0492379)
Courtesy of BMW OF NORTH AMERICA, INC.

0492109 HOLDING SLEEVE

0492109 331330 Holding sleeve Mechanical tool

NOTE: **(Assembly sleeve) For fitting the taper roller bearing on the bevel drive pinion**

Storage Location

C16

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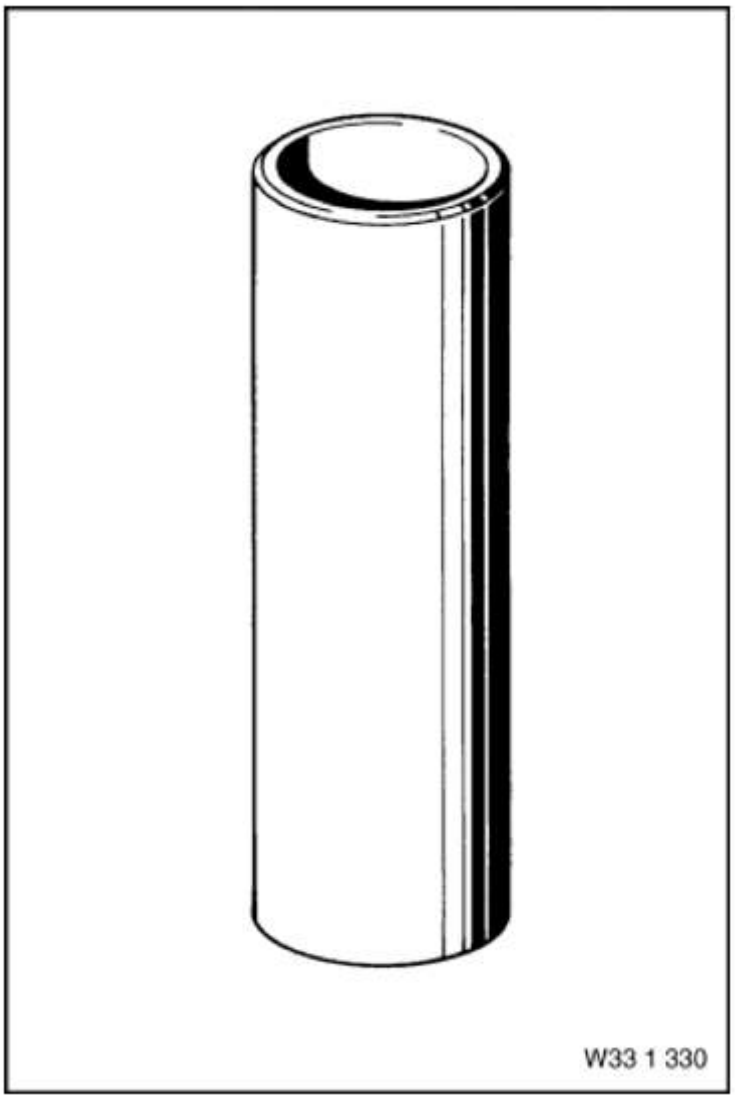


Fig. 126: Identifying Holding Sleeve (0492109)
Courtesy of BMW OF NORTH AMERICA, INC.

0492381 HOLDING SLEEVE

0492381 334103 Holding sleeve AM

NOTE: **(Press-in sleeve)**

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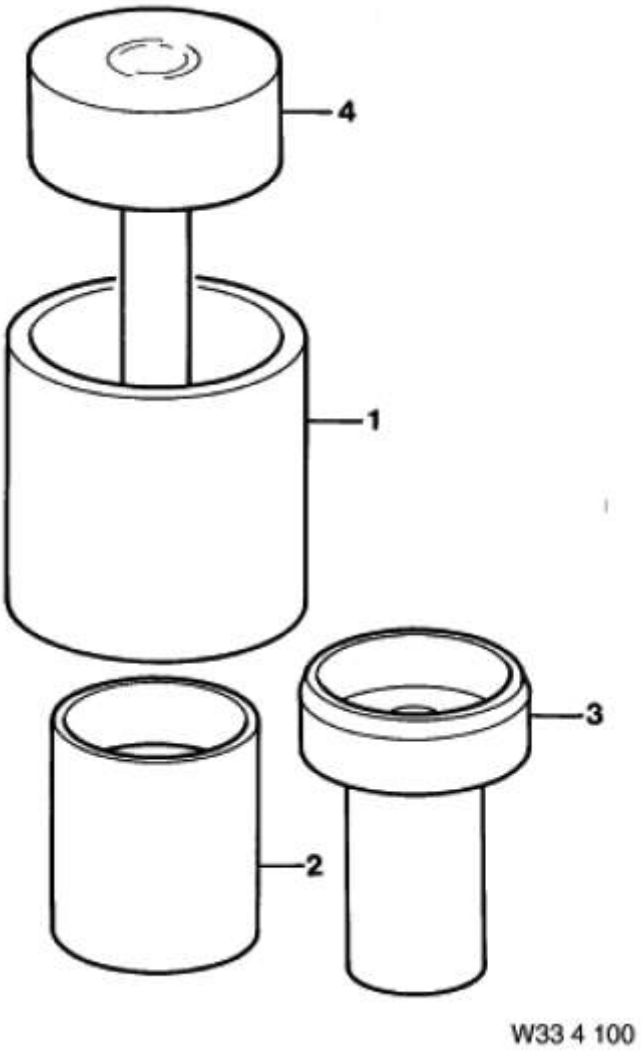


Fig. 127: Identifying Holding Sleeve (0492381)
Courtesy of BMW OF NORTH AMERICA, INC.

2156254 HOLDING

2156254 Holding sleeve AM

NOTE: **Sleeve C1 in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 128: Identifying Holding Sleeve (2156254)
Courtesy of BMW OF NORTH AMERICA, INC.

0494986 HOLDING SLEEVE

0494986 334474 Holding sleeve Minimum set: Mechanical tools AM

NOTE: **(support sleeve)**

Storage Location

B49



Fig. 129: Identifying Holding Sleeve (0494986)
Courtesy of BMW OF NORTH AMERICA, INC.

0492380 HOLDING SLEEVE

0492380 334102 Holding sleeve AM

NOTE: **(Press-out sleeve)**

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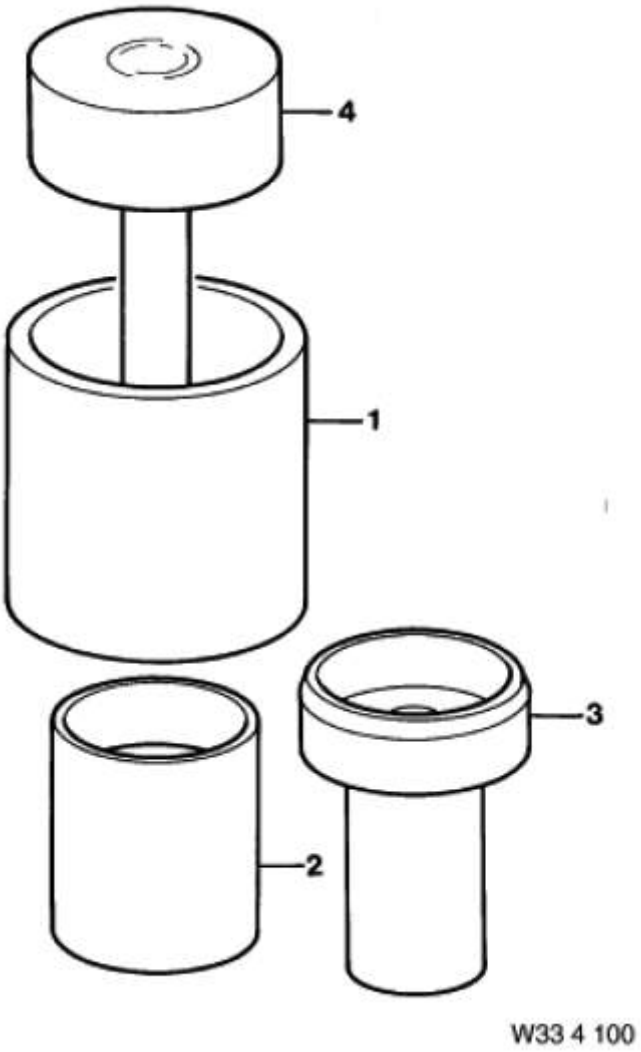
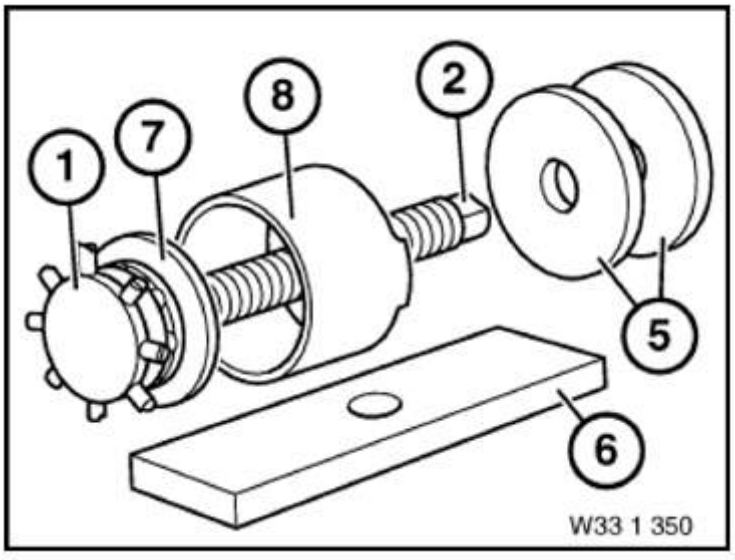


Fig. 130: Identifying Holding Sleeve (0492380)
Courtesy of BMW OF NORTH AMERICA, INC.

0492120 HOLDING SLEEVE

0492120 331358 Holding sleeve AM

NOTE: (Pressure sleeve) Can no longer be ordered separately. Only available as part of set 11 5 330 = 83 30 0 495 127.



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Fig. 131: Identifying Holding Sleeve (0492120)
Courtesy of BMW OF NORTH AMERICA, INC.

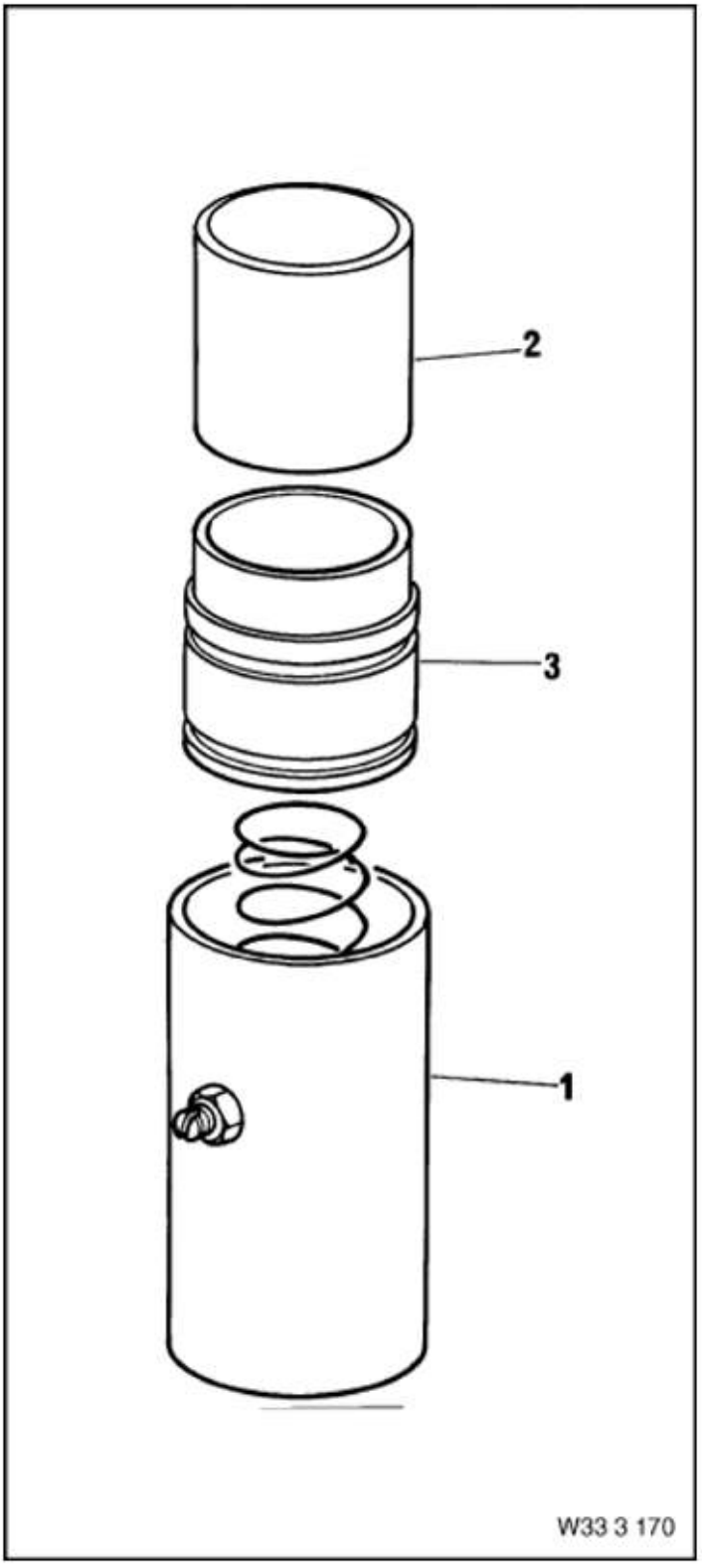
0492251 HOLDING SLEEVE

0492251 333173 Holding sleeve AM

NOTE: **(Guide sleeve) to press in the front rubber mount**

Storage Location

X5



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Fig. 132: Identifying Holding Sleeve (0492251)
Courtesy of BMW OF NORTH AMERICA, INC.

0492267 HOLDING SLEEVE

0492267 333213 Holding sleeve AM

NOTE: (Spacer sleeve) For pressing the ball joint into the support arm

Storage Location

X5

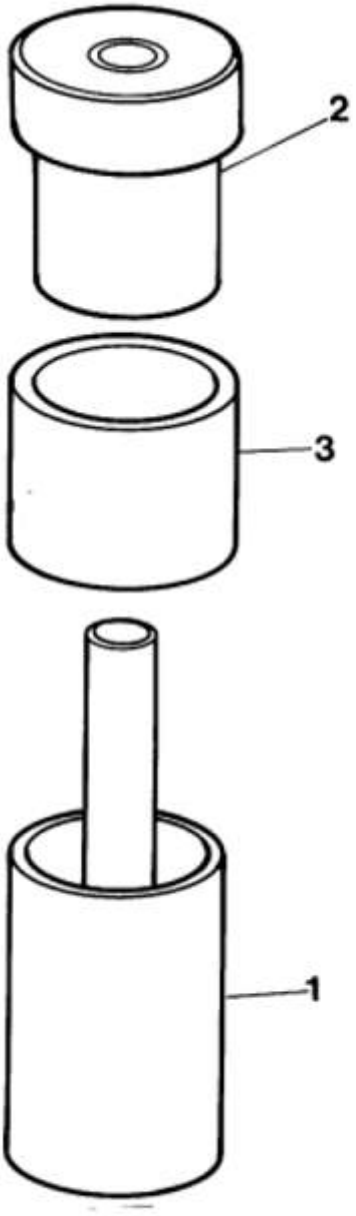


Fig. 133: Identifying Holding Sleeve (0492267)
Courtesy of BMW OF NORTH AMERICA, INC.

2159986 HOLDING

2159986 Holding sleeve AM

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NOTE: **Sleeve H1 (removing gear finding component) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 134: Identifying Holding Sleeve (2159986)
Courtesy of BMW OF NORTH AMERICA, INC.

0492348 HOLDING SLEEVE

0492348 334020 Holding sleeve Mechanical tool

NOTE: **For gripping the rear wheel bearing when drawing in the rear axle shaft**

Storage Location

X9

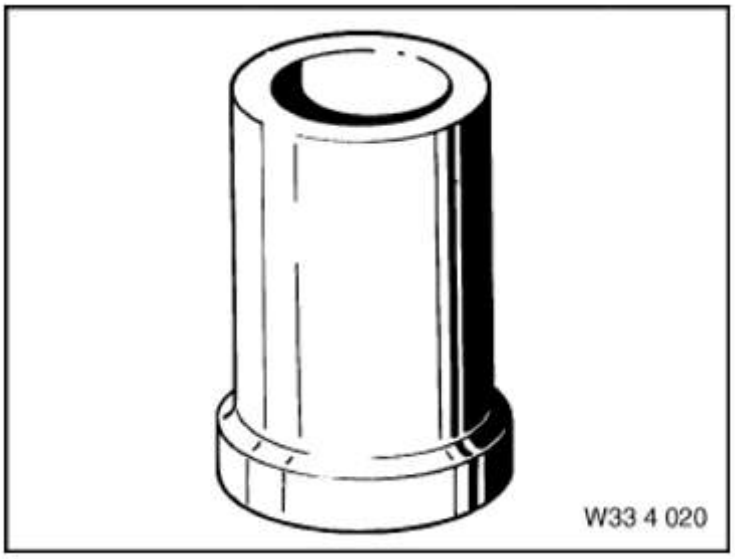


Fig. 135: Identifying Holding Sleeve (0492348)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492242 HOLDING SLEEVE

0492242 333154 Holding sleeve AM

NOTE: **(spacer sleeve) For press-fitting the ball joint in the wheel carrier**

Storage Location

Z8

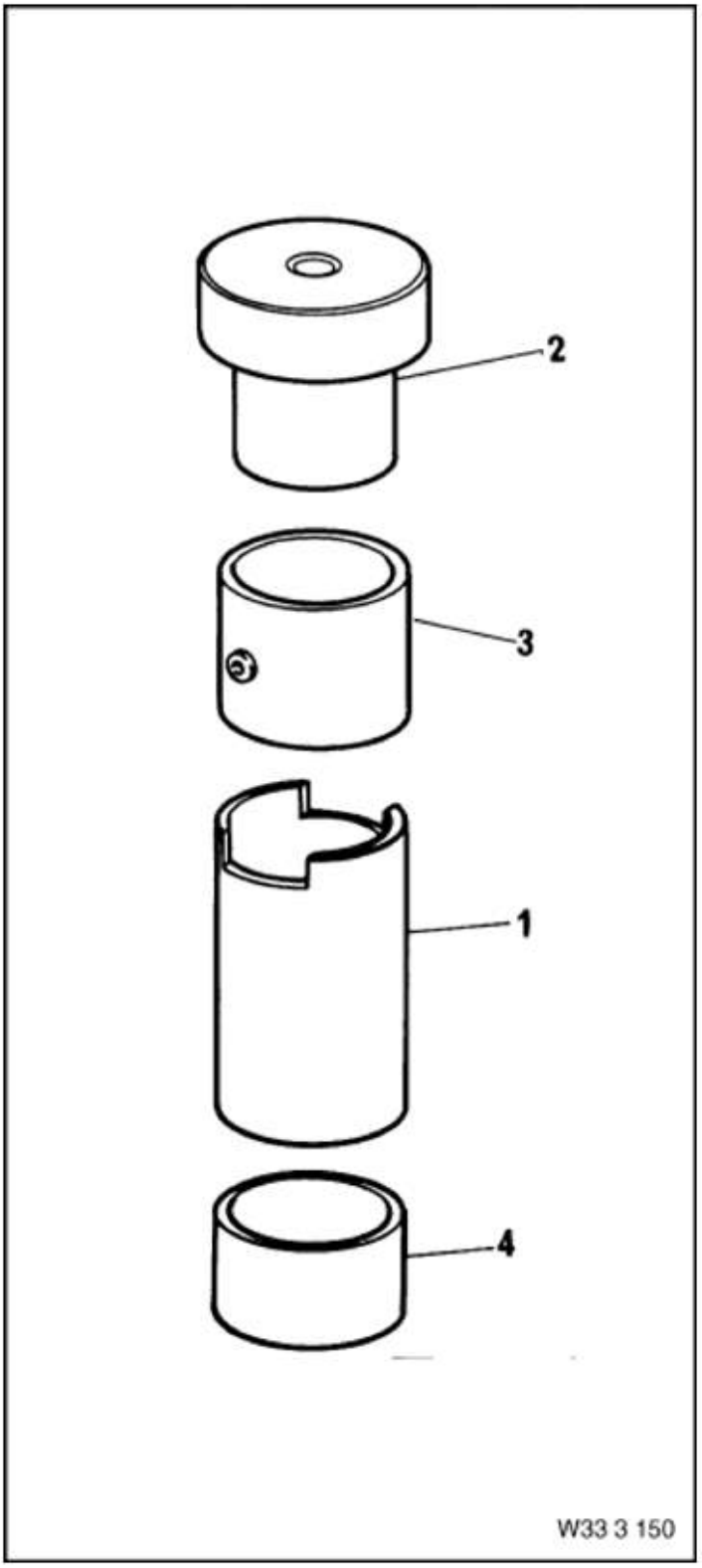


Fig. 136: Identifying Holding Sleeve (0492242)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492384 HOLDING SLEEVE

0492384 334111 Holding sleeve AM

NOTE: **(Support sleeve) For pressing out**

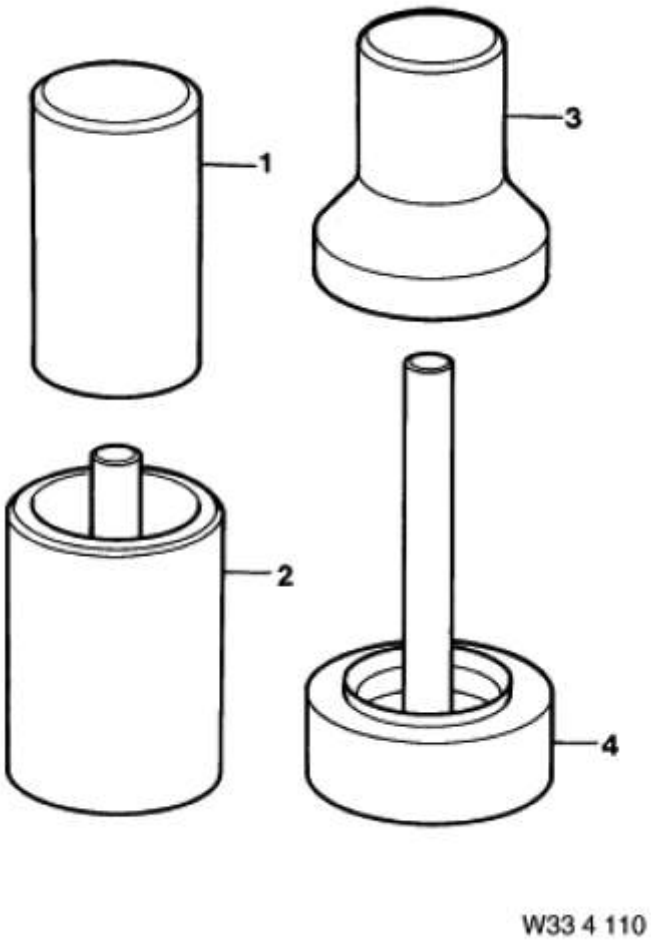


Fig. 137: Identifying Holding Sleeve (0492384)
Courtesy of BMW OF NORTH AMERICA, INC.

2156258 HOLDING

2156258 Holding sleeve AM

NOTE: **Sleeve E1 (M24) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)

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Fig. 138: Identifying Holding Sleeve (2156258)
Courtesy of BMW OF NORTH AMERICA, INC.

0492206 HOLDING SLEEVE

0492206 333053 Holding sleeve AM

NOTE: **Series: E28, E30 discontinued, available as part of set of special tools only**

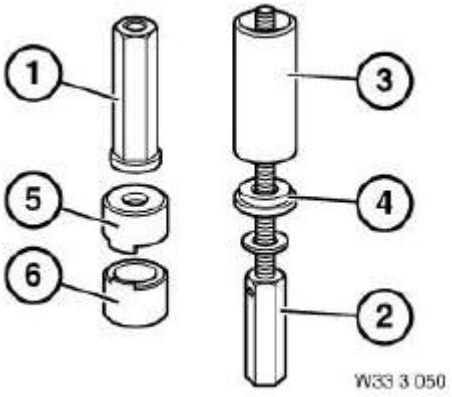


Fig. 139: Identifying Holding Sleeve (0492206)
Courtesy of BMW OF NORTH AMERICA, INC.

0492259 HOLDING SLEEVE

0492259 333193 Holding sleeve AM

NOTE: **(Spacer sleeve) for pressing in the rubber mount in the wishbone**

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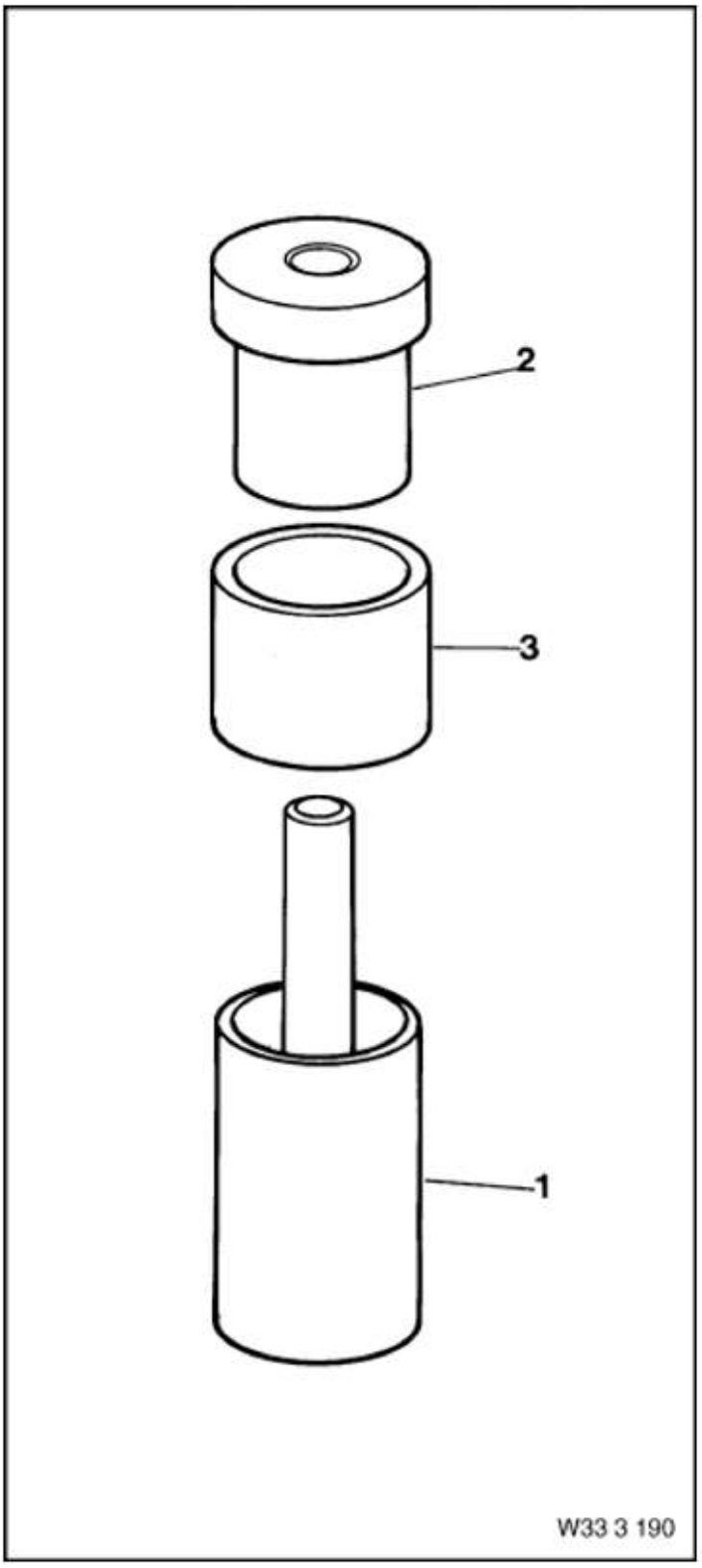


Fig. 140: Identifying Holding Sleeve (0492259)
Courtesy of BMW OF NORTH AMERICA, INC.

0492241 HOLDING SLEEVE

0492241 333153 Holding sleeve AM

NOTE: (spacer sleeve) For press-fitting the rubber mount into the leading link

Storage Location

Z8

cardiagn.com

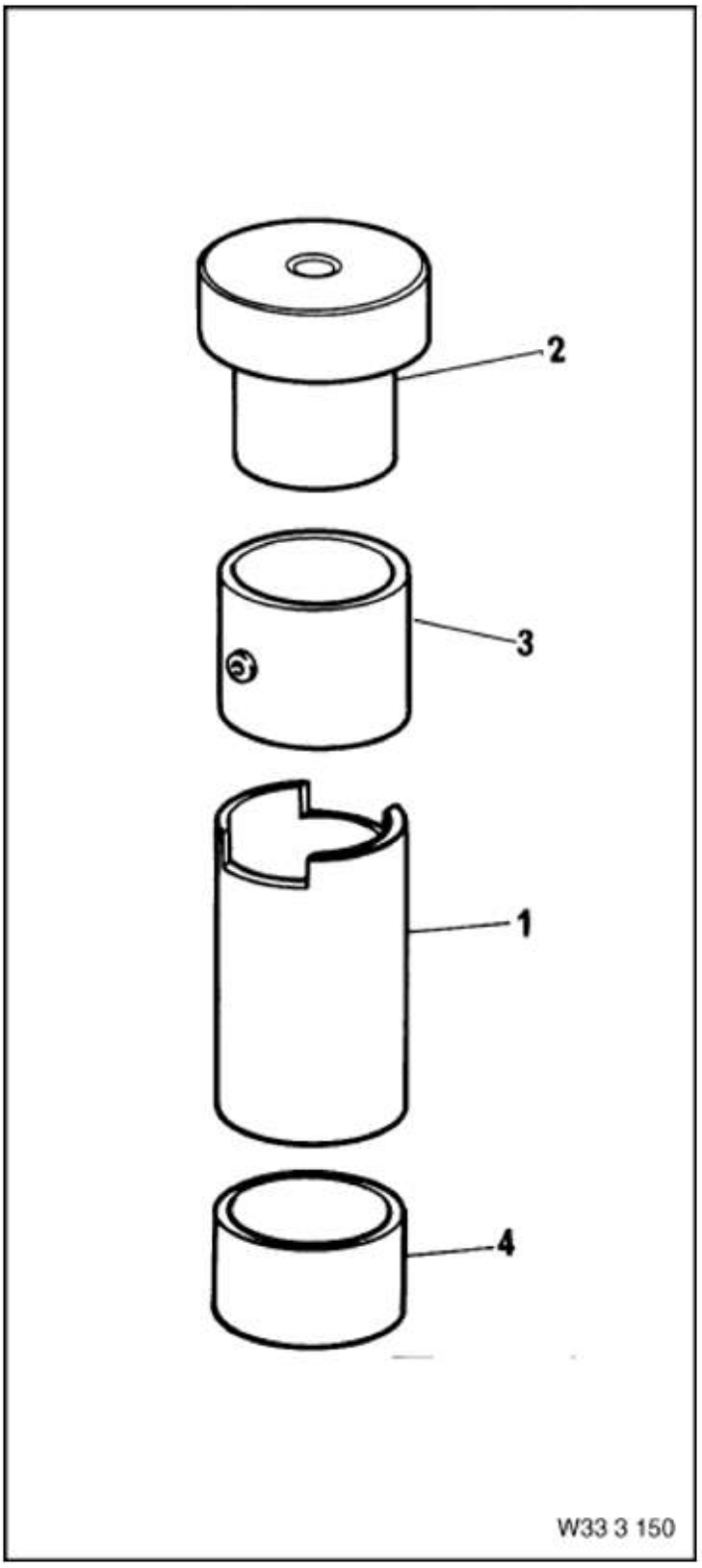


Fig. 141: Identifying Holding Sleeve (0492241)
Courtesy of BMW OF NORTH AMERICA, INC.

2156246 HYDRAULIC

2156246 Hydraulic cylinders AM

NOTE: Hydraulic cylinder (hydraulic actuator) in connection with lever, (81 64 2 156 247), for removal and installation of wheel bearings, propeller shafts and drive flanges.

SI number

cardiagn.com

08 06 09 (544)



Fig. 142: Identifying Hydraulic Cylinders (2156246)
Courtesy of BMW OF NORTH AMERICA, INC.

0496079 INSERT

0496079 335205 Insert AM

NOTE: **(Insert) Foam material insert (1 set = 2 pieces)**

SI number

01 01 07 (333)

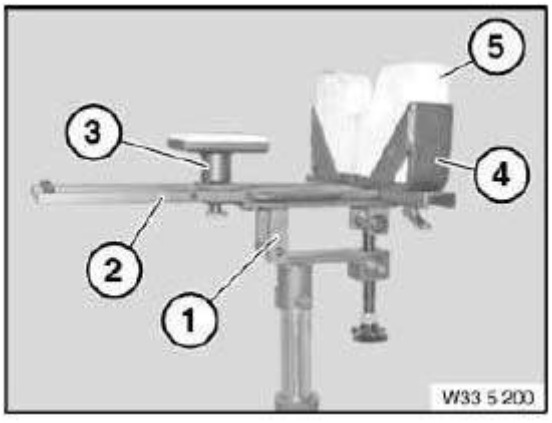


Fig. 143: Identifying Insert (0496079)
Courtesy of BMW OF NORTH AMERICA, INC.

0494800 INSERT

0494800 331113 Insert AM

NOTE: **(Insert) Foam insert, top.**

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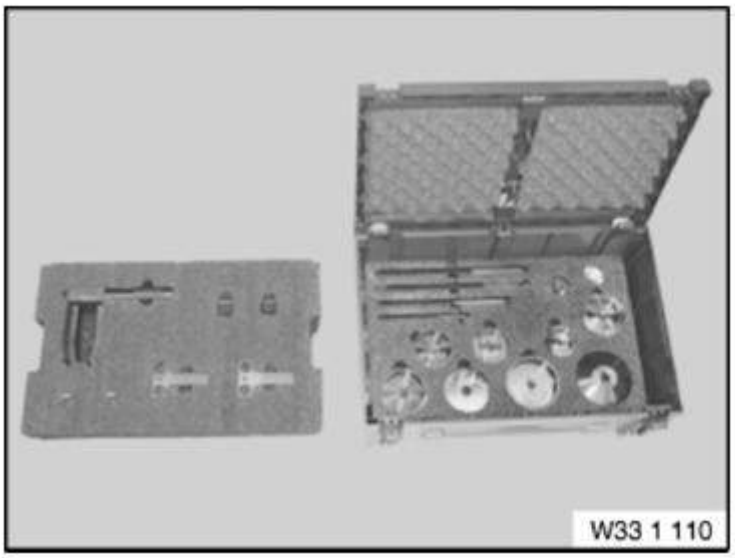


Fig. 144: Identifying Insert (0494800)
Courtesy of BMW OF NORTH AMERICA, INC.

0494799 INSERT

0494799 331112 Insert AM

NOTE: **(Insert) Foam insert, bottom.**

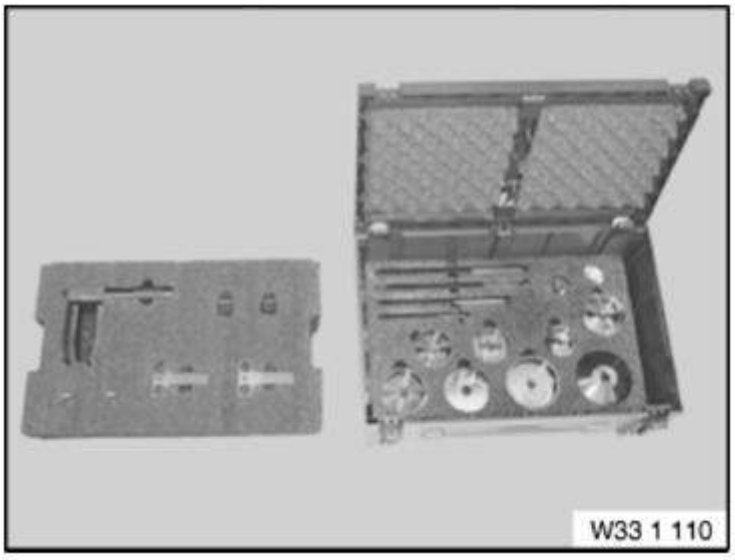


Fig. 145: Identifying Insert (0494799)
Courtesy of BMW OF NORTH AMERICA, INC.

0496019 JOINT

0496019 335201 Joint AM

SI number

01 01 07 (333)

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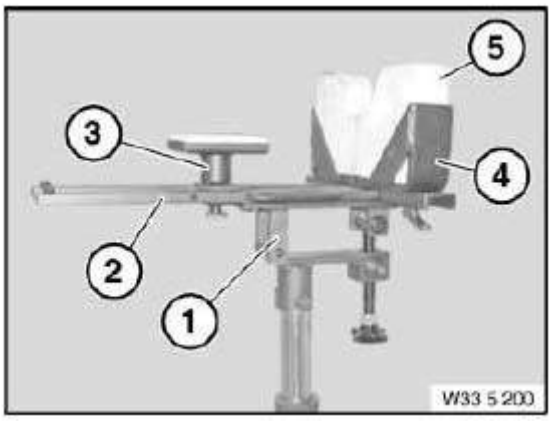


Fig. 146: Identifying Joint (0496019)
Courtesy of BMW OF NORTH AMERICA, INC.

2156247 LEVER

2156247 Lever AM

NOTE: Lever in connection with hydraulic cylinder (hydraulic actuator), (81 64 2 156 246), for removal and installation of wheel bearings, propeller shafts and drive flanges.

SI number

08 06 09 (544)



Fig. 147: Identifying Lever (2156247)
Courtesy of BMW OF NORTH AMERICA, INC.

0492370 MANDREL

0492370 334060 Mandrel Mechanical tool

NOTE: (Drift) For driving in the retainer on the rear axle shaft

Storage Location

X8

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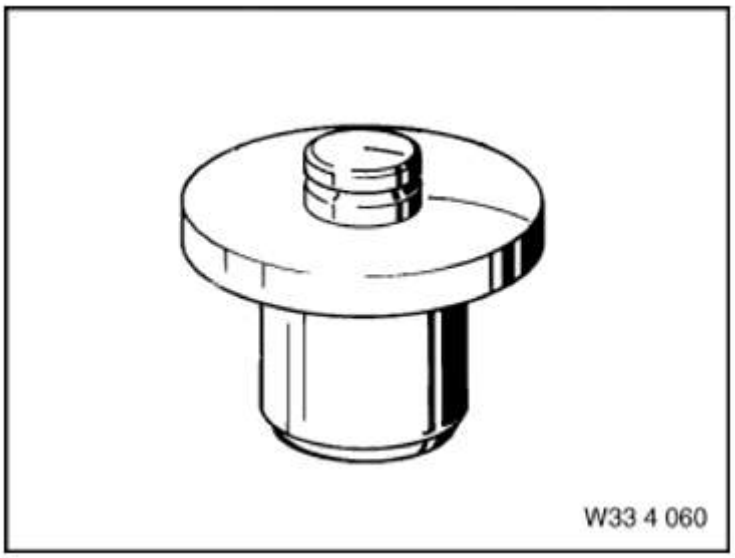


Fig. 148: Identifying Mandrel (0492370)
Courtesy of BMW OF NORTH AMERICA, INC.

0492160 MANDREL

0492160 331470 Mandrel Mechanical tool

NOTE: **(Guide mandrel) For fitting differential gear shaft into rear axle final drive**

Storage Location

X4

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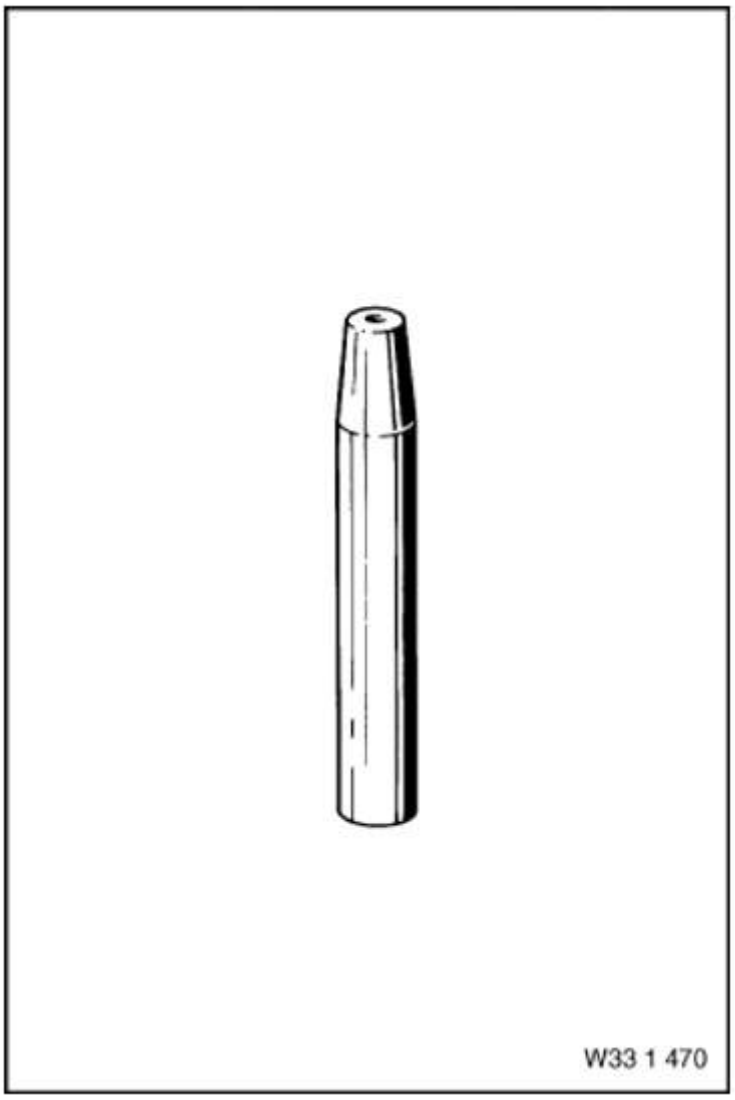


Fig. 149: Identifying Mandrel (0492160)
Courtesy of BMW OF NORTH AMERICA, INC.

0492088 MANDREL

0492088 331210 Mandrel Mechanical tool

Replaced by: 83300492338

NOTE: **(Drift) For radial seal on output flange - Replaced by 33 3 420. (0 492 338)**

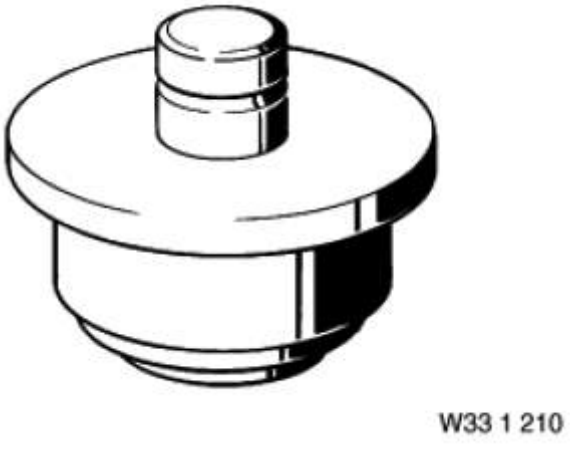


Fig. 150: Identifying Mandrel (0492088)

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Courtesy of BMW OF NORTH AMERICA, INC.

0495593 MANDREL

0495593 Mechanical Mandrel Minimum set: Mechanical tools 335080 tool

NOTE: **For driving in shaft seal on drive shaft.**

Storage Location

A16

SI number

01 21 06 (300)



Fig. 151: Identifying Mandrel (0495593)
Courtesy of BMW OF NORTH AMERICA, INC.

0492347 MANDREL

0492347 334010 Mandrel Mechanical tool

NOTE: **(Drive-out mandrel) For the rear axle shaft/Replaced by 33 2 116. (0 492 175) and 33 4 200. (0 492 436)**

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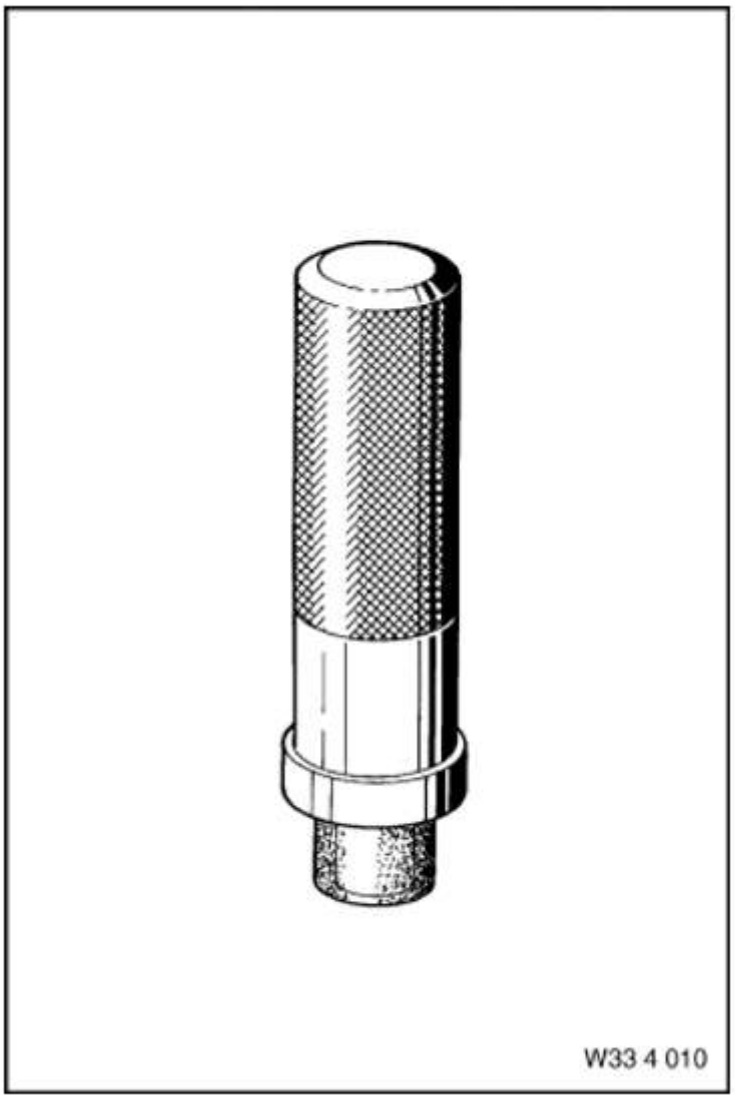


Fig. 152: Identifying Mandrel (0492347)
Courtesy of BMW OF NORTH AMERICA, INC.

0492369 MANDREL

0492369 334050 Mandrel Mechanical tool

NOTE: **(Drift) For driving in the retainer on the rear axle shaft (wheel bearing) and on the drive flange of the rear axle final drive (final drive types K and M)**

Storage Location

A16

SI number

01 03 91 (333)

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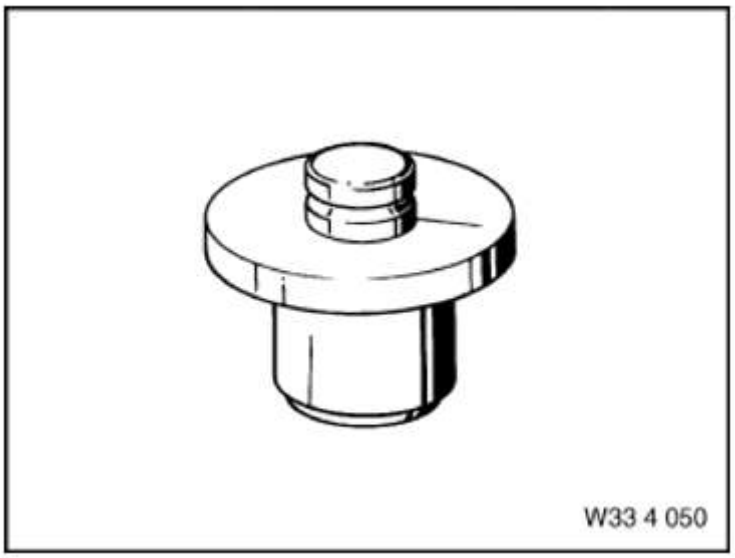


Fig. 153: Identifying Mandrel (0492369)
Courtesy of BMW OF NORTH AMERICA, INC.

0495862 MANDREL

0495862 335140 Mandrel Minimum set: Mechanical tools AM

NOTE: **(Drift) For driving radial shaft seal of output shaft into rear axle final drive. Rear axle final drive: 215**

Storage Location

B21

C21

SI number

01 01 07 (333)



Fig. 154: Identifying Mandrel (0495862)
Courtesy of BMW OF NORTH AMERICA, INC.

0492093 MANDREL

0492093 331260 Mandrel Mechanical tool

NOTE: **(Drift) For driving in the radial seal rings in the rear axle final drive at the output flange with flange diameter 35 mm**

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Storage Location

X7

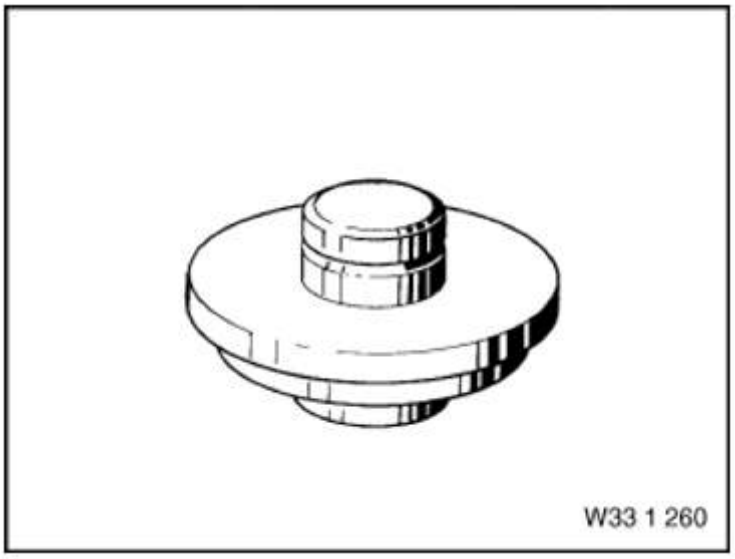


Fig. 155: Identifying Mandrel (0492093)
Courtesy of BMW OF NORTH AMERICA, INC.

0495860 MANDREL

0495860 Mechanical Mandrel Minimum set: Mechanical tools 335130 tool

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 01 07 (333)



Fig. 156: Identifying Mandrel (0495860)
Courtesy of BMW OF NORTH AMERICA, INC.

0492085 MANDREL

0492085 331180 Mandrel Mechanical tool

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Replaced by: 83300491891

NOTE: **(Drift) Replaced by 31 2 040. (0 491 891)**

0496596 MANDREL

0496596 330150 Mandrel Minimum set: Mechanical tools Mechanical tool

NOTE: **(Drift) For driving radial shaft seal onto drive flange. Replaced by 33 3 470/0 496 596**

Storage Location

B26

SI number

01 09 09 (532)

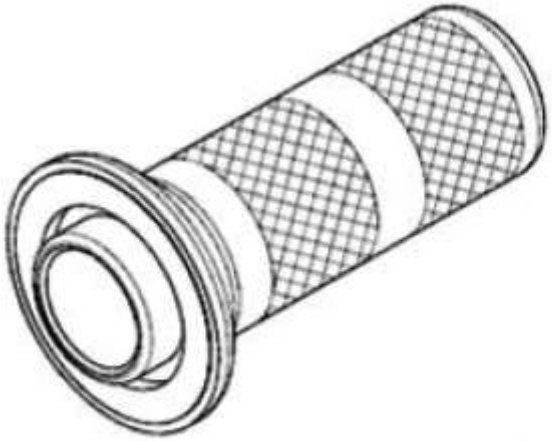


Fig. 157: Identifying Mandrel (0496596)
Courtesy of BMW OF NORTH AMERICA, INC.

0492095 MANDREL

0492095 331280 Mandrel Mechanical tool

Replaced by: 83300492342

NOTE: **(Drift) For driving the radial sealing ring into the output flange, flange diameter 43 mm - Replaced by 33 3 460. (0 492 342)**

SI number

01 10 90 (288)

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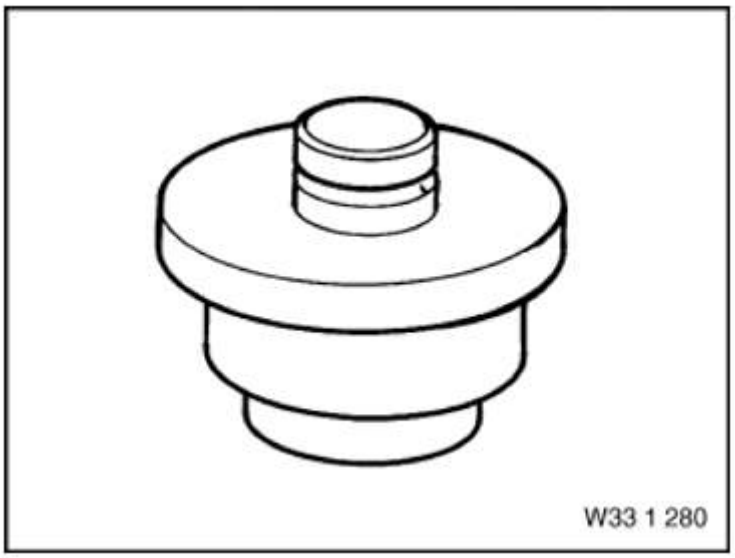


Fig. 158: Identifying Mandrel (0492095)
Courtesy of BMW OF NORTH AMERICA, INC.

0492336 MANDREL

0492336 333380 Mandrel Mechanical tool

Replaced by: 83300492338

NOTE: **(Drift) For fitting the radial sealing ring, right-hand output end/Replaced by 33 3 420. (0 492 338)**

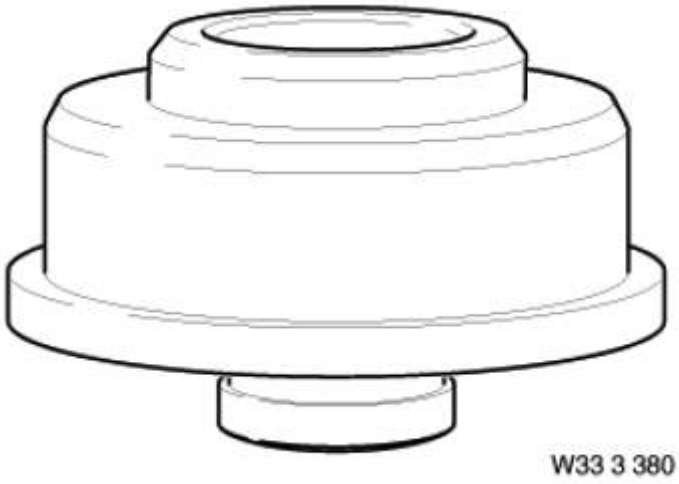


Fig. 159: Identifying Mandrel (0492336)
Courtesy of BMW OF NORTH AMERICA, INC.

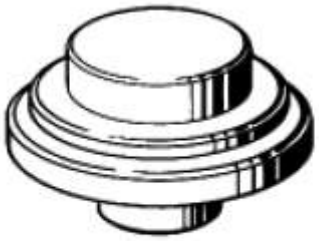
0492084 MANDREL

0492084 331170 Mandrel Mechanical tool

Replaced by: 83300492339

NOTE: **(Drift) For driving the radial seal into the output flange with flange diameter 38 mm - Replaced by 33 3 430. (0 492 339)**

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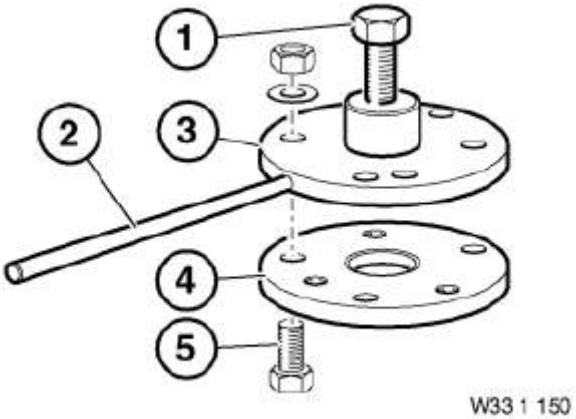
W33 1 170

Fig. 160: Identifying Mandrel (0492084)
Courtesy of BMW OF NORTH AMERICA, INC.

0493266 MANDREL

0493266 331152 Mandrel AM

NOTE: **Discontinued, can only be ordered using complete tool**



W33 1 150

Fig. 161: Identifying Mandrel (0493266)
Courtesy of BMW OF NORTH AMERICA, INC.

0496551 NUT

0496551 334303 Nut Minimum set: Mechanical tools AM

NOTE: **(Nut TR20)**

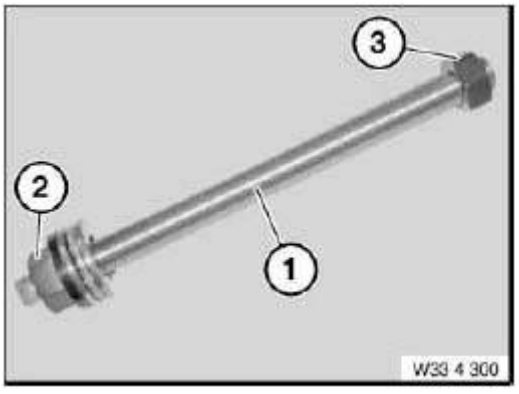


Fig. 162: Identifying Nut (0496551)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492191 NUT

0492191 332305 Nut AM

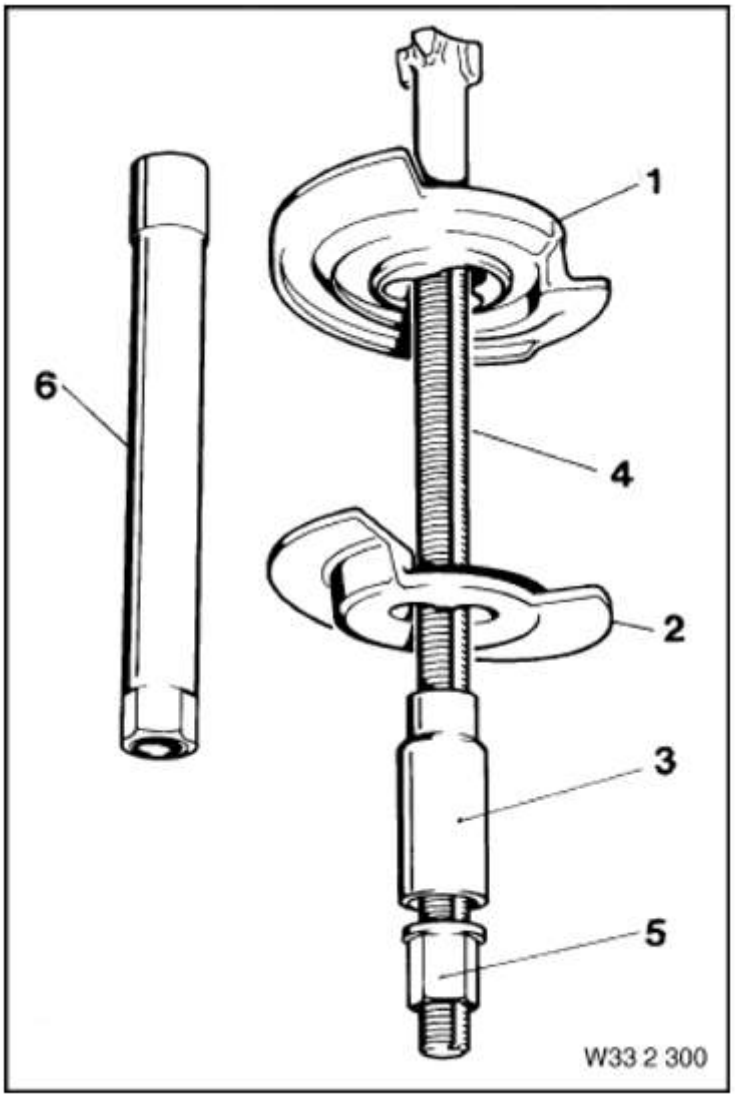


Fig. 163: Identifying Nut (0492191)
Courtesy of BMW OF NORTH AMERICA, INC.

0492181 NUT

0492181 332122 Nut AM

NOTE: **Liquidation of existing inventory and then available only as a complete tool set 33 2 120 = 83 30 0 492 179 - as of 09.12.2011**

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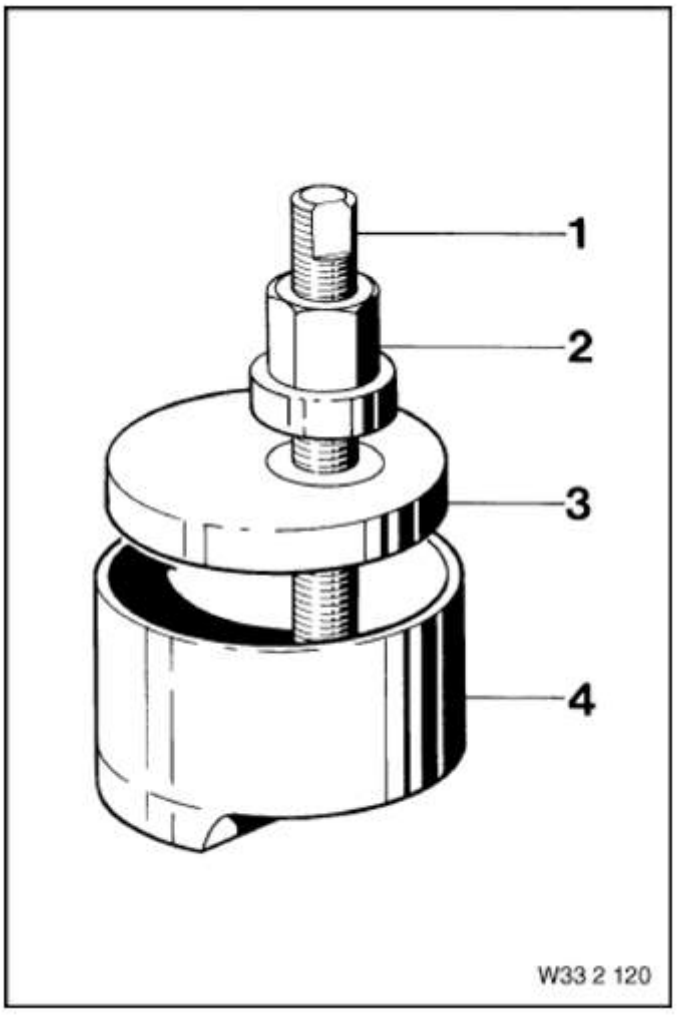


Fig. 164: Identifying Nut (0492181)
Courtesy of BMW OF NORTH AMERICA, INC.

0495903 NUT

0495903 335166 Nut Minimum set: Mechanical tools AM

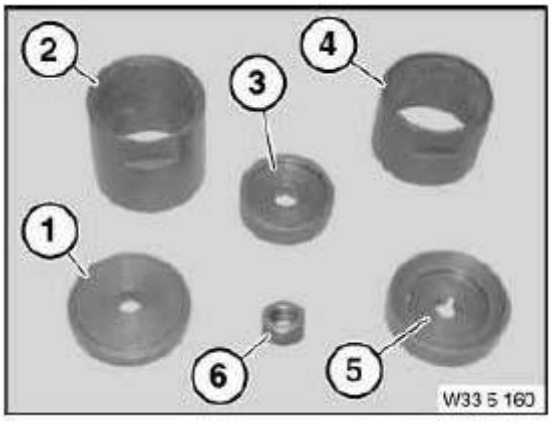
NOTE: **(Nut M12x1.5) discontinued, can only be ordered using complete tool**

Storage Location

B22

SI number

01 01 07 (333)



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Fig. 165: Identifying Nut (0495903)
Courtesy of BMW OF NORTH AMERICA, INC.

0494982 NUT

0494982 334466 Nut Minimum set: Mechanical tools AM

NOTE: (Thrust nut)



Fig. 166: Identifying Nut (0494982)
Courtesy of BMW OF NORTH AMERICA, INC.

0493562 NUT

0493562 333114 Nut AM

NOTE: Series: E30, E36

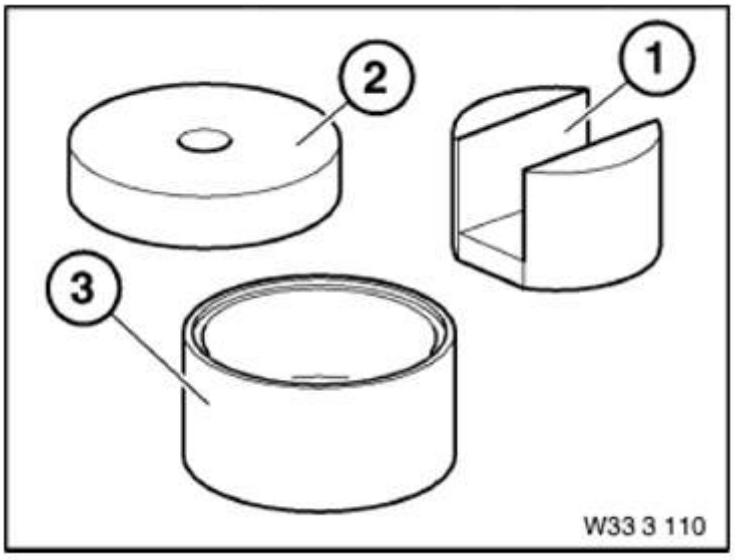


Fig. 167: Identifying Nut (0493562)
Courtesy of BMW OF NORTH AMERICA, INC.

0492219 NUT

0492219 333104 Nut AM

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NOTE: **(Nut with bearing) Model series: E28, E30, E31, E34, E36, RR1**

Storage Location

C13



Fig. 168: Identifying Nut (0492219)
Courtesy of BMW OF NORTH AMERICA, INC.

0492204 NUT

0492204 333051 Nut AM

NOTE: **(Nut with bearing) Model series: E28, E30, E83**

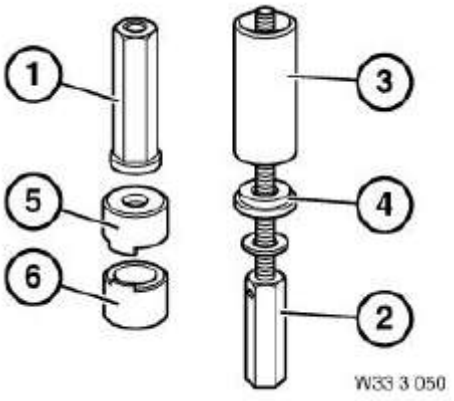


Fig. 169: Identifying Nut (0492204)
Courtesy of BMW OF NORTH AMERICA, INC.

0492116 NUT

0492116 331354 Nut AM

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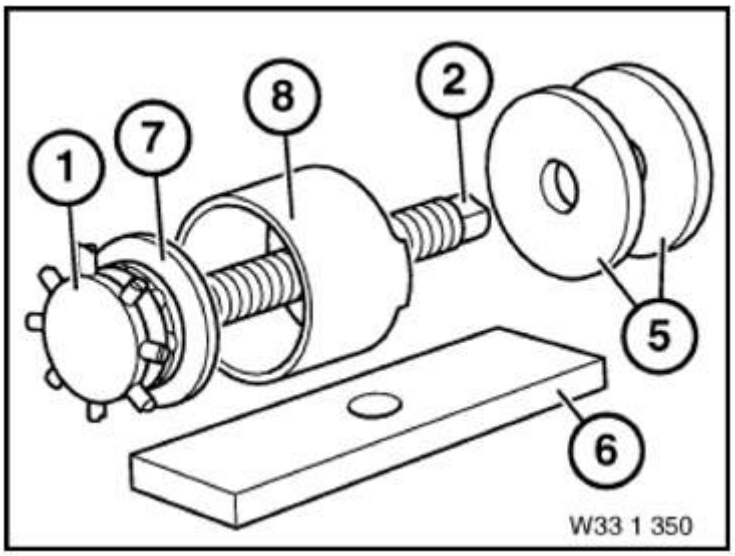


Fig. 170: Identifying Nut (0492116)
Courtesy of BMW OF NORTH AMERICA, INC.

0496555 NUT

0496555 333013 Nut Minimum set: Mechanical tools AM

NOTE: **(nut M12x1.5 (high wall))**

SI number

01 16 08 (476)

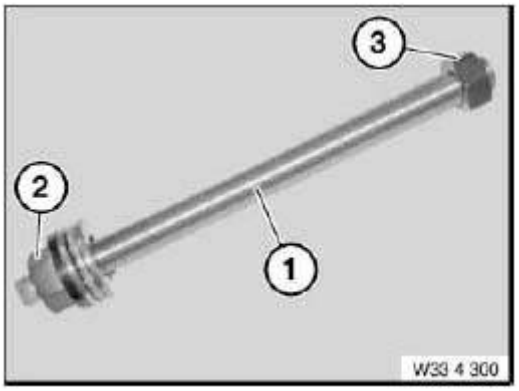


Fig. 171: Identifying Nut (0496555)
Courtesy of BMW OF NORTH AMERICA, INC.

0496554 NUT

0496554 333012 Nut Minimum set: Mechanical tools AM

NOTE: **(nut TR12 with thrust bearing)**

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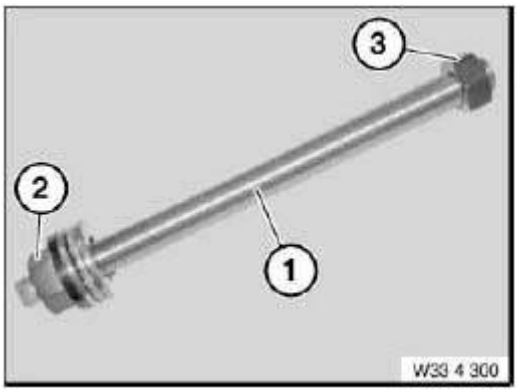


Fig. 172: Identifying Nut (0496554)
Courtesy of BMW OF NORTH AMERICA, INC.

0496536 NUT

0496536 334302 Nut Minimum set: Mechanical tools AM

NOTE: (nut TR20 with thrust bearing)

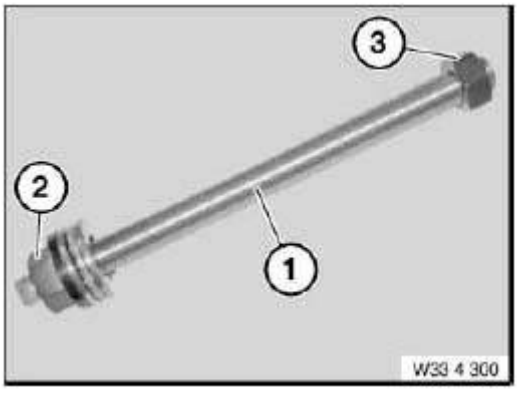


Fig. 173: Identifying Nut (0496536)
Courtesy of BMW OF NORTH AMERICA, INC.

0495812 NUT

0495812 335104 Nut Minimum set: Mechanical tools AM

NOTE: (Nut with thrust piece) discontinued, can only be ordered using complete tool

SI number

01 01 07 (333)

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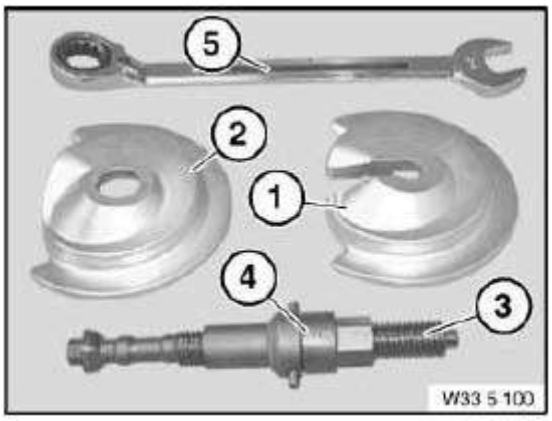


Fig. 174: Identifying Nut (0495812)
Courtesy of BMW OF NORTH AMERICA, INC.

0495307 OPEN-END WRENCH

0495307 335000 Open-end wrench Mechanical tool

NOTE: (Open-end spanner SW17)

0492398 PIPE

0492398 334141 Pipe Minimum set: Mechanical tools AM

NOTE: (Threaded tube) Deletion, only available via tool set

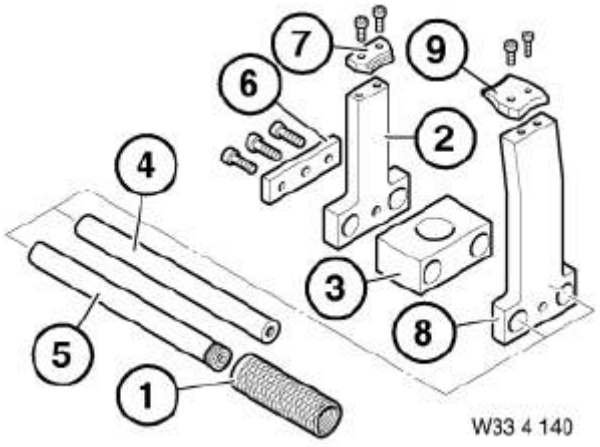


Fig. 175: Identifying Pipe (0492398)
Courtesy of BMW OF NORTH AMERICA, INC.

0492395 PLATE

0492395 334132 Plate AM

NOTE: (Shaped plate, top) For pulling in

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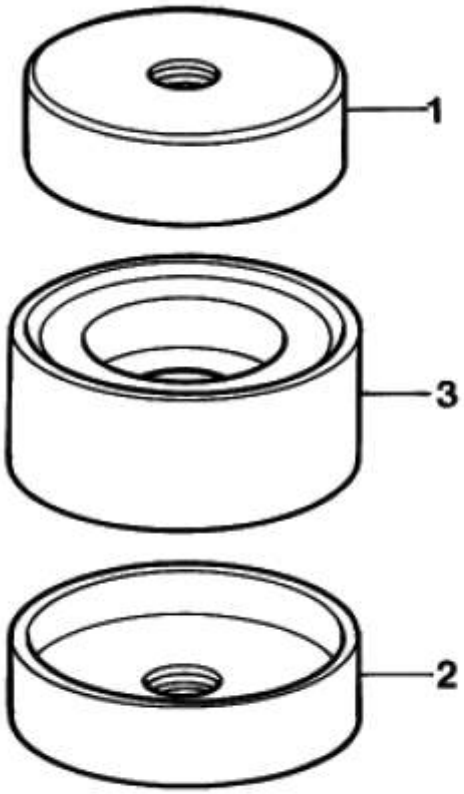


Fig. 176: Identifying Plate (0492395)
Courtesy of BMW OF NORTH AMERICA, INC.

0492403 PLATE

0492403 334146 Plate Minimum set: Mechanical tools AM

NOTE: (Fixing plate) With screws Deletion, only available via tool set

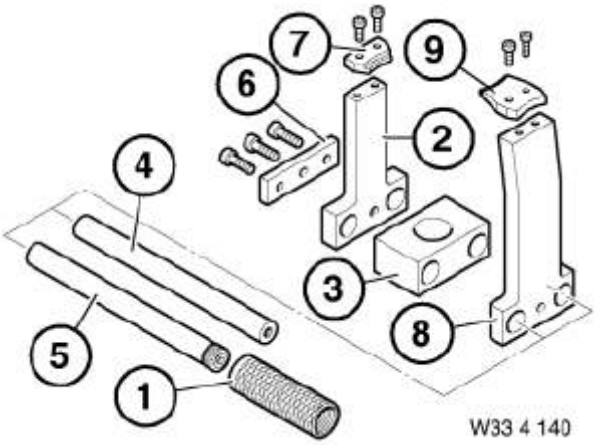


Fig. 177: Identifying Plate (0492403)
Courtesy of BMW OF NORTH AMERICA, INC.

0492396 PLATE

0492396 334133 Plate AM

NOTE: (Shaped plate, bottom) For pulling in

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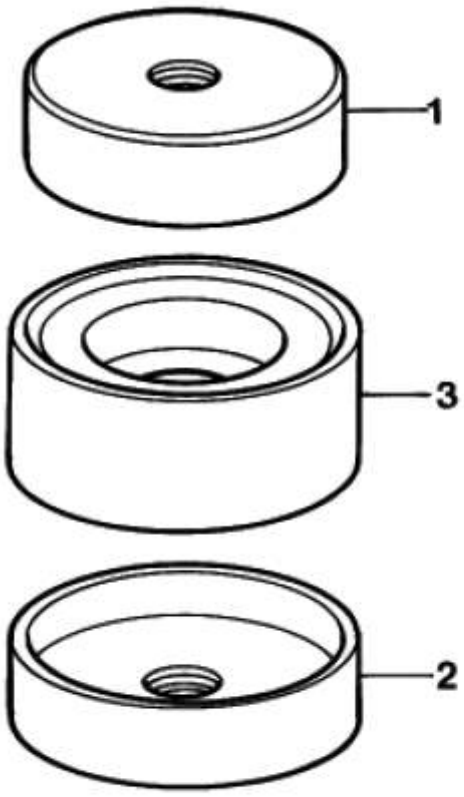


Fig. 178: Identifying Plate (0492396)
Courtesy of BMW OF NORTH AMERICA, INC.

0492394 PLATE

0492394 334131 Plate AM

NOTE: **(Shaped plate, top) For removing**

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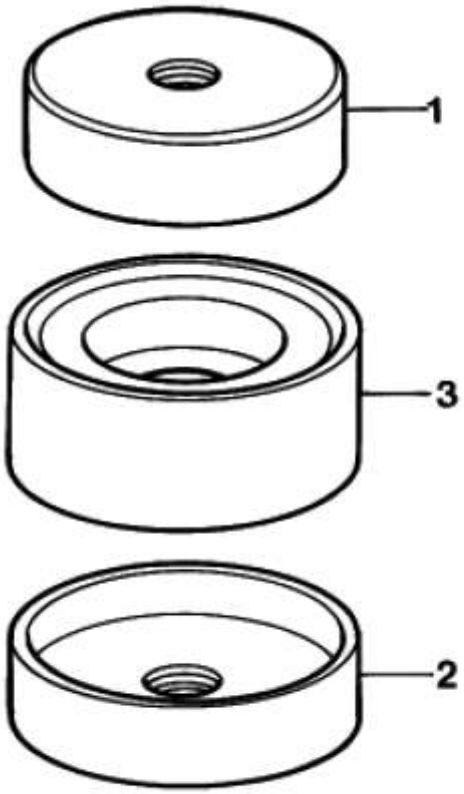


Fig. 179: Identifying Plate (0492394)
Courtesy of BMW OF NORTH AMERICA, INC.

0494872 PLATE

0494872 331154 Plate AM

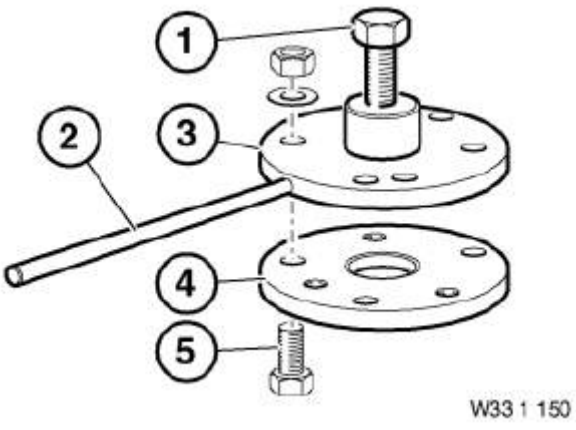
NOTE: **(adapter plate) Transmission: GS6-57DZ, GS6-53BZ (G transmission) GS6-51DZ, GS6-51BZ (H transmission) Deletion, only available via tool set**

Storage Location

C17

SI number

01 11 04 (093)



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Fig. 180: Identifying Plate (0494872)
Courtesy of BMW OF NORTH AMERICA, INC.

0492072 PLATE

0492072 331000 Plate Mechanical tool

NOTE: (Engine fixture) for the longneck rear axle differential

0494617 PLIERS

0494617 334407 Pliers AM

NOTE: (clamping ring (55...61 mm)) Model series: E67 No longer available separately, only via complete tool set 0493416 = 33 4 400.

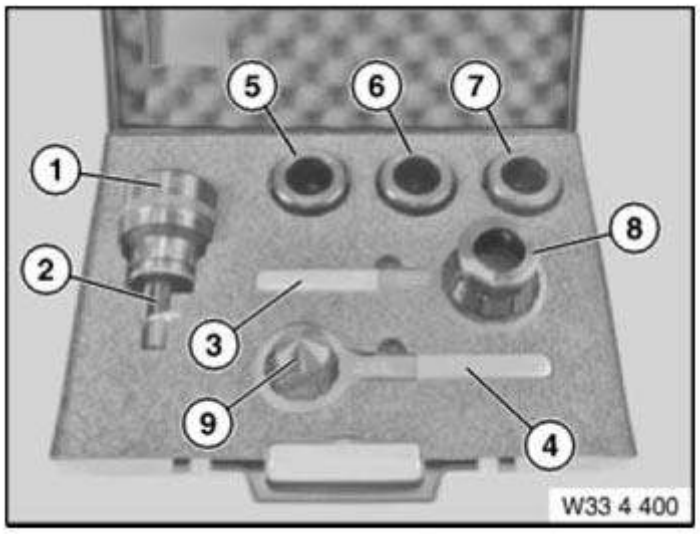
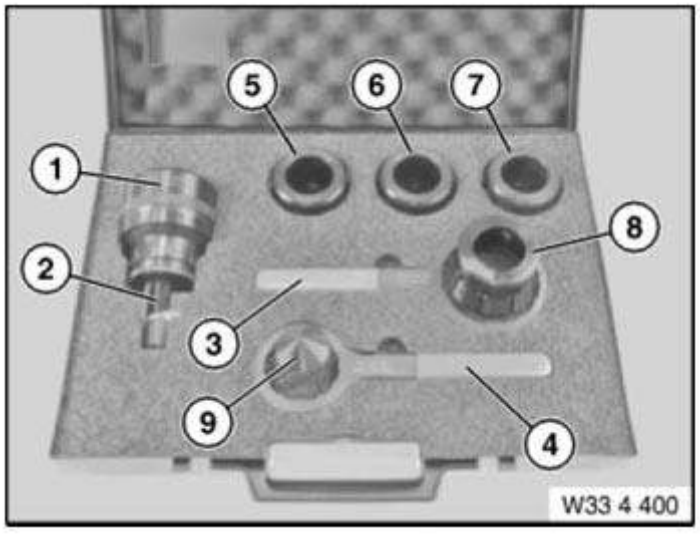


Fig. 181: Identifying Pliers (0494617)
Courtesy of BMW OF NORTH AMERICA, INC.

0493821 PLIERS

0493821 334406 Pliers AM

NOTE: (Clamping ring (50 to 55 mm)) No longer available separately, only available as part of complete tool set 0493416 = 33 4 400.



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Fig. 182: Identifying Pliers (0493821)
Courtesy of BMW OF NORTH AMERICA, INC.

0493820 PLIERS

0493820 334405 Pliers AM

NOTE: (Clamping ring (45 to 51 mm)) No longer available separately, only available as part of complete tool set 0493416 = 33 4 400.

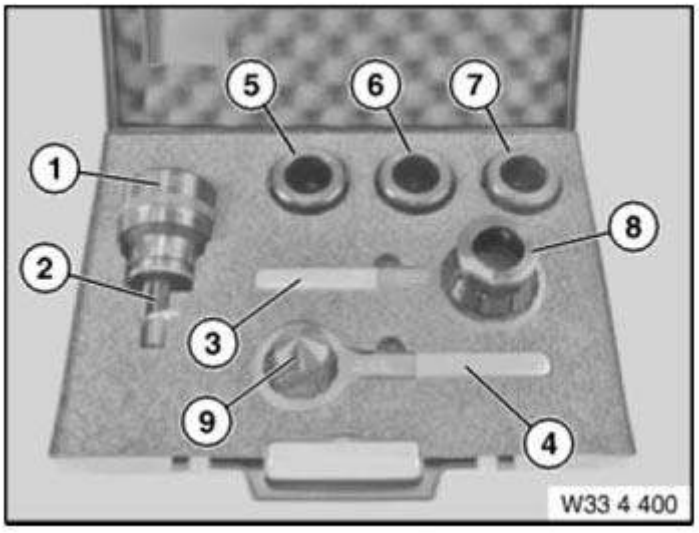


Fig. 183: Identifying Pliers (0493820)
Courtesy of BMW OF NORTH AMERICA, INC.

0493857 RING

0493857 333032 Ring AM

NOTE: (pipe) For extracting and press-fitting the rubber mount in the 13Â° trailing arm

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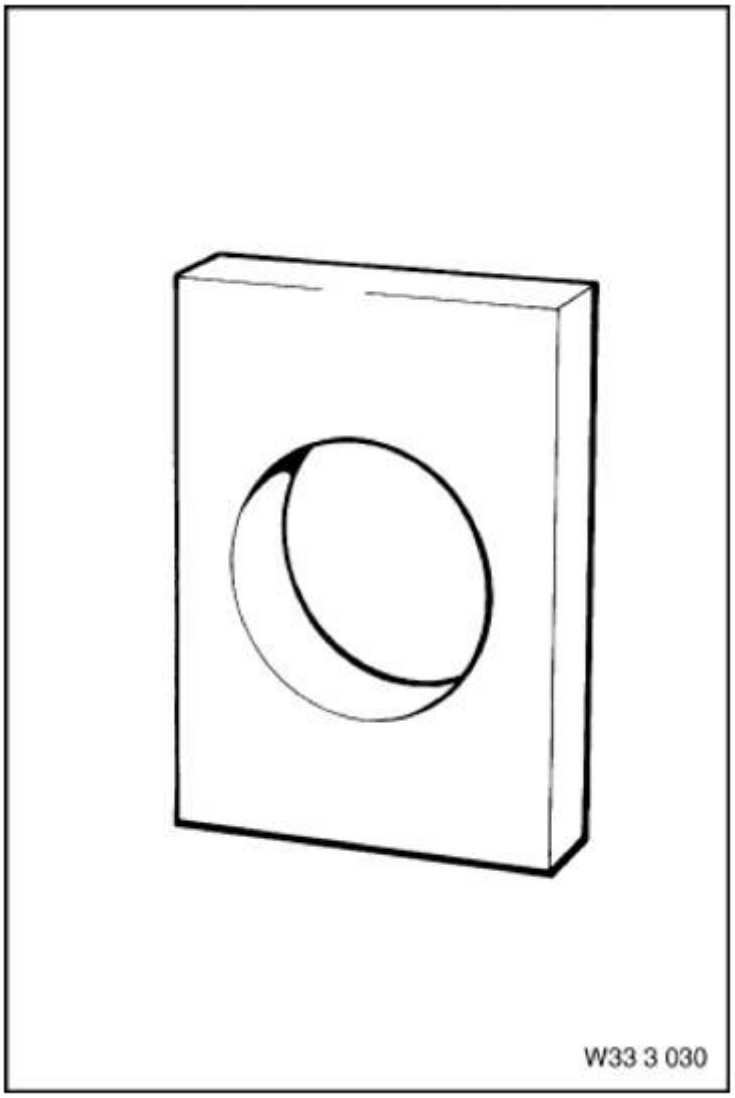


Fig. 184: Identifying Ring (0493857)
Courtesy of BMW OF NORTH AMERICA, INC.

0496538 RING

0496538 334408 Ring AM

NOTE: **(Clamping ring) Model series: F01, F02. Available only as complete special tool set 33 4 400.**

SI number

01 18 08 (482)

0495552 RING SPANNER

0495552 335050 Ring spanner Minimum set: Mechanical tools Mechanical tool

NOTE: **Multi-tooth ring spanner SW65 For releasing and tightening down flange nut on rear axle final drive. Only ring spanners with a torque of 700 Nm may be used - as at 02/2014.**

Storage Location

A18

SI number

cardiagn.com

01 21 06 (300)



Fig. 185: Identifying Ring Spanner (0495552)
Courtesy of BMW OF NORTH AMERICA, INC.

0492210 RING SPANNER

0492210 333060 Ring spanner Mechanical tool

NOTE: **(Ring spanner WAF 19) For toe adjustment at the rear axle**

Storage Location

X3

SI number

01 07 88 (972)

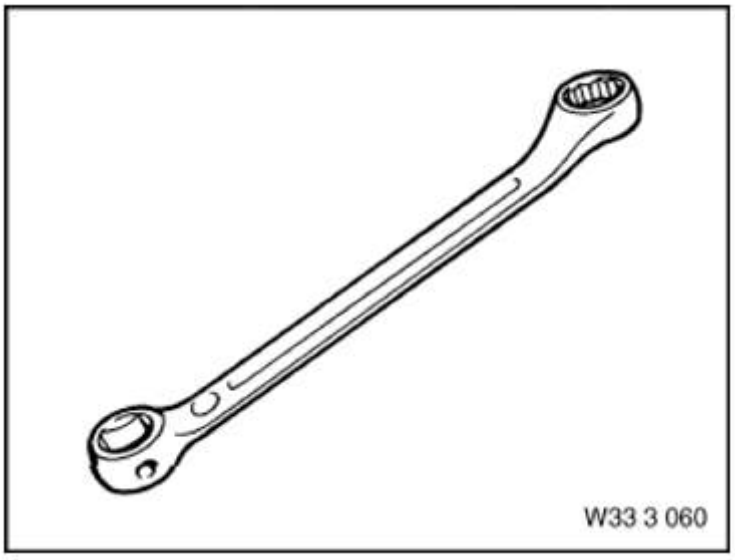


Fig. 186: Identifying Ring Spanner (0492210)
Courtesy of BMW OF NORTH AMERICA, INC.

0495813 RING SPANNER

0495813 335105 Ring spanner Minimum set: Mechanical tools AM

NOTE: **(Reversible ratchet ring spanner SW24) discontinued, available as part of set of special tools only**

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SI number

01 01 07 (333)

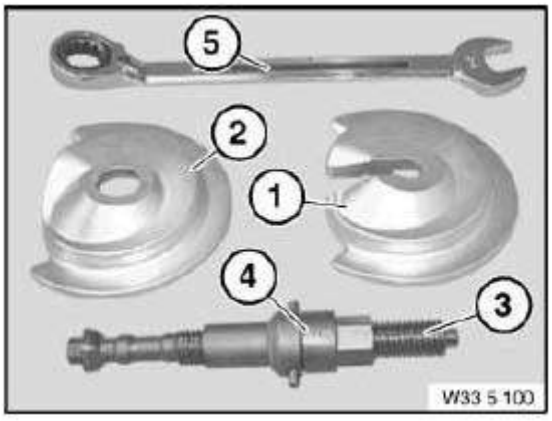


Fig. 187: Identifying Ring Spanner (0495813)
Courtesy of BMW OF NORTH AMERICA, INC.

0492402 ROD

0492402 334145 Rod Minimum set: Mechanical tools AM

NOTE: **(Guide rod) With thread dog point**

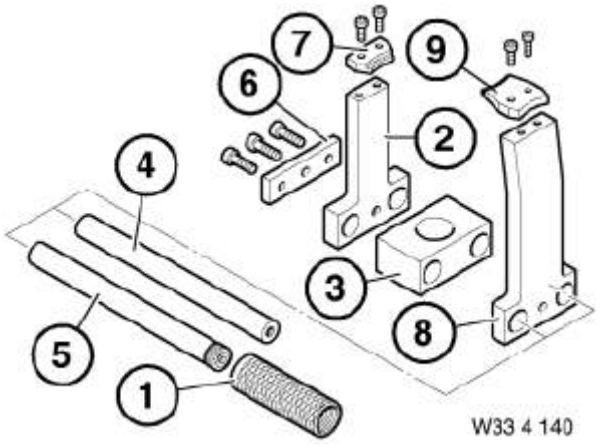


Fig. 188: Identifying Rod (0492402)
Courtesy of BMW OF NORTH AMERICA, INC.

0492401 ROD

0492401 334144 Rod Minimum set: Mechanical tools AM

NOTE: **(Guide rod)**

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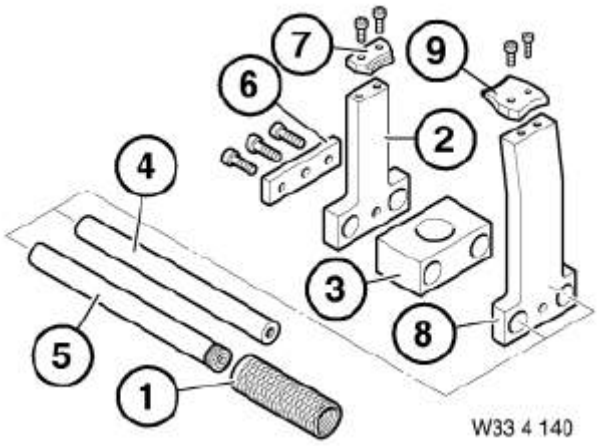


Fig. 189: Identifying Rod (0492401)
Courtesy of BMW OF NORTH AMERICA, INC.

0495855 ROD

0495855 335123 Rod Minimum set: Mechanical tools AM

NOTE: **Only available via complete tool set 33 5 120 -> (83 30 0 495 851).**

SI number

01 01 07 (333)

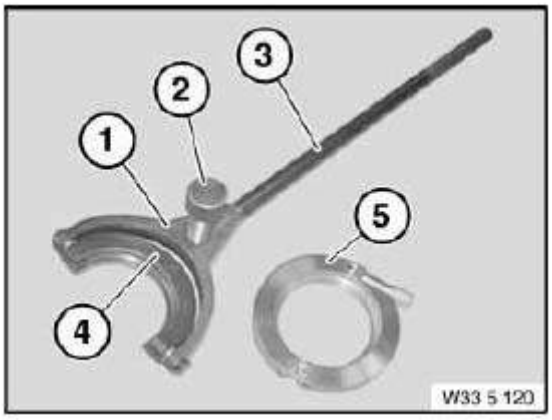


Fig. 190: Identifying Rod (0495855)
Courtesy of BMW OF NORTH AMERICA, INC.

0492337 ROD

0492337 333410 Rod Mechanical tool

NOTE: **(Split rod) For removing and installing the actuator unit of the active rear axle kinematics**

SI number

01 01 92 (469)

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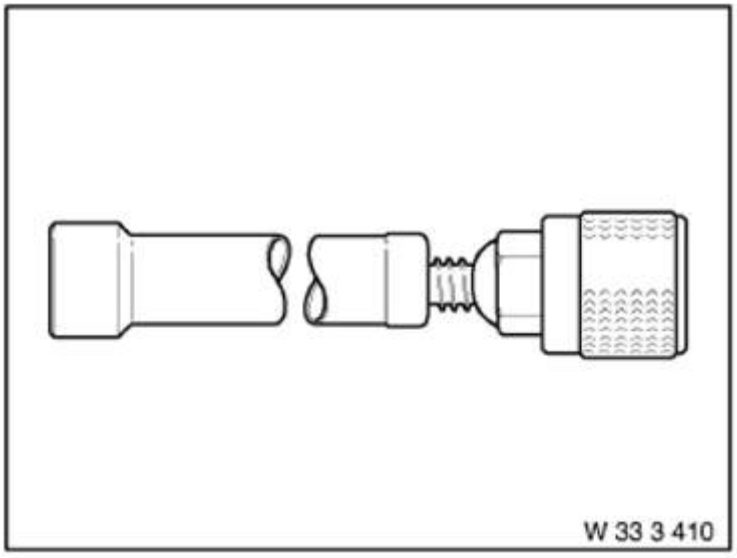


Fig. 191: Identifying Rod (0492337)
Courtesy of BMW OF NORTH AMERICA, INC.

0492081 SCREW

0492081 331072 Screw AM

NOTE: **(Knurled screws (M16 2 x))**

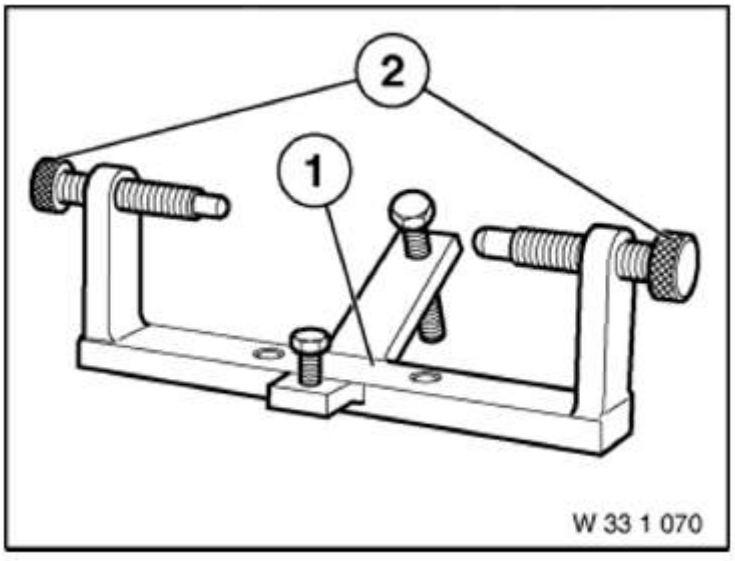


Fig. 192: Identifying Screw (0492081)
Courtesy of BMW OF NORTH AMERICA, INC.

0494873 SCREW

0494873 331155 Screw AM

NOTE: **(countersunk screws M10x30 (3 x)) Transmission: GS6-57DZ, GS6-53BZ (G transmission) GS6-51DZ, GS6-51BZ (H transmission) Deletion, only available via tool set**

Storage Location

C17

SI number

cardiagn.com

01 11 04 (093)

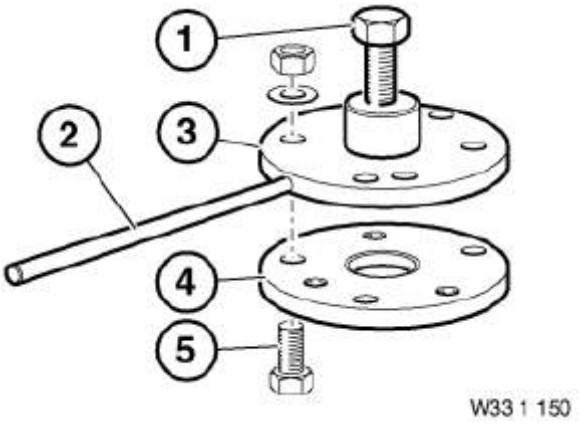


Fig. 193: Identifying Screw (0494873)
Courtesy of BMW OF NORTH AMERICA, INC.

0495854 SCREW

0495854 335122 Minimum set: Mechanical tools AM

NOTE: **(Knurled screw with thrust piece) available as part of set of special tools 33 5 120 -> (83 30 0 495 851) only.**

SI number

01 01 07 (333)

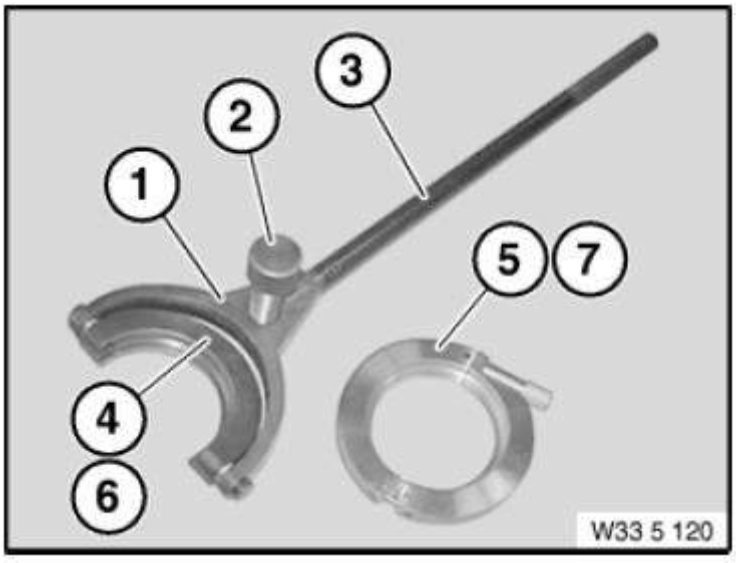


Fig. 194: Identifying Screw (0495854)
Courtesy of BMW OF NORTH AMERICA, INC.

0492151 SCREW

0492151 331431 Screw AM

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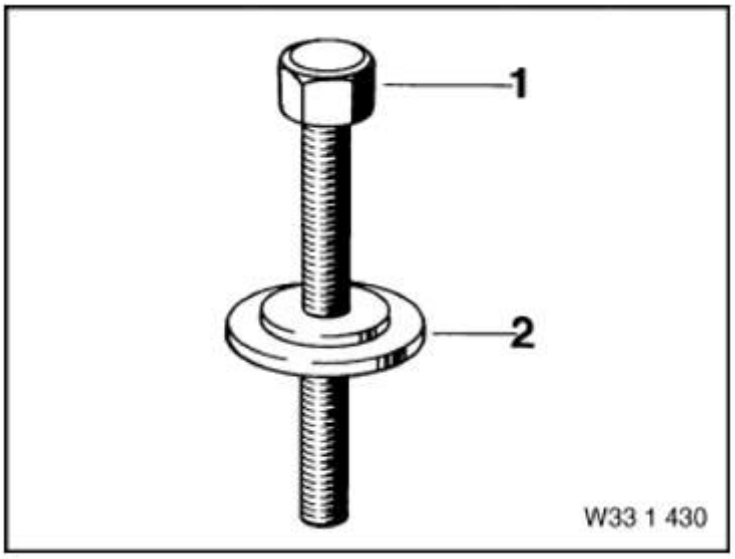


Fig. 195: Identifying Screw (0492151)
Courtesy of BMW OF NORTH AMERICA, INC.

2159983 SCREW

2159983 Screw AM

NOTE: **Screws K1 (M12x1.5) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 196: Identifying Screw (2159983)
Courtesy of BMW OF NORTH AMERICA, INC.

2159984 SCREW

2159984 Screw AM

NOTE: **Screws K2 (M14x1.5) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

cardiagn.com

08 06 09 (544)



Fig. 197: Identifying Screw (2159984)
Courtesy of BMW OF NORTH AMERICA, INC.

0495856 SHAPED ELEMENT

0495856 335124 Shaped element Minimum set: Mechanical tools AM

NOTE: **(Shaped element) shaped element (bearing shell) available as part of set of special tools 33 5 120 -> (83 30 0 495 851) only.**

SI number

01 01 07 (333)

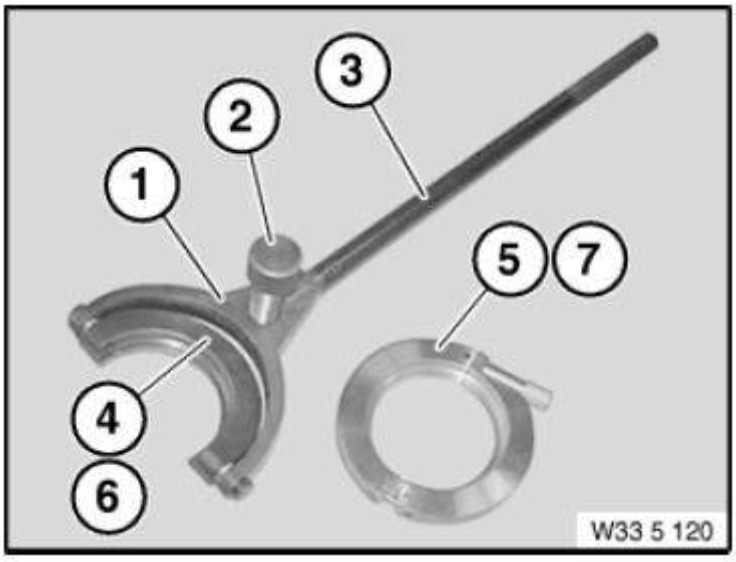


Fig. 198: Identifying Shaped Element (0495856)
Courtesy of BMW OF NORTH AMERICA, INC.

0492320 SHAPED ELEMENT

0492320 333323 Shaped element AM

NOTE: **For pulling the front rubber mounts out of the rear axle support, series: E36, E46**

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Storage Location

B13

C13

0492391 SHAPED ELEMENT

0492391 334123 Shaped element AM

NOTE: **For positioning the wishbone when pressing in the ball joint**

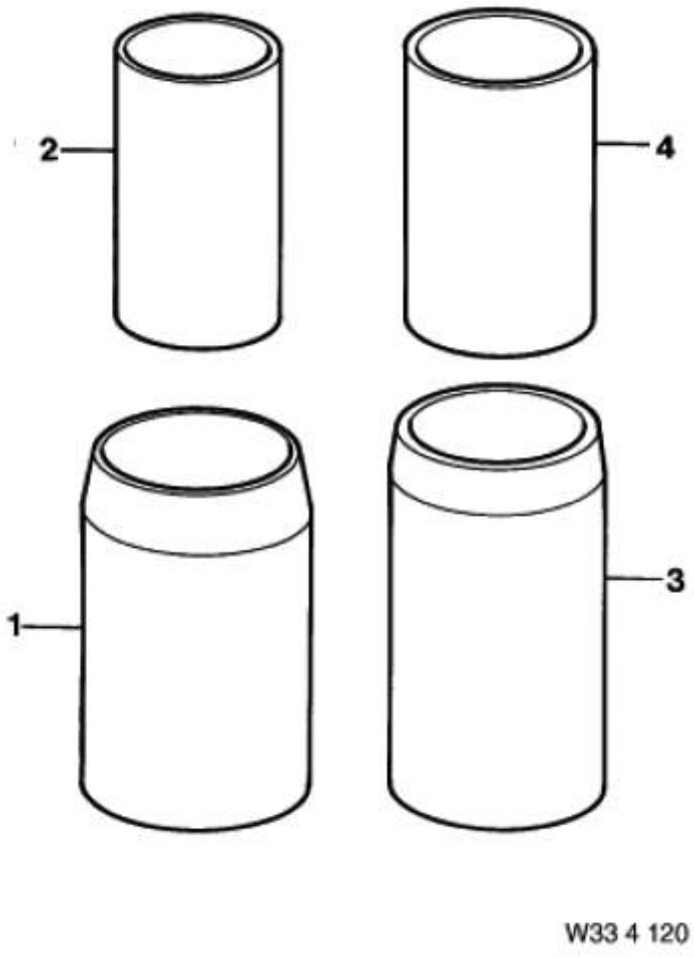


Fig. 199: Identifying Shaped Element (0492391)
Courtesy of BMW OF NORTH AMERICA, INC.

0492382 SHAPED ELEMENT

0492382 334104 Shaped element AM

NOTE: **For pressing in**

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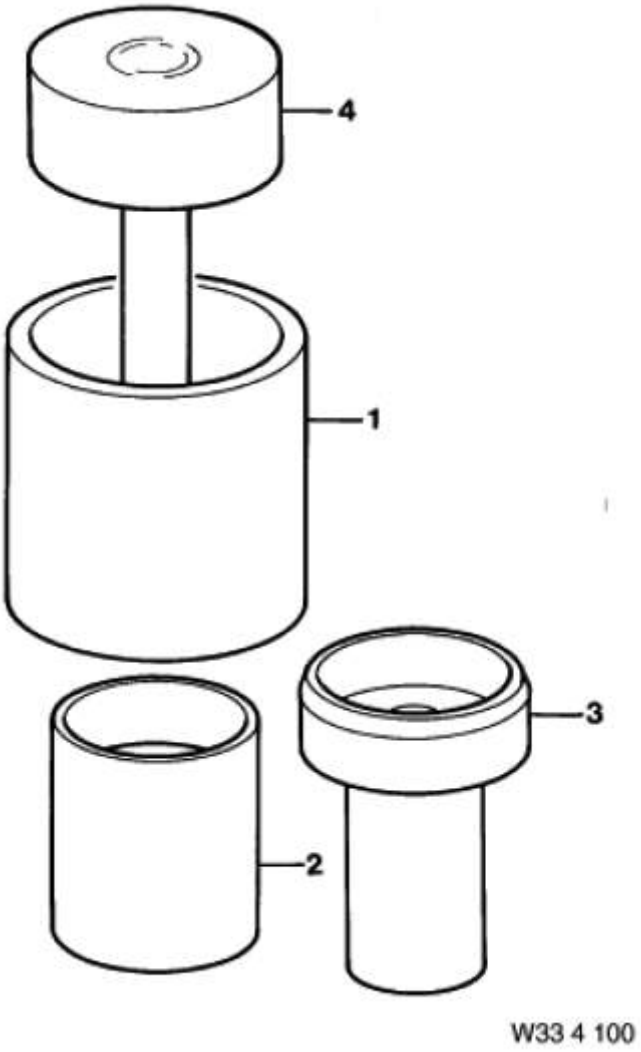


Fig. 200: Identifying Shaped Element (0492382)
Courtesy of BMW OF NORTH AMERICA, INC.

0492389 SHAPED ELEMENT

0492389 334121 Shaped element AM

NOTE: **For positioning when pressing out the ball joint**

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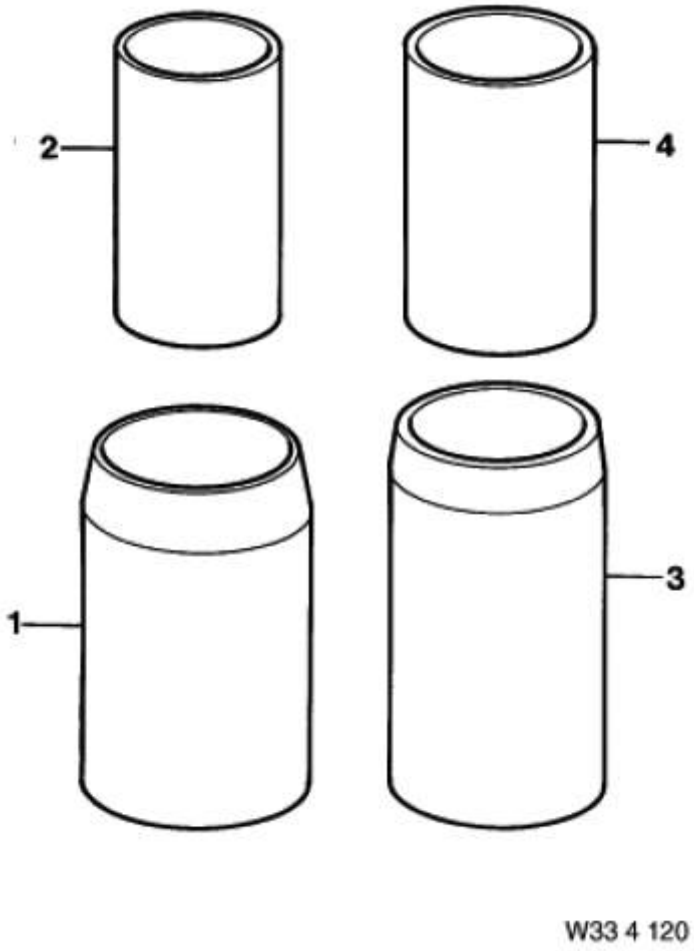


Fig. 201: Identifying Shaped Element (0492389)
Courtesy of BMW OF NORTH AMERICA, INC.

0492387 SHAPED ELEMENT

0492387 334114 Shaped element AM

NOTE: **For pressing in**

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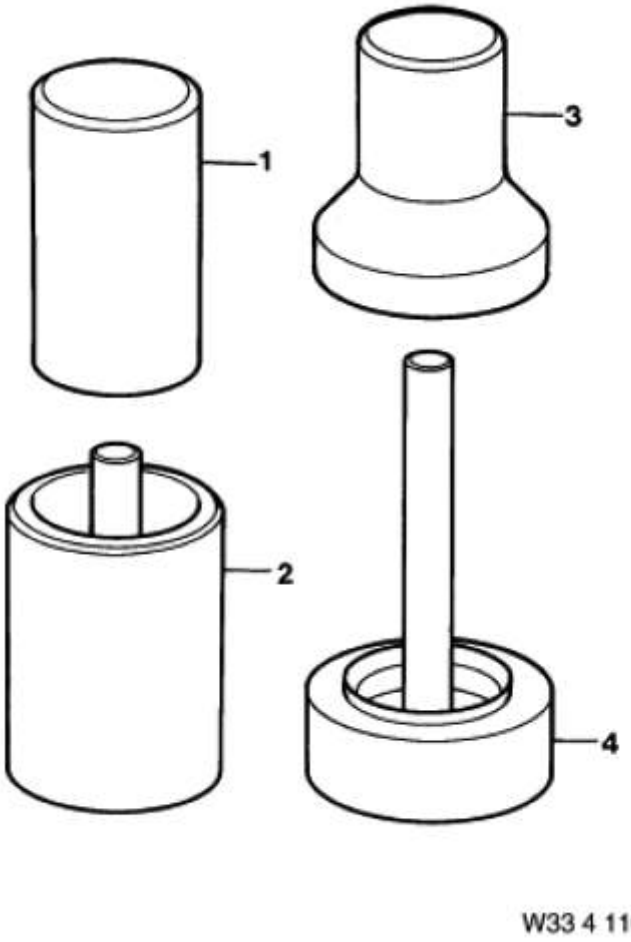


Fig. 202: Identifying Shaped Element (0492387)
Courtesy of BMW OF NORTH AMERICA, INC.

2293791 SHAPED ELEMENT

2293791 Shaped element Minimum set: Mechanical tools Mechanical tool

NOTE: **For pulling out rubber mounts in rear axle support mounting.**

Storage Location

C29

SI number

01 22 11 (753)

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Fig. 203: Identifying Shaped Element (2293791)
Courtesy of BMW OF NORTH AMERICA, INC.

0492318 SHAPED ELEMENT

0492318 333321 Shaped element AM

NOTE: **For pulling the rear rubber mounts out of the rear axle support, series: E36, E46**

Storage Location

B13

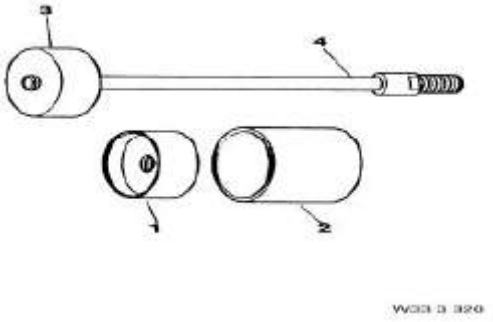


Fig. 204: Identifying Shaped Element (0492318)
Courtesy of BMW OF NORTH AMERICA, INC.

0495857 SHAPED ELEMENT

0495857 335125 Shaped element Minimum set: Mechanical tools AM

NOTE: **Sale of existing inventory then available as part of set of tools 33 5 120 -> (83 30 0 495 851) only.**

SI number

01 01 07 (333)

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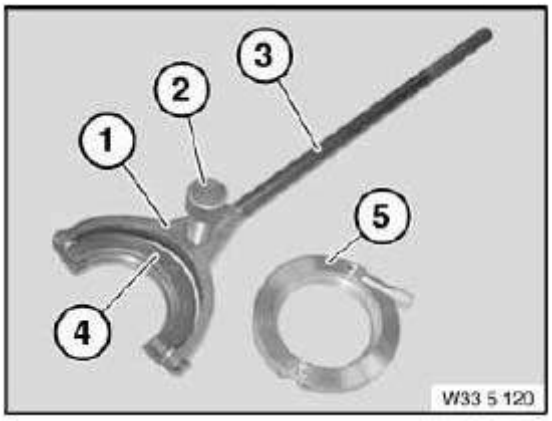


Fig. 205: Identifying Shaped Element (0495857)
Courtesy of BMW OF NORTH AMERICA, INC.

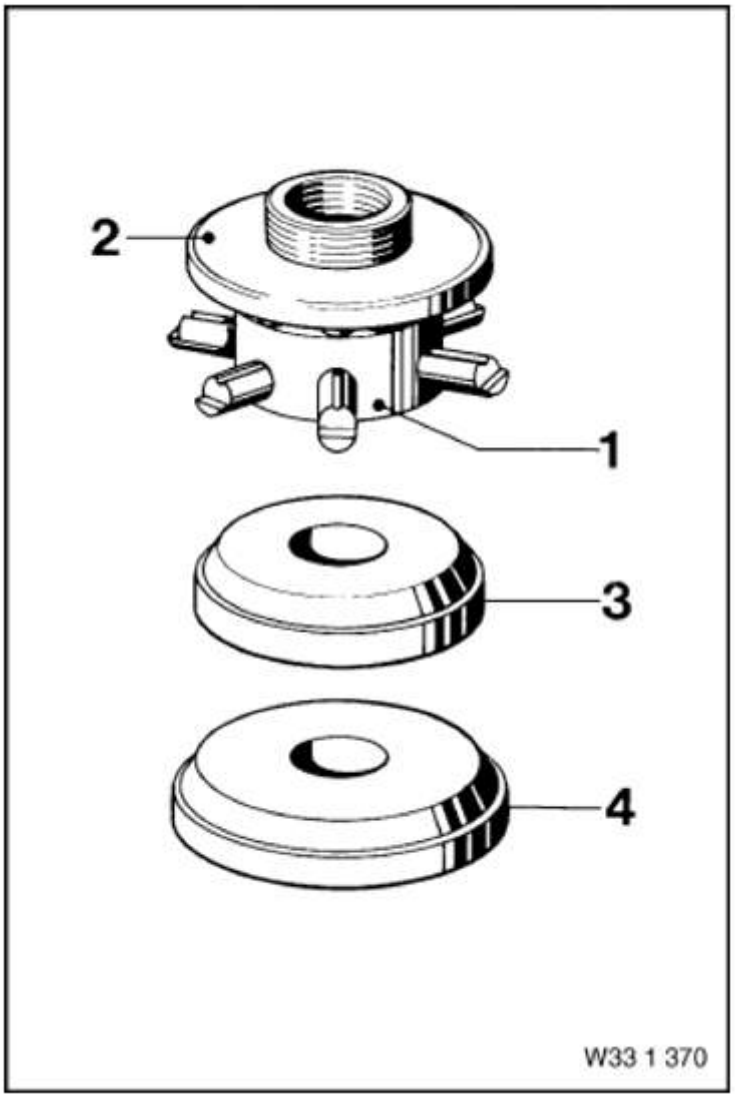
0492132 SHAPED PART

0492132 331371 Shaped part AM

NOTE: **(Shaped part)**

Storage Location

Y8



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Fig. 206: Identifying Shaped Part (0492132)
Courtesy of BMW OF NORTH AMERICA, INC.

2230163 SHAPED

2230163 Shaped part AM

NOTE: **For removing the wheel bearing inner race from the drive flange hub in combination with special tool 33 4 400 and hydraulic tool 81 64 2 160 009.**

Storage Location

C29

C30

SI number

01 15 11 (737)



Fig. 207: Identifying Shaped (2230163)
Courtesy of BMW OF NORTH AMERICA, INC.

0496765 SHAPED PART

0496765 335126 Shaped part Minimum set: Mechanical tools AM

In conjunction with: 33 5 120 = 0495851

NOTE: **For pressing output shaft out of rear axle final drive.**

SI number

01 28 09 (600)

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Fig. 208: Identifying Shaped Part (0496765)
Courtesy of BMW OF NORTH AMERICA, INC.

0496795 SHAPED PART

0496795 335127 Shaped part Minimum set: Mechanical tools AM

NOTE: **For driving output shaft into rear axle final drive.**

SI number

01 28 09 (600)

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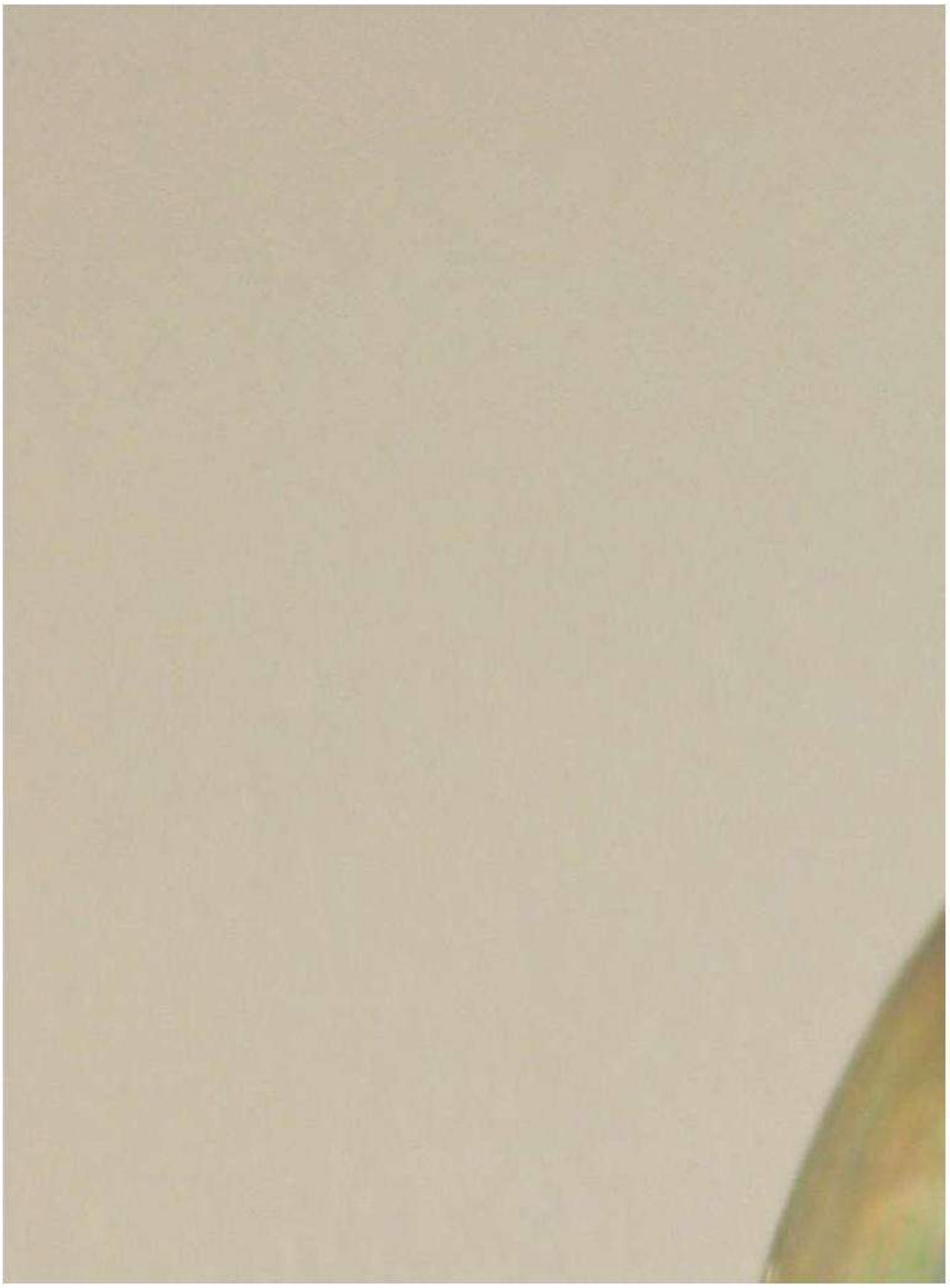


Fig. 209: Identifying Shaped Part (0496795)
Courtesy of BMW OF NORTH AMERICA, INC.

0492114 SHAPED PART

0492114 331351 Shaped part AM

NOTE: **(Shaped part)**

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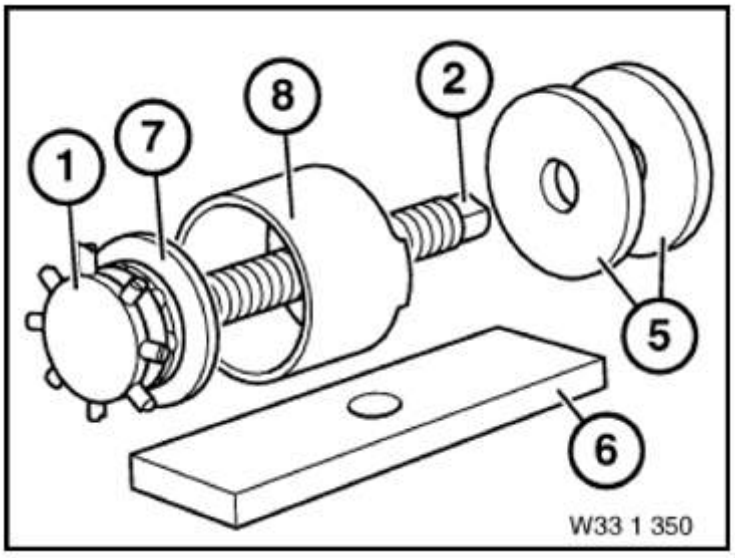


Fig. 210: Identifying Shaped Part (0492114)
Courtesy of BMW OF NORTH AMERICA, INC.

0492399 SHAPED PART

0492399 334142 Shaped part Minimum set: Mechanical tools AM

NOTE: **(Shaped part) 2 pieces Model series: E38, E39, E46 Deletion, only available via tool set**

Storage Location

B8

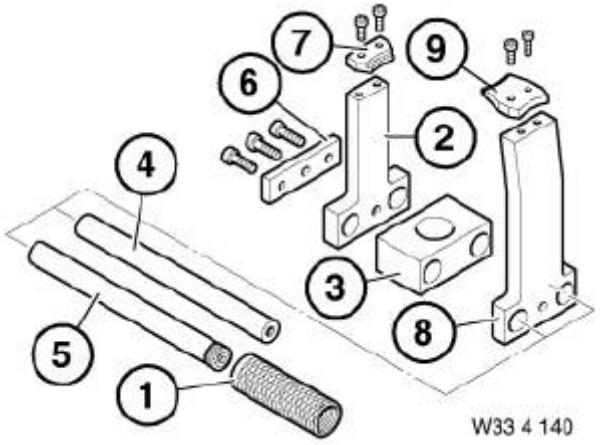


Fig. 211: Identifying Shaped Part (0492399)
Courtesy of BMW OF NORTH AMERICA, INC.

0492400 SHAPED PART

0492400 334143 Shaped part Minimum set: Mechanical tools AM

NOTE: **(Shaped part)**

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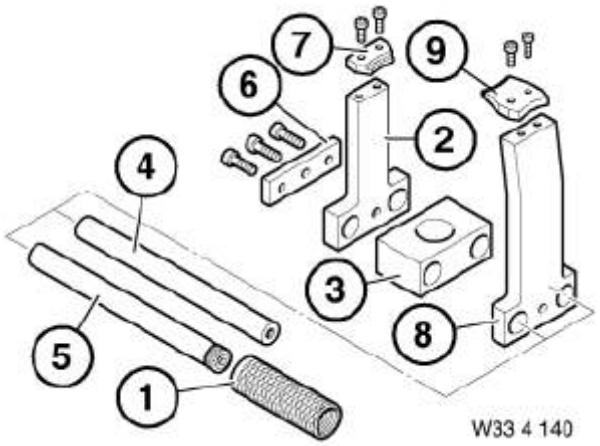


Fig. 212: Identifying Shaped Part (0492400)
Courtesy of BMW OF NORTH AMERICA, INC.

0492405 SHAPED PART

0492405 334148 Shaped part Minimum set: Mechanical tools AM

NOTE: **(Shaped part) 2 pieces Model series: E39/2, E65, E67, RR1**

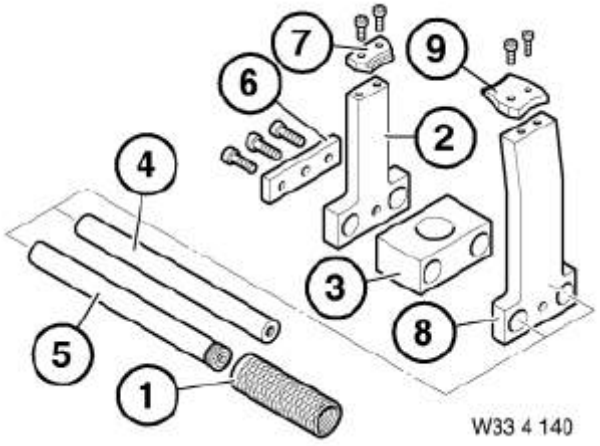


Fig. 213: Identifying Shaped Part (0492405)
Courtesy of BMW OF NORTH AMERICA, INC.

0492278 SHELL

0492278 333242 Shell AM

Replaced by: 83300493416

NOTE: **(Shell) Model series: E31, E38 Discontinuation and replaced by 33 4 400. (0 493 416)**

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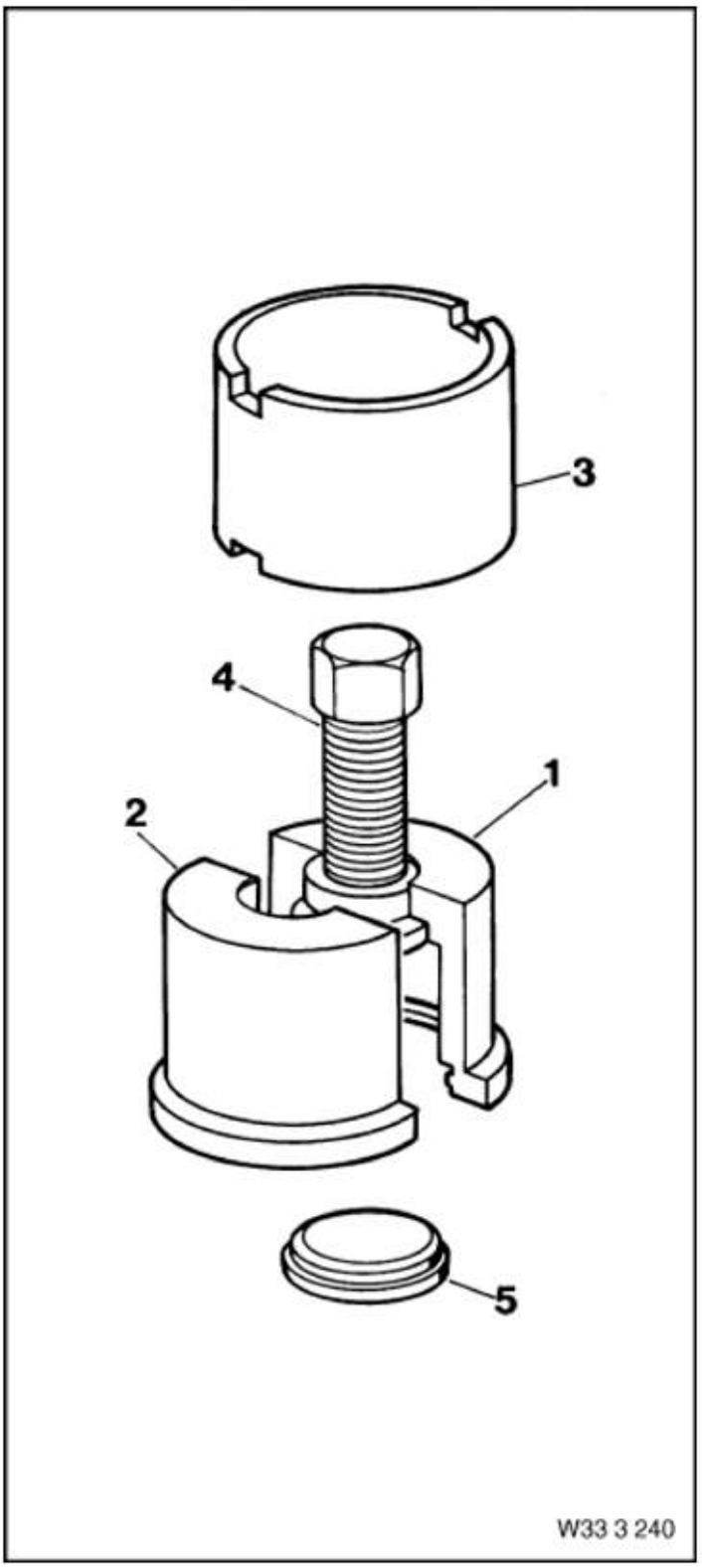


Fig. 214: Identifying Shell (0492278)
Courtesy of BMW OF NORTH AMERICA, INC.

0492375 SHELL

0492375 334092 Shell AM

Replaced by: 83300493416

NOTE: **Discontinuation and replaced by 33 4 400 (0 493 416)**

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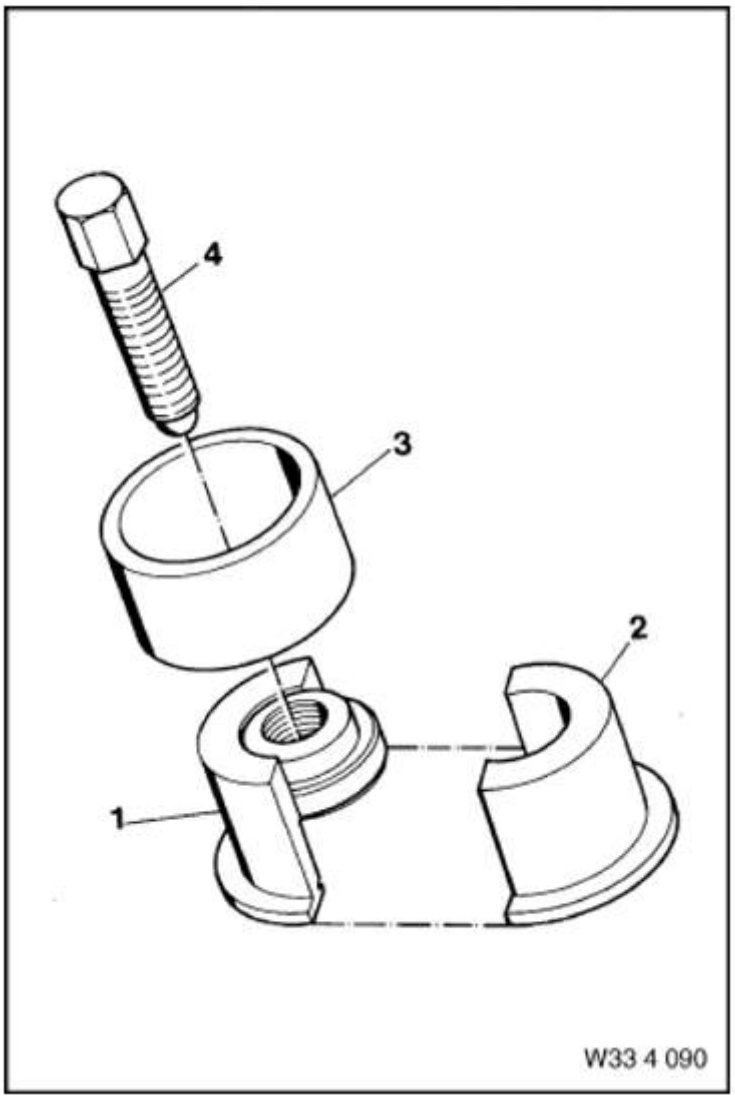


Fig. 215: Identifying Shell (0492375)
Courtesy of BMW OF NORTH AMERICA, INC.

0492277 SHELL

0492277 333241 Shell AM

Replaced by: 83300493416

NOTE: **(Shell) Model series: E31, E38 Discontinuation and replaced by 33 4 400. (0 493 416)**

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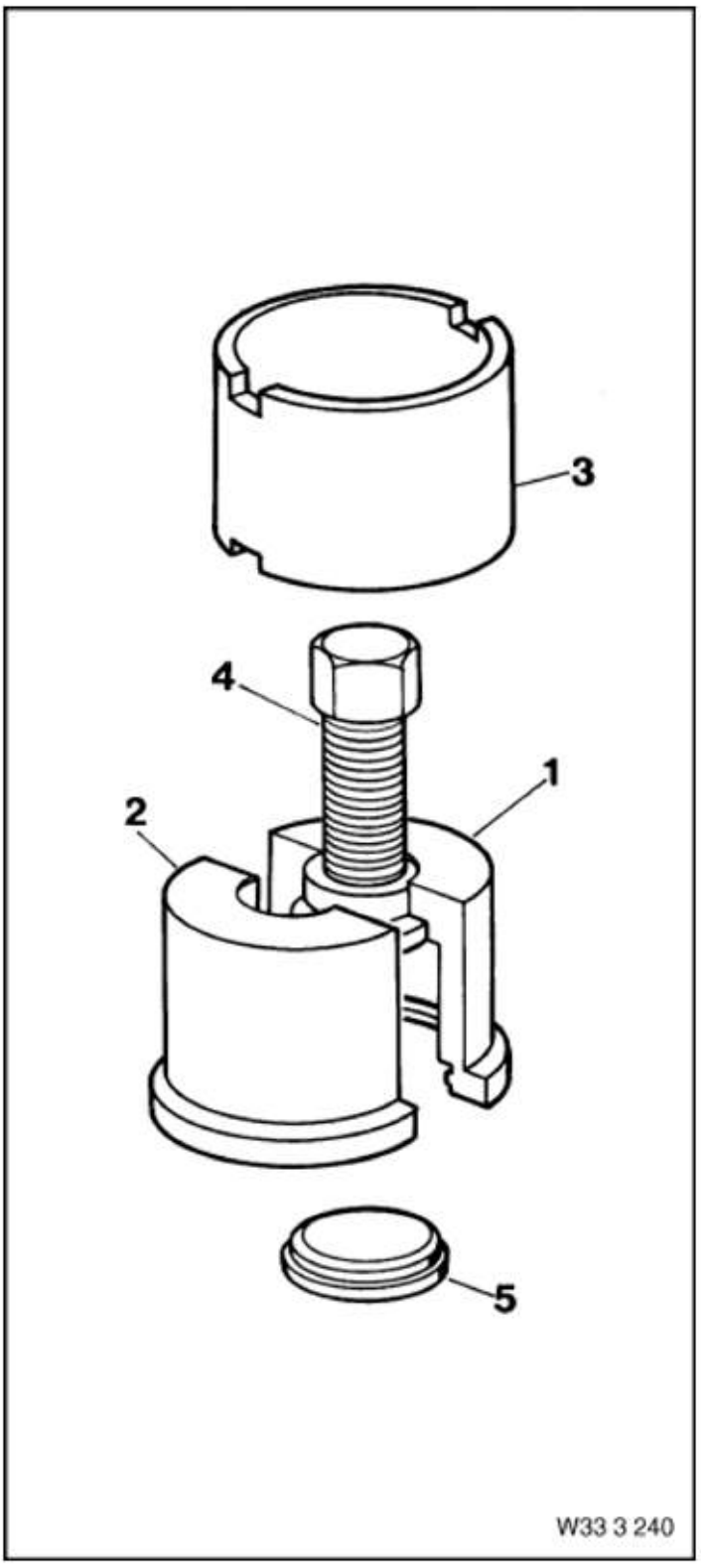


Fig. 216: Identifying Shell (0492277)
Courtesy of BMW OF NORTH AMERICA, INC.

0492374 SHELL

0492374 334091 Shell AM

NOTE: **(Bearing shell)**

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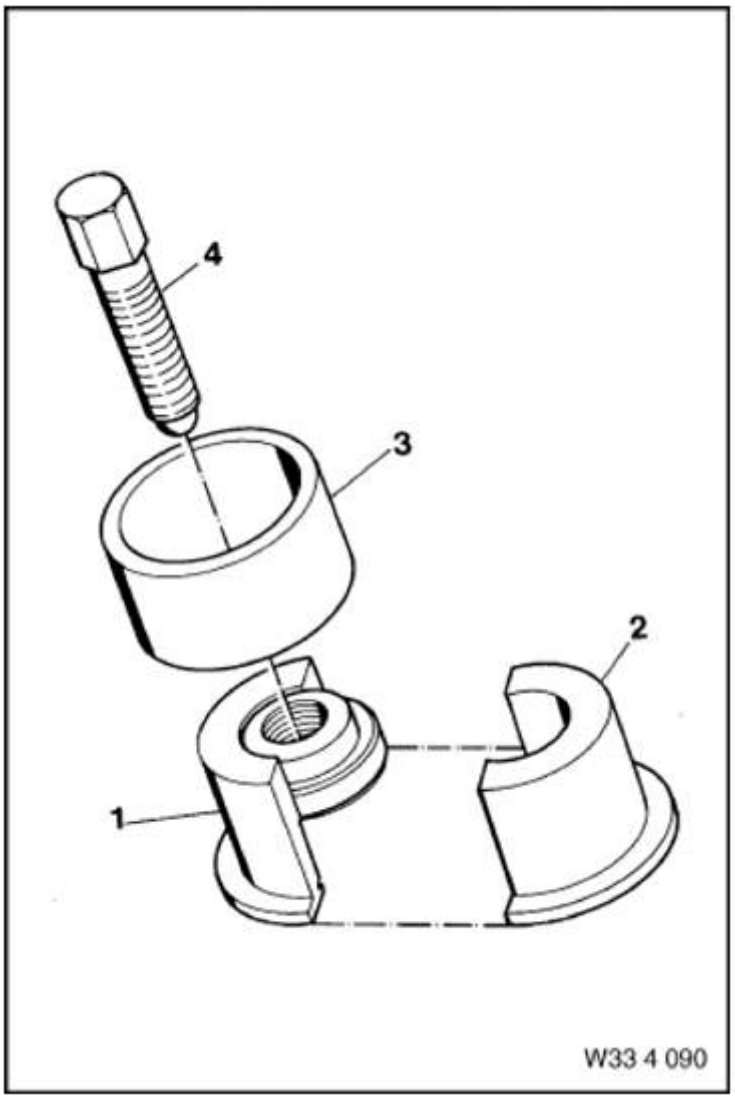


Fig. 217: Identifying Shell (0492374)
Courtesy of BMW OF NORTH AMERICA, INC.

0495553 SOCKET NUT

0495553 335060 Socket nut Minimum set: Mechanical tools Mechanical tool

NOTE: **(Socket nut) z34 For holding the gearbox input shaft when releasing and tightening down flange nut.**

Storage Location

A18

SI number

01 21 06 (300)

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Fig. 218: Identifying Socket Nut (0495553)
Courtesy of BMW OF NORTH AMERICA, INC.

0492192 SOCKET WRENCH

0492192 332306 Socket wrench AM

NOTE: (Socket wrench)

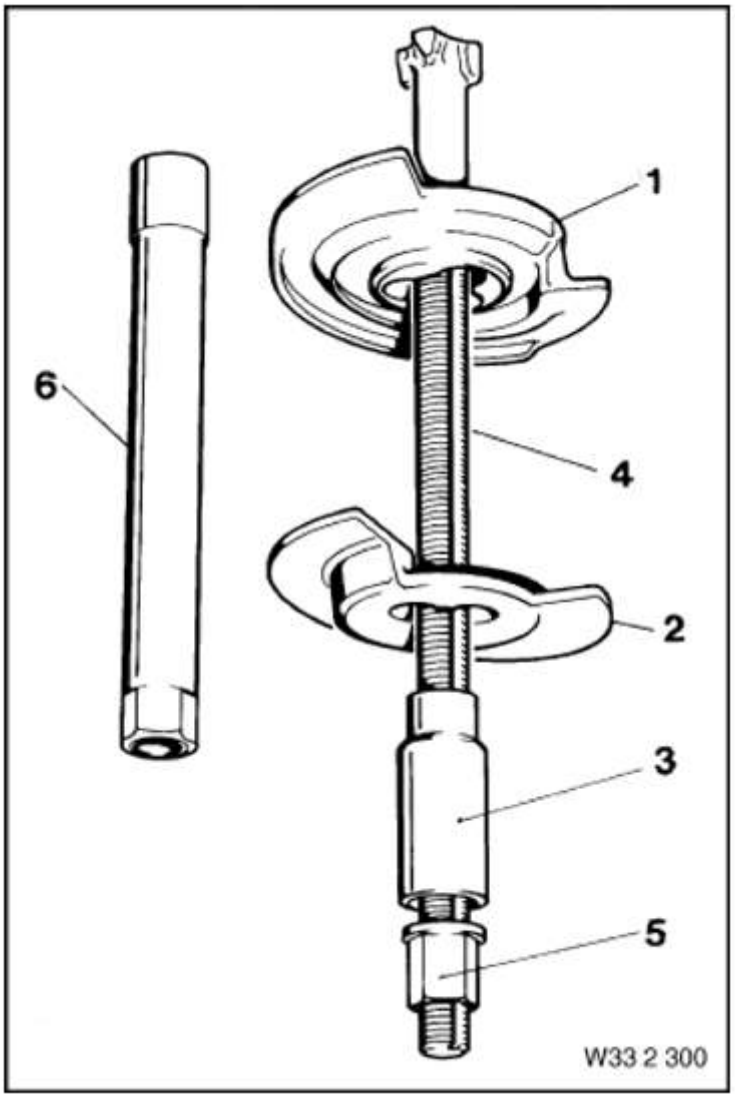


Fig. 219: Identifying Socket Wrench (0492192)
Courtesy of BMW OF NORTH AMERICA, INC.

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0496516 SOCKET WRENCH

0496516 330042 Socket wrench Minimum set: Mechanical tools AM

NOTE: **(Socket wrench, hex socket, 6 mm) discontinued, available as part of set of special tools only**

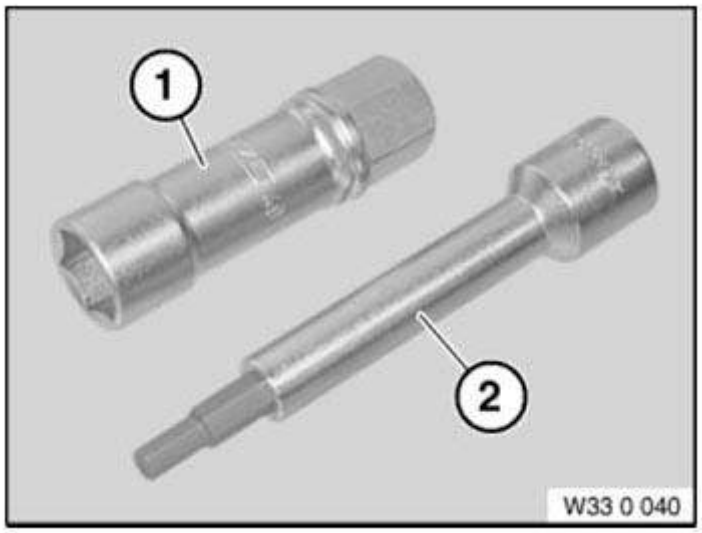


Fig. 220: Identifying Socket Wrench (0496516)
Courtesy of BMW OF NORTH AMERICA, INC.

0496515 SOCKET WRENCH

0496515 330041 Socket wrench Minimum set: Mechanical tools AM

NOTE: **(Socket wrench SW18) discontinued, available as part of set of special tools only**

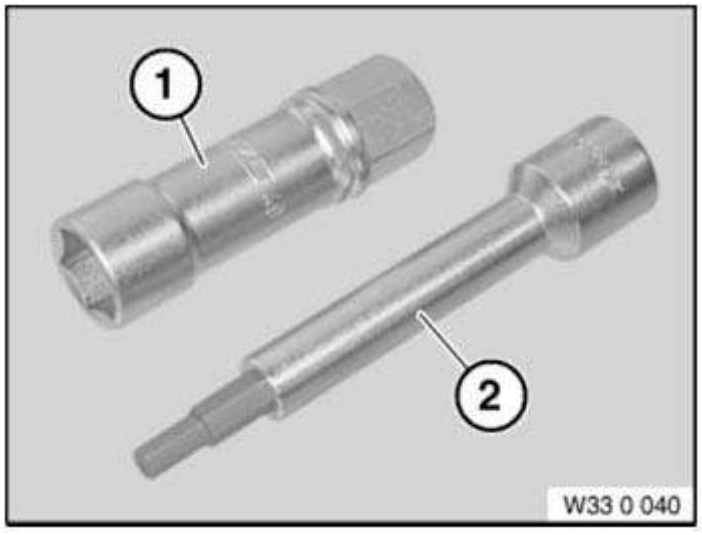


Fig. 221: Identifying Socket Wrench (0496515)
Courtesy of BMW OF NORTH AMERICA, INC.

0496514 SOCKET WRENCH

0496514 330040 Socket wrench Minimum set: Mechanical tools AM

NOTE: **(Socket wrench SW18) For releasing and tightening down support bearing screw connection.**

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Storage Location

A25

SI number

01 18 08 (482)

Consisting of:

1. 0496515 Socket wrench

NOTE: **(Socket wrench SW18) discontinued, available as part of set of special tools only**

2. 0496516 Socket wrench

NOTE: **(Socket wrench, hex socket, 6 mm) discontinued, available as part of set of special tools only**

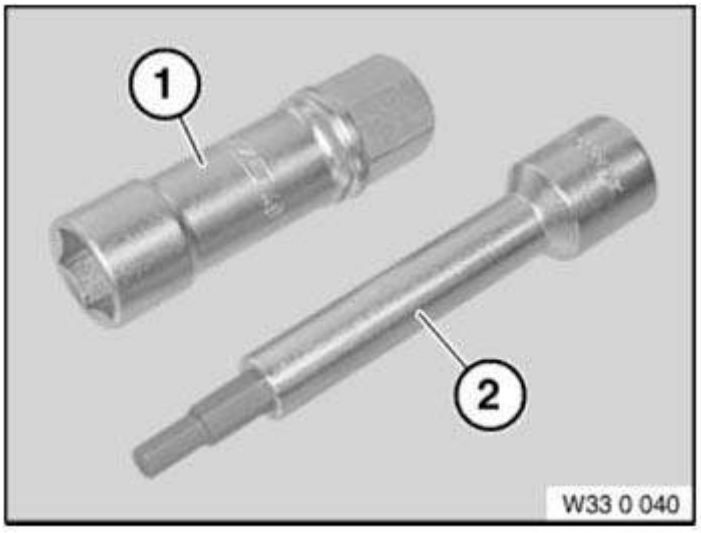
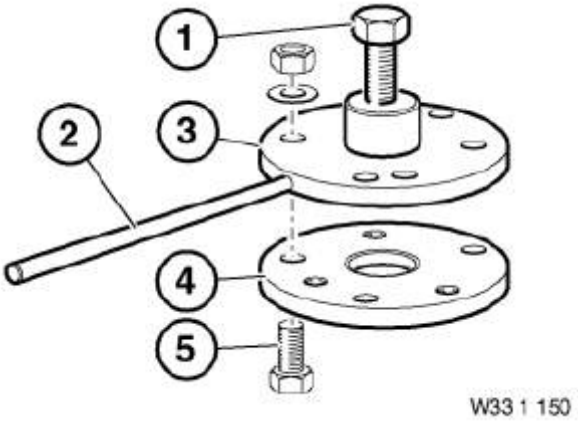


Fig. 222: Identifying Socket Wrench (0496514)
Courtesy of BMW OF NORTH AMERICA, INC.

0493265 SPINDLE

0493265 331151 Spindle AM

NOTE: **Discontinued, can only be ordered using complete tool**



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Fig. 223: Identifying Spindle (0493265)
Courtesy of BMW OF NORTH AMERICA, INC.

2156262 SPINDLE

2156262 Spindle AM

NOTE: **Spindle F3 (M24/270mm) in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 06 09 (544)



Fig. 224: Identifying Spindle (2156262)
Courtesy of BMW OF NORTH AMERICA, INC.

0492222 SPINDLE

0492222 333107 Spindle AM

NOTE: **For installing - model series: E28, E30, E31, E36**

Storage Location

C13

cardiagn.com



Fig. 225: Identifying Spindle (0492222)
Courtesy of BMW OF NORTH AMERICA, INC.

0496535 SPINDLE

0496535 334301 Spindle Minimum set: Mechanical tools AM

NOTE: **(spindle TR20 (length 300 mm))**

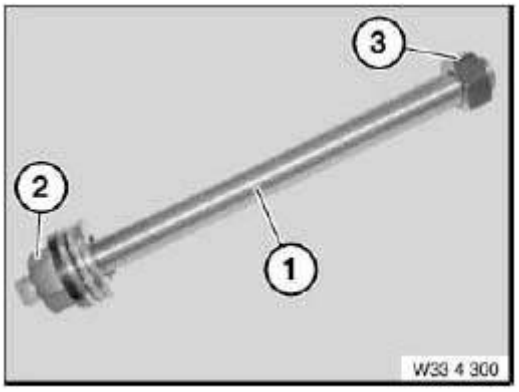


Fig. 226: Identifying Spindle (0496535)
Courtesy of BMW OF NORTH AMERICA, INC.

0492180 SPINDLE

0492180 332121 Spindle AM

NOTE: **(Threaded spindle, long) Series: E36/5 sale of existing inventory and then available as part of set of special tools 33 2 120 = 83 30 0 492 179 only - as of 09.12.2011**

SI number

01 01 94 (766)

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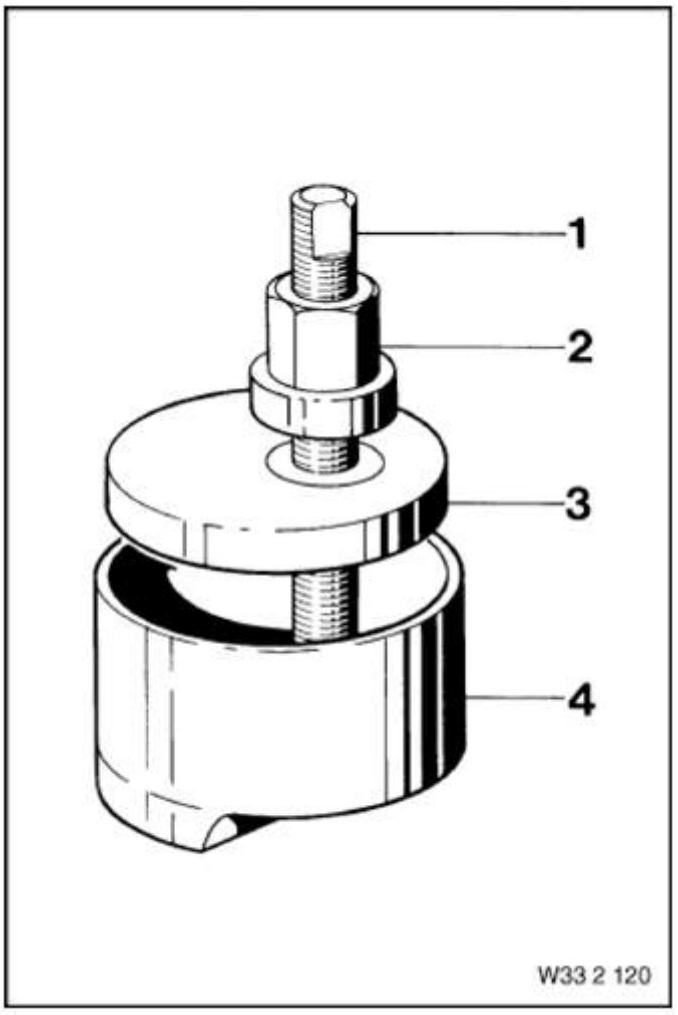


Fig. 227: Identifying Spindle (0492180)
Courtesy of BMW OF NORTH AMERICA, INC.

0493817 SPINDLE

0493817 334402 Spindle AM

NOTE: **No longer available separately, only available as part of complete tool set 0493416 = 33 4 400.**

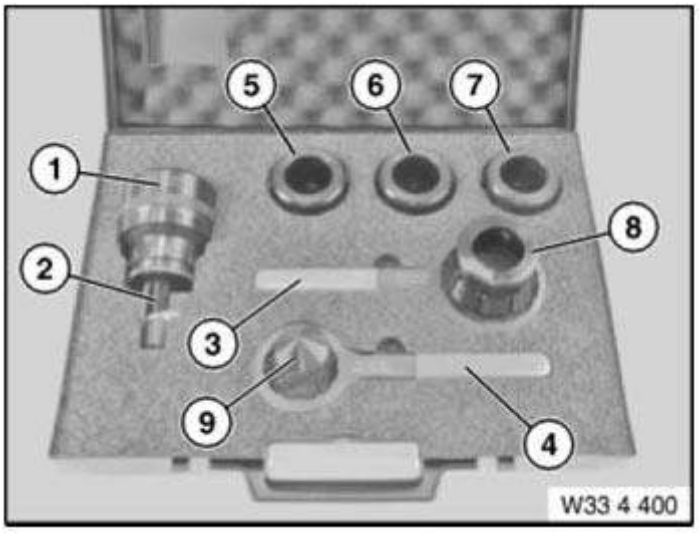


Fig. 228: Identifying Spindle (0493817)
Courtesy of BMW OF NORTH AMERICA, INC.

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2156270 SPINDLE

2156270 Spindle AM

NOTE: **Spindle F2 (M20/M24/355mm) in connection with adapter kit 1 (BMW), (81 64 2 155 745), and MINI adapter kit, (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**



Fig. 229: Identifying Spindle (2156270)
Courtesy of BMW OF NORTH AMERICA, INC.

SI number

08 06 09 (544)

0492218 SPINDLE

0492218 333103 Spindle AM

NOTE: **(Spindle for installation) Model series: E28, E30, E31, E36, RR1**

Storage Location

C13



cardiagn.com

Fig. 230: Identifying Spindle (0492218)
Courtesy of BMW OF NORTH AMERICA, INC.

0492205 SPINDLE

0492205 333052 Spindle AM

NOTE: Series: E28, E30, E83

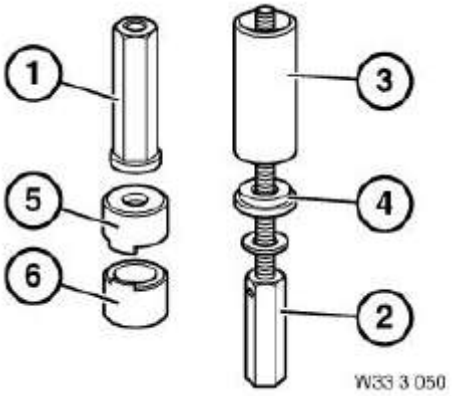


Fig. 231: Identifying Spindle (0492205)
Courtesy of BMW OF NORTH AMERICA, INC.

0494981 SPINDLE

0494981 334465 Spindle Minimum set: Mechanical tools AM

NOTE: (spindle 205 mm, M12)



Fig. 232: Identifying Spindle (0494981)
Courtesy of BMW OF NORTH AMERICA, INC.

0495811 SPINDLE

0495811 335103 Spindle Minimum set: Mechanical tools AM

NOTE: Discontinued, can only be ordered using complete tool

SI number

cardiagn.com

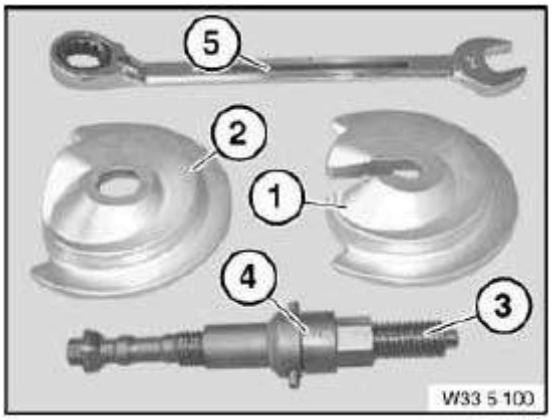


Fig. 233: Identifying Spindle (0495811)
Courtesy of BMW OF NORTH AMERICA, INC.

0492190 SPINDLE

0492190 332304 Spindle AM

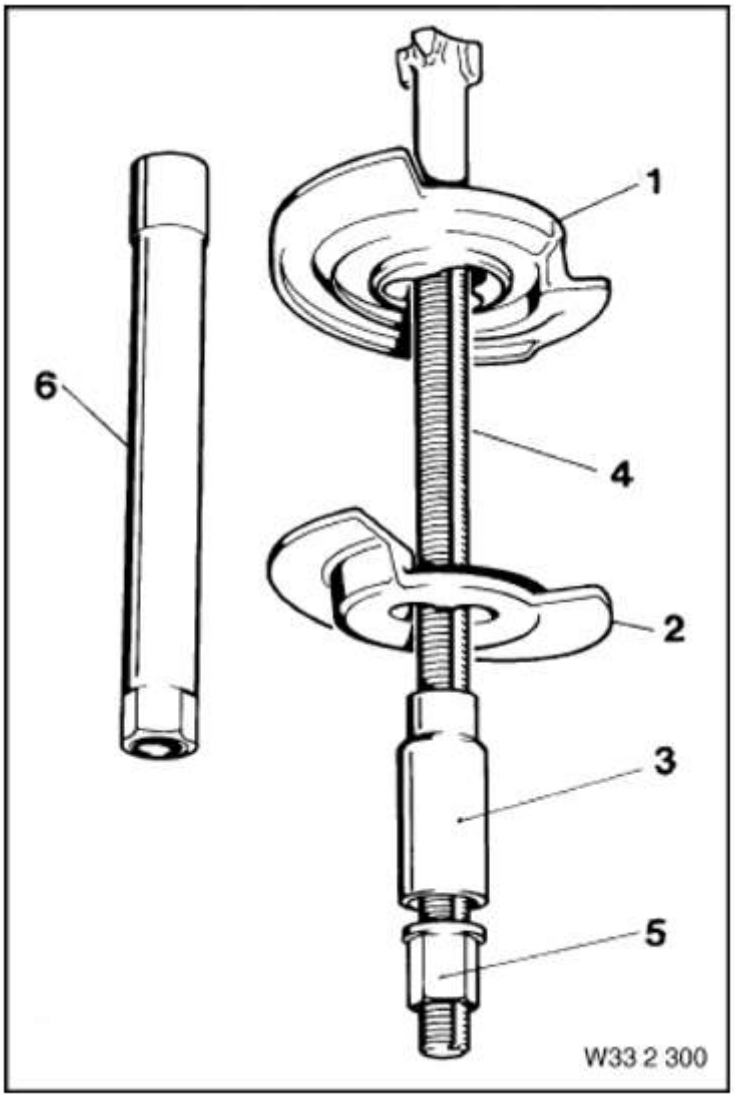


Fig. 234: Identifying Spindle (0492190)
Courtesy of BMW OF NORTH AMERICA, INC.

0492317 SPINDLE

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0492317 333320 Spindle AM

NOTE: **For removing and installing front/rear rubber mounts in rear axle support**

Storage Location

B13

SI number

01 10 90 (288)

Consisting of:

1. **0492318** Shaped element

   NOTE: **For pulling the rear rubber mounts out of the rear axle support, series: E36, E46**

2. **0492319** Washer

   NOTE: **(Thrust washer) For installing the front/rear rubber mount, series: E36, E46**

3. **0492320** Shaped element

   NOTE: **For pulling the front rubber mounts out of the rear axle support, series: E36, E46**

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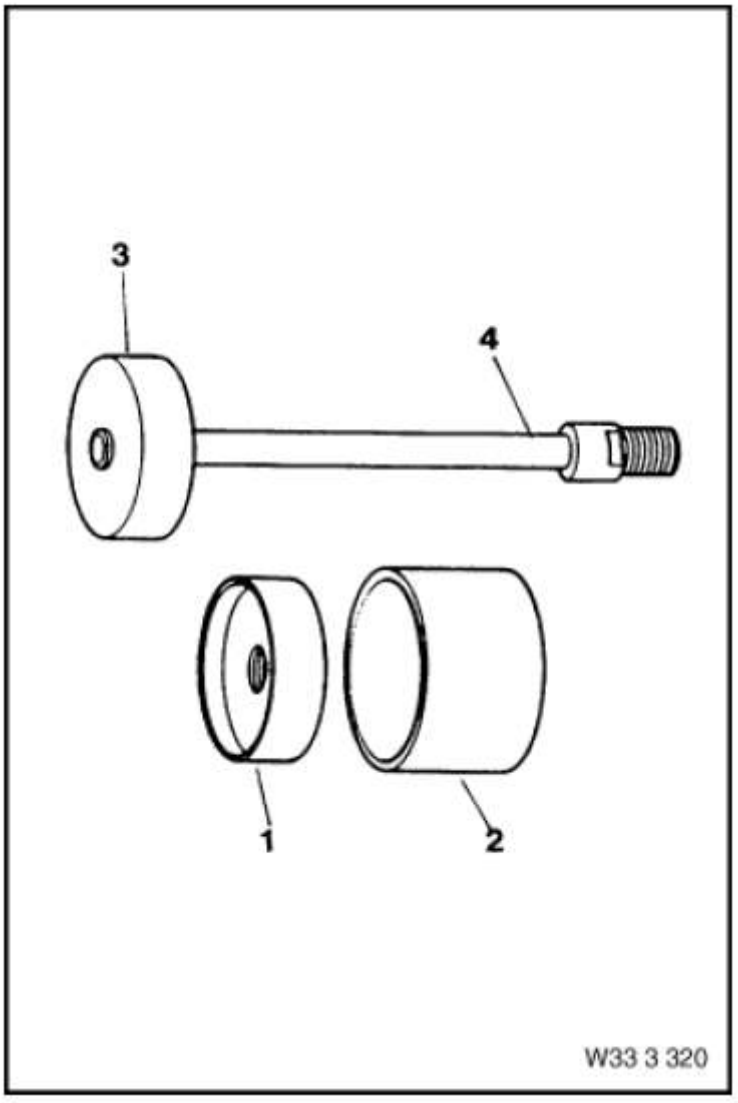


Fig. 235: Identifying Spindle (0492317)
Courtesy of BMW OF NORTH AMERICA, INC.

4. 0492321 Spindle

NOTE: **For pulling out the front rubber mount, series: E36, E46**

0492115 SPINDLE

0492115 331352 Spindle AM

NOTE: **(Spindle, short)**

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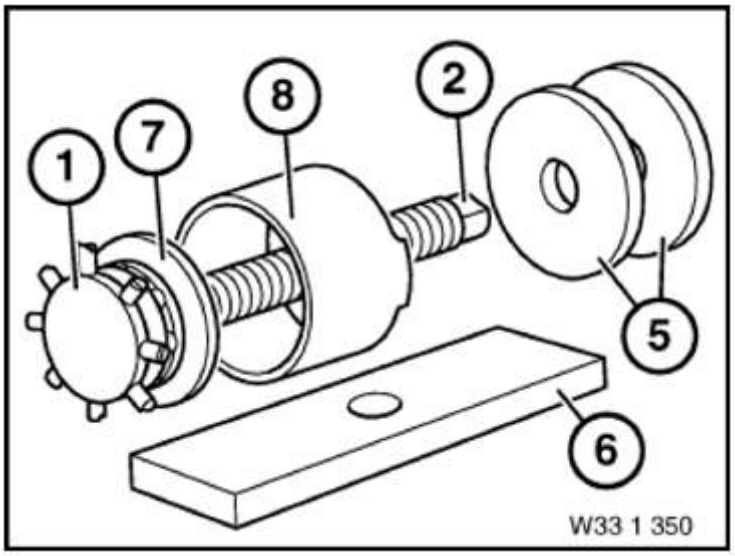


Fig. 236: Identifying Spindle (0492115)
Courtesy of BMW OF NORTH AMERICA, INC.

0492280 SPINDLE

0492280 333244 Spindle AM

Replaced by: 83300493416

NOTE: **Discontinuation and replaced by 33 4 400. (0 493 416)**

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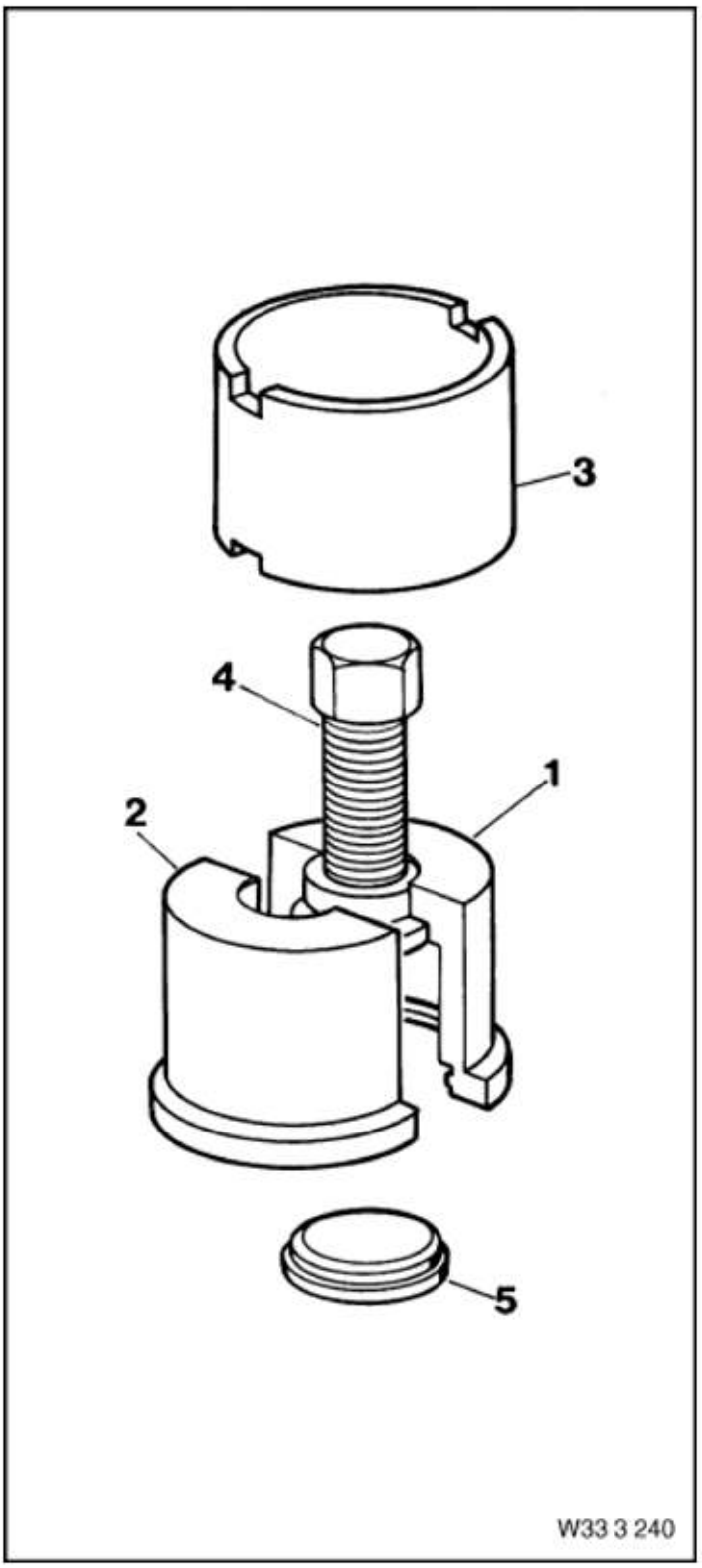


Fig. 237: Identifying Spindle (0492280)
Courtesy of BMW OF NORTH AMERICA, INC.

0496553 SPINDLE

0496553 333011 Spindle Minimum set: Mechanical tools AM

NOTE: **(spindle TR12)**

SI number

01 16 08 (476)

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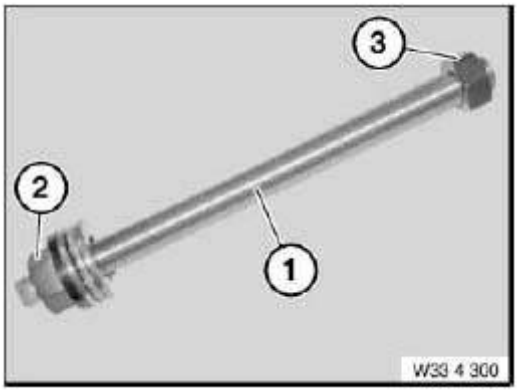


Fig. 238: Identifying Spindle (0496553)
Courtesy of BMW OF NORTH AMERICA, INC.

0496534 SPINDLE

0496534 334300 Spindle Minimum set: Mechanical tools AM

In conjunction with: 33 4 030, 33 4 040 = 0492359

NOTE: (spindle TR20 with nut)

SI number

01 16 08 (476)

Consisting of:

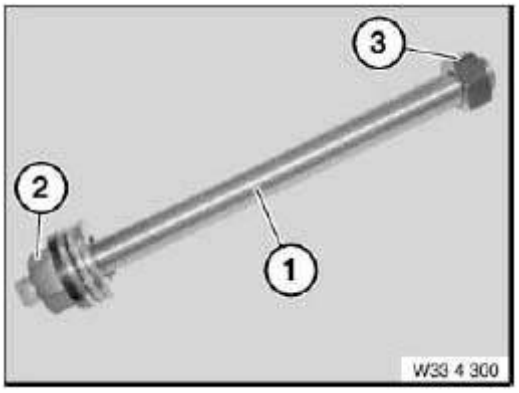


Fig. 239: Identifying Spindle (0496534)
Courtesy of BMW OF NORTH AMERICA, INC.

1. 0496535 Spindle

   NOTE: (spindle TR20 (length 300 mm))

2. 0496536 Nut

   NOTE: (nut TR20 with thrust bearing)

3. 0496551 Nut

   NOTE: (Nut TR20)

2156271 SPINDLE

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2156271 Spindle AM

NOTE: **Spindle F1 (M24/425 mm) in connection with adapter kit 1 (BMW), (81 64 2 155 745), for removal and installation of wheel bearings, propeller shafts drive flanges.**

SI number

08 06 09 (544)



Fig. 240: Identifying Spindle (2156271)
Courtesy of BMW OF NORTH AMERICA, INC.

0492216 SPINDLE

0492216 333101 Spindle AM

Replaced by: 83300492222

NOTE: **Replaced by 33 3 107. (0 492 222)**

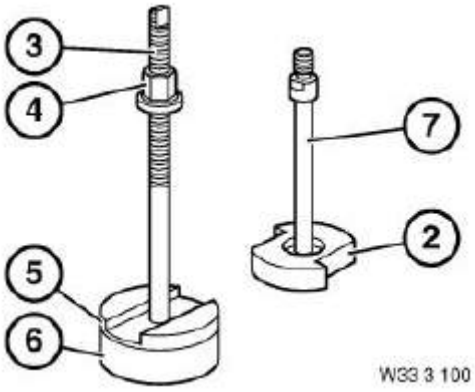


Fig. 241: Identifying Spindle (0492216)
Courtesy of BMW OF NORTH AMERICA, INC.

0496552 SPINDLE

0496552 333010 Spindle Minimum set: Mechanical tools AM

NOTE: **(spindle TR12 with nut)**

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SI number

01 16 08 (476)

Consisting of:

1. 0496553 Spindle

   NOTE: (spindle TR12)

2. 0496554 Nut

   NOTE: (nut TR12 with thrust bearing)

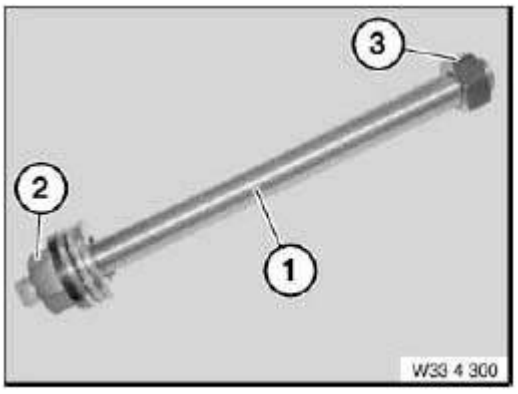


Fig. 242: Identifying Spindle (0496552)
Courtesy of BMW OF NORTH AMERICA, INC.

3. 0496555 Nut

   NOTE: (nut M12x1.5 (high wall))

0492377 SPINDLE

0492377 334094 Spindle AM

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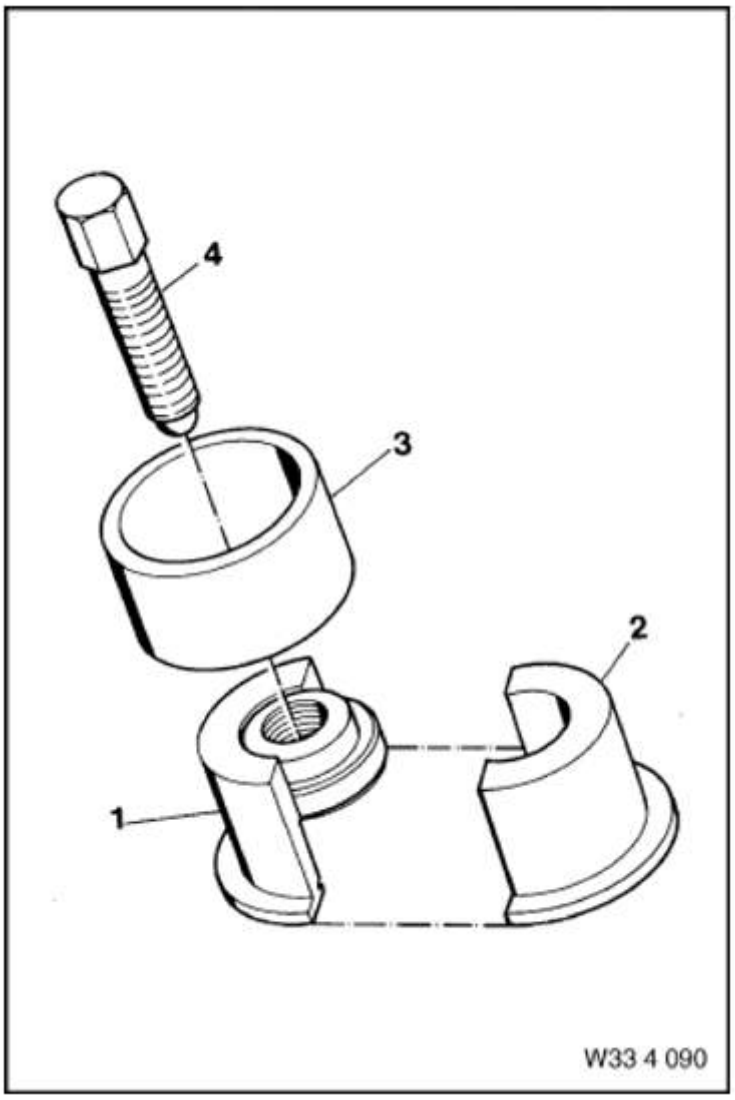


Fig. 243: Identifying Spindle (0492377)
Courtesy of BMW OF NORTH AMERICA, INC.

0492321 SPINDLE

0492321 333324 Spindle AM

NOTE: **For pulling out the front rubber mount, series: E36, E46**

Storage Location

B13

C13

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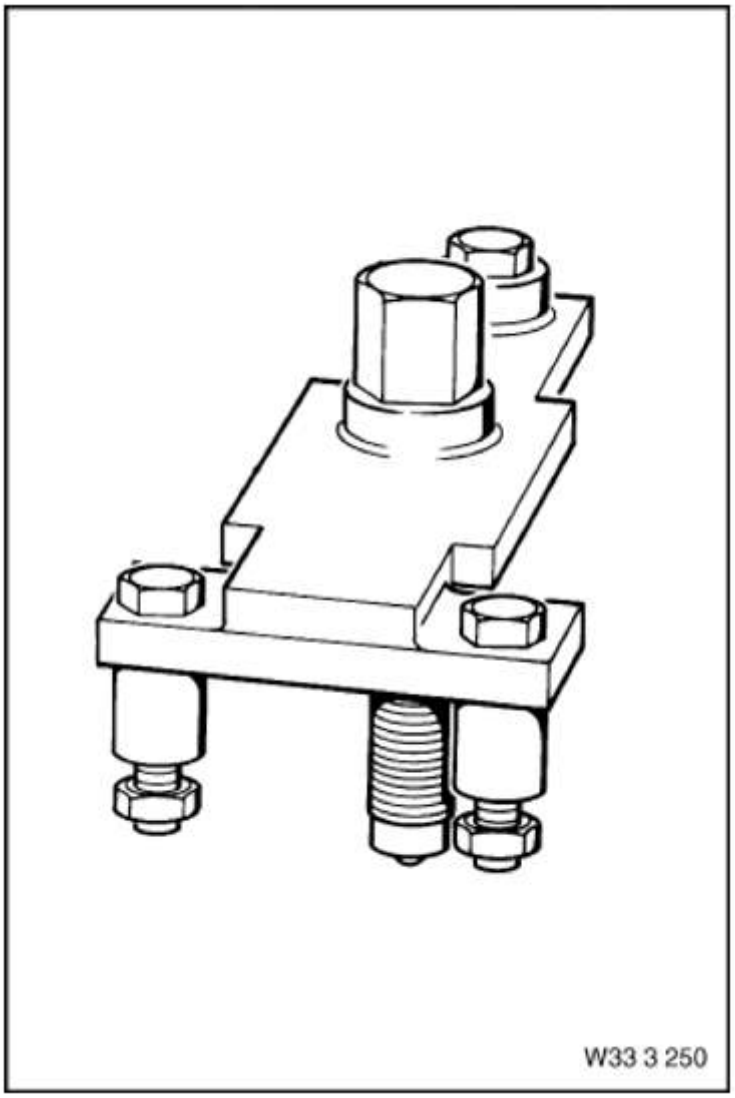


Fig. 244: Identifying Spindle (0492321)
Courtesy of BMW OF NORTH AMERICA, INC.

0492285 SPINDLE

0492285 333251 Spindle AM

NOTE: **(Spindle with pressure pad)**



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Fig. 245: Identifying Spindle (0492285)
Courtesy of BMW OF NORTH AMERICA, INC.

0492187 SPRING CUPS

0492187 332301 Spring cups AM

NOTE: (spring cup, top)

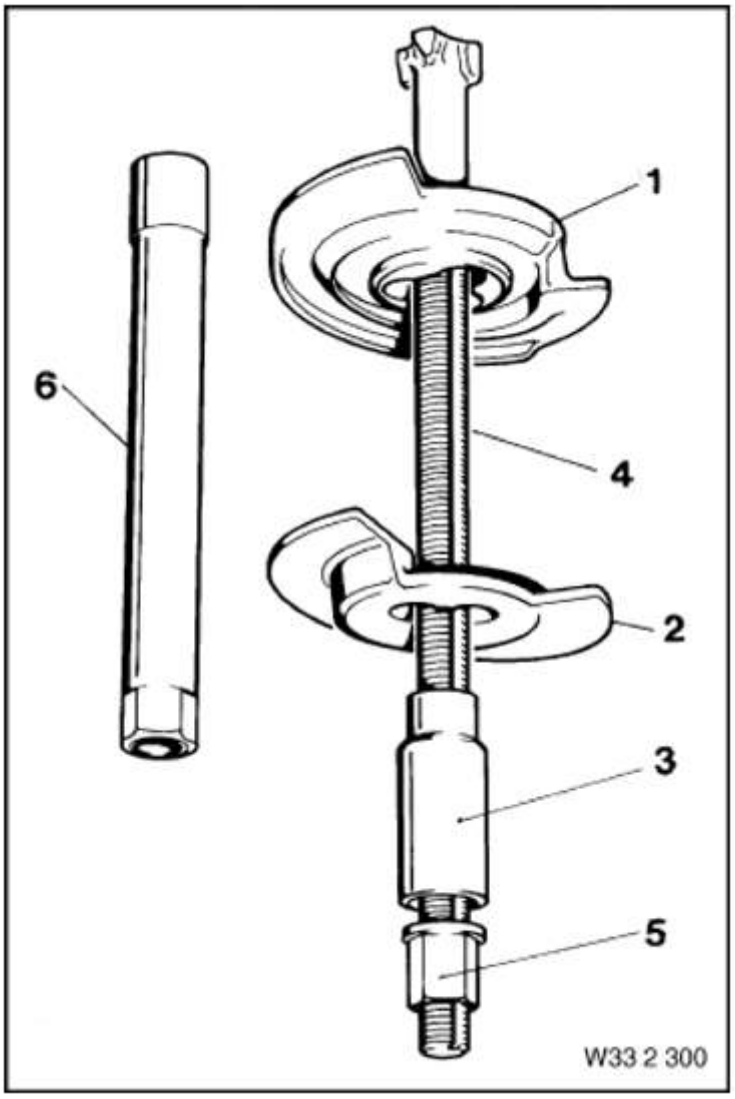


Fig. 246: Identifying Spring Cups (0492187)
Courtesy of BMW OF NORTH AMERICA, INC.

0495807 SPRING CUPS

0495807 335102 Spring cups Minimum set: Mechanical tools AM

NOTE: Discontinued, can only be ordered using complete tool

SI number

01 01 07 (333)

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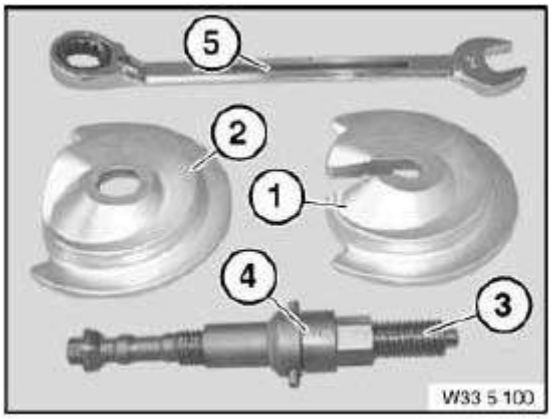


Fig. 247: Identifying Spring Cups (0495807)
Courtesy of BMW OF NORTH AMERICA, INC.

0492188 SPRING CUPS

0492188 332302 Spring cups AM

NOTE: (spring cup, bottom)

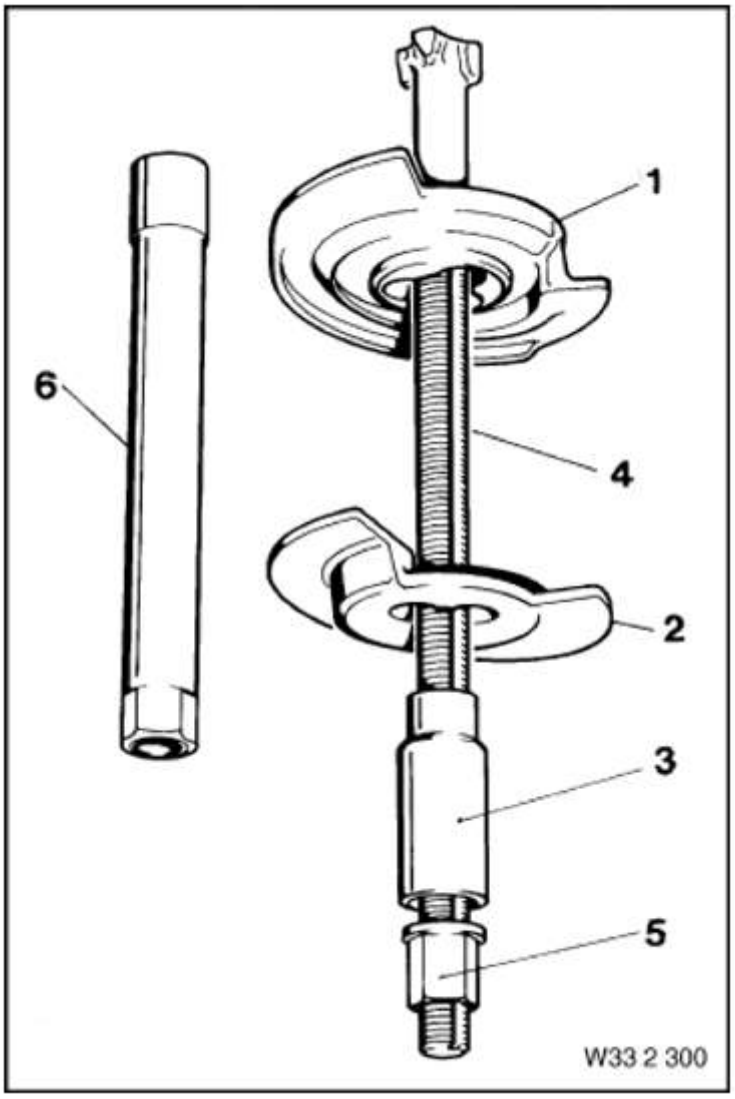


Fig. 248: Identifying Spring Cups (0492188)
Courtesy of BMW OF NORTH AMERICA, INC.

0495806 SPRING CUPS

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0495806 335101 Spring cups Minimum set: Mechanical tools AM

NOTE: **Discontinued, can only be ordered using complete tool**

SI number

01 01 07 (333)

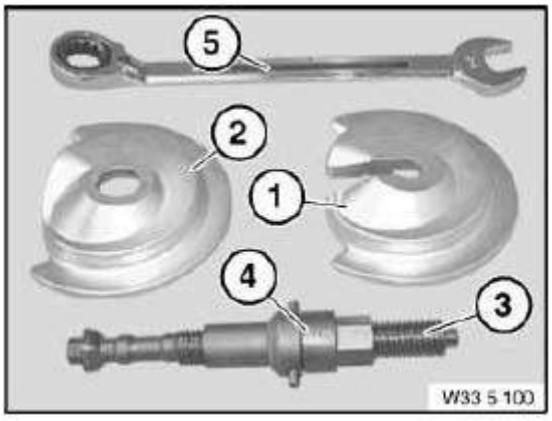


Fig. 249: Identifying Spring Cups (0495806)
Courtesy of BMW OF NORTH AMERICA, INC.

0492186 SPRING TENSIONER

0492186 332300 Spring tensioner AM

NOTE: **For tensioning coil springs when removing and installing coil springs and/or shock absorbers**

SI number

01 05 90 (207)

Consisting of:

1. **0492187** Spring cups

   NOTE: **(spring cup, top)**

2. **0492188** Spring cups

   NOTE: **(spring cup, bottom)**

3. **0492189** Synchronising key

   NOTE: **(synchronising key, complete)**

4. **0492190** Spindle
5. **0492191** Nut
6. **0492192** Socket wrench

   NOTE: **(Socket wrench)**

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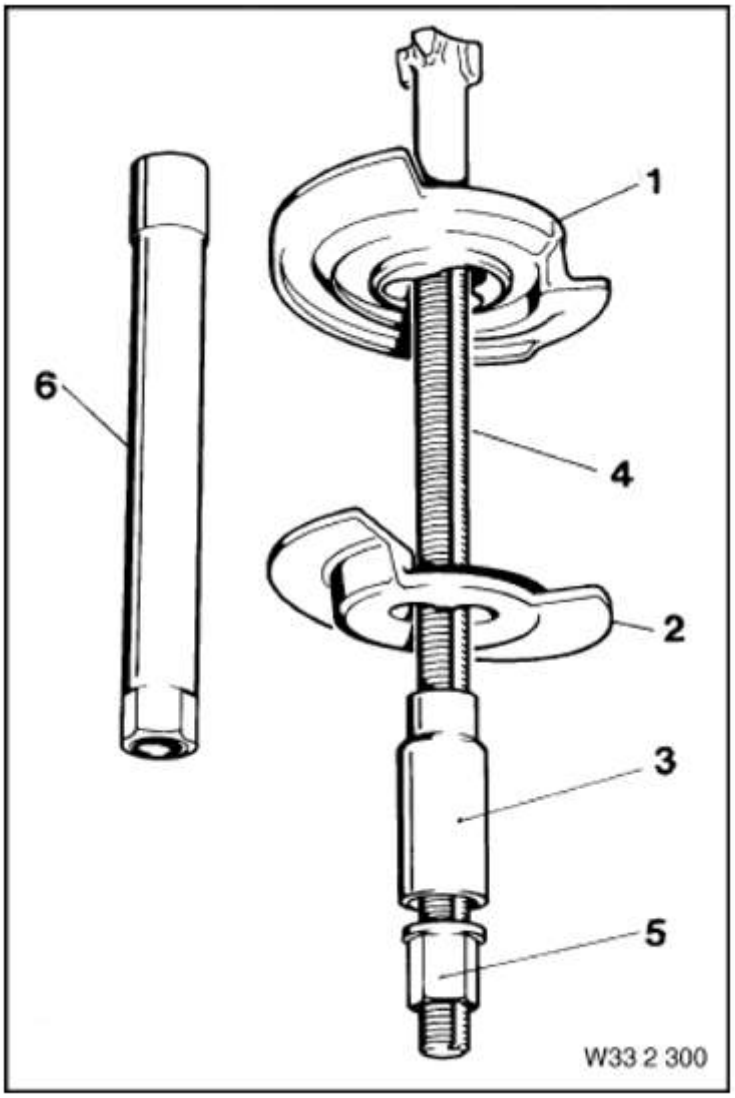


Fig. 250: Identifying Spring Tensioner (0492186)
Courtesy of BMW OF NORTH AMERICA, INC.

0495682 SPRING TENSIONER

0495682 335100 Spring tensioner Minimum set: Mechanical tools AM

NOTE: **For tensioning or removing and installing barrel spring on rear axle.**

SI number

01 01 07 (333)

Consisting of:

1. 0495806 Spring cups

NOTE: **Discontinued, can only be ordered using complete tool**

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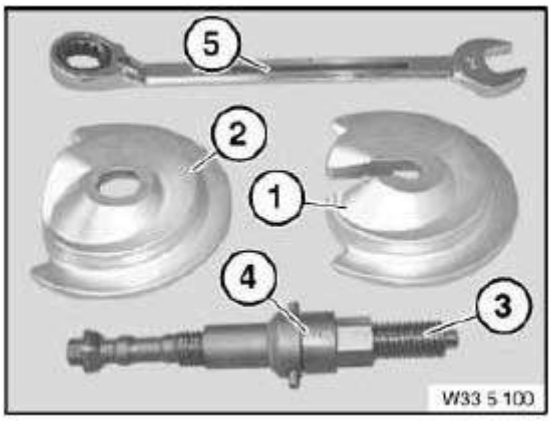


Fig. 251: Identifying Spring Tensioner (0495682)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0495807 Spring cups

NOTE: Discontinued, can only be ordered using complete tool

3. 0495811 Spindle

NOTE: Discontinued, can only be ordered using complete tool

4. 0495812 Nut

NOTE: (Nut with thrust piece) discontinued, can only be ordered using complete tool

5. 0495813 Ring spanner

NOTE: (Reversible ratchet ring spanner SW24) discontinued, available as part of set of special tools only

6. 0495816 Case

NOTE: (Case) Case with insert discontinued, can only be ordered using complete tool

0492104 SYNCHRONISING KEY

0492104 331308 Synchronising key AM

Storage Location

Y4

cardiagn.com

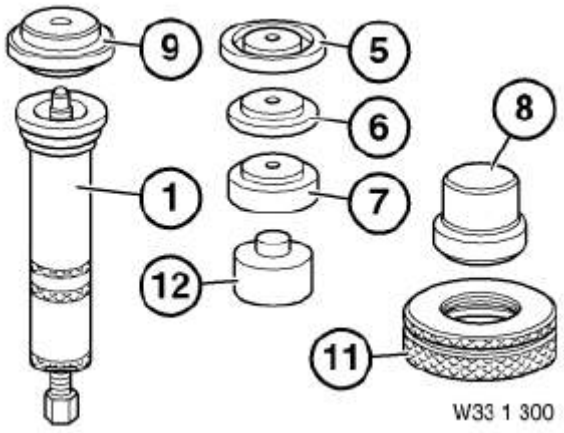


Fig. 252: Identifying Synchronising Key (0492104)
Courtesy of BMW OF NORTH AMERICA, INC.

0492213 SYNCHRONISING KEY

0492213 333072 Synchronising key AM

NOTE: For ball bearing, inner

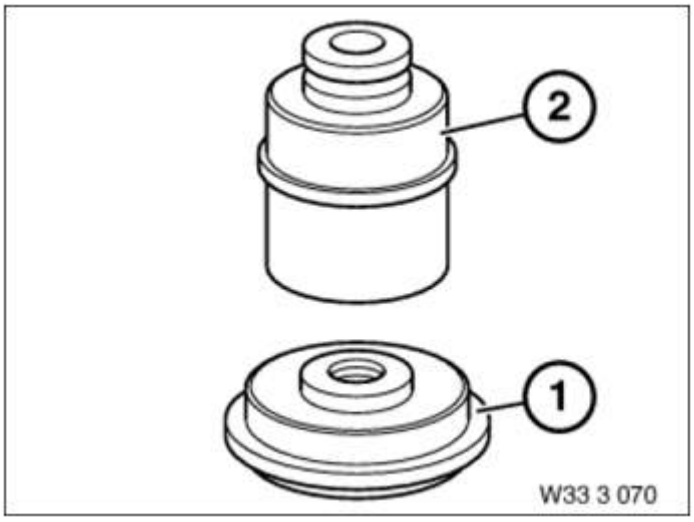


Fig. 253: Identifying Synchronising Key (0492213)
Courtesy of BMW OF NORTH AMERICA, INC.

0492182 SYNCHRONISING KEY

0492182 332123 Synchronising key AM

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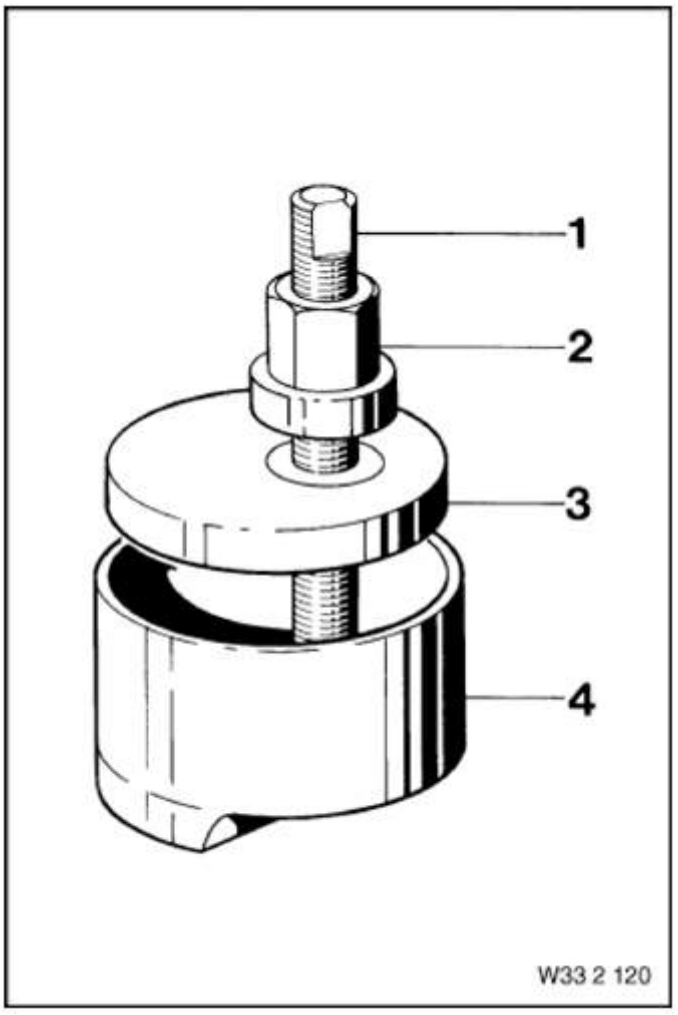


Fig. 254: Identifying Synchronising Key (0492182)
Courtesy of BMW OF NORTH AMERICA, INC.

0495417 SYNCHRONISING KEY

0495417 332191 Synchronising key AM

NOTE: **(Thrust piece (for removing)) Deletion, only available via tool set**

Storage Location

C53

SI number

01 18 05 (214)

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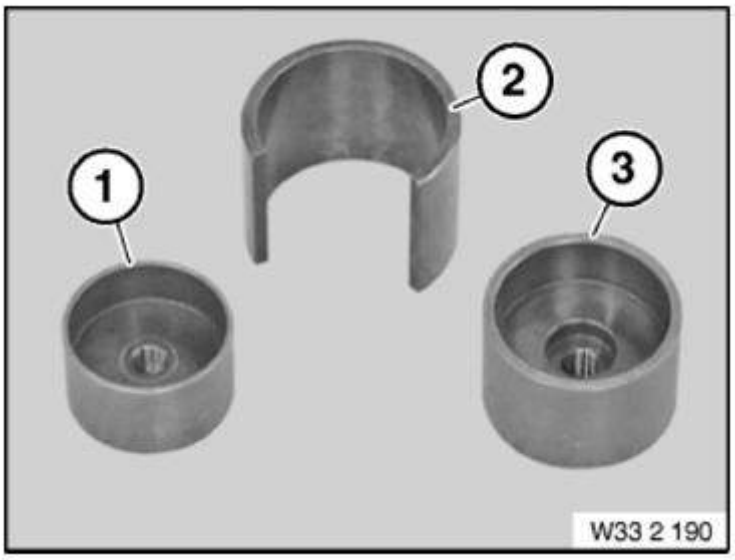


Fig. 255: Identifying Synchronising Key (0495417)
Courtesy of BMW OF NORTH AMERICA, INC.

0492254 SYNCHRONISING KEY

0492254 333182 Synchronising key AM

NOTE: **For pressing the rubber mount out of the rear axle final drive mounting Series: E31**

Storage Location

C14

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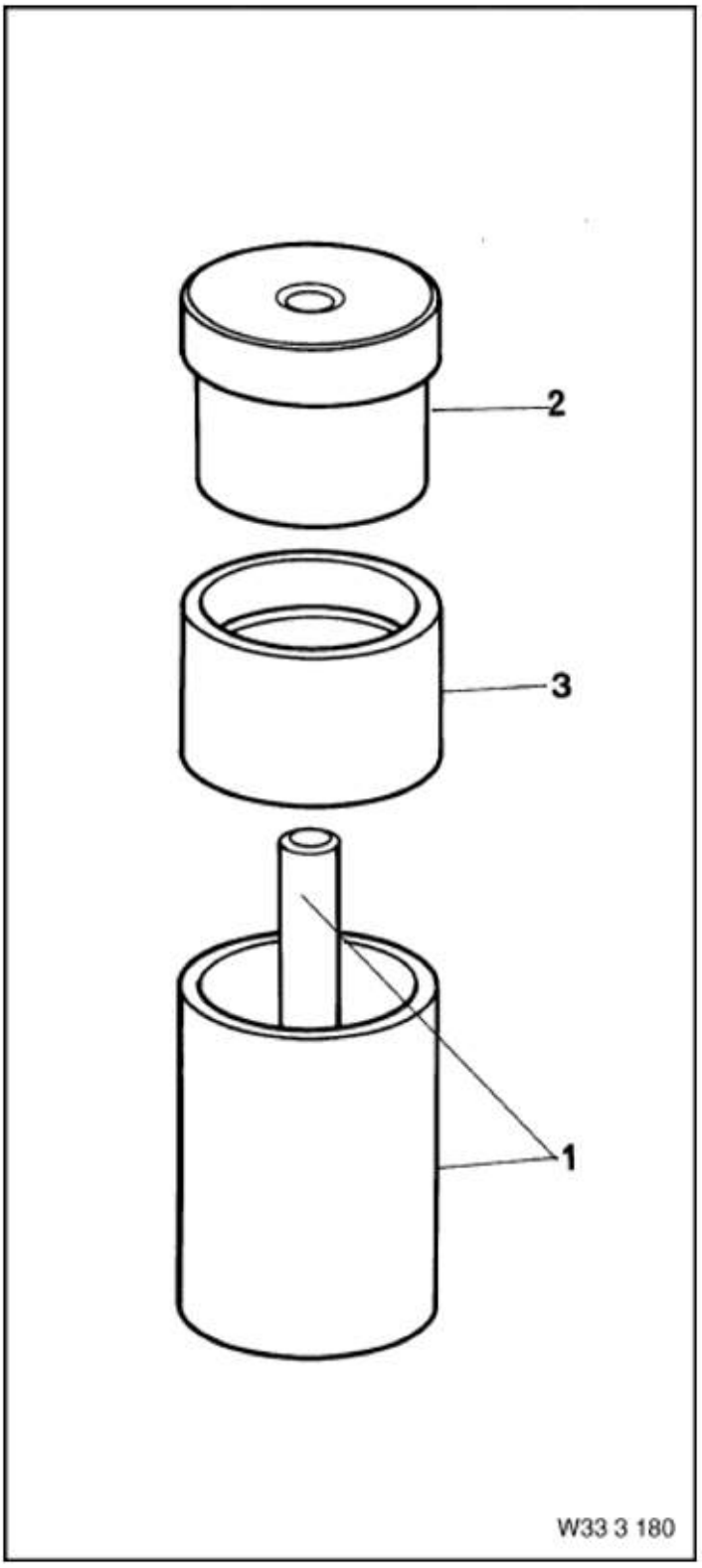


Fig. 256: Identifying Synchronising Key (0492254)
Courtesy of BMW OF NORTH AMERICA, INC.

0492201 SYNCHRONISING KEY

0492201 333030 Synchronising key AM

NOTE: (thrust piece and pipe) For extracting and press-fitting the rotation slide bearing and rubber mount in the 13Â° trailing arm

Storage Location

X10

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Consisting of:

1. 0493856 Synchronising key

NOTE: **For removing and installing the rotary slide mount in the 13Â° trailing arm/Series: E34, E32/Model: M5, 750i**

2. 0493857 Ring

NOTE: **(pipe) For extracting and press-fitting the rubber mount in the 13Â° trailing arm**

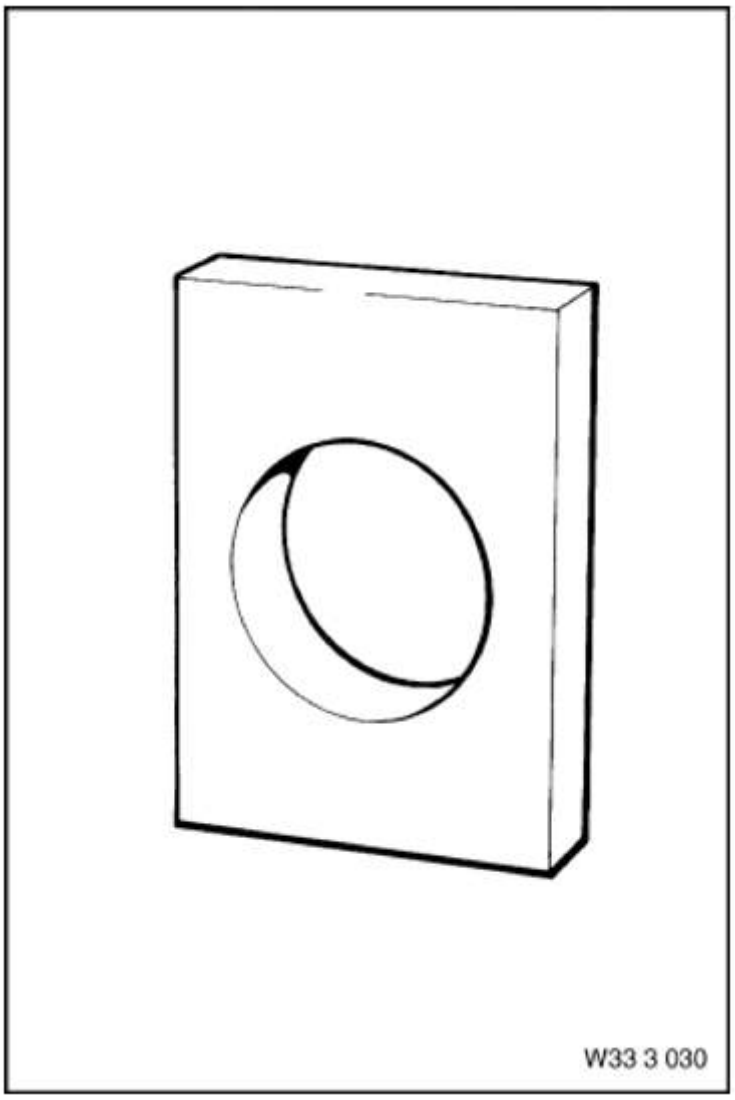


Fig. 257: Identifying Synchronising Key (0492201)
Courtesy of BMW OF NORTH AMERICA, INC.

0492266 SYNCHRONISING KEY

0492266 333212 Synchronising key AM

NOTE: **For pressing the ball joint out of the engine support arm or wheel carrier**

Storage Location

X5

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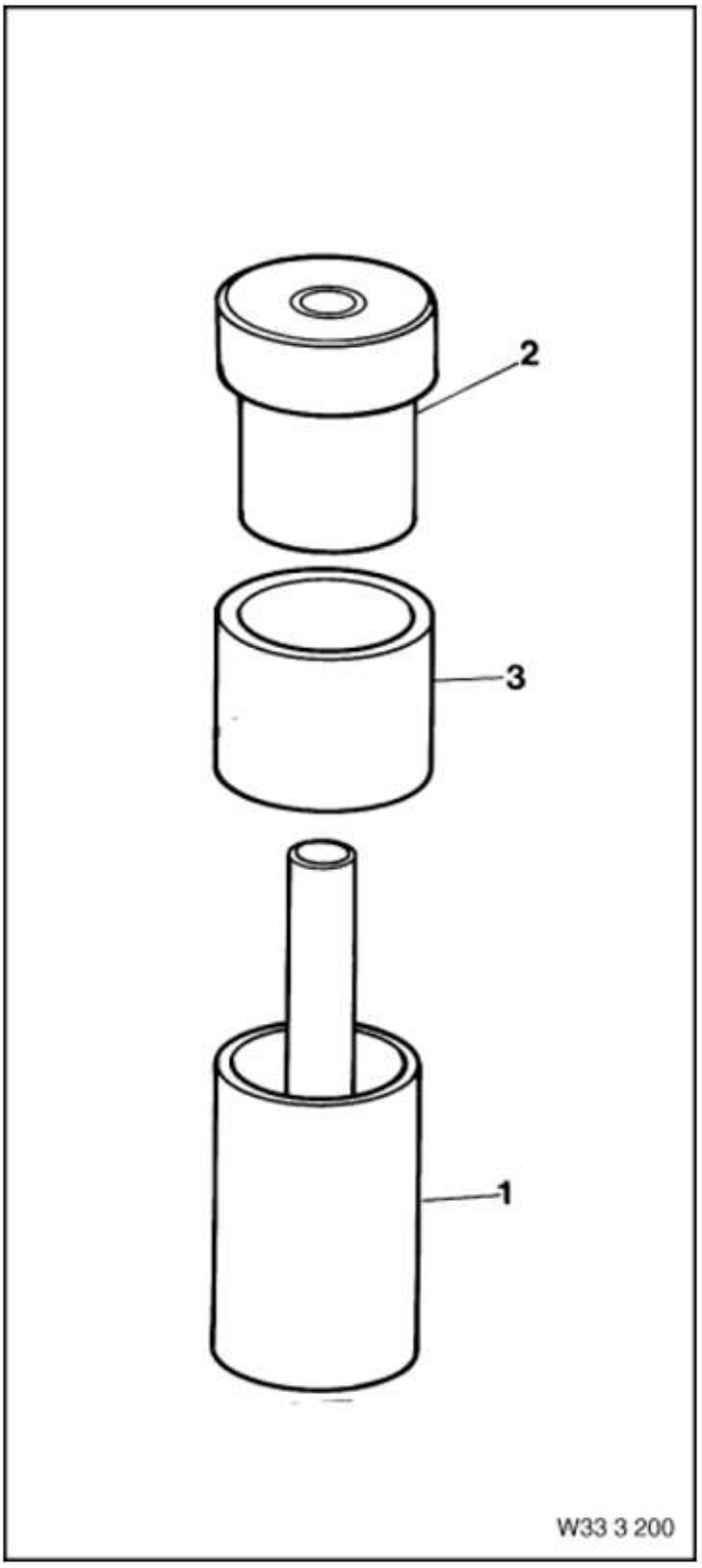


Fig. 258: Identifying Synchronising Key (0492266)
Courtesy of BMW OF NORTH AMERICA, INC.

0492406 SYNCHRONISING KEY

0492406 334149 Synchronising key Minimum set: Mechanical tools AM

NOTE: **(Synchronising key (2 x)) With countersunk screw - model series: E39/2, E65, E67, E87**

SI number

01 15 04 (117)

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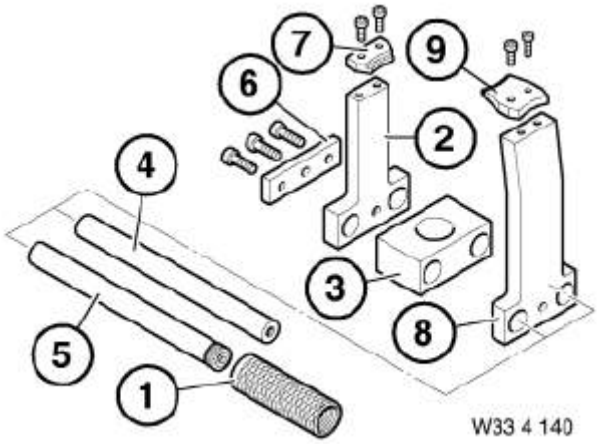


Fig. 259: Identifying Synchronising Key (0492406)
Courtesy of BMW OF NORTH AMERICA, INC.

0496539 SYNCHRONISING KEY

0496539 334409 Synchronising key AM

NOTE: **Series: F01, F02. Remaining inventories will be sold off and then it will no longer be available separately, only available as part of complete tool set 0493416 = 33 4 400.**

0492209 SYNCHRONISING KEY

0492209 333056 Synchronising key AM

NOTE: **Series: E28, E30 Model: 316 - 323i discontinued, available as part of set of special tools only**

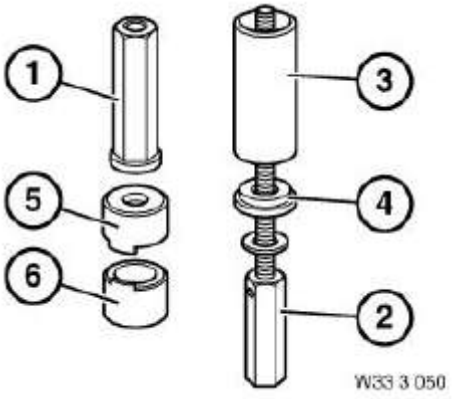


Fig. 260: Identifying Synchronising Key (0492209)
Courtesy of BMW OF NORTH AMERICA, INC.

0492250 SYNCHRONISING KEY

0492250 333172 Synchronising key AM

NOTE: **For pressing out the front rubber mount**

Storage Location

X5

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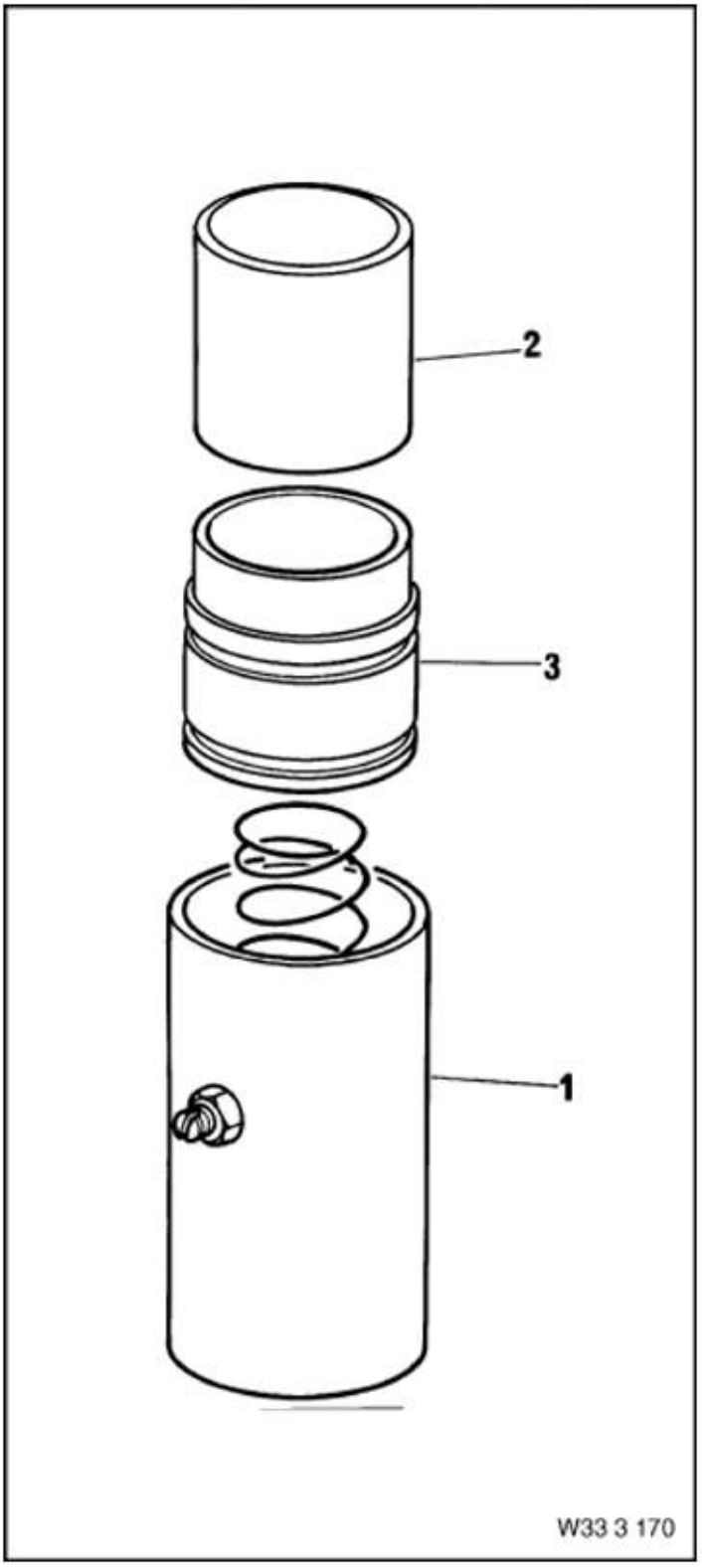


Fig. 261: Identifying Synchronising Key (0492250)
Courtesy of BMW OF NORTH AMERICA, INC.

0493856 SYNCHRONISING KEY

0493856 333031 Synchronising key AM

NOTE: **For removing and installing the rotary slide mount in the 13Â° trailing arm/Series: E34, E32/Model: M5, 750i**

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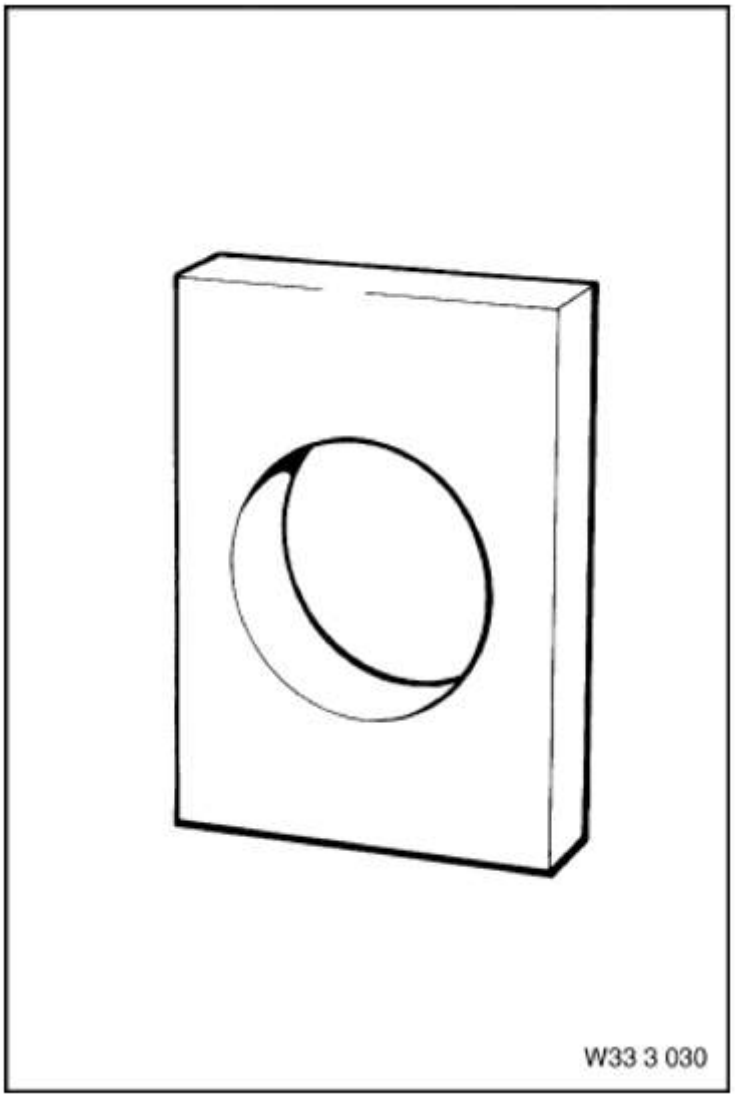


Fig. 262: Identifying Synchronising Key (0493856)
Courtesy of BMW OF NORTH AMERICA, INC.

0494046 SYNCHRONISING KEY

0494046 334210 Synchronising key Mechanical tool

NOTE: **For removing rubber mount in rear axle support (E46/5)**

SI number

01 12 01 (743)

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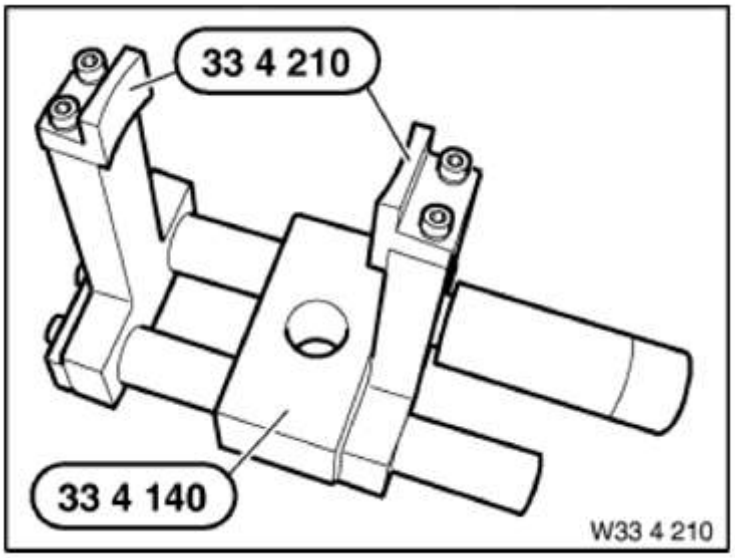


Fig. 263: Identifying Synchronising Key (0494046)
Courtesy of BMW OF NORTH AMERICA, INC.

0492281 SYNCHRONISING KEY

0492281 333245 Synchronising key AM

Replaced by: 83300493416

NOTE: **(Synchronising key) Model series: E38, E39 Discontinuation and replaced by 33 4 400. (0 493 416)**

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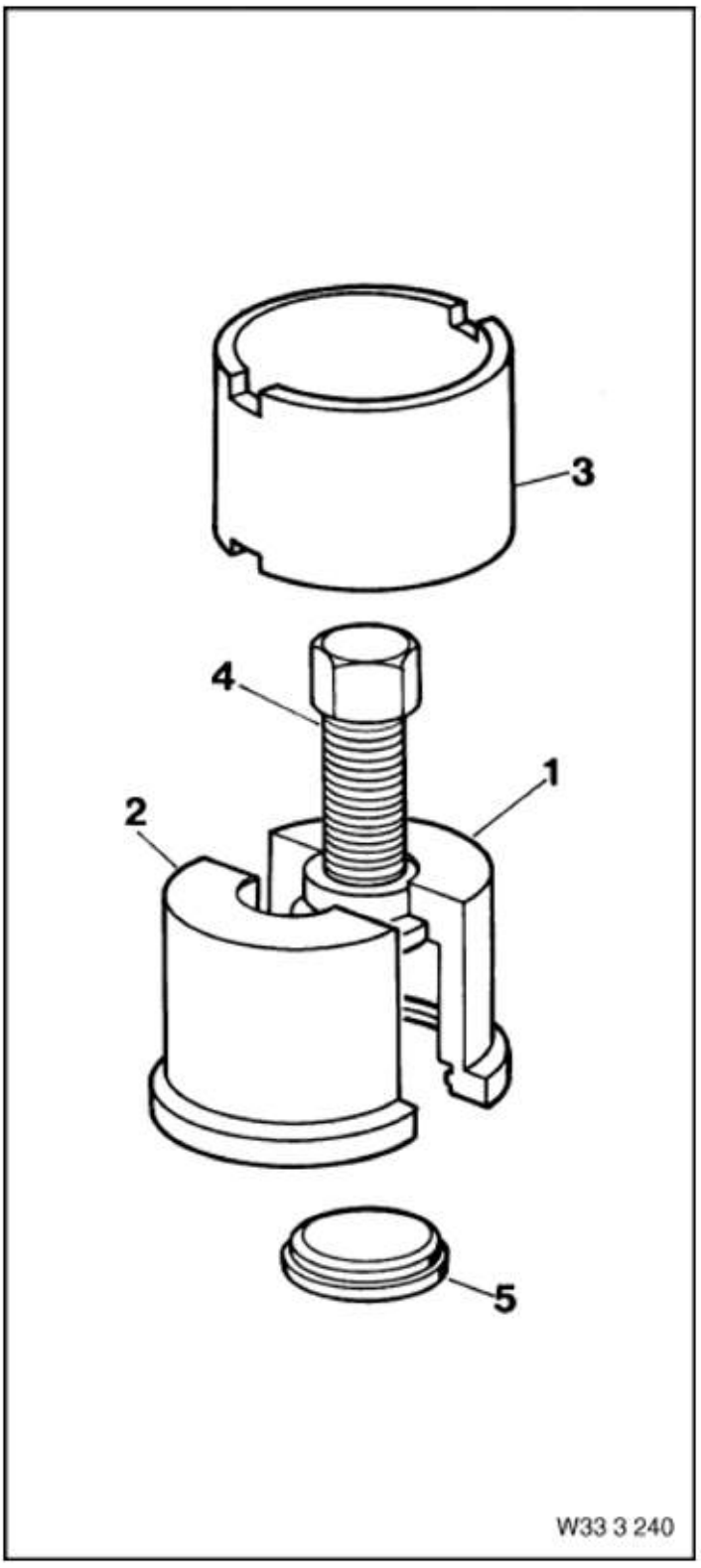


Fig. 264: Identifying Synchronising Key (0492281)
Courtesy of BMW OF NORTH AMERICA, INC.

0492102 SYNCHRONISING KEY

0492102 331306 Synchronising key AM

Storage Location

Y4

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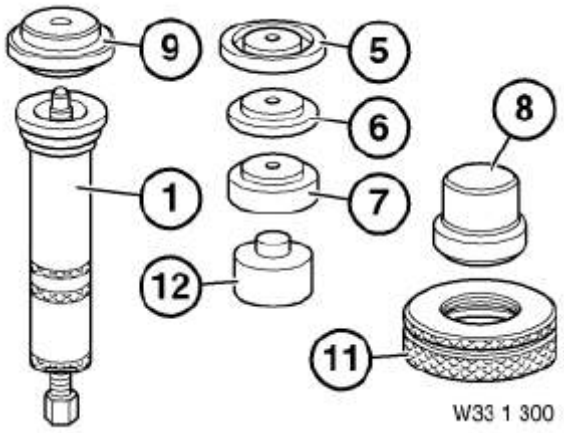


Fig. 265: Identifying Synchronising Key (0492102)
Courtesy of BMW OF NORTH AMERICA, INC.

0492207 SYNCHRONISING KEY

0492207 333054 Synchronising key AM

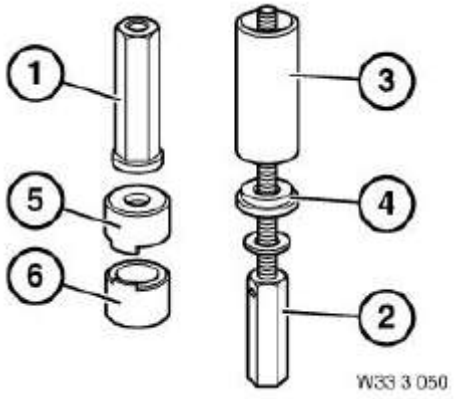


Fig. 266: Identifying Synchronising Key (0492207)
Courtesy of BMW OF NORTH AMERICA, INC.

0492258 SYNCHRONISING KEY

0492258 333192 Synchronising key AM

NOTE: **For pressing out the rubber mount from the wishbone**

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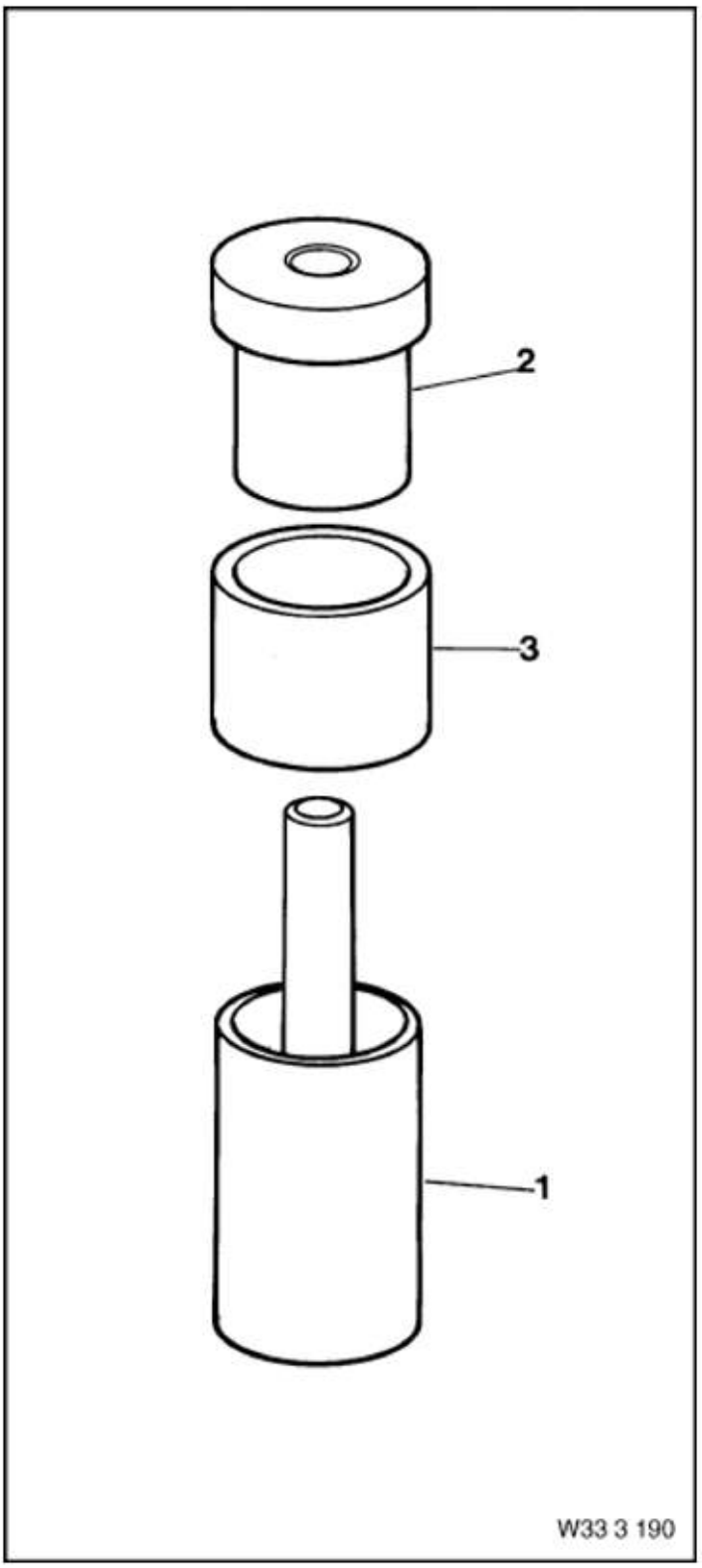


Fig. 267: Identifying Synchronising Key (0492258)
Courtesy of BMW OF NORTH AMERICA, INC.

0492189 SYNCHRONISING KEY

0492189 332303 Synchronising key AM

NOTE: (synchronising key, complete)

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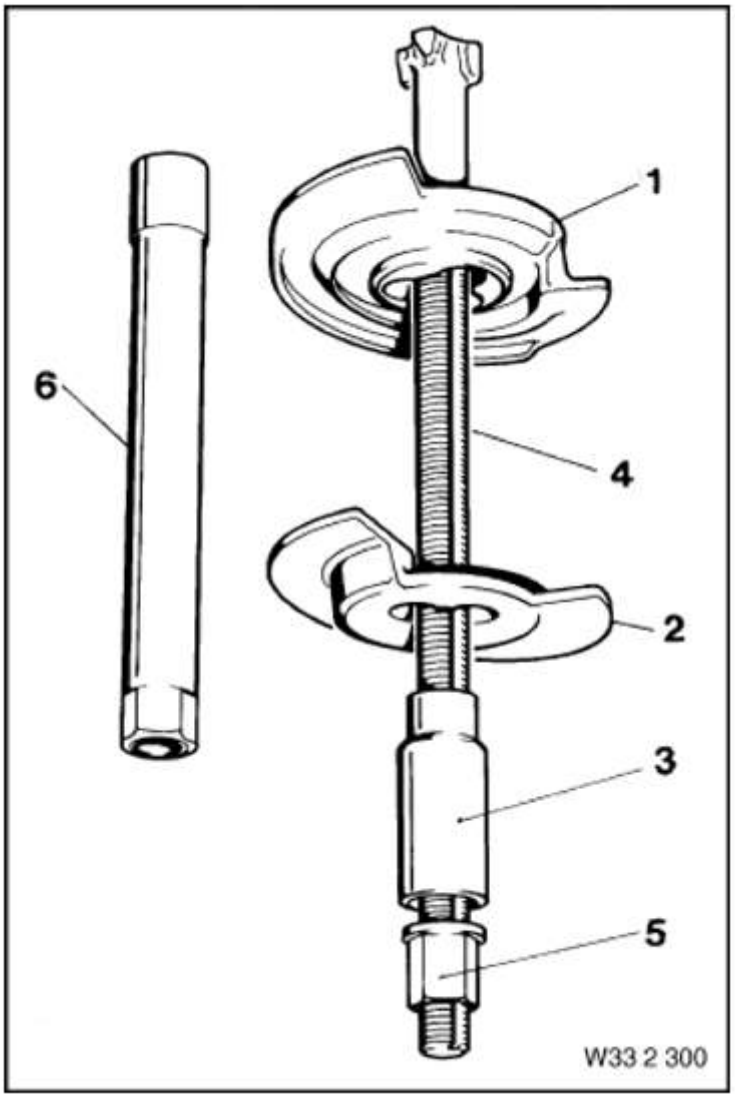


Fig. 268: Identifying Synchronising Key (0492189)
Courtesy of BMW OF NORTH AMERICA, INC.

0492404 SYNCHRONISING KEY

0492404 334147 Synchronising key Minimum set: Mechanical tools AM

NOTE: **(Synchronising key (2 x)) With screws - model series: E38, E39, E46 Deletion, only available via tool set**

Storage Location

B8

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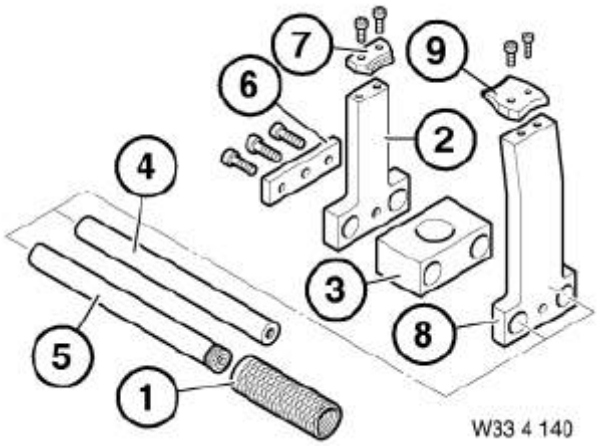


Fig. 269: Identifying Synchronising Key (0492404)
Courtesy of BMW OF NORTH AMERICA, INC.

0495419 SYNCHRONISING KEY

0495419 332193 Synchronising key AM

NOTE: **(Thrust piece (for installing)) Deletion, only available via tool set**

Storage Location

C53

SI number

01 18 05 (214)

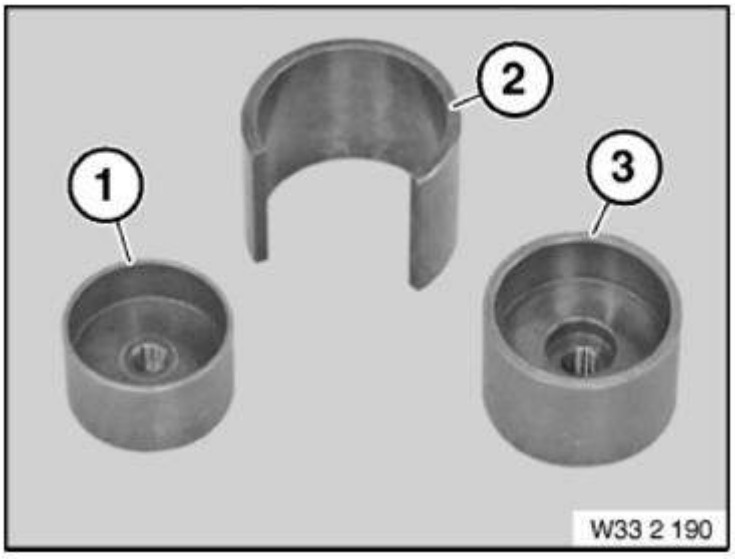


Fig. 270: Identifying Synchronising Key (0495419)
Courtesy of BMW OF NORTH AMERICA, INC.

0492240 SYNCHRONISING KEY

0492240 333152 Synchronising key AM

NOTE: **For pressing the rubber mount out of the leading link**

Storage Location

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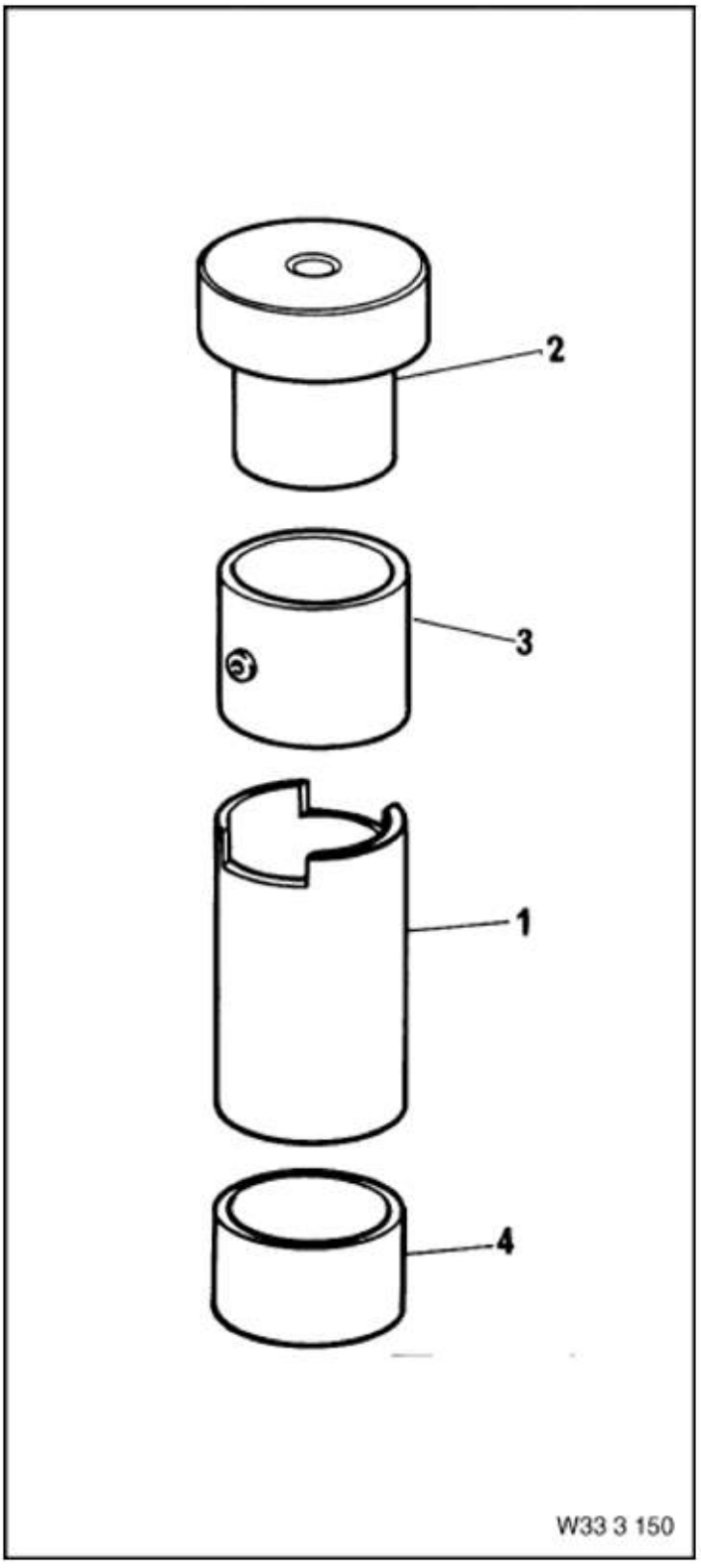


Fig. 271: Identifying Synchronising Key (0492240)
Courtesy of BMW OF NORTH AMERICA, INC.

0492208 SYNCHRONISING KEY

0492208 333055 Synchronising key AM

NOTE: **(Synchronising key) Model series: E28, E30 Model: 518 - 735i discontinued, available as part of set of special tools only**

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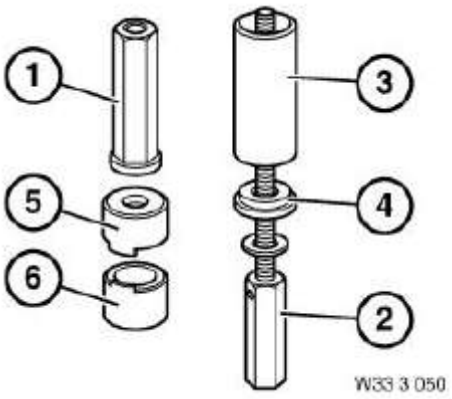


Fig. 272: Identifying Synchronising Key (0492208)
Courtesy of BMW OF NORTH AMERICA, INC.

0492103 SYNCHRONISING KEY

0492103 331307 Synchronising key AM

NOTE: Not available individually. Only via complete tool set

Storage Location

Y4

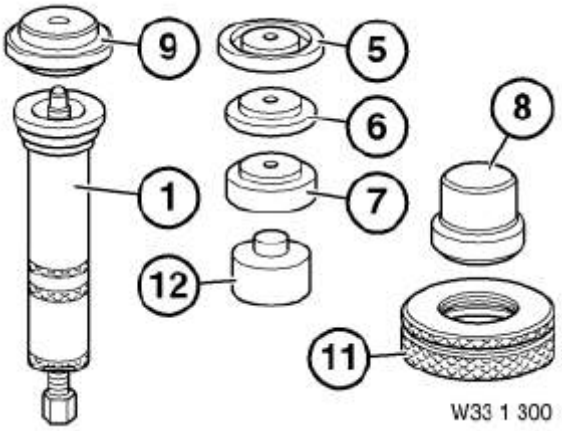


Fig. 273: Identifying Synchronising Key (0492103)
Courtesy of BMW OF NORTH AMERICA, INC.

0492108 SYNCHRONISING KEY

0492108 331312 Synchronising key AM

NOTE: For pulling the bearing inner race off the drive flange - Series: E36/5 Discontinued, only available via complete tool

Storage Location

Y4

SI number

01 01 94 (766)

0492212 SYNCHRONISING KEY

0492212 333071 Synchronising key AM

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NOTE: For ball bearing, outer

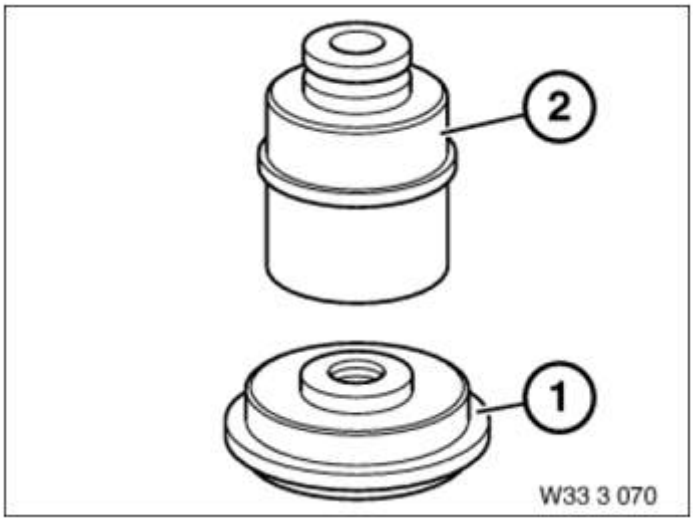


Fig. 274: Identifying Synchronising Key (0492212)
Courtesy of BMW OF NORTH AMERICA, INC.

0492101 SYNCHRONISING KEY

0492101 331305 Synchronising key AM

NOTE: (Thrust piece (old)) Discontinued, only available via complete tool

Storage Location

Y4

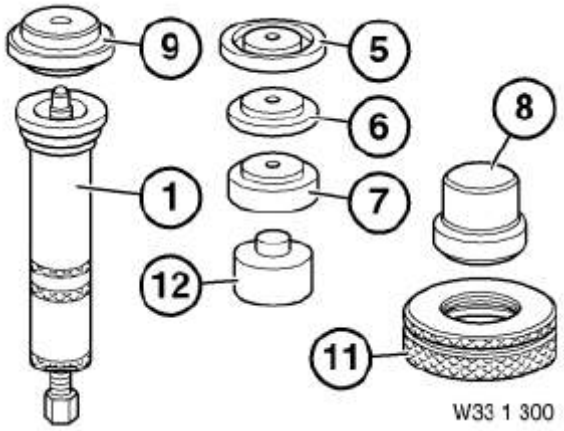


Fig. 275: Identifying Synchronising Key (0492101)
Courtesy of BMW OF NORTH AMERICA, INC.

0492202 SYNCHRONISING KEY

0492202 333040 Synchronising key Mechanical tool

NOTE: For removing and installing the rubber mounts in the 13Â° trailing arm

Storage Location

X10

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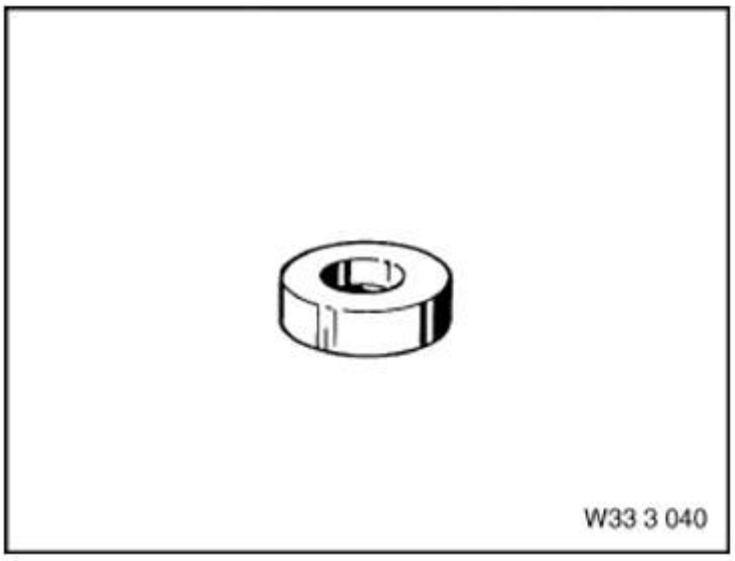


Fig. 276: Identifying Synchronising Key (0492202)
Courtesy of BMW OF NORTH AMERICA, INC.

0492105 SYNCHRONISING KEY

0492105 331309 Synchronising key AM

NOTE: **For rear axle differential and for installing the camshaft sprocket on the crankshaft (M70) Discontinued, only available via complete tool**

Storage Location

Y4

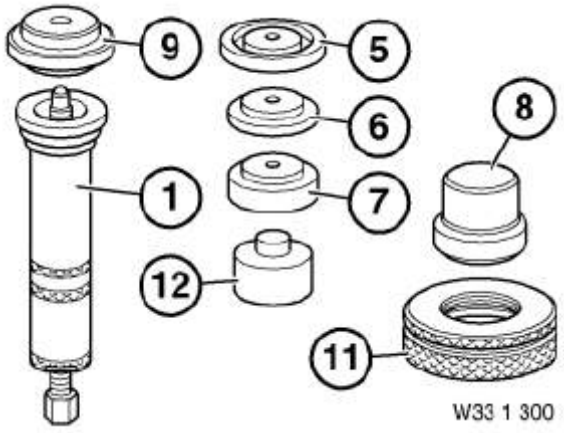


Fig. 277: Identifying Synchronising Key (0492105)
Courtesy of BMW OF NORTH AMERICA, INC.

0492214 TENSIONING STRAP

0492214 333080 Tensioning strap Mechanical tool

NOTE: **For removing and installing the pressure accumulator for the hydraulic unit of the rear axle differential lock**

Storage Location

X10

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Y10

SI number

01 07 92 (516)

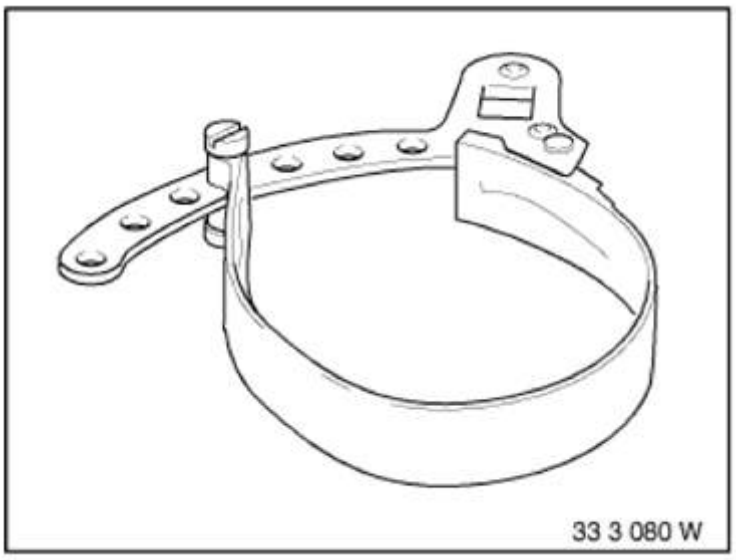


Fig. 278: Identifying Tensioning Strap (0492214)
Courtesy of BMW OF NORTH AMERICA, INC.

0492264 TOOL

0492264 333210 Tool AM

NOTE: **(Set of pressing-in/pressing-out tools) Form pressing in and pressing out the ball joint position in the supporting arm and wheel carrier**

Storage Location

X5

SI number

01 05 90 (207)

Consisting of:

1 = 0492265 Bush

NOTE: **For accommodating the engine support arm or wheel carrier when pressing out the ball joint**

2 = 0492266 Synchronising key

NOTE: **For pressing the ball joint out of the engine support arm or wheel carrier**

3 = 0492267 Holding sleeve

NOTE: **(Spacer sleeve) For pressing the ball joint into the support arm**

3 = 0492268 Holding sleeve

NOTE: **(Spacer sleeve) For pressing the ball joint into the wheel carrier**

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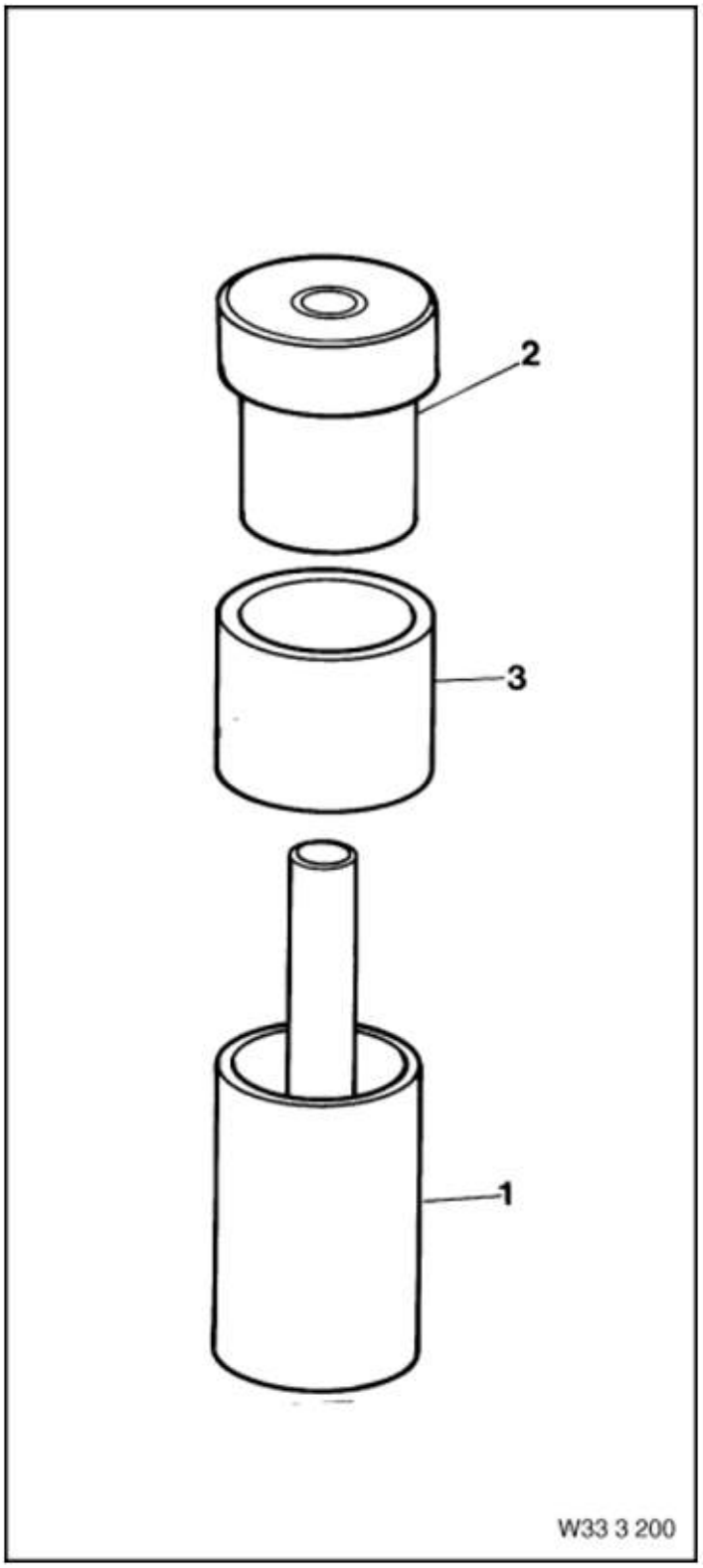


Fig. 279: Identifying Tool (0492264)
Courtesy of BMW OF NORTH AMERICA, INC.

0492373 TOOL

0492373 334090 Tool AM

Replaced by: 83300493416

NOTE: **For removing the bearing shell on the rear axle shaft. Replaced by 33 4 400. (0 493 416)**

Storage Location

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Y5

Consisting of:

1. 0492374 Shell

   NOTE: **(Bearing shell)**

2. 0492375 Shell

   NOTE: **Discontinuation and replaced by 33 4 400 (0 493 416)**

3. 0492376 Holding sleeve
4. 0492377 Spindle

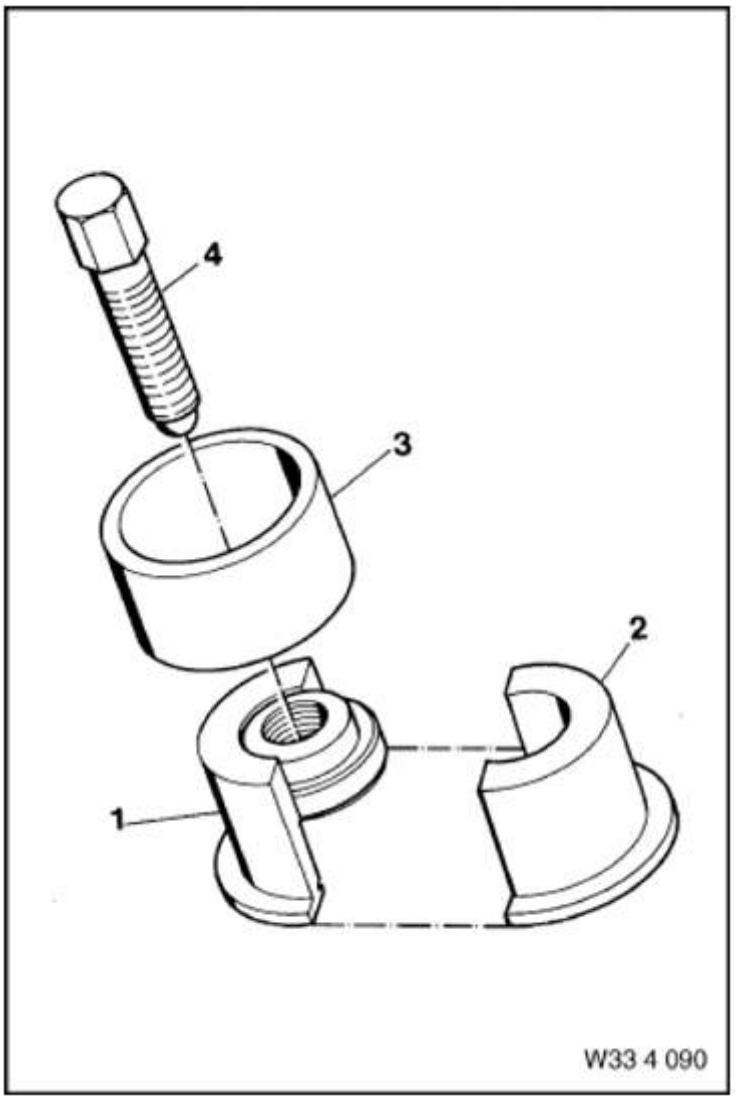


Fig. 280: Identifying Tool (0492373)
Courtesy of BMW OF NORTH AMERICA, INC.

0492223 TOOL

0492223 333110 Tool AM

NOTE: **For removing and installing rubber mount in rear axle support**

Storage Location

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A14

Consisting of:

1 = 0492224 Washer

NOTE: **(Shaped washer) For pulling out the top rubber mount Series: E30, E36**

2 = 0492225 Washer

NOTE: **(Shaped washer) For installing the bottom rubber mount Series: E30, E36**

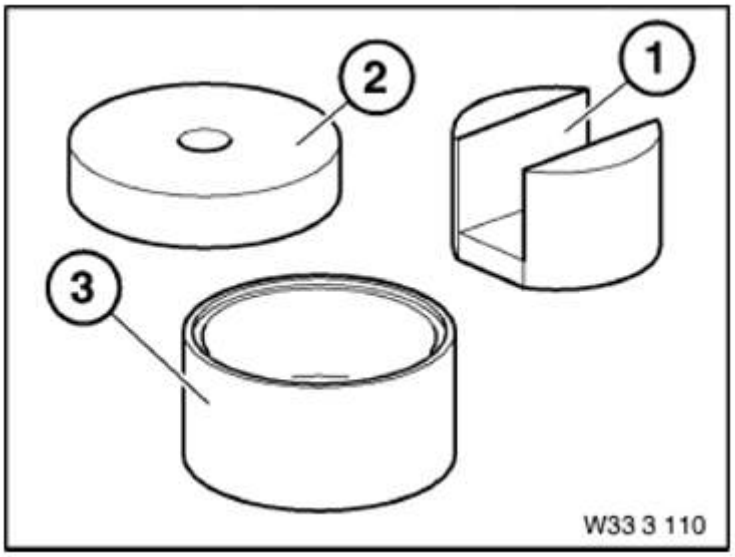


Fig. 281: Identifying Tool (0492223)
Courtesy of BMW OF NORTH AMERICA, INC.

3 = 0492226 Washer

NOTE: **(Form disc) Replaced by 33 3 115. (0 492 227)**

5 = 0492227 Washer

NOTE: **(Shaped washer) For gripping when installing**

4 = 0493562 Nut

NOTE: **Series: E30, E36**

0492092 TOOL

0492092 331250 Tool Mechanical tool

NOTE: **For pulling off drive flanges**

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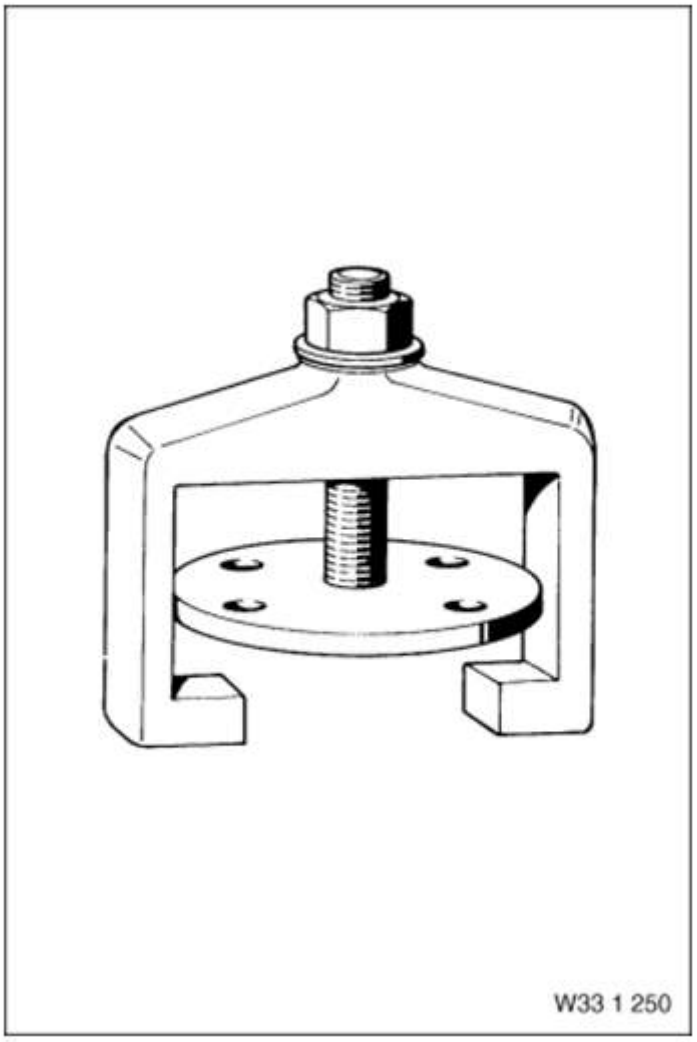


Fig. 282: Identifying Tool (0492092)
Courtesy of BMW OF NORTH AMERICA, INC.

0492238 TOOL

0492238 333150 Tool AM

NOTE: **(extraction/press-fit tool set) For extracting and press-fitting the rubber mounts into the leading link**

Storage Location

Z8

SI number

01 05 90 (207)

Consisting of:

1. 0492239 Bush

   NOTE: **For accommodating the leading link when pressing out**

2. 0492240 Synchronising key

   NOTE: **For pressing the rubber mount out of the leading link**

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3. 0492241 Holding sleeve

NOTE: **(spacer sleeve) For press-fitting the rubber mount into the leading link**

4. 0492242 Holding sleeve

NOTE: **(spacer sleeve) For press-fitting the ball joint in the wheel carrier**

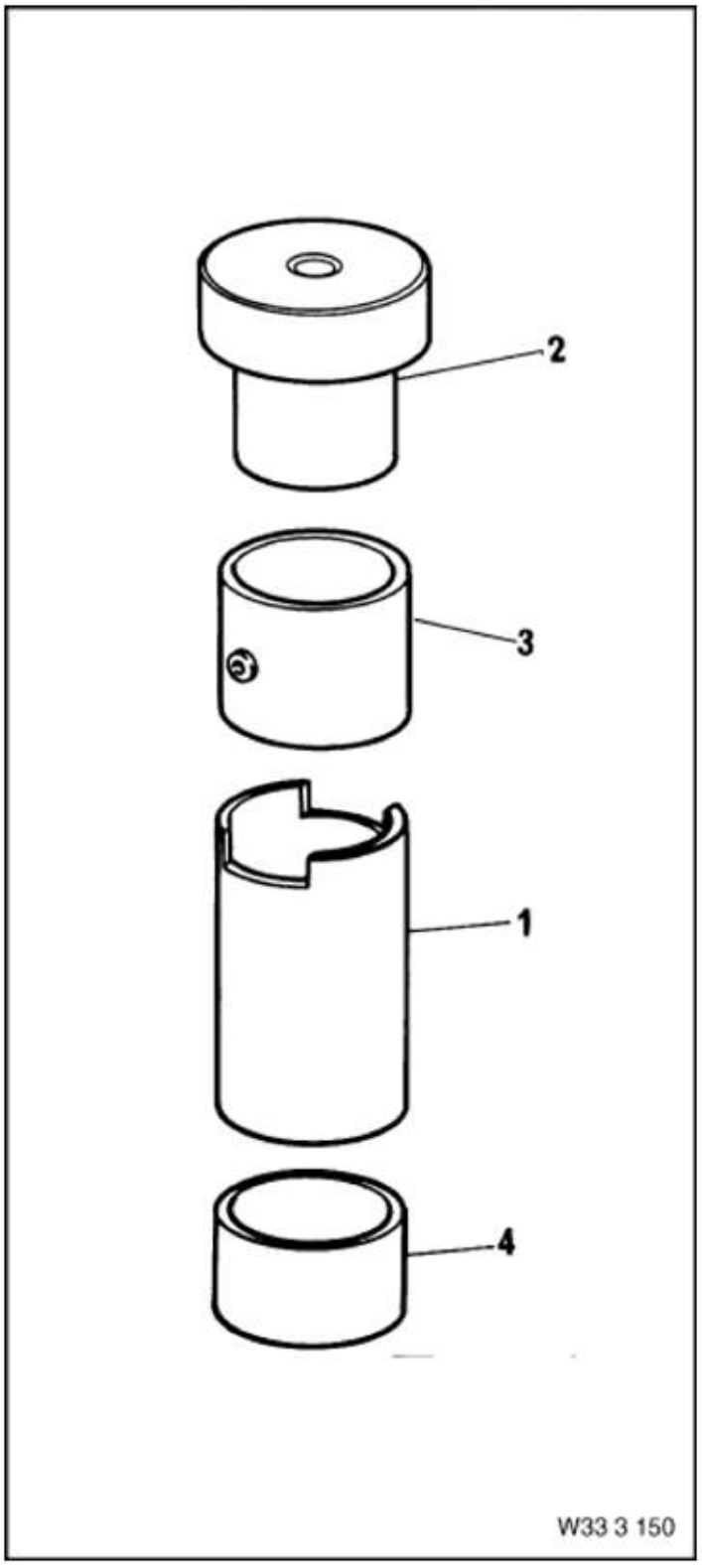


Fig. 283: Identifying Tool (0492238)
Courtesy of BMW OF NORTH AMERICA, INC.

0492211 TOOL

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0492211 333070 Tool AM

NOTE: To pull in the wheel bearings and radial seals on the rear axle - model year: up to 82 (E23, E24)

Consisting of:

1. 0492212 Synchronising key

   NOTE: For ball bearing, outer

2. 0492213 Synchronising key

   NOTE: For ball bearing, inner

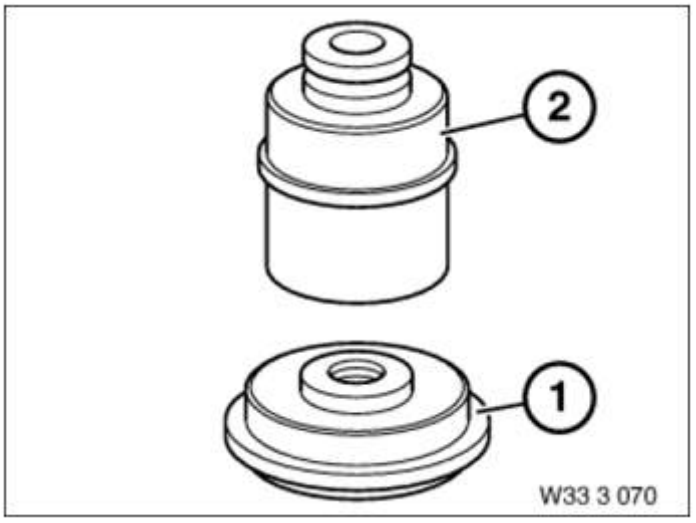


Fig. 284: Identifying Tool (0492211)
Courtesy of BMW OF NORTH AMERICA, INC.

0494929 TOOL

0494929 334460 Tool Minimum set: Mechanical tools AM

NOTE: For removing and installing 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)

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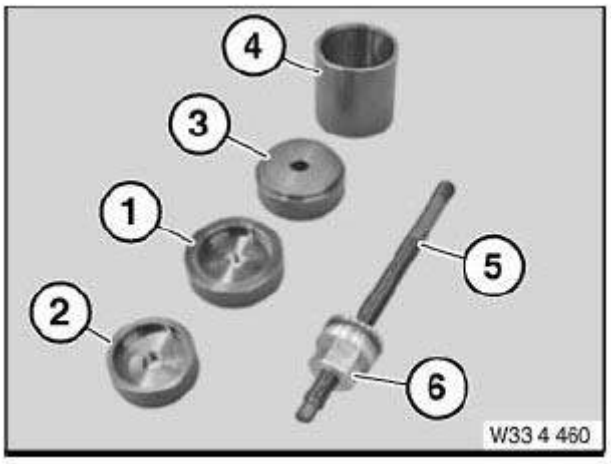


Fig. 285: Identifying Tool (0494929)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0494978 Washer

   NOTE: **(pull-out disc)**

3. 0494979 Holder

   NOTE: **(Countersupport) 0496208 =119850**

4. 0494980 Holding sleeve

   NOTE: **(support sleeve)**

5. 0494981 Spindle

   NOTE: **(spindle 205 mm, M12)**

6. 0494982 Nut

   NOTE: **(Thrust nut)**

0492256 TOOL

0492256 333190 Tool AM

NOTE: **(Extraction tool and press-in tool set) for extracting and pressing in the rubber mount in the wishbone/rubber mount in the wishbone not available separately as replacement part**

SI number

01 05 90 (207)

Consisting of:

1. 0492257 Bush

   NOTE: **For holding the wishbone when pressing out the rubber mount**

2. 0492258 Synchronising key

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NOTE: **For pressing out the rubber mount from the wishbone**

3. **0492259** Holding sleeve

NOTE: **(Spacer sleeve) for pressing in the rubber mount in the wishbone**

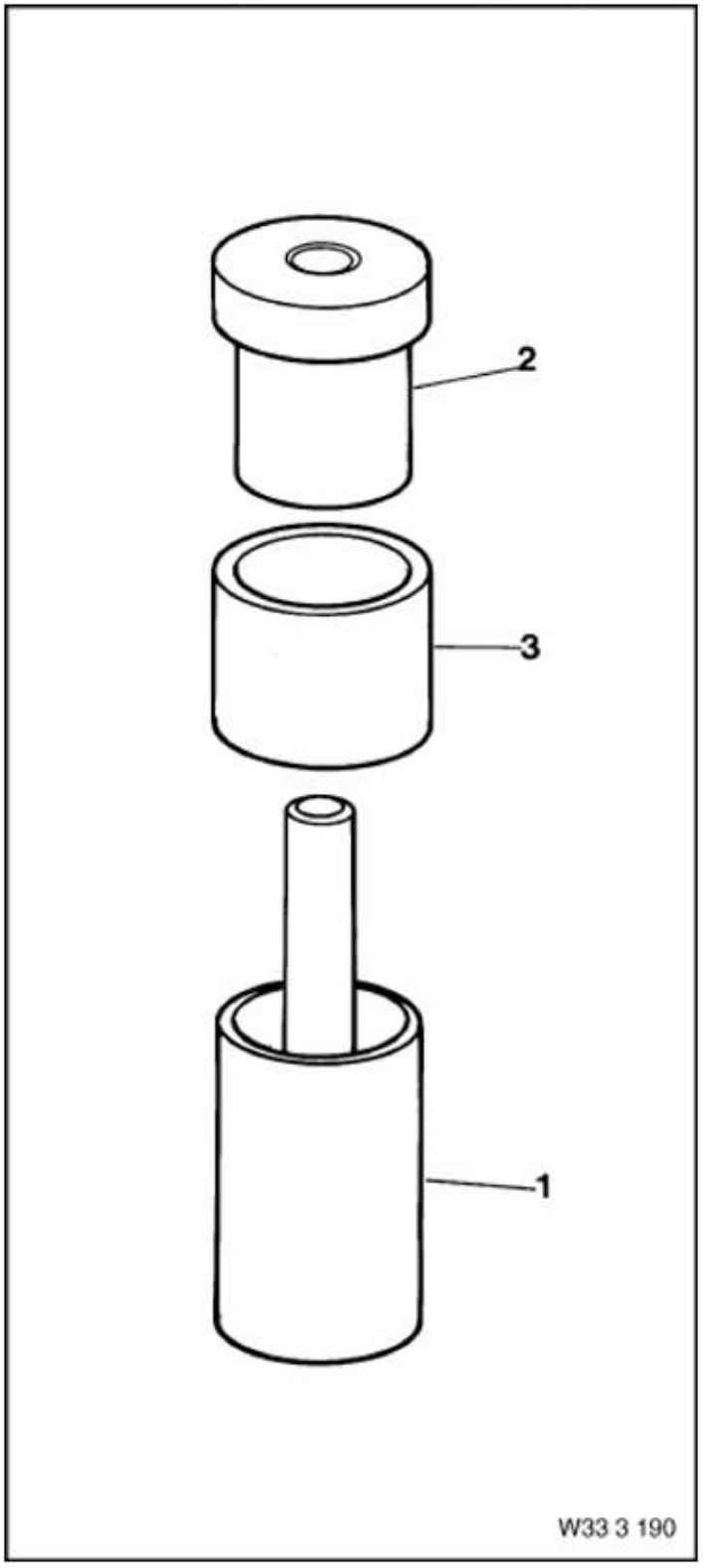


Fig. 286: Identifying Tool (0492256)
Courtesy of BMW OF NORTH AMERICA, INC.

0492248 TOOL

0492248 333170 Tool AM

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NOTE: **(Pressing-in/out tool set) for removing and installing the rubber mount on the front trailing arm**

Storage Location

X5

SI number

01 05 90 (207)

Consisting of:

1. **0492249** Bush

   NOTE: **For accommodating the trailing arm when pressing out**

2. **0492250** Synchronising key

   NOTE: **For pressing out the front rubber mount**

3. **0492251** Holding sleeve

   NOTE: **(Guide sleeve) to press in the front rubber mount**

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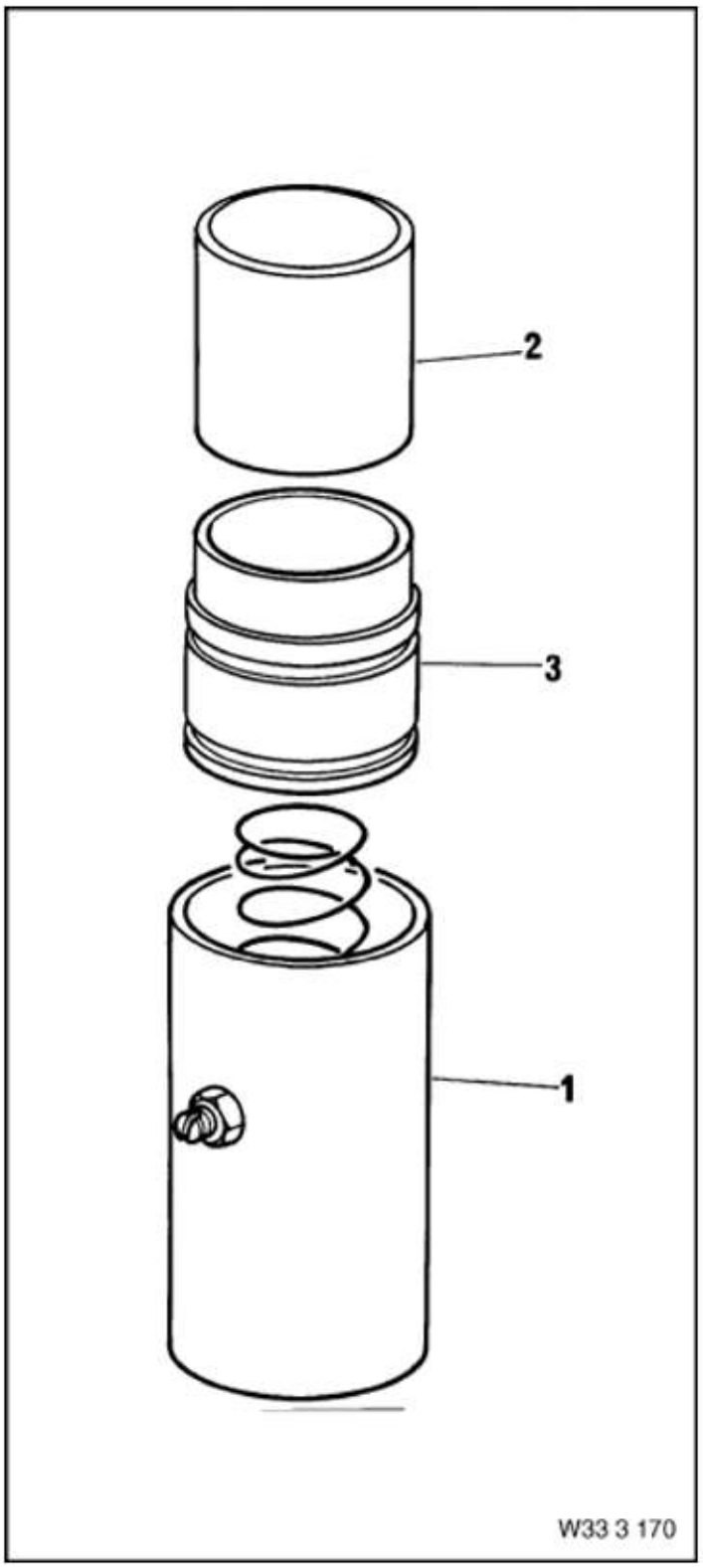


Fig. 287: Identifying Tool (0492248)
Courtesy of BMW OF NORTH AMERICA, INC.

0492252 TOOL

0492252 333180 Tool AM

NOTE: (extractor/press-fit tool set) For extracting and press-fitting the rubber mount in the differential carrier

Storage Location

C14

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SI number

01 05 90 (207)

Consisting of:

1. **0494195** Bush

   NOTE: **Series: E31, E46**

2. **0492254** Synchronising key

   NOTE: **For pressing the rubber mount out of the rear axle final drive mounting Series: E31**

3. **0492255** Holding sleeve

   NOTE: **(spacer sleeve) For pressing the rubber mount into the differential carrier - Series: E31**

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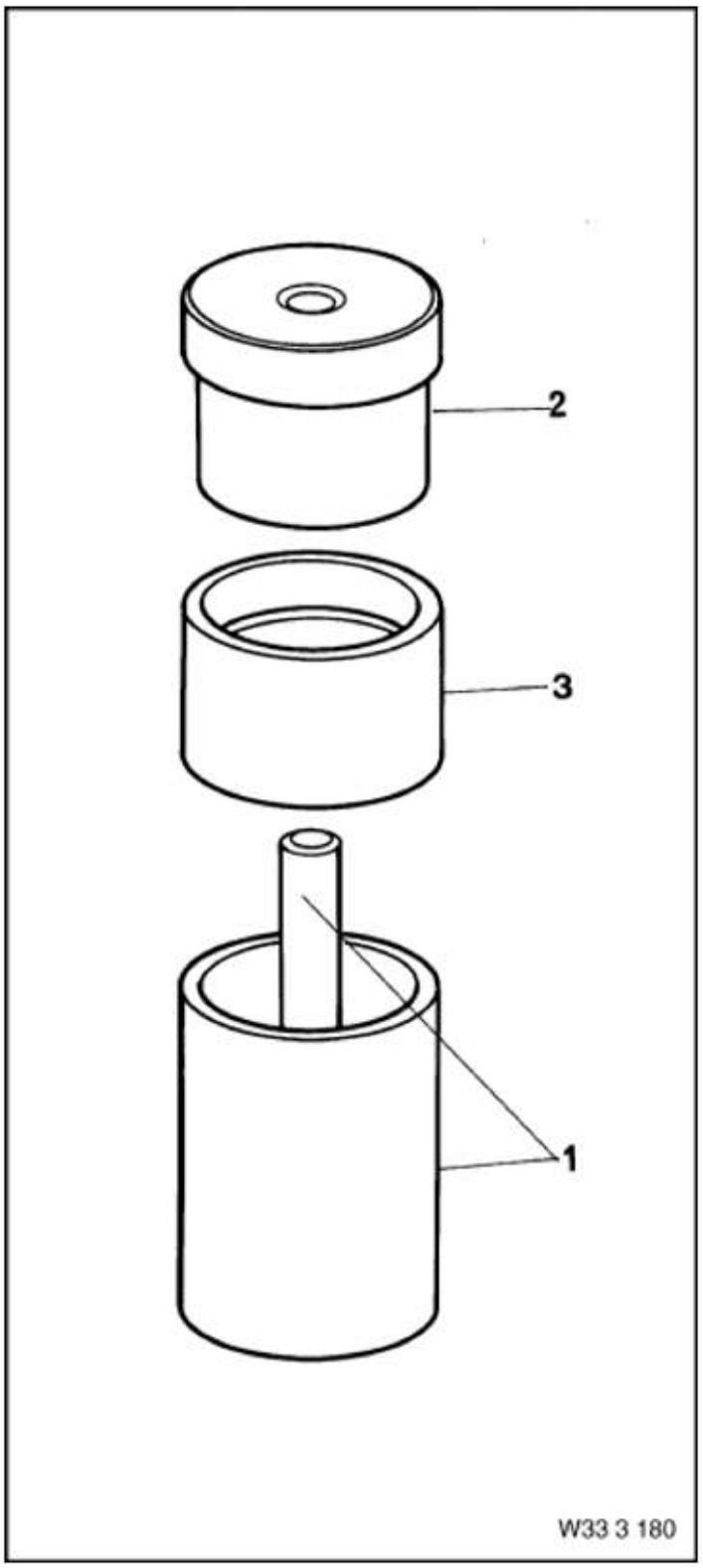


Fig. 288: Identifying Tool (0492252)
Courtesy of BMW OF NORTH AMERICA, INC.

0492215 TOOL

0492215 333100 Tool AM

NOTE: (Tool set) For removing and installing rubber mounts in rear axle support

Storage Location

C13

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Consisting of:

1. 0492216 Spindle

   NOTE: Replaced by 33 3 107. (0 492 222)

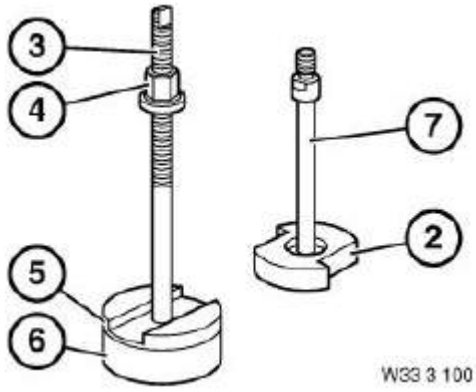


Fig. 289: Identifying Tool (0492215)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0492217 Washer

   NOTE: (Shaped washer) For removing - model series: E28

3. 0492218 Spindle

   NOTE: (Spindle for installation) Model series: E28, E30, E31, E36, RR1

4. 0492219 Nut

   NOTE: (Nut with bearing) Model series: E28, E30, E31, E34, E36, RR1

5. 0492220 Washer

   NOTE: (Shaped washer) For installing - model series: E28

6. 0492221 Washer

   NOTE: (Shape washer) For counter support during installing - model series: E28

7. 0492222 Spindle

   NOTE: For installing - model series: E28, E30, E31, E36

0492276 TOOL

0492276 333240 Tool AM

Replaced by: 83300493416

NOTE: (Tool set) For removing bearing inner race from drive flange (rear wheel bearing) - Replaced by 33 4 400. (0 493 416)

Storage Location

C28

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SI number

01 05 90 (207)

Consisting of:

1. **0492277** Shell

   NOTE: **(Shell) Model series: E31, E38 Discontinuation and replaced by 33 4 400. (0 493 416)**

2. **0492278** Shell

   NOTE: **(Shell) Model series: E31, E38 Discontinuation and replaced by 33 4 400. (0 493 416)**

3. **0492279** Bush

   NOTE: **(Clamping bush) Discontinuation and replaced by 33 4 400. (0 493 416)**

4. **0492280** Spindle

   NOTE: **Discontinuation and replaced by 33 4 400. (0 493 416)**

5. **0492281** Synchronising key

   NOTE: **(Synchronising key) Model series: E38, E39 Discontinuation and replaced by 33 4 400. (0 493 416)**

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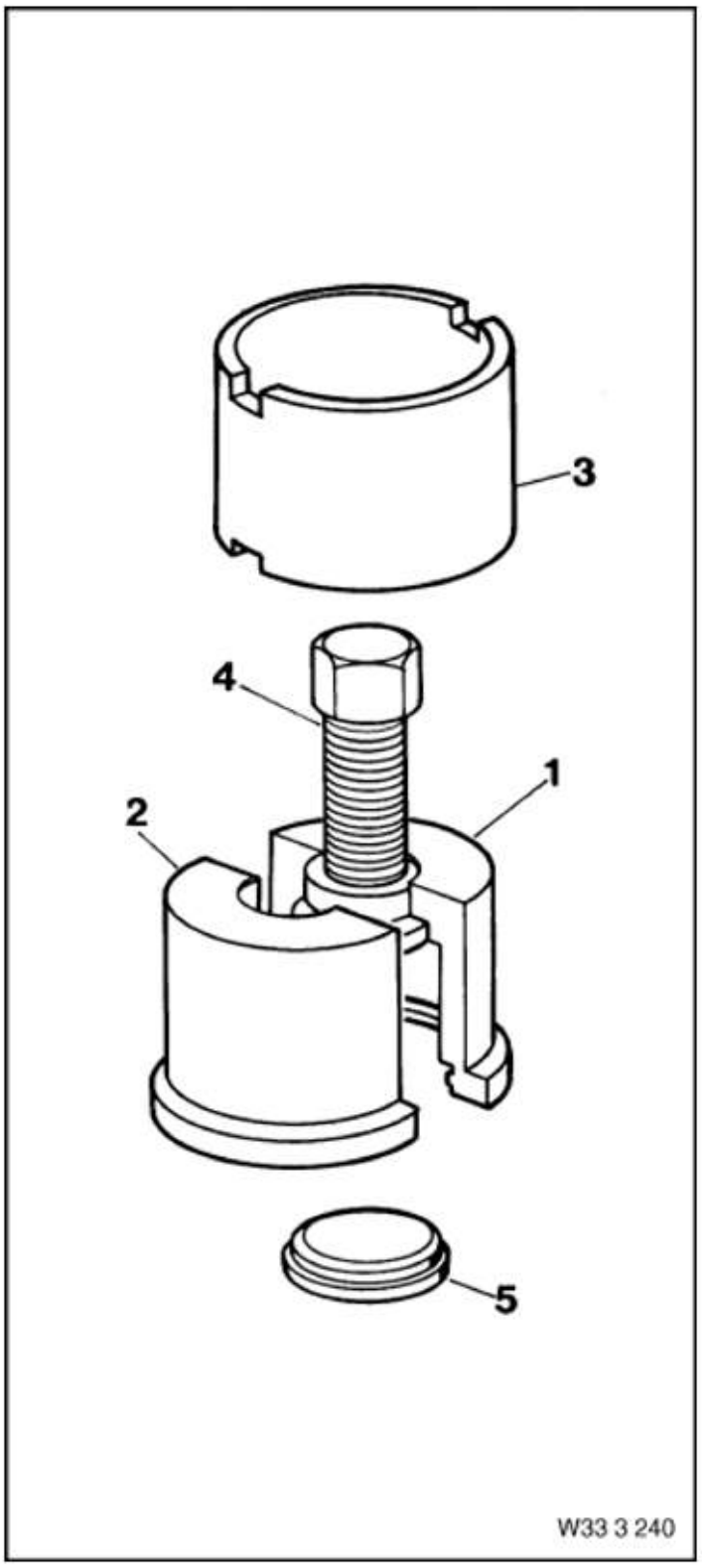


Fig. 290: Identifying Tool (0492276)
Courtesy of BMW OF NORTH AMERICA, INC.

0492228 TOOL

0492228 333120 Tool AM

NOTE: (tool set) For removing and fitting the rubber mounts in the rear axle support, lateral

Storage Location

Y9

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SI number

01 04 88 (566)

Consisting of:

1. 0492229 Washer

NOTE: **(Extractor disc) sale of existing inventory and then available as part of complete tool set 33 3 120 = 83 30 0 492 228 only - as of 29.11.2011**

2. 0492230 Washer

NOTE: **(Installation disc) Liquidation of existing inventory and then available only via complete tool set 33 3 120 = 83 30 0 492 228 - status 29.11.2011**

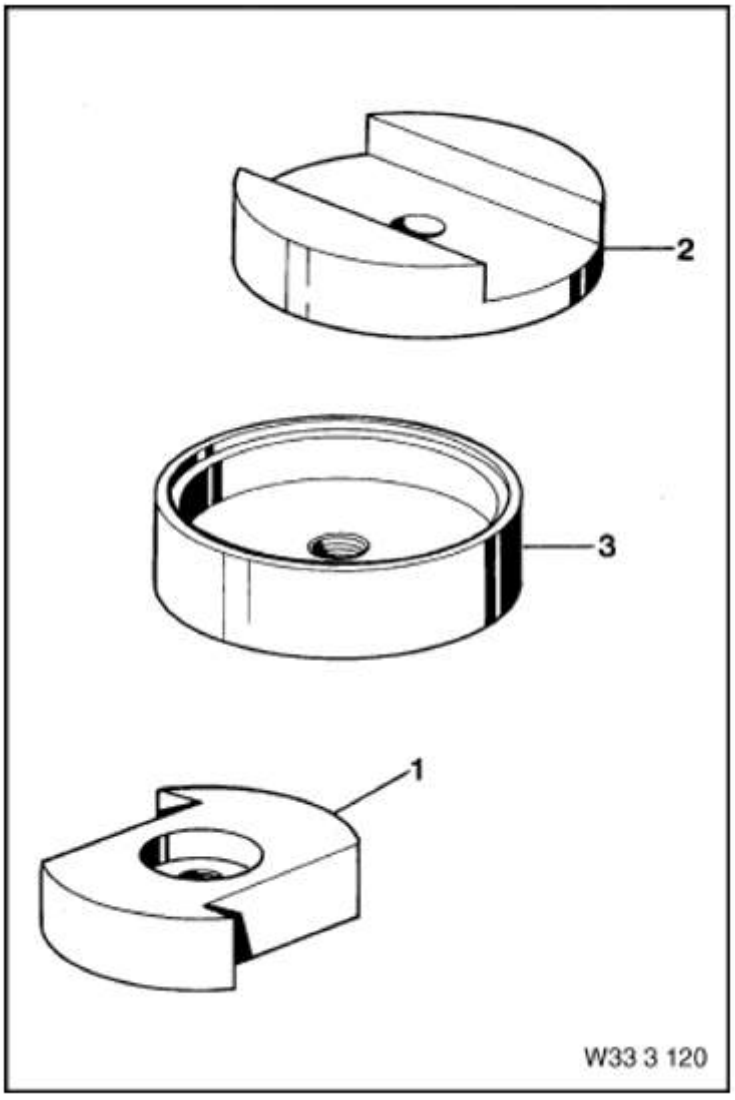


Fig. 291: Identifying Tool (0492228)
Courtesy of BMW OF NORTH AMERICA, INC.

3. 0492231 Washer

NOTE: **For counter support when pulling in Only available via complete tool set 33 3 120 = 83 30 0 492 228 - status 29.11.2011**

0492284 TOOL

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0492284 333250 Tool AM

Replaced by: 83300492436

NOTE: **(Tool set) For pulling out rear drive flange from wheel bearing - replaced by 33 4 200. (0 492 436)**

Consisting of:

1. 0492285 Spindle

   NOTE: **(Spindle with pressure pad)**

2. 0492286 Basic unit

   NOTE: **Discontinuation and replaced by 33 4 200. (0 492 436)**

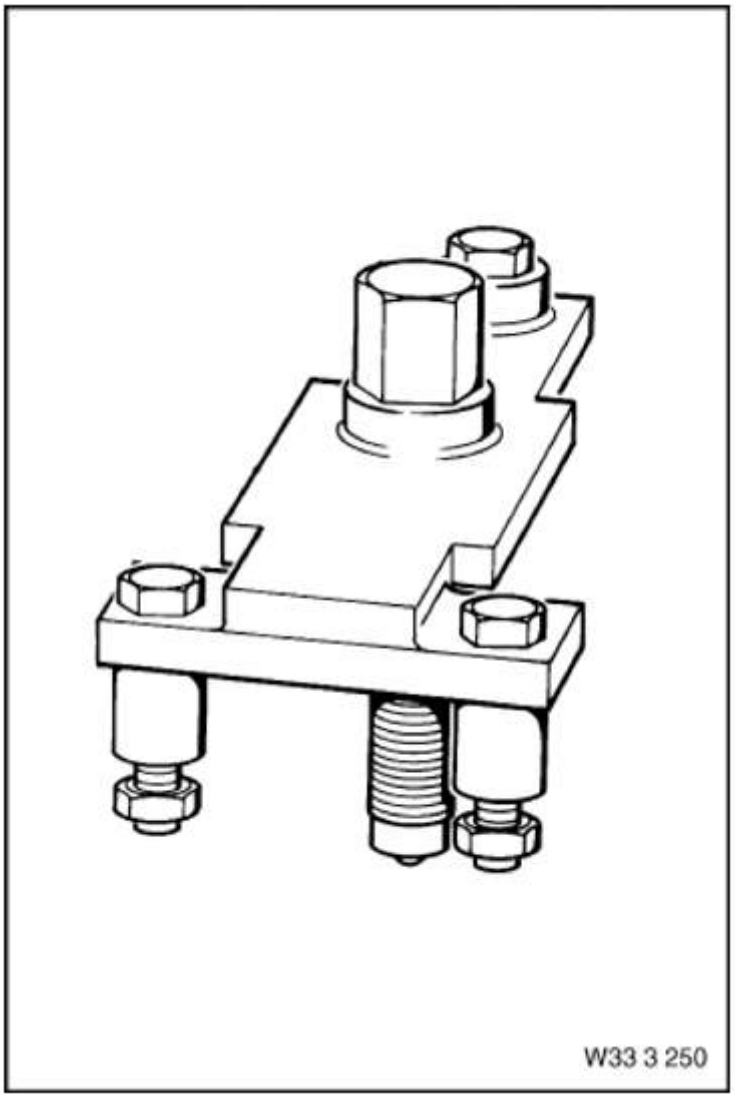


Fig. 292: Identifying Tool (0492284)
Courtesy of BMW OF NORTH AMERICA, INC.

0492091 TOOL

0492091 331240 Tool Mechanical tool

NOTE: **To pull off of ball bearings from the drive shaft (pinion head) - discontinued on 18.01.95**

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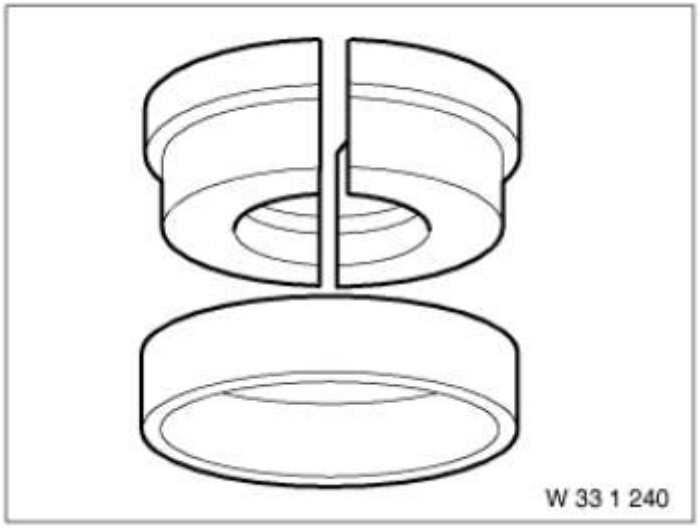


Fig. 293: Identifying Tool (0492091)
Courtesy of BMW OF NORTH AMERICA, INC.

0492131 TOOL

0492131 331370 Tool AM

NOTE: **(Tool supplement) For 33 1 350, 33 1 360, 33 1 356, 33 1 362, 33 1 363 and 33 1 358**

Storage Location

Y8

Consisting of:

1. 0492132 Shaped part

   NOTE: **(Shaped part)**

2. 0492133 Washer

   NOTE: **(Thrust washer)**

3. 0492134 Washer

   NOTE: **(Installation washer) For bearing shell (engine on inside)**

4. 0492135 Washer

   NOTE: **(Installation disc) for bearing shell (outside drive) discontinued, available as part of set of special tools only**

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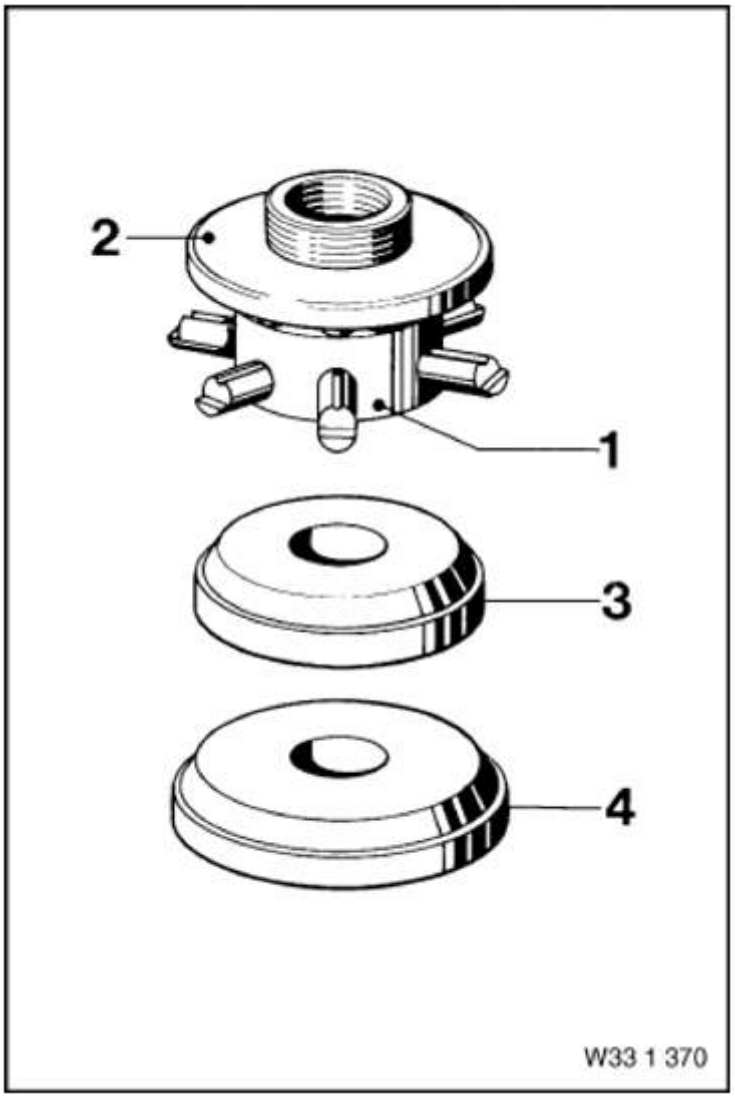


Fig. 294: Identifying Tool (0492131)
Courtesy of BMW OF NORTH AMERICA, INC.

0494930 TOOL

0494930 334470 Tool Minimum set: Mechanical tools AM

NOTE: **(tool set) For removing and installing trailing arm rubber mount on rear axle support.**

Storage Location

B49

SI number

01 15 04 (117)

Consisting of:

1. 0494983 Washer

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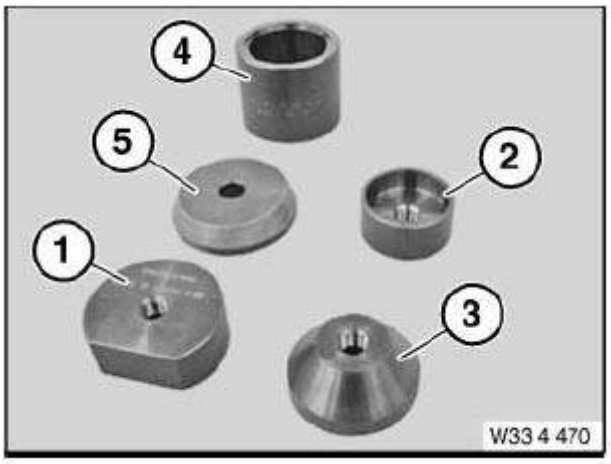


Fig. 295: Identifying Tool (0494930)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **(draw-in disc)**

2. 0494984 Washer

NOTE: **(pull-out disc)**

3. 0494985 Washer

NOTE: **(draw-in disc)**

4. 0494986 Holding sleeve

NOTE: **(support sleeve)**

5. 0494987 Holder

NOTE: **(Countersupport) 0496208 =119850**

0494754 TOOL

0494754 331110 Tool AM

NOTE: **(Tool set) Complete tool set in a case, for removing and installing the rubber mounts in the rear axle support. The case contains the following special tools: - 33 3 314/315 - 33 3 370 - 33 4 140 - 33 4 150 - 33 4 210**

SI number

01 19 03 (017)

Consisting of:

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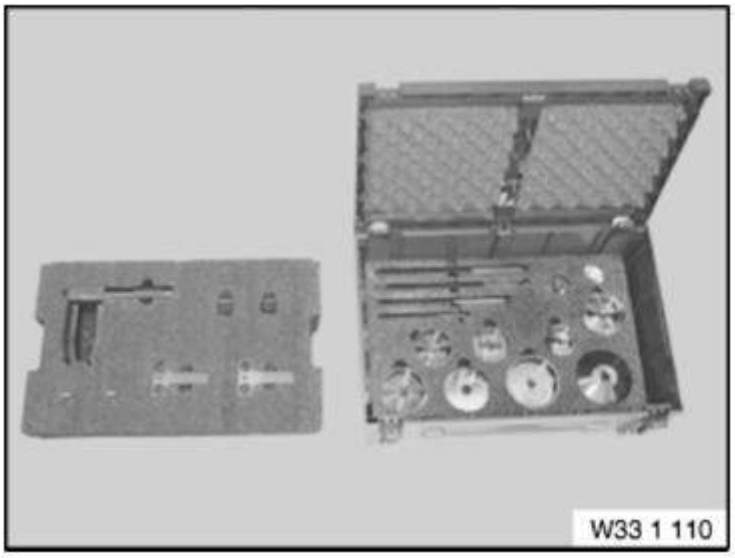


Fig. 296: Identifying Tool (0494754)
Courtesy of BMW OF NORTH AMERICA, INC.

1. 0494798 Case

   NOTE: (Case) with label.

2. 0494799 Insert

   NOTE: (Insert) Foam insert, bottom.

3. 0494800 Insert

   NOTE: (Insert) Foam insert, top.

2208573 TOOL SET

2208573 Tool set AM

NOTE: Threaded spindle set for removing and installing the rubber mount on the rear axle support.

SI number

08 06 10 (658)

Consisting of:

4 = 2208574
3 = 2208575
2 = 2208576

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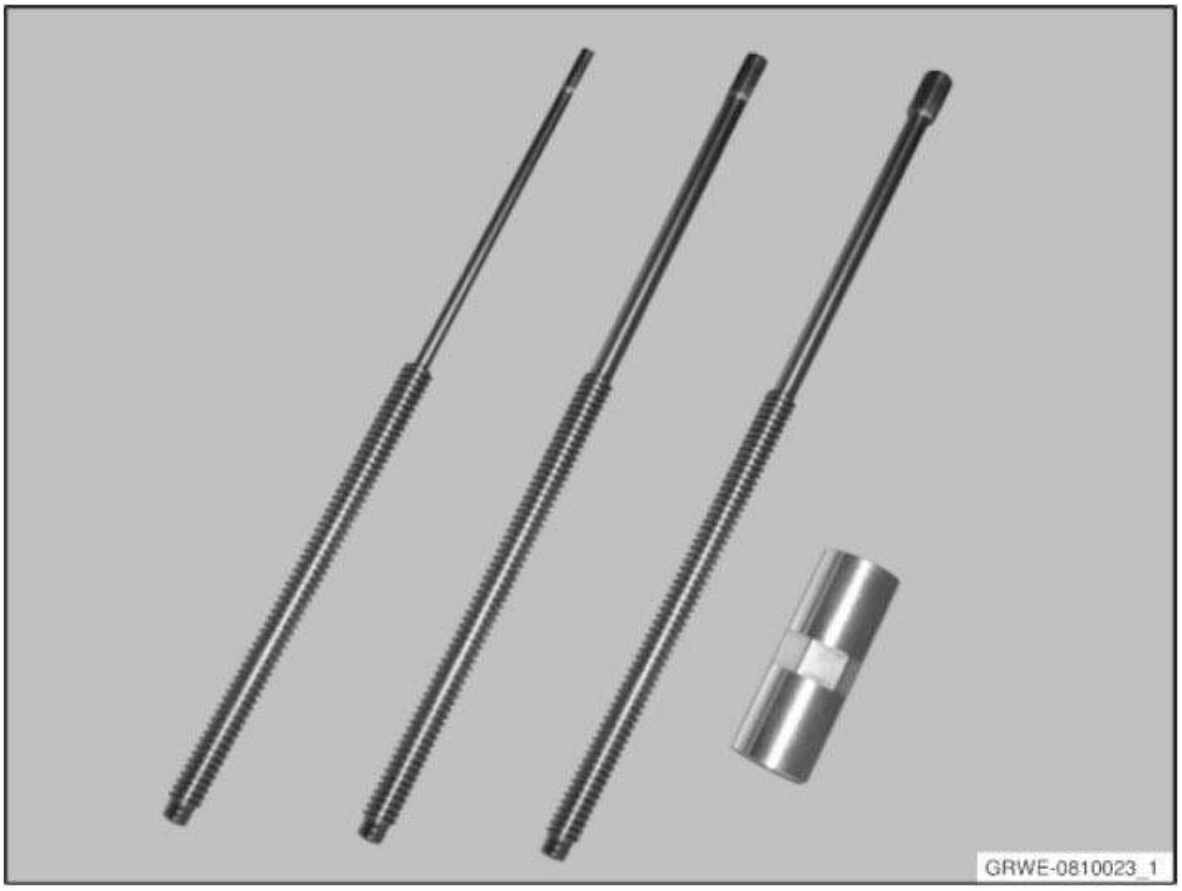


Fig. 297: Identifying Tool Set (2208573)
Courtesy of BMW OF NORTH AMERICA, INC.

1 = 2208577

2155746 TOOL SET

2155746 Tool set AM

NOTE: **Adapter kit 2 (BMW), (BMW-specific adapters), for installation and removal of wheel bearings, propeller shafts and drive shafts.**

SI number

08 12 14 (155)

Consisting of:

1 = 2159721

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Fig. 298: Identifying Tool Set (2155746)
Courtesy of BMW OF NORTH AMERICA, INC.

14 = 2159722
18 = 2156282
17 = 2156283
2 = 2159723
16 = 2156275
15 = 2156273
13 = 2156280
12 = 2156279
11 = 2156278
10 = 2156277
3 = 2156285
4 = 2159724
5 = 2156289
6 = 2156288
7 = 2156287
8 = 2156286
9 = 2156284

2160009 TOOL SET

2160009 Tool set AM

NOTE: **A set of the BMW hydraulic tool system for wheel bearings and output shafts (basic set for BMW, consisting of 81 64 2 155 744, 81 64 2 155 745, 81 64 2 155 746)**

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SI number

08 12 14 (155)



Fig. 299: Identifying Tool Set (2160009)
Courtesy of BMW OF NORTH AMERICA, INC.

2155744 TOOL SET

2155744 Tool set AM

NOTE: **Hydraulic unit (basic unit) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 12 14 (155)

Consisting of:

2 = 2156247
1 = 2156246

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Fig. 300: Identifying Tool Set (2155744)
Courtesy of BMW OF NORTH AMERICA, INC.

2155745 TOOL SET

2155745 Tool set AM

NOTE: **Wheel bearing adapter kit 1 (BMW), (spindles and tensioning nuts) for removal and installation of wheel bearings, propeller shafts and drive flanges.**

SI number

08 12 14 (155)

Consisting of:

15 = 2156262

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Fig. 301: Identifying Tool Set (2155745)
Courtesy of BMW OF NORTH AMERICA, INC.

14 = 2159720
13 = 2156257
12 = 2156256
11 = 2318476
10 = 2159986
9 = 2159985
1 = 2156252
2 = 2156253
3 = 2156254
4 = 2156255
5 = 2156258
6 = 2156260
7 = 2156265
8 = 2156271
16 = 2156270

0496077 UPHOLSTERY

0496077 335203 Upholstery AM

SI number

01 01 07 (333)

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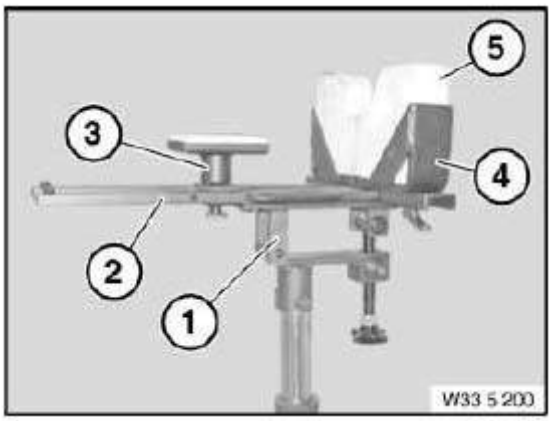


Fig. 302: Identifying Upholstery (0496077)
Courtesy of BMW OF NORTH AMERICA, INC.

2293776 WASHER

2293776 Washer Minimum set: Mechanical tools AM

NOTE: **For installing ball joint in rear wheel carrier (bottom camber control arm),**

Storage Location

C30

SI number

01 22 11 (753)

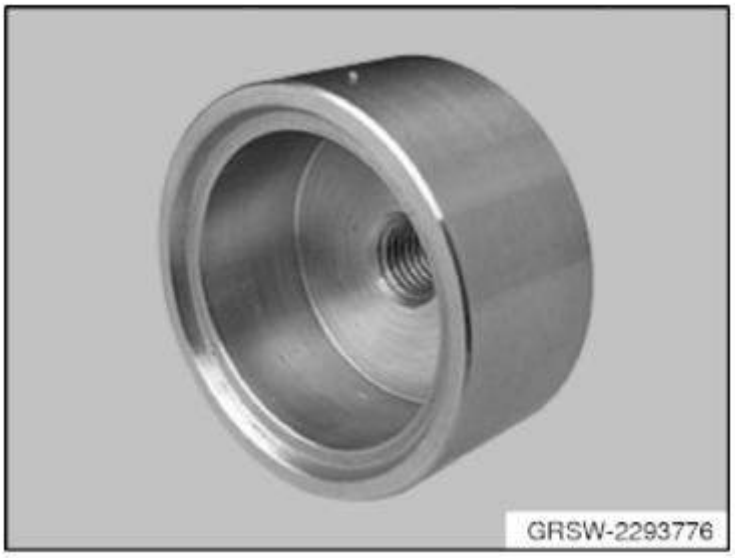


Fig. 303: Identifying Washer (2293776)
Courtesy of BMW OF NORTH AMERICA, INC.

0492231 WASHER

0492231 333123 Washer AM

NOTE: **For counter support when pulling in Only available via complete tool set 33 3 120 = 83 30 0 492 228 - status 29.11.2011**

0493648 WASHER

cardiagn.com

0493648 332150 Washer Minimum set: Mechanical tools Mechanical tool

Replaced by: 83300494797

NOTE: **(Shim) For removing and installing output shaft in drive flange, front and rear, as well as for removing front wheel bearing unit. Replaced by 33 2 160 (0 494 797)**

SI number

01 15 99 (483)

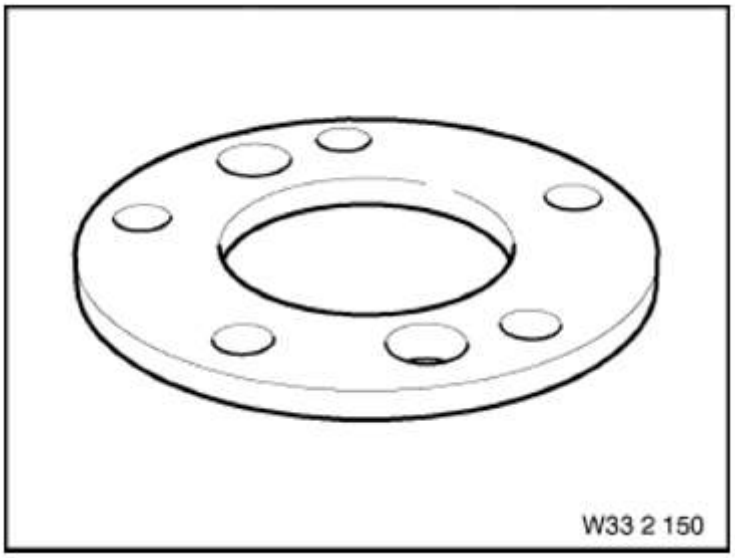


Fig. 304: Identifying Washer (0493648)
Courtesy of BMW OF NORTH AMERICA, INC.

2293772 WASHER

2293772 Washer Minimum set: Mechanical tools Mechanical tool

NOTE: **For installing rubber mount in rear wheel carrier (bottom trailing arm).**

Storage Location

C30

SI number

01 22 11 (753)

cardiagn.com

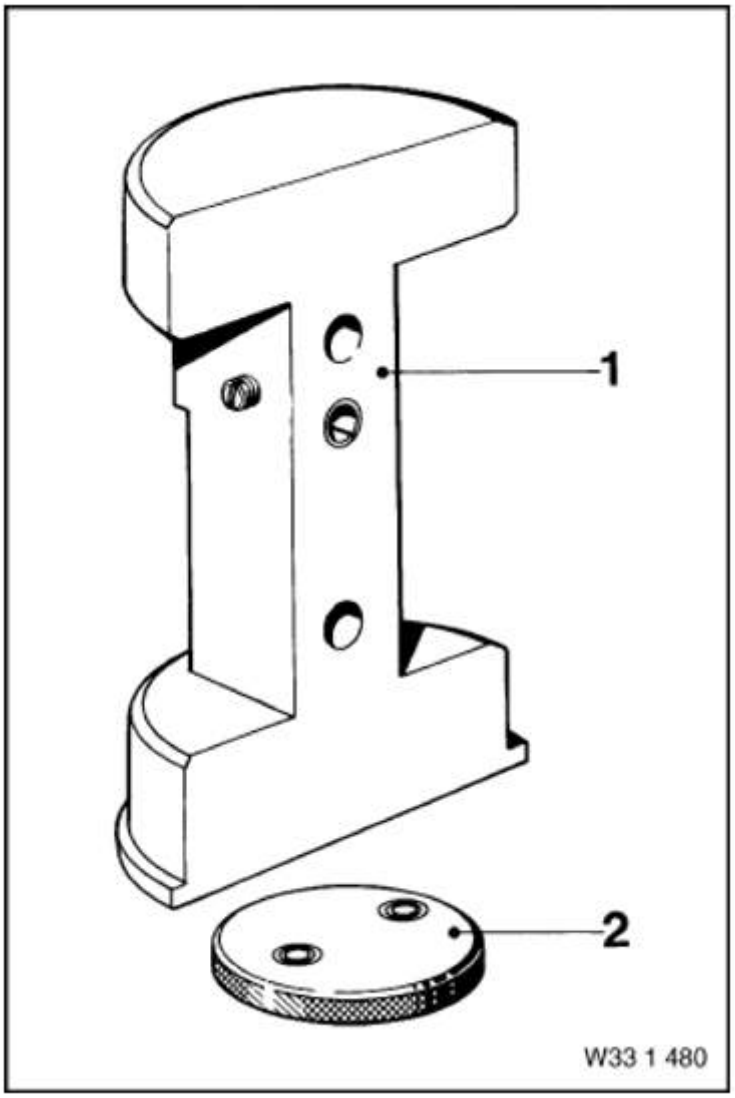


Fig. 305: Identifying Washer (2293772)
Courtesy of BMW OF NORTH AMERICA, INC.

0492163 WASHER

0492163 331482 Washer AM

NOTE: **(Measuring disc)**



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Fig. 306: Identifying Washer (0492163)
Courtesy of BMW OF NORTH AMERICA, INC.

0492159 WASHER

0492159 331462 Washer AM

NOTE: (Measuring disc)

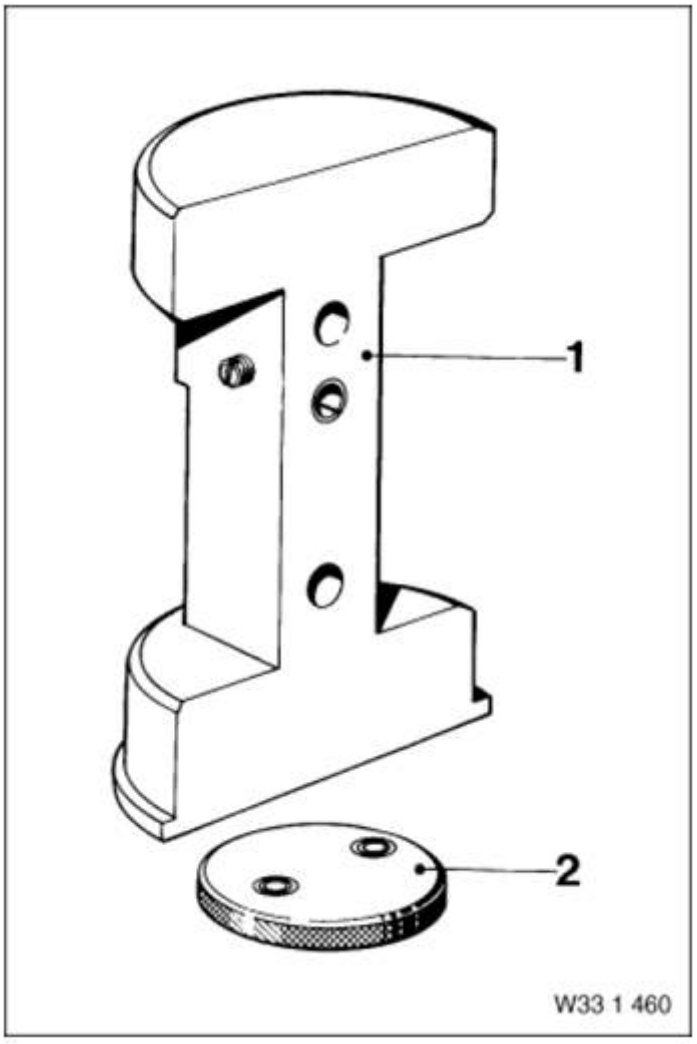


Fig. 307: Identifying Washer (0492159)
Courtesy of BMW OF NORTH AMERICA, INC.

0494985 WASHER

0494985 334473 Washer Minimum set: Mechanical tools AM

NOTE: (draw-in disc)

Storage Location

B49

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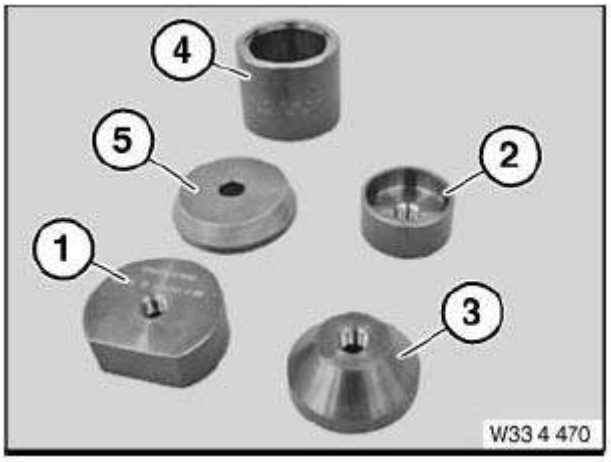


Fig. 308: Identifying Washer (0494985)
Courtesy of BMW OF NORTH AMERICA, INC.

0494978 WASHER

0494978 334462 Washer Minimum set: Mechanical tools AM

NOTE: (pull-out disc)

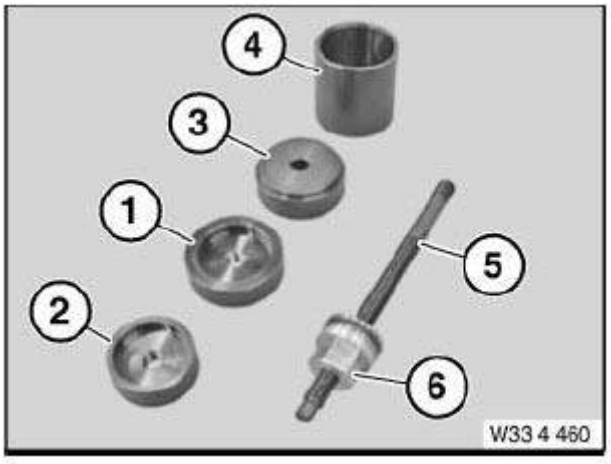


Fig. 309: Identifying Washer (0494978)
Courtesy of BMW OF NORTH AMERICA, INC.

0492230 WASHER

0492230 333122 Washer AM

NOTE: (Installation disc) Liquidation of existing inventory and then available only via complete tool set 33 3 120 = 83 30 0 492 228 - status 29.11.2011

0492134 WASHER

0492134 331373 Washer AM

NOTE: (Installation washer) For bearing shell (engine on inside)

Storage Location

Y8

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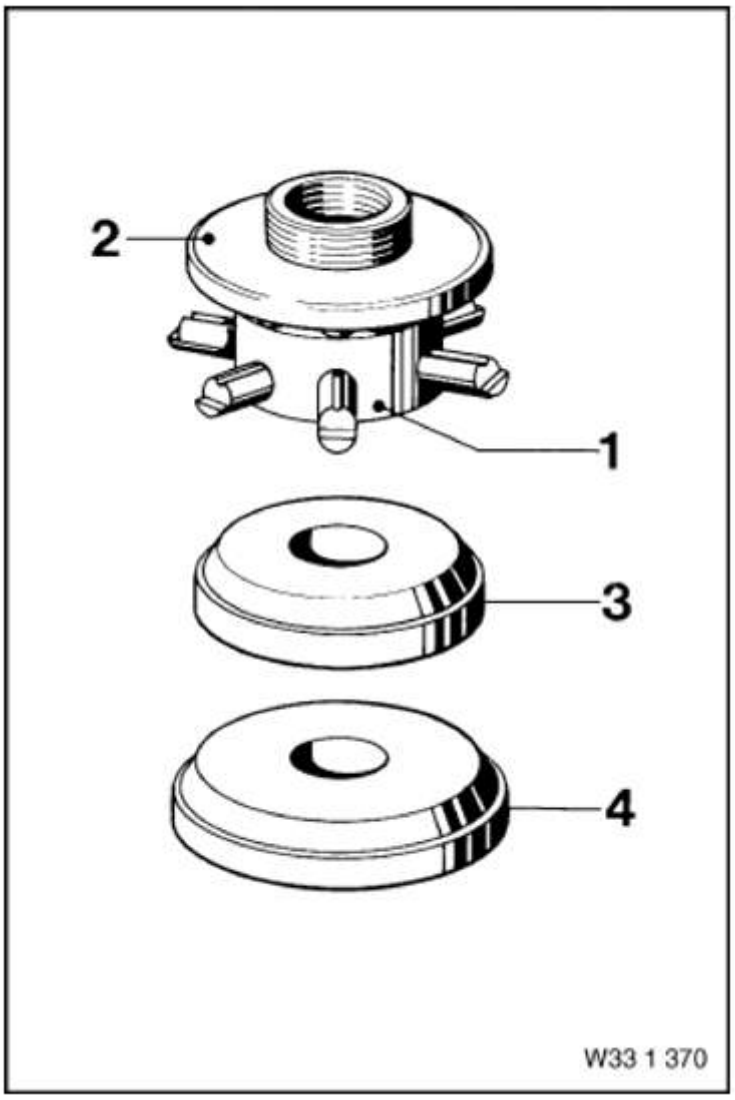


Fig. 310: Identifying Washer (0492134)
Courtesy of BMW OF NORTH AMERICA, INC.

0492221 WASHER

0492221 333106 Washer AM

NOTE: **(Shape washer) For counter support during installing - model series: E28**

Storage Location

C13

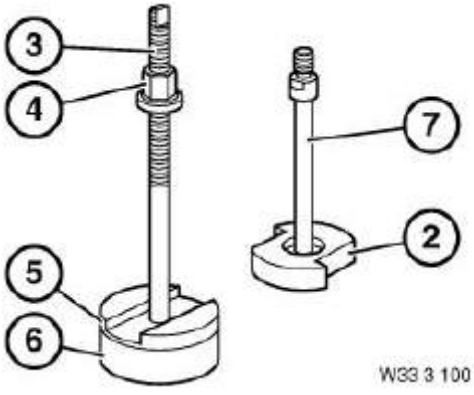


Fig. 311: Identifying Washer (0492221)

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Courtesy of BMW OF NORTH AMERICA, INC.

0495877 WASHER

0495877 335165 Washer Minimum set: Mechanical tools AM

NOTE: **Discontinued, can only be ordered using complete tool**

Storage Location

B22

SI number

01 01 07 (333)

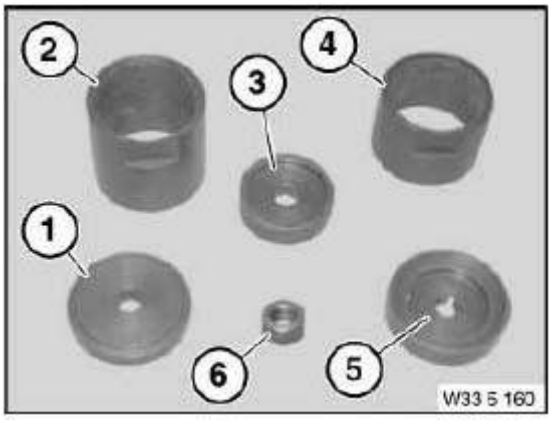


Fig. 312: Identifying Washer (0495877)
Courtesy of BMW OF NORTH AMERICA, INC.

0492227 WASHER

0492227 333115 Washer AM

NOTE: **(Shaped washer) For gripping when installing**

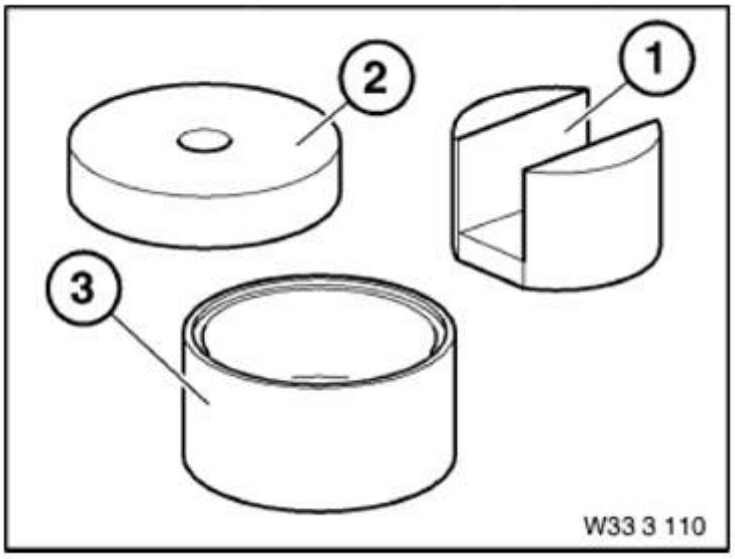


Fig. 313: Identifying Washer (0492227)
Courtesy of BMW OF NORTH AMERICA, INC.

0492155 WASHER

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0492155 331442 Washer AM

NOTE: (Washer without thread)

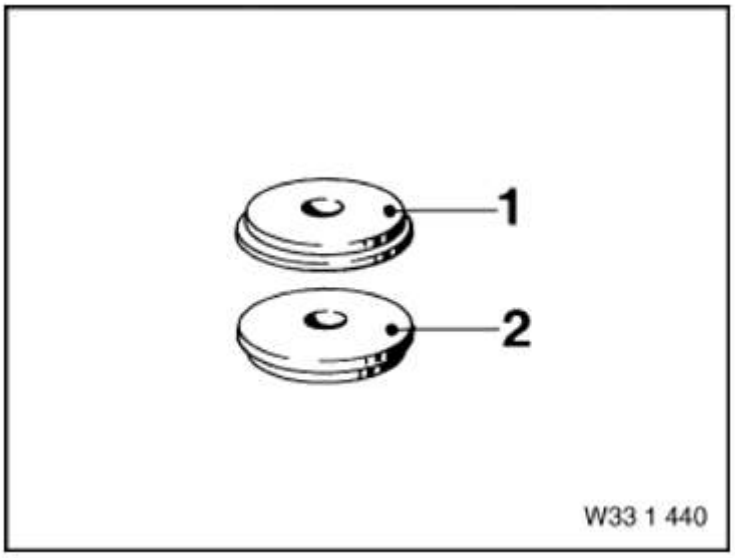


Fig. 314: Identifying Washer (0492155)
Courtesy of BMW OF NORTH AMERICA, INC.

0492217 WASHER

0492217 333102 Washer AM

NOTE: (Shaped washer) For removing - model series: E28

Storage Location

C13

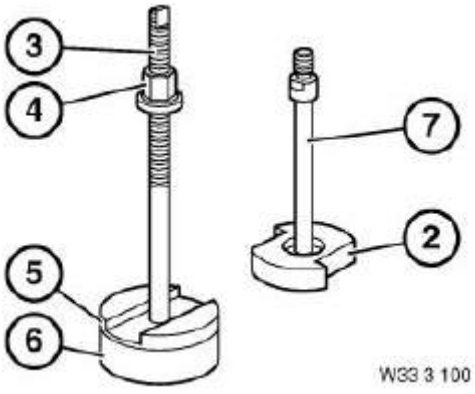


Fig. 315: Identifying Washer (0492217)
Courtesy of BMW OF NORTH AMERICA, INC.

0492117 WASHER

0492117 331355 Washer AM

NOTE: (Installation washer (2 pieces))

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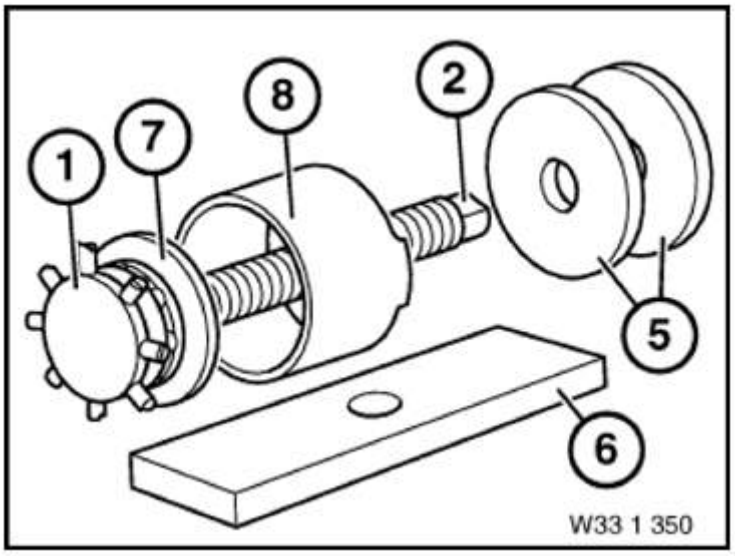


Fig. 316: Identifying Washer (0492117)
Courtesy of BMW OF NORTH AMERICA, INC.

2156255 WASHER

2156255 Washer AM

NOTE: **Contact disc D1 in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**



Fig. 317: Identifying Washer (2156255)
Courtesy of BMW OF NORTH AMERICA, INC.

SI number

08 06 09 (544)

0492107 WASHER

0492107 331311 Washer AM

NOTE: **(Disc) Discontinued, only available via complete tool**

Storage Location

cardiagn.com

Y4

Z4

0492229 WASHER

0492229 333121 Washer AM

NOTE: **(Extractor disc) sale of existing inventory and then available as part of complete tool set 33 3 120 = 83 30 0 492 228 only - as of 29.11.2011**

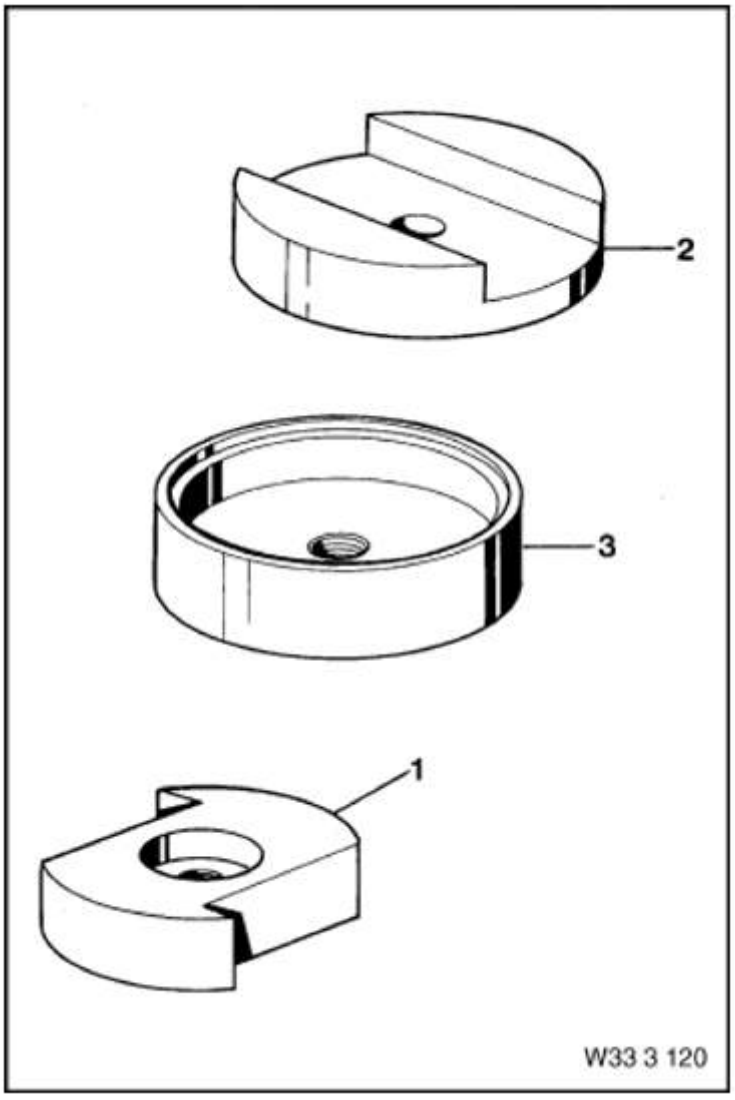


Fig. 318: Identifying Washer (0492229)
Courtesy of BMW OF NORTH AMERICA, INC.

0492133 WASHER

0492133 331372 Washer AM

NOTE: **(Thrust washer)**

Storage Location

Y8

cardiagn.com

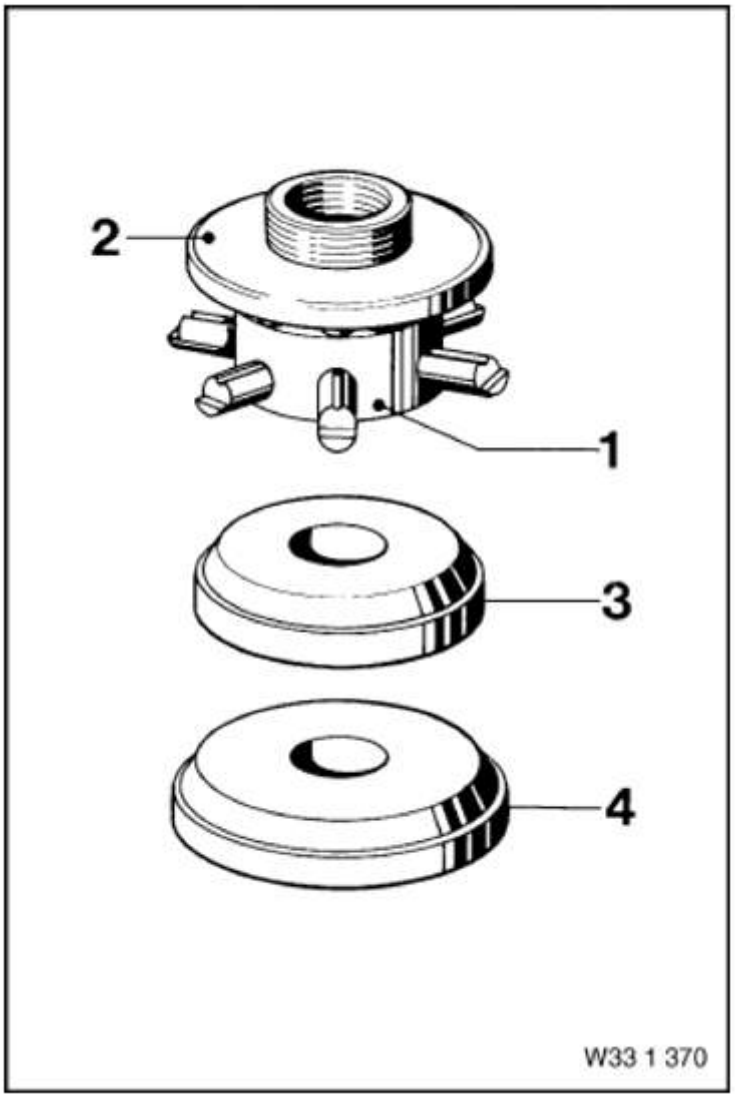


Fig. 319: Identifying Washer (0492133)
Courtesy of BMW OF NORTH AMERICA, INC.

0492099 WASHER

0492099 331303 Washer AM

Replaced by: 83300492107

NOTE: **(Disc) Replaced by 33 1 311. (0 492 107)**

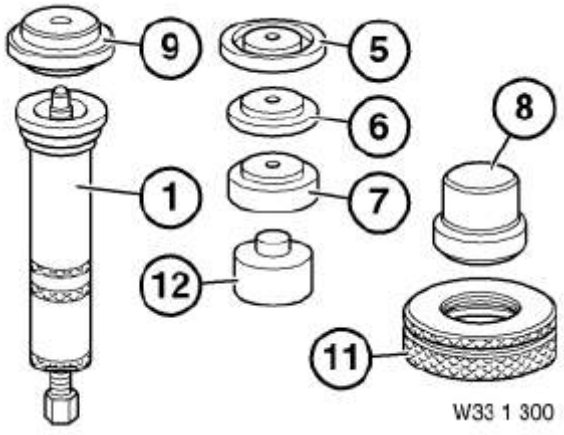


Fig. 320: Identifying Washer (0492099)

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Courtesy of BMW OF NORTH AMERICA, INC.

0492319 WASHER

0492319 333322 Washer AM

NOTE: **(Thrust washer) For installing the front/rear rubber mount, series: E36, E46**

Storage Location

B13

2293775 WASHER

2293775 Washer Minimum set: Mechanical tools Mechanical tool

NOTE: **For removing ball joint in rear wheel carrier (bottom camber arm).**

Storage Location

C29

SI number

01 22 11 (753)



Fig. 321: Identifying Washer (2293775)
Courtesy of BMW OF NORTH AMERICA, INC.

0492220 WASHER

0492220 333105 Washer AM

NOTE: **(Shaped washer) For installing - model series: E28**

Storage Location

C13

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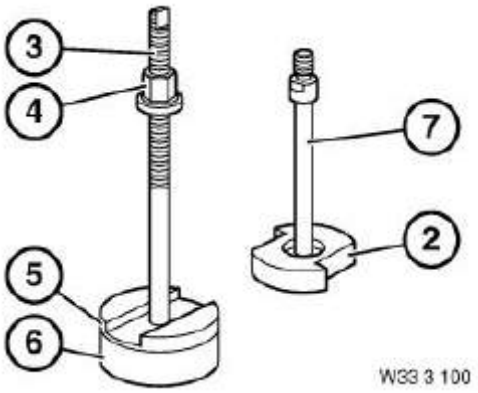


Fig. 322: Identifying Washer (0492220)
Courtesy of BMW OF NORTH AMERICA, INC.

0492098 WASHER

0492098 331302 Washer AM

Replaced by: 83300492107

NOTE: **(Disc) Replaced by 33 1 311. (0 492 107)**

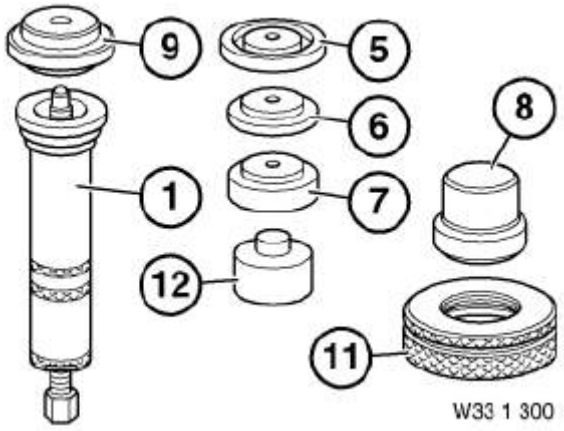


Fig. 323: Identifying Washer (0492098)
Courtesy of BMW OF NORTH AMERICA, INC.

2293788 WASHER

2293788 Washer Minimum set: Mechanical tools Mechanical tool

NOTE: **For installing rubber mounts in rear axle support mounting.**

Storage Location

C29

SI number

01 22 11 (753)

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Fig. 324: Identifying Washer (2293788)
Courtesy of BMW OF NORTH AMERICA, INC.

0494984 WASHER

0494984 334472 Washer Minimum set: Mechanical tools AM

NOTE: **(pull-out disc)**

Storage Location

B49

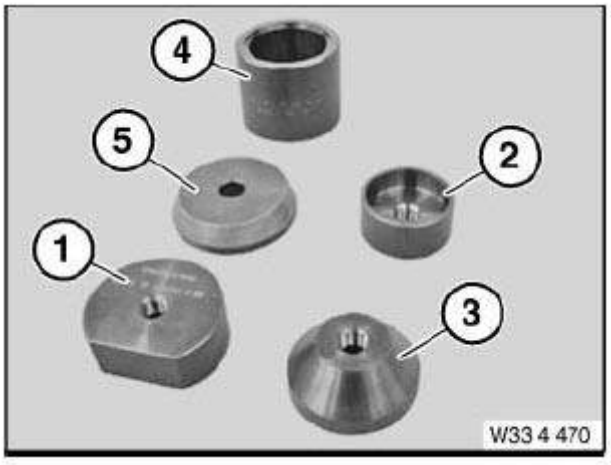


Fig. 325: Identifying Washer (0494984)
Courtesy of BMW OF NORTH AMERICA, INC.

0495873 WASHER

0495873 335161 Washer Minimum set: Mechanical tools AM

NOTE: **Discontinued, can only be ordered using complete tool**

Storage Location

A22

SI number

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01 01 07 (333)

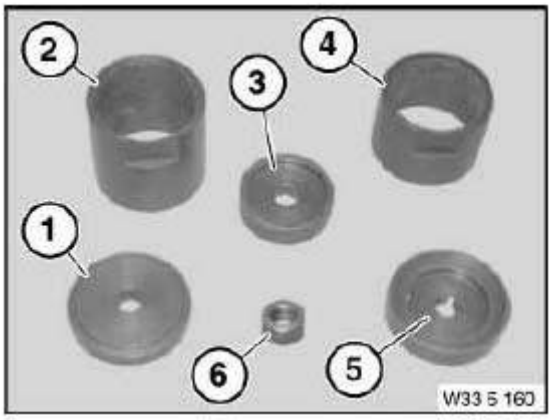


Fig. 326: Identifying Washer (0495873)
Courtesy of BMW OF NORTH AMERICA, INC.

0495875 WASHER

0495875 335163 Washer Minimum set: Mechanical tools AM

NOTE: **Discontinued, can only be ordered using complete tool**

Storage Location

A22

SI number

01 22 06 (307)

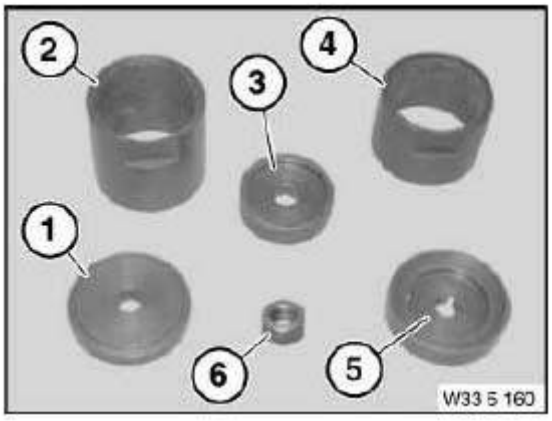


Fig. 327: Identifying Washer (0495875)
Courtesy of BMW OF NORTH AMERICA, INC.

0494977 WASHER

0494977 334461 Washer Minimum set: Mechanical tools AM

NOTE: **(draw-in disc)**

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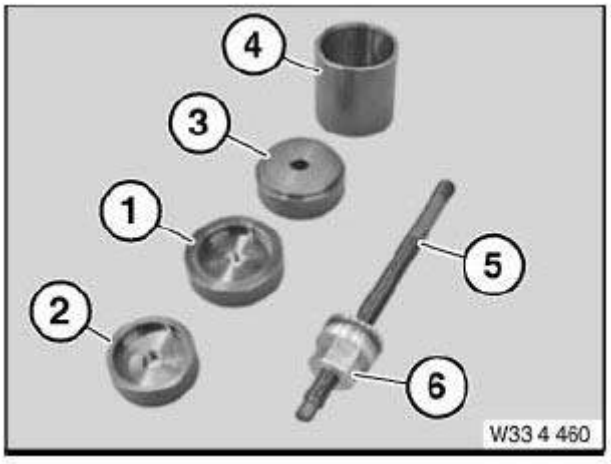


Fig. 328: Identifying Washer (0494977)
Courtesy of BMW OF NORTH AMERICA, INC.

0492089 WASHER

0492089 331220 Washer Mechanical tool

NOTE: For driving in the radial shaft seal on the input flange

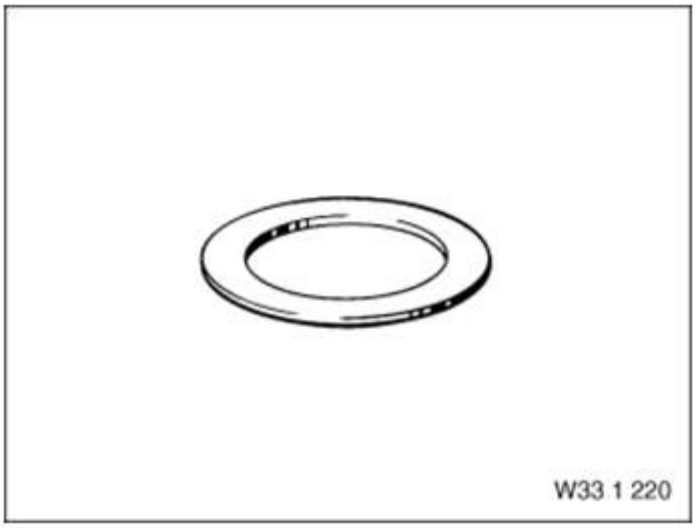


Fig. 329: Identifying Washer (0492089)
Courtesy of BMW OF NORTH AMERICA, INC.

0492224 WASHER

0492224 333111 Washer AM

NOTE: (Shaped washer) For pulling out the top rubber mount Series: E30, E36

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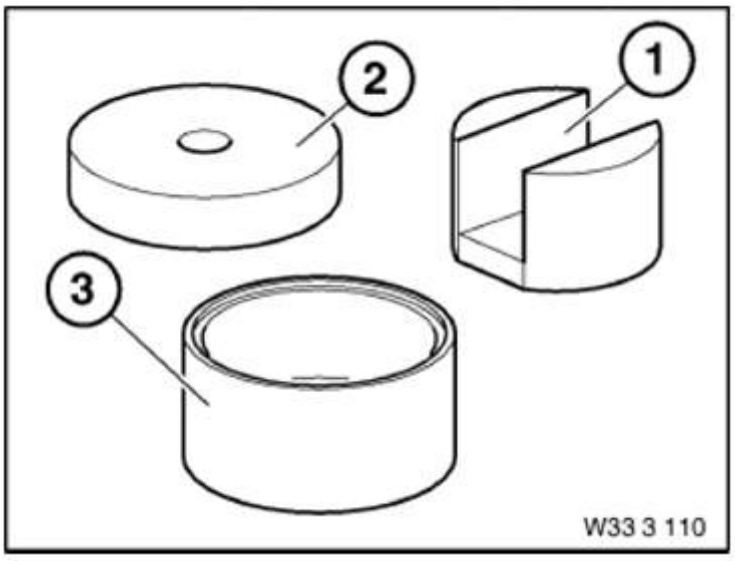


Fig. 330: Identifying Washer (0492224)
Courtesy of BMW OF NORTH AMERICA, INC.

2293790 WASHER

2293790 Washer Minimum set: Mechanical tools Mechanical tool

NOTE: **For installing rubber mounts in rear axle support mounting.**

Storage Location

C29

SI number

01 22 11 (753)



Fig. 331: Identifying Washer (2293790)
Courtesy of BMW OF NORTH AMERICA, INC.

0492138 WASHER

0492138 331382 Washer AM

NOTE: **(Measuring disc)**

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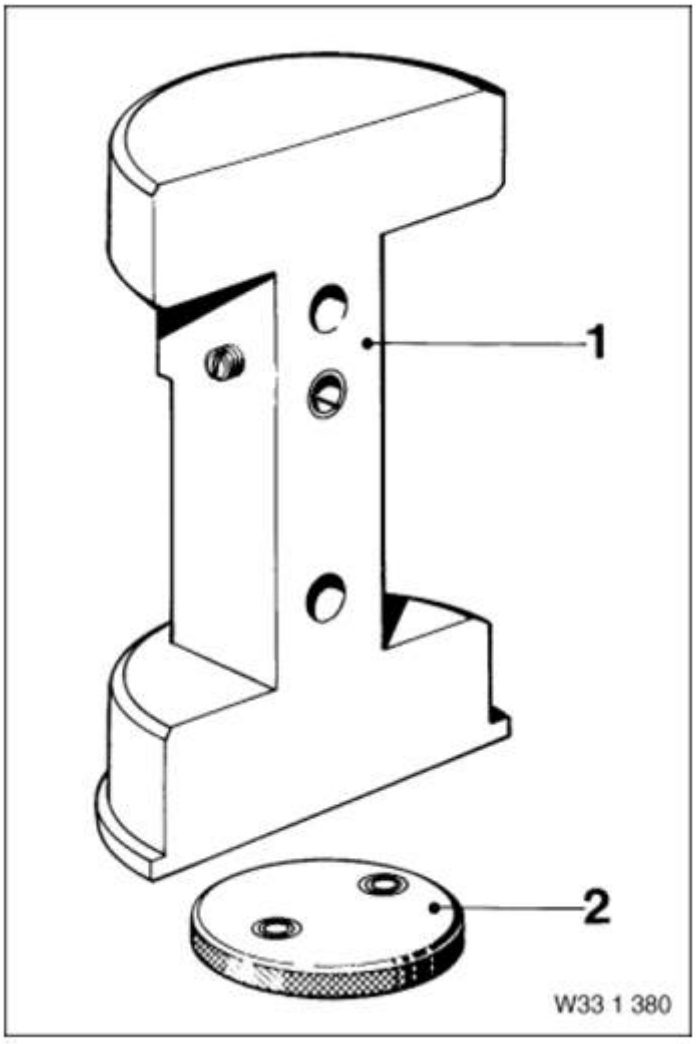


Fig. 332: Identifying Washer (0492138)
Courtesy of BMW OF NORTH AMERICA, INC.

2156265 WASHER

2156265 Washer AM

NOTE: **Contact disc (M24) E3 in connection with adapter kit 1 (BMW), (81 64 2 155 745) and MINI adapter kit (81 64 2 294 517), for removal and installation of wheel bearings, propeller shafts and drive flanges.**



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Fig. 333: Identifying Washer (2156265)
Courtesy of BMW OF NORTH AMERICA, INC.

SI number

08 06 09 (544)

0492135 WASHER

0492135 331374 Washer AM

NOTE: **(Installation disc) for bearing shell (outside drive) discontinued, available as part of set of special tools only**

Storage Location

Y8

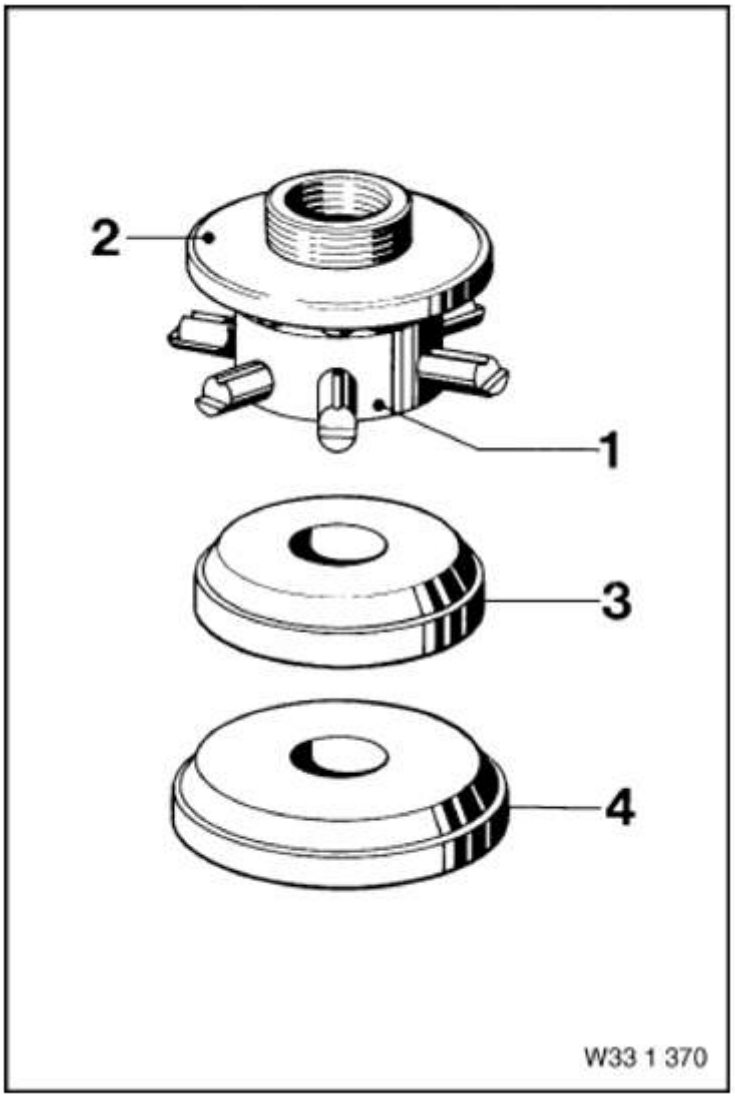


Fig. 334: Identifying Washer (0492135)
Courtesy of BMW OF NORTH AMERICA, INC.

0494631 WASHER

0494631 331153 Washer AM

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Fig. 335: Identifying Washer (0494631)
Courtesy of BMW OF NORTH AMERICA, INC.

0492152 WASHER

0492152 331432 Washer AM

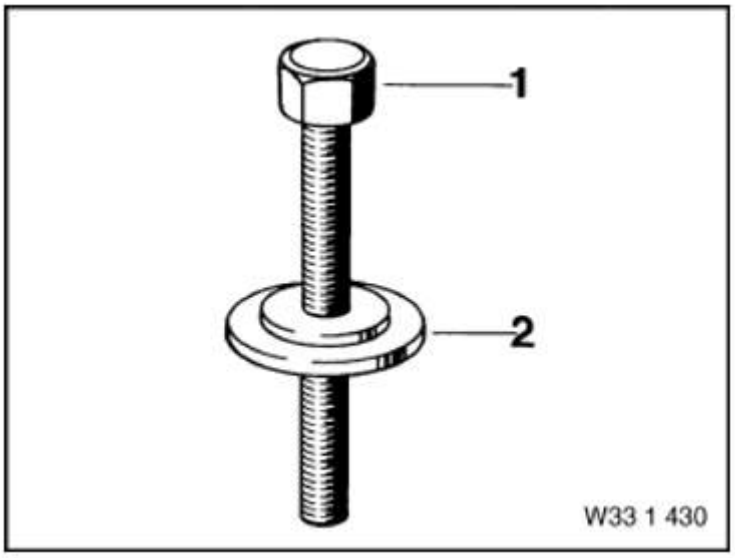


Fig. 336: Identifying Washer (0492152)
Courtesy of BMW OF NORTH AMERICA, INC.

0492145 WASHER

0492145 331412 Washer AM

NOTE: **(Measuring disc)**

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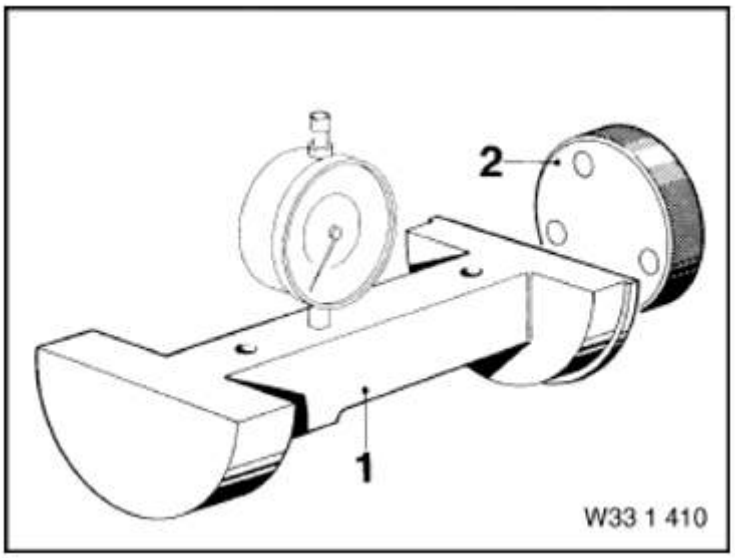


Fig. 337: Identifying Washer (0492145)
Courtesy of BMW OF NORTH AMERICA, INC.

2293768 WASHER

2293768 Washer Minimum set: Mechanical tools AM

NOTE: **For removing rubber mounts in rear wheel carrier (top wishbone and bottom trailing arm)**

Storage Location

C30

SI number

01 22 11 (753)

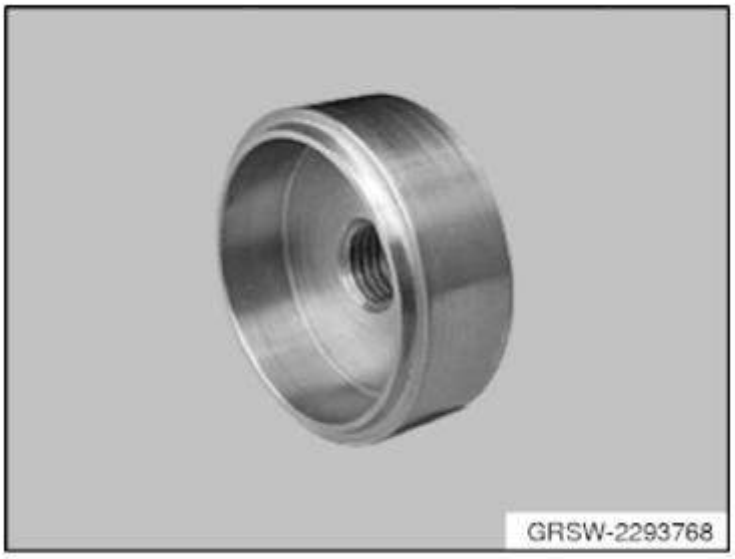


Fig. 338: Identifying Washer (2293768)
Courtesy of BMW OF NORTH AMERICA, INC.

0494983 WASHER

0494983 334471 Washer Minimum set: Mechanical tools AM

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NOTE: **(draw-in disc)**

Storage Location

B49

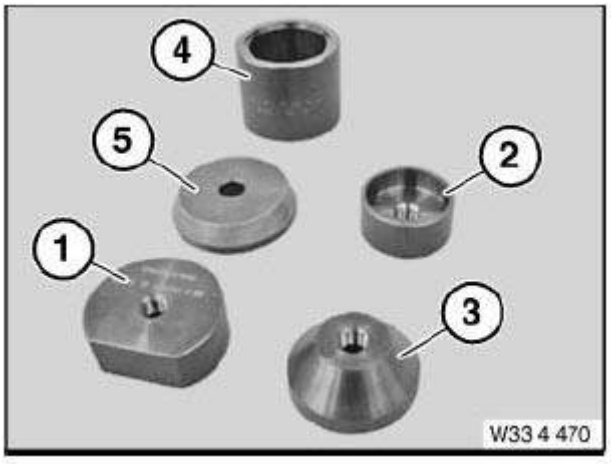


Fig. 339: Identifying Washer (0494983)
Courtesy of BMW OF NORTH AMERICA, INC.

2293770 WASHER

2293770 Washer Minimum set: Mechanical tools AM

NOTE: **For installing rubber mount in rear wheel carrier (top wishbone).**

Storage Location

C29

SI number

01 22 11 (753)

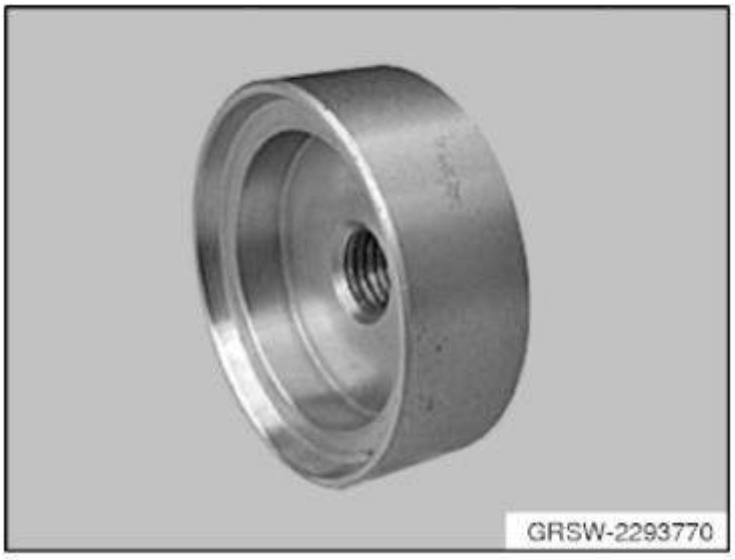


Fig. 340: Identifying Washer (2293770)
Courtesy of BMW OF NORTH AMERICA, INC.

0492225 WASHER

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0492225 333112 Washer AM

NOTE: (Shaped washer) For installing the bottom rubber mount Series: E30, E36

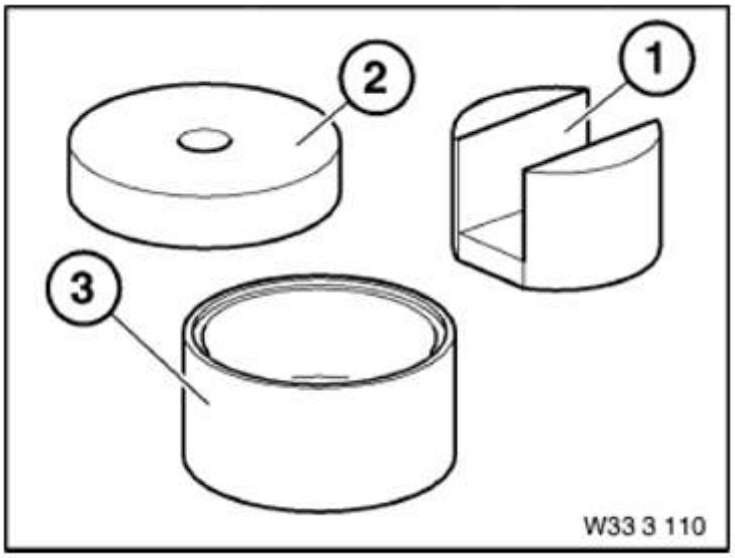


Fig. 341: Identifying Washer (0492225)
Courtesy of BMW OF NORTH AMERICA, INC.

0492100 WASHER

0492100 331304 Washer AM

Replaced by: 83300492107

NOTE: (Disc) Replaced by 33 1 311. (0 492 107)

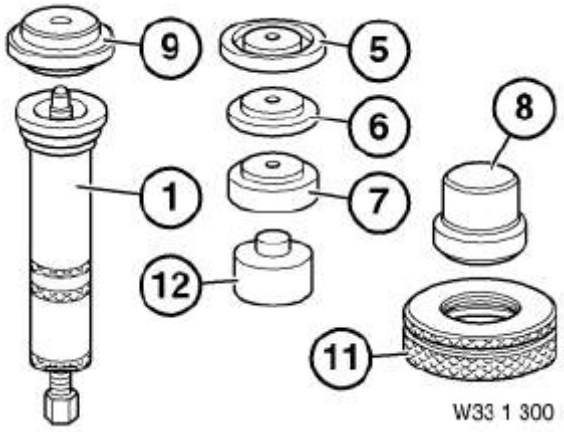


Fig. 342: Identifying Washer (0492100)
Courtesy of BMW OF NORTH AMERICA, INC.

0492119 WASHER

0492119 331357 Washer AM

NOTE: (Thrust washer)

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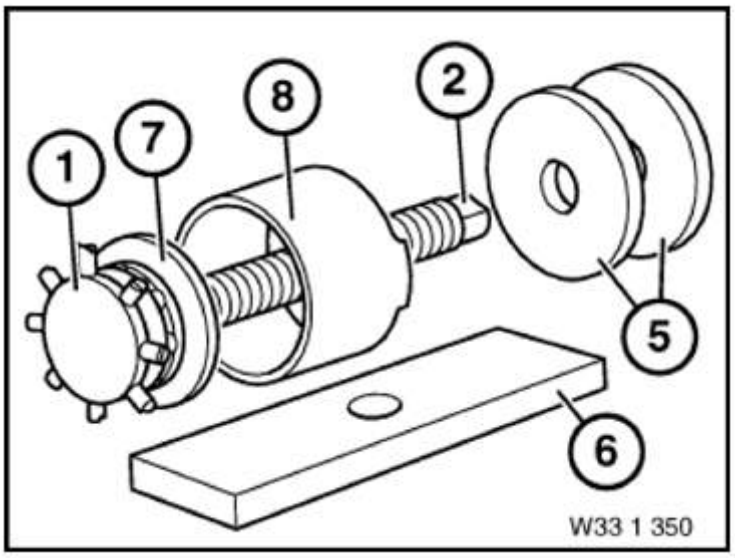


Fig. 343: Identifying Washer (0492119)
Courtesy of BMW OF NORTH AMERICA, INC.

0492154 WASHER

0492154 331441 Washer AM

NOTE: **(Washer with thread)**

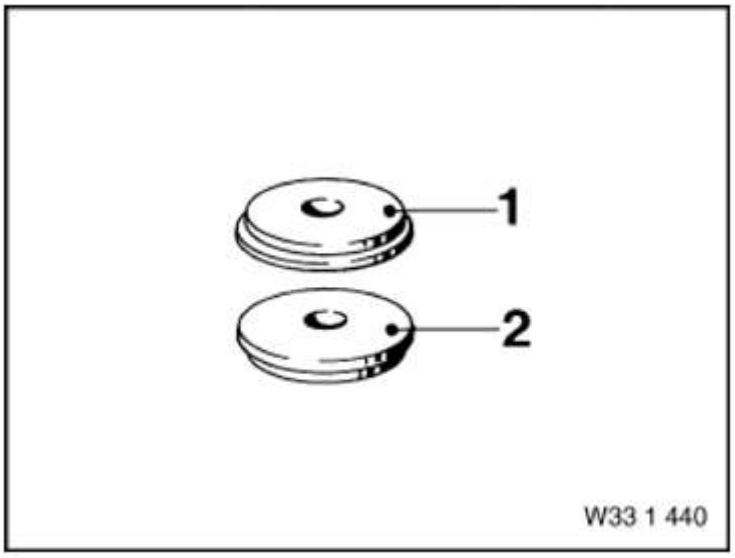


Fig. 344: Identifying Washer (0492154)
Courtesy of BMW OF NORTH AMERICA, INC.

0492141 WASHER

0492141 331392 Washer AM

NOTE: **(Measuring disc)**

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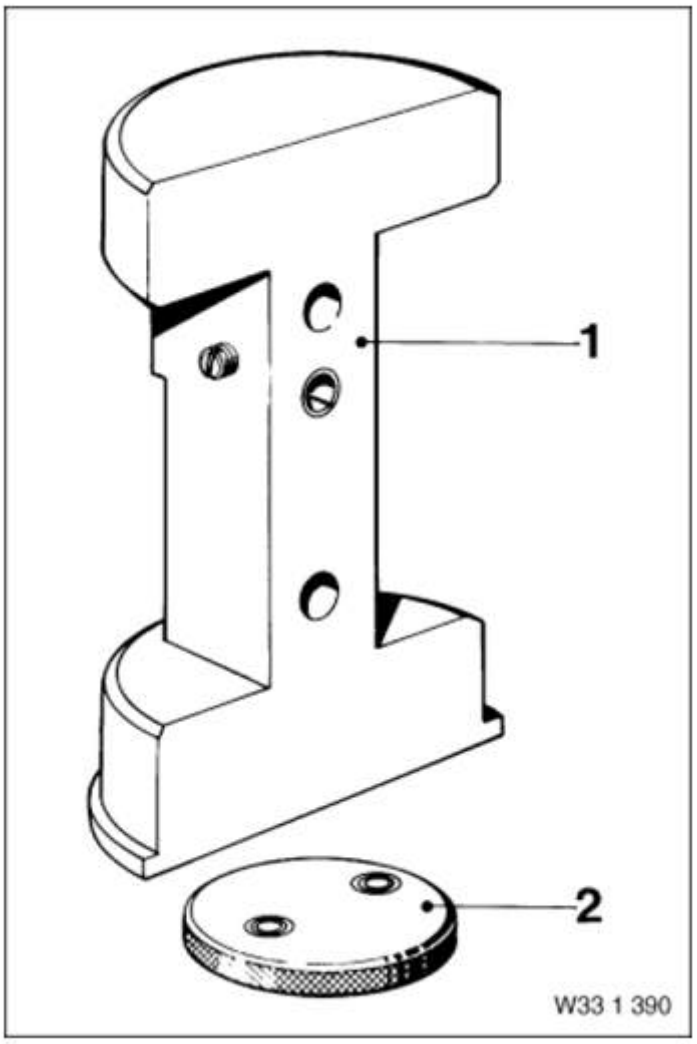


Fig. 345: Identifying Washer (0492141)
Courtesy of BMW OF NORTH AMERICA, INC.

0492327 WASHER

0492327 333340 Washer Mechanical tool

NOTE: **(Shaped disc) For pulling the rubber mount out of the front trailing arm**

Storage Location

A14

SI number

01 10 90 (288)

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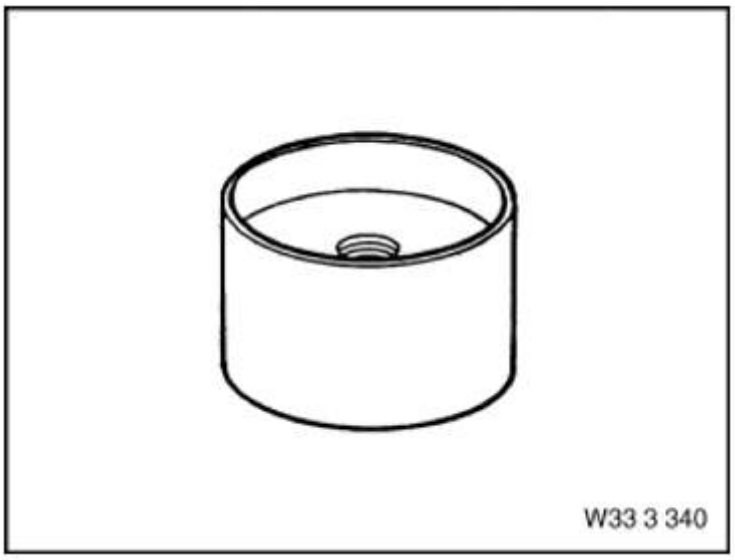


Fig. 346: Identifying Washer (0492327)
Courtesy of BMW OF NORTH AMERICA, INC.

0492226 WASHER

0492226 333113 Washer AM

Replaced by: 83300492227

NOTE: **(Form disc) Replaced by 33 3 115. (0 492 227)**

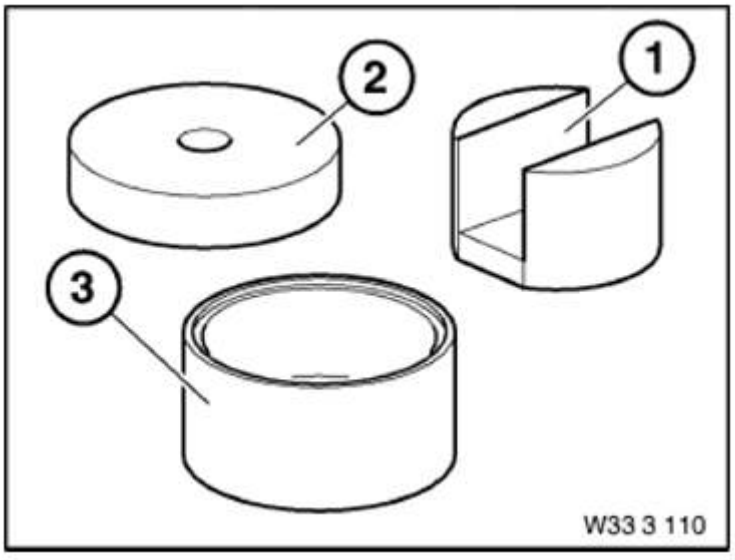


Fig. 347: Identifying Washer (0492226)
Courtesy of BMW OF NORTH AMERICA, INC.

0492082 WRENCH

0492082 331100 Wrench Mechanical tool

NOTE: **(Key) To counter-hold the drive flange - Replaced by universal key**

0493818 WRENCH

0493818 334403 Wrench AM

NOTE: **(Ignition key) Discontinued, only available via complete tool**

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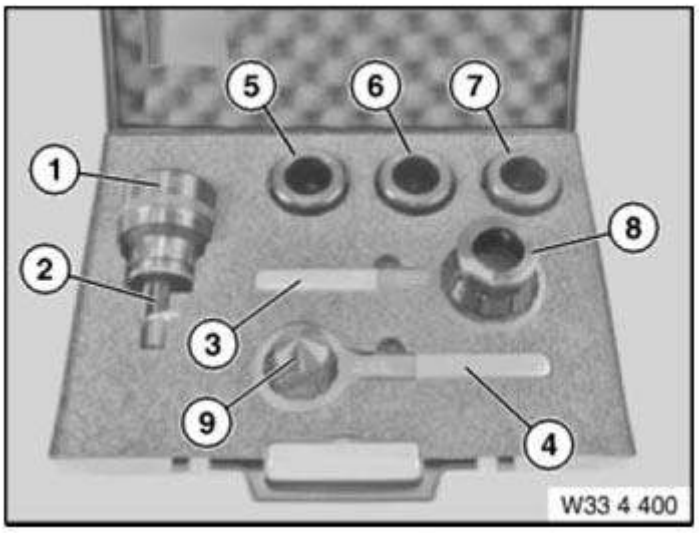


Fig. 348: Identifying Wrench (0493818)
Courtesy of BMW OF NORTH AMERICA, INC.

0496959 WRENCH

0496959 330080 Wrench Minimum set: Mechanical tools AM

In conjunction with: **33 5 070 = 0495554**

NOTE: **For loosening and tightening the propeller shaft to rear axle final drive screw connection (slot nut). SW50. Replaces SWZ 33 5 040 (0495551) as well from 09/2014.**



Fig. 349: Identifying Wrench (0496959)
Courtesy of BMW OF NORTH AMERICA, INC.

Storage Location

B28

SI number

01 11 10 (641)

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0493819 WRENCH

0493819 334404 Wrench AM

NOTE: **(Ignition key) Discontinued, only available via complete tool**

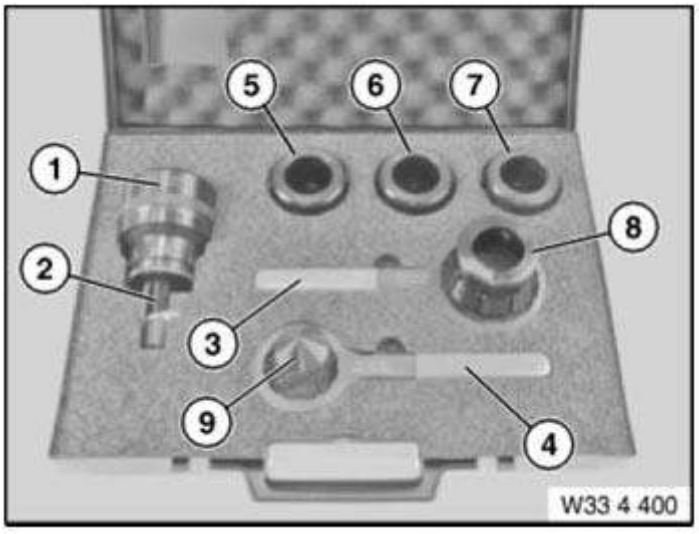


Fig. 350: Identifying Wrench (0493819)
Courtesy of BMW OF NORTH AMERICA, INC.

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GENERAL - TRACK WIDTH

33 00 GENERAL - TRACK WIDTH

GENERAL - TRACK WIDTH SPECIFICATION

Track width for normal position and rim offset (ET)	Â	Â
• ET32	mm	1632
• ET38	mm	1620
• ET43	mm	1610
• ET48	mm	1600
• ET51	mm	1595

TED-TED-TDMUC3300-F25_HOEHEB1S1 REAR AXLE - RIDE HEIGHT, BMW, F25

33 00 REAR AXLE - RIDE HEIGHT F25

REAR AXLE - RIDE HEIGHT SPECIFICATION

Ride height in normal position (attach tape measure to bottom middle of rim flange and measure to lower edge of wheel arch)		Â
Tolerance ride height in • NORMAL POSITION max. Â±10 mm • DESIGN POSITION max. Â±2 mm		Â
Difference ride height between left/right in • NORMAL POSITION 10 mm • DESIGN POSITION 2 mm		Â
Series	Â	Â
17" wheel rim	mm	664
18" wheel rim	mm	677
19" wheel rim	mm	689
20" wheel rim	mm	702
21" wheel rim	mm	715
Sport suspension (not low slung)	Â	Â
17" wheel rim	mm	664
18" wheel rim	mm	677
19" wheel rim	mm	689

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20" wheel rim	mm	702
21" wheel rim	mm	715

REAR AXLE FINAL DRIVE, 188LW

33 10 REAR AXLE FINAL DRIVE 188LW

REAR AXLE FINAL DRIVE SPECIFICATION

Use only approved final drive oils (refer to **REAR AXLE - OPERATING FLUIDS** .	Â	Â
Refilling oil quantity	litre	0.85

REAR AXLE FINAL DRIVE, 215LW

33 10 REAR AXLE FINAL DRIVE 215LW

REAR AXLE FINAL DRIVE SPECIFICATION

Use only approved final drive oils (refer to **REAR AXLE - OPERATING FLUIDS**).	Â	Â
Refilling oil quantity	litre	0, 9

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SUSPENSION

Rear Axle - Tightening Torques - X3 Utility

ANTI-ROLL BAR

33 55 ANTI-ROLL BAR

TIGHTENING TORQUE SPECIFICATION - ANTI-ROLL BAR

Â	Type	Thread	Tightening specifications	Dimension
1AZ Retaining bracket, anti-roll bar to rear axle support	F01/F02/F03/F04/F07/F06/F10/F11/F12/F13/F18	M10	Replace screws.	56 Nm
	F25/F26	M8	Replace screw.	34 Nm
2AZ Anti-roll bar link to anti-roll bar/swinging arm	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M10	Replace nuts.	56 Nm
	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18	M12	Replace nuts. Jointing torque Angle of rotation	Â 45 Nm 45 Â°
3AZ Vibration absorber to anti-roll bar bracket	F01/F02/F06/F07/F10/F11/F12	Â	Replace screw.	19 Nm
4AZ Anti-roll bar link to wheel carrier	F25/F26	M10	Replace screw.	56 Nm

REAR AXLE SUSPENSION

33 33 REAR AXLE SUSPENSION

TIGHTENING TORQUE SPECIFICATION - REAR AXLE SUSPENSION

Â	Type	Thread	Tightening specifications	Dimension
1AZ Rear axle support with rubber mounts to body	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18	M14	Â	165 Nm
	F25/F26	M12	Replace screws. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
2AZ Compression strut, front, to body	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18	M10	Replace screws. Jointing torque Angle of rotation	Â 56 Nm 45 Â°
	F25/F26	M12	Â	100 Nm
3AZ Rear compression strut to body	F03	M10	Replace screws. Jointing torque Angle of rotation	Â 56 Nm 45 Â°
4AZ Vibration absorber to rear axle support, front	F10/F11/F12/F13	M8	Â	19 Nm

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5AZ	Reinforcement plate to rear axle support	F06 M6/F10 M5/F12 M6/F13 M6	M10	Â	56 Nm
6AZ	Reinforcement plate on cross reinforcement	F12M	M12	Replace screws Jointing torque Angle of rotation	Â 100 Nm 90 Â°

REAR DIFFERENTIAL CASE WITH COVER

33 11 REAR DIFFERENTIAL CASE WITH COVER

TIGHTENING TORQUE SPECIFICATION - REAR DIFFERENTIAL CASE WITH COVER

Â		Type	Thread	Tightening specifications	Dimension
1AZ	Case Covers **TRANSMISSION ALLOCATION**	F01/F02/F06/F07/F10/F11/F12/F13/F18	M12	205AL 225AL	140 Nm
		F01/F02/F03/F04/F25/F26	M10	235K 235L 215LW	90 Nm
		F25/F26	M10	188LW	55 Nm
2AZ	Screw plug with O-ring	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M22	Replace screw plug with O-ring.	60 Nm
		F06 M6/F10 M5/F12 M6/F13 M6	M22	Replace screw plugs with O-ring.	45 Nm
3AZ	Vibration absorber to holder/housing cover	F01/F02/F06/F07/F10/F11	M12	Â	100 Nm
4AZ	Adapter to front of rear axle differential	F06 M6/F10 M5/F12 M6/F13 M6	M12	Â	100 Nm
5AZ	Adapter to rear of rear axle differential	F06 M6/F10 M5/F12 M6/F13 M6	M12	Â	69 Nm
6AZ	Temperature sensor to oil sump	F06 M6/F10 M5/F12 M6/F13	M6	Â	14 Nm
7AZ	Servomotor to rear axle final drive	F06 M6/F10 M5/F12 M6/F13 M6	M6	Â	10 Nm
8AZ	Side lid to rear axle differential	F06 M6/F10 M5/F12 M6/F13 M6	M8	Tighten screws crosswise.	32 Nm
9AZ	Oil sump to rear axle differential	F06 M6/F10 M5/F12 M6/F13 M6	M6	Â	12 Nm
10AZ	Vibration absorber to adapter at rear of rear axle differential	F06 M6/F10 M5/F12 M6/F13 M6	M8	Insert screw with Loctite. Remove any adhesive residue from the thread.)	21 Nm

REAR AXLE DIFFERENTIAL MOUNTINGS

33 17 REAR AXLE DIFFERENTIAL MOUNTINGS

TIGHTENING TORQUE SPECIFICATION - REAR AXLE DIFFERENTIAL MOUNTINGS

Â	Type	Thread	Tightening specifications	Dimension

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1AZ	Rear differential to rear axle carrier, front	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18	M12	Follow repair instruction. Replace screws. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
		F25/F26	M12	FOLLOW REPAIR INSTRUCTION .	100 Nm
2AZ	Rear differential to rear axle carrier, rear	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18	M14	Follow repair instruction. Replace nut.	175 Nm
		F25/F26	M14	FOLLOW REPAIR INSTRUCTION . Replace nut.	165 Nm
3AZ	Vibration absorber on front right rear axle final drive	F10/F11	M12	Replace nut.	56 Nm
4AZ	Vibration absorber to vibration absorber holder	F25/F26	M14	Â	100 Nm
5AZ	Front adapter to rear axle differential	F06 M6/F10 M5/F12 M6/F13 M6	M12	Replace screws.	120 Nm
6AZ	Rear adapter to rear axle differential	F06 M6/F10 M5/F12 M6/F13 M6	M12	Â	120 Nm

SHOCK ABSORBERS

33 52 SHOCK ABSORBERS

TIGHTENING TORQUE SPECIFICATION - SHOCK ABSORBERS

Â		Type	Thread	Tightening specifications	Dimension
1AZ	Nut and locknut/self-locking nut	F01/F02/F03/F04/F06/F10/F12/F13/F18	M8	Replace nuts.	28 Nm
		F07/F11	M8	Replace screws.	28 Nm
		F25/F26	M8	Replace screws. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	Â 25 Nm 45 Â°
2AZ	Support bearing flange to shock absorber	F01/F02/F04/F06/F07/F10/F11/F12/F13/F18	M12	Replace nut.	27 Nm
		F25/F26	M12	Replace nut.	34 Nm
3AZ	Shock absorber to wheel carrier	F01/F02/F04/F06/F10/F12/F13/F18	M16	Replace screw. TIGHTEN DOWN IN NORMAL POSITION .	250 Nm
		F06 M6/F10 M5/F12 M6/F13 M6	M14	TIGHTEN DOWN IN NORMAL POSITION .	165 Nm
4AZ	Shock absorber to swinging arm	F07/F11	M14	TIGHTEN DOWN IN NORMAL POSITION .	165 Nm
				Replace screw and nut.	

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5AZ	Spring strut to camber rod	F25/F26	M14	Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	Â 100 Nm 90 Â°

TRAILING ARMS AND STRUTS

33 32 TRAILING ARMS AND STRUTS

TIGHTENING TORQUE SPECIFICATION - TRAILING ARMS AND STRUTS

Â		Type	Thread	Tightening specifications	Dimension
1AZ	Trailing arm to rear axle support	F25/F26	M12	**TIGHTEN DOWN IN NORMAL POSITION** . Replace screw and nut. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
2AZ	Trailing arm to wheel carrier	F25/F26	M12	**TIGHTEN DOWN IN NORMAL POSITION** . Replace screw and nut. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
3AZ	Control arm to rear axle support	F25/F26	M12	**TIGHTEN DOWN IN NORMAL POSITION** . Replace screw and nut. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
4AZ	Guide arm to wheel carrier	F25/F26	M14	**TIGHTEN DOWN IN NORMAL POSITION** . Replace screw. Jointing torque Angle of rotation	Â 165 Nm 90 Â°
5AZ	Wishbone to rear axle support	F25/F26	M14	Replace screw and nut. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
6AZ	Wishbone to wheel carrier	F25/F26	M12	**TIGHTEN DOWN IN NORMAL POSITION** . Replace screw and nut. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
7AZ	Toe arm to rear axle support	F25/F26	M14	**TIGHTEN DOWN IN NORMAL POSITION** . Replace nut.	165 Nm
8AZ	Toe arm to wheel carrier	F25/F26	M14	**TIGHTEN DOWN IN NORMAL POSITION** . Replace screw. Jointing torque Angle of rotation	Â 165 Nm 90 Â°
9AZ	Camber arm to wheel carrier	F25/F26	M14	Replace screw and nut. Jointing torque Angle of rotation	Â 100 Nm 90 Â°
10AZ	Camber arm to rear axle support	F25/F26	M14	**TIGHTEN DOWN IN NORMAL POSITION** . Replace eccentric bolt and nut. Jointing torque Angle of rotation	Â 80 Nm 90 Â°

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WHEEL BEARINGS

33 41 WHEEL BEARINGS

TIGHTENING TORQUE SPECIFICATION - WHEEL BEARINGS

Â	Type	Thread	Tightening specifications	Dimension
1AZ Output shaft on drive flange hub	F01/F02/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M27	Replace collar nut. Jointing torque and angle of rotation must be observed without fail. Jointing torque Angle of rotation	Â 100 Nm 45 Â°
	F06 M6/F10 M5/F12 M6/F13 M6	M16	Observe the repair instructions. Replace collar bolt and spring. Jointing torque Angle of rotation	Â 50 Nm 155 Â°
	F03	M27	Replace collar nut.	420 Nm
2AZ Wheel bearing to wheel carrier	F01/F02/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M12	Replace screws.	100 Nm

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SUSPENSION

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

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.**

LIMITED SLIP DIFFERENTIALS REFERENCE CHART

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 Â

MOTORSPORT VEHICLES

MOTORSPORT VEHICLES REFERENCE CHART

Model	Part Number
All E46 M3, E60 M5, E63/E64 M6, E85 M roadster, E86 M coupe	83 22 1 470 080 (SAF-XJ)

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All F10 M5, F12 and F13 M6 with S63T engine	83 22 1 470 080 (SAF-XJ)
E82 (M Coupe) with the N54T engine E90, E92 and E93 (M3) with the S65 engine	Only use the specially formulated rear differential oil, BMW part number 83 22 2 282 583 (Quantity 3).

NON LIMITED SLIP DIFFERENTIALS

NON LIMITED SLIP DIFFERENTIALS REFERENCE CHART

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)	33 11 7 695 240 or 07 51 2 293 972

E71 X6 XDRIVE35I AND X6 XDRIVE50I: REAR DIFFERENTIAL WITH SUPERPOSING GEAR UNITS (QMVH)

The rear differential assembly consists of three separate filler plugs, one in the center for the angle drive with differential gear and one additional filler plug on each of the left and right superposing gear units.

Angle drive with differential gear (center filler plug): PN 83 22 9 407 768 (SAF-XO)

Superposing gear units (two outer filler plugs): PN 83 12 0 445 838 (SAF-CARBON)

3.0 FINAL DRIVE OIL FOR BMW M1 MOTORSPORT COUPE

The final drive of a BMW M1 is integrated into the manual transmission and the 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 long-life service rating. No oil changes are required for the life of the vehicle.

5.0 CARS WITHOUT SERVICE INDICATOR

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

Refer to Service Maintenance checklist for respective model year.

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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 M3/M5/M6 Up to 1, 200 miles max. engine speed 5500 RPM

Generally avoid full-throttle position 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

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

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).

Wurth Part No. 8932700

Loctite Part No. 21438

All Models

Resealing Final drive Cover can be obtained via Applied Industrial Technologies

Order item number 39246 (Loctite 5970 300ml)

10.0 PINION FLANGE LUBRICANT

All Models

To eliminate cracking or clicking noise from the rear of the vehicle while engaging a drive gear, releasing clutch, during load reversal (shifting from reverse to drive, etc.) or when accelerating from a stationary position.

BMW Part No. 83 22 0 443 864 Lubricant

OPERATING FLUIDS AS OF 11/2015

HYPOID OILS FOR DIFFERENTIAL X5/X6 REAR AXLE TRANSVERSE MOMENT DISTRIBUTION (QMVH TRANSMISSION)

Standard equipment: Series X6 - E71; X5M - F85; X6M - F86

Optional equipment: Series X5 - E70, F15, F16

	BMW part number	BMW part number	

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Trade name	China	Rest of the world	Container size
	Basic transmission, center: BMW final drive oil SAF-XO	33 11 7 695 240	1000 ml
Variable ratio transmission left/right: BMW final drive oil SAF-Carbon Mod.	83 12 0 446 012	83 12 0 445 832	3 x 500 ml

NOTE: For capacities for rear axle differential, see Technical data.

General information about final-drive transmission oils

Final-drive and hypoid transmission oil must fulfil the following requirements for handling high loads as arise at the tooth flanks of the hypoid gear:

- high load-carrying capacity
- high degree of immunity from seizure
- good protection against wear
- optimum frictional behavior and temperature stability
- compatibility with sealing materials
- resistance to ageing

A brand-name hypoid transmission oil already possesses these and other characteristics thanks to its high concentration of EP agents (EP = Extreme Pressure).

Oil additives

All final drives are designed in such a way that there is absolutely no need to use oil additives. BMW is totally against the use of such additives. We will also accept no liability for any consequences resulting from the use of additives.

HYPOID OILS FOR FINAL DRIVE WITHOUT DISC-TYPE LIMITED-SLIP DIFFERENTIAL

Exception: E30/325iX differential with viscous self-locking differential.

Up to model year 07/2011:

Trade name	BMW part number China	BMW part number Rest of the world	Container size
	BMW Synthetics OSP	33 11 7 695 240	1000 ml
BMW Synthetics OSP	83 22 9 407 768		60-liter barrel
	BMW Synthetics OSP	83 22 2 148 570	12x1 liter

As of model year 07/2011:

Hypoid Axle Oil G1 (BOT448) (for all rear axle differentials apart from M vehicles)	83 22 2 295 532 3 x 500 ml

Trade name	Manufacturer/Supplier
AGIP HLX	Agip
Aral transmission oil BS	Aral
Castrol SAF-X0	Castrol
Castrol Syntrax Longlife 75W-90	Castrol

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Castrol Syntrax B 75W-85	Castrol
Dearon BHS	DEA
FINA PONTONIC MS	Fina
FINA PONTONIC MX	Fina
Veedol SAF 66	Veedol
Mobil Gearlube VS 600	Mobil
BP Energear SHX	BP
VALVOLINE SynPower Gear Oil GL-5 Society of Automotive Engineers 75W-90	Valvoline
TRANSELF BM 75W--90	Elf
Shell transmission oil OLS-BMW	Shell
Westfalen Fugo BMO	Westfalen AG
MOTUL HYPO SYNT	Motul
Avia Hypoid 75W--90 EP	AVIA
Esso transmission oil NLS 75W--90	Esso
Fuchs TITAN Gear H 75W--90	Fuchs
Wintershall gear fluid BOS	Schmierstoffraffinerie Salzbergen GmbH
TOTAL Transmission ALD Society of Automotive Engineers 75W-90	

NOTE: **The above oils satisfy the demands required of lifetime oils.**

Oil change intervals are given in the vehicle-specific inspection sheets.

Before opening the container, "mix" the transmission oil to distribute the additives evenly through the oil.

General information about final-drive transmission oils

Final-drive and hypoid transmission oil must fulfil the following requirements for handling high loads as arise at the tooth flanks of the hypoid gear:

- high load-carrying capacity
- high degree of immunity from seizure
- good protection against wear
- optimum frictional behavior and temperature stability
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Oil additives

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HYPOID OILS FOR FINAL DRIVE UNIT WITH DISC-TYPE LIMITED SLIP DIFFERENTIAL (M MODELS AND WITH SA209 SELF-LOCKING DIFFERENTIAL)

As well as for final drive unit with electro-hydraulic limited-slip differential

Standard version: 1 Series: E82/M Coupe

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Standard version: 3-Series: E90/M3, E92/M3, E93/M3

Trade name	BMW part number China	BMW part number Rest of the world	Container size
BMW differential oil SAF-XJ + FM Booster	83 21 2 155 243	83 22 2 282 583	3x500 ml

Standard version: 3-Series:	Z3M, Z3 with SA209, E36 with SA209, E36/M3, E46/M3, E85/M Roadster, E86/M Coupe, F80/M3, F82/M4 Coupe, F83/M4 Convertible	
Standard version: 5-Series:	**E34/M5, E39/M5, E60/M5, E61/M5, F10/M5**	
Standard version: 6-Series:	**E63/M6, E64/M6, F06/M6, F12/M6, F13/M6**	
Trade name	**BMW part number Rest of the world**	**Container size**
BMW MSP/A synthetic differential oil	83 22 9 405 462	1000 ml (Trade Unit)
BMW MSP/A synthetic differential oil	83 22 2 365 988	12x1 liter
BMW MSP/A synthetic differential oil	83 22 9 407 871	208-liter barrel

Specific Hypoid oils released by name

Trade name	Manufacturer/Supplier
Castrol SAF-XJ	Castrol
Castrol Syntrax Limited Slip 75W-140	Castrol
MOTUL HYPO SYNT LS	Motul
Mobil transmission oil VS 500	Mobil
Aral transmission oil BS-LSX	Aral
BP Energear SHX-ZR	BP
Avia Hypoid 75W--140 LSX	AVIA
Agip HLZ	Agip
FINA PONTONIC MLK	Fina
Shell transmission oil ZLS-BMW	Shell
Wintershall gear fluid BMS Plus	Schmierstoffraffinerie Salzbergen GmbH
Westfalen Fugo BMS	Westfalen AG

NOTE: **The above oils satisfy the demands required of lifetime oils.**

Oil change intervals are given in the vehicle-specific inspection sheets.

Before opening the container, "mix" the transmission oil to distribute the additives evenly through the oil.

General information about final-drive transmission oils

Final-drive and hypoid transmission oil must fulfil the following requirements for handling high loads as arise at the tooth flanks of the hypoid gear:

- high load-carrying capacity
- high degree of immunity from seizure
- good protection against wear
- optimum frictional behavior and temperature stability

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- compatibility with sealing materials
- resistance to ageing

A brand-name hypoid transmission oil already possesses these and other characteristics thanks to its high concentration of EP agents (EP = Extreme Pressure).

Oil additives

All final drives are designed in such a way that there is absolutely no need to use oil additives. BMW is totally against the use of such additives. We will also accept no liability for any consequences resulting from the use of additives.

FINAL-DRIVE GEAR OILS FOR BMW M1 MOTORSPORT COUP

In the BMW M1, the final drive is integrated into the manual transmission and is lubricated by the same oil. The following oil specifications apply:

During the breaking-in phase or after replacing the final drive (the first 1, 000 km (approx. 620 miles), use of the following oils is approved:

Trade name	Manufacturer/Supplier
Fuchs Renogear H 90	Fuchs
Veedol Multigear AX	Veedol

After this period, only manual-transmission gear oils that comply with specification SAE 80 MIL-L-2105 A or API-GL 4 may be used.

These manual-transmission gear oils are available from the parts sales department:

Trade name	BMW part number	Container size
Manual transmission oil	81 22 9 407 052	20-liter canister
Manual transmission oil	81 22 9 407 053	50-liter barrel
Manual transmission oil	81 22 9 407 178	205-liter barrel

NOTE: **Oil-change intervals and rules to be followed when breaking can be found in the maintenance documentation or the Repair Instructions of the model in question.**

General information about final-drive transmission oils

Final-drive and hypoid transmission oil must fulfil the following requirements for handling high loads as arise at the tooth flanks of the hypoid gear:

- high load-carrying capacity
- high degree of immunity from seizure
- good protection against wear
- optimum frictional behavior and temperature stability
- compatibility with sealing materials
- resistance to ageing

A brand-name hypoid transmission oil already possesses these and other characteristics thanks to its high concentration of EP agents (EP = Extreme Pressure).

Oil additives

All final drives are designed in such a way that there is absolutely no need to use oil additives. BMW is totally

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against the use of such additives. We will also accept no liability for any consequences resulting from the use of additives.

OUTPUT SHAFTS

The joints of the output shafts are lubricated for life and therefore maintenance-free. If repairs are carried out, the amount of joint grease required is enclosed in the "Repair kit, gaiter".

WHEEL BEARINGS

See **2.0 APPROVED HIGH TEMPERATURE MULTI-PURPOSE GREASE** .

GREASE FOR FLANGE NUT AND INPUT FLANGE, GLUE FOR THREADS OF FLANGE NUT

The following grease should be used for greasing the contact surfaces of the flange nut to the bearing inner ring and to the insert nut, and for greasing the face of the drive flange.

The Drei Bond glue is to be used for the threads of the flange nut.

Trade name	BMW part number	Container size
Castrol Optitemp HAT LF1	83 23 0 417 754	50g tube
Drei Bond adhesive, type 1385	83 19 0 417 376	50g tube

TRANSMISSION OIL FOR ELECTRIC VEHICLES

Model series:I12			
Trade name	**Transmission:**	**BMW part number**	**Container size**
ATF 6	GA6F21AW	83 22 2 355 599	1000 ml
BMW i TF	GE2I12GK	83 22 2 365 760	1000 ml

Series : E82 e; M12, I01, I01 Range extender			
Trade name	**Gearbox:**	**BMW part number**	**Container size**
Hypoid Axle Oil G1	GE1B100H; GE1E84H; GE1B130H; GE1B131H	83 22 2 295 532	3 x 500 ml

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Article GUID: A00396002

ELECTRONIC CHASSIS ALIGNMENT

32 00... ADDITIONAL WORK FOR CAMBER CORRECTION

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

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

Necessary preliminary tasks:

Adjust **TOE-IN**.

Check camber values; if necessary, replace **swivel bearing** . See **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** or **31 21 090 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWIVEL BEARING** with over- or under-dimension variant.

NOTE: Camber correction swivel bearings are marked with an -/+ and, if applicable, with a color coding/part number at position (1), see Fig. 1!

Version	Identification	Color coding	Part number
Standard	Â	No color coding	6 855 953/954
Plus 30'	+	Green color dot	6 857 411/412
Minus 30'	-	Blue color dot	6 857 413/414

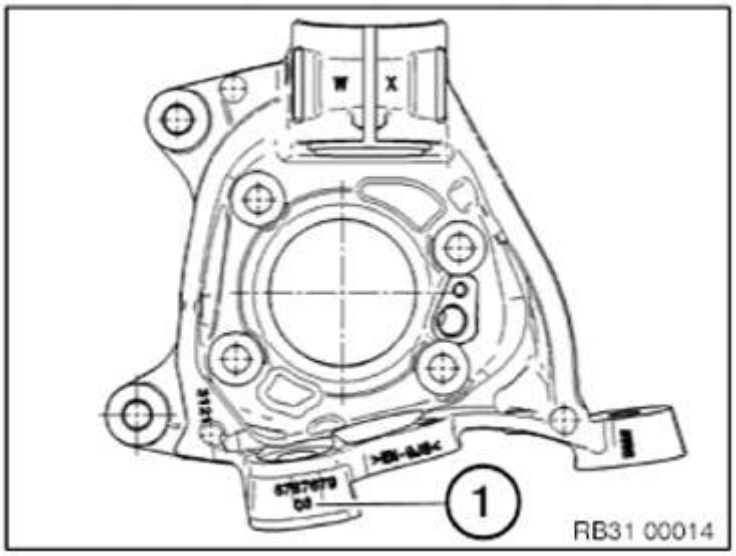


Fig. 1: Identifying Swivel Bearings Mark
Courtesy of BMW OF NORTH AMERICA, INC.

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

After Installation note:

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- Check directional stability of car; if necessary, repeat **TOE-IN** adjustment.

32 00 620 ADJUSTING REAR AXLE

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

Adjusting camber:

Renew nut (1) and eccentric bolt (2) and tighten to 5 Nm.

Turn eccentric bolt (2) to adjust camber to setpoint value.

Tighten nut (1).

Tightening torque **33 32 10AZ** .

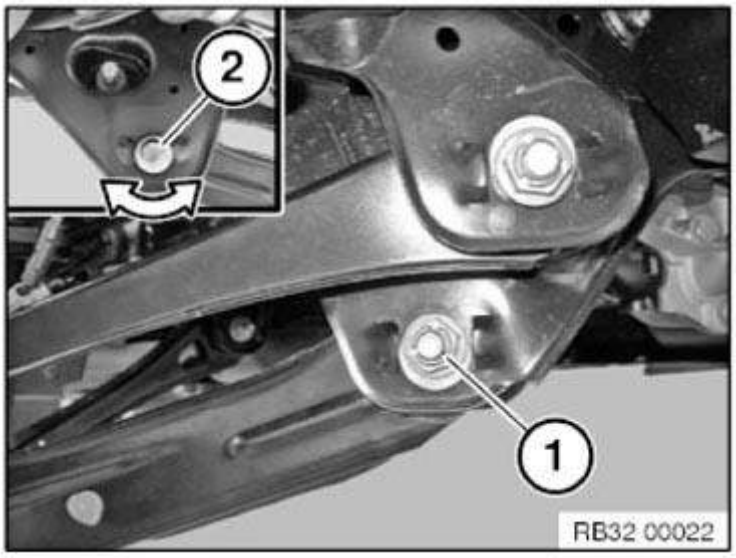


Fig. 2: Turning Eccentric Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Adjusting toe:

Renew nut (2) and eccentric bolt (1) and tighten to 5 Nm.

Turn eccentric bolt (1) to adjust toe to setpoint value.

Tighten nut (2).

Tightening torque **33 32 7AZ** .

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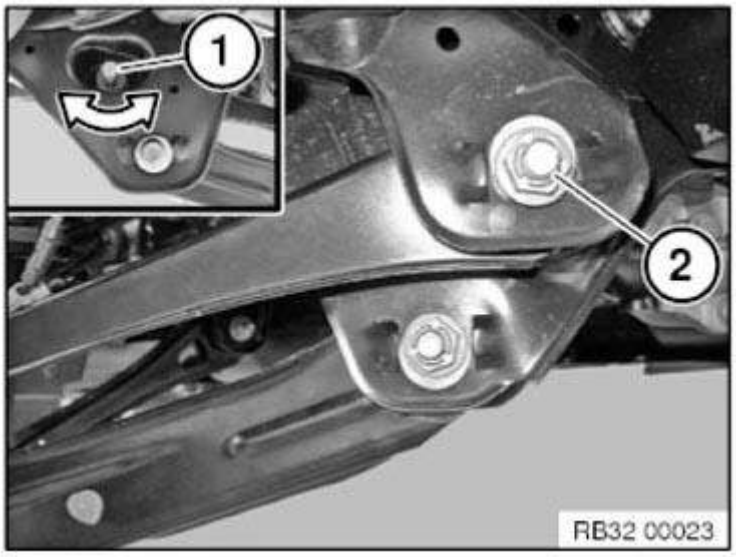


Fig. 3: Turning Eccentric Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

32 00 601 ADJUSTING TOE-IN ON FRONT AXLE

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

Version with active steering:

- Align steering wheel.
- Set total steering angle by means of the service function "Carry out initial operation/adjustment for active steering" to "zero".
- If necessary, secure with steering wheel arrester.

Version without active steering:

Remove front **UNDERBODY PROTECTION** .

Move steering into straight-ahead driving position by means of markings on cap (1) and steering box (2).

Align steering wheel and secure with steering wheel arrester.

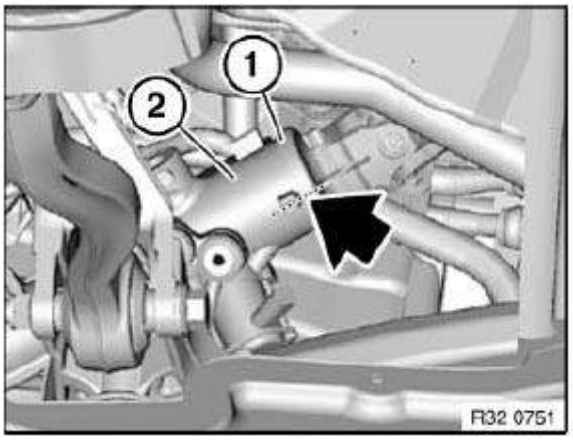


Fig. 4: Locating Steering Box Mark On Cap
Courtesy of BMW OF NORTH AMERICA, INC.

Clean thread on track rod.

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Slacken clamping nut (2), gripping track rod end (1) in the process.

Remove clamp (4).

Turn track rod (3) to adjust toe-in to setpoint value.

Version with active steering: Check total steering angle; if necessary, set to "zero".

Check toe values, repeat adjustment if necessary.

Tighten down clamping nut (2).

Tightening torque **32 21 2AZ** .

Fit clamp (4).

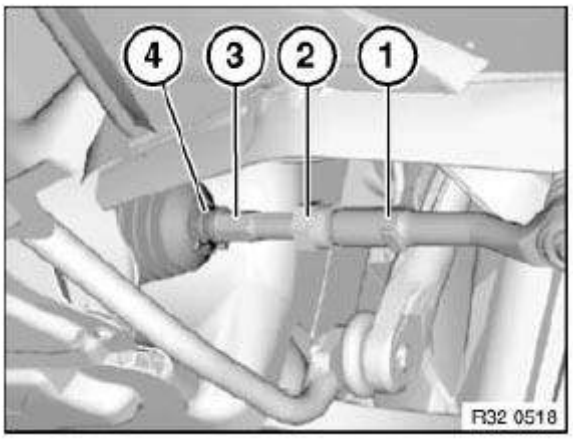


Fig. 5: Identifying Clamping Nut, Track Rod And Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check directional stability of vehicle; if necessary, repeat toe-in adjustment

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

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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.

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

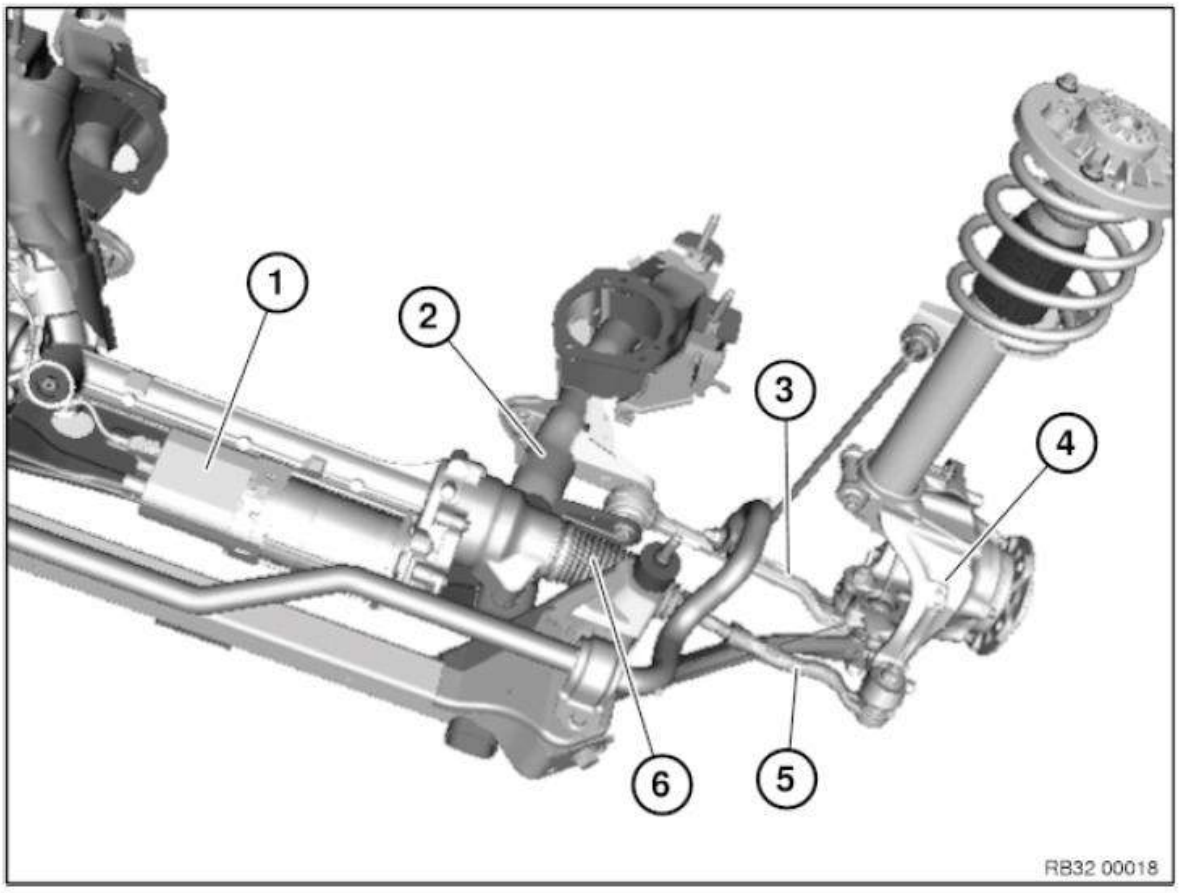


Fig. 6: Overview Of Front Axle Steering Wheel
Courtesy of BMW OF NORTH AMERICA, INC.

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

Release the following screw connections:

- Steering box to front axle support
- Lower wishbone to front axle support
- Track rod end to track rod

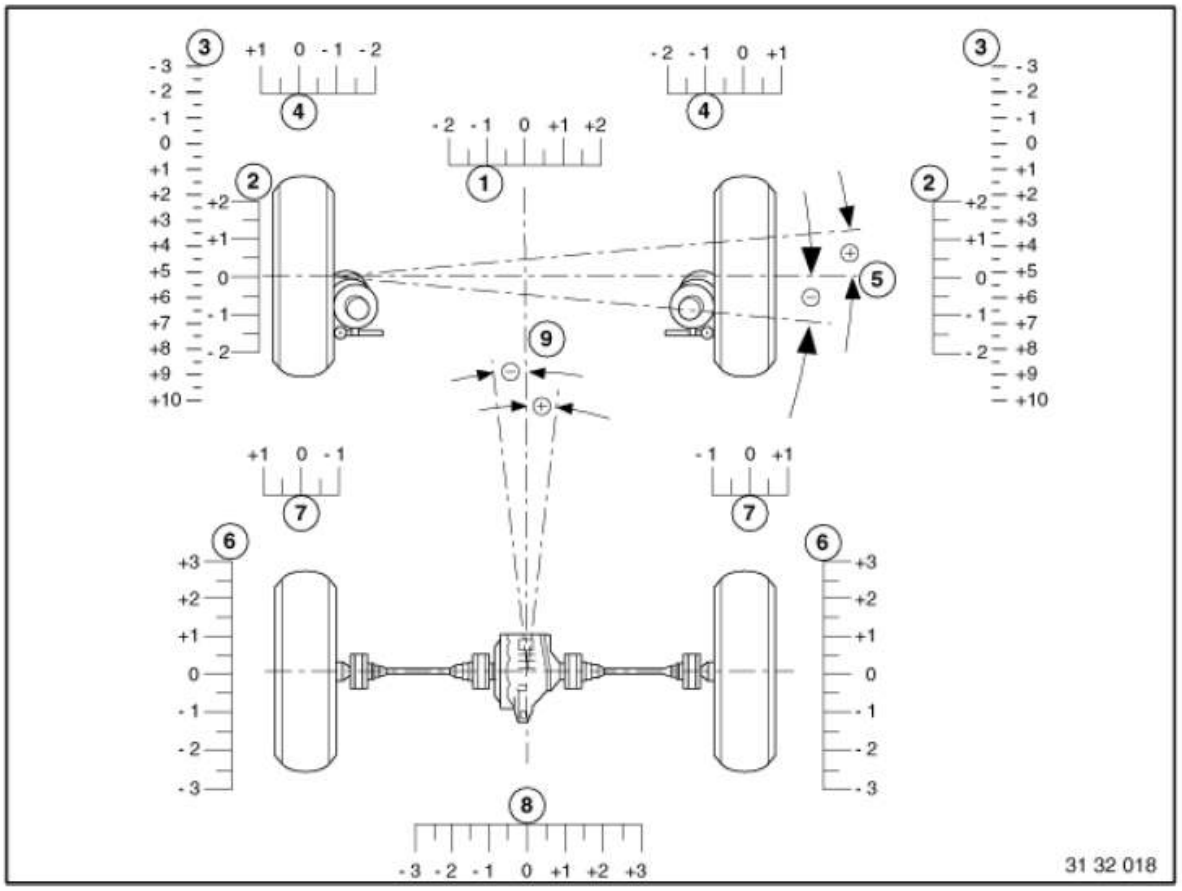
Replace the following components:

- Steering box (1)
- Front axle support (2)
- Wishbone, bottom (3)
- Swivel bearing (4)

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- Track rod end (5)
- Track rod (6)

32 00... GENERAL CHASSIS AND SUSPENSION DEFINITIONS



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

Fig. 7: Identifying Chassis And Suspension Dimension
Courtesy of BMW OF NORTH AMERICA, INC.

32 00... GENERAL INFORMATION AND DEFINITIONS

Toe angle difference

a - Toe difference angle

D - Center point of operating circle

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

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

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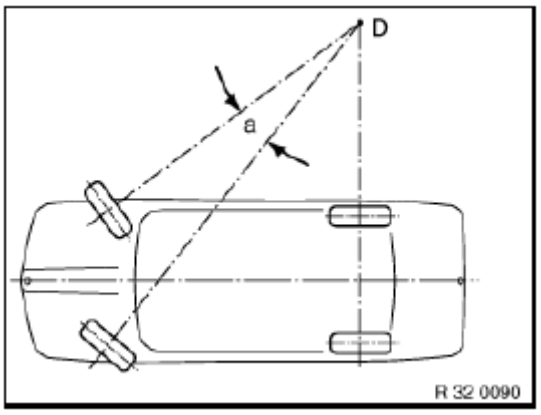


Fig. 8: Identifying Toe Angle Difference
Courtesy of BMW OF NORTH AMERICA, INC.

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

Camber

Inclination of the wheel from the perpendicular.

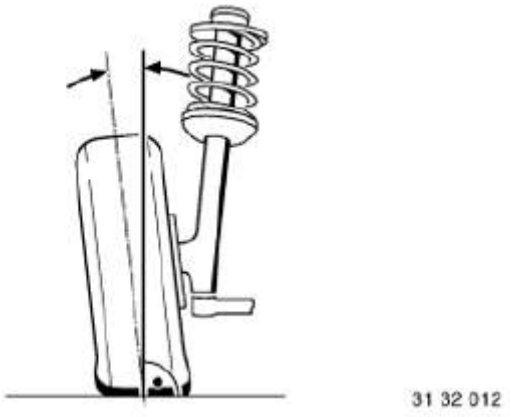


Fig. 9: Identifying Inclination Angle Of Wheel
Courtesy of BMW OF NORTH AMERICA, INC.

Toe

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

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

Measurement is performed in "straight-ahead mode".

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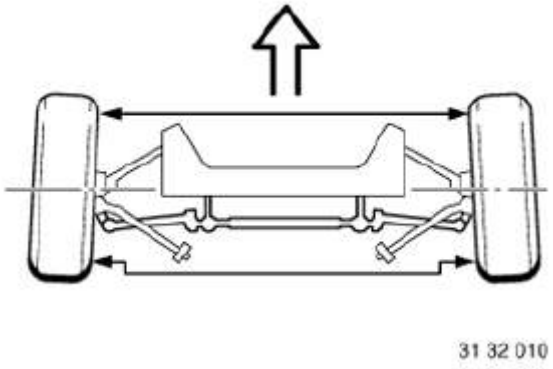


Fig. 10: Removing Front And Rear Wheels Distance
Courtesy of BMW OF NORTH AMERICA, INC.

Castor

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

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

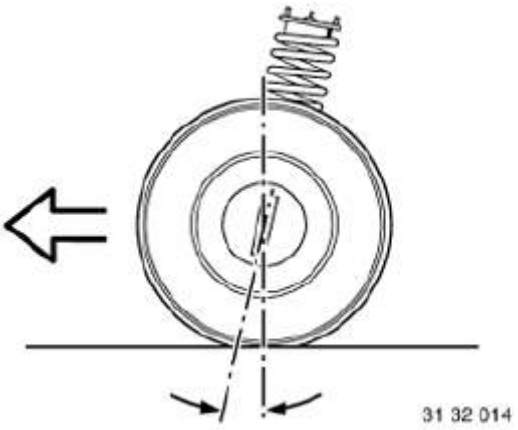


Fig. 11: Identifying Castor Angle
Courtesy of BMW OF NORTH AMERICA, INC.

Geometrical driving axis 1

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

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

Symmetrical axis 2

Center line running through front and rear axles.

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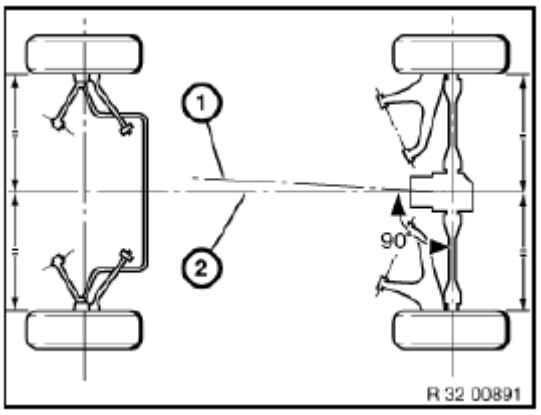


Fig. 12: Identifying Geometrical Driving Axis Dimension
Courtesy of BMW OF NORTH AMERICA, INC.

Wheel misalignment

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

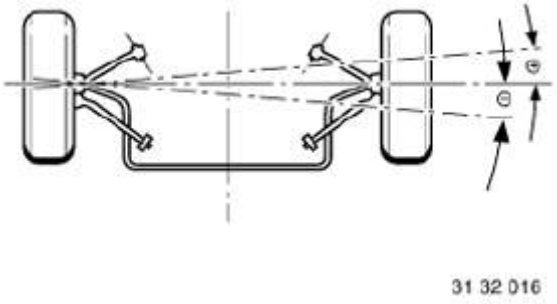


Fig. 13: Identifying Wheel Misalignment Angle
Courtesy of BMW OF NORTH AMERICA, INC.

Kingpin offset/scrub radius

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

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

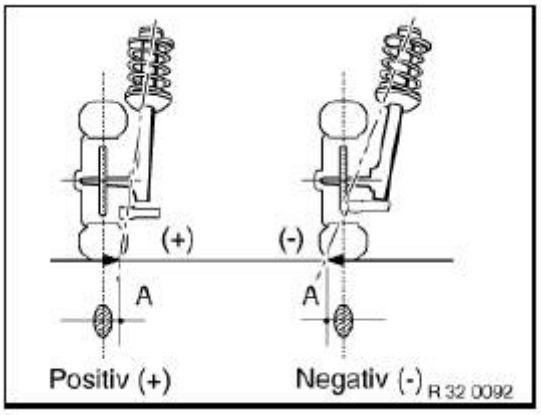


Fig. 14: Identifying Kingpin Offset/Scrub Radius Dimension
Courtesy of BMW OF NORTH AMERICA, INC.

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32 00... IDENTIFICATION OF SUSPENSION WITHOUT LABEL

NOTE: **If the front spring strut does not have a label for suspension identification, the type of suspension can be identified from the part number.**

32 00 150 KDS CHASSIS/WHEEL ALIGNMENT CHECK WITH VEHICLE LOAD UP TO DESIGN POSITION

Carry out wheel alignment with DIN load **only** :

IMPORTANT:

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

NOTE:

- **Read and comply with GENERAL INFORMATION AND DEFINITIONS.**
- **Read and comply with GENERAL CHASSIS DEFINITION.**
- **Update KDS DATA STATES.**
- **Check compliance with TEST CONDITIONS, repair vehicle if necessary.**

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

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

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

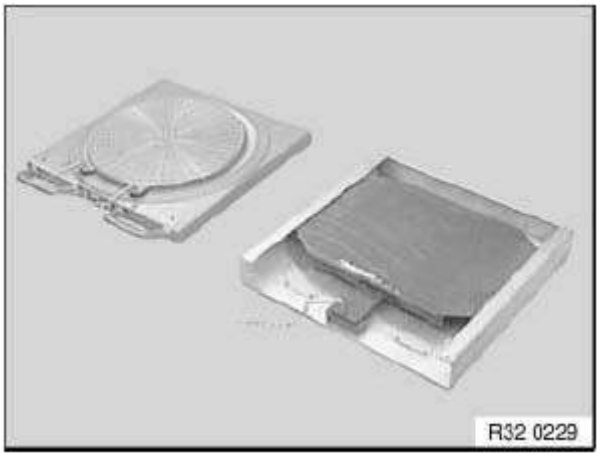


Fig. 15: Identifying Rotary And Sliding Plates
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Vehicles with active steering:**
Start up active steering prior to wheel alignment!
On vehicles with rear axle slip angle control:
Service function "Moving HSR actuator to center position" is included in active steering start-up.

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

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

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IMPORTANT: Due to excessive measuring inaccuracy, other quick-clamping units are not permitted!
Illustration of KDS II pickup

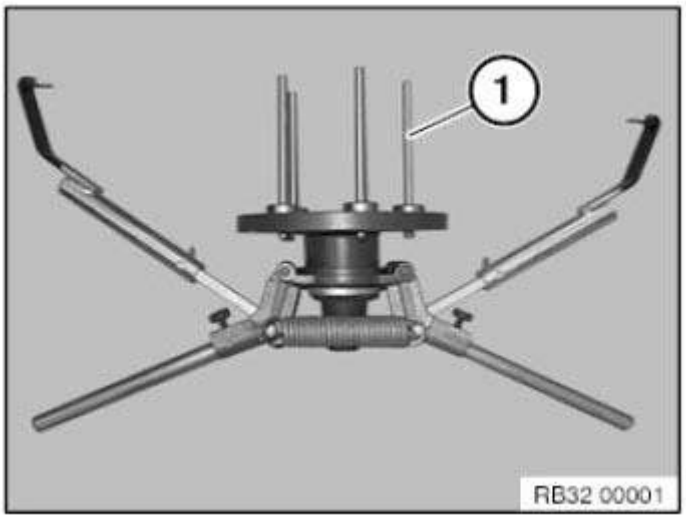


Fig. 16: Identifying Control Pins
Courtesy of BMW OF NORTH AMERICA, INC.

- Enter customer and vehicle data.
- Identify chassis version and select vehicle.
- Enter tire inflation pressure and tread depth.
- Move **VEHICLE INTO DESIGN POSITION**.
- Install brake tensioner.

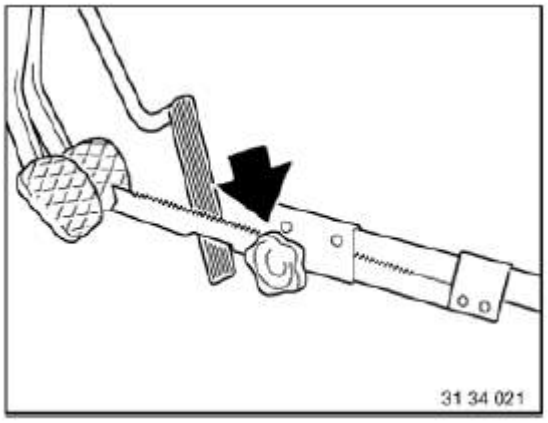


Fig. 17: Locating Brake Tensioner
Courtesy of BMW OF NORTH AMERICA, INC.

- Remove locking pins from both rotary and sliding plates.
- Perform input measurement in accordance with equipment manufacturer's instructions.
- If necessary, adjust **front axle and rear axle** . See **32 00 601 ADJUSTING TOE-IN ON FRONT AXLE** or **32 00... ADDITIONAL WORK FOR CAMBER CORRECTION**.
- Perform output measurement in accordance with equipment manufacturer's instructions.
- Save and print out test record.
- Insert locking pins into both rotary and sliding plates.
- Remove chassis/wheel alignment system.

32 00... KDS DATA STATUSES

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Setpoint values for wheel alignment are not published in ISTA.

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

32 00 155 KDS WHEEL ALIGNMENT CHECK WITH RIDE HEIGHT MEASUREMENT WITHOUT VEHICLE LOAD

Do not perform wheel alignment with the vehicle unladen.

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

NOTE:
- **Read and comply with GENERAL INFORMATION AND DEFINITIONS.**
- **Read and comply with GENERAL CHASSIS DEFINITION.**
- **Update KDS DATA STATES.**
- **Check compliance with TEST CONDITIONS, repair vehicle if necessary.**

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

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

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

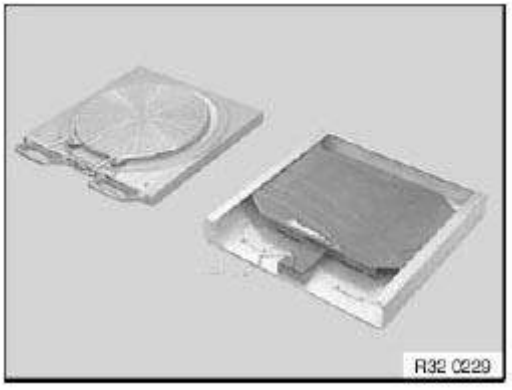


Fig. 18: Identifying Rotary And Sliding Plates
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE:
- **Vehicles with active steering:**

  Start up active steering prior to wheel alignment.

  On vehicles with rear axle slip angle control: Service function "Moving HSR actuator to center position" is included in active steering start-up.

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

IMPORTANT: Use only quick connectors with poly control pins (1).
Due to excessive measuring inaccuracy, other quick-clamping units are not permitted!

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Illustration of KDSII pick-up!

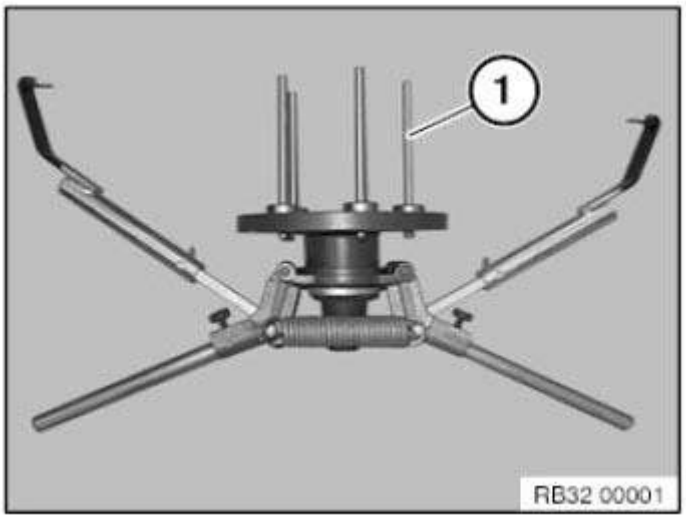


Fig. 19: Identifying Control Pins
Courtesy of BMW OF NORTH AMERICA, INC.

- Enter customer and vehicle data
- Identify chassis version and select vehicle
- Enter tire inflation pressure and tread depth
- Measure **VEHICLE RIDE HEIGHT** with tape measure (only Beissbarth KDSII wheel alignment equipment)

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

- Install brake tensioner.

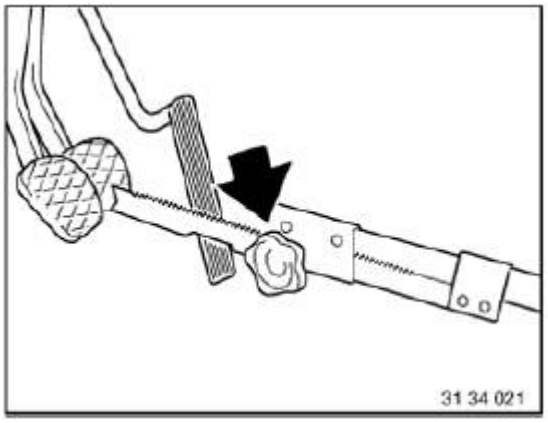


Fig. 20: Locating Brake Tensioner
Courtesy of BMW OF NORTH AMERICA, INC.

- Remove locking pins from both rotary and sliding plates.
- Perform input measurement in accordance with equipment manufacturer's instructions.
- If necessary, adjust **front axle and rear axle** . See **32 00 601 ADJUSTING TOE-IN ON FRONT AXLE**, **32 00... ADDITIONAL WORK FOR CAMBER CORRECTION** or **32 00 620 ADJUSTING REAR AXLE**.
- Perform output measurement in accordance with equipment manufacturer's instructions.
- Save and print out test record.

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- Insert locking pins into both rotary and sliding plates
- Remove chassis/wheel alignment system

31 33... MEASURING VEHICLE RIDE HEIGHT

Determine actual ride height (A) - to do so, attach tape measure to rim flange (2) at bottom middle and measure to wheel arch lower edge (1).

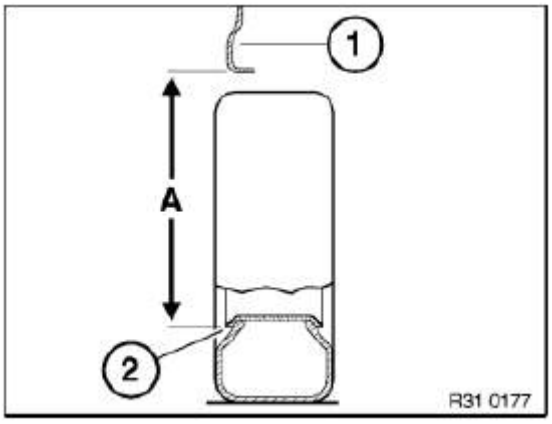


Fig. 21: Checking Actual Ride Height
Courtesy of BMW OF NORTH AMERICA, INC.

32 00... MOVING VEHICLE INTO DESIGN POSITION

Necessary preliminary tasks:

- Move **VEHICLE INTO NORMAL POSITION**.
- **F01/F02/F07/F11/F15/F16: Version with air suspension system:**
  - Remove ignition key.
  - Pull fuse for air supply unit control unit.
- Add/distribute weights in area of spring struts until the vehicle ride height is within the tolerance. See **FRONT AXLE - RIDE HEIGHT, BMW, F25** or **REAR AXLE - RIDE HEIGHT, BMW, F25**).

  Measure **VEHICLE RIDE HEIGHT** .

32 00... MOVING VEHICLE INTO NORMAL POSITION

Necessary preliminary tasks:

- Check compliance with **TEST CONDITIONS**, repair vehicle if necessary.
- F01/F02/F04/F11/F15/F16/F85/F86: Version with air suspension system: Carry out **RIDE HEIGHT ADJUSTMENT** .
- Check vehicle interior and luggage compartment (including spare wheel well) for load status, if applicable, unload motor vehicle.
- Introduce DIN load (refer to **TECHNICAL DATA**) into vehicle.

32 00... NOTES ON REPLACEMENT OF STEERING GEAR/STEERING COLUMN/STEERING SHAFT FOLLOWING ACCIDENT DAMAGE

Steering gear facts:

In the event of accidents or driving conditions similar to accidents, shock-like loads can cause different types of damage to steering boxes. When a steering box is externally undamaged, it is sometimes only possible to

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identify damage with great difficulty and with great effort. However, damage of this nature poses an unacceptable risk to the vehicle because it can result in failure of the steering system.

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

Steering gear procedure:

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

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

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

C. Permissible tolerances exceeded during axle/wheel alignment (include alignment record with invoice/report if necessary)

D. Fire damage

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

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

Facts on steering column and steering shaft:

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

Procedure for steering column and steering shaft:

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

- Visible or noticeable damage, deformation or breakage of the steering column or the steering shaft
- Damage, permanent deformation or breakage of the track rod
- Unacceptable torque increase and jamming when the steering column is turned from limit position to limit position (without hydraulic/electrical support)
- Permissible tolerances exceeded after wheel alignment (include alignment record with invoice/report if necessary)

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- Positive check for activated crash system of the mechanical steering column:

  If there is no visible damage to the steering column, the steering column needs to be checked for an activated crash system:

  1. Open steering column lock
  2. Pull steering wheel out towards the driver (towards the body) until the physical limit position is reached, but do not use excessive force
  3. Push steering wheel towards engine compartment (approx. 20-30 mm away from body) into the comfort position and lock

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

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

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

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

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

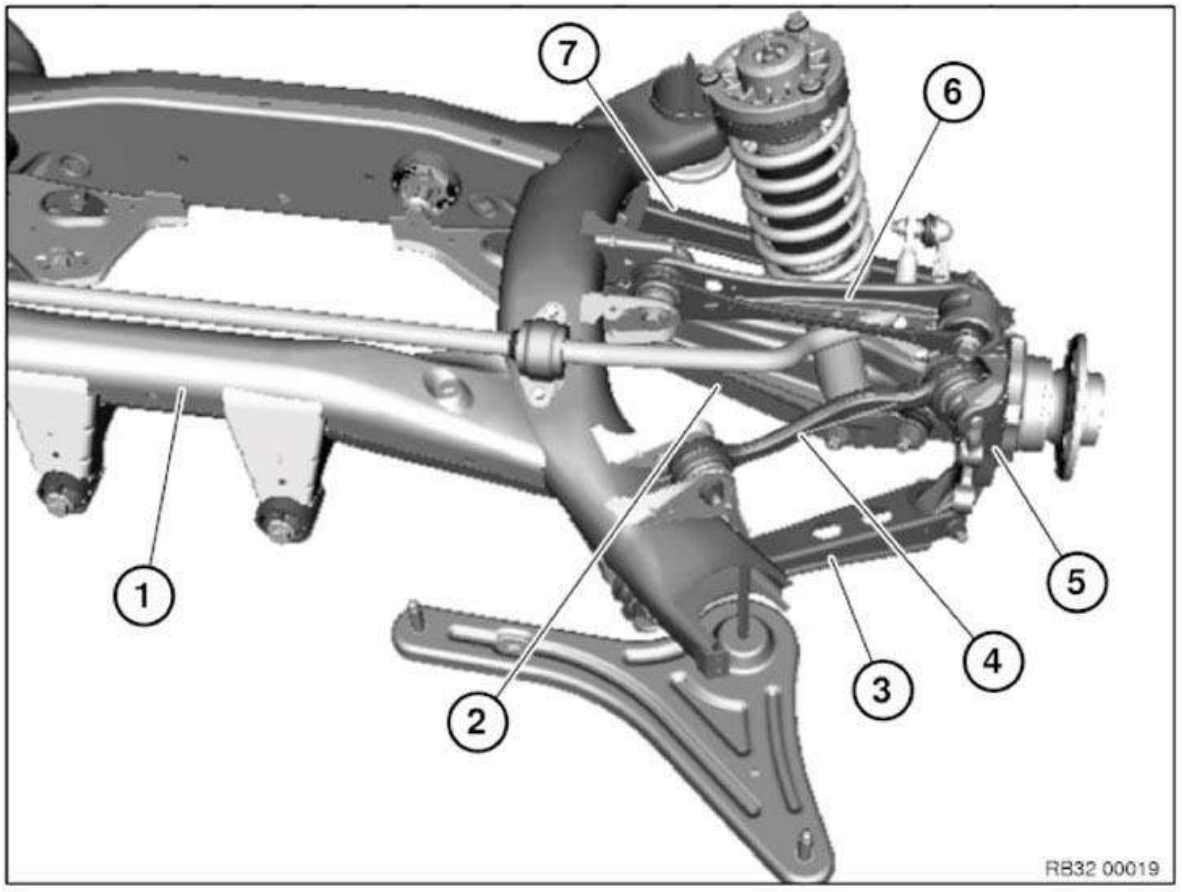


Fig. 22: Identifying Rear Axle Support, Wheel Carrier And Toe Arm
Courtesy of BMW OF NORTH AMERICA, INC.

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

- **Release of following screw connections:**
  - Camber arm on rear axle support (2)
  - Toe arm on rear axle support (7)
- **Replacement of following parts:**
  - Rear axle support (1)
  - Toe arm (2)
  - Wheel carrier (5)
  - Wishbone (6)
  - Toe arm (7)

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 safety 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.**

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

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- Open seat belt buckle and driver's door

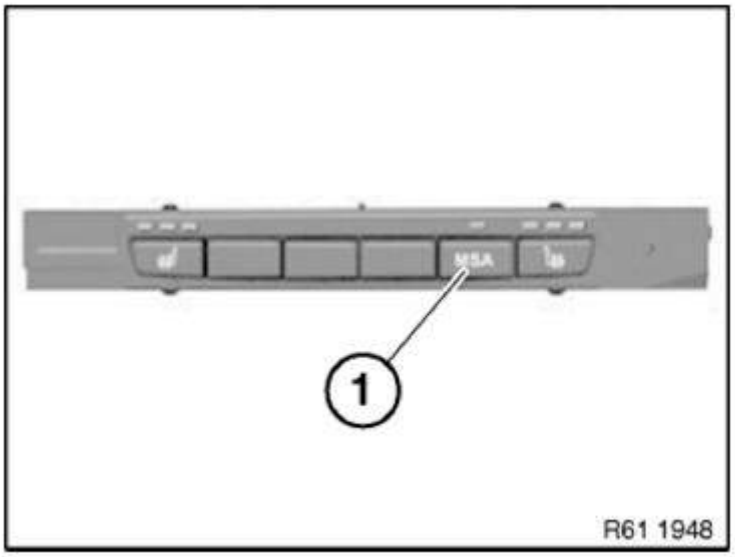


Fig. 23: Identifying MSA Button In Passenger Compartment
Courtesy of BMW OF NORTH AMERICA, INC.

- 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.

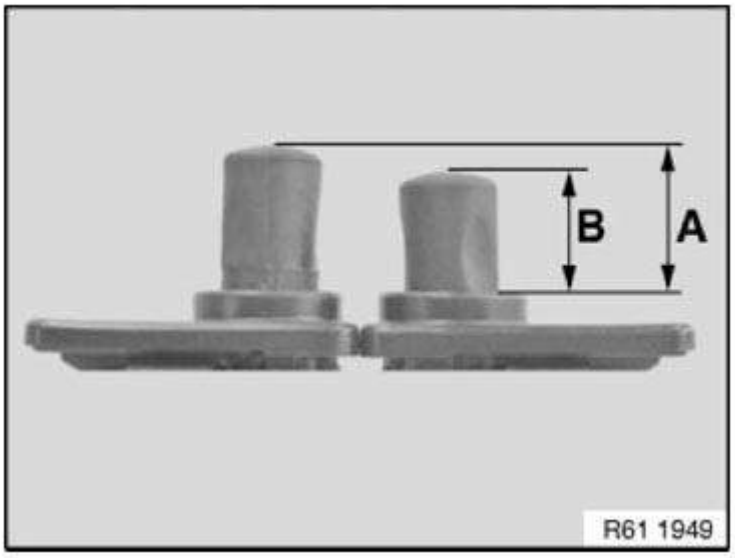


Fig. 24: Identifying Engine Bonnet/Hood Dimension
Courtesy of BMW OF NORTH AMERICA, INC.

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!

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Recycling:

Observe country-specific waste disposal regulations.

Measures if oil is unintentionally released:

- **Personal precautionary measures:** Danger of slipping! Keep noninvolved 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.

34 52.. START-UP OF ICM CONTROL UNIT

NOTE: Start-up of ICM control unit must be carried out:

- **After replacement or removal and installation of ICM control unit**

Connect vehicle to BMW diagnosis system.

Select and carry out start-up of ICM control unit under Service functions.

32 00... TEST CONDITIONS FOR CHASSIS/WHEEL ALIGNMENT CHECK

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

1. Only BMW approved wheel and tire combinations may be installed on the vehicle
2. Correct tread depth. The tread depth for each axle may differ from left to right by max. 1-2 mm.
3. Correct tire pressure (see label on vehicle).
4. All chassis and suspension components must be technically OK.
5. Condition of suspension and shock absorbers OK: Visually inspect for breakage, etc.
6. Vehicles with self-levelling suspension: Pull fuse of air supply system so that there is no controlling down or up.

MECHANICAL STEERING GEAR

32 11... NOTES ON CHECKING STEERING BACKLASH ON VEHICLES WITH RACK-AND-PINION STEERING

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

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

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

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

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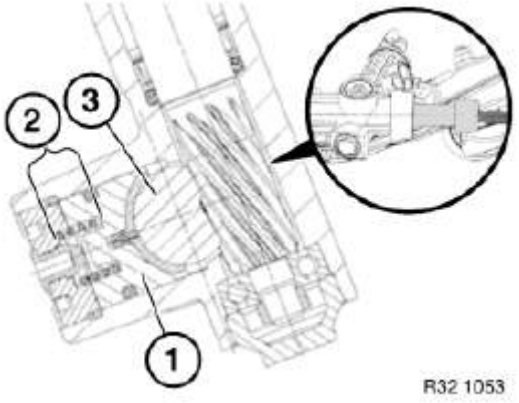


Fig. 25: Identifying Thrust Member, Spring And Rack
Courtesy of BMW OF NORTH AMERICA, INC.

3 = Rack

Solution:

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

Desired state:

The steering must be backlash-free in all components!

32 00... NOTES ON REPLACEMENT OF STEERING GEAR/STEERING COLUMN/STEERING SHAFT FOLLOWING ACCIDENT DAMAGE

Steering gear facts:

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

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

Steering gear procedure:

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

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

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

C. Permissible tolerances exceeded during axle/wheel alignment (include alignment record with invoice/report if necessary)

D. Fire damage

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E. Damage, permanent deformation or fractures to:

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

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

Facts on steering column and steering shaft:

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

Procedure for steering column and steering shaft:

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

- Visible or noticeable damage, deformation or breakage of the steering column or the steering shaft
- Damage, permanent deformation or breakage of the track rod
- Unacceptable torque increase and jamming when the steering column is turned from limit position to limit position (without hydraulic/electrical support)
- Permissible tolerances exceeded after wheel alignment (include alignment record with invoice/report if necessary)
- Positive check for activated crash system of the mechanical steering column:

  If there is no visible damage to the steering column, the steering column needs to be checked for an activated crash system:

  1. Open steering column lock
  2. Pull steering wheel out towards the driver (towards the body) until the physical limit position is reached, but do not use excessive force
  3. Push steering wheel towards engine compartment (approx. 20-30 mm away from body) into the comfort position and lock

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

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

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

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

32 11 100 REPLACING GAITER FOR STEERING BOX ON LEFT OR RIGHT

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

Necessary preliminary tasks:

- Remove **UNDERBODY PROTECTION** .
- Remove **TRACK ROD END**.

Clean track rod.

Release band clamp (1) and **EAR CLIP** (3).

Detach gaiter (2) from track rod.

Installation note:

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

Clean track rod and apply grease to taper.

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

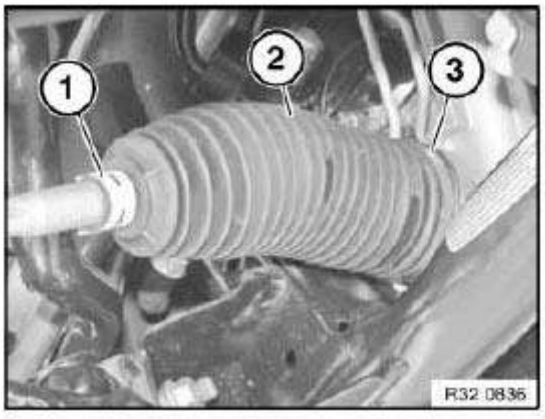


Fig. 26: Identifying Band Clamp, Track Rod And Gaiter
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Perform **CHASSIS/WHEEL ALIGNMENT CHECK**.

STEERING GEAR WITH SERVO UNIT

32 00... NOTES ON REPLACEMENT OF STEERING GEAR/STEERING COLUMN/STEERING SHAFT FOLLOWING ACCIDENT DAMAGE

Steering gear facts:

In the event of accidents or driving conditions similar to accidents, shock-like loads can cause different types of damage to steering boxes. When a steering box is externally undamaged, it is sometimes only possible to

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identify damage with great difficulty and with great effort. However, damage of this nature poses an unacceptable risk to the vehicle because it can result in failure of the steering system.

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

Steering gear procedure:

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

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

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

C. Permissible tolerances exceeded during axle/wheel alignment (include alignment record with invoice/report if necessary).

D. Fire damage

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

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

Facts on steering column and steering shaft:

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

Procedure for steering column and steering shaft:

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

- Visible or noticeable damage, deformation or breakage of the steering column or the steering shaft
- Damage, permanent deformation or breakage of the track rod
- Unacceptable torque increase and jamming when the steering column is turned from limit position to limit position (without hydraulic/electrical support)
- Permissible tolerances exceeded after wheel alignment (include alignment record with invoice/report if necessary)

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- Positive check for activated crash system of the mechanical steering column:

  If there is no visible damage to the steering column, the steering column needs to be checked for an activated crash system:

  1. Open steering column lock
  2. Pull steering wheel out towards the driver (towards the body) until the physical limit position is reached, but do not use excessive force
  3. Push steering wheel towards engine compartment (approx. 20-30 mm away from body) into the comfort position and lock

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

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

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

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

32 13 572 REPLACE ELECTRICAL STEERING BOX (EPS) (N52/N55/N57)

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

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

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

Necessary preliminary tasks:

- Disconnect **BATTERY EARTH LEAD** .

  NOTE: **High-current-carrying wiring laid with permanent positive connection (80 A fuse).**

- Remove **UNDERBODY PROTECTION** .
- Release **BOTTOM OF STEERING SHAFT AT STEERING BOX**.
- Release **LEFT AND RIGHT TRACK ROD END** at swivel bearing.
- Lower **FRONT AXLE SUPPORT** .
- Loosen **ANTI-ROLL BAR** on the front left and right.

Unlock plug connections (1) and disconnect.

Unfasten screws (2).

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Tightening torque, **32 00 1AZ** .

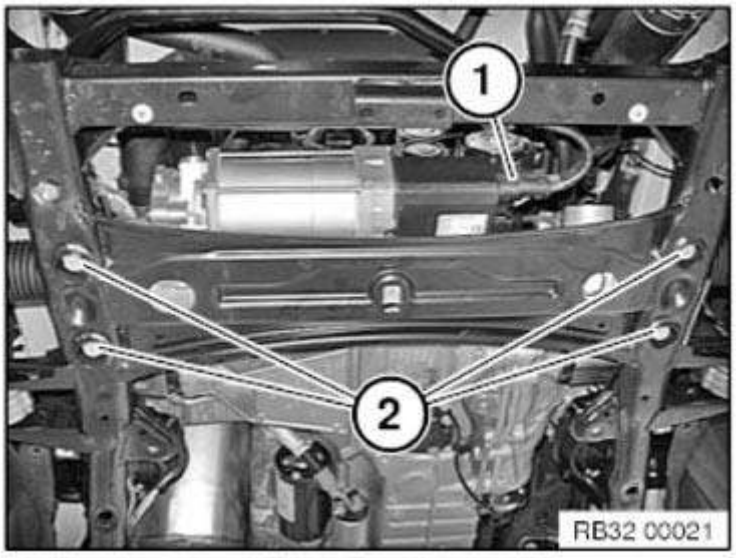


Fig. 27: Identifying Plug Connections And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Risk of damage!
IMPORTANT: Pay attention to connector housing on steering box while removing steering box!
Carefully remove steering gear towards the front!

Installation note:

Remount **TRACK ROD END** on left and right.

After installation:

- Turn steering wheel in both directions to the limit position. The airbag indicator light must not light up in the process.
- Carry out **PROGRAMMING/ENCODING** .
- Teach in **END STOP SOFTWARE**.
- Perform **CHASSIS/WHEEL ALIGNMENT CHECK**.

32 13 572 REPLACE ELECTRICAL STEERING GEAR (EPS) (N20/N47)

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

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

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

Necessary preliminary tasks:

- Disconnect **BATTERY EARTH LEAD** .

NOTE: **High-current-carrying wiring laid with permanent positive connection (80**

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A fuse).

- Remove **UNDERBODY PROTECTION** .
- Remove **FRONT WHEEL** on the left and right.
- Release **LEFT WISHBONE** at front axle carrier.
- Release **LEFT TENSION STRUT** at front axle carrier.
- Release **LEFT AND RIGHT TRACK ROD END** at swivel bearing.
- Release **ANTI-ROLL BAR LINK** at antiroll bar, left and right.
- Release **ANTI-ROLL BAR** at front axle carrier, left and right.
- Release **BOTTOM OF STEERING SHAFT AT STEERING BOX**.

Unlock plug connections (1) and disconnect.

Unfasten screws (2).

Tightening torque, **32 00 1AZ** .

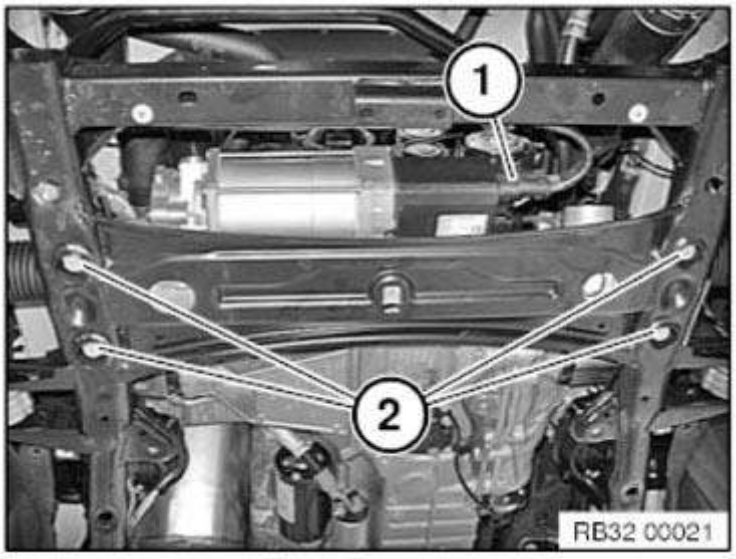


Fig. 28: Identifying Screws And Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Risk of damage!
Pay attention to connector housing on steering box while removing steering box!
IMPORTANT: Press back spring strut a little.
Hold up anti-roll bar.
Carefully remove steering box towards left-hand side.

Installation note:

Remount **TRACK ROD END** on left and right.

After installation:

- Turn steering wheel in both directions to the limit position. The airbag indicator light must not light up in the process.
- Carry out **PROGRAMMING/ENCODING** .
- Teach in **END STOP SOFTWARE**.
- Perform **CHASSIS/WHEEL ALIGNMENT CHECK**.

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

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

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

Necessary preliminary tasks:

- Disconnect **BATTERY EARTH LEAD** .

NOTE: High-current-carrying wiring laid with permanent positive connection (80 A fuse).

- Remove **UNDERBODY PROTECTION** .
- Release **LEFT WISHBONE** at front axle carrier.
- Release **LEFT TENSION STRUT** at front axle carrier.
- Release **LEFT AND RIGHT TRACK ROD END** at swivel bearing.
- **REMOVE** left output shaft.
- Release **ANTI-ROLL BAR** at front axle carrier, left and right.
- Release **ANTI-ROLL BAR LINKS** at anti-roll bar, left and right.
- Release **BOTTOM OF STEERING SHAFT AT STEERING BOX**.

Unlock plug connections (1) and disconnect.

Unfasten screws (2).

Tightening torque, **32 00 1AZ** .

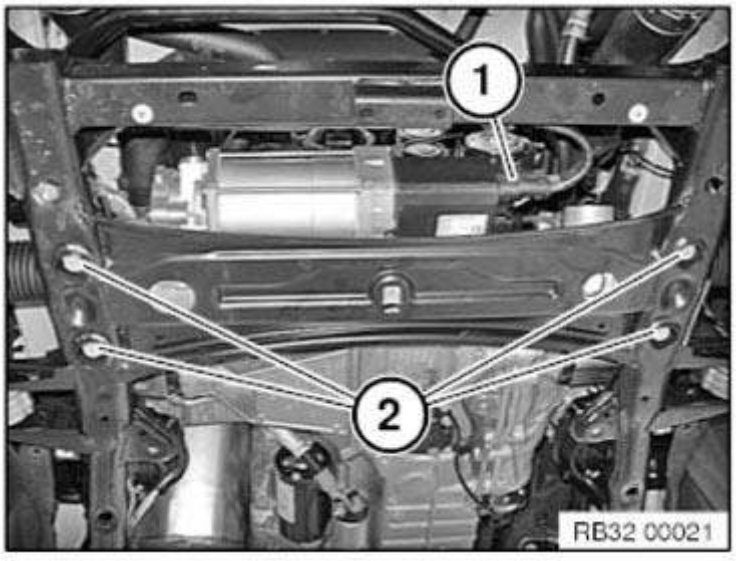


Fig. 29: Identifying Plug Connections And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

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Risk of damage!
Pay attention to connector housing on steering box while removing steering box!
IMPORTANT: Press back spring strut a little.
Hold up anti-roll bar.
Carefully remove steering box towards left-hand side.

Installation note:

Remount **TRACK ROD END** on left and right.

After installation:

- Turn steering wheel in both directions to the limit position. The airbag indicator light must not light up in the process.
- Carry out **PROGRAMMING/ENCODING** .
- Teach in **END STOP SOFTWARE**.
- Perform **CHASSIS/WHEEL ALIGNMENT CHECK**.

32 10... TEACHING IN END STOP SOFTWARE FOR ELECTRIC STEERING GEAR (EPS)

NOTE: **The end stop software must be taught in:**

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

Connect vehicle to BMW diagnosis system.

Select and perform end stop under Service functions.

STEERING ARMS, TIE RODS, STEER. DAMPER

32 41... INSTRUCTIONS FOR REMOVING AND INSTALLING EAR CLIPS

Special tools required:

- 32 1 260

NOTE: **The work steps are show on assorted components.**
Ear clip must always be replaced.

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

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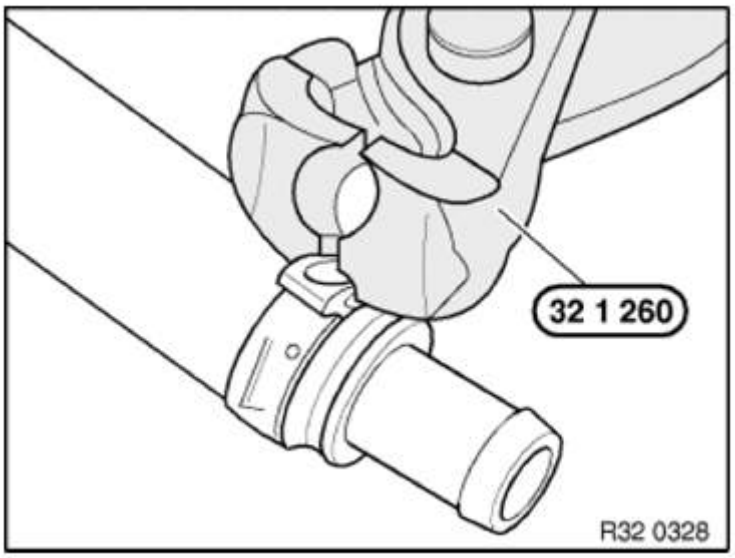


Fig. 30: Removing Ear Clip
Courtesy of BMW OF NORTH AMERICA, INC.

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

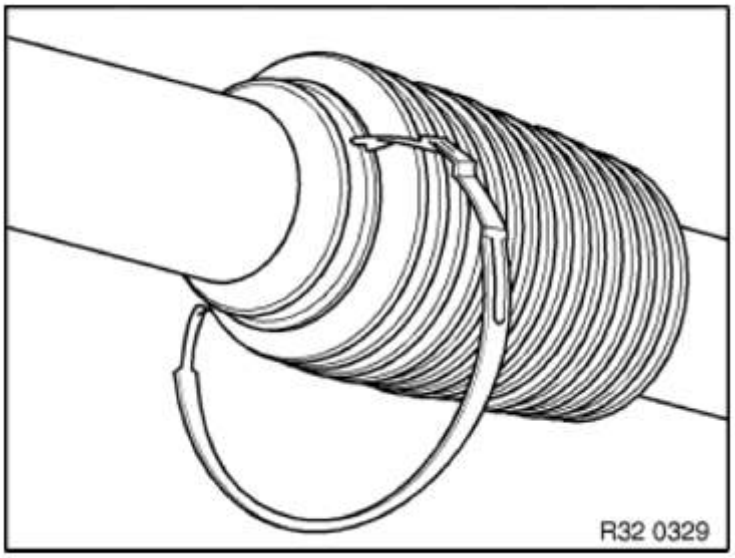


Fig. 31: Identifying Ear Clip
Courtesy of BMW OF NORTH AMERICA, INC.

Attach hook fastener and press ear together with special tool 32 1 260.

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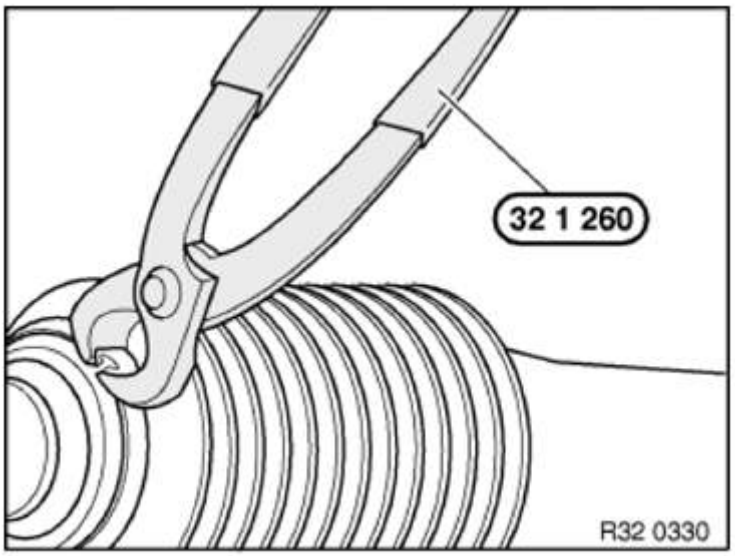


Fig. 32: Attaching Hook Fastener
Courtesy of BMW OF NORTH AMERICA, INC.

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

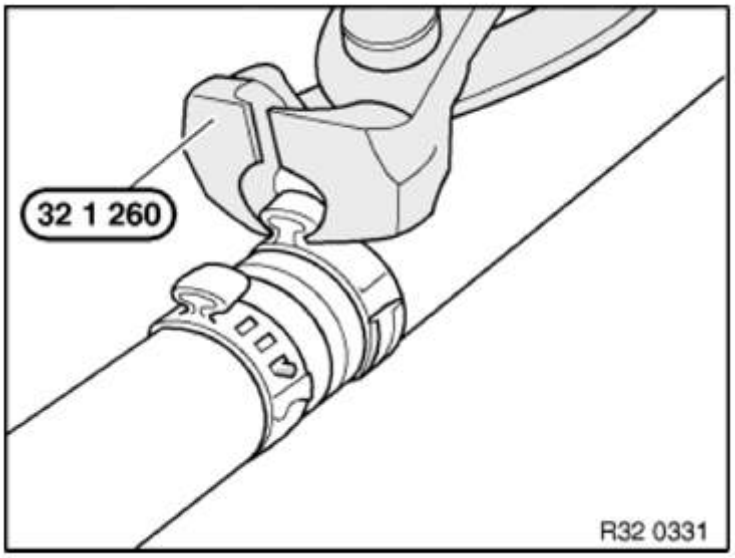


Fig. 33: Cutting Diagonal Pliers Area
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Gap (A) max. 1 mm!

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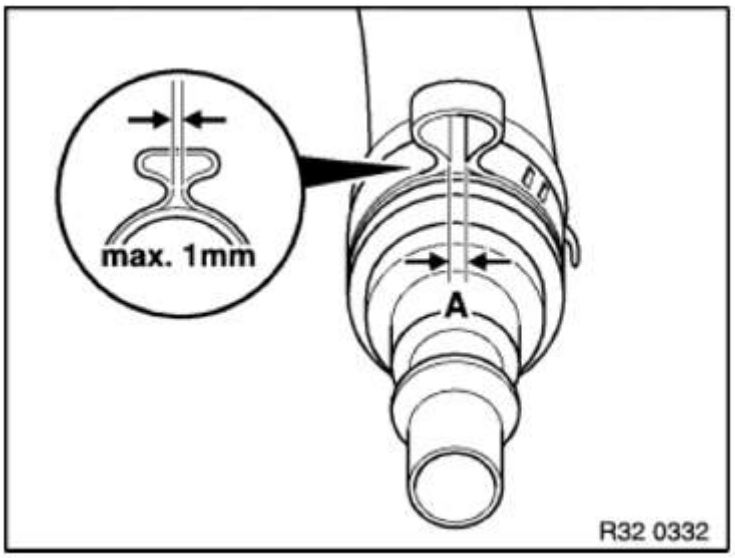


Fig. 34: Identifying Ear Clip Gap
Courtesy of BMW OF NORTH AMERICA, INC.

32 21 151 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT TRACK ROD END

Special tools required:

- 31 2 300

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

Necessary preliminary work:

- Remove **FRONT WHEEL** .

IMPORTANT: Do **not** release track rod end from swivel bearing with impact tool.
Check rubber boot and sliding ring for damage.
Do not pull stainless steel ring off journal.
If renewing swivel bearing, check seal seat of sliding ring between track rod and swivel bearing, replacing track rod end if necessary.

Loosen nut (1), gripping inner Torx socket if necessary.

Press track rod end (2) with special tool 31 2 300 off swivel bearing.

Unscrew nut (1).

Installation note:

Keep track rod end (2) to swivel bearing connection clean and free from oil and grease.

Replace self-locking nut.

Tightening torque **32 21 3AZ** .

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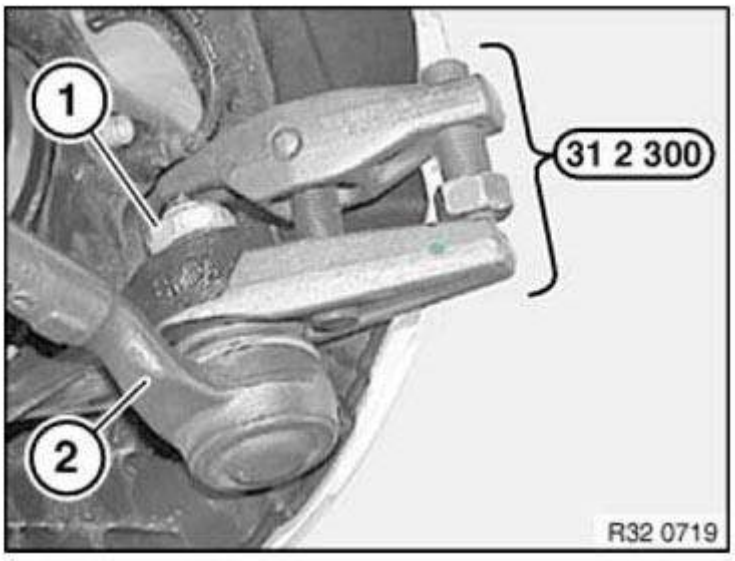


Fig. 35: Pressing Tie Rod End Using Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.

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

Loosen nut (1).

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

Installation note:

Check **GAITER** for damage, replace if necessary.

Screw track rod end onto track rod to dimension (A).

Tightening torque **32 21 2AZ** .

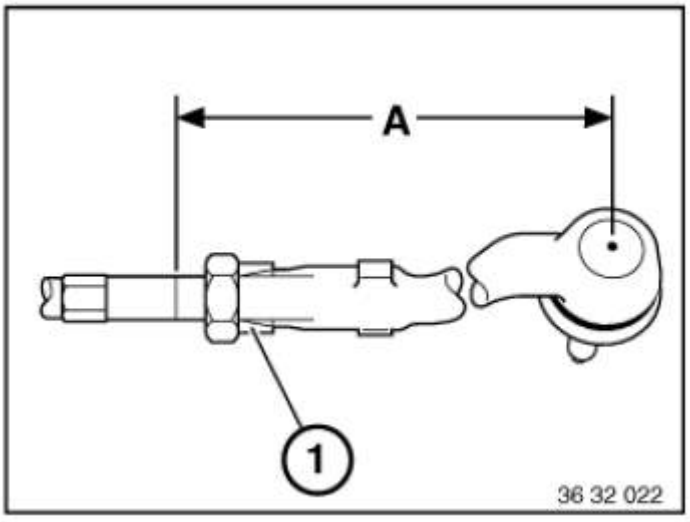


Fig. 36: Identifying Tie Rod End Dimension
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Perform **WHEEL ALIGNMENT CHECK**.

32 21 231 REPLACING (REMOVING AND INSTALLING) LEFT OR RIGHT TRACK ROD

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Special tools required:

- 32 3 160

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

Necessary preliminary work:

- Remove **TRACK ROD END FROM SWIVEL BEARING**.
- Remove **GAITER FROM STEERING BOX** and slide back

IMPORTANT: To avoid damage to rack and to suspension mounting, move rack in as far as possible.

Unscrew track rod with special tool 32 3 160 from rack of steering box.

Installation note:

Clean rack.

Check surface of rack for damage (e.g. corrosion).

Tightening torque **32 21 1AZ** .

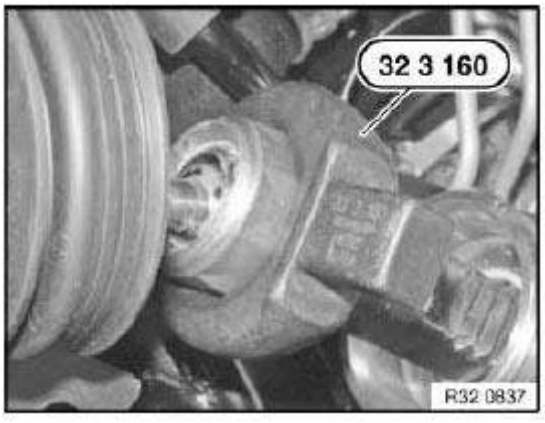


Fig. 37: Checking Surface Of Rack
Courtesy of BMW OF NORTH AMERICA, INC.

On replacement, assemble new part with gaiter:

- Determine dimension (A) on used part to simplify following adjustment of front axle
- Slacken clamping nut (2)
- Screw off track rod end; if necessary, grip track rod with open-end spanner
- Remove clamping ring (1) and screw off clamping nut (2)
- Slide gaiter (4) and ear clamp and band clamp (3) onto track rod
- Slide clamping nut (2) and clamping ring (1) onto track rod
- Screw track rod end onto track rod to dimension (A)
- Tighten down clamping nut (2)

  Tightening torque **32 21 2AZ** .

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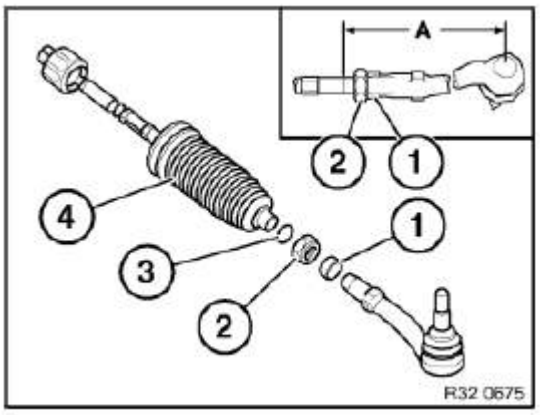


Fig. 38: Identifying Clamping Ring, Gaiter And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Only if replacing/removing track rod end: Perform **CHASSIS/WHEEL ALIGNMENT CHECK**.

STEERING COLUMN

32 31 020 REMOVING AND INSTALLING/REPLACING LOWER SECTION OF STEERING COLUMN SHROUD

Necessary preliminary work:

- Remove **TOP SECTION OF STEERING COLUMN CASING**.
- Move steering column in "top" and "extended" position.

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

Installation note:

Align steering column shroud by means of retaining lugs to steering column and press up as far as it will go.

Press steering column shroud on both sides together a little and then press upwards completely until retaining lugs snap into place.

Check installation position, correct if necessary.

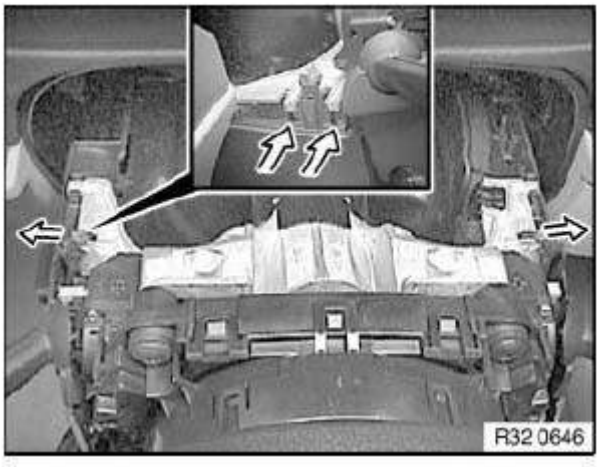


Fig. 39: Pressing Retaining Lugs
Courtesy of BMW OF NORTH AMERICA, INC.

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Tilt steering column shroud in downward direction.

If necessary, unlock plug connection (1) on steering column adjustment switch and (2) emergency starting aerial and disconnect.

Remove steering column shroud lower section.

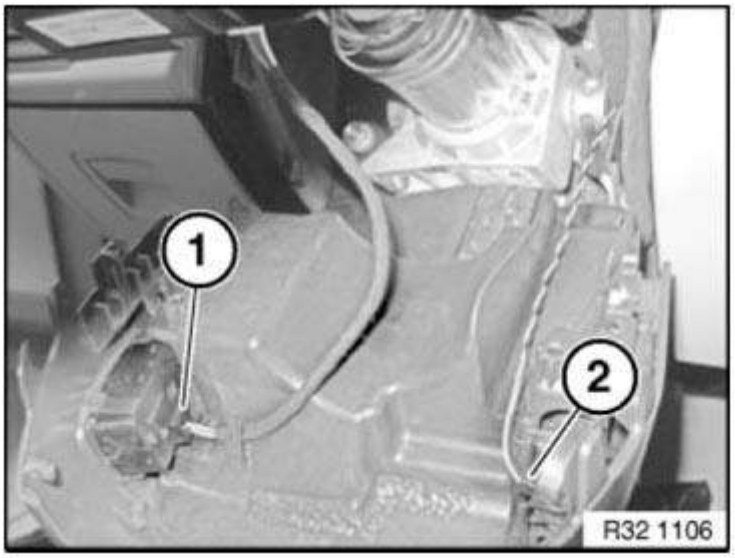


Fig. 40: Identifying Plug Connection And Steering Column Adjustment Switch
Courtesy of BMW OF NORTH AMERICA, INC.

32 31 082 REMOVING AND INSTALLING/REPLACING STEERING ANGLE SENSOR

NOTE: **The steering angle sensor is integrated in the EPS steering gear! Removing : See 32 13 572 REPLACE ELECTRICAL STEERING GEAR (EPS) (N20/N47) or 32 13 572 REPLACE ELECTRICAL STEERING BOX (EPS) (N52/N55/N57) and installing/replacing EPS steering box.**

32 31 090 REMOVING AND INSTALLING/REPLACING STEERING COLUMN

Necessary preliminary work:

- Move steering column into "extended" position.
- Disconnect battery earth lead.
- Remove **steering wheel** . See 32 33 000 REMOVING AND INSTALLING/REPLACING STEERING WHEEL or 32 33 010 REMOVING AND INSTALLING/REPLACING SPORT STEERING WHEEL.
- Remove upper and lower **steering column shroud** . See 32 31 003 REMOVING AND INSTALLING/REPLACING UPPER SECTION OF STEERING COLUMN SHROUD or 32 31 020 REMOVING AND INSTALLING/REPLACING LOWER SECTION OF STEERING COLUMN SHROUD.
- Remove **trim panel for pedal assembly** . See 51 45 184 REMOVING AND INSTALLING/REPLACING TRIM PANEL FOR PEDAL ASSEMBLY (ECE ONLY) or 51 45 184 REMOVING AND INSTALLING/REPLACING TRIM PANEL FOR PEDAL ASSEMBLY (US ONLY) .
- Remove STEERING COLUMN CONTROL PANEL .
- Unclip wiring harness and place to one side.
- REMOVE universal joint with corrugated tube.

Undo nuts (1) at bottom of steering column.

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Tightening torque **32 31 1AZ** .

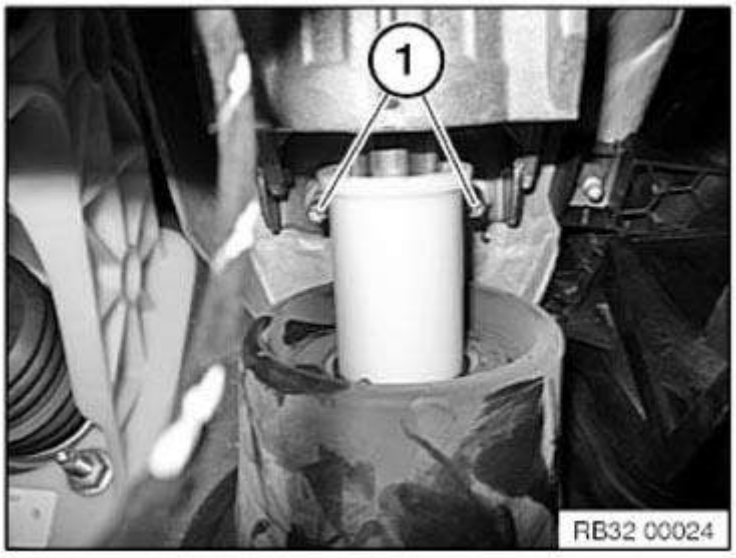


Fig. 41: Identifying Nuts Of Steering Column
Courtesy of BMW OF NORTH AMERICA, INC.

Secure steering column against falling out.

Undo nuts (1) at top of steering column.

Tightening torque **32 31 1AZ** .

Remove steering column by pulling upward.

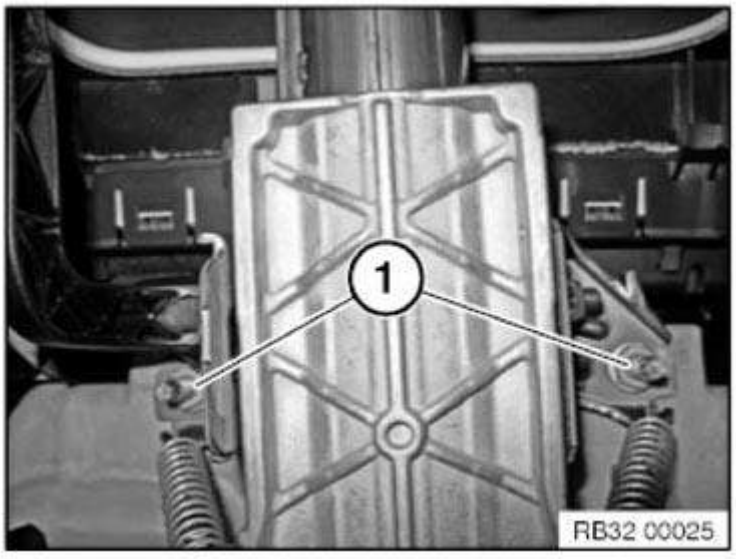


Fig. 42: Identifying Nuts Of Steering Column
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

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

32 31 211 REMOVING AND INSTALLING/REPLACING UNIVERSAL JOINT WITH CORRUGATED TUBING

After the steering shaft has been loosened on the steering gear/steering column, do not turn the

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IMPORTANT: steering wheel any more. If the lower section of the steering shaft is separated from the steering box/steering column, the steering column switch cluster may be damaged when the steering wheel is turned.

Necessary preliminary tasks:

- Remove **intake silencer housing** . See **13 71 000 REMOVING/REPLACING INTAKE SILENCER HOUSING (N47 D20 O1)** , **13 71 000 REMOVING AND INSTALLING/REPLACING INTAKE SILENCER HOUSING (N55)** or **13 71 000 REMOVING AND INSTALLING/REPLACING INTAKE SILENCER HOUSING (N52T)** (N57/N55/N52/N47/).
- **Remove** : See **51 45 184 REMOVING AND INSTALLING/REPLACING TRIM PANEL FOR PEDAL ASSEMBLY (ECE ONLY)** or **51 45 184 REMOVING AND INSTALLING/REPLACING TRIM PANEL FOR PEDAL ASSEMBLY (US ONLY)** trim panel for pedal mechanism.
- Move steering column in "top" and "retracted" position.

Remove clamping bolt (1) at steering box to the side over the wheel arch.

Installation note:

Clean screw threads to remove all remnants of screw locking adhesive.

Replace clamping bolts.

Tightening torque **32 31 2AZ** .

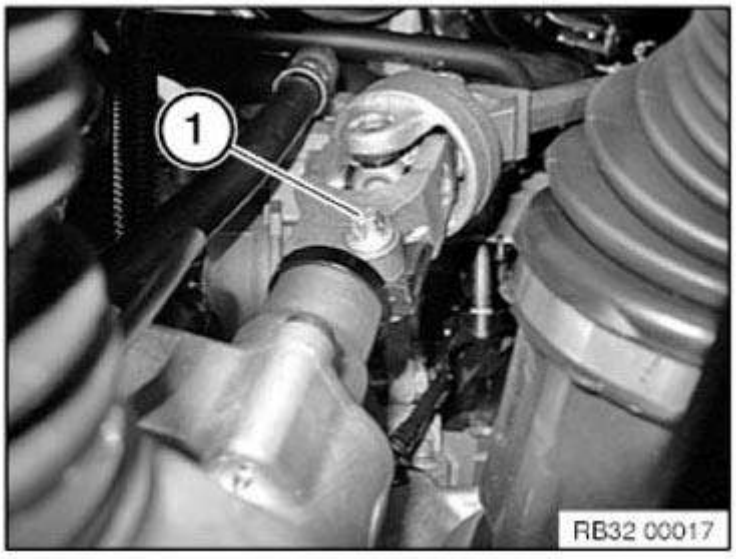


Fig. 43: Identifying Clamping Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Pull down corrugated tubing until clamping bolt (1) is accessible with tool (2).

Release clamping bolt (1) and remove universal joint together with corrugated tubing.

Installation note:

Clean screw threads to remove all remnants of screw locking adhesive.

Replace clamping bolts.

Counter-hold the steering shaft in the passenger compartment on the steering column when sliding the universal joint onto the steering column!

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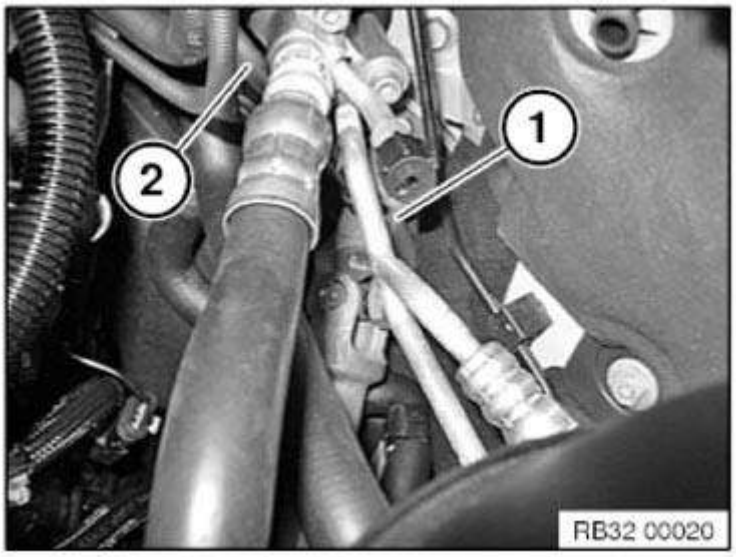


Fig. 44: Releasing Clamping Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Connect universal joint with corrugated tubing first to steering shaft and then to steering box.

Clamping bolt must rest in groove of steering box or steering column.

No subsequent retorquing permitted!

Tightening torque **32 31 3AZ** .

After installation:

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

32 31 003 REMOVING AND INSTALLING/REPLACING UPPER SECTION OF STEERING COLUMN SHROUD

Move steering column in "bottom" and "extended" position.

Pull steering column gap cover up carefully and clip out gap cover.

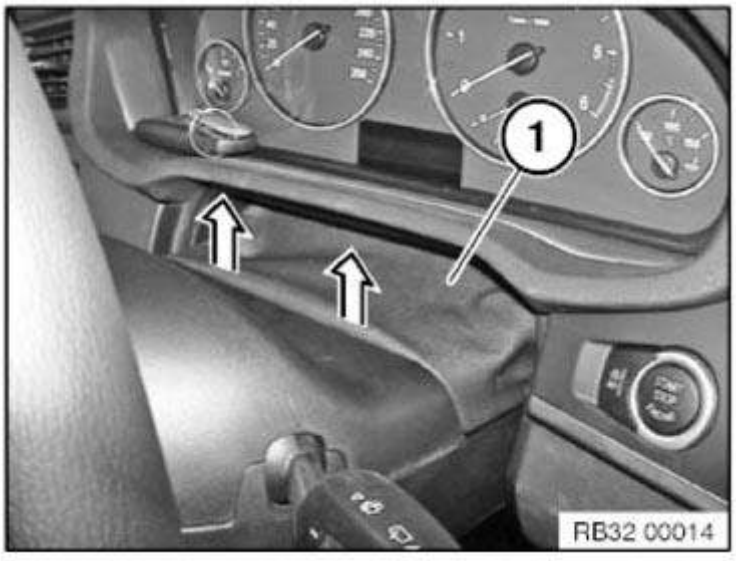


Fig. 45: Pulling Steering Column Gap Cover

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Courtesy of BMW OF NORTH AMERICA, INC.

Pull steering column shroud (1) up.

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

IMPORTANT: Risk of damage!
Carefully pull steering column shroud upper section (1) upward at rear and clip out.

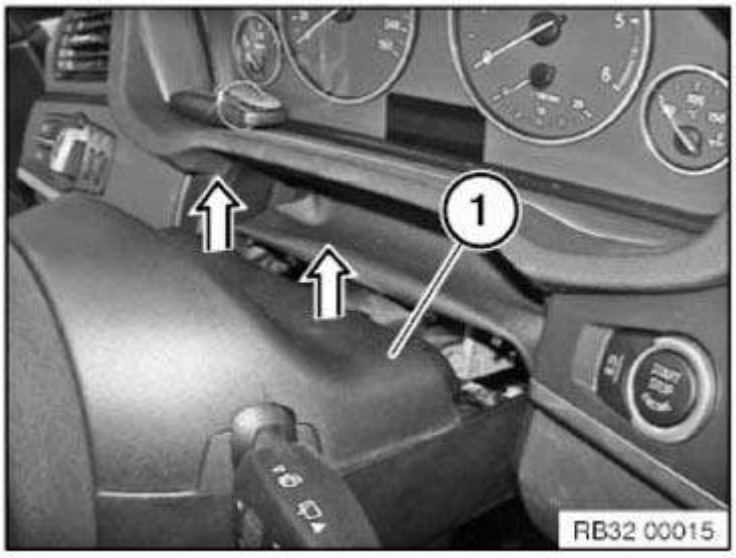


Fig. 46: Pulling Steering Column Shroud
Courtesy of BMW OF NORTH AMERICA, INC.

32 31 241 REPLACING STEERING COLUMN ADJUSTMENT LEVER

Necessary preliminary tasks:

- **Remove** : See **51 45 184 REMOVING AND INSTALLING/REPLACING TRIM PANEL FOR PEDAL ASSEMBLY (ECE ONLY)** or **51 45 184 REMOVING AND INSTALLING/REPLACING TRIM PANEL FOR PEDAL ASSEMBLY (US ONLY)** trim panel for pedal mechanism.

Release nuts (1) from footwell and detach adjustment lever.

Installation note:

Replace nut (1).

In installed or closed condition, the adjustment lever must be positioned parallel with the steering column!

Tightening torque **32 31 5AZ** .

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Fig. 47: Identifying Nuts From Footwell
Courtesy of BMW OF NORTH AMERICA, INC.

32 31 102 REPLACING STEERING SHAFT SLEEVE

Special tools required:

- 00 9 321

Necessary preliminary tasks:

- REMOVE lower section of steering shaft.

Press the steering shaft (1) into the inside of the footwell.

Pull out locking pins (2)!

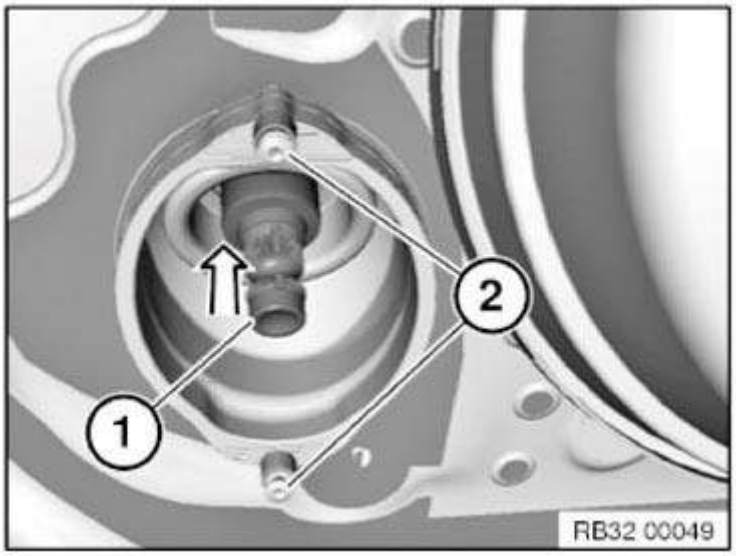


Fig. 48: Pressing Steering Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock the steering sleeve by pressing it in the direction of the arrow and remove it towards the outside.

Remove sleeve in direction of engine compartment.

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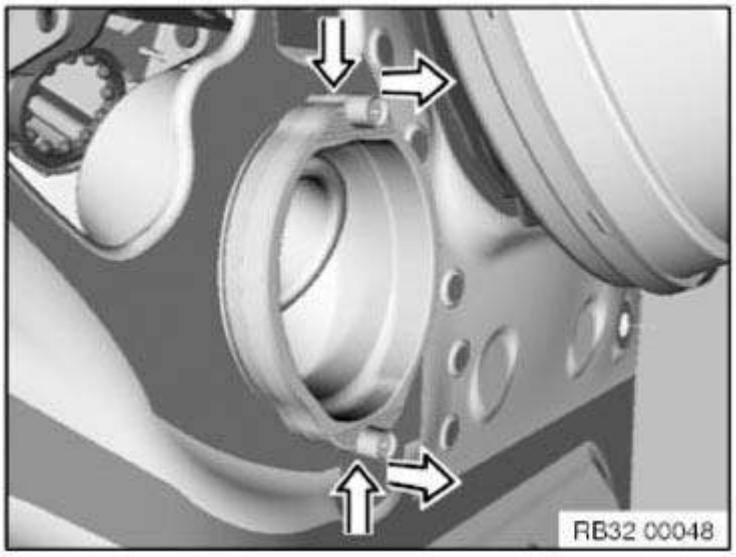


Fig. 49: Removing Sleeve Of Engine Compartment
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock the holder (1) at the top by pressing it in the direction of the arrow and remove it towards the footwell.

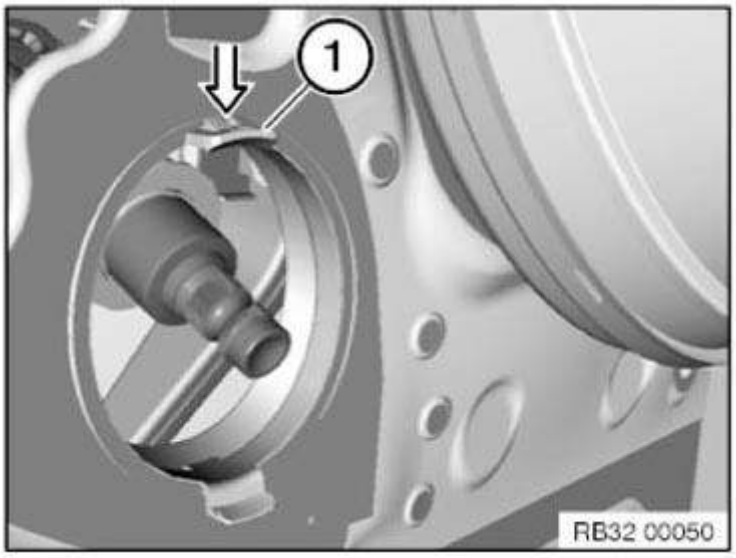


Fig. 50: Removing Holder
Courtesy of BMW OF NORTH AMERICA, INC.

STEERING WHEEL

32 33 010 REMOVING AND INSTALLING/REPLACING SPORT STEERING WHEEL

NOTE: Chassis/wheel alignment is not necessary after the steering wheel has been removed and installed or replaced.

Necessary preliminary work:

- Remove **AIRBAG UNIT**.

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

Unfasten plug connection.

Release screw (1) and remove sports steering wheel.

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Installation note:

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

Tightening torque **32 33 1AZ** .

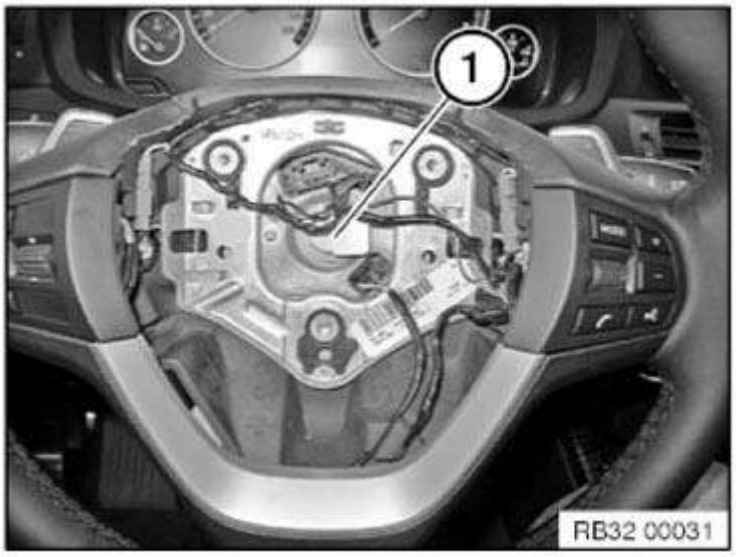


Fig. 51: Identifying Screw Of Sports Steering Wheel
Courtesy of BMW OF NORTH AMERICA, INC.



Fig. 52: Identifying Clock Springs On Steering Column Switch Cluster
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **There are clock springs installed with and without a mechanical anti-twist lock. Clock spring without mechanical anti-twist lock: (recognizable at the inspection glass for the mark of the neutral position)**

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

Installation note:

Version with steering wheel heating: Before fitting sports steering wheel on steering column, ensure correct

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cable routing.

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

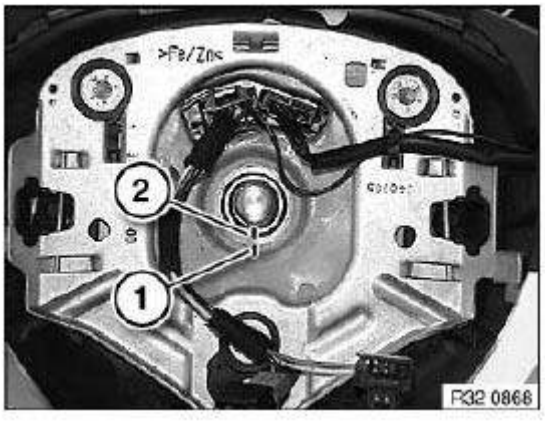


Fig. 53: Aligning Steering Wheel To Column Marking
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Reinstall **BOTH SHIFT PADDLES** .
- Modify **DESIGN COVER**.
- Modify both **SWITCHES ON SPORT STEERING WHEEL** .
- If necessary, modify **STEERING WHEEL ELECTRONICS MODULE CONTROL UNIT** .

32 33 000 REMOVING AND INSTALLING/REPLACING STEERING WHEEL

NOTE: **Chassis/wheel alignment is not necessary after the steering wheel has been removed and installed or replaced.**

Necessary preliminary work:

- Remove **AIRBAG UNIT**.

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

Disconnect plug connection.

Release screw (1) and remove steering wheel.

Tightening torque **32 33 1AZ** .

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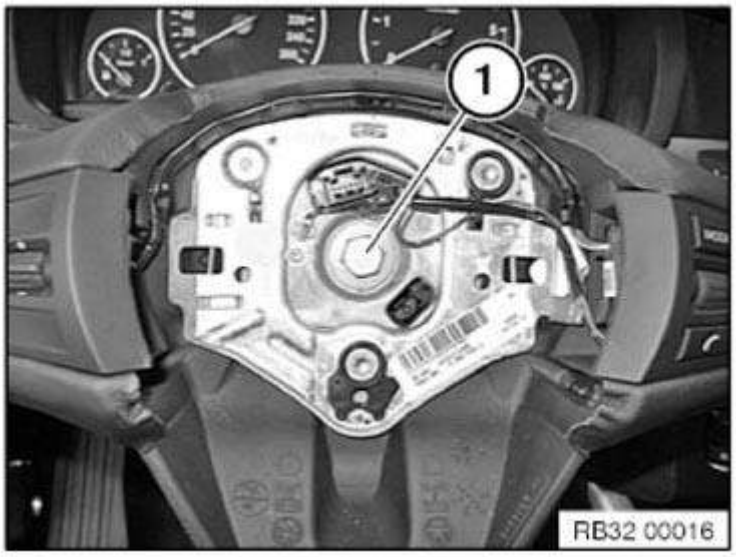


Fig. 54: Identifying Screw Of Steering Wheel
Courtesy of BMW OF NORTH AMERICA, INC.



Fig. 55: Identifying Clock Spring On Steering Column Switch Cluster
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **There are clock springs installed with and without a mechanical anti-twist lock. Clock spring without mechanical anti-twist lock: (recognizable at the inspection glass for the mark of the neutral position)**

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

Installation note:

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

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

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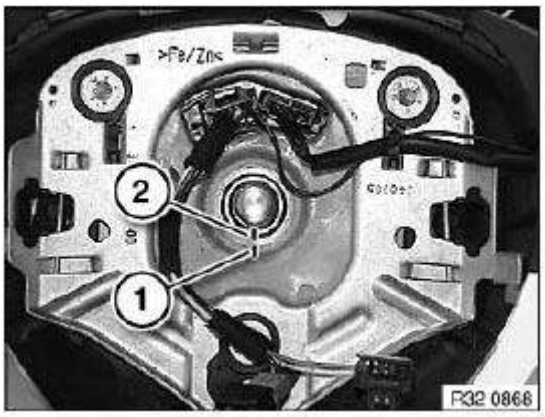


Fig. 56: Aligning Steering Wheel To Column Marking
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Modify design cover.
- Modify multifunction steering wheel switch.
- If necessary, modify steering wheel electronics module control unit.

32 33... REPLACING DESIGN COVER FOR SPORT STEERING WHEEL

NOTE: **Procedure is described under removing SWITCHES for multifunction steering wheel.**

STEERING WHEEL FOR AIRBAG

72 12... PROCEDURE AFTER AIRBAG DEPLOYMENT AS RESULT OF AN ACCIDENT

Check and/or replace following components after airbag deployment:

Satellites (control unit + sensor)

- Components
  - Satellite, A-/B-pillar, left/right
  - Satellite, front door
  - Satellite, rear seat
  - Satellite, driver's/passenger's side
  - Satellite, vehicle center
- Procedure
  - Inspect visually for mechanical damage
  - Read fault memory
  - Disconnect battery and observe waiting period
  - Rectify faults
  - Connect battery and observe waiting period (at least 10 seconds)
  - Delete fault memory
  - Switch off ignition and wait at least 2 minutes (no consumers may be switched on during this period such as interior light, radio, etc.)
  - Switch on ignition (wait at least 10 seconds)
  - Clear fault memory and if necessary rectify faults

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Cables and connectors

- Components and procedure
  - Check cables and connectors for damage, replace if necessary.

    (e.g. corrosion, correct engagement, bent pin)

Seat belt system

- Components
  - Automatic reel
  - Belt buckle tensioner
  - Seat belt height adjustment
  - Anchor fitting tensioner
- Procedure
  - Check components, replace if necessary

Seats

- Components
  - Seat
  - Airbag module
  - Active head restraint
- Procedure
  - Check seats (function check of seat mechanism), replace if necessary
  - Check seat screw/bolt connections
  - Replace gas generator of active head restraint

    If the severity of the crash has not caused any other damage to the seat, only the triggered gas generator needs to be replaced.

    External feature: The triggered head restraint is folded forwards and engaged.

    The repair work can be carried out in the vehicle with the rear panel removed. The entire system can be pushed back into its original position and the new gas generator installed.

    The gas generator can be replaced up to 5 times.

  - Replace airbag module and seat cover with upholstery
- **Only I01:** If one of the following criteria is fulfilled, the backrest frame must be replaced!

  (Part number of backrest frame: 52 10 7 388 646)

  - Activated belt tensioner
  - Activated end fitting pretensioner
  - Outer cover unclipped by a side collision
  - Outer cover ripped off by a side collision
  - Faulty clip connection on outer cover caused by a side collision

Driver's airbag

- Components
  - Airbag module

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

Front-passenger airbag

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

Side airbag, front/rear

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

Head airbag

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

Knee airbag

- Components
    - Trim panel (driver's side)
    - Lower section of glove box
    - Knee protection (driver's and passenger's sides)
- Procedure
    - Check components, replace if necessary

Passive knee protection

- Components
    - Trim panel (driver's side)

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- Glove box incl. knee protection (passenger's side)
- Procedure
  - Check components for damage, replace if necessary
  - Check retaining element

32 34 020 REMOVING AND INSTALLING/REPLACING AIRBAG UNIT

WARNING: **Observe the following instructions to avoid any risk of injury by the airbag unit.**

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

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

IMPORTANT: STEERING WHEEL must be replaced if airbag unit has been triggered!
Follow PROCEDURE AFTER AIRBAG DEPLOYMENT.

Necessary preliminary work:

- Disconnect BATTERY EARTH LEAD .
- If necessary, remove shift paddles.

Insert Torx screwdriver T25 (2) at an angle into concealed opening on reverse side of steering wheel until a spring resistance is felt (approx. 1.5 cm).

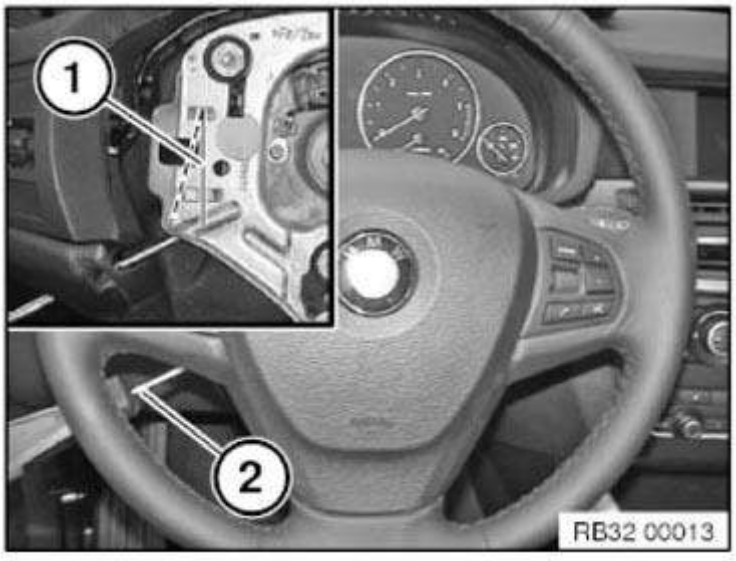
Press spring leg (1) inward until airbag is unlocked.

Repeat procedure on other side.

Installation note:

Make sure electrical leads are correctly positioned.

Snap airbag unit with uniform pressing force plane-parallel in direction of steering column shaft into steering wheel.



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Fig. 57: Pressing Spring Leg
Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: **Danger of injury!**
Airbag unit may only be set down with the airbag itself facing upwards .

Tilt airbag unit forwards.

Disconnect plug connections and remove airbag unit.

Installation note:

Connect plugs to connections of same color on airbag unit.

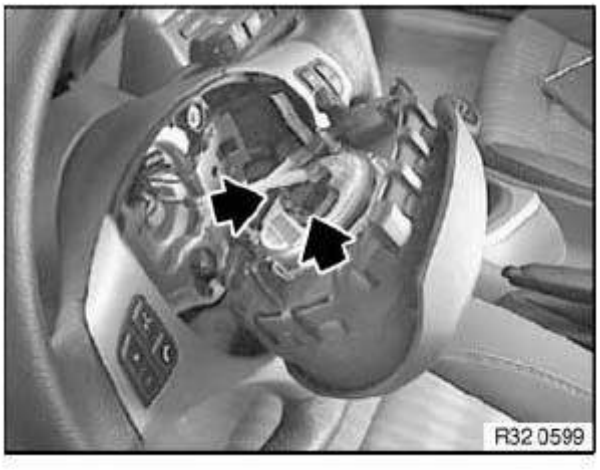


Fig. 58: Locating Plug Connections Of Airbag Unit
Courtesy of BMW OF NORTH AMERICA, INC.

32 34 030 REMOVING AND INSTALLING/REPLACING AIRBAG UNIT (SPORTS STEERING WHEEL)

WARNING: **Observe the following instructions to avoid any risk of injury by the airbag unit.**

- **Comply with safety regulations for handling components with gas generators.**
- **Do not exert any force on the airbag unit.**
- **Use only specified release tool for the airbag unit.**

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

IMPORTANT: **Steering wheel** . See 32 33 000 REMOVING AND INSTALLING/REPLACING STEERING WHEEL or 32 33 010 REMOVING AND INSTALLING/REPLACING SPORT STEERING WHEEL must be replaced if airbag unit has been triggered!
Follow PROCEDURE AFTER AIRBAG DEPLOYMENT.

Necessary preliminary work:

- Disconnect BATTERY EARTH LEAD .

Insert Torx screwdriver (T25) (2) at an angle into concealed opening on reverse side of steering wheel until a spring resistance is felt (approx. 1.5 cm).

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Press spring leg (1) inward until airbag is unlocked.

Repeat procedure on other side.

Installation note:

Make sure electrical leads are correctly positioned.

Snap airbag unit with uniform pressing force plane-parallel in direction of steering column shaft into steering wheel.

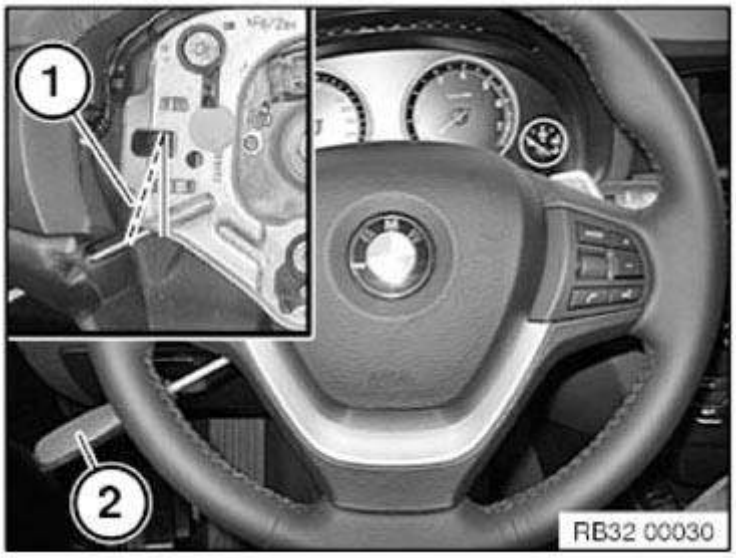


Fig. 59: Pressing Spring Leg
Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: **Danger of injury!**
The airbag unit may only be set down with the airbag itself facing up .

Tilt airbag unit forwards.

Disconnect plug connections and remove airbag unit.

Installation note:

Connect plugs to connections of same color on airbag unit.

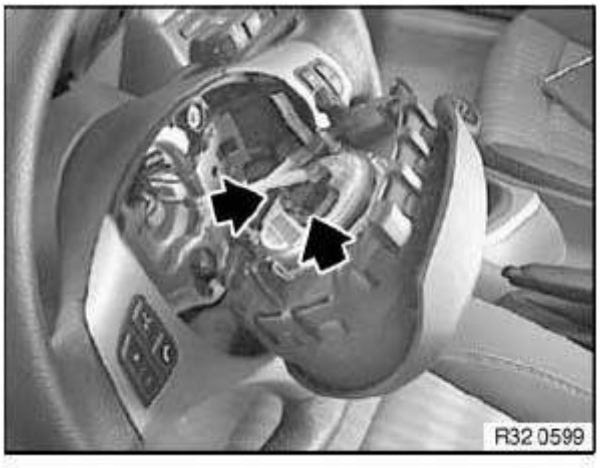


Fig. 60: Locating Plug Connections Of Airbag Unit
Courtesy of BMW OF NORTH AMERICA, INC.

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72 00... SAFETY REGULATIONS FOR HANDLING COMPONENTS WITH GAS GENERATORS

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

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

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

This applies in particular to the following components:

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

1. **Regulations**

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

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

   The following components used by BMW:

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

   Handling, transporting and storing non-fired gas generators are subject to the "Explosive Materials Act" (law relating to the use of explosives dated 13/09/1976).

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

2. **Dismantling and installation**
   - Inspection, testing and installation work may only be carried out by expert trained personnel in BMW Service.
   - Work on components of the airbag system should only ever be carried out with the battery disconnected, the negative terminal post covered and the plug connection of the cable leading to the gas generator disconnected. If only the battery is disconnected, the following prescribed waiting period must be observed without fail:
     - 30 min. for vehicles up to 9/93
     - 1 min. for vehicles from 9/93 onward
   - In the event of breaks in work, a component with a gas generator that has been removed must be secured against access by other persons.
   - Individual components must never be repaired. Instead, always replace them.
   - Do not treat airbag system components with cleaning agents or grease.

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- Components of the airbag system must not be exposed to temperatures in excess of 75 Â°C.
- Airbag system components, including electronic diagnostic components, which have been dropped from heights in excess of 0.5 m must not be reinstalled in the vehicles.
- Do not remove components of the airbag system from the original packaging until immediately before they are to be installed in the vehicle.
- Before installing, subject components such as housing, connector pins, etc. of the airbag system (including diagnosis electronics) to a visual inspection for damage and replace if necessary.
- Airbag system components may only be electrically tested while they are installed and only with the BMW ISTA.
- **Danger of injury:** The airbag module may only be set down with the airbag itself facing *upwards* . Otherwise the alternator will be thrown upwards if it is ignited.
- Do not point the ignition squib of a gas generator at other persons.
- Components with gas generators must not be fired while they are removed. They must be disposed of by special disposal companies or returned to BMW in the packaging of the new components.
- When carrying out straightening and welding work with an electric welder:
  - Disconnect battery
  - Cover negative terminal (post)
- Avoid all contact with the skin when removing a fired airbag module - wear gloves. Wash with water after contact with the skin.

3. **Transport**
   - Components with gas generators must be sent off in the packaging of the new components.
4. **Storage**
   - Observe the regulations of the relevant trade supervisory authority and the applicable national regulations.

PUMP AND OIL SUPPLY

32 41... INSTRUCTIONS FOR REMOVING AND INSTALLING EAR CLIPS

Special tools required:

- 32 1 260

NOTE: **The work steps are show on assorted components.**
Ear clip must always be replaced.

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

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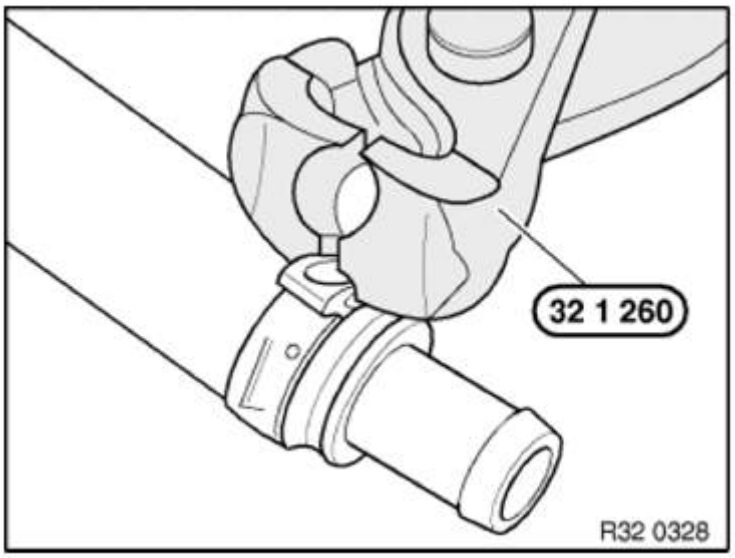


Fig. 61: Removing Ear Clip
Courtesy of BMW OF NORTH AMERICA, INC.

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

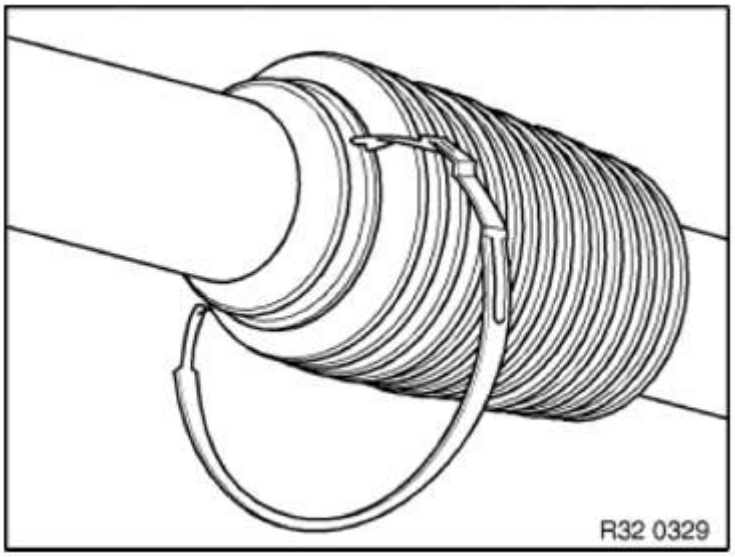


Fig. 62: Identifying Ear Clip
Courtesy of BMW OF NORTH AMERICA, INC.

Attach hook fastener and press ear together with special tool 32 1 260.

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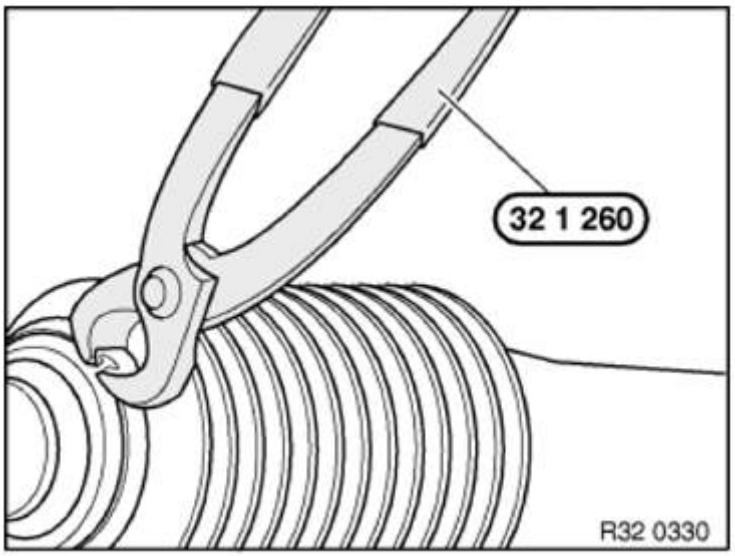


Fig. 63: Attaching Hook Fastener
Courtesy of BMW OF NORTH AMERICA, INC.

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

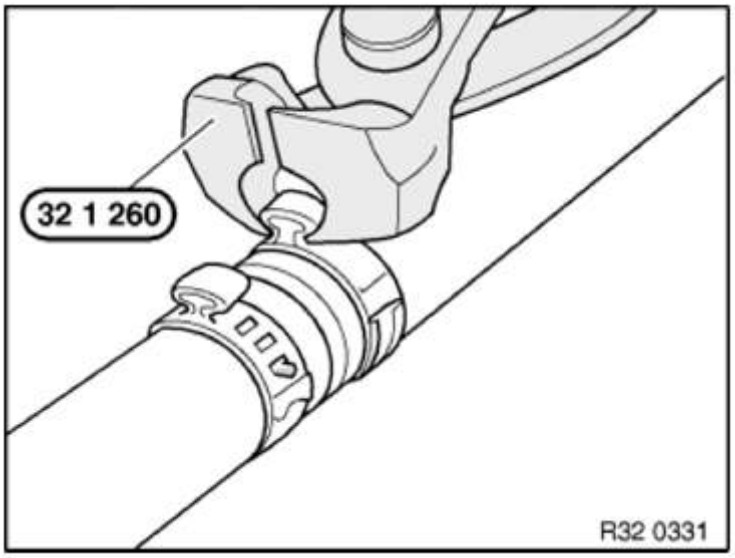


Fig. 64: Cutting Diagonal Pliers Area
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Gap (A) max. 1 mm!

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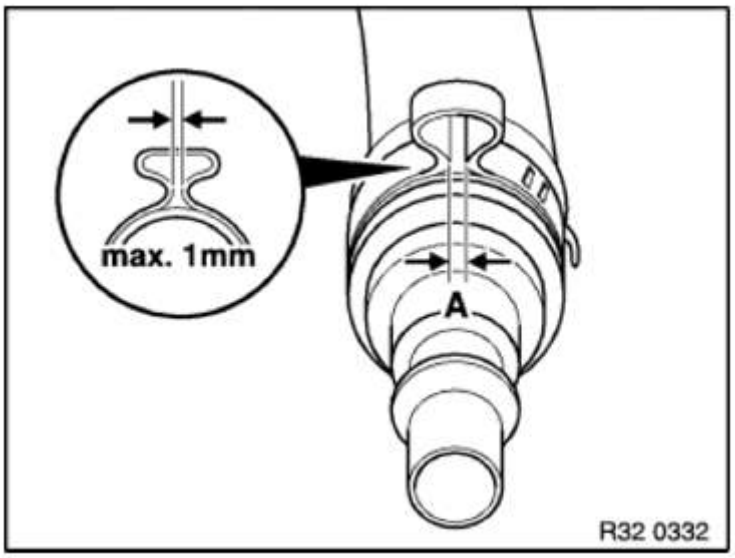


Fig. 65: Identifying Ear Clip Gap
Courtesy of BMW OF NORTH AMERICA, INC.

ELECTRONIC POWER STEERING

34 52.. START-UP OF ICM CONTROL UNIT

NOTE: **Start-up of ICM control unit must be carried out:**

- **After replacement or removal and installation of ICM control unit**

Connect vehicle to BMW diagnosis system.

Select and carry out start-up of ICM control unit under Service functions.

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STEERING AND WHEEL ALIGNMENT

0492035 ADAPTER

0492035 322132 Adapter AM

NOTE: (Adapter) inner 1/2" - outer 3/8"

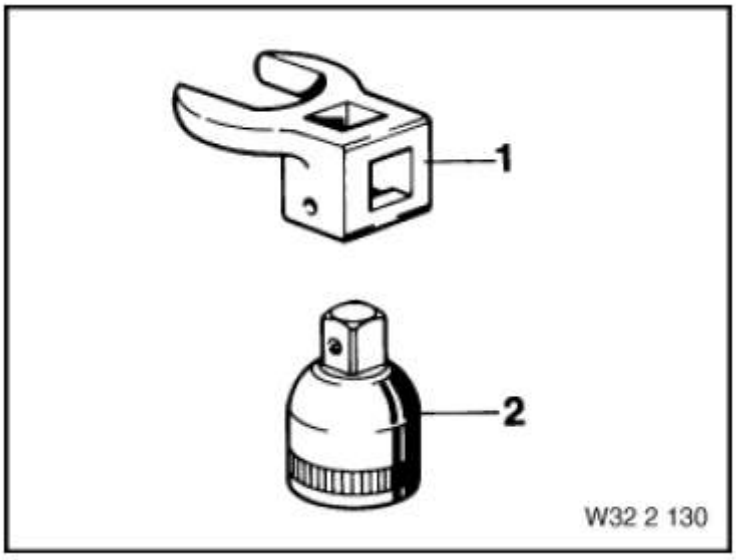


Fig. 1: Identifying Adapter (0492035)
Courtesy of BMW OF NORTH AMERICA, INC.

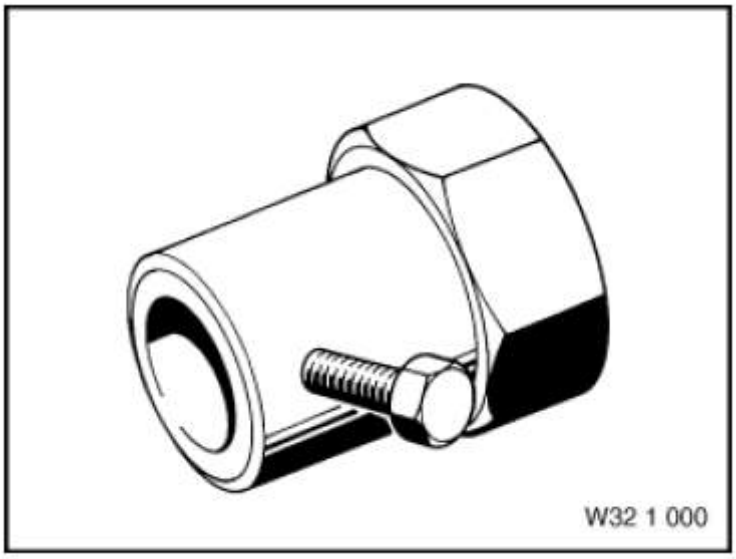
0491986 ADAPTER

0491986 321000 Adapter Mechanical tool

NOTE: For measuring the coefficient of friction on the steering box.

Storage Location

A11



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Fig. 2: Identifying Adapter (0491986)
Courtesy of BMW OF NORTH AMERICA, INC.

0493958 ADAPTER CABLE

0493958 324250 Adapter cable Minimum set: Measuring and testing equipment MP

NOTE: **(V adapter cable 8-pin) For troubleshooting for steering column module**

Storage Location

N208

SI number

02 06 01 (763)

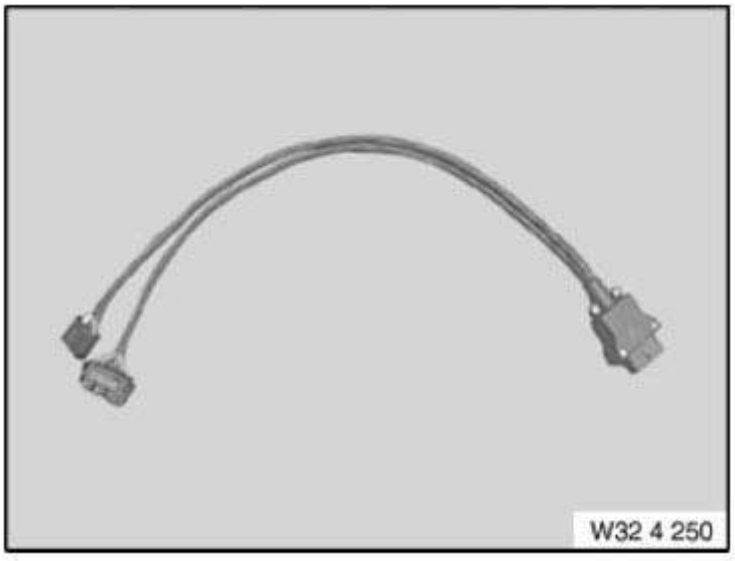


Fig. 3: Identifying Adapter Cable (0493958)
Courtesy of BMW OF NORTH AMERICA, INC.

0492014 BASIC BODY

0492014 322001 Basic body Minimum set: Mechanical tools AM

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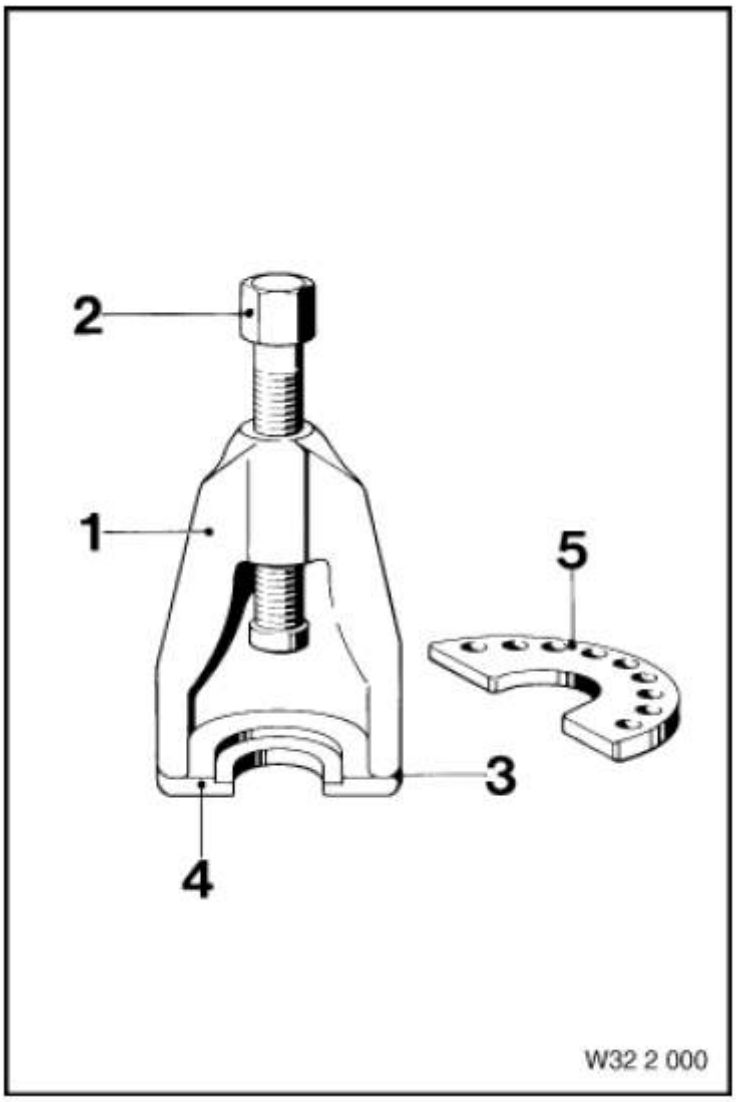
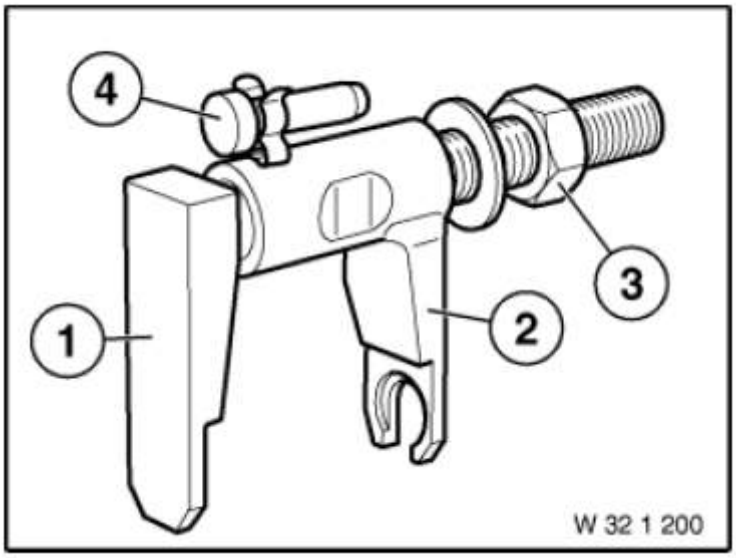


Fig. 4: Identifying Basic Body (0492014)
Courtesy of BMW OF NORTH AMERICA, INC.

0492004 BASIC BODY

0492004 321201 Basic body AM

NOTE: **(Basic body)**



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Fig. 5: Identifying Basic Body (0492004)
Courtesy of BMW OF NORTH AMERICA, INC.

0492007 BOLT

0492007 321204 Bolt AM

NOTE: **(Pressure pin) discontinued, available as part of set of special tools only**

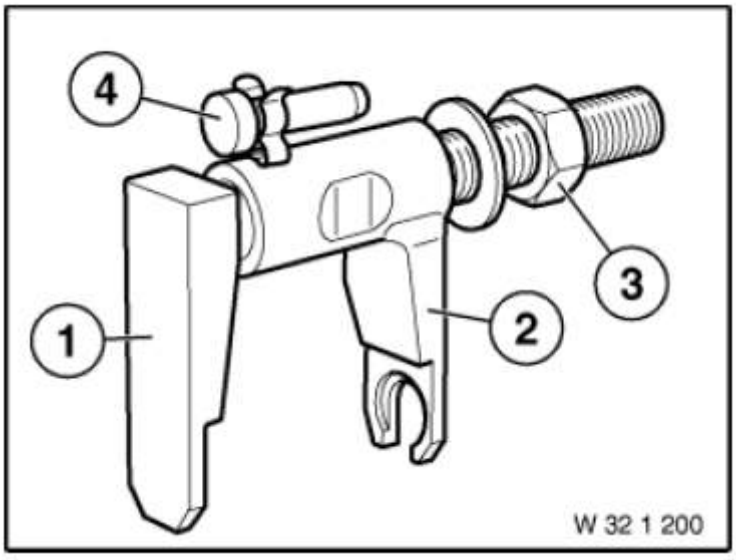


Fig. 6: Identifying Bolt (0492007)
Courtesy of BMW OF NORTH AMERICA, INC.

0492032 BOLT

0492032 322123 Bolt AM

Replaced by: 83300492036

NOTE: **(Measuring bolt) Discontinuation and replaced by 32 2 140. (0 492 036)**

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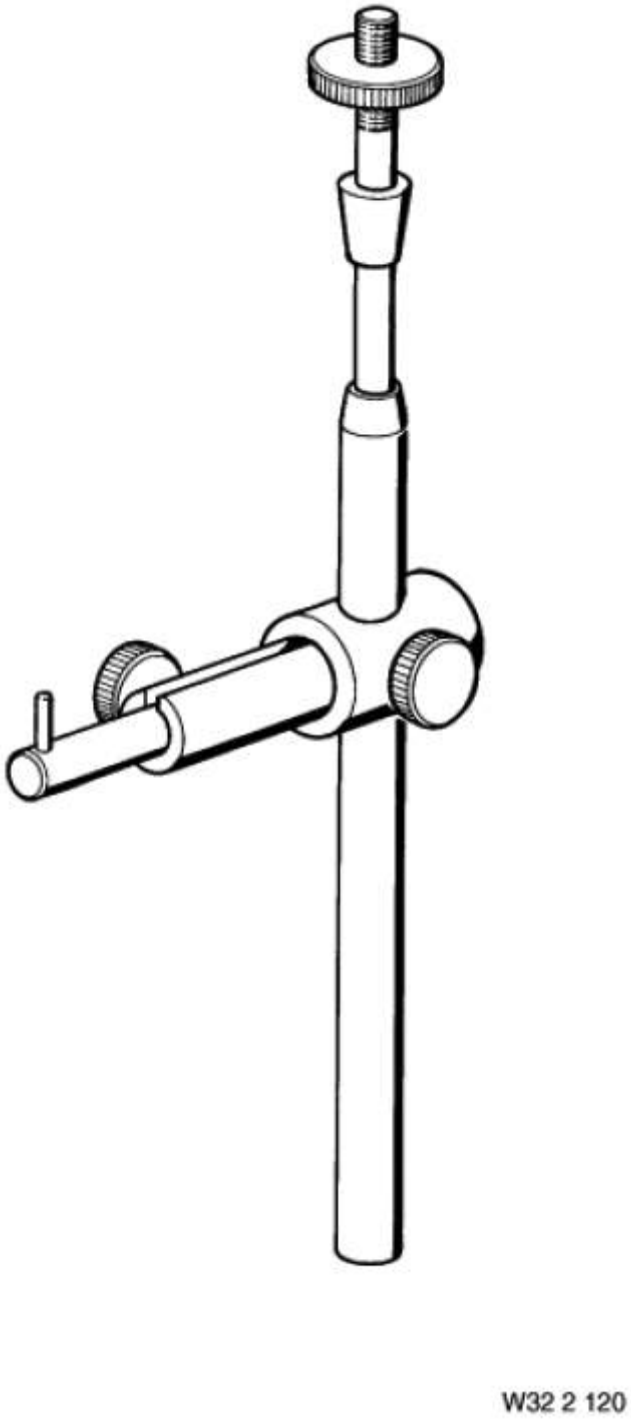


Fig. 7: Identifying Bolt (0492032)
Courtesy of BMW OF NORTH AMERICA, INC.

0492046 BUSH

0492046 323053 Bush AM

NOTE: **(slip bush) For fitting the snap ring to the lower steering shaft bearing - Model: 2500... 3.0 CSi Deletion, only available via tool set**

Storage Location

A8

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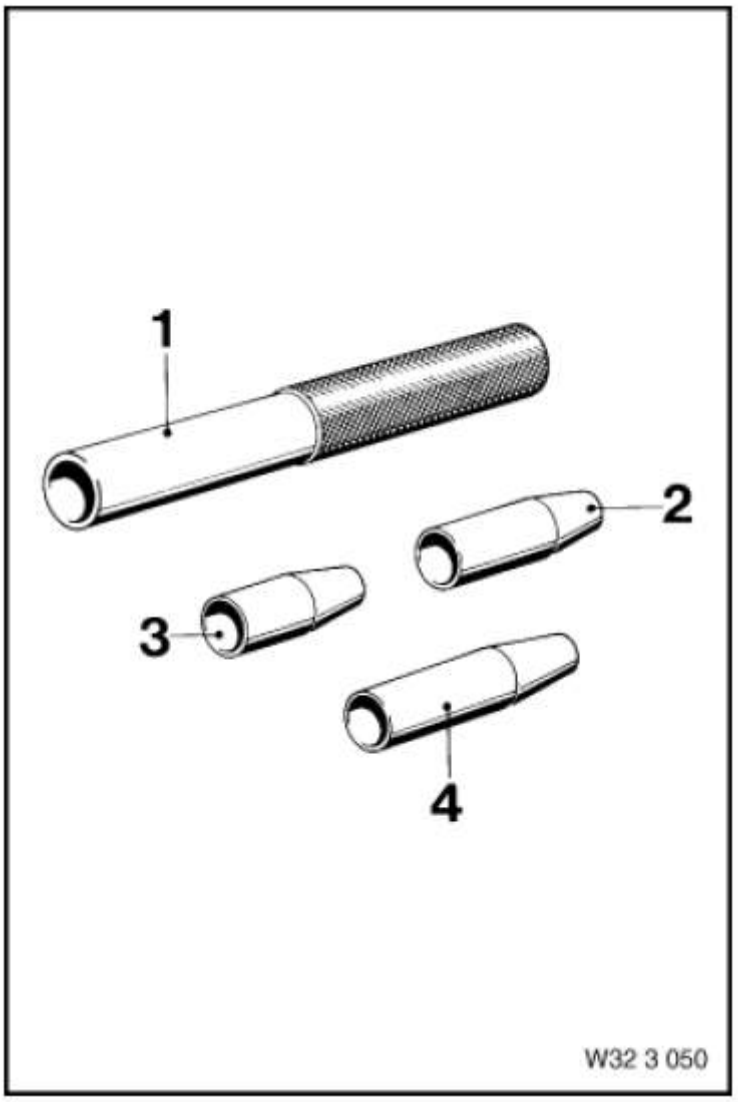


Fig. 8: Identifying Bush (0492046)
Courtesy of BMW OF NORTH AMERICA, INC.

0493179 BUSH

0493179 323040 Bush Mechanical tool

NOTE: **(Slip bush) For fitting steering angle sensor on steering column**

Storage Location

A3

SI number

01 02 98 (302)

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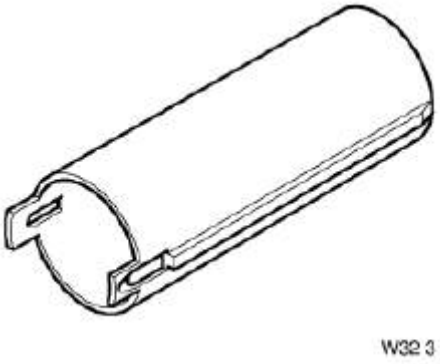


Fig. 9: Identifying Bush (0493179)
Courtesy of BMW OF NORTH AMERICA, INC.

0492048 BUSH

0492048 323060 Bush Mechanical tool

NOTE: For installing the hub on the shaft of the power steering pump (vane pump) - From steering wheel mounting with screw

Storage Location

A14

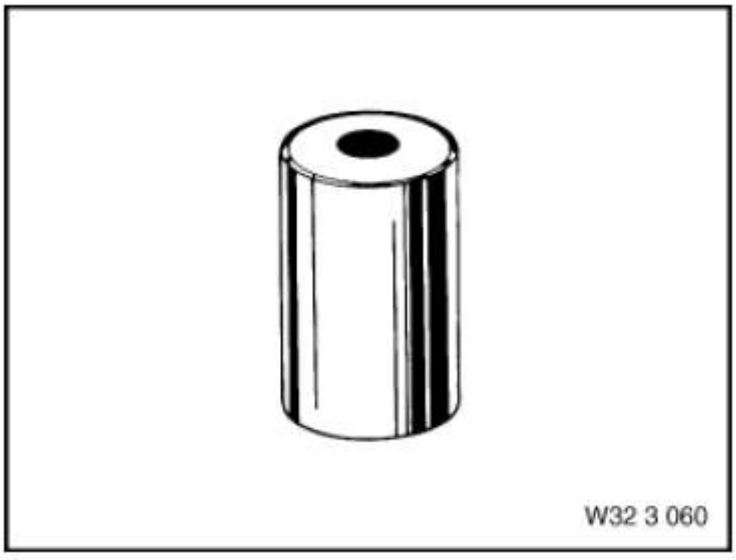


Fig. 10: Identifying Bush (0492048)
Courtesy of BMW OF NORTH AMERICA, INC.

0492051 BUSH

0492051 323072 Bush Minimum set: Mechanical tools AM

NOTE: (Slip bush)

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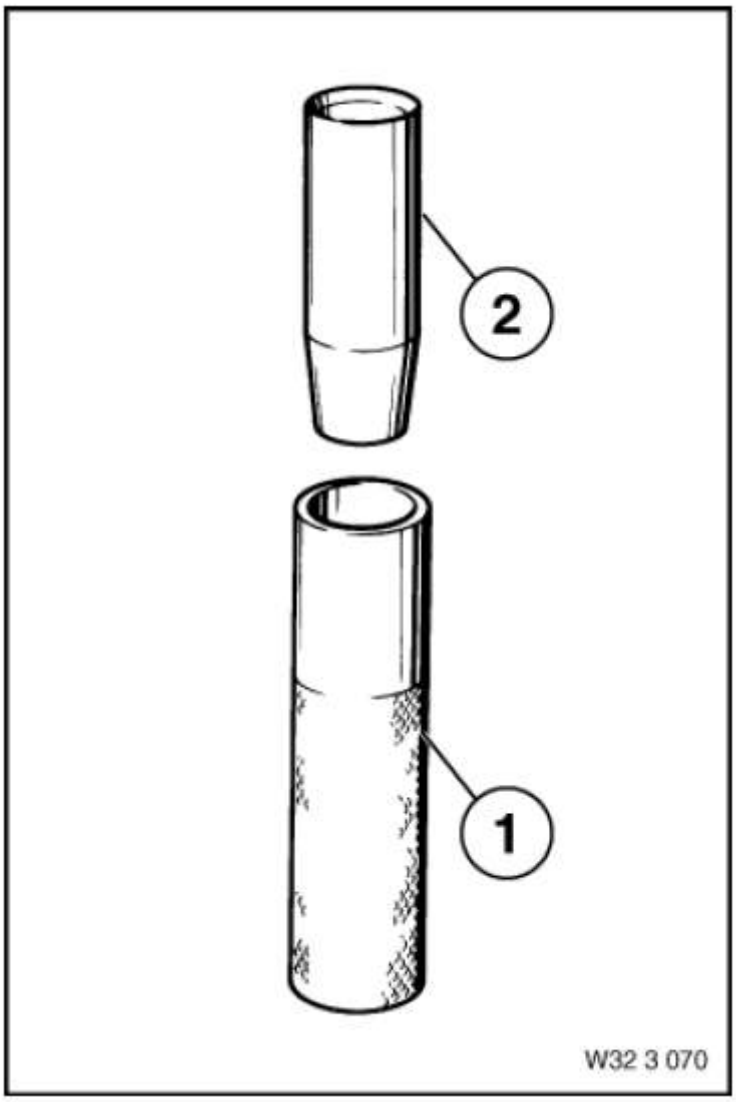


Fig. 11: Identifying Bush (0492051)
Courtesy of BMW OF NORTH AMERICA, INC.

0492045 BUSH

0492045 323052 Bush AM

NOTE: **(slip bush) For fitting the snap ring when a flat nut is used for steering wheel mount - Model year: Up to 73, discontinued, available as part of set of special tools only**

Storage Location

A8

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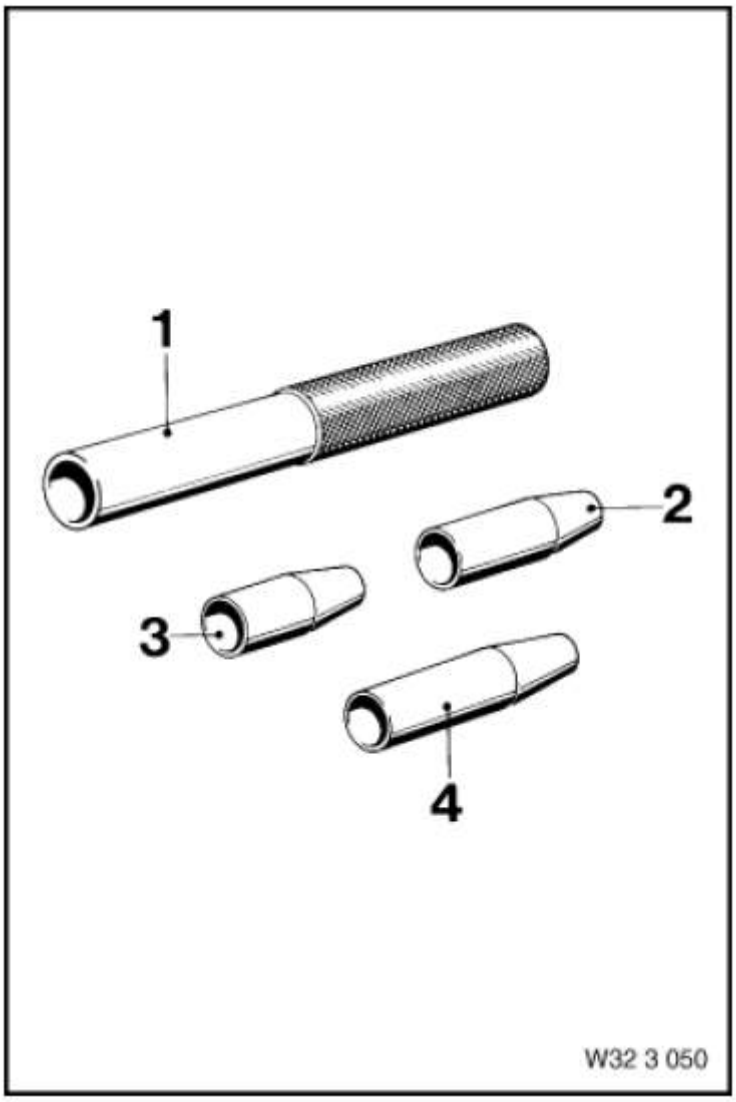


Fig. 12: Identifying Bush (0492045)
Courtesy of BMW OF NORTH AMERICA, INC.

0492047 BUSH

0492047 323054 Bush AM

NOTE: **(slip bush) For fitting the snap ring when a stop nut is used for steering wheel mount - Model year: From 74 discontinued, available as part of set of special tools only**

Storage Location

A8

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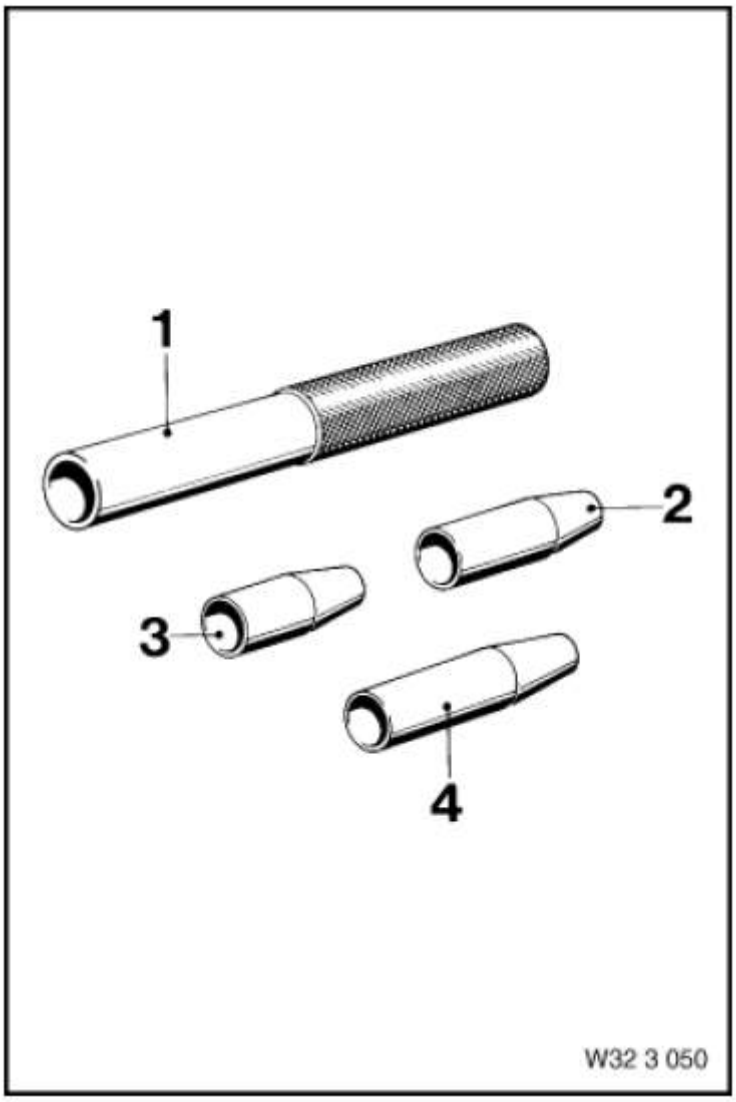


Fig. 13: Identifying Bush (0492047)
Courtesy of BMW OF NORTH AMERICA, INC.

0494468 CLAMP

00494468 321280 Clamp Minimum set: Mechanical tools Mechanical tool

NOTE: **For locating electric motor on hydraulic unit valve body**

Storage Location

B44

SI number

01 10 02 (907)

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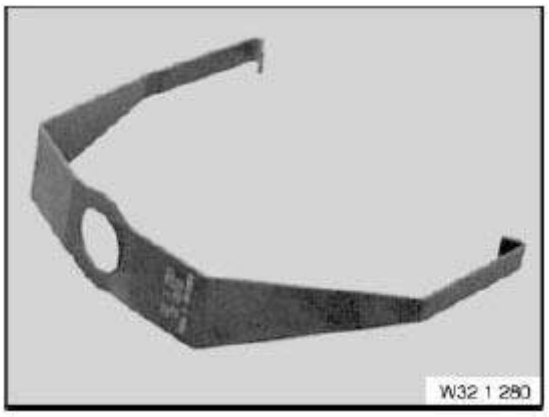


Fig. 14: Identifying Clamp (00494468)
Courtesy of BMW OF NORTH AMERICA, INC.

0494469 CLAMP

0494469 323180 Clamp Minimum set: Mechanical tools Mechanical tool

NOTE: **For locking middle position of steering box**

Storage Location

B44

SI number

01 10 02 (907)

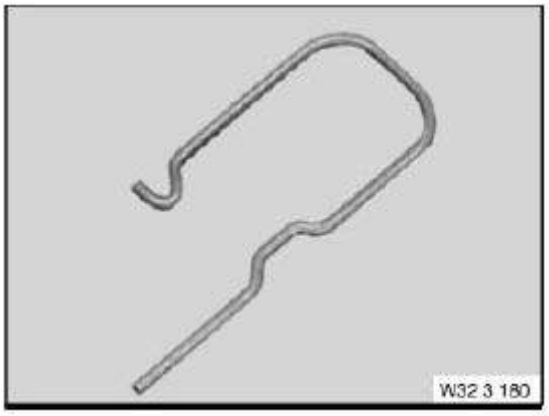


Fig. 15: Identifying Clamp (0494469)
Courtesy of BMW OF NORTH AMERICA, INC.

0492068 DEVICE

0492068 324050 Device Mechanical tool

NOTE: **For holding down the drop arm when checking the mechanical play in the power steering box**

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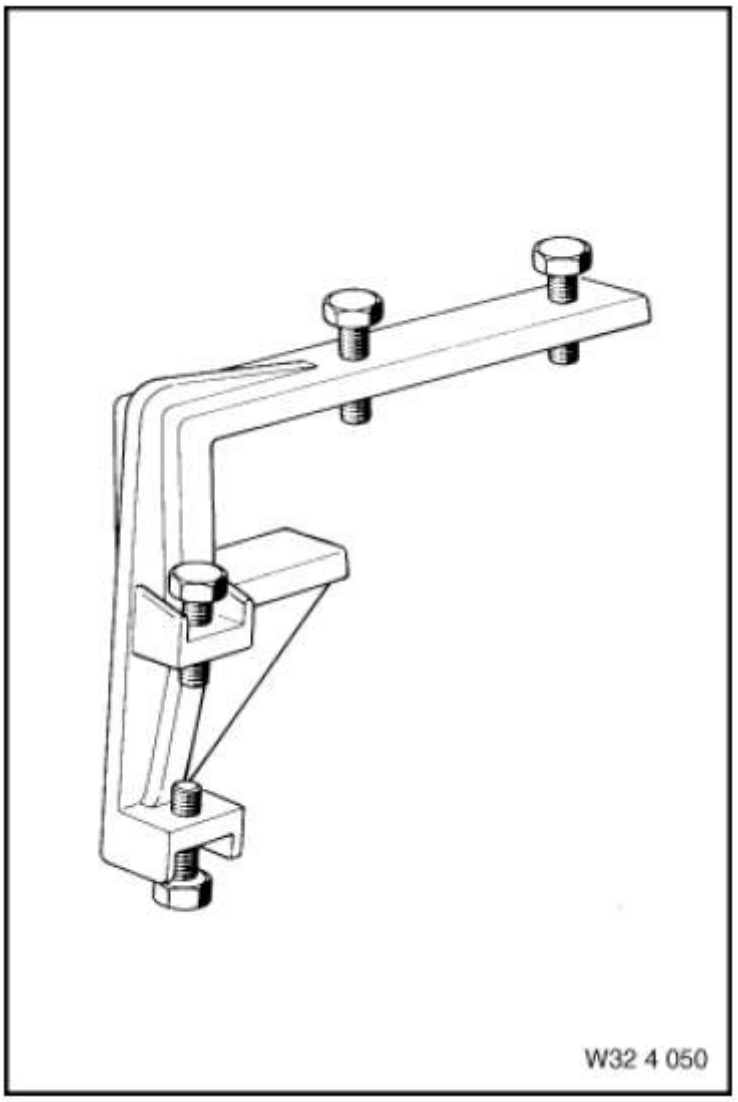


Fig. 16: Identifying Device (0492068)
Courtesy of BMW OF NORTH AMERICA, INC.

0492067 DEVICE

0492067 324040 Device Mechanical tool

NOTE: For holding down the drop arm when checking mechanical play in the hydro-steering gear - model year: from 82

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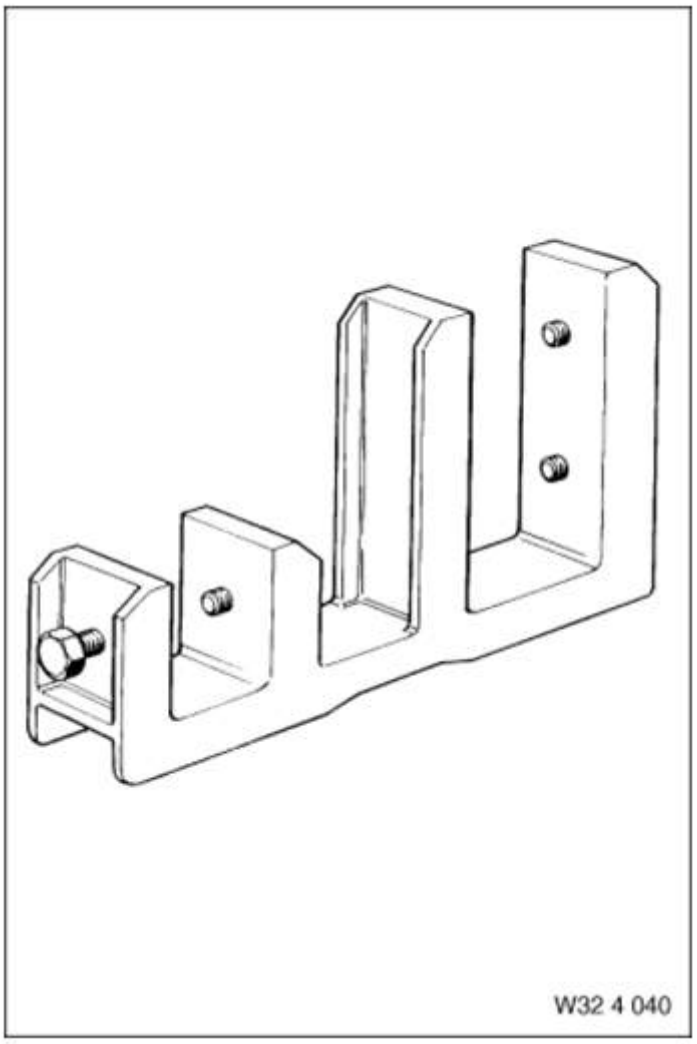


Fig. 17: Identifying Device (0492067)
Courtesy of BMW OF NORTH AMERICA, INC.

0492019 DEVICE

0492019 322020 Device Mechanical tool

NOTE: For pulling fluid blocks out of the track-rod arm

0492066 DEVICE

0492066 324030 Device Mechanical tool

NOTE: For holding down the drop arm when checking mechanical play in the hydro-steering gear - model year: up to 82

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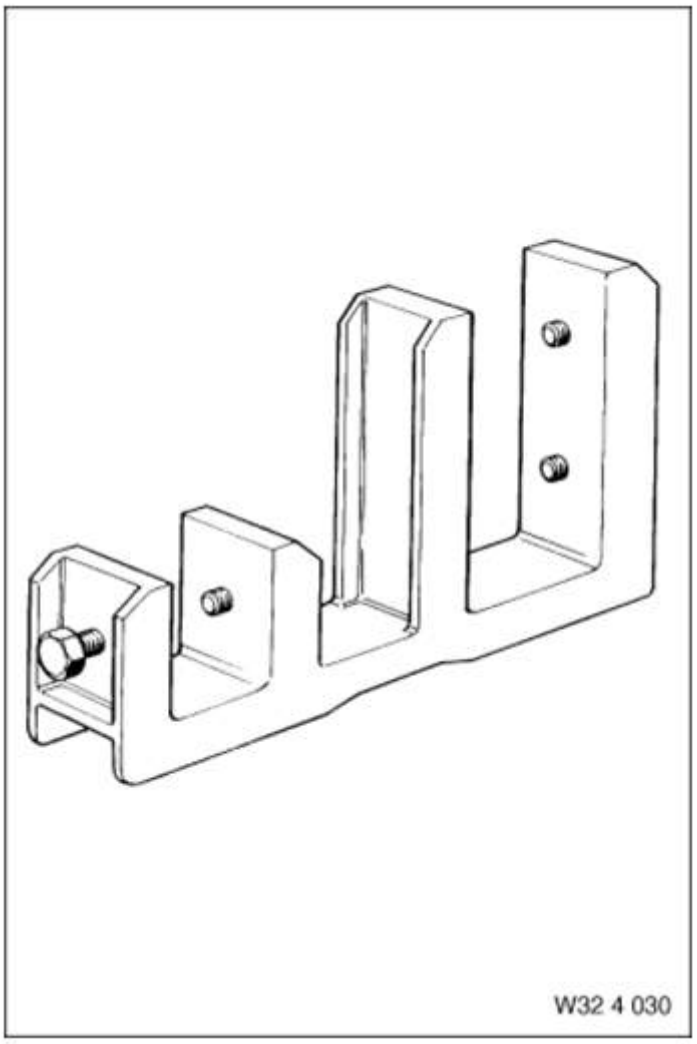


Fig. 18: Identifying Device (0492066)
Courtesy of BMW OF NORTH AMERICA, INC.

0492020 DEVICE

0492020 322030 Device AM

NOTE: **For removing and installing the fluid blocks in the track-rod arm**

Storage Location

X6

Consisting of:

1. 0492021 Mandrel
2. 0492022 Holding sleeve

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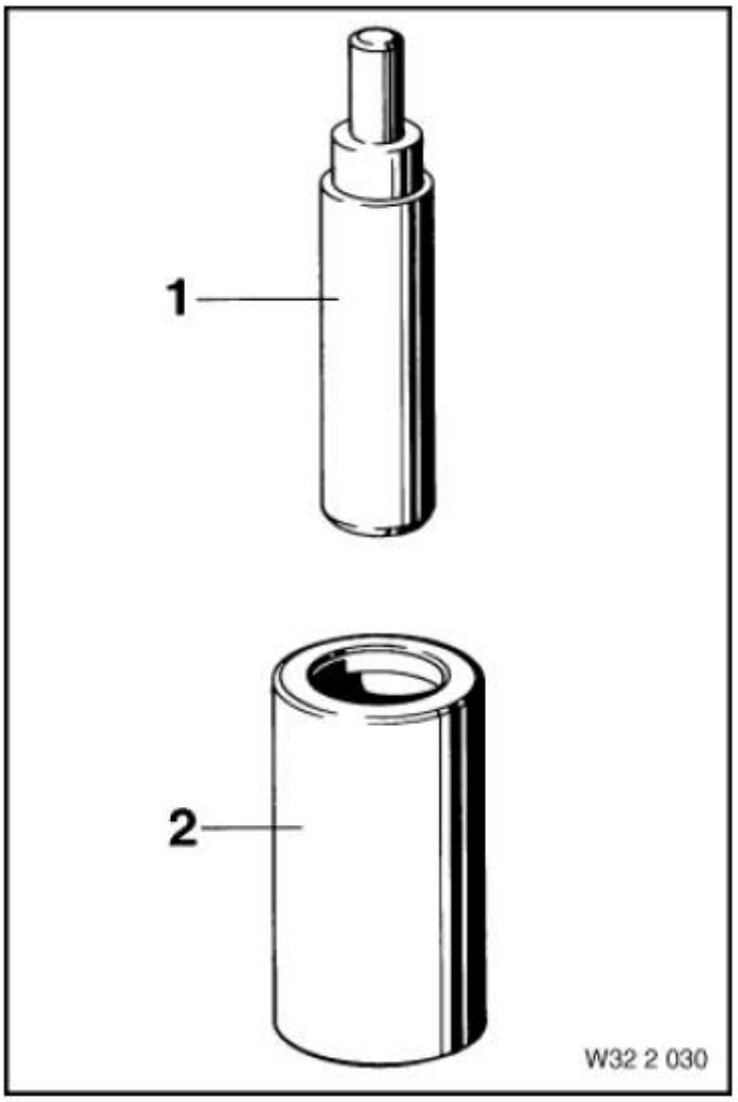


Fig. 19: Identifying Device (0492020)
Courtesy of BMW OF NORTH AMERICA, INC.

0492003 DEVICE

0492003 321200 Device AM

NOTE: **For removing and installing lock pin on steering column adjustment - replace steering column adjustment lever**

Storage Location

A12

SI number

01 05 95 (932)

Consisting of:

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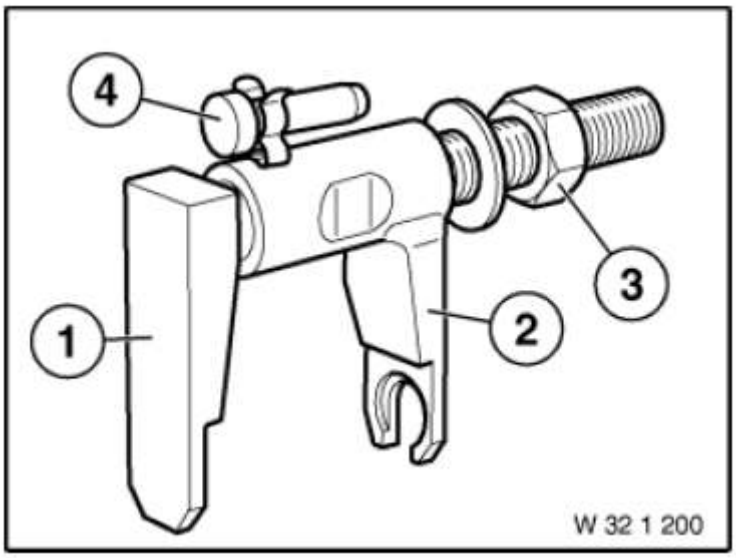


Fig. 20: Identifying Device (0492003)
Courtesy of BMW OF NORTH AMERICA, INC.

1. 0492004 Basic body

   NOTE: (Basic body)

2. 0492005 Tool

   NOTE: (Shaped element) discontinued, available as part of set of special tools only

3. 0492006 Nut

   NOTE: (Thrust nut)

4. 0492007 Bolt

   NOTE: (Pressure pin) discontinued, available as part of set of special tools only

0492069 DEVICE

0492069 324060 Device Mechanical tool

NOTE: For holding down the drop arm when checking the mechanical play in the power steering box

SI number

01 04 86 (566)

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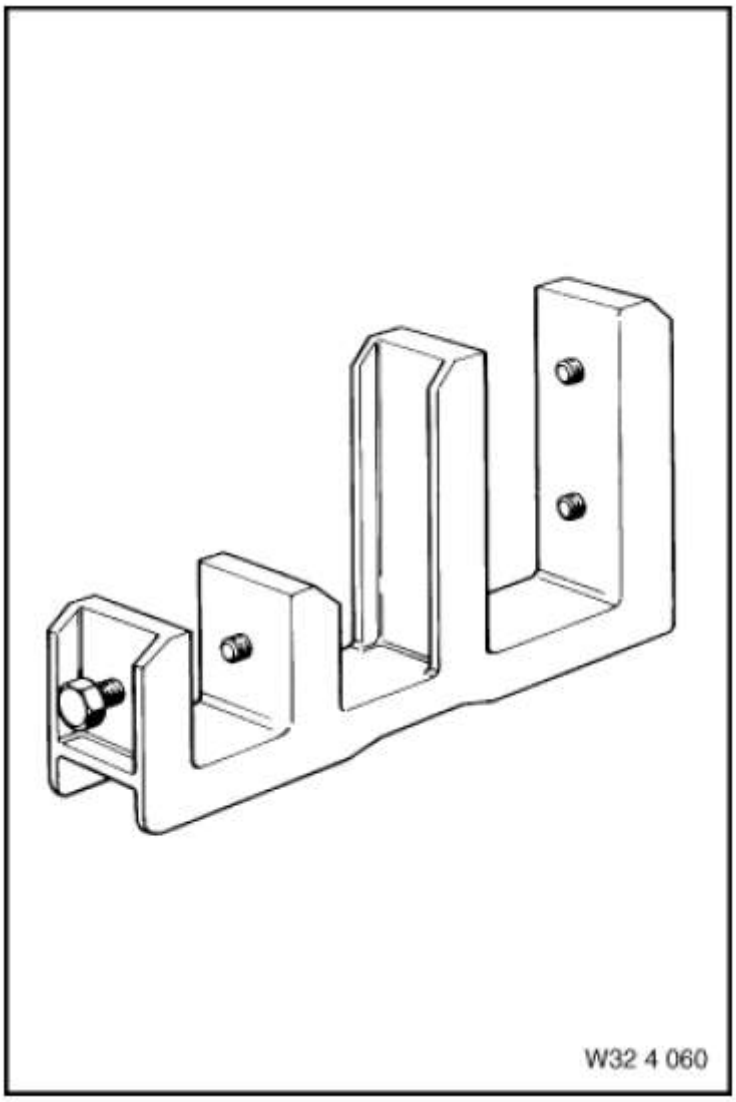


Fig. 21: Identifying Device (0492069)
Courtesy of BMW OF NORTH AMERICA, INC.

0492071 DOUBLE-HEAD BOX WRENCH

0492071 324100 Double-head box wrench Mechanical tool

NOTE: **(Open double ring spanner AF 17/19) For installing and removing the pipe bend on the power steering pump - model: 520, 525, 2500...3.3L, 2800CS, 2800CSA, 3.0CS, 3.0CSA**

Storage Location

B10

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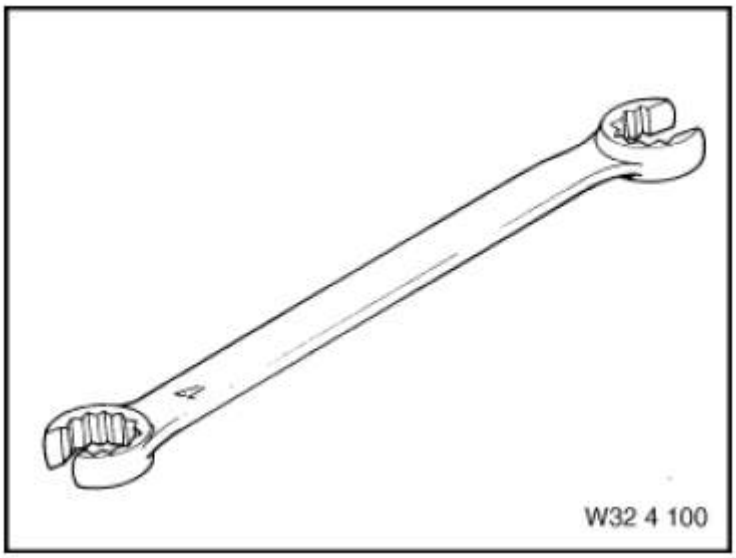


Fig. 22: Identifying Double-Head Box Wrench (0492071)
Courtesy of BMW OF NORTH AMERICA, INC.

0493650 EXTENSION

0493650 323151 Extension Minimum set: Mechanical tools AM

NOTE: For torque wrench Available only as a complete tool set 32 3 150 (83 30 0 493 649) - as of 13.07.2012.

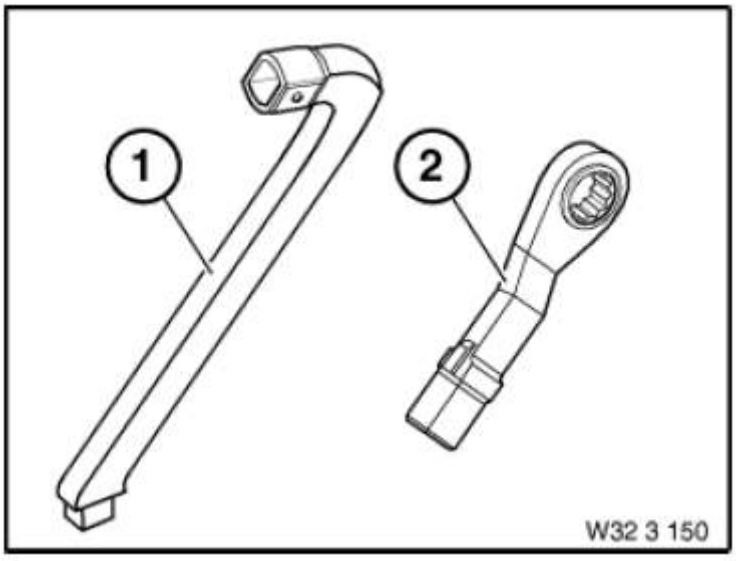


Fig. 23: Identifying Extension (0493650)
Courtesy of BMW OF NORTH AMERICA, INC.

0494815 EXTRACTOR

0494815 323092 Extractor Minimum set: Mechanical tools AM

NOTE: (extractor lower section)

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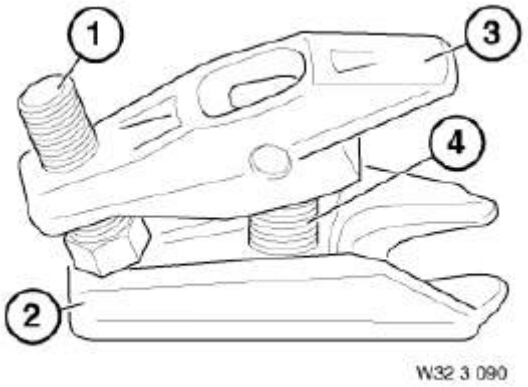


Fig. 24: Identifying Extractor (0494815)
Courtesy of BMW OF NORTH AMERICA, INC.

0492053 EXTRACTOR

0492053 323090 Extractor Minimum set: Mechanical tools AM

NOTE: **For pressing wheel control joint off wheel carrier E30 (325ix), E34 (525ix), E36, E46, Z1, Z3. For pressing track rod off wheel carrier E34 (525ix).**

Storage Location

B12

SI number

01 04 92 (487)

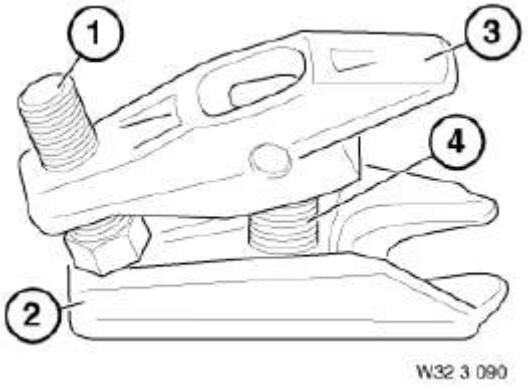


Fig. 25: Identifying Extractor (0492053)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

2 = 0494815 Extractor

NOTE: **(extractor lower section)**

3 = 0494816 Extractor

NOTE: **(extractor upper part)**

4 = 0494817 Spindle

NOTE: **(spindle with cylindrical pin)**

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1 = 0493263 Screw

NOTE: **(Pressure bolt) Replaced by 31 2 311 (0 495 800)**

0494816 EXTRACTOR

0494816 323093 Extractor Minimum set: Mechanical tools AM

NOTE: **(extractor upper part)**

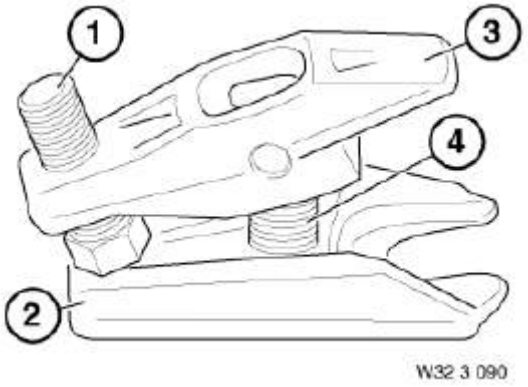


Fig. 26: Identifying Extractor (0494816)
Courtesy of BMW OF NORTH AMERICA, INC.

0491993 FIXTURE

0491993 321100 Fixture Mechanical tool

NOTE: **For supporting the rack-and-pinion steering during removal and installation**

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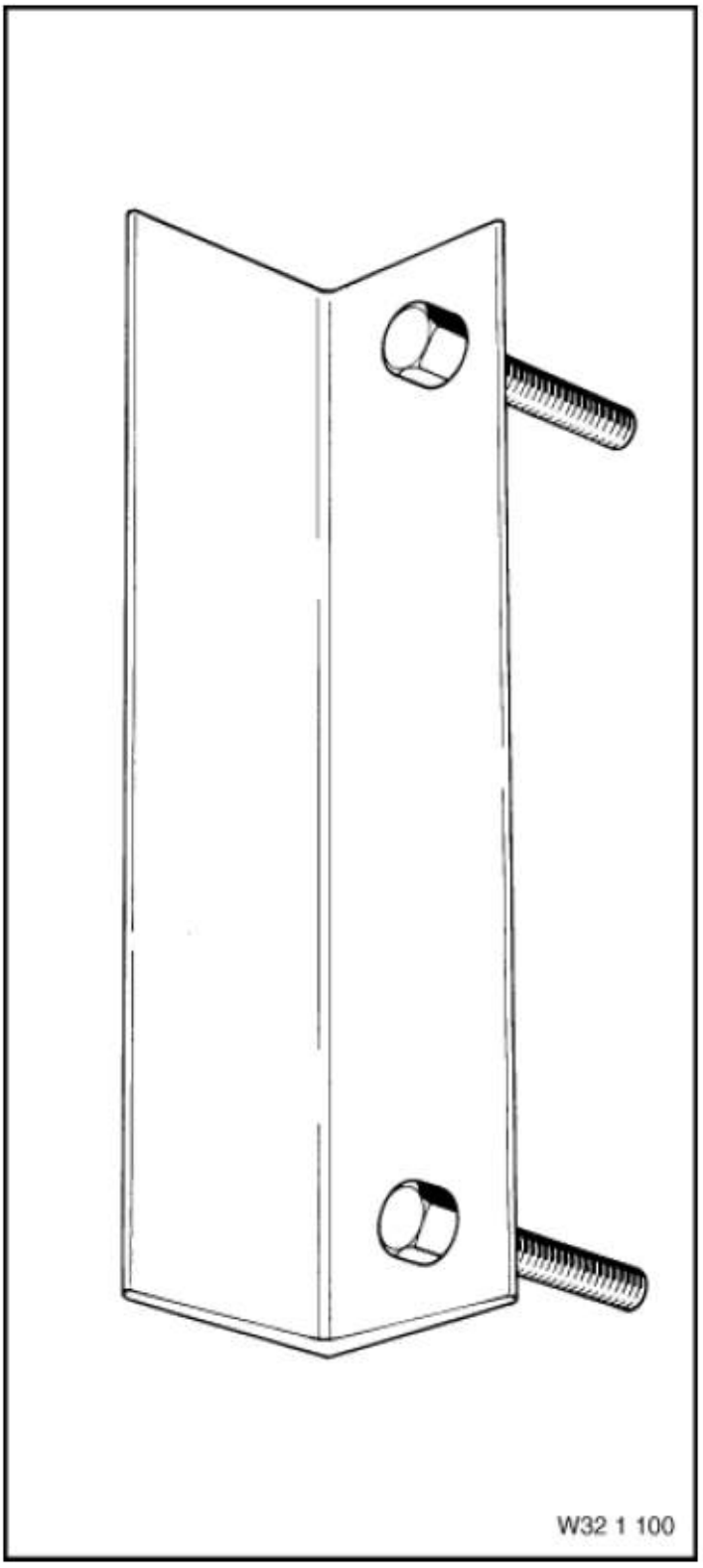


Fig. 27: Identifying Fixture (0491993)
Courtesy of BMW OF NORTH AMERICA, INC.

0492036 GAUGE

0492036 322140 Gauge Minimum set: Mechanical tools AM

NOTE: **(Test gauge) For measuring the drop arm**

Storage Location

C5

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SI number

01 06 94 (801)

Consisting of:

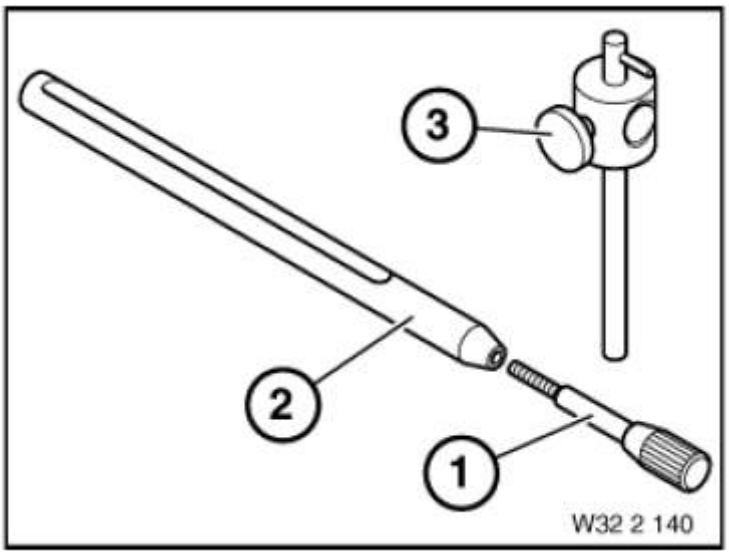


Fig. 28: Identifying Gauge (0492036)
Courtesy of BMW OF NORTH AMERICA, INC.

1. **0492037** Screw

   Note:

2. **0492038** Rod

   NOTE: (Guide rod)

3. **0492039** Measuring device

   NOTE: (Sensor) Deletion, only available via tool set

0492029 GAUGE

0492029 322120 Gauge AM

Replaced by: 83300492036

NOTE: (Test gauge) For measuring the drop arm - Replaced by 32 2 140. (0 492 036)

Consisting of:

1. **0492030** Spindle

   NOTE: Discontinuation and replaced by 32 2 140. (0 492 036)

2. **0492031** Shaped part

   NOTE: (Shaped part)

3. **0492032** Bolt

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NOTE: **(Measuring bolt) Discontinuation and replaced by 32 2 140. (0 492 036)**

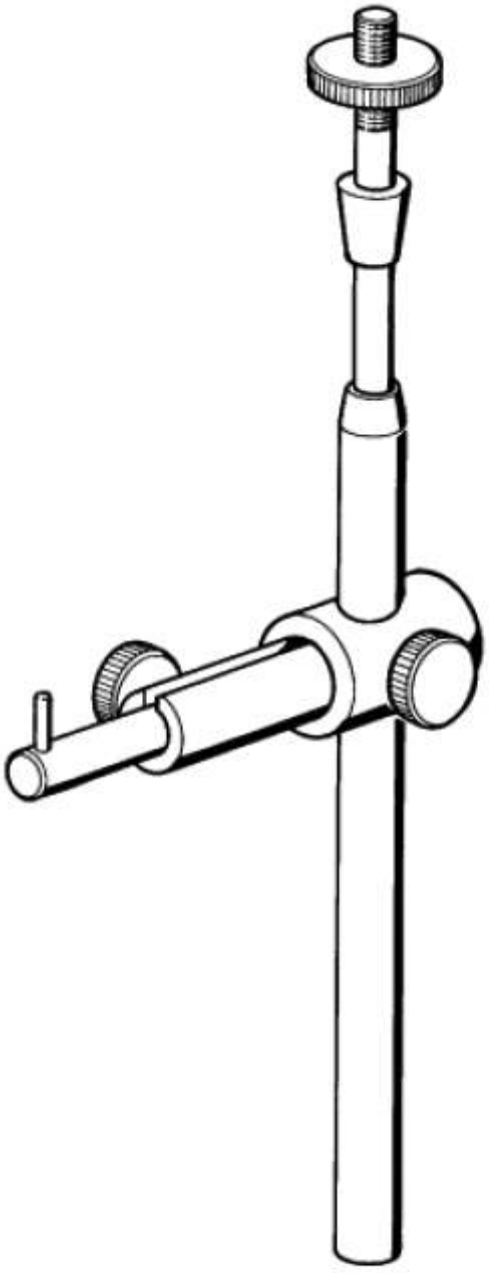


Fig. 29: Identifying Gauge (0492029)
Courtesy of BMW OF NORTH AMERICA, INC.

0491997 HANDLE

0491997 321140 Handle Mechanical tool

NOTE: **For drift/rack-and-pinion steering**

Storage Location

B16

C16

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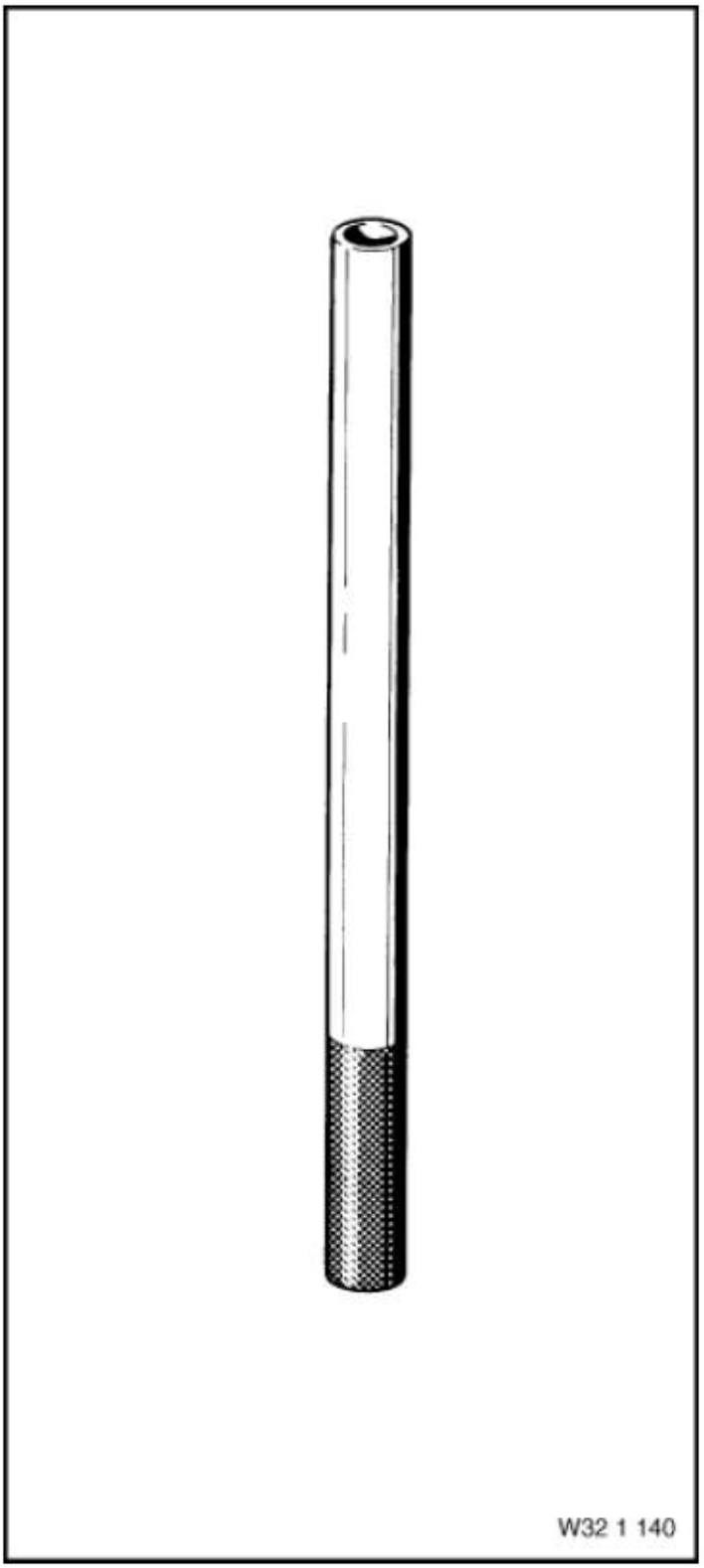


Fig. 30: Identifying Handle (0491997)
Courtesy of BMW OF NORTH AMERICA, INC.

0492012 HOLDER

0492012 321250 Holder Mechanical tool

NOTE: **(Counter support) For drift 32 1 140 when driving out the radial shaft seal together with bearing from the bearing bush**

Storage Location

A13

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SI number

01 05 95 (932)

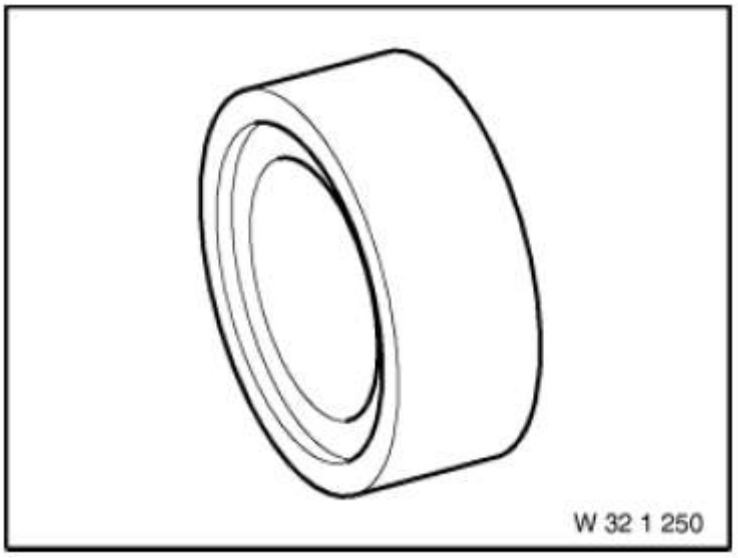


Fig. 31: Identifying Holder (0492012)
Courtesy of BMW OF NORTH AMERICA, INC.

0492022 HOLDING SLEEVE

0492022 322032 Holding sleeve AM

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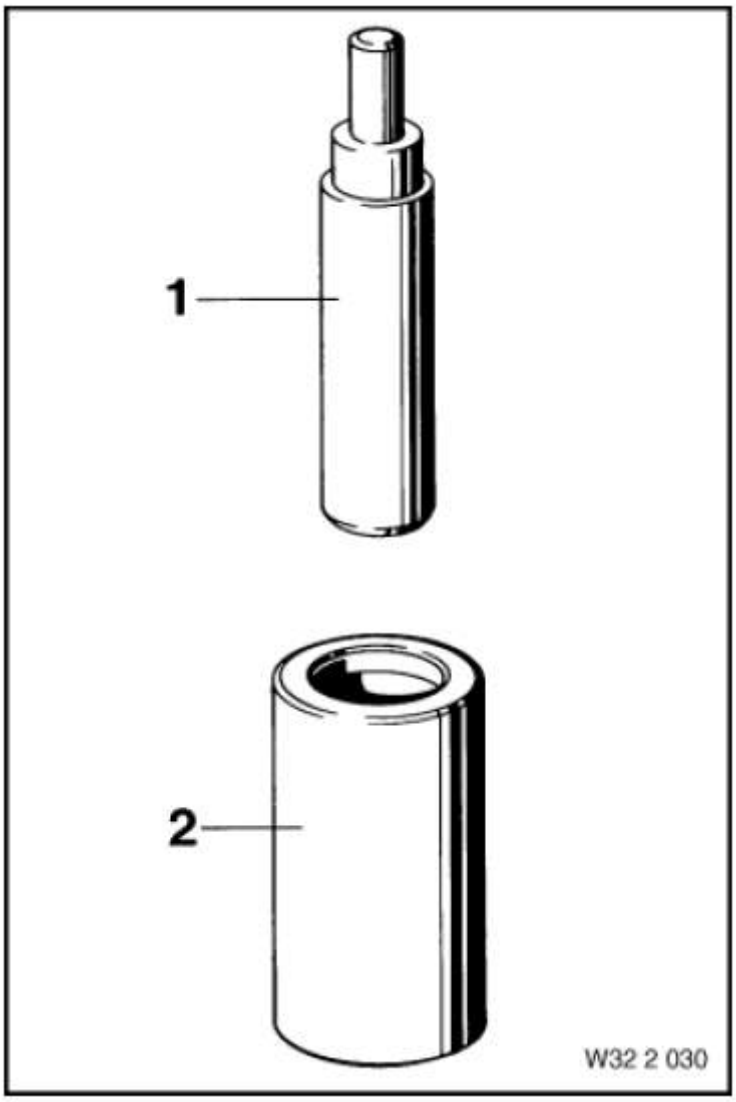


Fig. 32: Identifying Holding Sleeve (0492022)
Courtesy of BMW OF NORTH AMERICA, INC.

0492043 HOLDING SLEEVE

0492043 323050 Holding sleeve AM

NOTE: **(assembly sleeves) For fitting the snap rings to the steering shaft**

Storage Location

A8

Consisting of:

1. 0492044 Pipe

   NOTE: **(Impact rod) discontinued, available as part of set of special tools only**

2. 0492045 Bush

   NOTE: **(slip bush) For fitting the snap ring when a flat nut is used for steering wheel mount - Model year: Up to 73, discontinued, available as part of set of special tools only**

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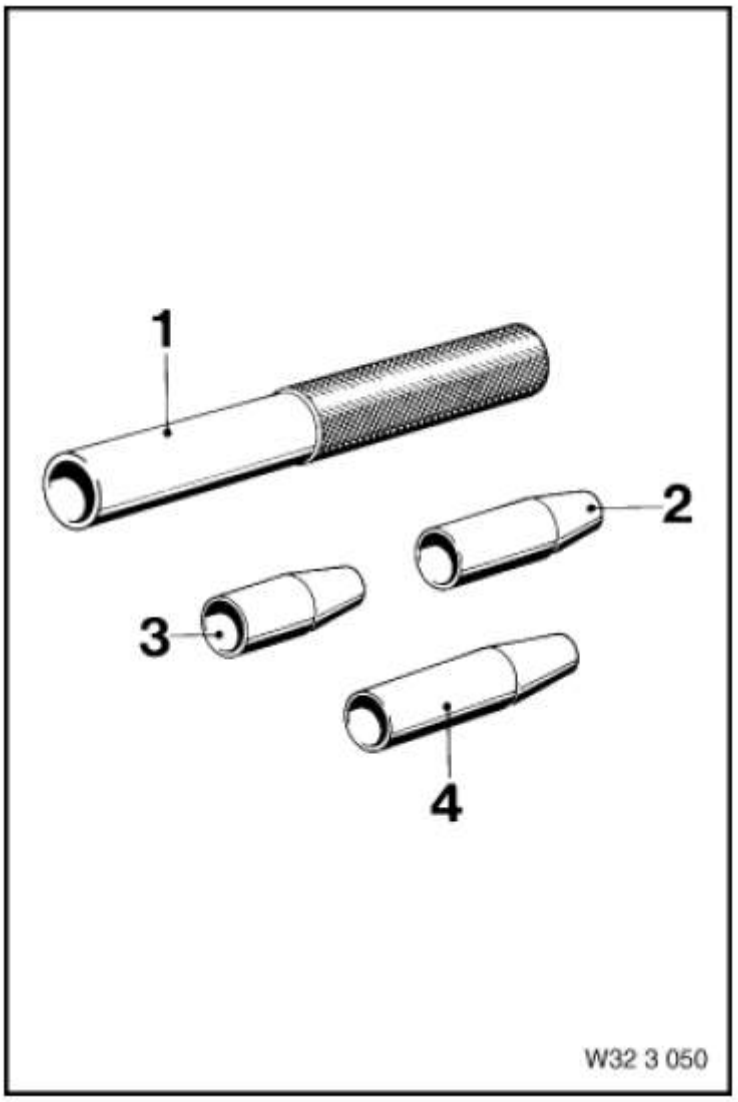


Fig. 33: Identifying Holding Sleeve (0492043)
Courtesy of BMW OF NORTH AMERICA, INC.

3. 0492046 Bush

NOTE: **(slip bush) For fitting the snap ring to the lower steering shaft bearing - Model: 2500... 3.0 CSi Deletion, only available via tool set**

4. 0492047 Bush

NOTE: **(slip bush) For fitting the snap ring when a stop nut is used for steering wheel mount - Model year: From 74 discontinued, available as part of set of special tools only**

0492008 MANDREL

0492008 321210 Mandrel Mechanical tool

NOTE: **(Drift) For driving the radial seal ring out of the bearing bush of the rack-and-pinion hydraulic steering**

Storage Location

C16

SI number

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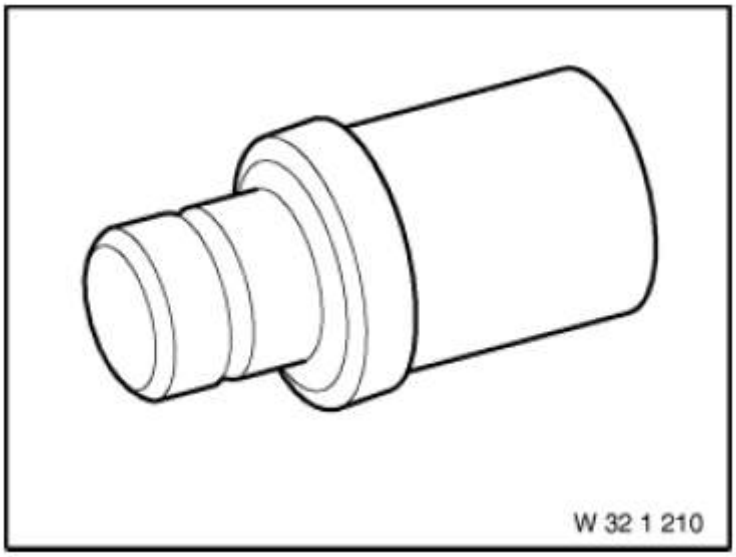


Fig. 34: Identifying Mandrel (0492008)
Courtesy of BMW OF NORTH AMERICA, INC.

0493322 MANDREL

0493322 321080 Mandrel Mechanical tool

NOTE: **(Drift) for radial sealing ring in the valve body/steering box**

Storage Location

X8

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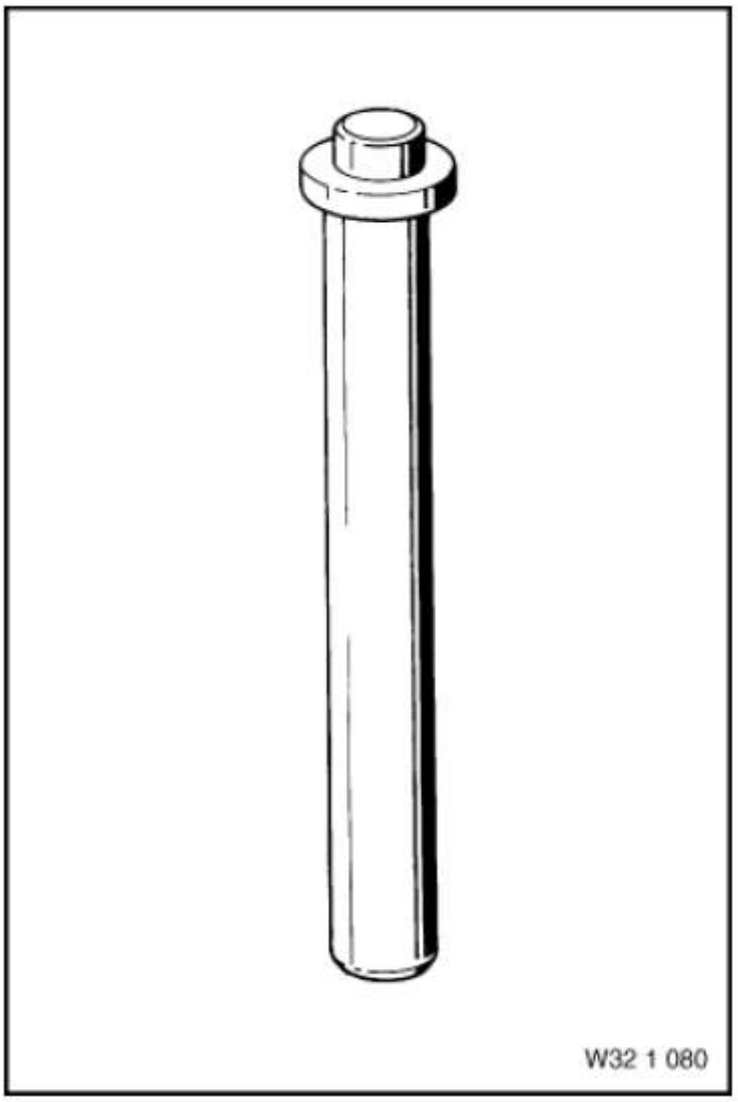


Fig. 35: Identifying Mandrel (0493322)
Courtesy of BMW OF NORTH AMERICA, INC.

0495291 MANDREL

0495291 323130 Mandrel Mechanical tool

NOTE: **(Drift) Drift for for driving in steering shaft guide bearing on E46 (new steering box). Series introduction 1998.**

Storage Location

B16

SI number

01 02 98 (302)

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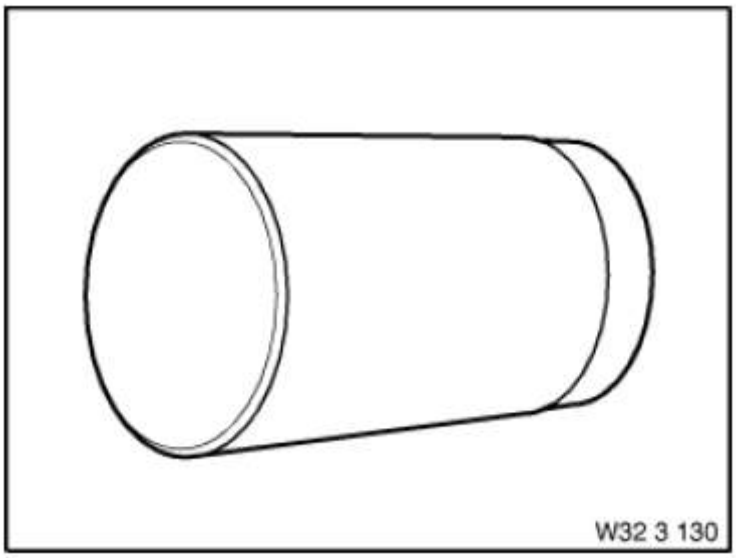


Fig. 36: Identifying Mandrel (0495291)
Courtesy of BMW OF NORTH AMERICA, INC.

0491995 MANDREL

0491995 321120 Mandrel Mechanical tool

NOTE: **(Drift) For driving out radial shaft seal in cylinder barrel**

Storage Location

X8

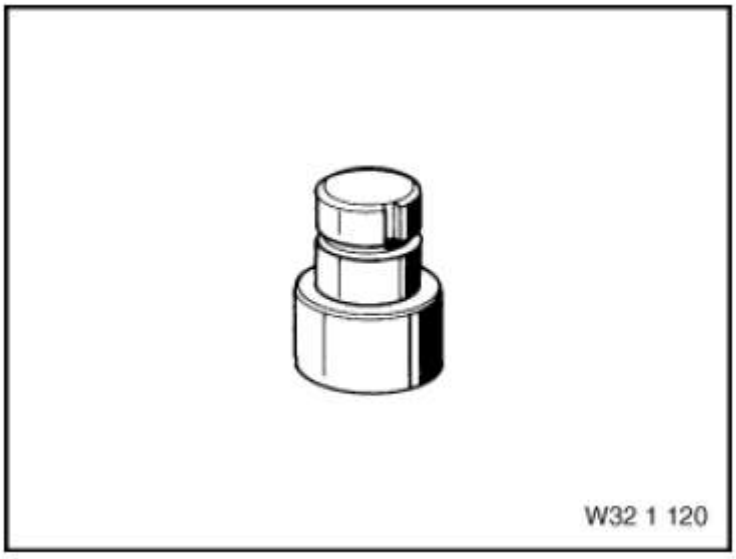


Fig. 37: Identifying Mandrel (0491995)
Courtesy of BMW OF NORTH AMERICA, INC.

0491998 MANDREL

0491998 321150 Mandrel Mechanical tool

NOTE: **(Drift) For fitting the radial seal in the transmission housing of rack-and-pinion steering**

Storage Location

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A15

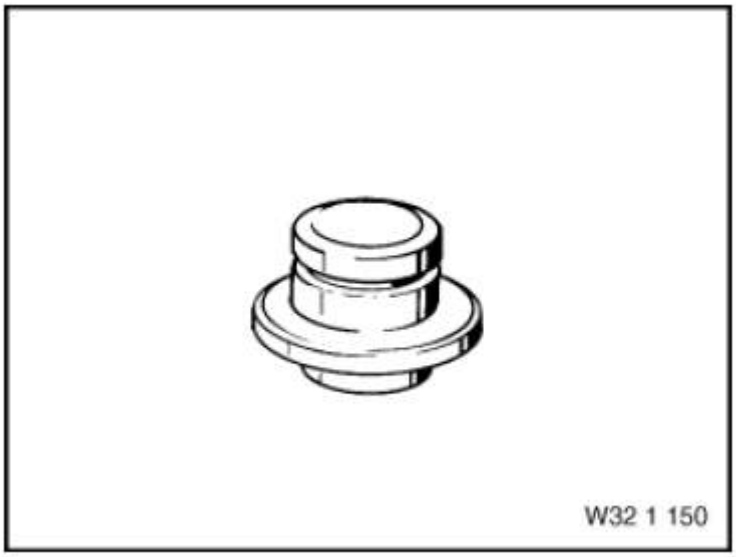


Fig. 38: Identifying Mandrel (0491998)
Courtesy of BMW OF NORTH AMERICA, INC.

0492011 MANDREL

0492011 321240 Mandrel Mechanical tool

NOTE: **(Drift) For driving the radial seal ring into the bearing bush (steering shaft) on the rack-and-pinion hydraulic steering**

Storage Location

C16

SI number

01 05 95 (932)

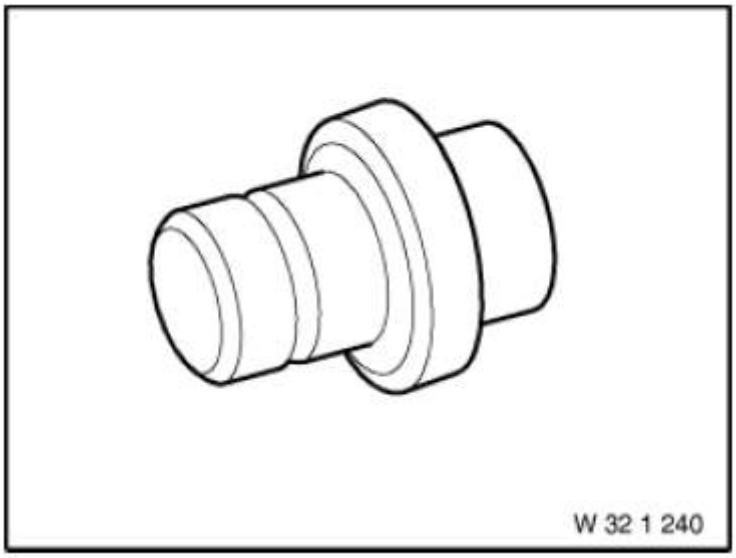


Fig. 39: Identifying Mandrel (0492011)
Courtesy of BMW OF NORTH AMERICA, INC.

0492010 MANDREL

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0492010 321230 Mandrel Mechanical tool

NOTE: **(drift) For fitting the radial sealing ring in the steering spindle housing of the rack and pinion power steering unit**

Storage Location

C16

SI number

01 05 95 (932)

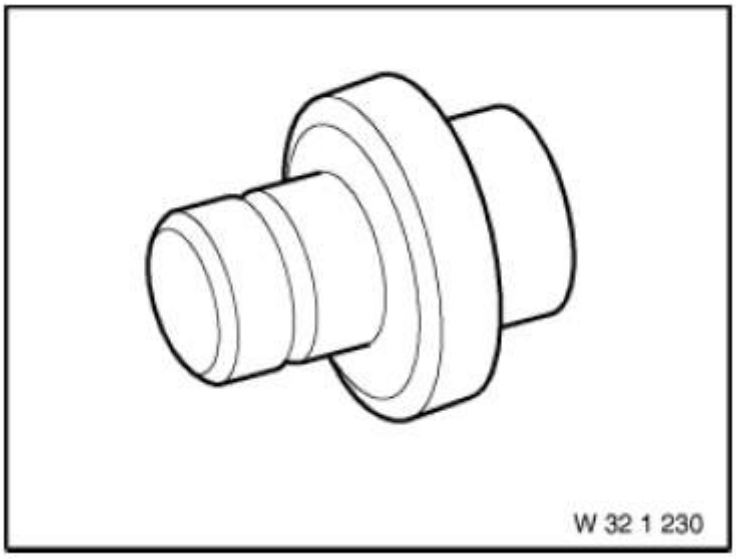


Fig. 40: Identifying Mandrel (0492010)
Courtesy of BMW OF NORTH AMERICA, INC.

0492009 MANDREL

0492009 321220 Mandrel Mechanical tool

NOTE: **(Drift) For driving radial shaft seal into bearing bush of rack and pinion power steering unit**

Storage Location

C16

SI number

01 05 95 (932)

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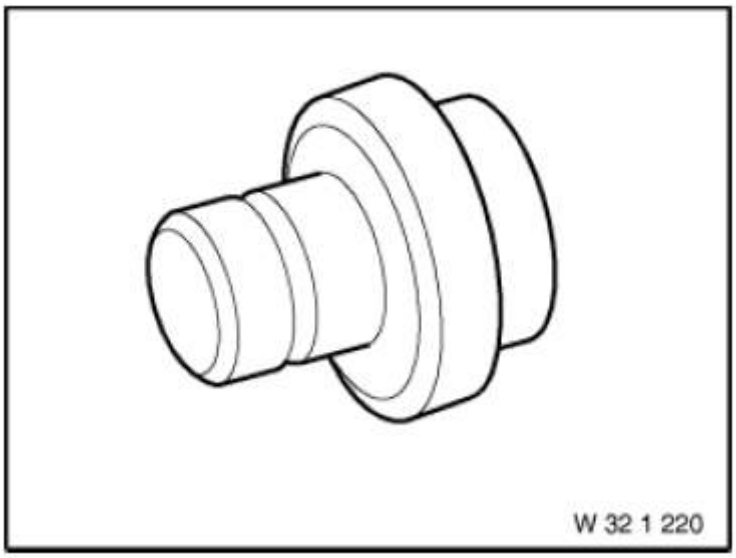


Fig. 41: Identifying Mandrel (0492009)
Courtesy of BMW OF NORTH AMERICA, INC.

0491996 MANDREL

0491996 321130 Mandrel Mechanical tool

NOTE: **(drift) For driving out the radial sealing ring in the cylinder barrel, inside and outside**

Storage Location

X8

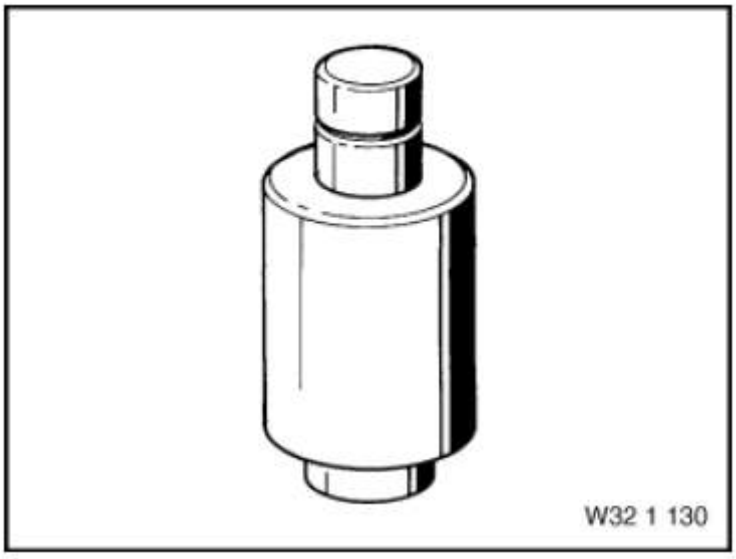


Fig. 42: Identifying Mandrel (0491996)
Courtesy of BMW OF NORTH AMERICA, INC.

0492021 MANDREL

0492021 322031 Mandrel AM

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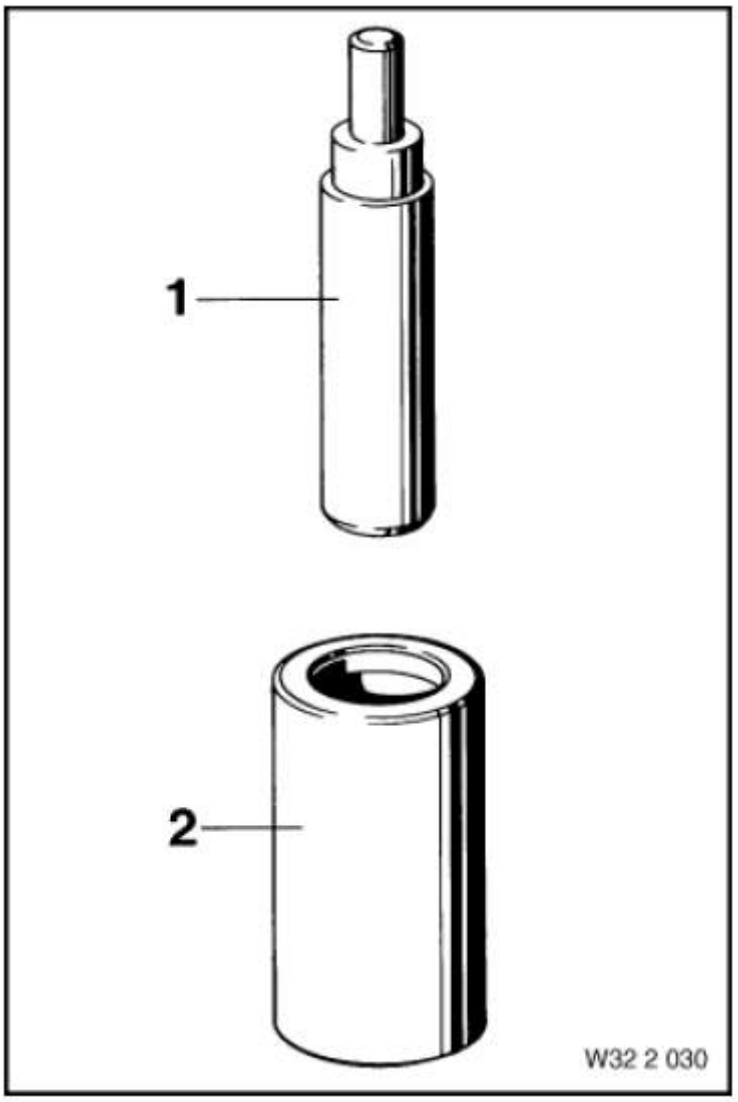


Fig. 43: Identifying Mandrel (0492021)
Courtesy of BMW OF NORTH AMERICA, INC.

0492001 MANDREL

0492001 321180 Mandrel Mechanical tool

NOTE: **(drift) For radial sealing ring of the power steering**

Storage Location

C16

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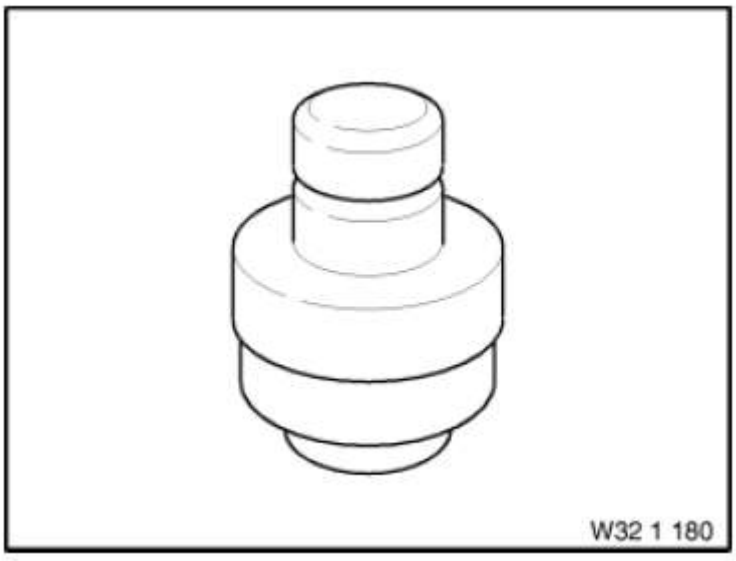


Fig. 44: Identifying Mandrel (0492001)
Courtesy of BMW OF NORTH AMERICA, INC.

0495580 MANDREL

0495580 324270 Mandrel Mechanical tool

NOTE: **(Drift) For driving in steering spindle bearing.**

Storage Location

B20

SI number

01 11 06 (265)



Fig. 45: Identifying Mandrel (0495580)
Courtesy of BMW OF NORTH AMERICA, INC.

0491999 MANDREL

0491999 321160 Mandrel Mechanical tool

NOTE: **(Drift) For roller bearing in the valve body of rack-and-pinion steering**

Storage Location

X8

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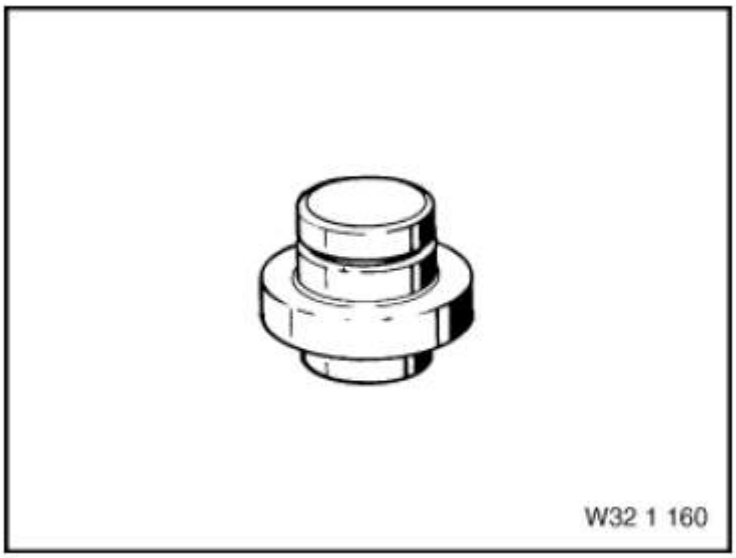


Fig. 46: Identifying Mandrel (0491999)
Courtesy of BMW OF NORTH AMERICA, INC.

0491989 MANDREL

0491989 321060 Mandrel Mechanical tool

NOTE: **(Drift) For radial seal ring of inner steering sector shaft in steering box**

Storage Location

A15

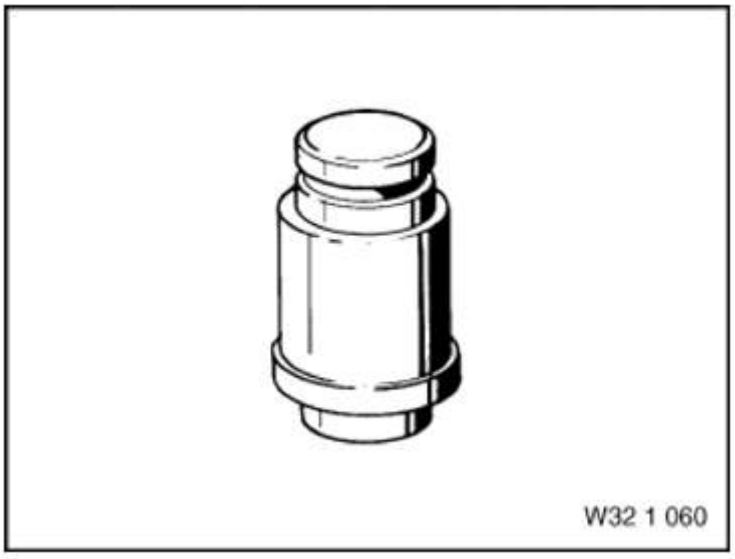


Fig. 47: Identifying Mandrel (0491989)
Courtesy of BMW OF NORTH AMERICA, INC.

0492039 MEASURING DEVICE

0492039 322143 Measuring device Minimum set: Mechanical tools AM

NOTE: **(Sensor) Deletion, only available via tool set**

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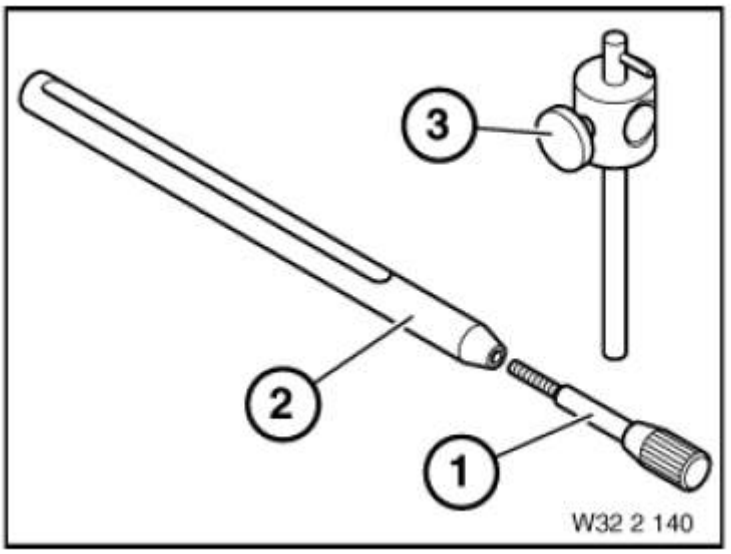


Fig. 48: Identifying Measuring Device (0492039)
Courtesy of BMW OF NORTH AMERICA, INC.

0492006 NUT

0492006 321203 Nut AM

NOTE: (Thrust nut)

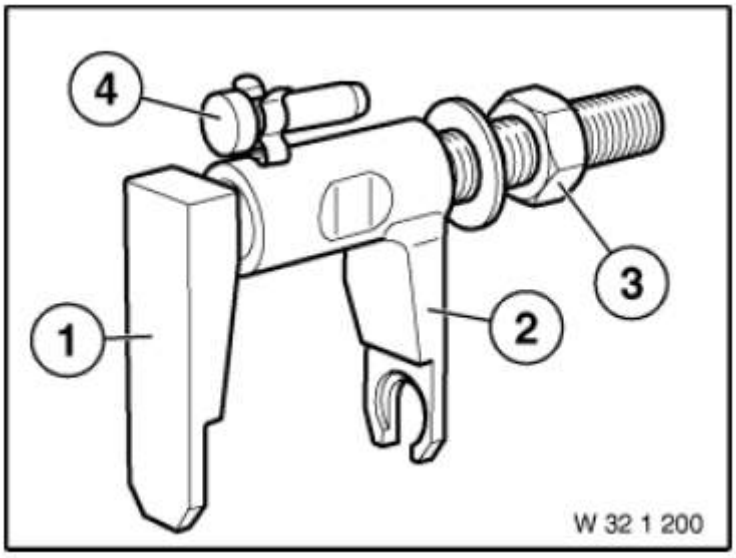


Fig. 49: Identifying Nut (0492006)
Courtesy of BMW OF NORTH AMERICA, INC.

0492054 OPEN-END WRENCH

0492054 323100 Open-end wrench Mechanical tool

NOTE: (open-end wrench WAF 32) For adjusting telescopic spindle sliding force

Storage Location

Y3

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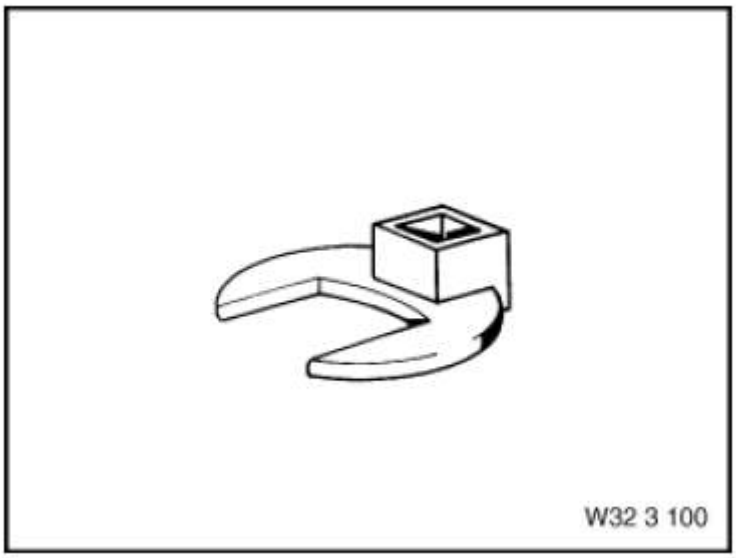


Fig. 50: Identifying Open-End Wrench (0492054)
Courtesy of BMW OF NORTH AMERICA, INC.

0492034 OPEN-END WRENCH

0492034 322131 Open-end wrench AM

NOTE: **(Open-end spanner AF 22)**

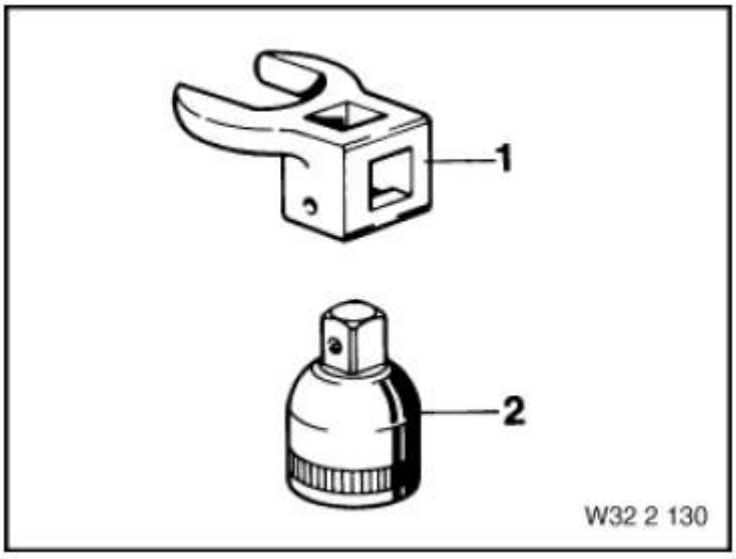


Fig. 51: Identifying Open-End Wrench (0492034)
Courtesy of BMW OF NORTH AMERICA, INC.

0492027 OPEN-END WRENCH

0492027 322100 Open-end wrench Mechanical tool

NOTE: **(open-end wrench WAF 27) For adjusting left track rod on rack**

Storage Location

Y4

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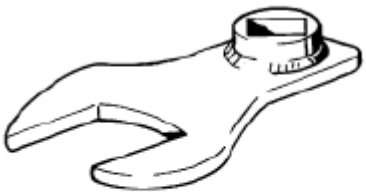


Fig. 52: Identifying Open-End Wrench (0492027)
Courtesy of BMW OF NORTH AMERICA, INC.

0492033 OPEN-END WRENCH

0492033 322130 Open-end wrench AM

NOTE: (Open-end spanner AF 22) with inner reducer 1/2" - outer 3/8"

Consisting of:

1. **0492034** Open-end wrench

   NOTE: (Open-end spanner AF 22)

2. **0492035** Adapter

   NOTE: (Adapter) inner 1/2" - outer 3/8"

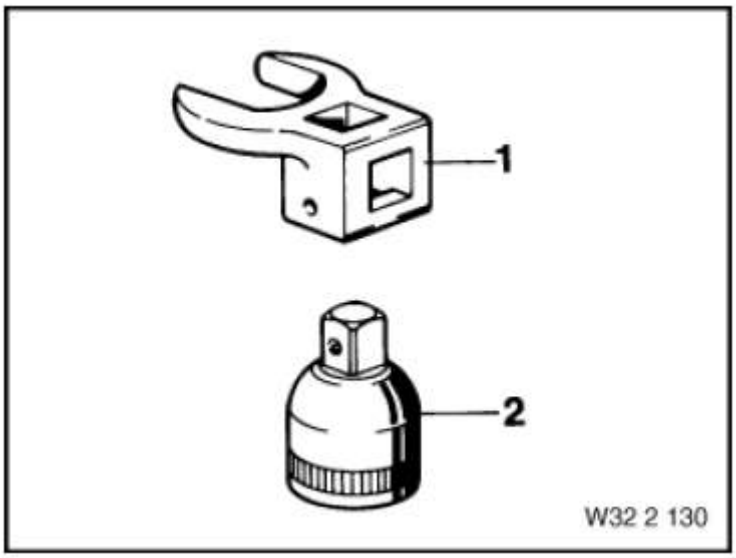


Fig. 53: Identifying Open-End Wrench (0492033)
Courtesy of BMW OF NORTH AMERICA, INC.

0492028 OPEN-END WRENCH INSERT

0492028 322110 Open-end wrench insert Mechanical tool

NOTE: (open-end wrench insert WAF 32) For screwing track rod to rack

Storage Location

A11

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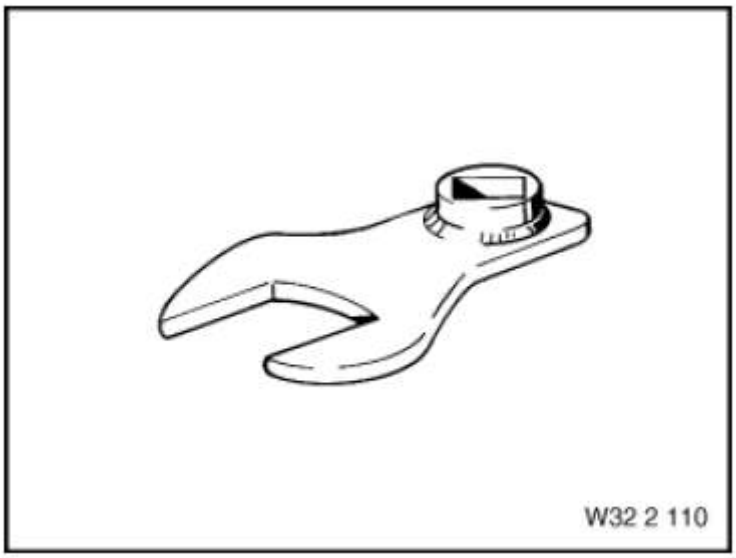


Fig. 54: Identifying Open-End Wrench Insert (0492028)
Courtesy of BMW OF NORTH AMERICA, INC.

0494858 OPEN-END WRENCH INSERT

0494858 323200 Open-end wrench insert Mechanical tool

NOTE: **(Open-end wrench insert) SW34 For releasing and tightening down track rod connection to steering gear (rack)**

Storage Location

A84

SI number

01 01 04 (065)

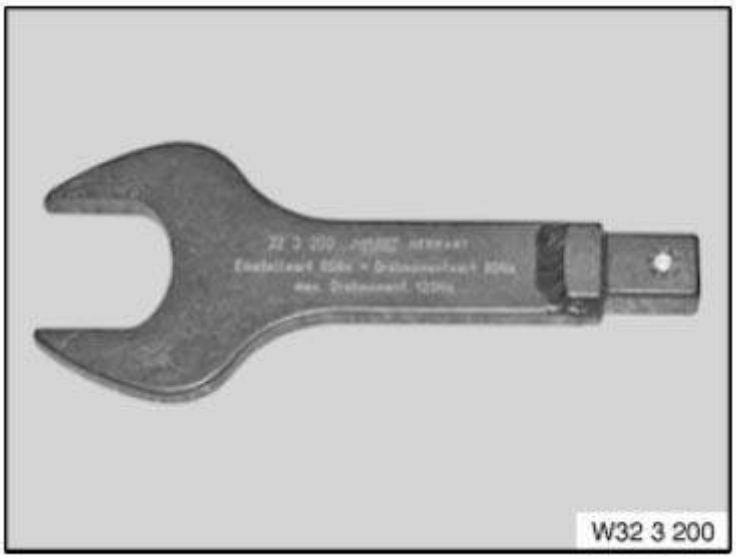


Fig. 55: Identifying Open-End Wrench Insert (0494858)
Courtesy of BMW OF NORTH AMERICA, INC.

0492023 OUTPUSHER

0492023 322040 Outpusher Mechanical tool

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NOTE: **For removing the track rod ball joints from the drop arm and track-rod arm**

Storage Location

C11

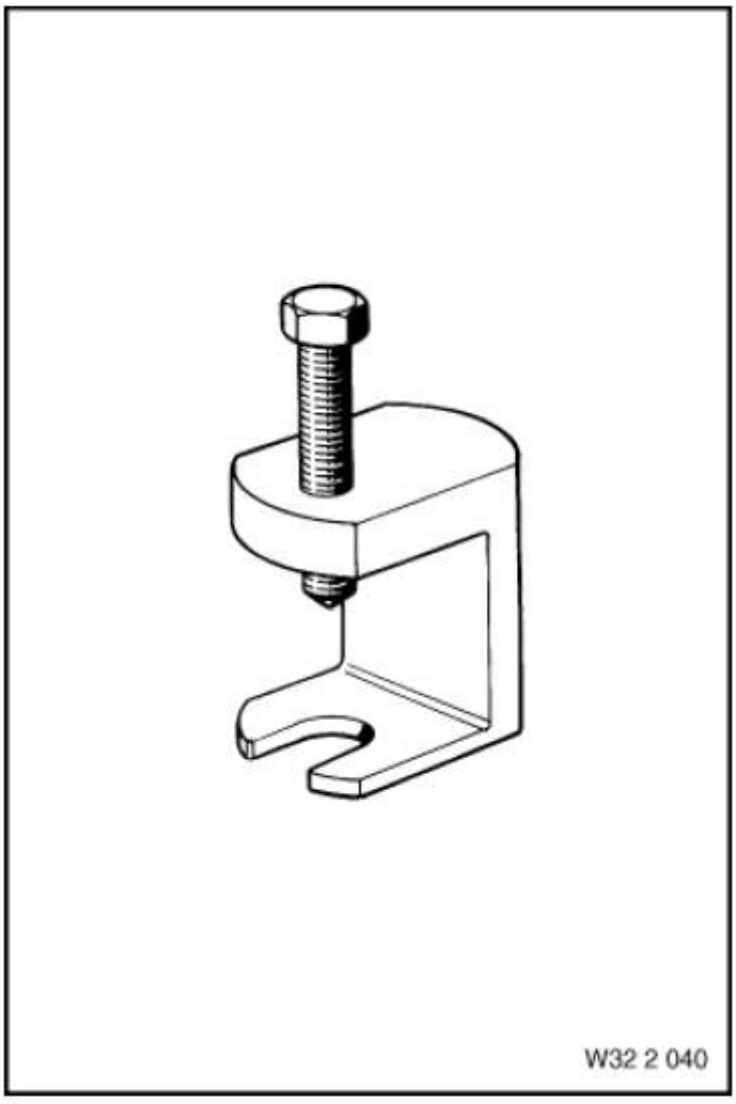


Fig. 56: Identifying Outpusher (0492023)
Courtesy of BMW OF NORTH AMERICA, INC.

0492026 OUTPUSHER

0492026 322090 Outpusher Mechanical tool

NOTE: **For pressing out the track rod center section from the drop arm and track-rod arm. Model: All except 520, 525**

0492002 OUTPUSHER

0492002 321190 Outpusher Minimum set: Mechanical tools Mechanical tool

NOTE: **For pressing out the conical seats from the track rod ball joints**

Storage Location

A12

SI number

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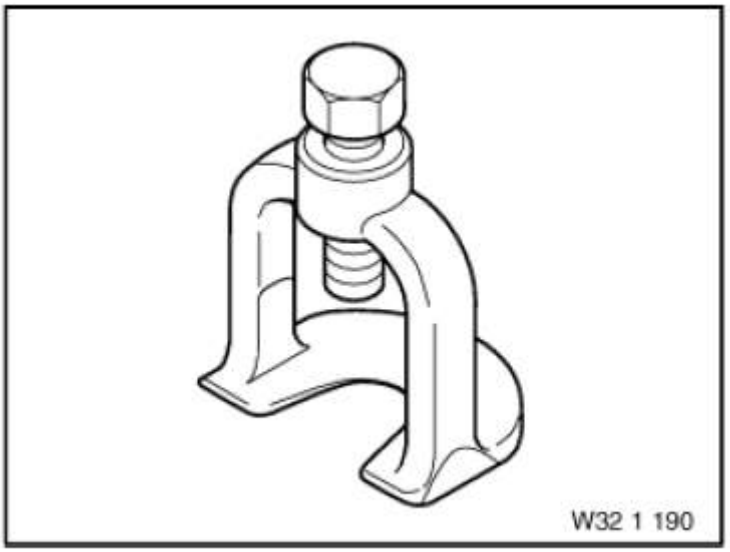


Fig. 57: Identifying Outpusher (0492002)
Courtesy of BMW OF NORTH AMERICA, INC.

0492025 OUTPUSHER

0492025 322070 Outpusher Mechanical tool

NOTE: **For pressing out the track rod middle section from the drop arm and track-rod arm**

Storage Location

A12

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Fig. 58: Identifying Outpusher (0492025)
Courtesy of BMW OF NORTH AMERICA, INC.

0492024 OUTPUSHER

0492024 322050 Outpusher Mechanical tool

NOTE: **For pressing out the side and middle track rod ball joints**

Storage Location

Y6

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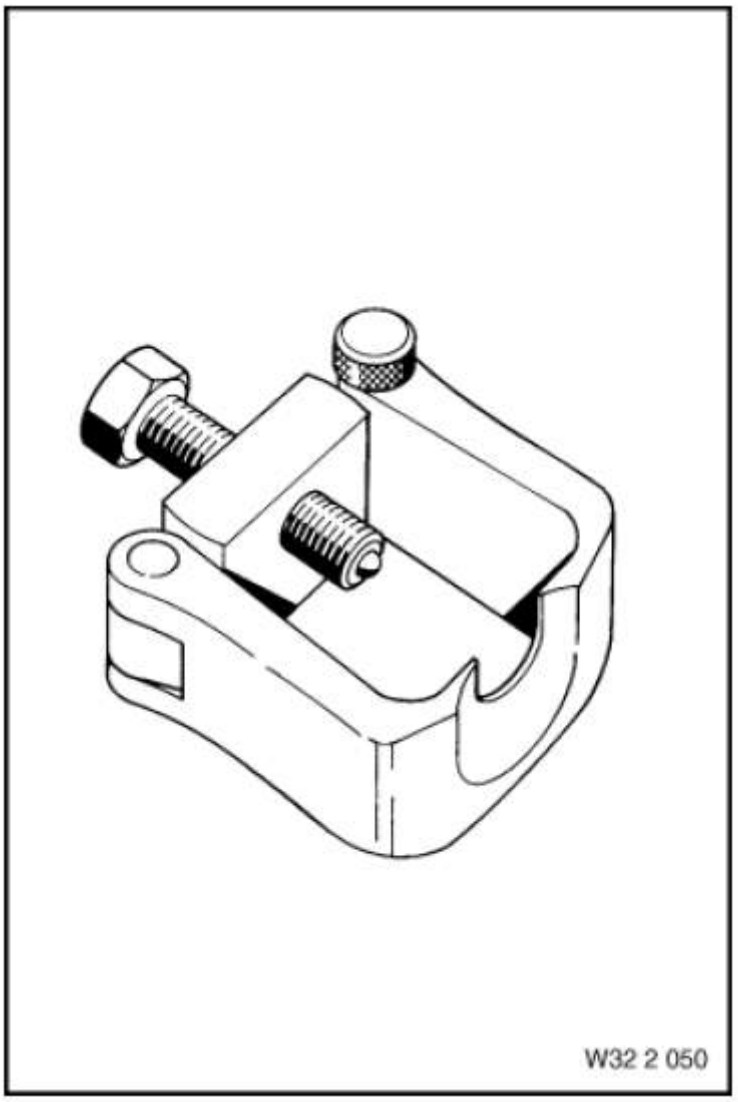


Fig. 59: Identifying Outpusher (0492024)
Courtesy of BMW OF NORTH AMERICA, INC.

0491994 PIN WRENCH

0491994 321110 Pin wrench Mechanical tool

NOTE: **For releasing and tightening the nut on the cylinder barrel of the rack-and-pinion steering**

Storage Location

Y3

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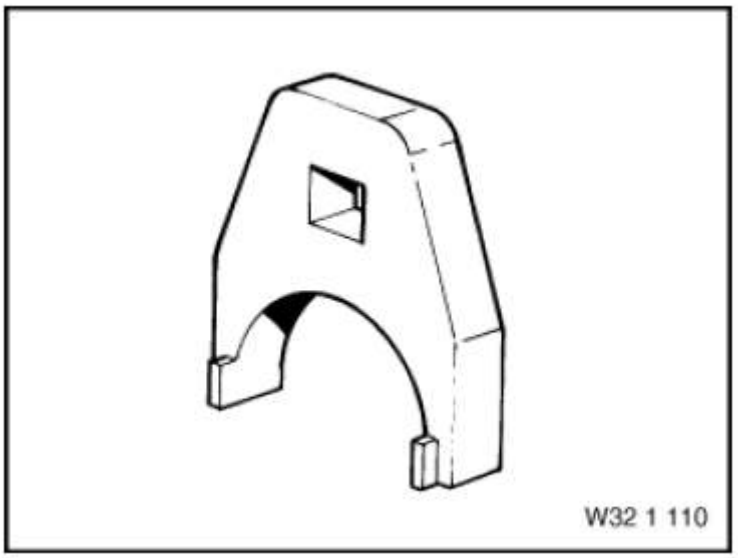


Fig. 60: Identifying Pin Wrench (0491994)
Courtesy of BMW OF NORTH AMERICA, INC.

0492044 PIPE

0492044 323051 Pipe AM

NOTE: **(Impact rod) discontinued, available as part of set of special tools only**

Storage Location

A8

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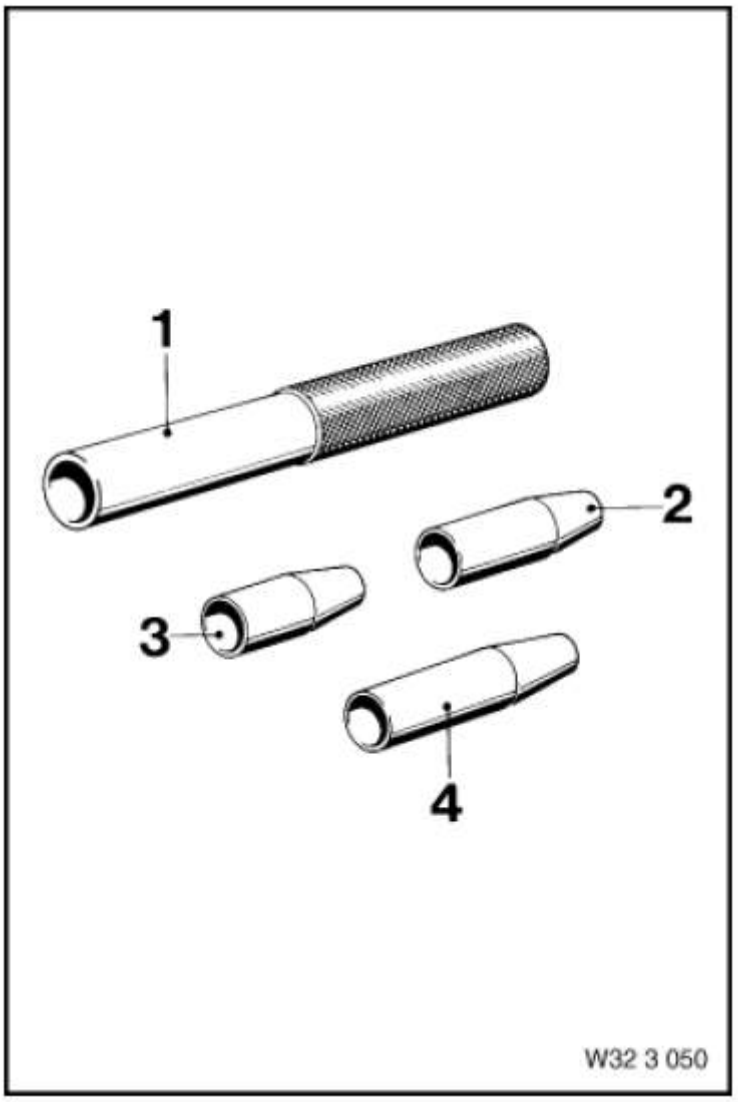


Fig. 61: Identifying Pipe (0492044)
Courtesy of BMW OF NORTH AMERICA, INC.

0492050 PIPE

0492050 323071 Pipe Minimum set: Mechanical tools AM

NOTE: **(Impact rod) discontinued, available as part of set of special tools only**

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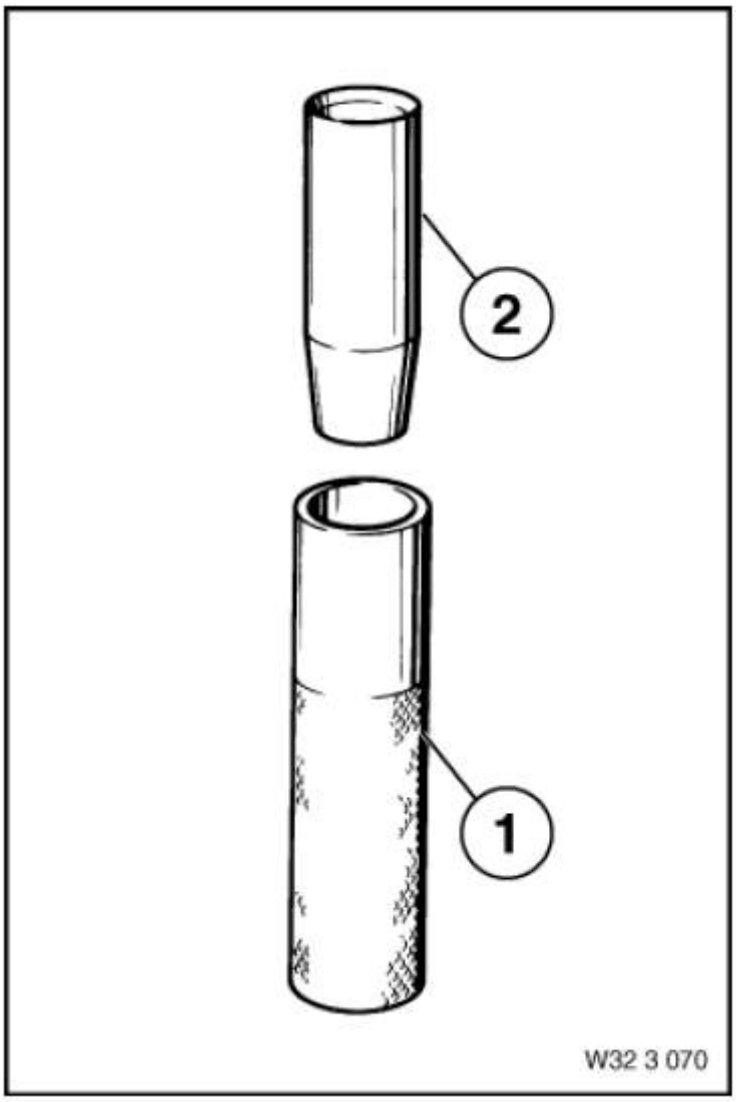


Fig. 62: Identifying Pipe (0492050)
Courtesy of BMW OF NORTH AMERICA, INC.

0492017 PLATE

0492017 322004 Plate Minimum set: Mechanical tools AM

NOTE: **(Extractor plate) Model series: All except E23 Deletion, only available via tool set**

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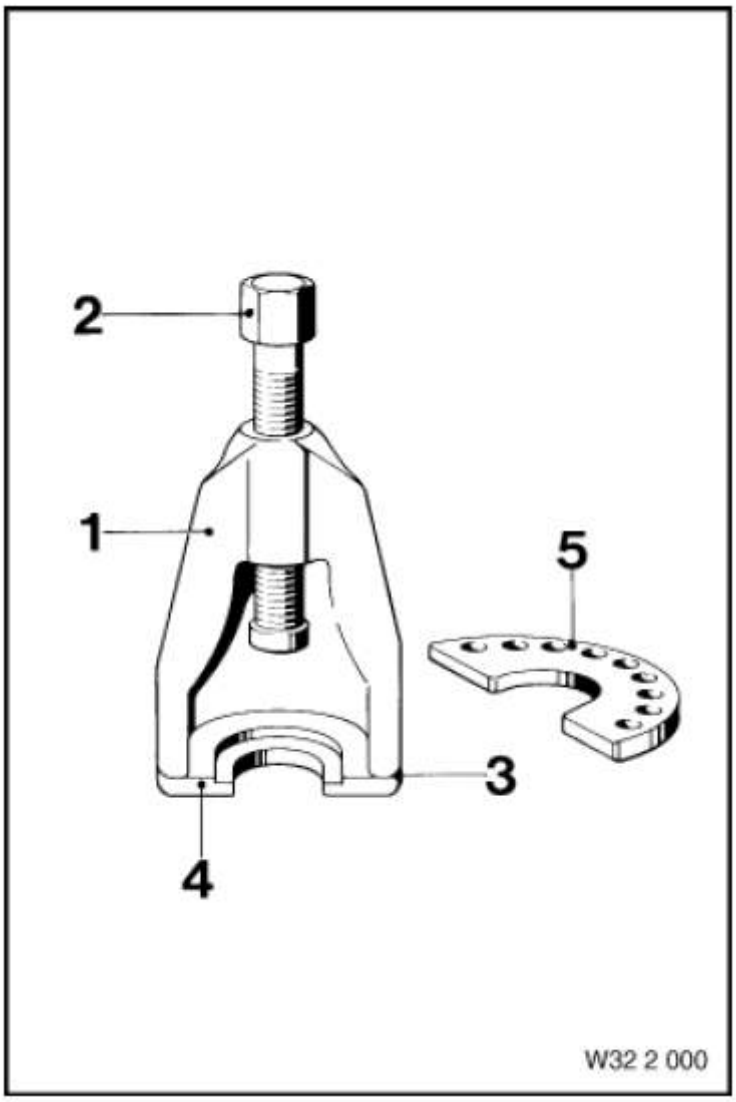


Fig. 63: Identifying Plate (0492017)
Courtesy of BMW OF NORTH AMERICA, INC.

0492018 PLATE

0492018 322005 Plate Minimum set: Mechanical tools AM

NOTE: **(Extractor plate) Model series: E23 Discontinued, only available via complete tool**

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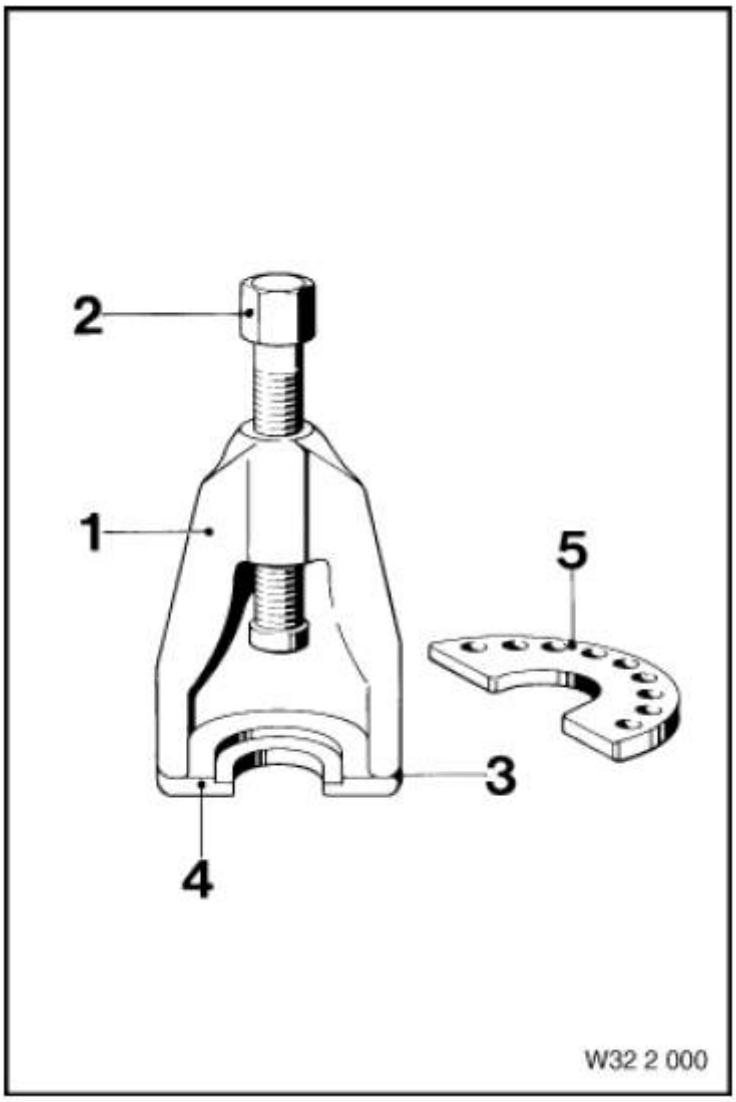


Fig. 64: Identifying Plate (0492018)
Courtesy of BMW OF NORTH AMERICA, INC.

0492042 PLIERS

0492042 323020 Pliers Mechanical tool

NOTE: For fitting of one-ear clamp, make: Saltus 480-20 5 200. Miscellaneous: USA only

0494179 PLUG

0494179 321270 Plug Minimum set: Mechanical tools Mechanical tool

NOTE: (Plugs (set)) 27-piece, 3x per size - For sealing off hydraulic lines for brakes, steering etc.

SI number

01 14 01 (766)

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Fig. 65: Identifying Plug (0494179)
Courtesy of BMW OF NORTH AMERICA, INC.

0492038 ROD

0492038 322142 Rod Minimum set: Mechanical tools AM

NOTE: **(Guide rod)**

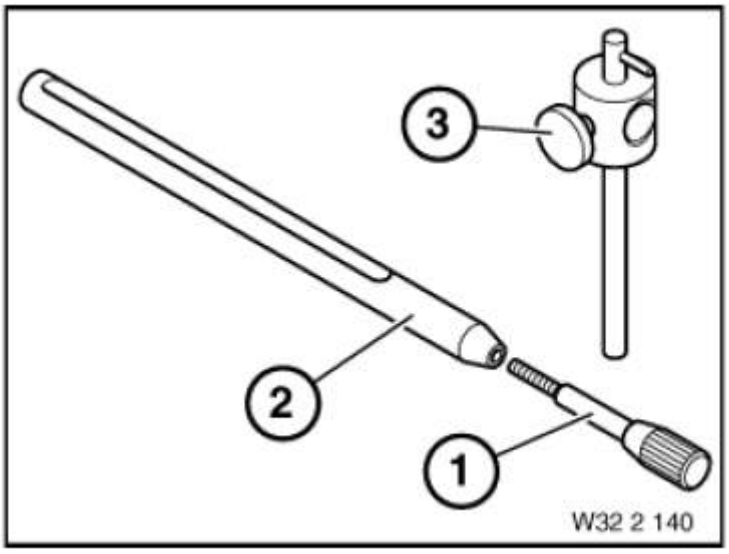


Fig. 66: Identifying Rod (0492038)
Courtesy of BMW OF NORTH AMERICA, INC.

0492037 SCREW

0492037 322141 Screw Minimum set: Mechanical tools AM

Note:

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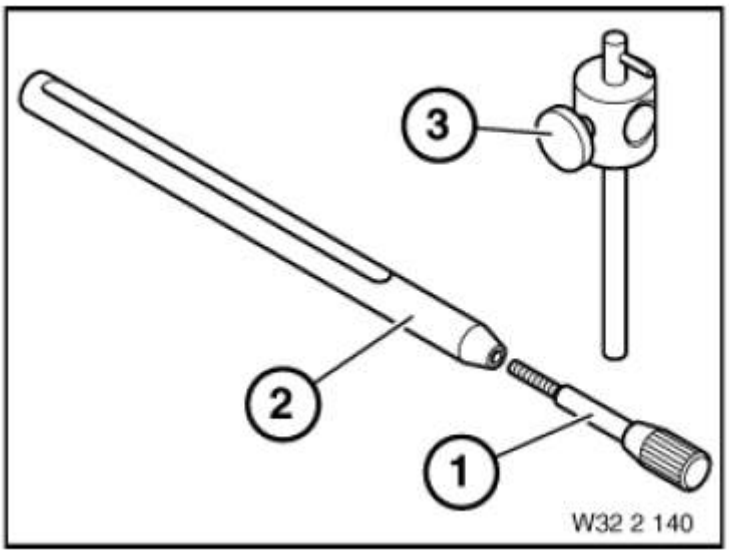


Fig. 67: Identifying Screw (0492037)
Courtesy of BMW OF NORTH AMERICA, INC.

0493263 SCREW

0493263 323091 Screw Minimum set: Mechanical tools AM

NOTE: **(Pressure bolt) Replaced by 31 2 311 (0 495 800)**

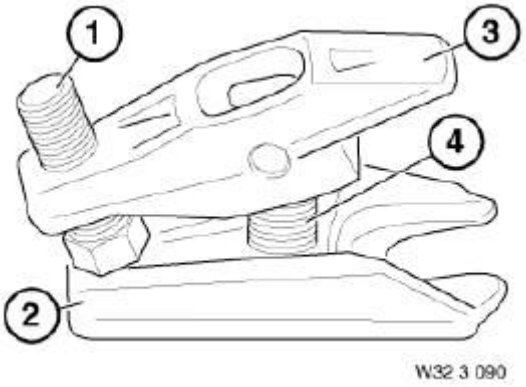


Fig. 68: Identifying Screw (0493263)
Courtesy of BMW OF NORTH AMERICA, INC.

0492016 SCREW

0492016 322003 Screw Minimum set: Mechanical tools AM

NOTE: **(Screw (9 units)) discontinued, available as part of set of special tools only**

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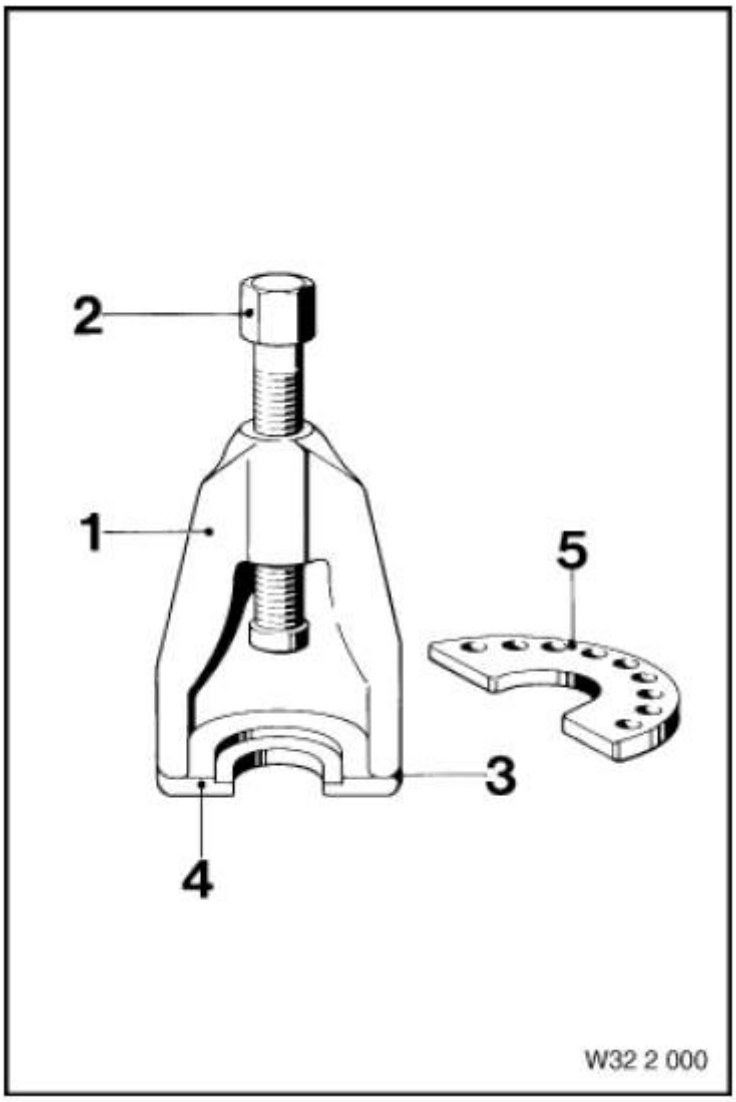


Fig. 69: Identifying Screw (0492016)
Courtesy of BMW OF NORTH AMERICA, INC.

0492040 SHAPED PART

0492040 323000 Shaped part Mechanical tool

NOTE: (Shaped part) Attaches to steering column/Compliance Test. Other: USA only

0492031 SHAPED PART

0492031 322122 Shaped part AM

NOTE: (Shaped part)

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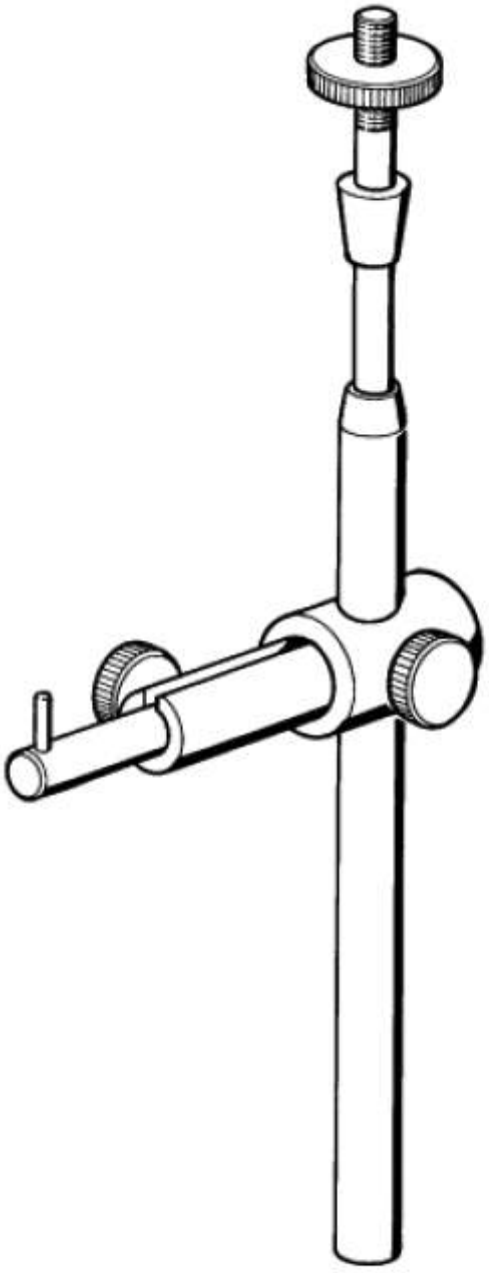


Fig. 70: Identifying Shaped Part (0492031)
Courtesy of BMW OF NORTH AMERICA, INC.

0493651 SOCKET RING SPANNER

0493651 323152 Socket ring spanner Minimum set: Mechanical tools AM

NOTE: **(Socket ring spanner) SW18 Available only as a complete tool set 32 3 150 (83 30 0 493 649) - as of 13.07.2012.**

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Fig. 71: Identifying Socket Ring Spanner (0493651)
Courtesy of BMW OF NORTH AMERICA, INC.

0492056 SOCKET WRENCH INSERT

0492056 323120 Socket wrench insert Mechanical tool

NOTE: **(Wrench socket Torx E8) For tightening the shear screw on the steering column**

Storage Location

A9

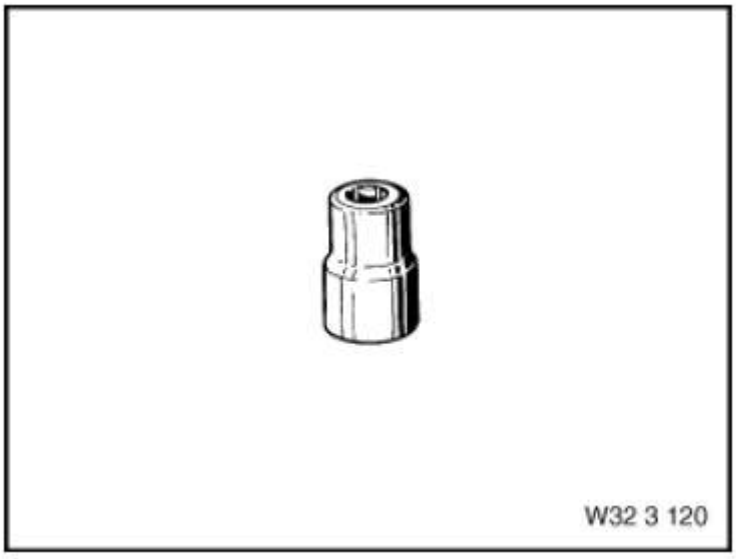


Fig. 72: Identifying Socket Wrench Insert (0492056)
Courtesy of BMW OF NORTH AMERICA, INC.

0492000 SOCKET WRENCH INSERT

0492000 321170 Socket wrench insert Mechanical tool

NOTE: **(Wrench socket, 8-sided) For adjusting the rack-and-pinion steering**

Storage Location

X8

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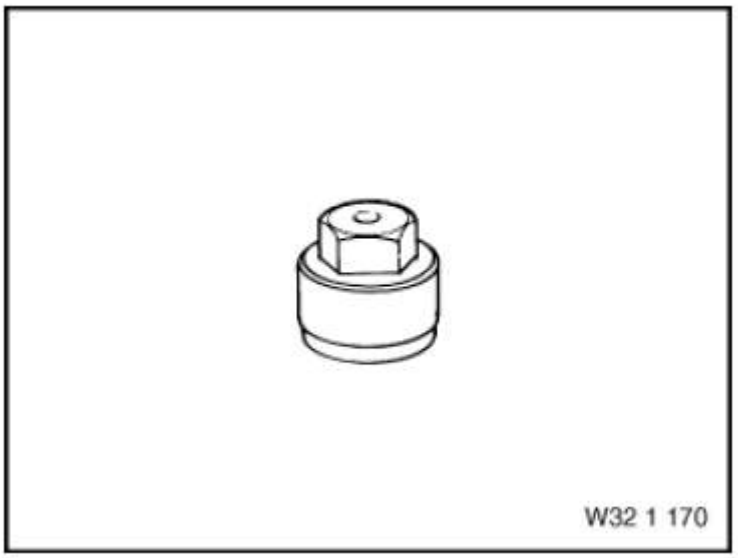


Fig. 73: Identifying Socket Wrench Insert (0492000)
Courtesy of BMW OF NORTH AMERICA, INC.

0492015 SPINDLE

0492015 322002 Spindle Minimum set: Mechanical tools AM

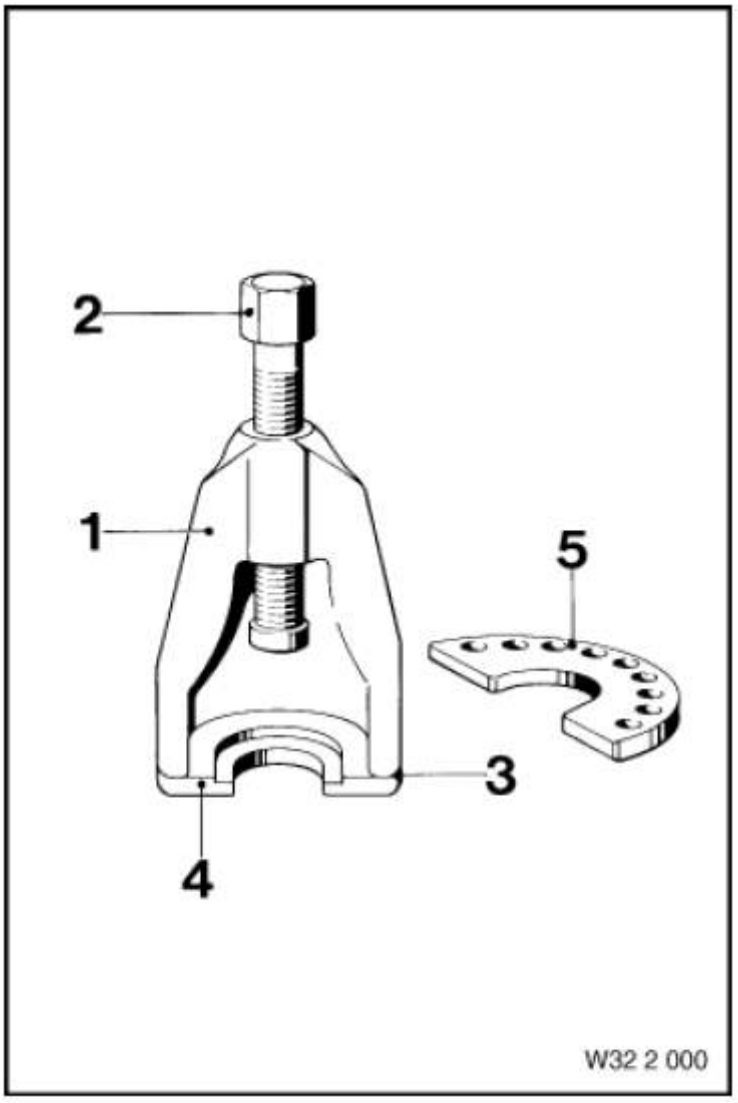


Fig. 74: Identifying Spindle (0492015)
Courtesy of BMW OF NORTH AMERICA, INC.

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0492030 SPINDLE

0492030 322121 Spindle AM

Replaced by: 83300492036

NOTE: **Discontinuation and replaced by 32 2 140. (0 492 036)**

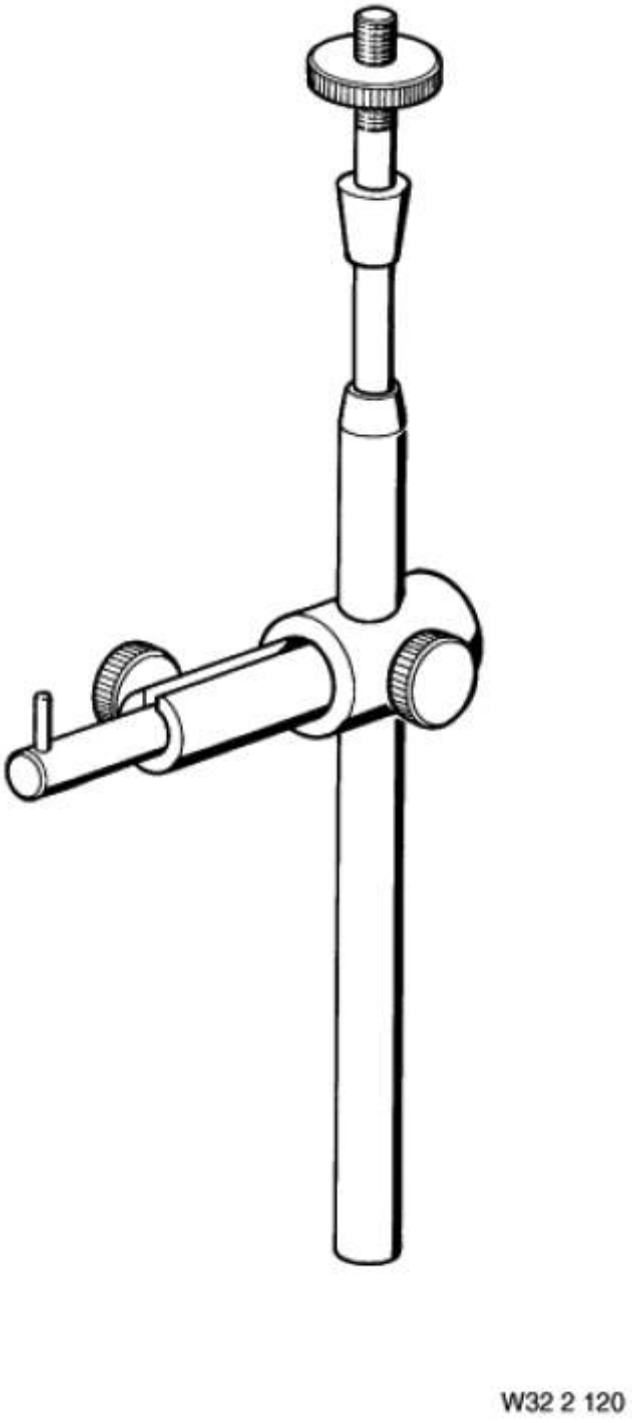


Fig. 75: Identifying Spindle (0492030)
Courtesy of BMW OF NORTH AMERICA, INC.

0494817 SPINDLE

0494817 323094 Spindle Minimum set: Mechanical tools AM

NOTE: **(spindle with cylindrical pin)**

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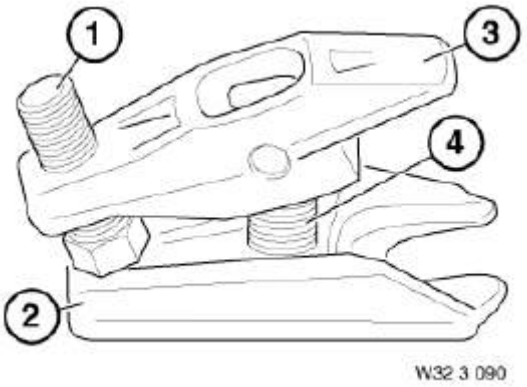


Fig. 76: Identifying Spindle (0494817)
Courtesy of BMW OF NORTH AMERICA, INC.

0491988 SYNCHRONISING KEY

0491988 321050 Synchronising key Mechanical tool

NOTE: **For removing and installing the fluid block in the track-rod arm**

Storage Location

A14

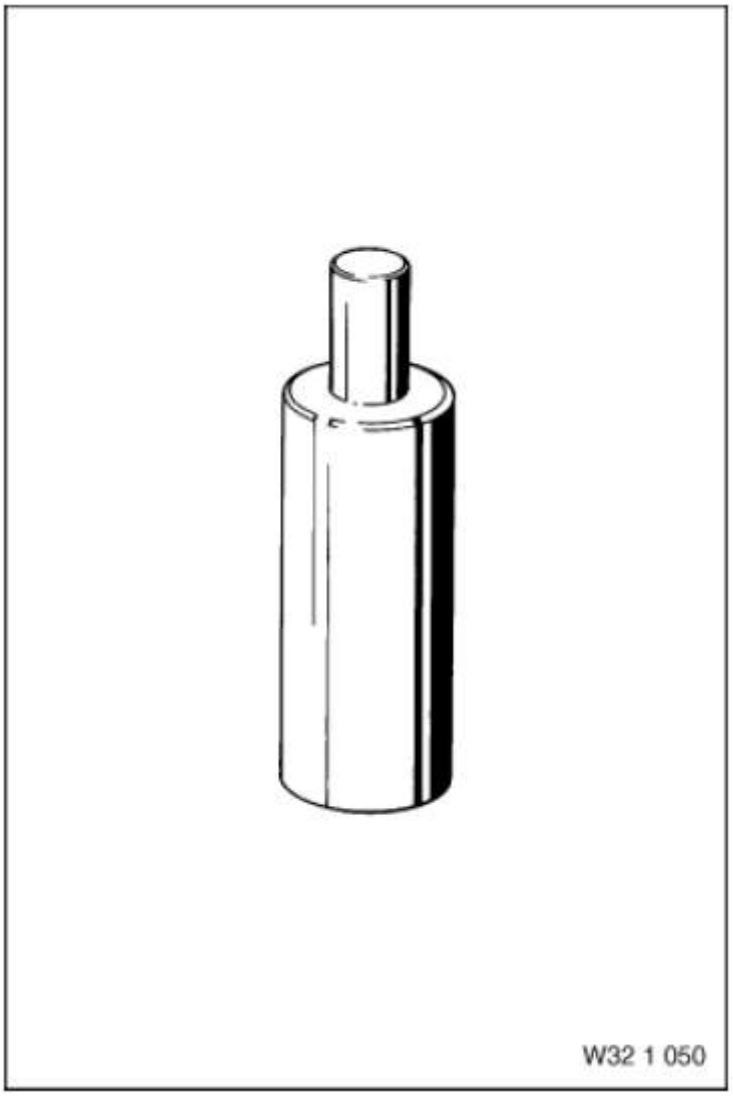


Fig. 77: Identifying Synchronising Key (0491988)

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Courtesy of BMW OF NORTH AMERICA, INC.

0491992 SYNCHRONISING KEY

0491992 321090 Synchronising key Minimum set: Mechanical tools Mechanical tool

NOTE: **For fitting circlip on steering shaft**

Storage Location

B5

SI number

01 03 95 (900)

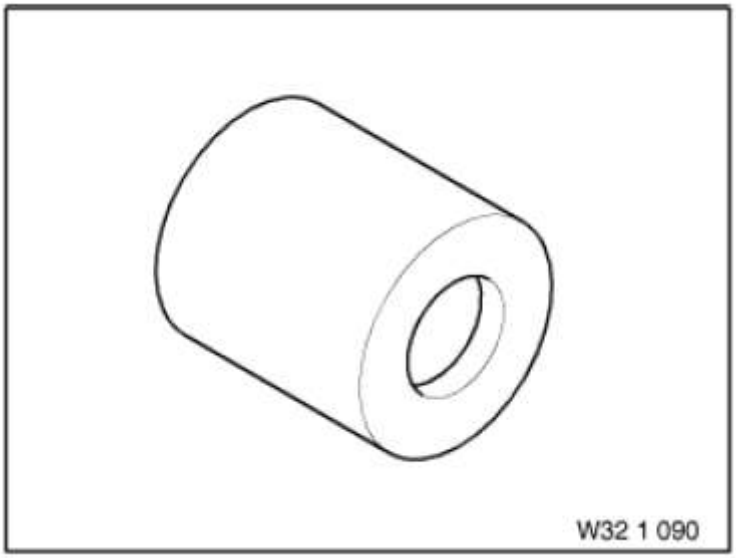


Fig. 78: Identifying Synchronising Key (0491992)
Courtesy of BMW OF NORTH AMERICA, INC.

0493517 TOOL

0493517 323080 Tool Mechanical tool

NOTE: **(Adjustment tool) For adjusting toe-in at rear axle (E36/2, E36/3, E36/C)**

Storage Location

B9

SI number

01 10 90 (288)

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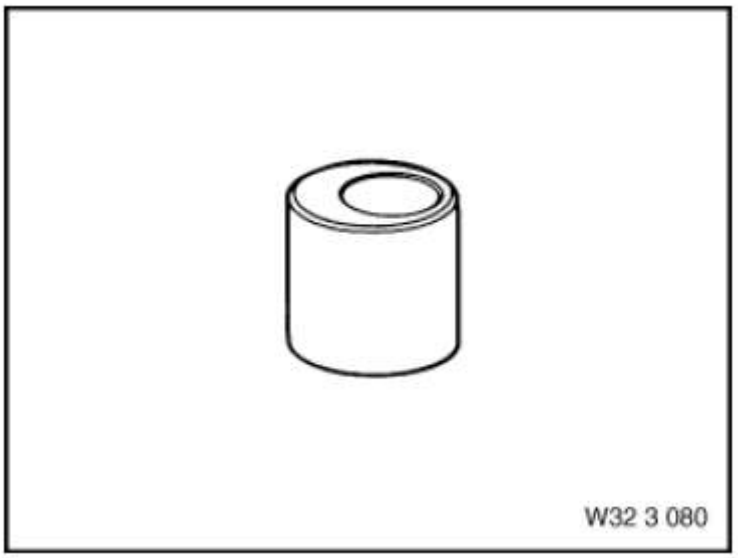


Fig. 79: Identifying Tool (0493517)
Courtesy of BMW OF NORTH AMERICA, INC.

0492013 TOOL

0492013 322000 Tool Minimum set: Mechanical tools AM

NOTE: **For detaching the drop arm from the steering box**

Storage Location

A12

Consisting of:

1. 0492014 Basic body
2. 0492015 Spindle
3. 0492016 Screw

   NOTE: **(Screw (9 units)) discontinued, available as part of set of special tools only**

4. 0492017 Plate

   NOTE: **(Extractor plate) Model series: All except E23 Deletion, only available via tool set**

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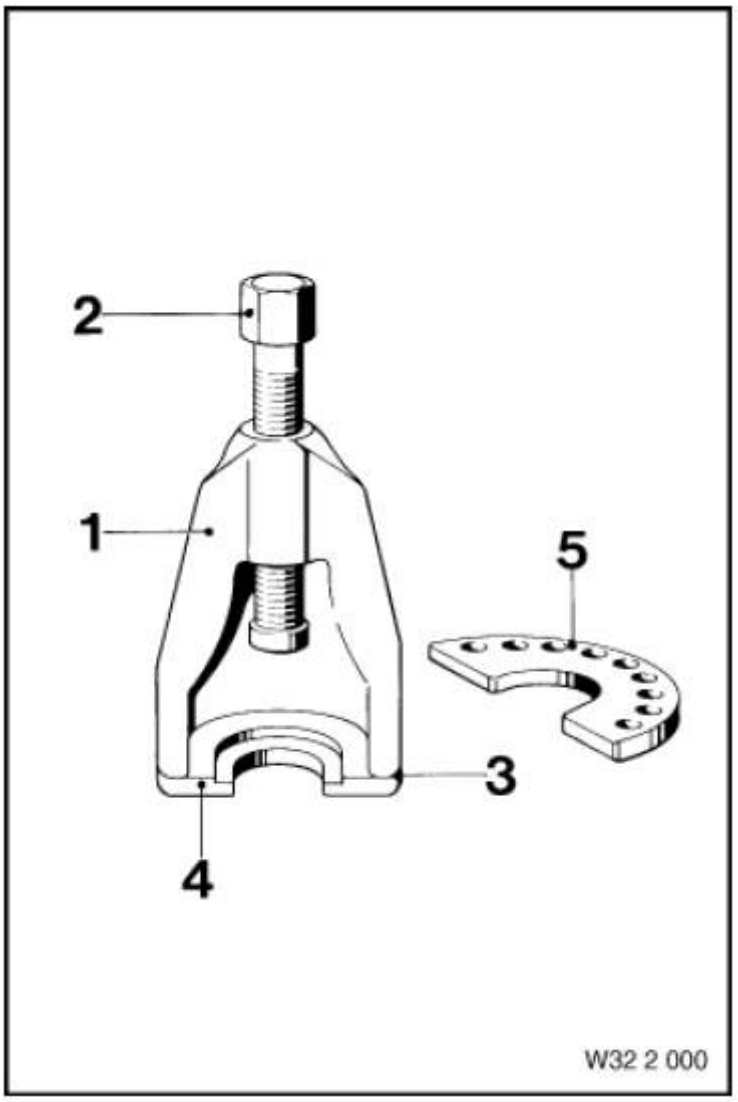


Fig. 80: Identifying Tool (0492013)
Courtesy of BMW OF NORTH AMERICA, INC.

5. 0492018 Plate

NOTE: **(Extractor plate) Model series: E23 Discontinued, only available via complete tool**

0493649 TOOL

0493649 323150 Tool Minimum set: Mechanical tools AM

NOTE: **(adjustment tool) For setting the camber on rear axle.**

Storage Location

C11

C12

SI number

01 15 99 (483)

Consisting of:

1. 0493650 Extension

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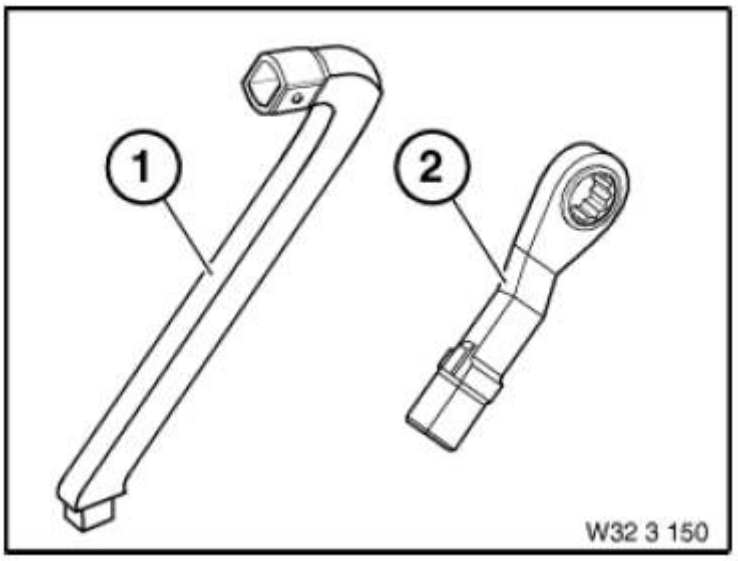


Fig. 81: Identifying Tool (0493649)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **For torque wrench Available only as a complete tool set 32 3 150 (83 30 0 493 649) - as of 13.07.2012.**

2. 0493651 Socket ring spanner

NOTE: **(Socket ring spanner) SW18 Available only as a complete tool set 32 3 150 (83 30 0 493 649) - as of 13.07.2012.**

0492041 TOOL

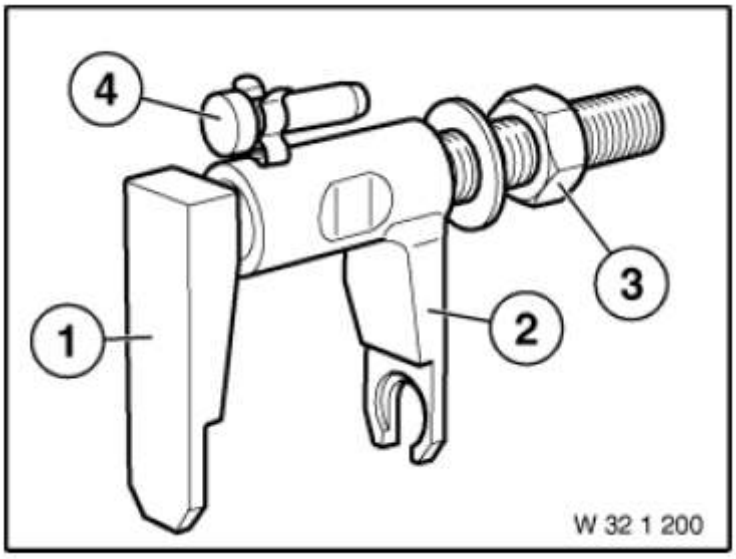
0492041 323010 Tool Mechanical tool

NOTE: **For break off of fastening tabs of the top steering column shroud. Other: USA only**

0492005 TOOL

0492005 321202 Tool AM

NOTE: **(Shaped element) discontinued, available as part of set of special tools only**



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Fig. 82: Identifying Tool (0492005)
Courtesy of BMW OF NORTH AMERICA, INC.

0492049 TOOL

0492049 323070 Tool Minimum set: Mechanical tools AM

NOTE: **(Tool set) For fitting the circlip on the steering shaft at the bottom**

Storage Location

C1

SI number

01 05 90 (207)

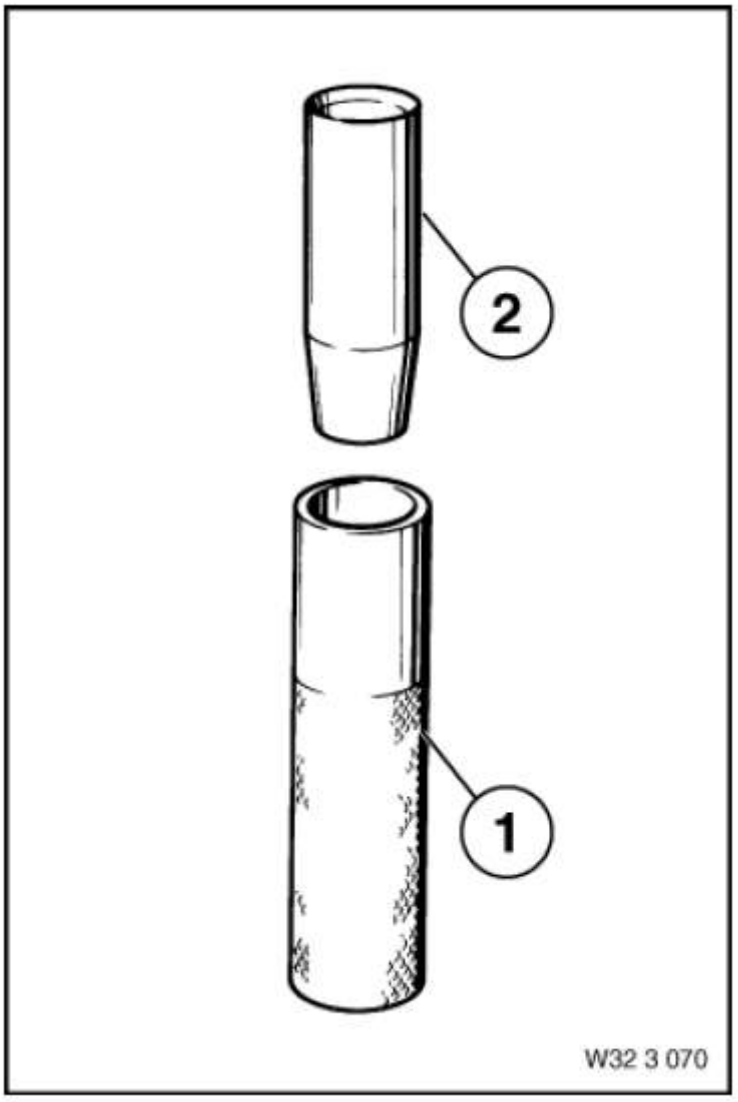
Consisting of:

1. 0492050 Pipe

   NOTE: **(Impact rod) discontinued, available as part of set of special tools only**

2. 0492051 Bush

   NOTE: **(Slip bush)**



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Fig. 83: Identifying Tool (0492049)
Courtesy of BMW OF NORTH AMERICA, INC.

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CHASSIS/WHEEL ALIGNMENT - NORMAL POSITION

32 00 CHASSIS/WHEEL ALIGNMENT - NORMAL POSITION F25

CHASSIS/WHEEL ALIGNMENT - NORMAL POSITION SPECIFICATION

CAR LOADED DOWN TO NORMAL POSITION	Vehicle with complete equipment for normal operation with: 2 x 68 kg on front seats (seats in centre position); 1 x 68 kg on rear seat (centre); 1 x 21 kg in luggage compartment (centre) and full fuel tank.

WHEEL ALIGNMENT

32 00 WHEEL ALIGNMENT F25 SERIE/SPORTLICHE FAHRWERKSABSTIMMUNG

WHEEL ALIGNMENT SPECIFICATION

OBSERVE TEST CONDITIONS !	Â	Â
Front axle:	Â	Â
Total toe-in	Â	0Â° 6' Â± 12'
Adjustment total toe-in (1)	Â	0Â° 6' Â± 4'
Toe difference (2) single wheel between left/right	Â	max. 12'
Camber (difference between left/right max. 30')	Â	- 0Â° 20' Â± 30'
Adjustment camber (1)	Â	- 0Â° 20' Â± 25'
Toe difference angle (difference between left/right max. 30')	Â	- 1Â° 30'
Castor angle	Â	(difference between left/right max. 30')
Front wheel offset	Â	0Â° Â± 15'
Maximum steering angle	Â	Â
• Inner cornering wheel	Approx. Â°	38Â° 00'
• Outer cornering wheel	Approx. Â°	32Â° 06'
Rear axle:	Â	Â
Total toe-in	Â	0Â° 12' Â± 12'
Adjustment total toe-in(1)	Â	0Â° 12' Â± 4'
Camber (difference between left/right max. 30')	Â	-1Â° 30' Â± 25'
Adjustment camber(1)	Â	-1Â° 30' Â± 5'
Geometrical driving axis	Â	0Â° Â± 12'

NOTE:

(1) To minimise adjusting errors (measuring inaccuracies), use a narrower tolerance for adjusting toe/camber.

(2) Toe difference front axle = criterion for steering wheel inclination

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SUSPENSION

Steering And Wheel Alignment - Tightening Torques - X3 Utility

DROP ARM

32 21 DROP ARM

TIGHTENING TORQUE SPECIFICATION - DROP ARM

Â	Type	Thread	Tightening specifications	Dimension
1AZ Track rod to rack	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F15/F16/F18/F25/F26/F85/F86	Â	Â	110 Nm
2AZ Track rod end to track rod	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	Â	Â	51 Nm
	F15/F16/F85/F86	Â	Â	32 Nm
3AZ Track rod end to swivel bearing	F01/F02/F04/F06/F07/F10/F11/F12/F13/F18	M14	Replace nut	165 Nm
	F03	M14	Replace nut	110 Nm
	F25/F26	M14	Replace nut	100 Nm
	F15/F16/F85/F86	M14	Replace nut	80 Nm

STEERING

32 00 STEERING

TIGHTENING TORQUE SPECIFICATION - STEERING

Â	Type	Thread	Tightening specifications	Dimension
1AZ Steering box to front axle carrier	F01/F02/F04/F06/F07/F10/F11/F12/F13/F18	M12	Renew screws Jointing torque Angle of rotation	Â 100 Nm 90 Â°
	F01/F02/F07/F10/F11/F12/F13, 4WD	M14	Replace screws and nuts Jointing torque Angle of rotation	Â 100 Nm 105 Â°
	F03	M14	Â	165 Nm
	F25/F26	M12	Â	100 Nm
	F15/F16/F85/F86	M10	Renew screws 1. Jointing torque 2. Release all bolts again by 3. Jointing torque 4. Angle of rotation	Â 24 Nm 90 Â° 56 Nm 90 Â°
2AZ EH converter to steering box	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F15/F16	Â	Â	3 Nm
3AZ Heat shield to steering gear	F15/F16	Â	Â	8 Nm

STEERING COLUMN

32 31 STEERING COLUMN

TIGHTENING TORQUE SPECIFICATION - STEERING COLUMN

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Â		Type	Thread	Tightening specifications	Dimension
1AZ	Steering column to dashboard support	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M8	Â	21 Nm
		F15/F16/F85/F86	M8	Â	19 Nm
2AZ	Lower steering shaft to steering gear	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F15/F16/F18/F85/F86	M8	Recut screw thread. Replace clamping bolt No retorquing permitted!	28 Nm
		F25/F26	M8	Recut screw thread. Replace clamping bolt No retorquing permitted!	24 Nm
3AZ	Centre steering shaft to lower steering shaft/steering column	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F15/F16/F18/F85/F86	M8	Recut screw thread. Replace clamping bolt No retorquing permitted!	28 Nm
		F25/F26	M8	Recut screw thread. Replace clamping bolt No retorquing permitted!	24 Nm
4AZ	Steering shaft bearing to 2nd bulkhead	F01/F02/F03/F04/F07/F10/F11/F12/F13/F18	M6	Â	5 Nm
5AZ	Adjustment lever to steering column	F15/F16/F25/F26	M8	Â	7 Nm
6AZ	Bearing plate to steering shaft	F15/F16/F85/F86	Â	Â	20 Nm
7AZ	Bearing plate to bulkhead	F15/F16/F85/F86	Â	Â	8 Nm

STEERING WHEEL

32 33 STEERING WHEEL

TIGHTENING TORQUE SPECIFICATION - STEERING WHEEL

Â		Type	Thread	Tightening specifications	Dimension
1AZ	Steering wheel to steering column	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F15/F16/F18/F25/F26/F85/F86	M12	Â	62 Nm

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WHEELS

36 10 713 CHECKING ONE ROAD WHEEL ON BALANCING MACHINE FOR LATERAL AND RADIAL RUNOUT (WHEEL REMOVED)

Special tools required:

- 36 1 030
- 36 1 031
- 36 1 032
- 36 1 033
- 36 1 034
- 36 1 035
- 36 1 036

Necessary preliminary tasks:

- Remove **WHEEL**

Mount wheel in balancing machine.

To avoid clamping errors, fit the wheel on the balancing machine in the same way as it is also fitted on the vehicle (valve position facing down).

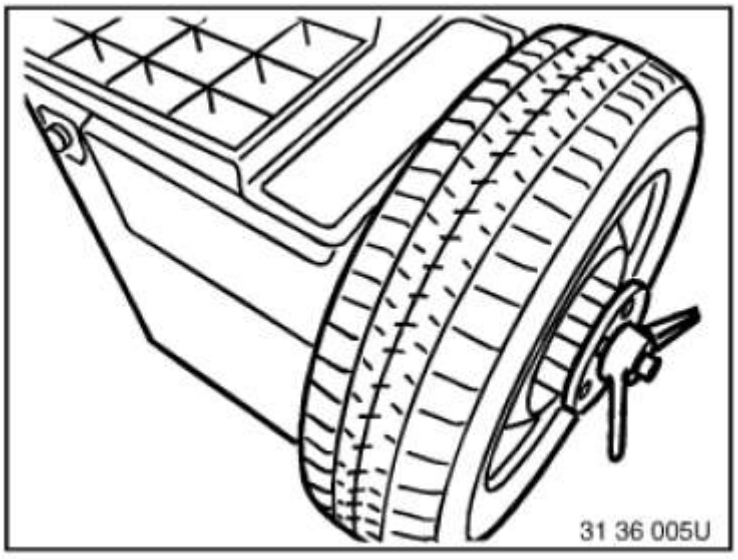


Fig. 1: Fitting Wheel On Balancing Machine
Courtesy of BMW OF NORTH AMERICA, INC.

Use suitable wheel centering element supplied with corresponding balancing machine.

1. Basic flange.
2. Wheel centering element.
3. Type flange.
4. Clamping nut.

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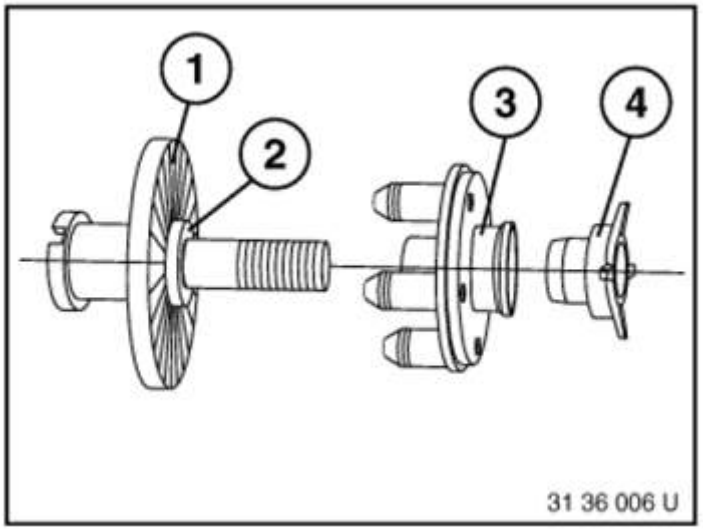


Fig. 2: Identifying Basic Flange, Wheel Centering Element, Type Flange, Clamping Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Use special tool **36 1 030** for checking.

Special tool **36 1 030** consists of:

1. Base **36 1 031**
2. Post with clamp **36 1 032**
3. Holder with clamp **36 1 033**
4. Clamp **36 1 034**
5. Measuring roll **36 1 035**
6. Dial gauge **36 1 036**

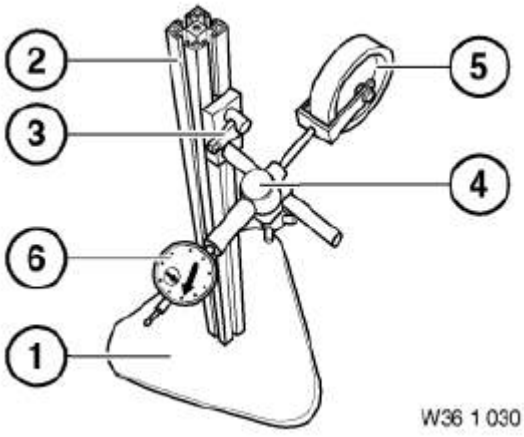


Fig. 3: Identifying Special Tool 36 1 030 Components
Courtesy of BMW OF NORTH AMERICA, INC.

Position special tool **36 1 030** on tire tread surface.

Turn wheel by hand and measure max. **radial tire runout** . See **TWO-PART ALLOY WHEELS** , **WHEELS ONE-PART ALLOY WHEELS** or **WHEELS STEEL AND ALUMINUM STRIP WHEELS** .

NOTE: **Measuring device must be vertical to tire tread surface.**

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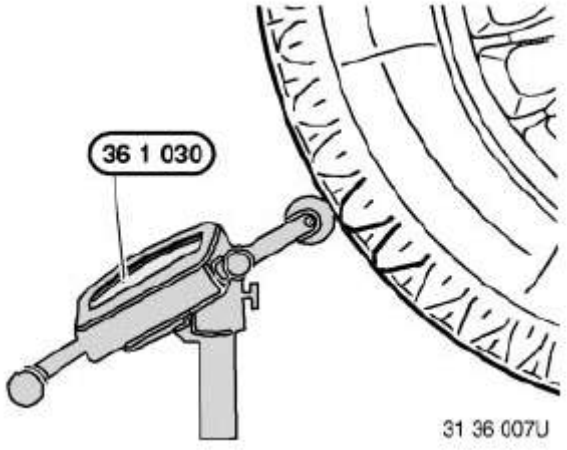


Fig. 4: Measuring Radial Tire Runout
Courtesy of BMW OF NORTH AMERICA, INC.

Position special tool **36 1 030** on tire sidewall.

Turn wheel by hand and measure max. **lateral tire runout** . See **WHEELS TWO-PART ALLOY WHEELS** , **ONE-PART ALLOY WHEELS** or **STEEL AND ALUMINUM STRIP WHEELS** .

NOTE: Measuring device must be vertical to tire side wall.

Never measure on tire inscription!

If necessary, check **DISC WHEEL** (wheel rim) for radial and face runout.

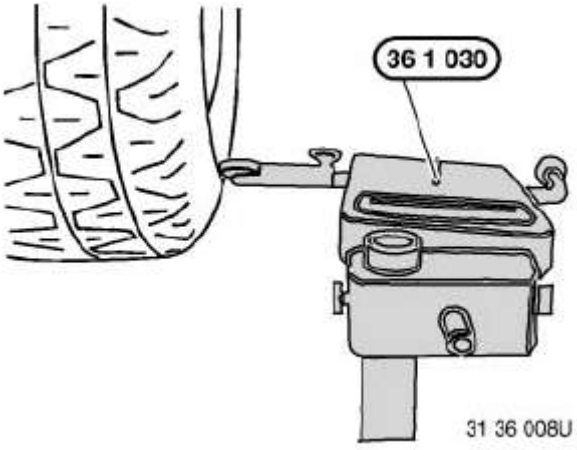


Fig. 5: Measuring Lateral Tire Runout
Courtesy of BMW OF NORTH AMERICA, INC.

36 10 715 CHECKING WHEEL RIM FOR LATERAL AND RADIAL RUNOUT

Necessary preliminary tasks:

- Remove **WHEEL**.
- Check **WHEEL** for lateral and radial runout.
- Remove **Tire** from disc wheel.
- Remove dirt from rim base and rim flange.

IMPORTANT: Disc wheels are not allowed to be repaired!

Mount disc wheel in balancing machine.

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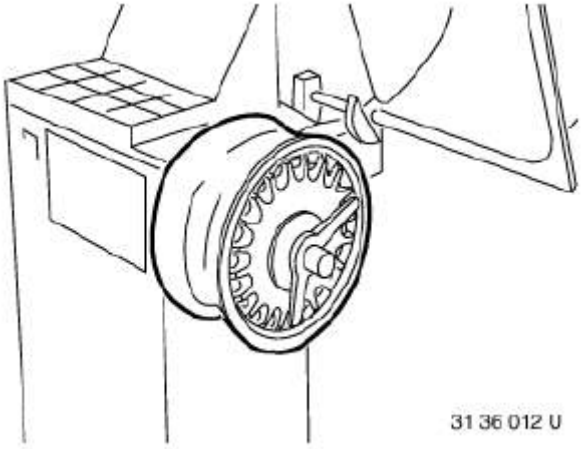


Fig. 6: Mounting Disc Wheel In Balancing Machine
Courtesy of BMW OF NORTH AMERICA, INC.

Use suitable wheel centering element supplied with corresponding balancing machine.

1. Basic flange
2. Wheel centering element
3. Type flange
4. Clamping nut

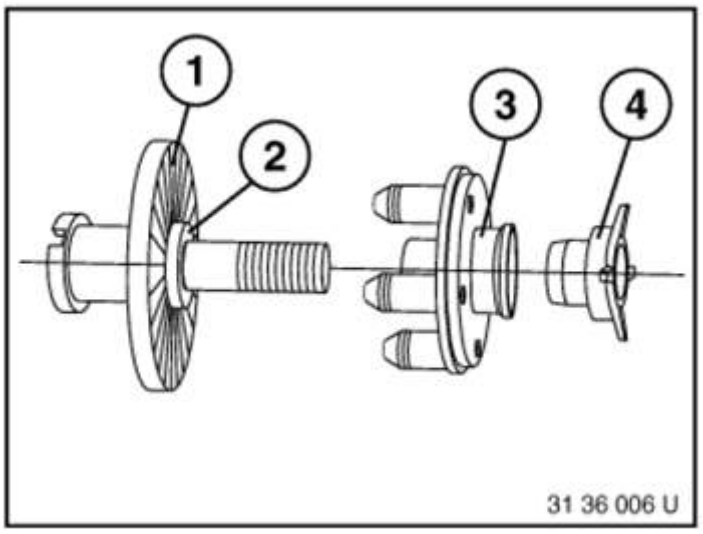


Fig. 7: Identifying Basic Flange, Wheel Centering Element, Type Flange, Clamping Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Place dial gauge sensor on rim shoulder.

Turn wheel by hand and measure max. **radial runout** . See **TWO-PART ALLOY WHEELS** , **ONE-PART ALLOY WHEELS** or **STEEL AND ALUMINUM STRIP WHEELS** .

Carry out measurement on both rim shoulder sides.

NOTE: Dial gauge must be vertical to rim shoulder.

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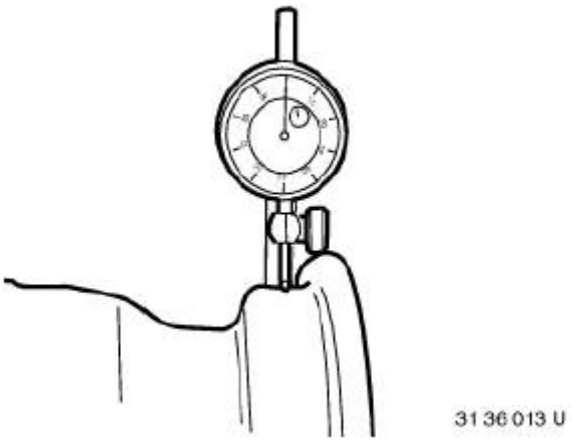


Fig. 8: Checking Rim Shoulder Runout Using Dial Gauge Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Position sensor on rim flange.

Turn wheel by hand and measure max. **lateral runout** . See **TWO-PART ALLOY WHEELS** , **ONE-PART ALLOY WHEELS** or **STEEL AND ALUMINUM STRIP WHEELS** .

Carry out measurement on both rim flanges.

NOTE: **Dial gauge must be vertical to rim flange.**

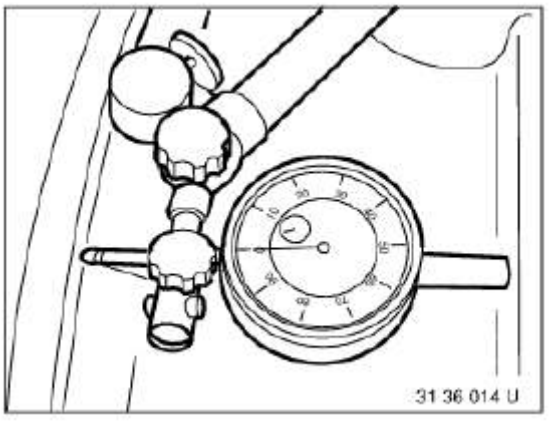


Fig. 9: Checking Rim Flange Lateral Runout
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Avoid clamping errors during subsequent installation work.

36 10... NOTES FOR REPAIRING ALUMINUM RIMS

In general, the economic viability must be checked prior to the repair.

It is possible to repair the following damage (applies to cast aluminum rims labelled as AlSi7 AlSi11, AlSi12):

- Depth of the damage in the aluminum at maximum 1 mm
- Distance of the damage from the outer rim edge at maximum 50 mm
- Paintwork damage on the remaining wheel rim

It is not possible to repair the following damage:

- Deformation and cracks

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- Polished, forged aluminum wheel rims are unsuitable for repair.

36 12... NOTES ON EXCHANGING TIRES DURING REPAIR

General:

- The tire size, manufacturer and tire tread must be the same on one axle
- To meet the BMW standards, the vehicle should be equipped with tires from the same manufacturer and with the same tire tread (tires approved by BMW) on all 4 wheels
- The difference in tire tread depth on one axle must not exceed 2 mm (control quality of suspension control systems and wheel alignment requirement)
- The tires with the higher tread depths must be mounted on the rear axle
- The DOT age difference must not exceed 4 years
- On exchanging the tires, the tire pressure must be adjusted

Additionally for all-wheel drive vehicles:

- The tire size, manufacturer and tire tread must be identical on all wheels; if mixed tires are fitted, different dimensions are permissible.
- The difference in tire tread depth on all wheels must not exceed 2 mm (control quality of suspension control systems and wheel alignment requirement)

36 10 300 REMOVE OR INSTALL FRONT OR REAR WHEEL

Special tools required:

- 36 1 300
- 81 25 2 344 011
- 36 1 335
- 36 1 010

IMPORTANT:	Wheel was balanced electronically. Observe safety information on raising the vehicle. Adhere to the instructions on initializing the Run Flat Indicator (RPA). During the installation of all four wheels (e.g. when changing from summer to winter wheels), the tire pressure must be checked! Observe the notes on tolerance compensation for the tire pressure control!

Observe the following procedure to prevent clamping errors and imbalance:

- Loosen wheel studs.
- Wheel positioned with valve facing down.
- If several wheels are simultaneously removed, mark installation position of wheels on tires (e.g. with a piece of chalk).
- Mark out wheel to wheel hub.
- Mark out lockable wheel stud in relation to wheel.
- Unscrew wheel studs. Remove wheel.

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Fig. 10: Locating Wheel Studs
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Some of the rim styling must be positioned in a certain direction!
Observe direction-of-rotation arrow on the wheel rim.



Fig. 11: Turning Wheel Rim
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Contact surfaces between:

- brake disc and wheel rim,
- brake disc and wheel hub,

must be clean and free from grease.

Remove dirt, grease residues and corrosion from contact surface with a drill and special tool 81 25 2 344 011.

IMPORTANT: Do not operate special tool 81 25 2 344 011 with an impact screwdriver!

NOTE: Degrease contact surface with universal cleaner.

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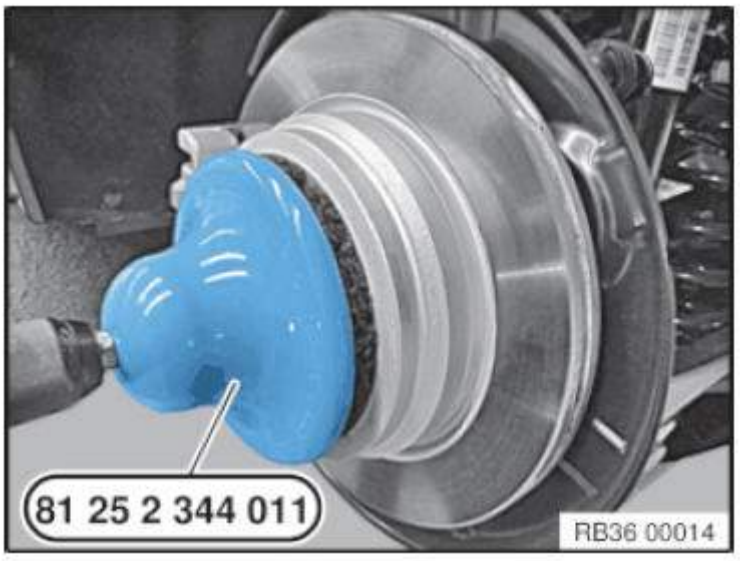


Fig. 12: Removing Dirt, Grease Residues And Corrosion From Contact Surface
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **If there are grease residues in the area of the wheel stud hole, the brake disc must be removed and cleaned.**

Remove dirt, grease residues and corrosion from contact surface with a drill and special tool 81 25 2 344 011.

IMPORTANT: Do not operate special tool 81 25 2 344 011 with an impact screwdriver!

NOTE: **Degrease contact surface with universal cleaner.**



Fig. 13: Removing Dirt, Grease Residues And Corrosion From Contact Surface
Courtesy of BMW OF NORTH AMERICA, INC.

Check brake disc retaining bolt (1) for tight fit.

IMPORTANT: Mounting bolt (1) must not under any circumstances protrude over contact surface (2) between brake disc and wheel rim.

Tightening torque brake disc retaining bolt:

- Front axle **34 11 1AZ**

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- Rear axle **34 21 1AZ**

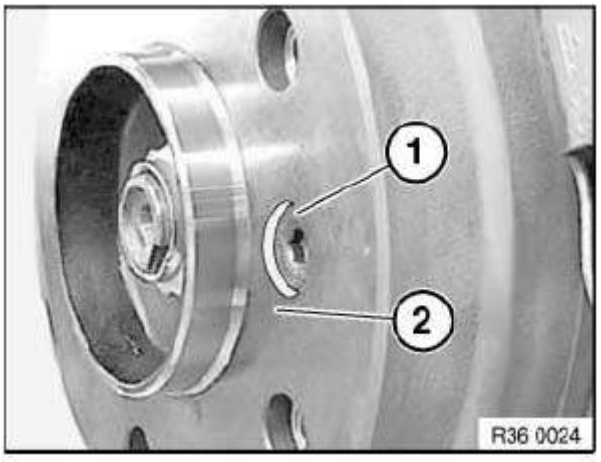


Fig. 14: Identifying Brake Disc Retaining Bolt And Contact Surface
Courtesy of BMW OF NORTH AMERICA, INC.

Apply a thin coat of grease to wheel centering (1) in wheel rim.

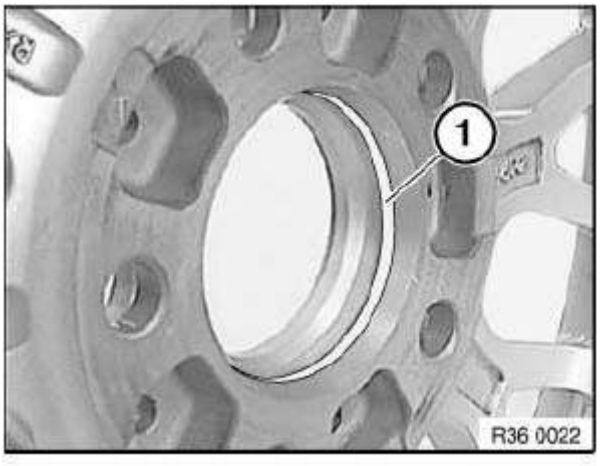


Fig. 15: Identifying Grease Applying Area On Wheel Centering In Wheel Rim
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **To release and tighten lockable wheel bolts, use a matching adapter from special tool 36 1 300, 36 1 335 or 36 1 010.**



Fig. 16: Identifying Lockable Wheel Bolts
Courtesy of BMW OF NORTH AMERICA, INC.

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Clean wheel studs and check threads for damage, replace, if necessary.

Replace rusty wheel studs.

IMPORTANT: Do not apply oil to wheel studs.

IMPORTANT: Under no circumstances use pneumatic or electric screwdrivers to install and tighten the wheel studs.

IMPORTANT: Wheel rim must rest uniformly against the brake disc.
In the case of non-original BMW wheel studs/rims it may be necessary to retighten the wheel studs on account of setting properties (refer to manufacturer's documents).



Fig. 17: Locating Brake Disc Bolts
Courtesy of BMW OF NORTH AMERICA, INC.

Tightening specifications:

1. Screw in wheel bolts and evenly tighten crosswise by hand in order to center the wheel rim.
2. Tighten down wheel studs in crosswise sequence with a calibrated torque wrench to prescribed tightening torque **36 10 1AZ** .
3. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.

36 10 508 STATIONARY WHEEL BALANCING

Special tools required:

- 36 1 010
- **36 1 020**

Necessary preliminary tasks:

- Remove **WHEEL**.

IMPORTANT: Use only BMW-approved balance weights.

Remove any fitted balancing weights, stones in tread pattern and larger dirt contaminations.

Check tire pressure and tire for condition, damage, flat spots (irregularities caused by e.g. parking of vehicle with tires which have run hot). If necessary, check **WHEEL AND TIRE** for radial and lateral runout.

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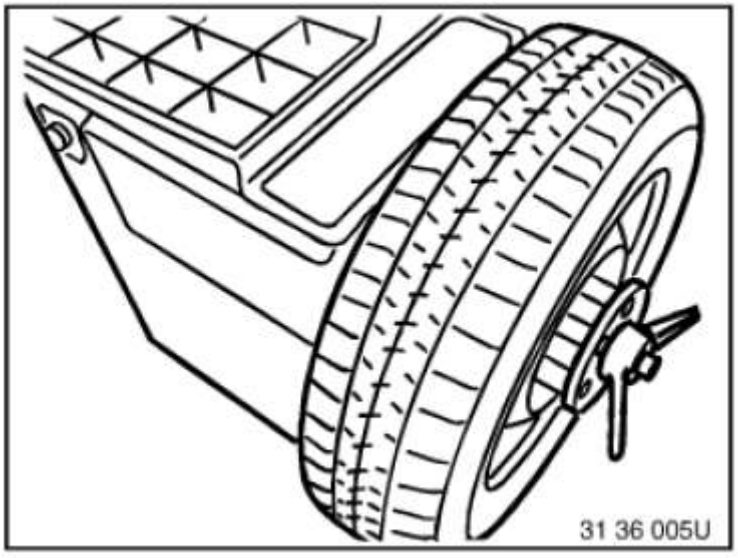


Fig. 18: Identifying Stationary Wheel Balancing
Courtesy of BMW OF NORTH AMERICA, INC.

Use BMW-approved wheel centering elements of relevant balancing machine manufacturers.

1. Basic flange
2. Wheel centering element
3. Type flange
4. Clamping nut

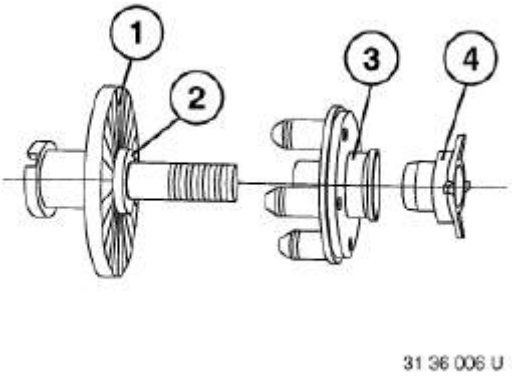


Fig. 19: Identifying Basic Flange, Wheel Centering Element, Type Flange, Clamping Nut
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: To avoid clamping errors, it will be necessary to fit the wheel on the balancing machine in the same way (e.g. valve facing down) as it is then fitted on the vehicle.
Balance wheel in accordance with operating instructions of relevant balancing machine.

On light-alloy rims with distinctive J-shape rim flange, proceed as follows:

1. Gently force off tire sidewall with special tool **36 1 020** at appropriate point from rim flange.
2. Install retaining clip (1).
3. Remove special tool **36 1 020** .

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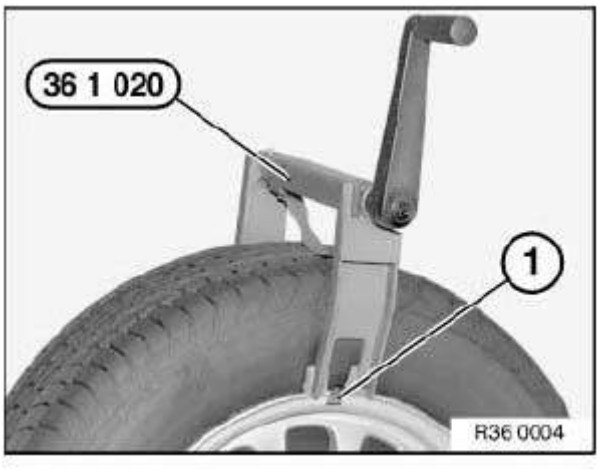


Fig. 20: Removing Special Tool 36 1 020
Courtesy of BMW OF NORTH AMERICA, INC.

Raise retaining clip with special tool 36 1 010. Slide balance weight underneath and allow it to snap into place.

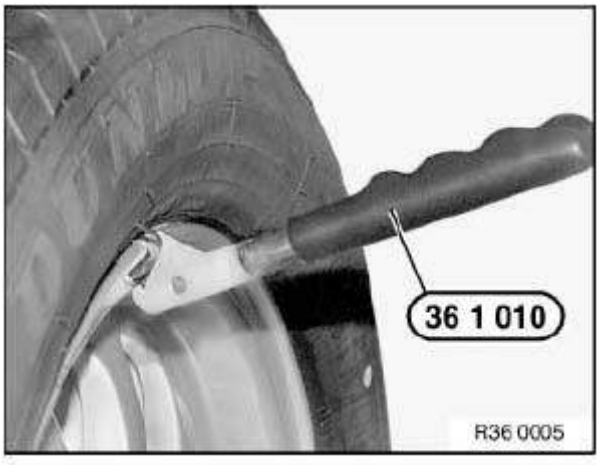


Fig. 21: Lifting Retaining Clip Using Special Tool 36 1 010
Courtesy of BMW OF NORTH AMERICA, INC.

Arrangement of balance weights for light-alloy rims with distinctive J-shape rim flanges.

1. Retaining spring
2. Balance weight

Adhesive weights must be used on all other light-alloy rims.

Max. imbalance , See **TWO-PART ALLOY WHEELS** , **ONE-PART ALLOY WHEELS** or **STEEL AND ALUMINUM STRIP WHEELS** per wheel.

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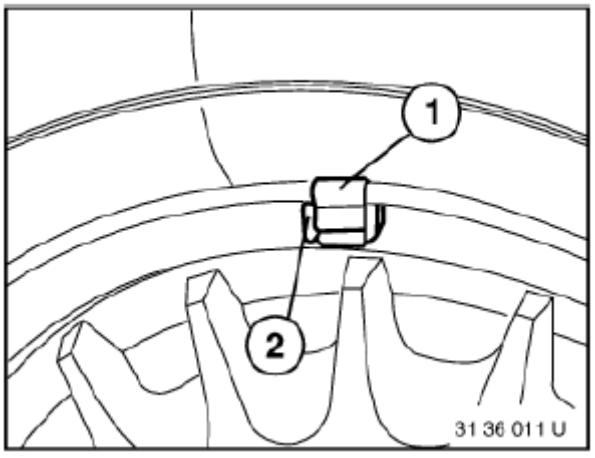


Fig. 22: Identifying Spring Retainer And Balance Weight
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **When using adhesive weights, proceed as follows:**

1. **Carefully remove any adhesive weights. Do not damage wheel rim when doing so.**
2. **Select suitable location for fitting.**
3. **Clean adhesive area thoroughly.**

DISC WHEELS (RIMS)

36 10 715 CHECKING WHEEL RIM FOR LATERAL AND RADIAL RUNOUT

Necessary preliminary tasks:

- Remove **WHEEL**.
- Check **WHEEL** for lateral and radial runout.
- Remove **TIRE** from disc wheel.
- Remove dirt from rim base and rim flange.

IMPORTANT: Disc wheels are not allowed to be repaired!

Mount disc wheel in balancing machine.

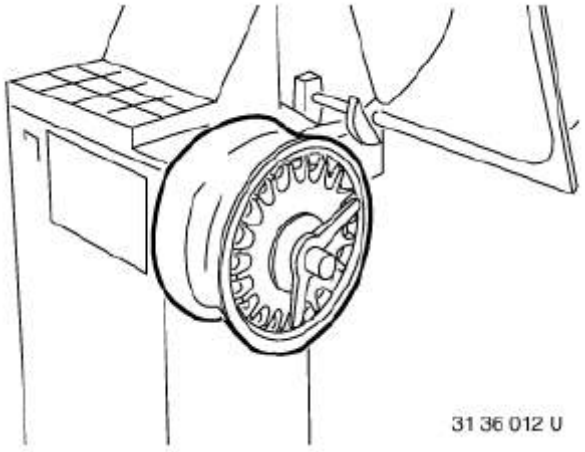


Fig. 23: Mounting Disc Wheel In Balancing Machine
Courtesy of BMW OF NORTH AMERICA, INC.

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Use suitable wheel centering element supplied with corresponding balancing machine.

1. Basic flange
2. Wheel centering element
3. Type flange
4. Clamping nut

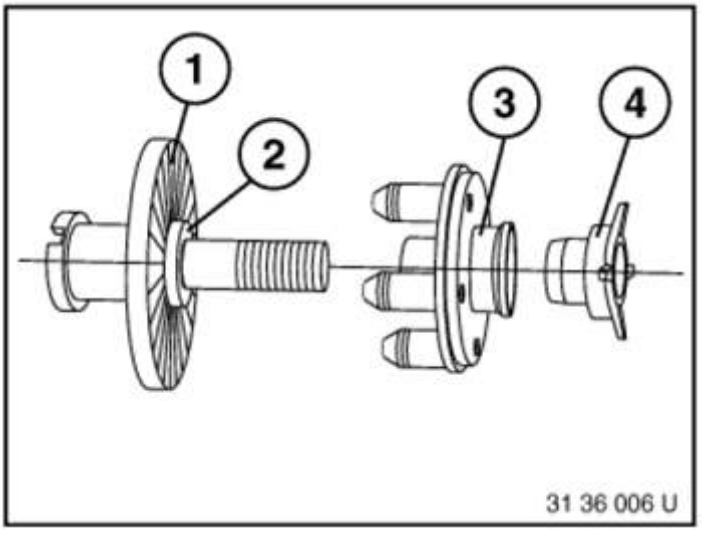


Fig. 24: Identifying Basic Flange, Wheel Centering Element, Type Flange, Clamping Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Place dial gauge sensor on rim shoulder.

Turn wheel by hand and measure max. **radial runout** . See TWO-PART ALLOY WHEELS , ONE-PART ALLOY WHEELS or STEEL AND ALUMINUM STRIP WHEELS .

Carry out measurement on both rim shoulder sides.

NOTE: Dial gauge must be vertical to rim shoulder.

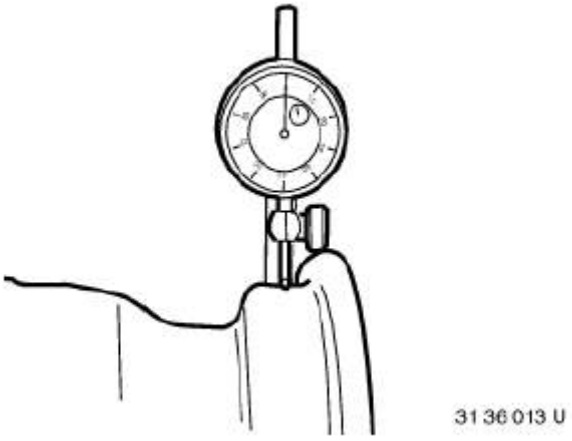


Fig. 25: Checking Rim Shoulder Runout Using Dial Gauge Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Position sensor on rim flange.

Turn wheel by hand and measure max. **lateral runout** . See TWO-PART ALLOY WHEELS , ONE-PART ALLOY WHEELS or STEEL AND ALUMINUM STRIP WHEELS .

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Carry out measurement on both rim flanges.

NOTE: **Dial gauge must be vertical to rim flange.**

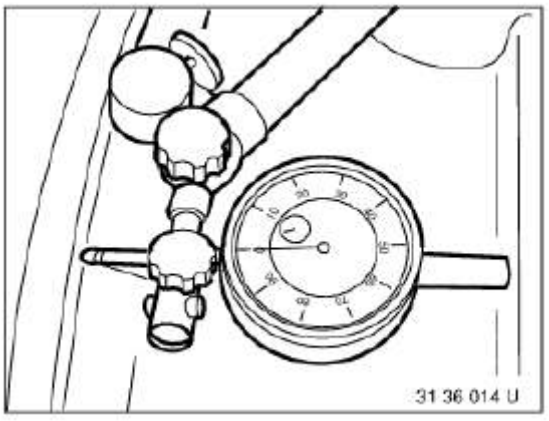


Fig. 26: Checking Rim Flange Lateral Runout
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Avoid clamping errors during subsequent installation work.

36 00... GENERAL INFORMATION ON LIGHT ALLOY DISC WHEELS

NOTE: **It is sometimes difficult to distinguish light alloy disc wheels visually from steel disc wheels.**

Identifying features:

- Sticker on light alloy disc wheel. (1) = Indication "Aluminum"
- Wall thickness of rim dish: approx. 8 mm.
- Light alloy disc wheels are not magnetic.
- Light alloy disc wheels can be identified from their BMW parts numbers.

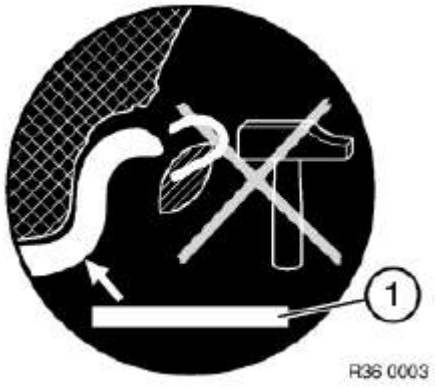


Fig. 27: Identifying Sticker On Light Alloy Disc Wheel
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT:

- Use only BMW-approved two-part balancing weights.
- When fitting two-part balancing weights, always use specified tools.
- Do not straighten light alloy disc wheels: always replace damaged light alloy disc wheels.
- Notches in light alloy disc wheels can lead to cracking.

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- Do not lubricate wheel studs.
- When fitting tires, avoid damaging light alloy disc wheels, e.g. on sharp-edged retaining claws on tire fitting machine.

36 11 000 INITIALIZING RUN FLAT INDICATOR (RPA)

NOTE: **Checking the tire pressure is based on speed monitoring of the wheels in relation to each other. A tire puncture is detected and signalled by way of a deviation in specific speed ratios.**
The four tires mounted on the vehicle are monitored while the vehicle is driving.
Initialization must be carried out in each case immediately after tire pressures have been corrected, after tires/wheels have been exchanged and after repair work to the air spring system.

IMPORTANT: The Run Flat Indicator does not function when the vehicle is driven with the compact spare wheel.

36 11 503 RDC RESETTING

NOTE: **RDC monitors the tire pressure in the four wheels.**

Each tire incorporates an Wheel electronics module, which constantly monitors the tire pressure.

The system signals when the tire pressure drops in one or more tires.

Resetting must be carried out in each case immediately after tire pressures have been corrected, after tires/wheels have been replaced and after repairs to the air spring system.

Please refer to the relevant Owner's Handbook for details of the resetting procedure.

36 11 105 REMOVING AND INSTALLING RDC (TIRE PRESSURE CONTROL) CONTROL UNIT (LOW COST)

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE** (ESD protection).

Disconnect plug connection (1).

Press retaining tabs (2) apart as indicated by arrow.

Pull out TPC control unit

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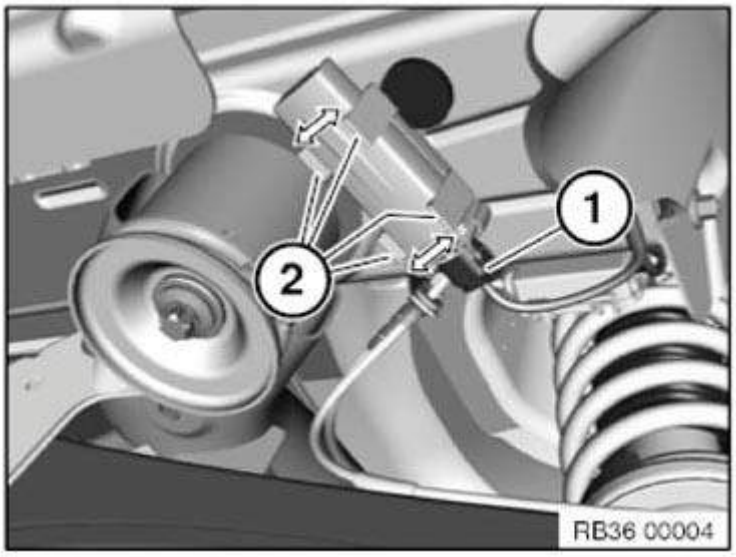


Fig. 28: Disconnecting Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Carry out programming/encoding

36 11 533 REMOVING AND INSTALLING/REPLACING RDC WHEEL ELECTRONICS (2ND GENERATION/3RD GENERATION)

IMPORTANT: Before removing and installing, check which generation of RDC wheel electronics module is installed!
If the wheel electronics have been removed, the complete valve must be replaced.

NOTE: **There are two different wheel electronics. The SP303 wheel electronics module must be used with RDC-01 and RDC-02 from model year 03/06.**
The Gen3 wheel electronics must be used with the RDC-LC from model year 09/2010 (all F0x/F1x vehicles).

If a tire sealant has been used, replace the wheel electronics.

When a tire has been removed, do not clean the rim with installed wheel electronics with high-pressure cleaning equipment.

Before the installation of new wheel electronics with valve, thoroughly clean the valve bore of the wheel rim.

Do not treat wheel electronics with solvents, cleaning agents etc. If dirt contamination, wipe with a clean cloth only.

Do not clean wheel electronics with compressed air.

Necessary preliminary tasks:

- **REMOVE TIRE**

Labelling of generation 2.3 wheel electronics

1. Transmission frequency of wheel electronics
2. Large Torx socket screw
3. BMW part number
4. Tightening torque of Torx screw and union nut

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5. Width across flats of union nut
6. Serial number of wheel electronics

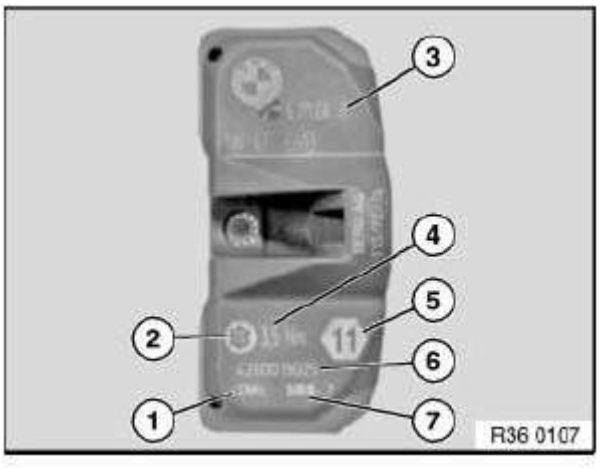


Fig. 29: Identifying Wheel Electronics Labelling (Generation 2.3)
Courtesy of BMW OF NORTH AMERICA, INC.

7. Production date of wheel electronics

Labelling of generation 2.4 and 3.3 wheel electronics

1. Data Matrixcode
2. BMW part number
3. FCC ID = radio authorization
4. Wheel electronics ID
5. Transmission frequency
6. Pressure sensor
7. Production date of wheel electronics
8. Tightening torque
9. Width across flats of union nut

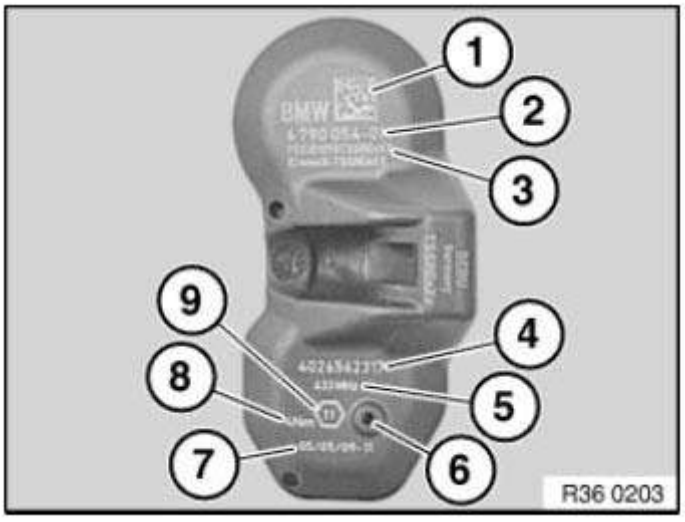


Fig. 30: Identifying Wheel Electronics Labelling (Generation 2.4 And 3.3)
Courtesy of BMW OF NORTH AMERICA, INC.

Labelling of generation 3.4/3.41 wheel electronics

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1. FCC ID = radio authorization
2. Tightening torque
3. Pressure sensor
4. Data Matrixcode
5. Production date of wheel electronics
6. Transmission frequency
7. Wheel electronics ID
8. Width across flats of union nut
9. BMW part number

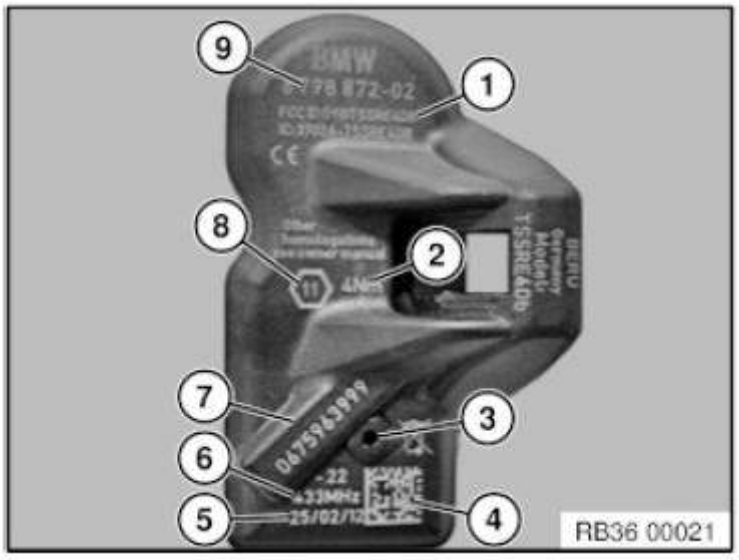


Fig. 31: Identifying Wheel Electronics Labelling (Generation 3.4/3.41)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **The following illustrations only show removal and refitting of the 3rd generation wheel electronics module. The instructions also apply without alteration to the 2nd generation wheel electronics.**

Removing wheel electronics

Release union nut (1).

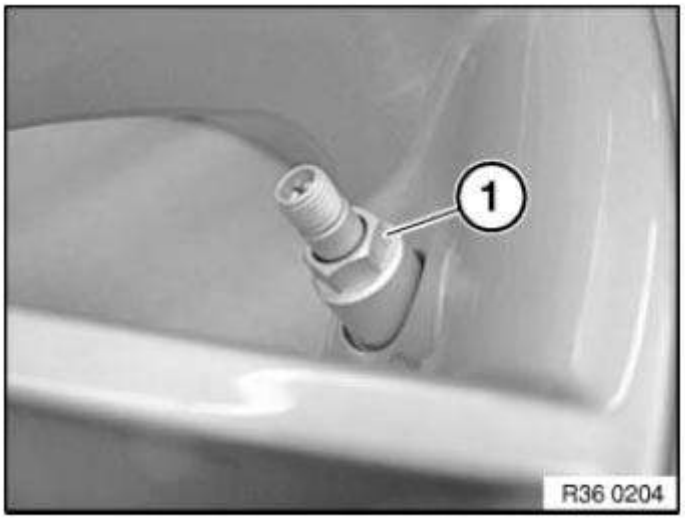


Fig. 32: Identifying Union Nut

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Courtesy of BMW OF NORTH AMERICA, INC.

Remove wheel electronics and valve (1) from valve hole.

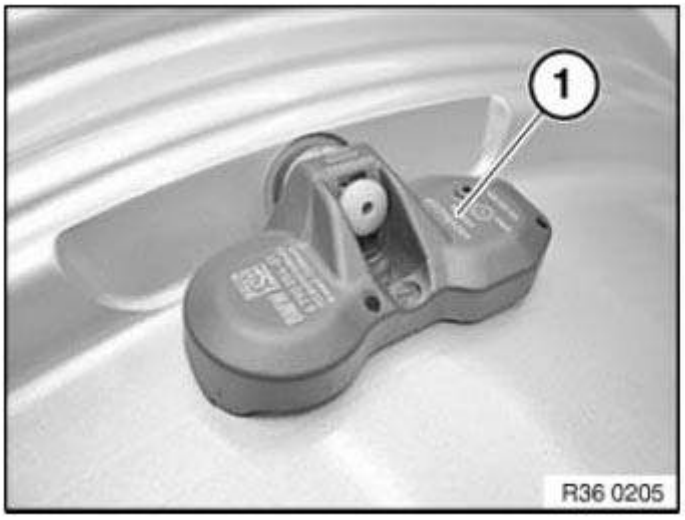


Fig. 33: Identifying Wheel Electronics And Valve From Valve Hole
Courtesy of BMW OF NORTH AMERICA, INC.

Using suitable pliers (2), unscrew valve (1) from the thread of the square-head bolt (3), while holding the wheel electronics module (4) firm. Completely unscrew valve (1).

Remove square head screw from fixture for wheel electronics module.

Installation note:

The valve must be renewed!

Failure to replace the part leads to leaks!

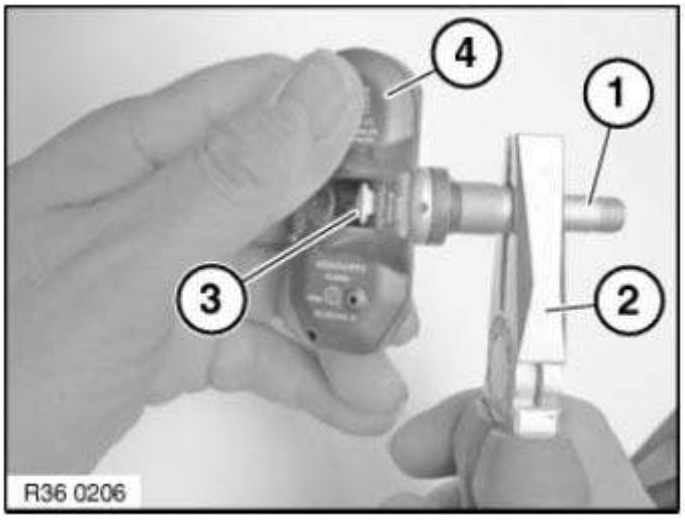


Fig. 34: Removing Square Head Screw From Fixture For Wheel Electronics Module
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Before the installation of new wheel electronics with valve, thoroughly clean the valve bore of the wheel rim!
Also make sure that the valve bore is free of burrs

Installing wheel electronics

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Insert new square-head bolt (1) in wheel electronics module (2).

Screw single-use valve insert (3) three turns onto square-head bolt (1).

NOTE: **Make sure the square bolt head (1) fits exactly in the fixture for the wheel electronics module!**

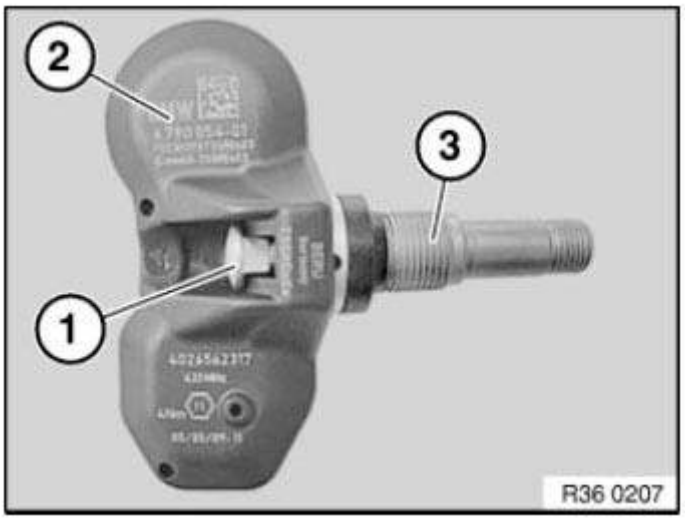


Fig. 35: Identifying Square-Head Bolt In Wheel Electronics Module
Courtesy of BMW OF NORTH AMERICA, INC.

Insert valve insert with wheel electronics into cleaned valve bore.

Both outer feet on the underside of the wheel electronics module must be resting against the rim wall.



Fig. 36: Inserting Valve Insert With Wheel Electronics Into Valve Bore
Courtesy of BMW OF NORTH AMERICA, INC.

Screw on union nut (1) by hand as far as it will go.

Tighten union nut until the inner strip-off ring breaks. Breakage is perceptible audibly and tangibly (momentary drop in torque resistance).

Then fully tighten union nut (1).

Tightening torque **36 11 1AZ** .

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Fig. 37: Identifying Union Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Fixing must not under any circumstances be retightened!
IMPORTANT: The square-head bolt should be located precisely in the wheel electronics module fixture.
After tightening, the wheel electronics module must fit snugly on the wheel rim!

TIRES

36 12... NOTES ON EXCHANGING TIRES DURING REPAIR

General:

- The tire size, manufacturer and tire tread must be the same on one axle
- To meet the BMW standards, the vehicle should be equipped with tires from the same manufacturer and with the same tire tread (tires approved by BMW) on all 4 wheels
- The difference in tire tread depth on one axle must not exceed 2 mm (control quality of suspension control systems and wheel alignment requirement)
- The tires with the higher tread depths must be mounted on the rear axle
- The DOT age difference must not exceed 4 years
- On exchanging the tires, the tire pressure must be adjusted

Additionally for all-wheel drive vehicles:

- The tire size, manufacturer and tire tread must be identical on all wheels; if mixed tires are fitted, different dimensions are permissible.
- The difference in tire tread depth on all wheels must not exceed 2 mm (control quality of suspension control systems and wheel alignment requirement)

36 12 005 REPLACING A RUN-FLAT TECHNOLOGY OR UHP TIRES

NOTE: **UHP tire = Ultra High Performance tire**
UHP tires are tires with an aspect ratio (H: B) ≤ 45 % or tires with a speed index ≥"V"

NOTE: **Follow the tire fitting machine manufacturer's operating instructions.**
It is absolutely essential to ensure that the equipment is in proper working condition and that there is no damage to the disc wheel and tire.
Balance WHEELS after completing work.

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For installation and removal work on run-flat tires and/or UHP tires on certified and approved tire fitting machines, the following successful training for the "Certified BMW tire fitter" is required.

IMPORTANT: Only approved and certified tire fitting machines may be used for installing run-flat tires and/or UHP tires!

Please refer to the operating instructions of the respective tire fitting machine for details of the exact fitting procedure.

Use only BMW-approved plastic-covered mounting levers!

Use only BMW-approved tire-fitting paste.

Pirelli tires can happen to have two little holes in the tread pattern!

IMPORTANT: These two holes are production-related!

The presence of these two little holes in the tread pattern does not represent a fault and does not affect the performance and the efficiency of the tires in any way!

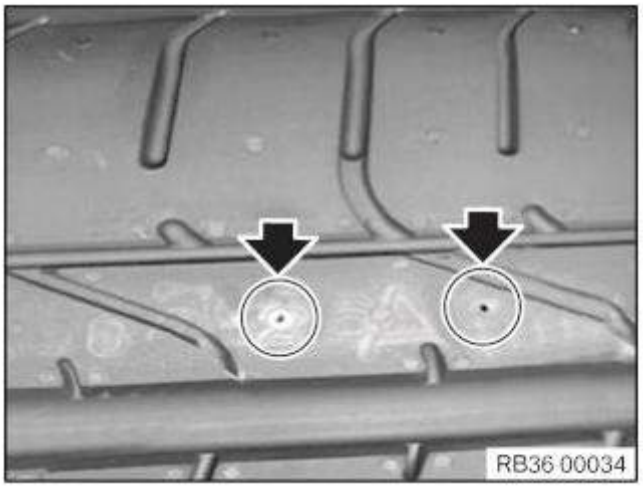
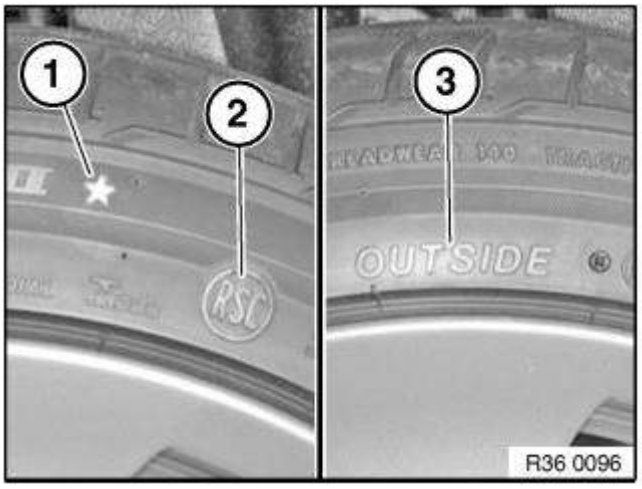


Fig. 38: Locating Holes In Tread Pattern
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Pay attention to different tire markings:**

- **Position (1) Identification of BMW-approved tires. Ensure that only BMW-approved tires are fitted.**
- **Item (2) RSC is the abbreviation for Run-flat System Component (run-flat tires).**
- **Item (3) Outside. The tire must be fitted so that the wording Outside is always situated on the outside of the rim.**



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Fig. 39: Identifying BMW-Approved Tires Mark
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Many tires are directional!
The arrow on the tire must point in the "Forward" direction of rotation!

Before removal:

IMPORTANT:
- Observe tire temperature of min. +15 Â°C.
- Clean wheel/tire unit
- Remove valve insert (deflate tire)
- Remove present balance weight

Dismantling of top tire bead:

Press off tire bead from rim flange as much as possible with unseating roller (1).

Note position of sensor - do not unseat in this area!

If using a pressing-off tool (2), unseat 3 to 4 times around circumference max. 1 cm from rim flange.

Observe pressing-off/unseating limitation.

Start at 90Â° or 270Â°.

Do not position at 0Â° or 180Â° Refer to following **Fig. 42**.

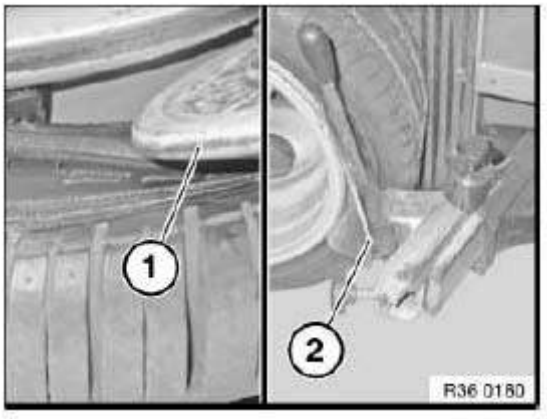


Fig. 40: Pressing Off Tire Bead From Rim Flange
Courtesy of BMW OF NORTH AMERICA, INC.

Apply sufficient lubricant as deeply as possible between wheel rim and tire.

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Fig. 41: Applying Lubricant Between Wheel Rim And Tire
Courtesy of BMW OF NORTH AMERICA, INC.

Position mounting head (1) in direction of rotation before valve (2).

Position hold-down device at 0Â° to stop tire in wheel drop center.

Position mounting lever (3) on mounting head.

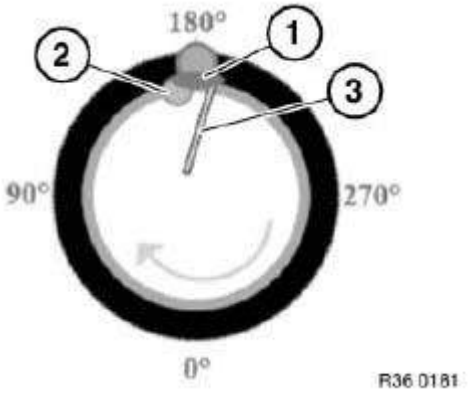
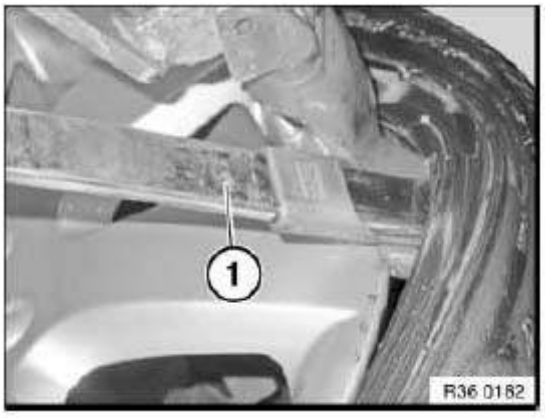


Fig. 42: Positioning Mounting Lever On Mounting Head
Courtesy of BMW OF NORTH AMERICA, INC.

Lever tire bead (1) over rim flange with mounting lever.

IMPORTANT: Avoid damaging the wheel rim by using a suitable mounting lever with protective coating. Make sure there is sufficient lubrication between tire bead and rim flange, apply lubricant if necessary!

Allow tire fitting machine to rotate slowly, and relieve tension on hold-down device and rollers during rotation.



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Fig. 43: Removing Bead Using Mounting Lever Over Rim Flange
Courtesy of BMW OF NORTH AMERICA, INC.

Dismantling of bottom tire bead:

IMPORTANT: Apply sufficient lubricant between wheel rim and tire.

Position mounting head (1) in direction of rotation before the sensor (2).

Position mounting lever (3) on mounting head (1).

Tire bead must be positioned entirely in wheel drop center opposite mounting head (1).

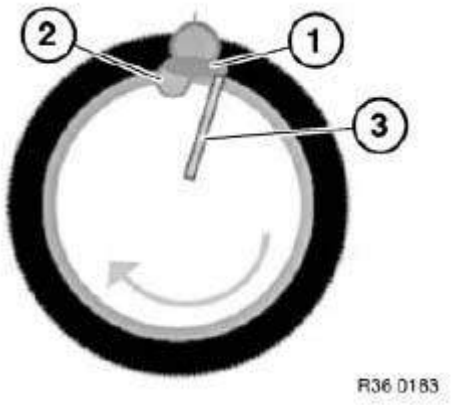


Fig. 44: Positioning Mounting Lever On Mounting Head
Courtesy of BMW OF NORTH AMERICA, INC.

Lever tire bead (1) over rim flange with mounting lever.

IMPORTANT: Avoid damaging the wheel rim by using a suitable mounting lever with protective coating.

Allow tire fitting machine to rotate slowly.

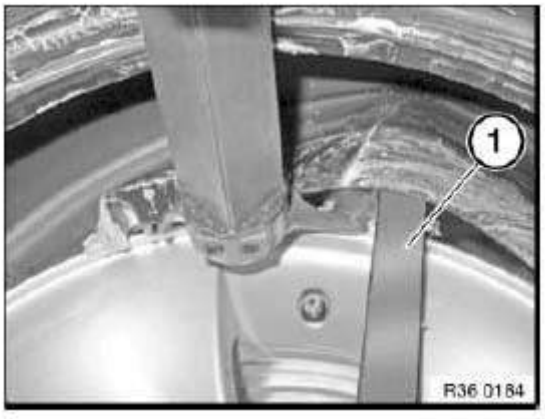


Fig. 45: Identifying Lever Bead With Mounting Lever Over Rim Flange
Courtesy of BMW OF NORTH AMERICA, INC.

Observe before mounting:

- Observe minimum tire air temperature of +15 Â°C! Refer to Recommendation for heating
- Clean wheel/tire
- Check wheel rim for burrs, wear and other damage
- Clean tire beads and check for evidence of damage

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- Check RDC sensor for damage
- Renew tire valve

Before Mounting:

IMPORTANT: Apply lubricant to inside of top tire bead (1) and to outside of top and bottom tire sidewall (2) up to top decorative line!

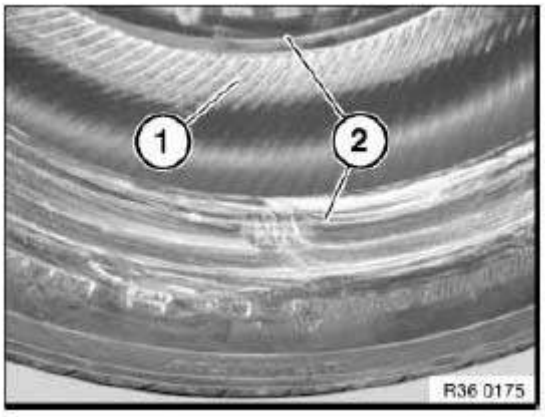


Fig. 46: Applying Lubricant To Inside Of Top Tire Bead
Courtesy of BMW OF NORTH AMERICA, INC.

Apply lubricant over entire well area.

Lever sensor spare.

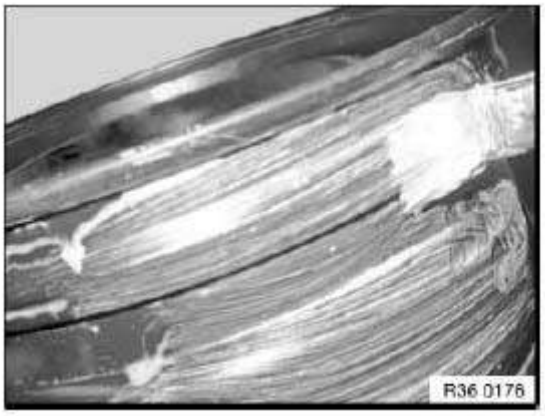


Fig. 47: Applying Lubricant Over Entire Well Area
Courtesy of BMW OF NORTH AMERICA, INC.

Installation of bottom tire bead:

Grip wheel and lay on tire.

IMPORTANT: Apply a light coating of lubricant to mounting head.

Fig. 48: Identifying Lubricant Applying Area To Mounting Head
Courtesy of BMW OF NORTH AMERICA, INC.

Position of the mounting head (1) as pictured.

Make sure tire is correctly positioned on mounting head. Position tire bead in relation to mounting head (1) in accordance with equipment manufacturer's specification.

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IMPORTANT: Position sensor (RDC) (3) and valve min. 10-15 cm before traction point/catching point (2).
Sensor must not be subjected to load.

Fig. 49: Positioning Sensor And Valve
Courtesy of BMW OF NORTH AMERICA, INC.

Allow tire fitting machine to rotate slowly.

Guide tire in direction of rotation and press towards wheel drop center.

Installation of top tire bead:

Position sensor (1) in relation to mounting head (2) as pictured.

IMPORTANT: Make sure tire is correctly positioned on mounting head. Position tire bead in relation to mounting head (2) in accordance with equipment manufacturer's specification.
Position sensor (RDC) (1) and valve min. 10-15 cm before traction point/catching point.
Sensor must not be subjected to load.

Coat bead holding-down element (3) with lubricant and insert.

Fig. 50: Positioning Sensor In Relation To Mounting Head
Courtesy of BMW OF NORTH AMERICA, INC.

Allow fitting machine to rotate slowly.

Insert additional bead holding-down elements (1) to hold the tire bead in wheel drop center.

The last part of the tire bead should jump over the rim flange in the sensor area.

IMPORTANT: Perform fitting in stages, take short breaks and relieve tension.
Avoid heavy deformations at the traction point.
Do not squash belt edge and side walls through hold-down devices.
Never use a mounting lever as a hold-down device.

Fig. 51: Inserting Additional Bead Holding-Down Elements
Courtesy of BMW OF NORTH AMERICA, INC.

Filling/inflating tire:

Remove all fitting aids.

IMPORTANT: Possibilities for safely mounting the wheel or incorporation in inflation apparatus should be utilized.
Observe instructions/conditions of trade association.
Observe national regulations!

Inflate with air (without valve insert).

- Increase pressure up to 3.3 bar in stages (fitting pressure).
- If the tire bead does not slip fully past the rim edge all round, do not under any circumstance increase the pressure.
- If necessary, release air and force off tire bead again.
- Coat rim flange and tire again with tire mounting paste.

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- Inflate tire again up to 3.3 bar.
- When tire beads are resting perfectly on rim shoulders, increase tire pressure to maximum 4.0 bar (settling pressure) to "settle" the tire.

Screw in valve insert and correct the tire pressure.

Observe notes on initialization of the **RUN FLAT INDICATOR** (RPA) or RDC (USA=TPM).

IMPORTANT: Advise the customer to avoid heavy acceleration and heavy breaking in the initial period. The assembly paste can cause the tire to turn on the wheel rim and give rise to imbalance.

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WHEELS WITH TIRES

0493609 ADAPTER

0493609 361421 Adapter AM

NOTE: **For rim support, model series: E39PL**

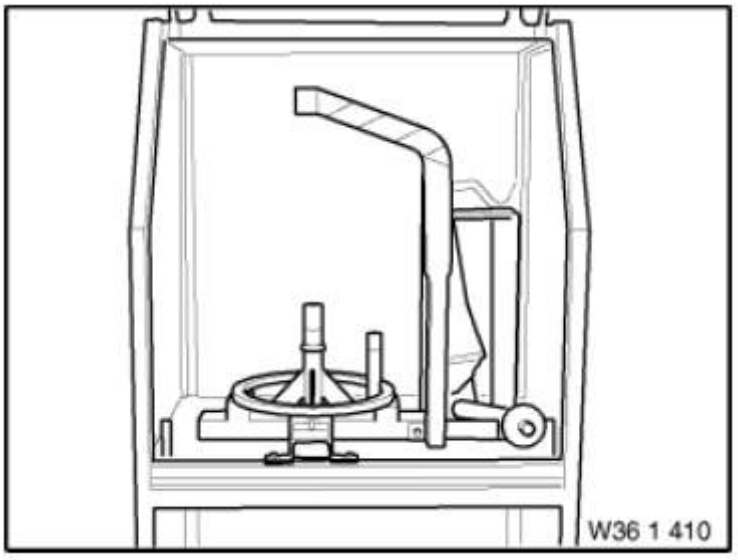


Fig. 1: Identifying Adapter (0493609)
Courtesy of BMW OF NORTH AMERICA, INC.

0495606 ADAPTER

0495606 362010 Adapter Minimum set: Mechanical tools AM

NOTE: **(BMW adapter kit for wheel bolts) for loosening/tightening wheel bolts with a security code. Adapter kit comprising 20 adapters for BMW vehicles.**

SI number

01 13 06 (275)



Fig. 2: Identifying Adapter (0495606)

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Courtesy of BMW OF NORTH AMERICA, INC.

0493603 ADAPTER

0493603 361415 Adapter AM

NOTE: For rim support, model series: E38/3

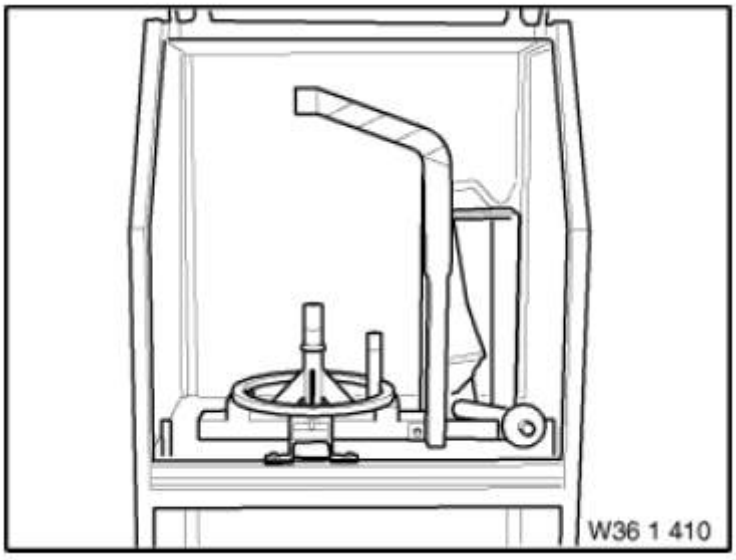


Fig. 3: Identifying Adapter (0493603)
Courtesy of BMW OF NORTH AMERICA, INC.

0493906 ADAPTER

0493906 361033 Adapter AM

NOTE: (Adapter) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.

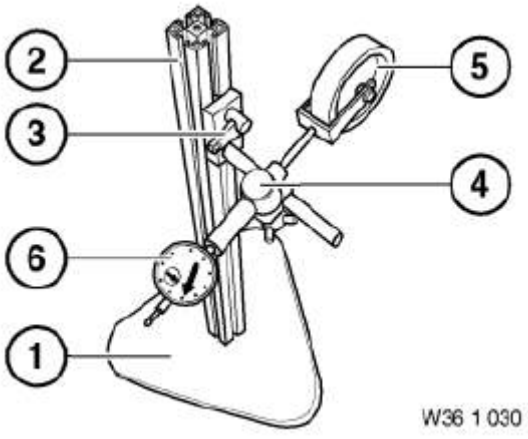


Fig. 4: Identifying Adapter (0493906)
Courtesy of BMW OF NORTH AMERICA, INC.

0493269 ADAPTER CABLE

0493269 361450 Adapter cable Mechanical tool

NOTE: (Adapter cable, 32-pin) For checking periphery of RDC control unit/introduction 4/98

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Storage Location

B118

SI number

02 03 99 (405)

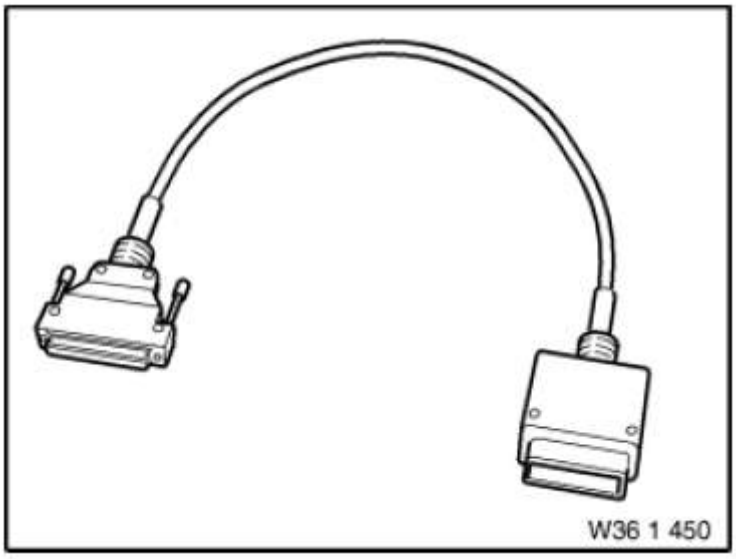


Fig. 5: Identifying Adapter Cable (0493269)
Courtesy of BMW OF NORTH AMERICA, INC.

0492542 BELT

0492542 361404 Belt AM

NOTE: **(Tensioning strap) with ABS ratchet and chafing protection**



Fig. 6: Identifying Belt (0492542)
Courtesy of BMW OF NORTH AMERICA, INC.

0493604 BELT

0493604 361416 Belt AM

NOTE: **(Tensioning strap)**

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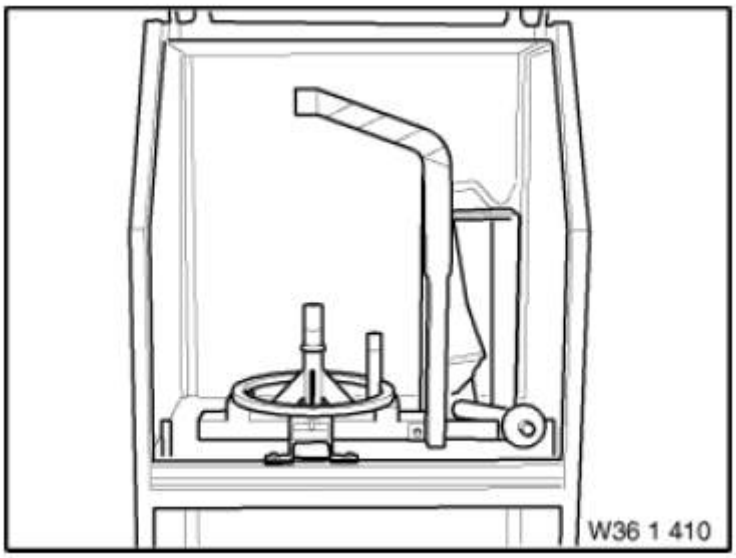


Fig. 7: Identifying Belt (0493604)
Courtesy of BMW OF NORTH AMERICA, INC.

0493600 CENTERING MOUNT

0493600 361412 Centering mount AM

NOTE: **(Centering) model series: E38/3**

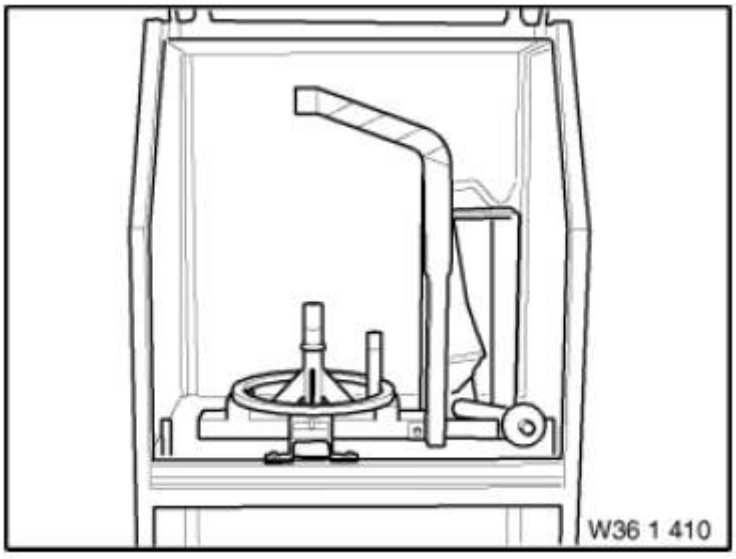


Fig. 8: Identifying Centering Mount (0493600)
Courtesy of BMW OF NORTH AMERICA, INC.

0493610 CENTERING MOUNT

0493610 361422 Centering mount AM

NOTE: **(Centering) model series: E39PL**

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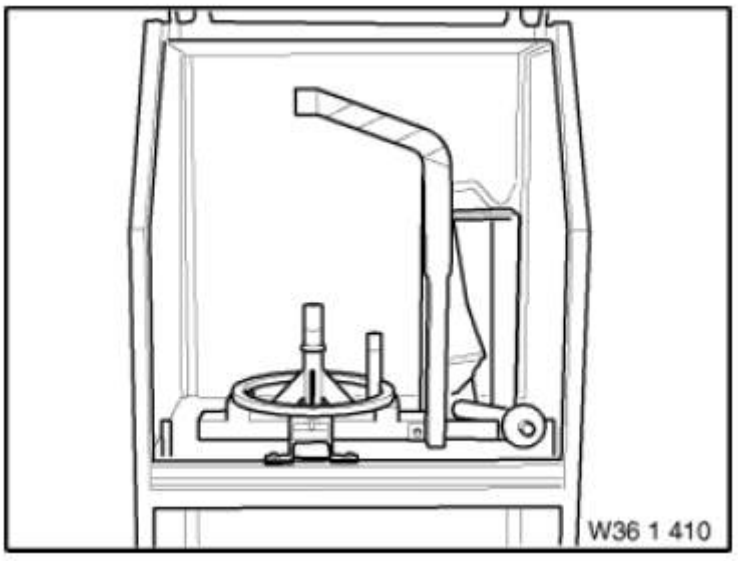


Fig. 9: Identifying Centering Mount (0493610)
Courtesy of BMW OF NORTH AMERICA, INC.

0493598 DEVICE

0493598 361410 Device AM

NOTE: For removal of support ring (E38/3 and E39PL)

Consisting of:

2 = **0493600** Centering mount

NOTE: (Centering) model series: E38/3

3 = **0493601** Support

NOTE: (Rim support) basic body

4 = **0493602** Screw

NOTE: For rim support

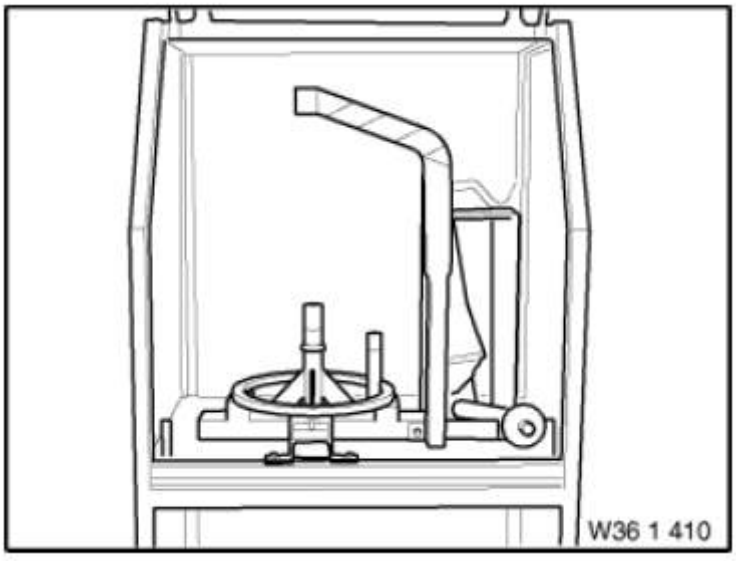


Fig. 10: Identifying Device (0493598)

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Courtesy of BMW OF NORTH AMERICA, INC.

5 = **0493603** Adapter

NOTE: **For rim support, model series: E38/3**

6 = **0493604** Belt

NOTE: **(Tensioning strap)**

7 = **0493605** Pump

NOTE: **(hydraulic pump)**

8 = **0493606** Line

NOTE: **(Hydraulic line)**

9 = **0493607** Hydraulic cylinders

NOTE: **With add-on parts**

10 = **0493609** Adapter

NOTE: **For rim support, model series: E39PL**

11 = **0493610** Centering mount

NOTE: **(Centering) model series: E39PL**

12 = **0493611** Lever

NOTE: **(Mounting lever)**

12 = **0493612** Operating instructions

NOTE: **German/English**

13 = **0493891** Washer

NOTE: **For installation of the emergency operation ring, series: E39PL**

1 = **0493599** Fixture

NOTE: **(Rim support)**

0492538 DEVICE

0492538 361400 Device AM

Replaced by: 83300493598

NOTE: **For dismantling support ring - BMW run-flat system with integrated support ring - Replaced by 36 1 410. (0 493 598)**

Consisting of:

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1. 0492539 Fixture

   NOTE: **(Rim support)**

2. 0492540 Support

   NOTE: **(Rim support with screw),**



Fig. 11: Identifying Device (0492538)
Courtesy of BMW OF NORTH AMERICA, INC.

3. 0492541 Lifting gear

   NOTE: **(Jack (make: Storz))**

4. 0492542 Belt

   NOTE: **(Tensioning strap) with ABS ratchet and chafing protection**

5. 0492543 Lever

   NOTE: **(Mounting lever 39...24" (make: Gedore))**

0493909 DIAL GAUGE

0493909 361036 Dial gauge AM

NOTE: **Discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

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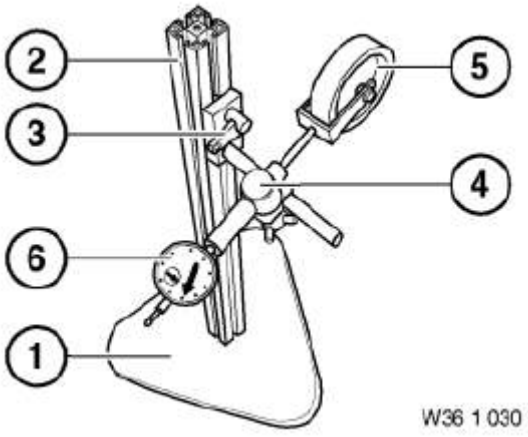


Fig. 12: Identifying Dial Gauge (0493909)
Courtesy of BMW OF NORTH AMERICA, INC.

0492517 EXTRACTOR

0492517 361050 Extractor Mechanical tool

NOTE: (Extractor for wheel cover)

0492539 FIXTURE

0492539 361401 Fixture AM

NOTE: (Rim support)



Fig. 13: Identifying Fixture (0492539)
Courtesy of BMW OF NORTH AMERICA, INC.

0493599 FIXTURE

0493599 361411 Fixture AM

NOTE: (Rim support)

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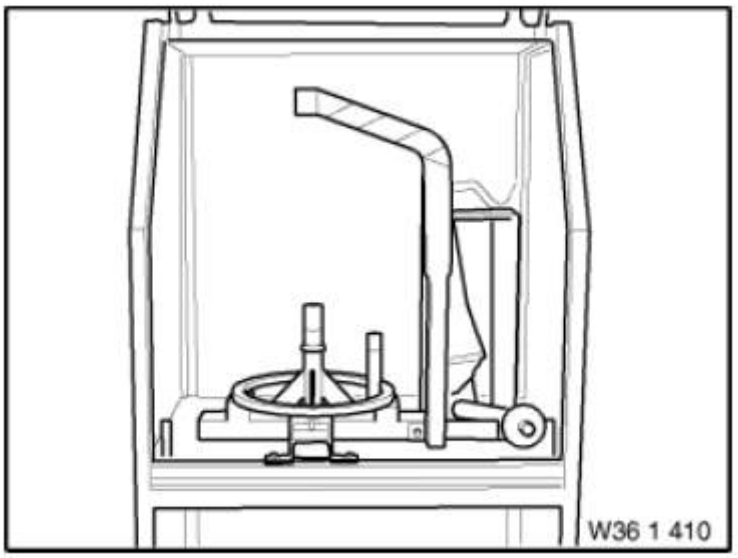


Fig. 14: Identifying Fixture (0493599)
Courtesy of BMW OF NORTH AMERICA, INC.

2338466 HOLDER

2338466 Holder Mechanical tool

NOTE: Replacement for holder 36 1 100 (0493771). Holder has longer guide pins and lengthened magnetic guides.

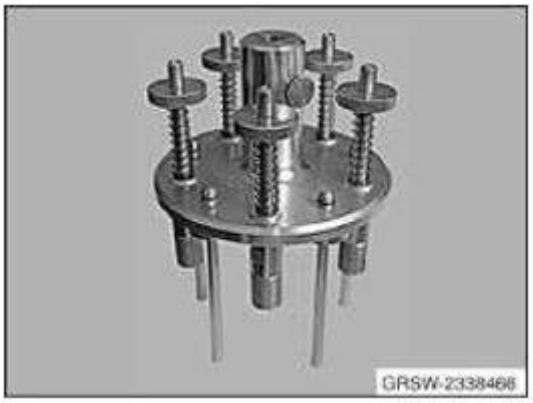


Fig. 15: Identifying Holder (2338466)
Courtesy of BMW OF NORTH AMERICA, INC.

0493904 HOLDER

0493904 361031 Holder AM

NOTE: (Holder) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.

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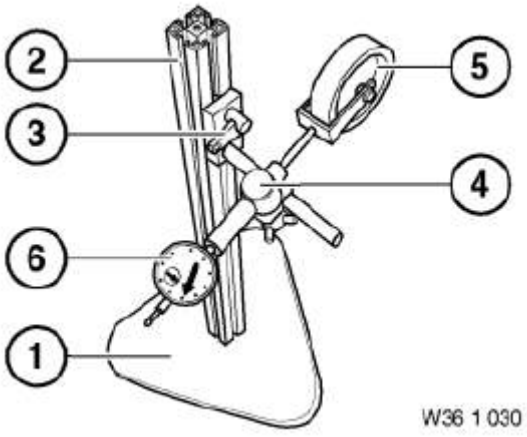


Fig. 16: Identifying Holder (0493904)
Courtesy of BMW OF NORTH AMERICA, INC.

0493607 HYDRAULIC CYLINDERS

0493607 361419 Hydraulic cylinders AM

NOTE: With add-on parts

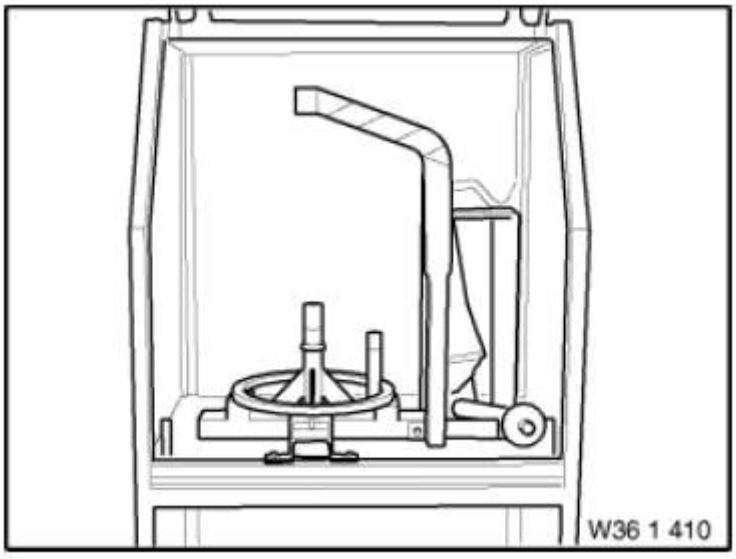


Fig. 17: Identifying Hydraulic Cylinders (0493607)
Courtesy of BMW OF NORTH AMERICA, INC.

0492543 LEVER

0492543 361405 Lever AM

NOTE: (Mounting lever 39...24" (make: Gedore))

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Fig. 18: Identifying Lever (0492543)
Courtesy of BMW OF NORTH AMERICA, INC.

0493611 LEVER

0493611 361423 Lever AM

NOTE: **(Mounting lever)**

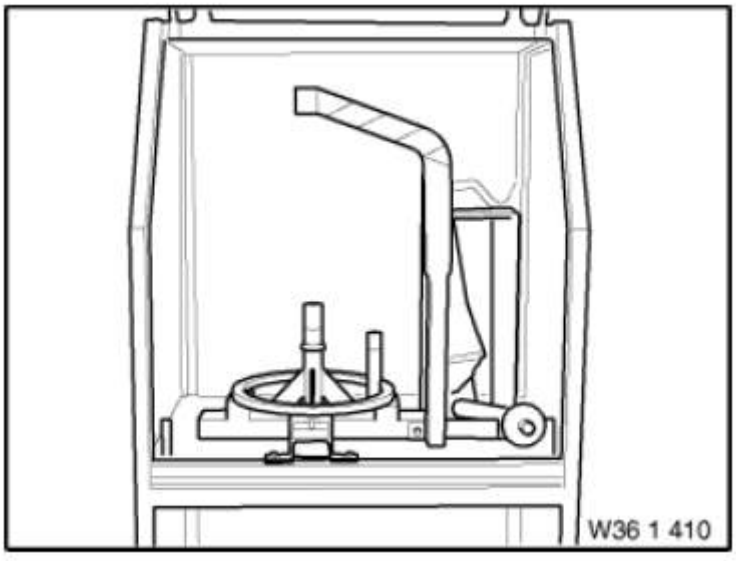


Fig. 19: Identifying Lever (0493611)
Courtesy of BMW OF NORTH AMERICA, INC.

0492541 LIFTING GEAR

0492541 361403 Lifting gear AM

NOTE: **(Jack (make: Storz))**

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Fig. 20: Identifying Lifting Gear (0492541)
Courtesy of BMW OF NORTH AMERICA, INC.

0493606 LINE

0493606 361418 Line AM

NOTE: (Hydraulic line)

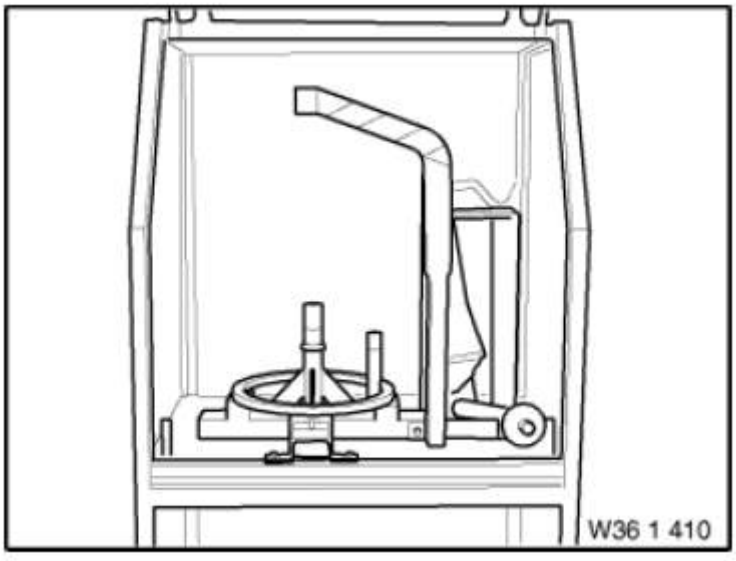


Fig. 21: Identifying Line (0493606)
Courtesy of BMW OF NORTH AMERICA, INC.

0493612 OPERATING INSTRUCTIONS

0493612 361429 Operating instructions AM

NOTE: German/English

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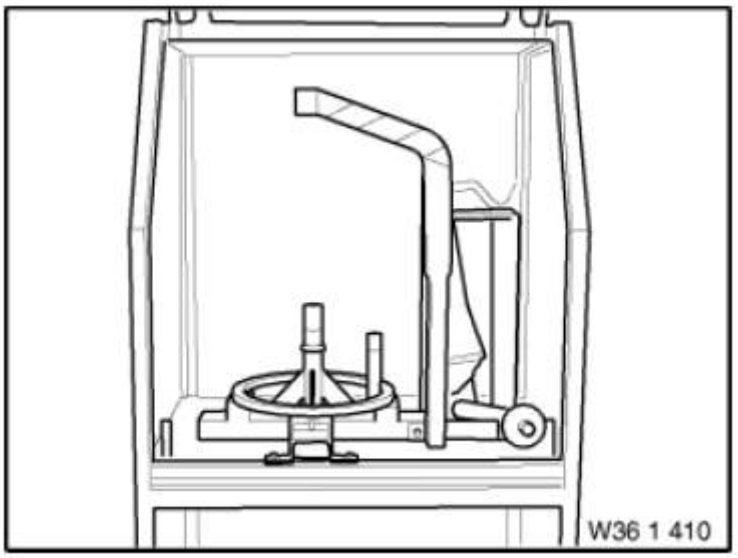


Fig. 22: Identifying Operating Instructions (0493612)
Courtesy of BMW OF NORTH AMERICA, INC.

0492516 PLIERS

0492516 361020 Pliers Mechanical tool

NOTE: **(tire clamp) For compressing the tire sidewalls during fitting or removal of the retaining spring**

SI number

01 01 96 (034)

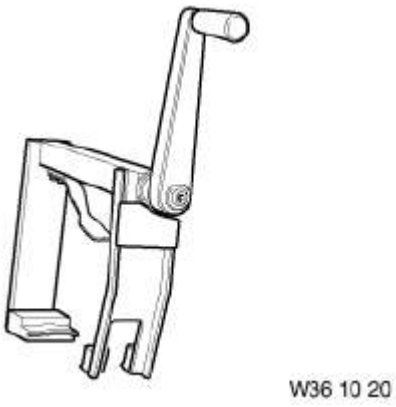


Fig. 23: Identifying Pliers (0492516)
Courtesy of BMW OF NORTH AMERICA, INC.

0493905 PROFILE STRIP

0493905 361032 Profile strip AM

NOTE: **(Profile strip) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

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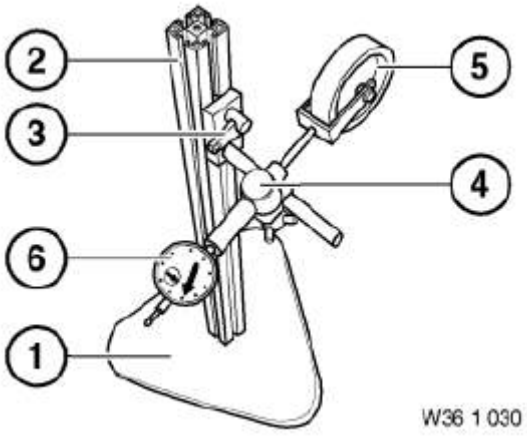


Fig. 24: Identifying Profile Strip (0493905)
Courtesy of BMW OF NORTH AMERICA, INC.

0493605 PUMP

0493605 361417 Pump AM

NOTE: (hydraulic pump)

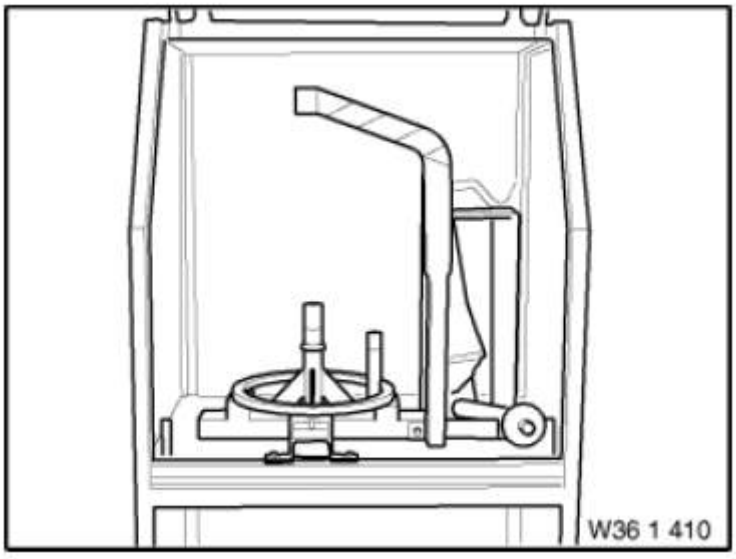


Fig. 25: Identifying Pump (0493605)
Courtesy of BMW OF NORTH AMERICA, INC.

0493908 ROLLER

0493908 361035 Roller AM

NOTE: (Measuring roller) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.

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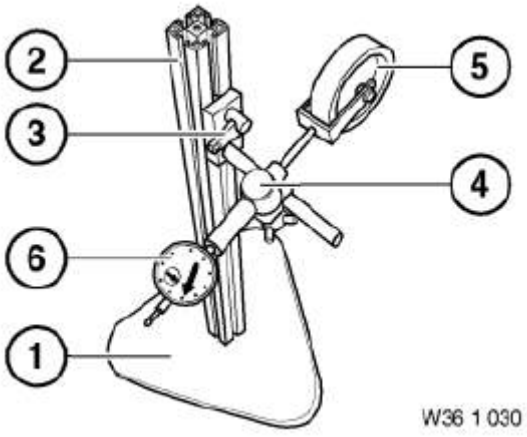


Fig. 26: Identifying Roller (0493908)
Courtesy of BMW OF NORTH AMERICA, INC.

0493602 SCREW

0493602 361414 Screw AM

NOTE: For rim support

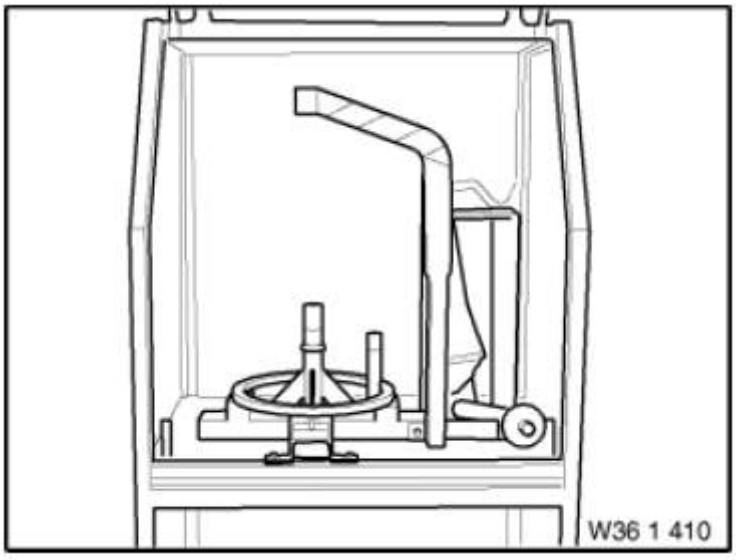


Fig. 27: Identifying Screw (0493602)
Courtesy of BMW OF NORTH AMERICA, INC.

0493601 SUPPORT

0493601 361413 Support AM

NOTE: (Rim support) basic body

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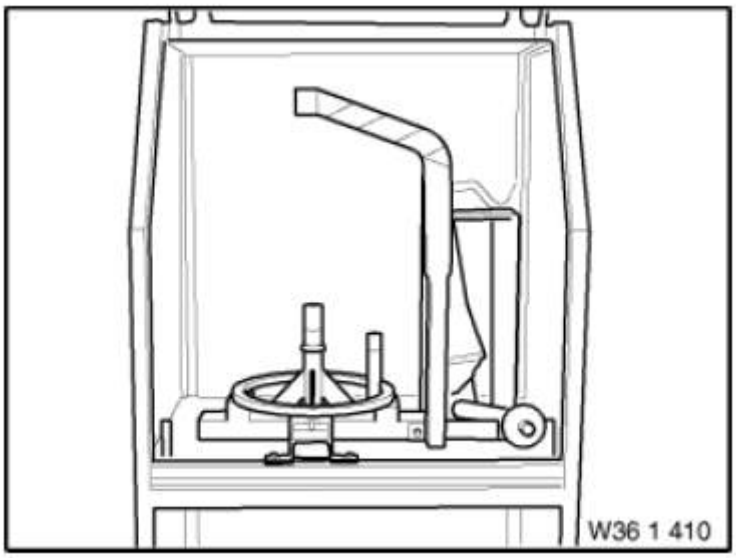


Fig. 28: Identifying Support (0493601)
Courtesy of BMW OF NORTH AMERICA, INC.

0492540 SUPPORT

0492540 361402 Support AM

NOTE: **(Rim support with screw),**



Fig. 29: Identifying Support (0492540)
Courtesy of BMW OF NORTH AMERICA, INC.

0493907 TERMINAL

0493907 361034 Terminal AM

NOTE: **(Terminal) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

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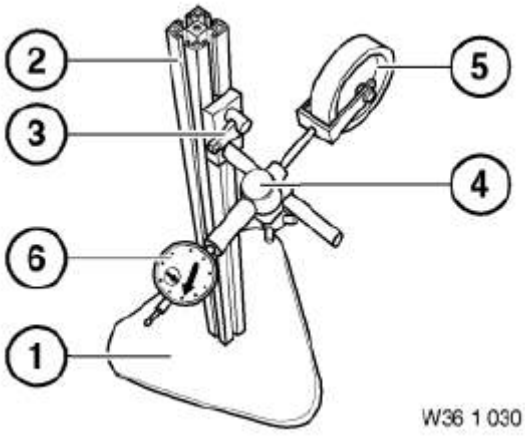


Fig. 30: Identifying Terminal (0493907)
Courtesy of BMW OF NORTH AMERICA, INC.

0493829 TESTER

0493829 361030 Tester AM

NOTE: **For measuring vertical and lateral runout of road wheels**

SI number

01 11 00 (594)

Consisting of:

1. 0493904 Holder

NOTE: **(Holder) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

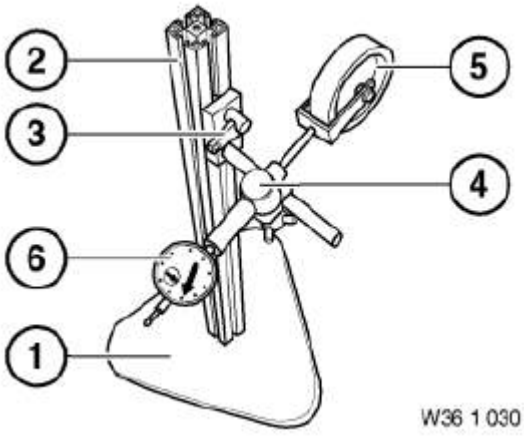


Fig. 31: Identifying Tester (0493829)
Courtesy of BMW OF NORTH AMERICA, INC.

2. 0493905 Profile strip

NOTE: **(Profile strip) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

3. 0493906 Adapter

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NOTE: **(Adapter) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

4. **0493907** Terminal

NOTE: **(Terminal) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

5. **0493908** Roller

NOTE: **(Measuring roller) Remaining inventories will be sold off, followed by discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

6. **0493909** Dial gauge

NOTE: **Discontinuation and then available as part of complete special tool set 36 1 030. (0 493 829) only.**

0493848 WASHER

0493848 361060 Washer Mechanical tool

NOTE: **To apply to the wheel rim when mounting the emergency wheel and tire**

0493891 WASHER

0493891 361424 Washer AM

NOTE: **For installation of the emergency operation ring, series: E39PL**

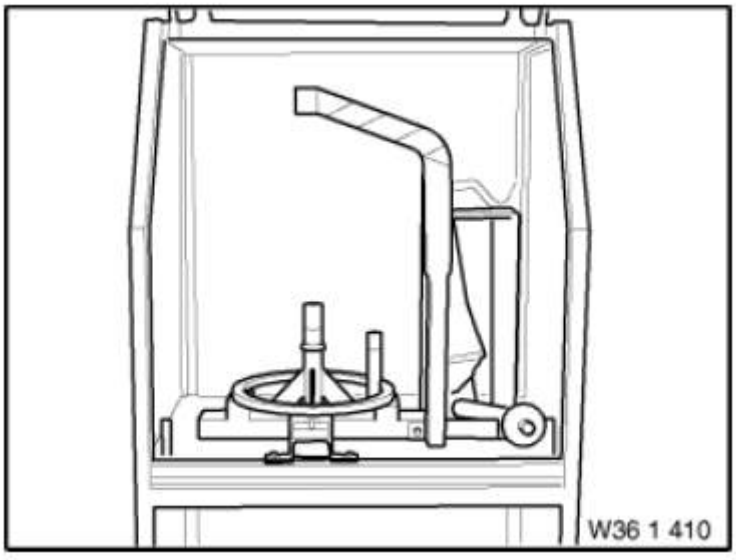


Fig. 32: Identifying Washer (0493891)
Courtesy of BMW OF NORTH AMERICA, INC.

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ONE-PART ALLOY WHEELS

36 10 WHEELS ONE-PART ALLOY WHEELS

ONE-PART ALLOY WHEELS SPECIFICATION

Max. radial runout of tire Rim with tire	max. mm	1.1
Max. axial runout or tire Rim with tire	max. mm	1.3
Max. radial runout out rim	max. mm	0.3
Max. axial runout of rim	max. mm	0.3
Max. imbalance for each side (before balancing)	max. g	90 for clamp weights 120 for stick-on weights
Permissible residual imbalance for each side (after balancing)	max. g	4
Elimination of imbalance: Up to 60 g with one weight or more than 60 g with two weights	Â	Â

STEEL AND ALUMINIUM STRIP WHEELS

36 10 WHEELS STEEL AND ALUMINIUM STRIP WHEELS

WHEELS AND ALUMINIUM STRIP WHEELS SPECIFICATION

Max. radial runout of tire Rim with tire	max. mm	1.6
Max. axial runout or tire Rim with tire	max. mm	1.8
Max. radial runout out rim	max. mm	0.8
Max. axial runout of rim	max. mm	0.8
Max. imbalance for each side (before balancing)	max. g	90 for clamp weights 120 for stick-on weights
Permissible residual imbalance for each side (after balancing)	max. g	4
Elimination of imbalance: Up to 60 g with one weight or more than 60 g with two weights	Â	Â

TWO-PART ALLOY WHEELS

36 10 WHEELS TWO-PART ALLOY WHEELS

TWO-PART ALLOY WHEELS SPECIFICATION

Max. radial runout of tire Rim with tire	max. mm	1.3
Max. axial runout or tire Rim with tire	max. mm	1.5
Max. radial runout out rim	max. mm	0.5
Max. axial runout of rim	max. mm	0.5
Max. imbalance for each side (before balancing)	max. g	90 for clamp weights 120 for stick-on weights
Permissible residual imbalance for each side (after balancing)	max. g	4

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Elimination of imbalance: Up to 60 g with one weight or more than 60 g with two weights	Â	Â

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SUSPENSION

Wheel And Tires - Tightening Torques - X3 Utility

WHEEL RIMS

36 11 WHEEL RIMS

TIGHTENING TORQUE SPECIFICATION - WHEEL RIMS

Â	Type	Thread	Tightening specifications	Value
1AZ Valve on disc wheel (Tyre Pressure Monitor)	F01, F02, F03, F04, F06, F07, F10, F11, F12, F13, F18, F25	Â	Â	3, 5 Nm
2AZ Wheel electronics (Tyre Pressure Monitor) on valve	F01, F02, F03, F04, F06, F07, F10, F11, F12, F13, F18, F25	Â	Â	3, 5 Nm
3AZ Valve on disc wheel (RDCi)	F25/F26	WAF 11	Â	8 Nm

WHEELS

36 10 WHEELS

TIGHTENING TORQUE SPECIFICATION - WHEELS

Â	Type	Thread	Tightening specifications	Dimension
1AZ Wheel bolt	F01/F02/F03/F04/F06/F07/F10/F11/F12/F13/F18/F25/F26	M14	• Screw in the wheel bolts and evenly tighten by hand in a crosswise sequence in order to centre the wheel rim. • Tighten the wheel bolts to the specified tightening toque in a crosswise sequence using a calibrated torque wrench. • Check all wheel bolts in the same sequence	140 Nm

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			and retighten to the prescribed tightening torque if necessary.	

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SUSPENSION

Wheels and Tires Operating Fluids

1.0 TIRE MOUNTING PASTE

Use only a lubricant specifically designed for this purpose (former BMW Part No. 81 22 9 407 288).

Wurth Tire Mounting Paste Part No. 892800

Silicone sprays are not acceptable, as they are extremely slippery and don't dry. If applied to the tire bead, it is likely that the tire moves on the rim, causing an imbalance.

2.0 WHEEL CLEANERS

Liquids for cleaning the alloy wheels must be strong enough to lift brake dust, road dirt, etc. off the painted wheel surface with minimum manual agitation, yet not attack the wheel material. The following cleaner has been thoroughly tested for optimum cleaning action and long-term compatibility with the wheel's surfaces:

Wheel Cleaner Spray BMW Part No. 82 14 1 467 045

3.0 WHEEL HUB COVERS

Covers may be affixed to the alloy rim by using Loctite 638 (former BMW Part No. 07 58 9 056 030). Covers may only be used once.

Loctite 638

- Wurth Part No. 8936010
- Loctite Part No. 21447

The cooling-turbine wheel covers of the M5 (E34) produced from March 1990 to October 1990 may be secured to the wheel by applying Loctite 242 to the attaching screw threads. First clean screw threads with Loctite Cleaning Solvent 755.

4.0 ANTI-CORROSION PASTE

Apply small amounts of Plastilube paste evenly around the centering cone of the alloy wheel rim and onto the contact areas of the brake hub.

Plastilube BMW Part No. 81 22 9 407 103.

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