

2005 BMW Z4
2003-05 SUSPENSION Rear - Z4

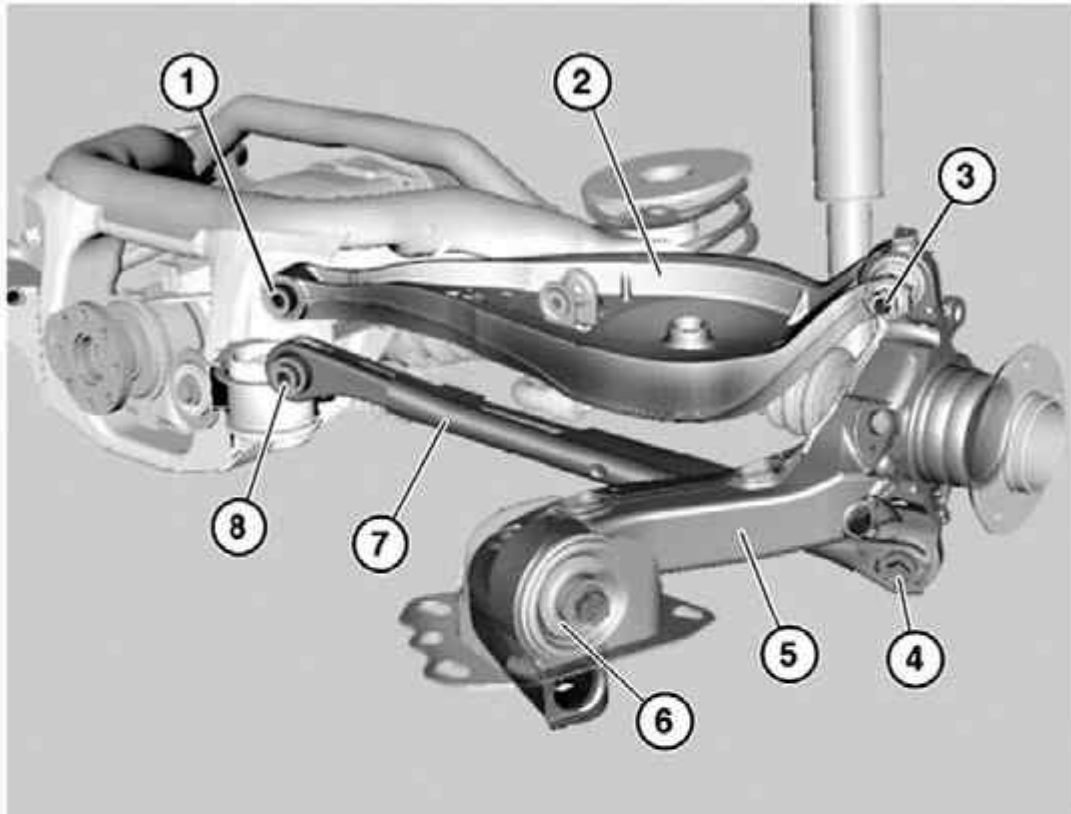
2003-05 SUSPENSION

Rear - Z4

DESCRIPTION & OPERATION

SUSPENSION

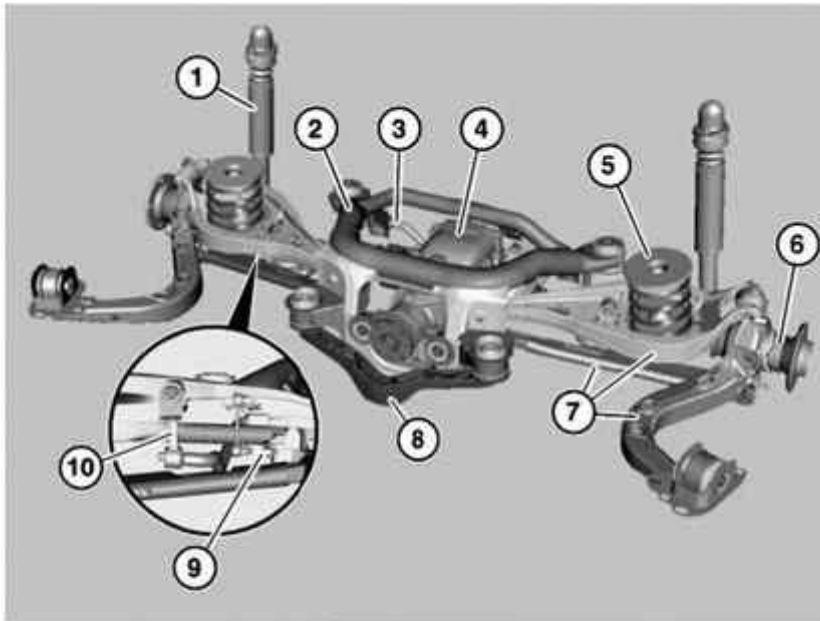
Chassis and suspension used on Z4 (E85) consists of lightweight aluminum suspension components. The rear suspension components are very similar to the 3-series (E46), with the following exceptions: track width is widened by 1.18" (30 mm), an added reinforcement plate with cooling duct (for differential), rubber bushings on subframe and trailing arms are harder, brake hoses, brake pad wear sensor wire and wheel speed sensor wires are routed on and underneath the trailing arms (additional brackets on arms). The springs and dampers are also similar to the 3-series (E46), except standard suspension ride level is .39" (10 mm) lower. Optional sports suspension ride level is an additional .59" (15 mm) lower. See **Fig. 1 -Fig. 3** .



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

Fig. 1: Identifying Control Arms With Rubber Mounts

Courtesy of BMW OF NORTH AMERICA, INC.

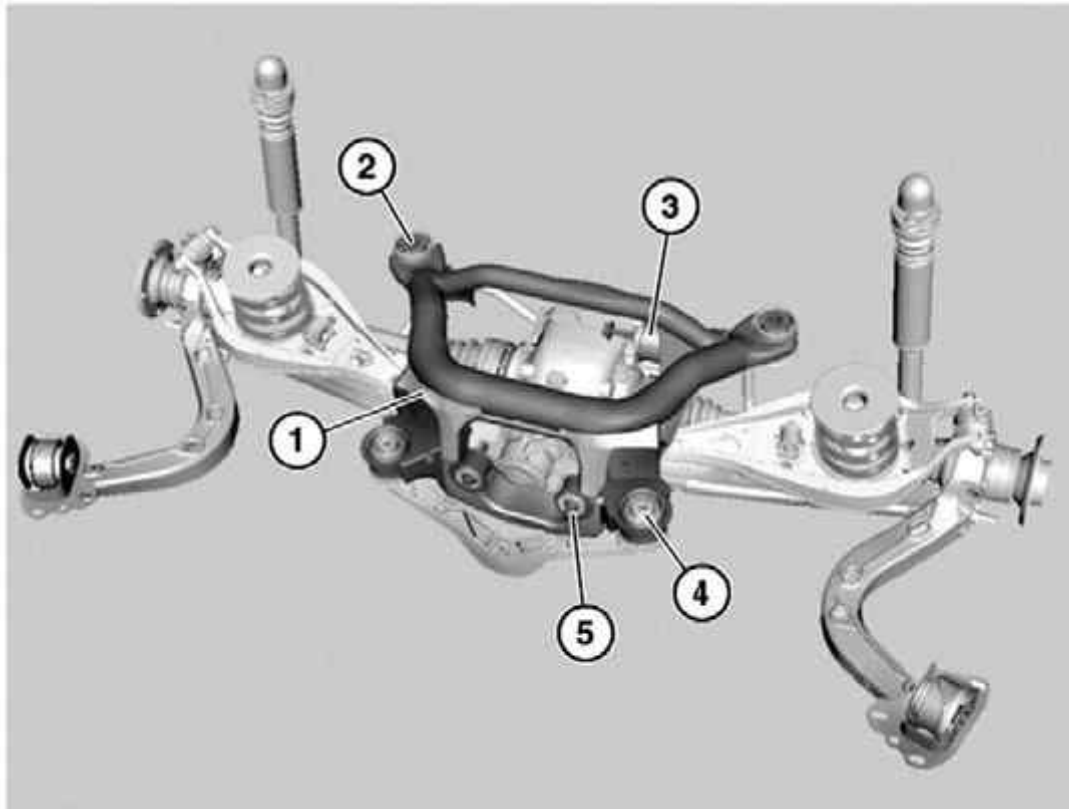


- 1 Shock absorber
- 2 Rear axle carrier with rubber mounts
- 3 Stabilizer
- 4 Final drive / output shafts
- 5 Coil spring
- 6 Wheel bearing / drive flange
- 7 Trailing arm / control arm / rubber mount
- 8 Tension strut
- 9 Ride level sensor
- 10 Stabilizer link

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Fig. 2: Identifying Rear Axle Layout

Courtesy of BMW OF NORTH AMERICA, INC.



- 1 Rear axle carrier
- 2 Rear axle carrier rubber mount, rear
- 3 Final drive mount, rear
- 4 Rear axle carrier rubber mount, front
- 5 Final drive mount, front

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Fig. 3: Identifying Rear Axle Carrier With Rubber Mounts
Courtesy of BMW OF NORTH AMERICA, INC.

ADJUSTMENTS

2005 BMW Z4

2003-05 SUSPENSION Rear - Z4

RIDE HEIGHT

To measure front ride height, see **RIDING HEIGHT ADJUSTMENT** in WHEEL ALIGNMENT article. Measure rear ride height from lower edge of wheel arch to bottom edge of wheel rim. Determine average value of each wheel after lifting and lowering vehicle body and then average each axle. See **REAR RIDE HEIGHT SPECIFICATIONS** table. If ride height is not within specification or deviates more than 0.4" (10 mm) between wheels, coil springs must be replaced. Replacement spring can be determined from parts microfiche, parts supplier, or on old spring at one end.

REAR RIDE HEIGHT SPECIFICATIONS

Application	In. (mm)
Standard Suspension	
16" Rim	22.6 (576)
17" Rim	23.3 (592)
18" Rim	23.7 (604)
Low-Slung Sports Suspension	
16" Rim	22.0 (560)
17" Rim	22.6 (576)
18" Rim	23.1 (588)

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

NOTE: See **SPECIFICATIONS & PROCEDURES** in WHEEL ALIGNMENT article.

TROUBLE SHOOTING

To trouble shoot most symptoms, see **TROUBLE SHOOTING** table.

Whether a spring strut shock absorber has to be replaced can only be ascertained by checking while it is installed with a shock absorber tester or while it is removed with a shock absorber test machine.

TROUBLE SHOOTING

Fault	Cause	Remedy
Shock Absorbers Bottoming	Rubber Damper Faulty	Check/Replace Rubber Damper
Shock Absorbers Bottoming	Shock Absorber Faulty	Replace Shock Absorber
Drumming Noise	Rubber Mount Of Rear Axle Carrier Faulty	Replace Rubber Mount
Drumming Noise	Rubber Mount Of Final Drive Suspension Faulty	Replace Rubber Mount
Drumming Noise	Rubber Mount Of Control Arm Faulty	Replace Rubber Mount
Drumming Noise	Rubber Mount Of Trailing Arm Faulty	Replace Rubber Mount

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Grinding Noise Only When Driving In Curves	Wheel Bearing Faulty	Replace Wheel Bearing
Poor Handling Characteristics Or Low Directional Stability	Rubber Mount Of Control Arm Faulty	Replace Rubber Mount
Poor Handling Characteristics Or Low Directional Stability	Rubber Mount Of Rear Axle Carrier Faulty	Replace Rubber Mount
Poor Handling Characteristics Or Low Directional Stability	Rear Axle Geometry Not OK	Perform Chassis Alignment
Shock Absorber Noise	Shock Absorber Loose	Tighten Shock Absorber
Shock Absorber Noise	Installed New Shock Absorber Was Stored Horizontally With Retracted Piston Rod	Store Shock Absorbers Standing Upright With Piston Rods Run Out At Room Temperature For 24 Hours
Shock Absorber noise	Shock Absorber Faulty	Shock Absorber Faulty
Rattling Noise	Shock Absorber Loose	Tighten Shock Absorber
Rattling Noise	Upper Shock Absorber Bushing Faulty	Replace Bushing
Rattling Noise	Lower Shock Absorber Bushing Faulty	Replace Shock Absorber
Rattling Noise	Stabilizer Bracket Loose	Tighten Bracket
Rattling Noise	Stabilizer Rubber Mount Faulty	Replace Rubber Mount
Rattling Noise	Stabilizer Broken	Replace Stabilizer
Rattling Noise	Rubber Mount On Rear Axle Carrier Faulty	Replace Rubber Mount
Worn Down Areas On Tire	Shock Absorber Faulty	Replace Shock Absorber
Excessive Tire Wear	Rear Axle Geometry Not OK	Perform Chassis Alignment
Long After Swinging Of Body After Driving Over Rough Road	Shock Absorber Effect Insufficient	Replace Shock Absorber
Body Dipping While Accelerating	Shock Absorber Effect Insufficient	Replace Shock Absorber
Wheels Jumping Even On Normal Road Surfaces	Shock Absorber Effect Insufficient	Replace Shock Absorber
Rear Of Car Out Of Control While Braking	Shock Absorber Effect Insufficient	Replace Shock Absorber
Rear End Skid When Braking With Each Side On Different Road Surface	Rubber Mount Of Trailing Arm Faulty	Replace Rubber Mount
Hesitation Of Rear Wheels With Hard Braking	Rubber Mount Of Trailing Arm Faulty	Replace Rubber Mount
Unsteady Taking Of Curves Due To Self-Steering Or Poor Rear End Track Stability	Rubber Mount On Rear Axle Carrier Faulty	Replace Rubber Mount
Unsteady Taking Of Curves Due To Self-Steering Or Poor Rear	Rubber Mount Of Final Drive Suspension Faulty	Replace Rubber Mount

End Track Stability

REMOVAL & INSTALLATION

AXLE CARRIER ASSEMBLY

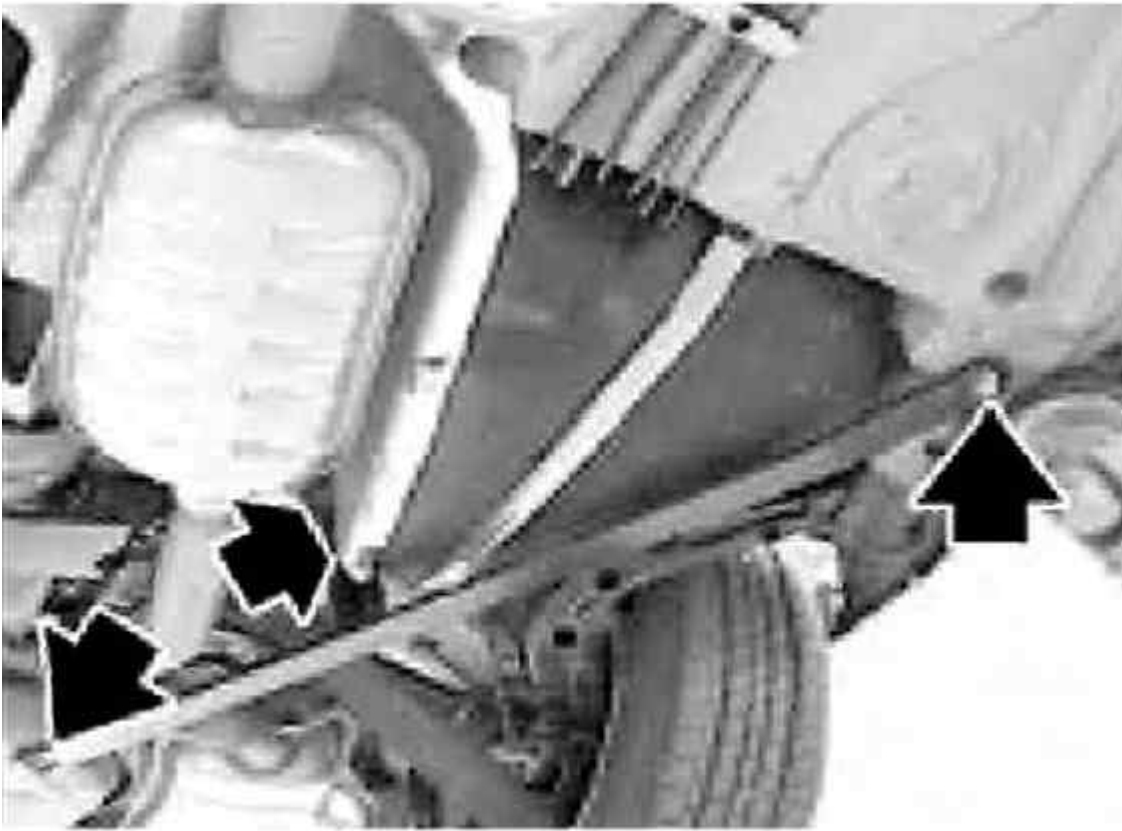
NOTE: Numbers in text refer to numbers in figures.

Removal

1. Raise and support vehicle. Remove rear wheels.
2. Remove tension strut/cross brace, if necessary. See **Fig. 4** .
3. Remove drive shaft. See appropriate DRIVE SHAFTS & UNIVERSAL JOINTS article in DRIVELINE/AXLES. Remove both coil springs. See **COIL SPRING** .
4. Remove tension strut. See **TENSION STRUT FOR REAR AXLE CARRIER** .
5. Disconnect handbrake cables from handbrake lever and pull out of rear axle carrier. See **PARKING BRAKE LEVER & MOUNTING PAN** in DISC article in BRAKES.
6. Release screw on holder of brake line on left and right. See **Fig. 5** .
7. Mark position of left and right eccentric bolts (1) to control arm with center punch marks (2). This simplifies subsequent camber adjustment. See **Fig. 6** .
8. Release nut (1) on trailing arm on left and right and remove eccentric bolt. See **Fig. 7** .
9. Disconnect ABS plug and brake pad wear sensor. Unscrew brake calipers, push them in between axle shaft and control arm and suspend from car with a piece of wire. See **CALIPER ASSEMBLY** in DISC article in BRAKES.
10. Mark position of bearing pedestal (1) to body (2) with colored mark (3) on left and right. This simplifies subsequent toe-in adjustment. Unfasten screws. See **Fig. 8** .
11. Support final drive with transmission lifter and Special Tool (33 4 410). See **Fig. 9** . Observe distance between Special Tool (33 4 410) and dust protection sleeve (1). If the dust protection sleeve (1) is damaged or bent, it may come into contact with the flange. This will cause noise. See **Fig. 10** .

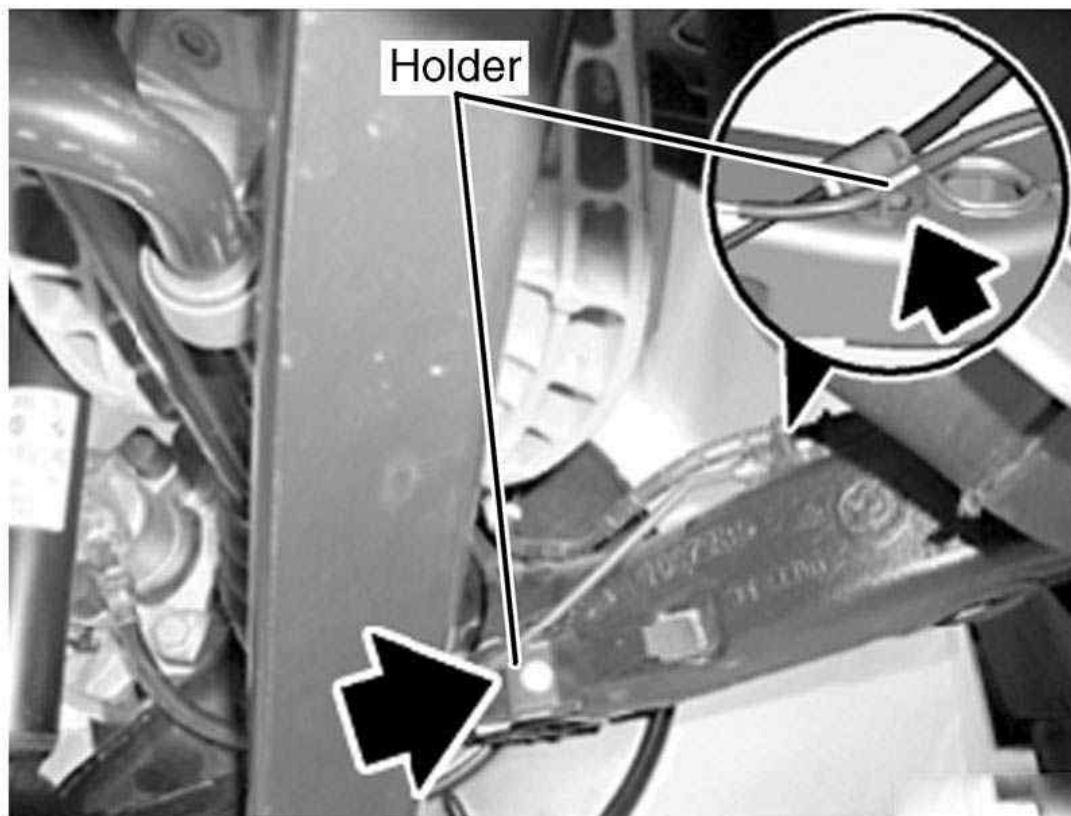
CAUTION: No one should be allowed to stand underneath rear axle carrier.

12. Unfasten screws. See **Fig. 11** .
13. Lower transmission lifter.



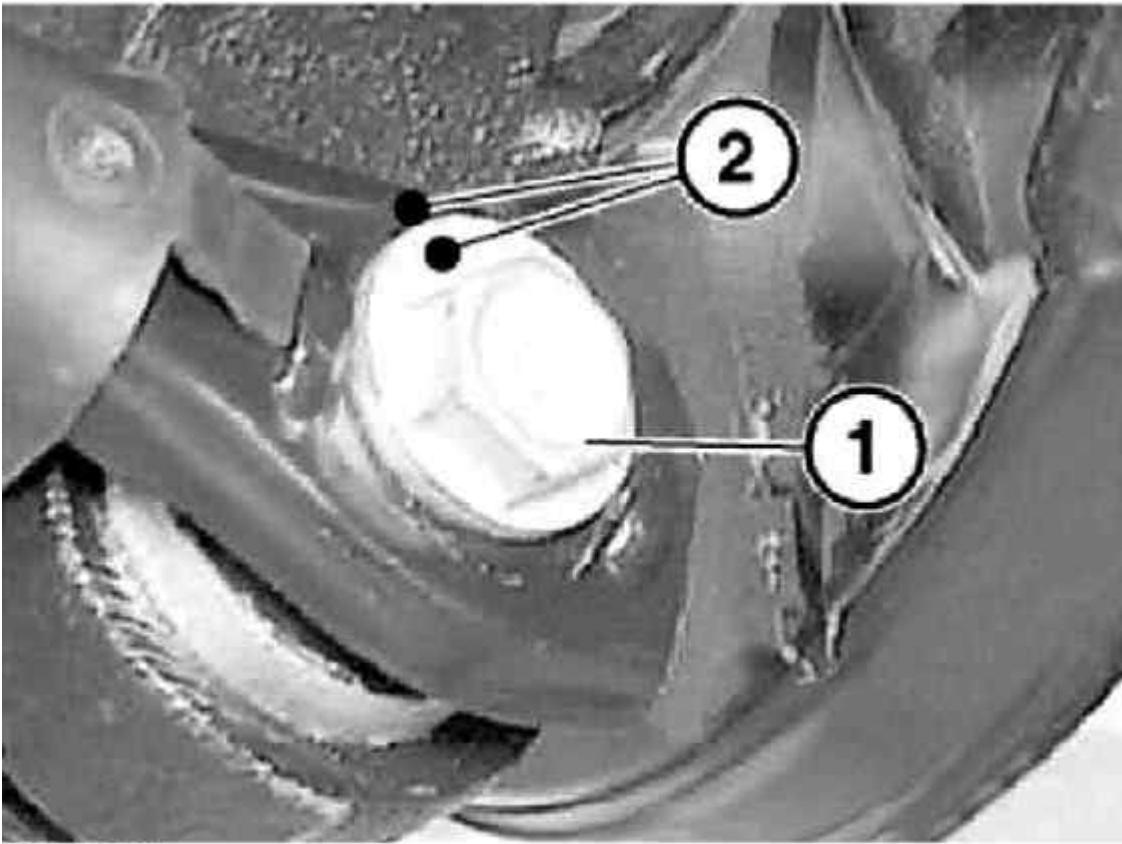
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Fig. 4: Removing Cross Brace/Tension Strut
Courtesy of BMW OF NORTH AMERICA, INC.



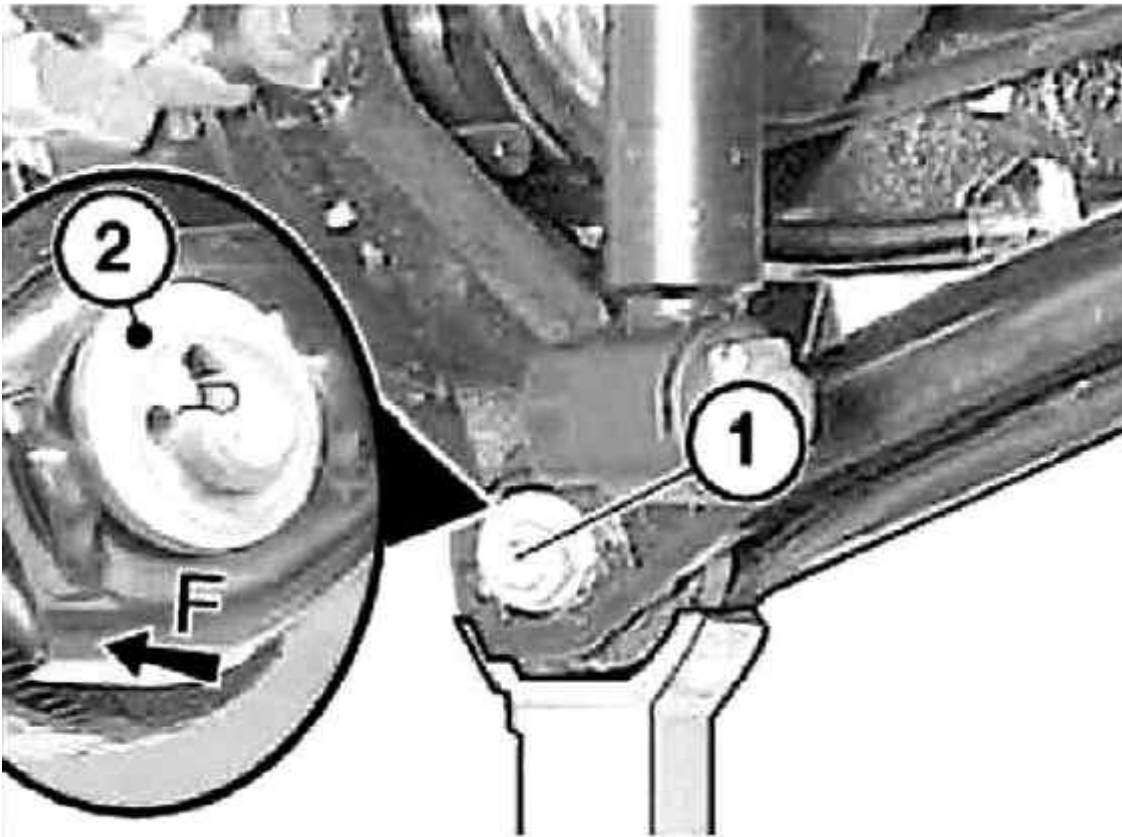
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Fig. 5: Locating Screw Of Brake Line Holder
Courtesy of BMW OF NORTH AMERICA, INC.



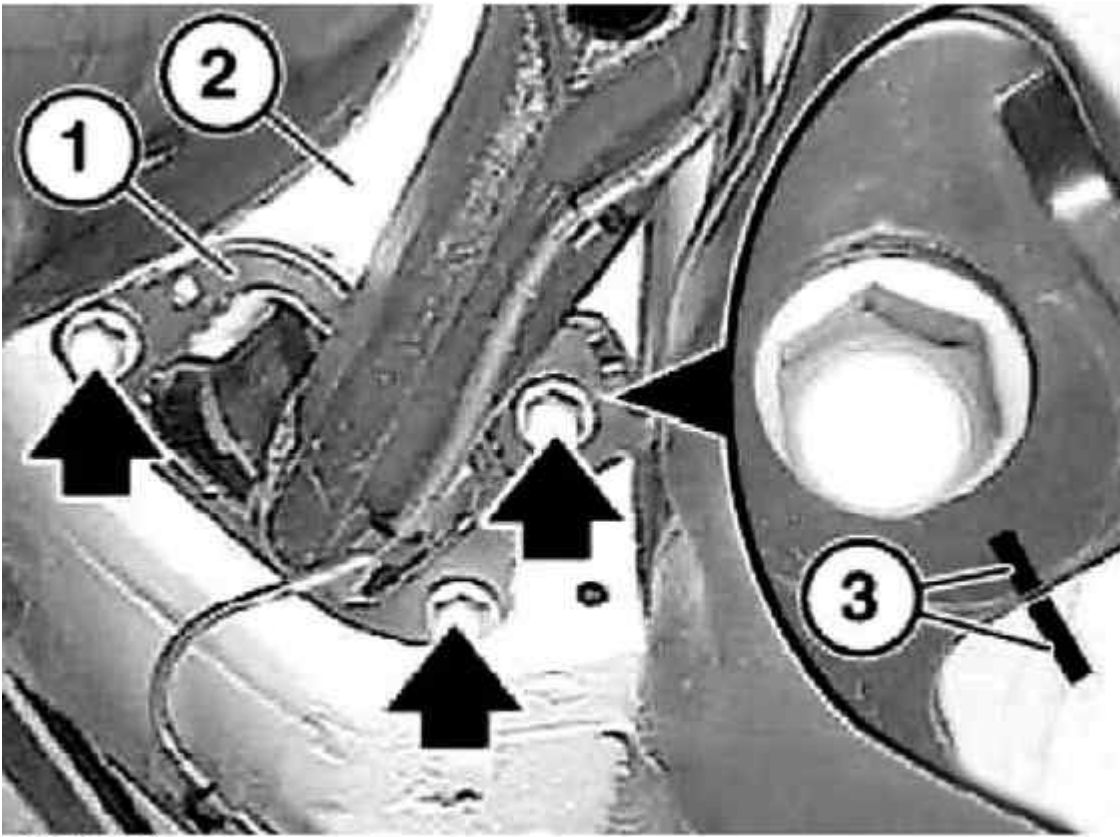
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Fig. 6: Marking Position Of Eccentric Bolts
Courtesy of BMW OF NORTH AMERICA, INC.



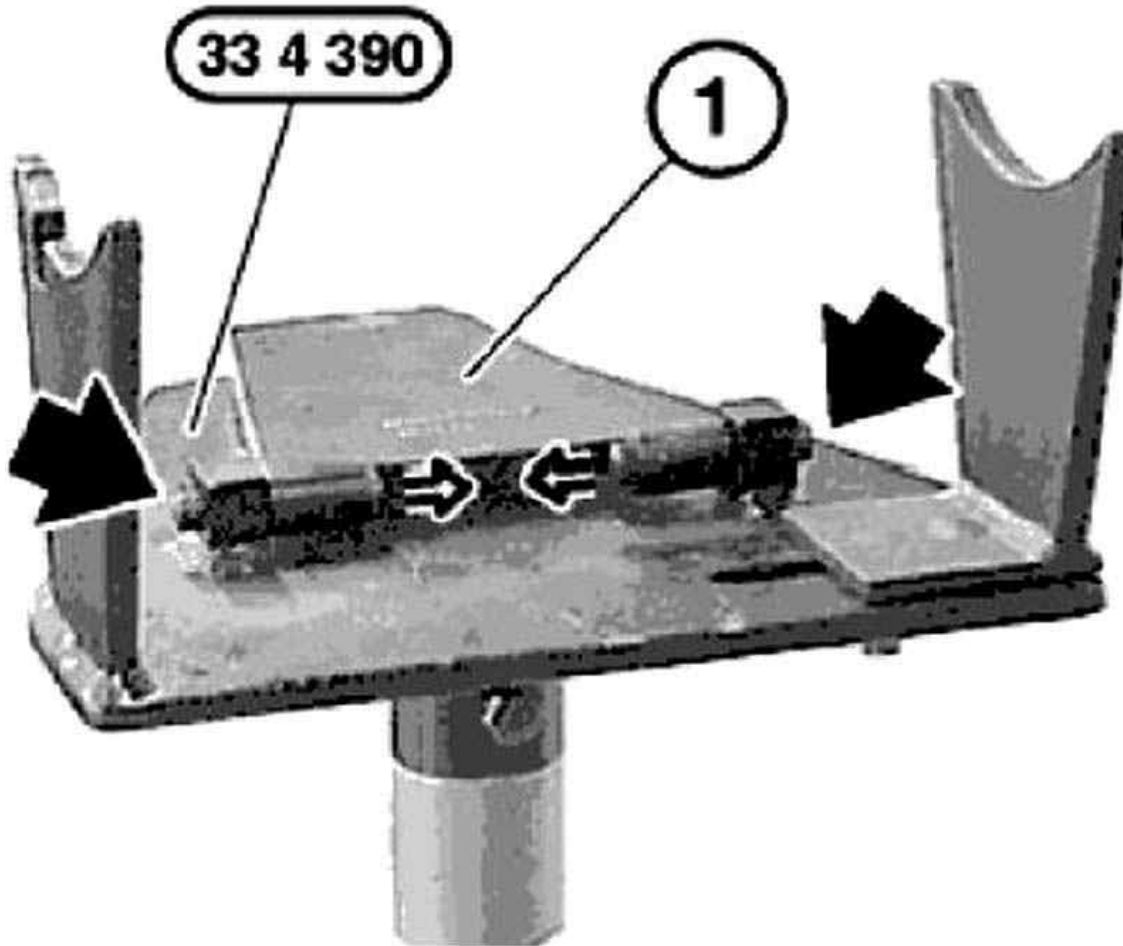
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Fig. 7: Removing Eccentric Bolt
Courtesy of BMW OF NORTH AMERICA, INC.



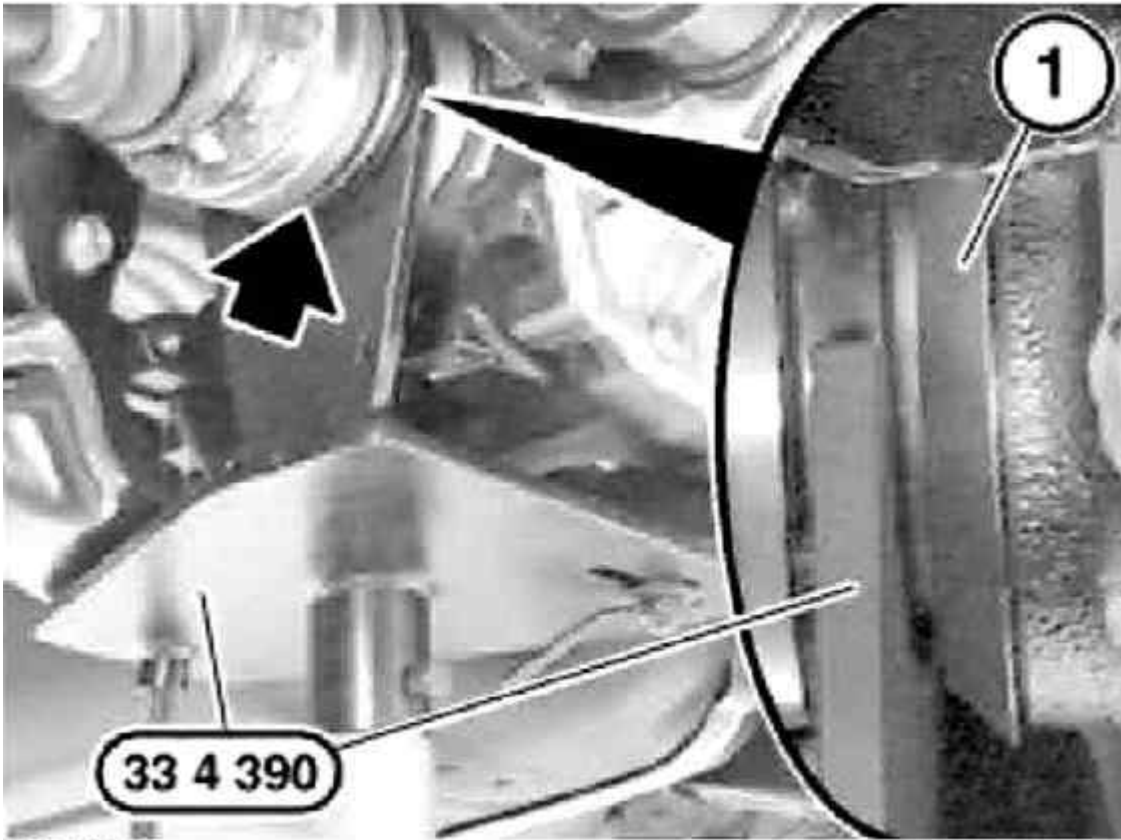
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Fig. 8: Marking Position Of Bearing Pedestal
Courtesy of BMW OF NORTH AMERICA, INC.



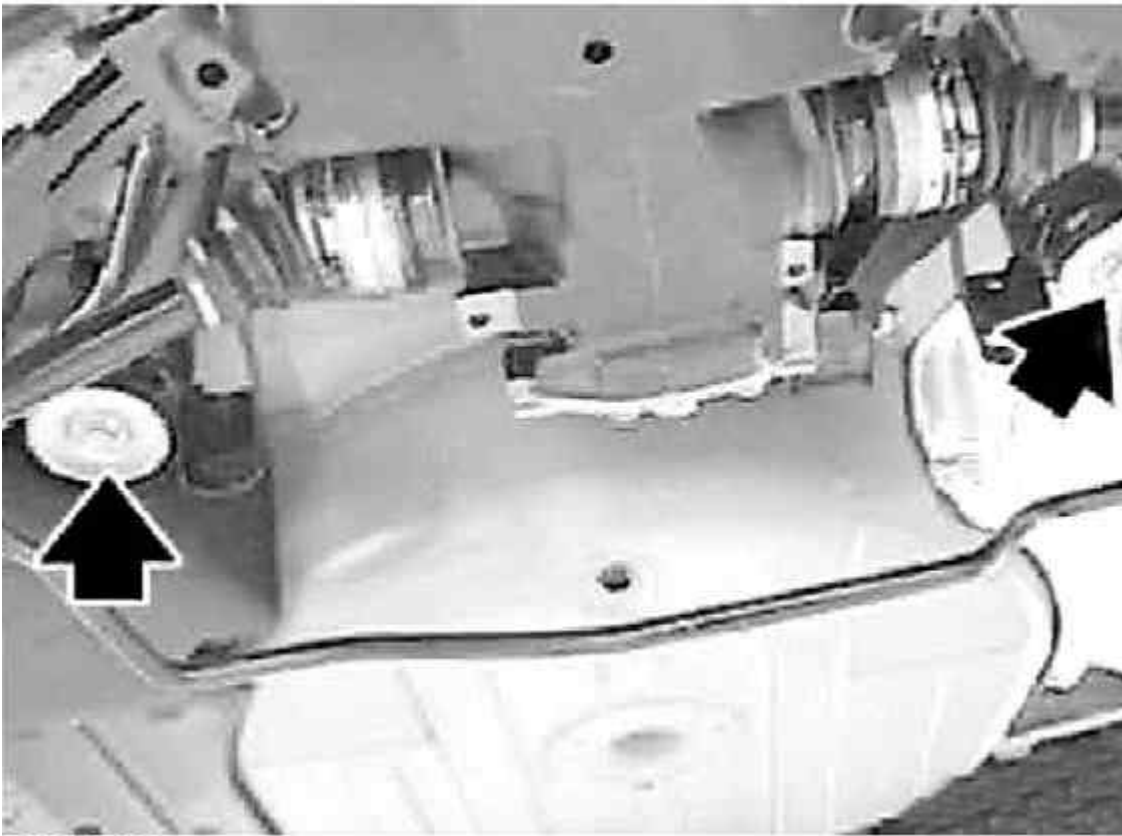
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Fig. 9: Preparing Transmission Lifter
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 10: Supporting Final Drive
Courtesy of BMW OF NORTH AMERICA, INC.



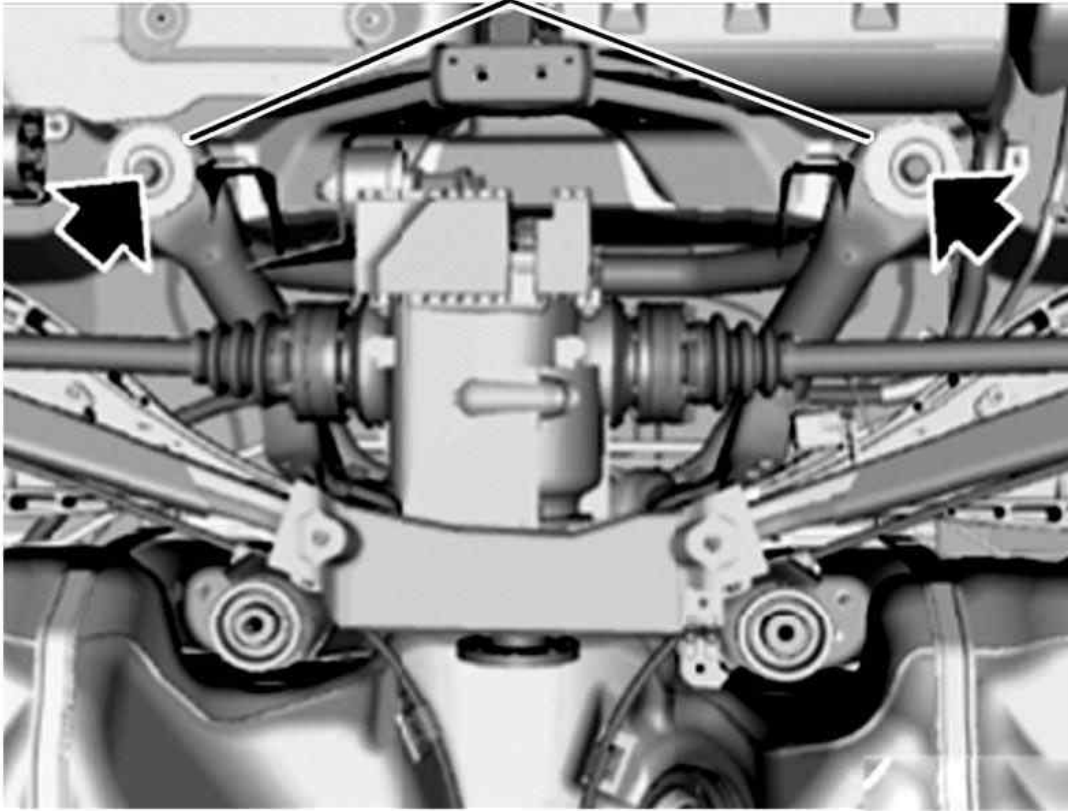
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Fig. 11: Locating Rear Axle Carrier Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

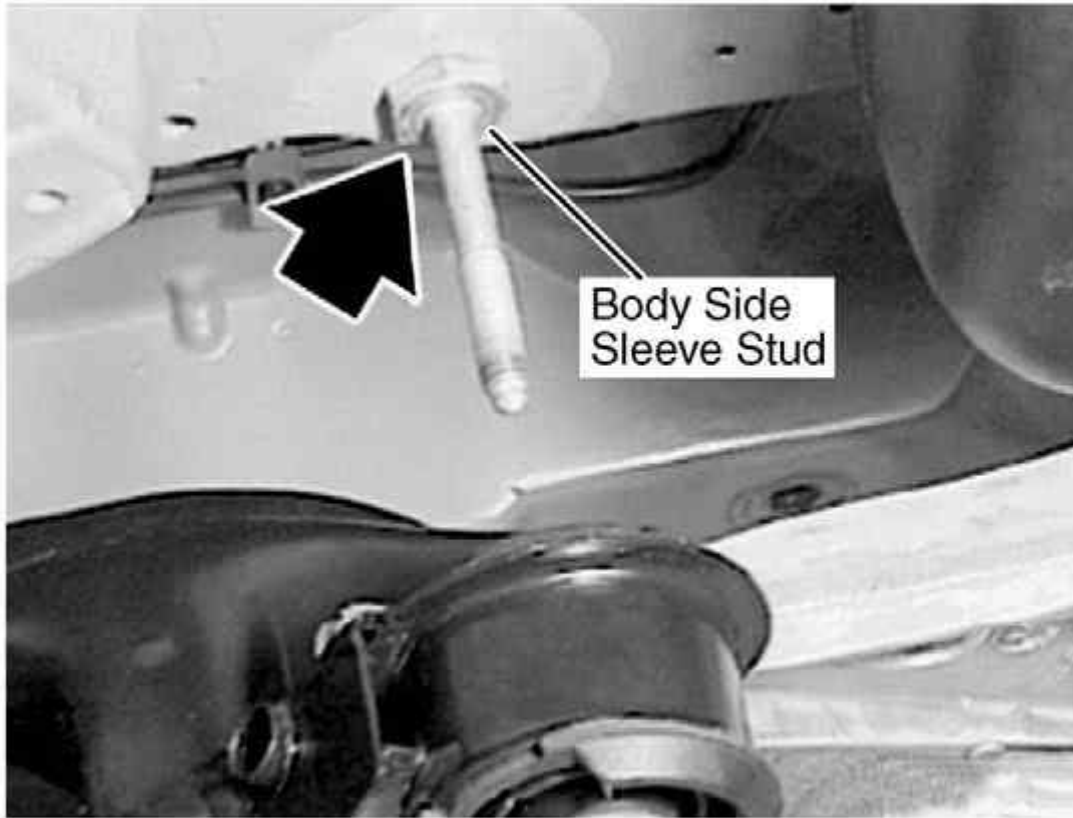
1. Replace damaged threaded bolts.
2. To install, reverse removal procedure. Replace self-locking nuts. Damaged threads in body side sleeves can be repaired with Helicoil thread inserts. See **Fig. 12** and **Fig. 13** . These inserts must be fitted flush with the original thread. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS** .
3. When installing eccentric bolt on trailing arm, note insertion direction of bolt threads. "F" is direction of travel. Fit eccentric washer (2). See **Fig. 7** . Tighten bolt to specification. See **TORQUE SPECIFICATIONS** .
4. When installing shock absorber to trailing arm bolt, thrust washer (2) on rubber mount must point to screw head. See **Fig. 14** .

Body Side
Sleeves



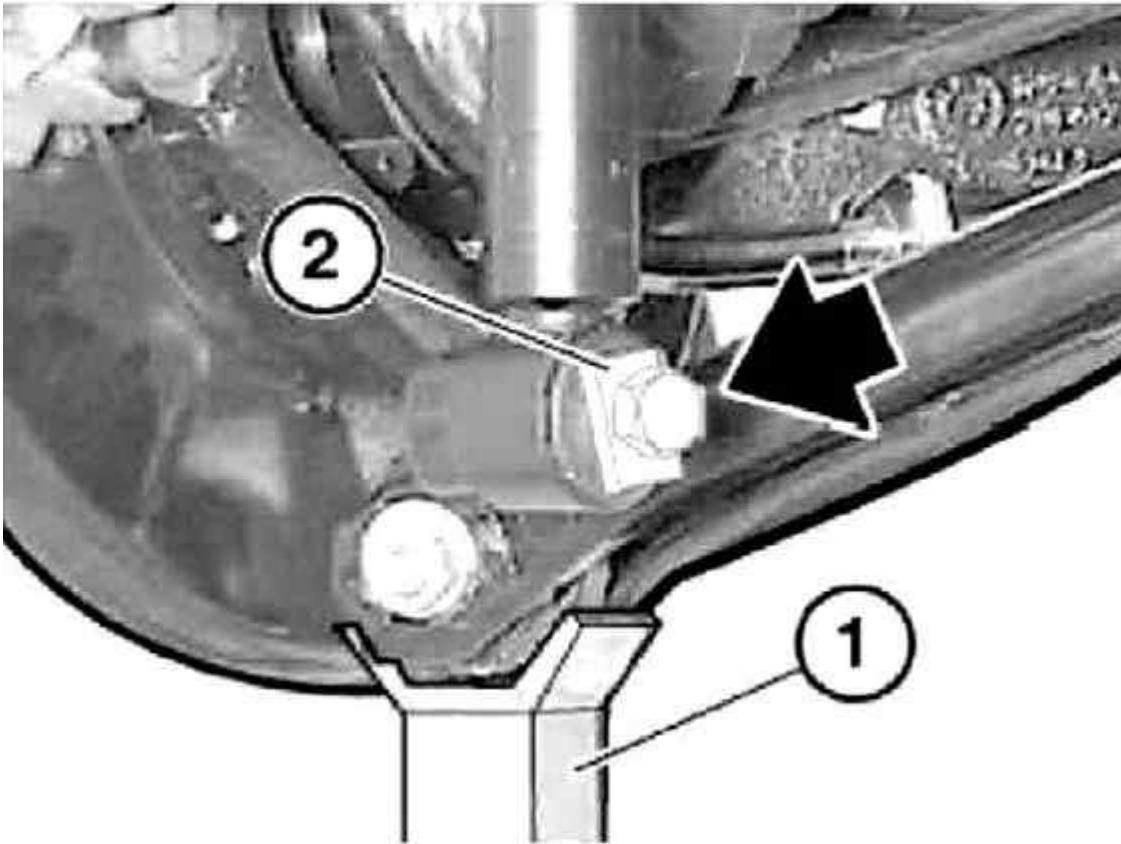
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Fig. 12: Identifying Body Side Sleeves (1 Of 2)
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 13: Identifying Body Side Sleeves (2 Of 2)
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 14: Removing Shock Absorber
Courtesy of BMW OF NORTH AMERICA, INC.

AXLE CARRIER RUBBER MOUNTS, FRONT

NOTE: Numbers in text refer to numbers in figures.

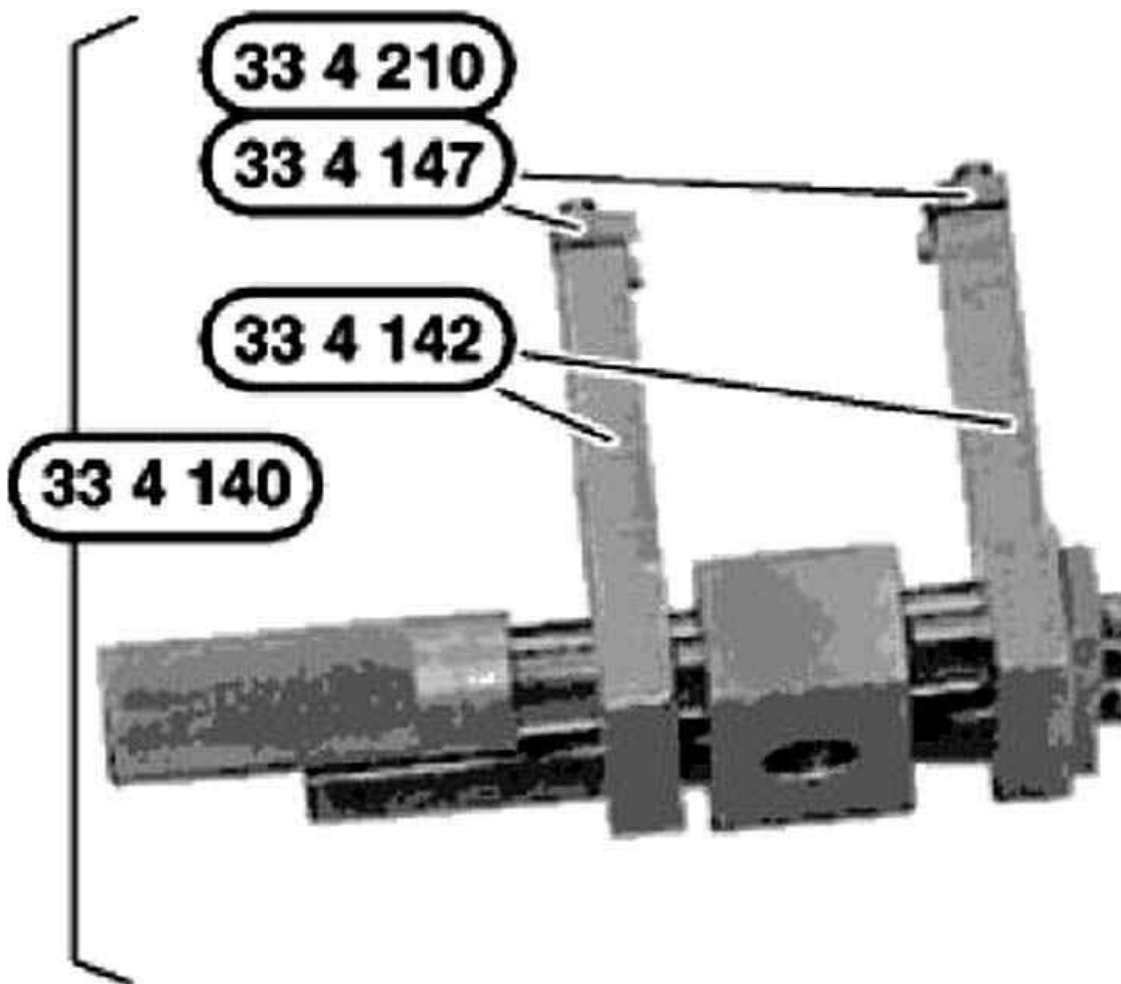
Removal & Installation

1. Lower rear axle carrier. See **AXLE CARRIER ASSEMBLY**.
2. Assemble Special Tool (33 4 140 with 33 4 142/147). See **Fig. 15**.
3. Place Special Tool (33 4 140/155 and 33 3 371/372) on openings of rubber mount and make sure they are correctly supported on bushing of rear axle carrier. Secure top of spindle with standard 12 mm nut (1). See **Fig. 16**.

CAUTION: Do not point air jet at fuel tank.

4. Heat axle carrier with an industrial hot air blower with maximum outlet temperature of 1112°F (600°C). Heat bearing bushing for approximately 2 minutes. Remove rubber mount.

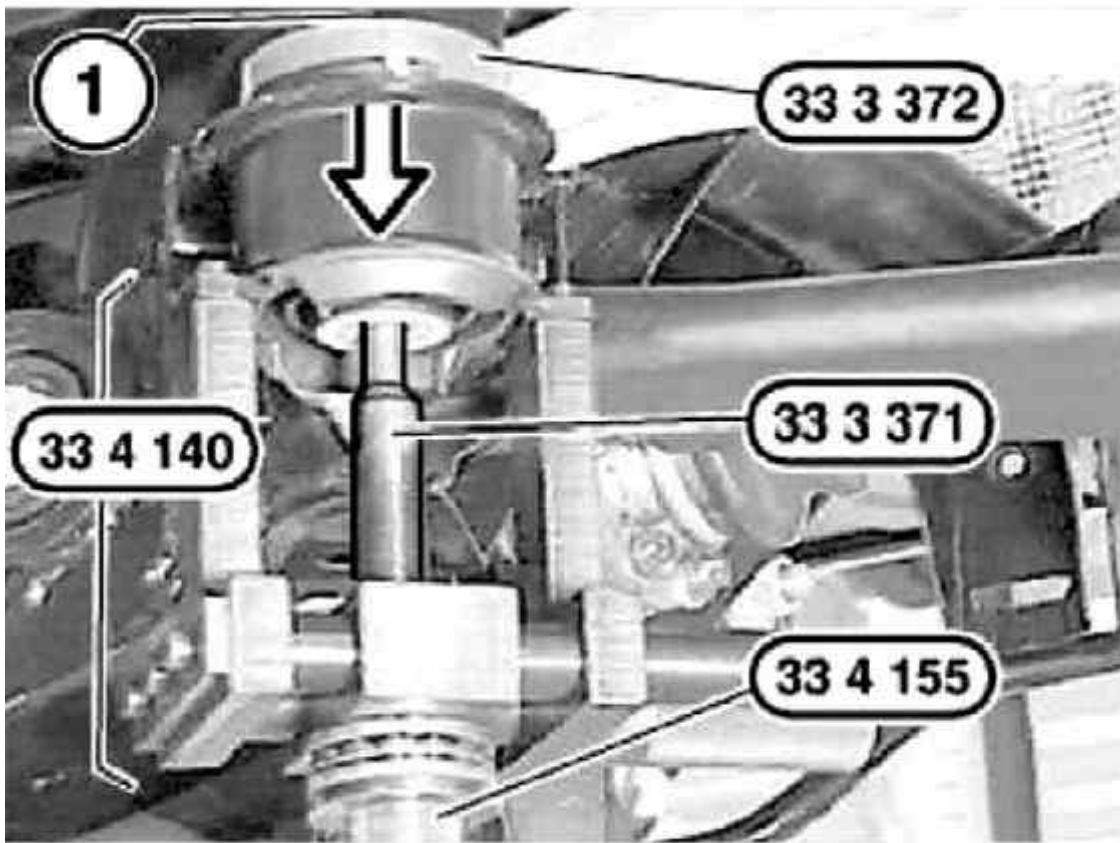
5. Coat NEW rubber mount (1) with Circolight. Front rubber mounts differ. Rubber mount VR is front right with elongated hole (1). Rubber mount VL is front left. Arrows (2) on rubber mount must point in longitudinal direction of vehicle. See **Fig. 17** .
6. Pull in with Special Tool (33 3 314/315/372/373) as far as it will go. See **Fig. 18** .
7. Install rear axle carrier. See **AXLE CARRIER ASSEMBLY** .
8. Adjust axle, ensuring seating of spring pads in control arms.



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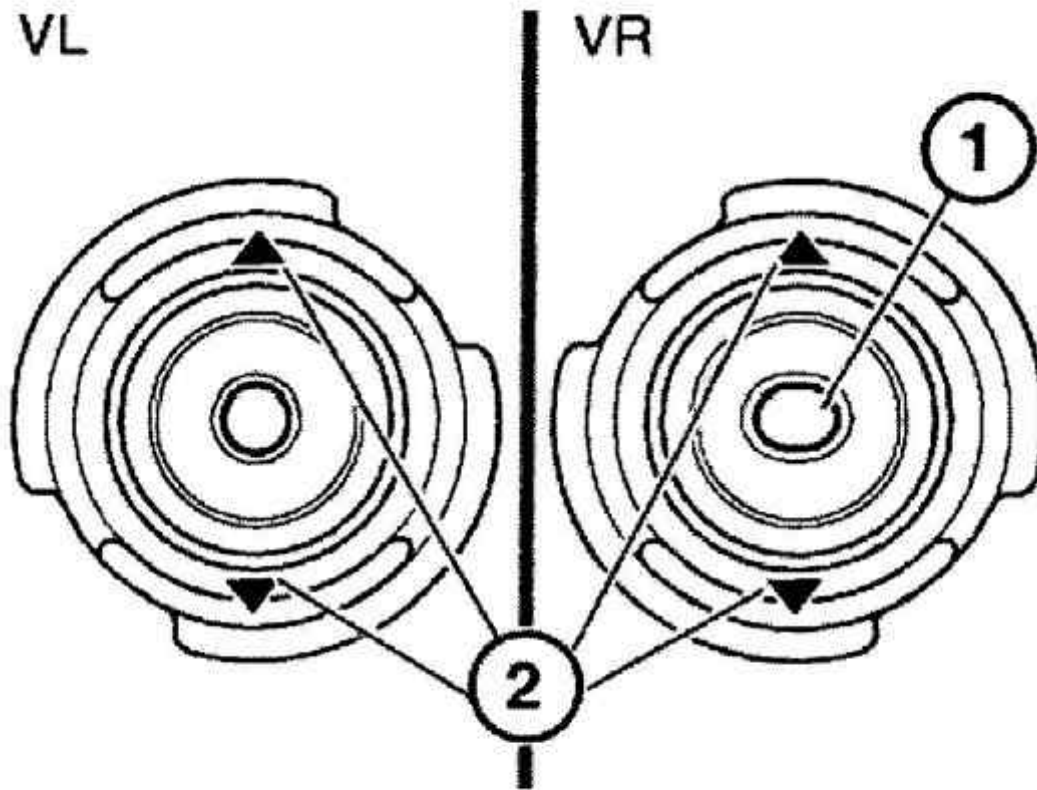
Fig. 15: Assembling Special Tool (33 4 140)

Courtesy of BMW OF NORTH AMERICA, INC.



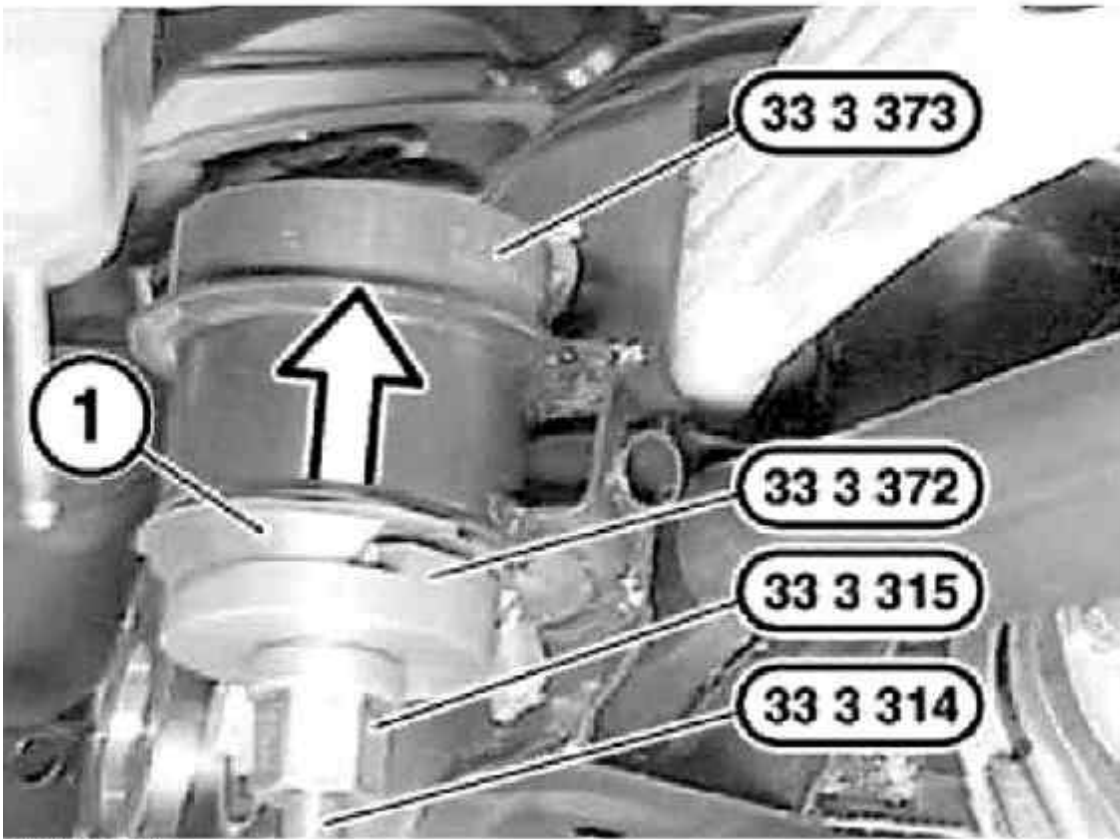
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Fig. 16: Positioning Special Tool (33 4 140)
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 17: Identifying Left & Right Rubber Mounts
Courtesy of BMW OF NORTH AMERICA, INC.



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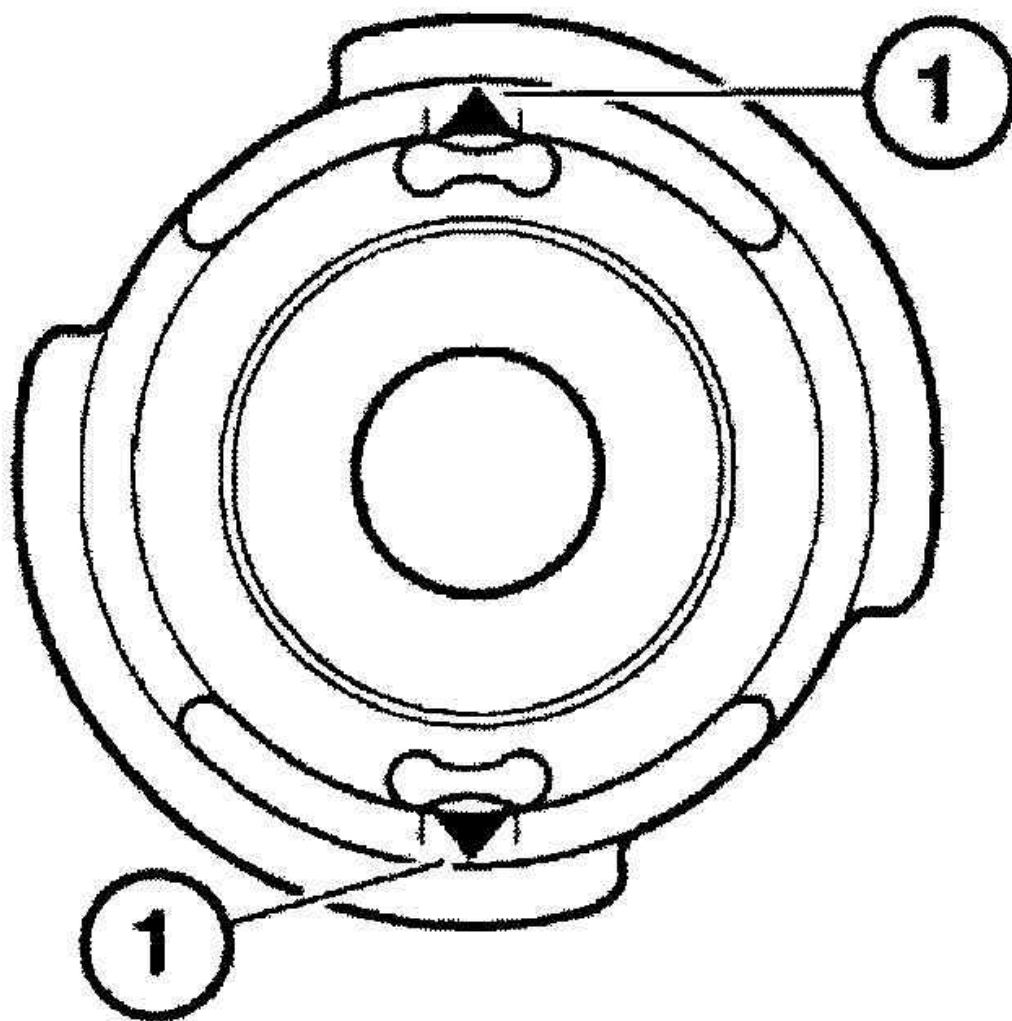
Fig. 18: Pulling In New Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

AXLE CARRIER RUBBER MOUNTS, REAR

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

Operation is identical to replacing rubber mount at front. See AXLE CARRIER RUBBER MOUNTS, FRONT . Arrows (1) on rubber mount must point in longitudinal direction of vehicle. See Fig. 19 .



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Fig. 19: Identifying Direction Of Rubber Mount At Rear
Courtesy of BMW OF NORTH AMERICA, INC.

COIL SPRING

NOTE: Numbers in text refer to numbers in figures.

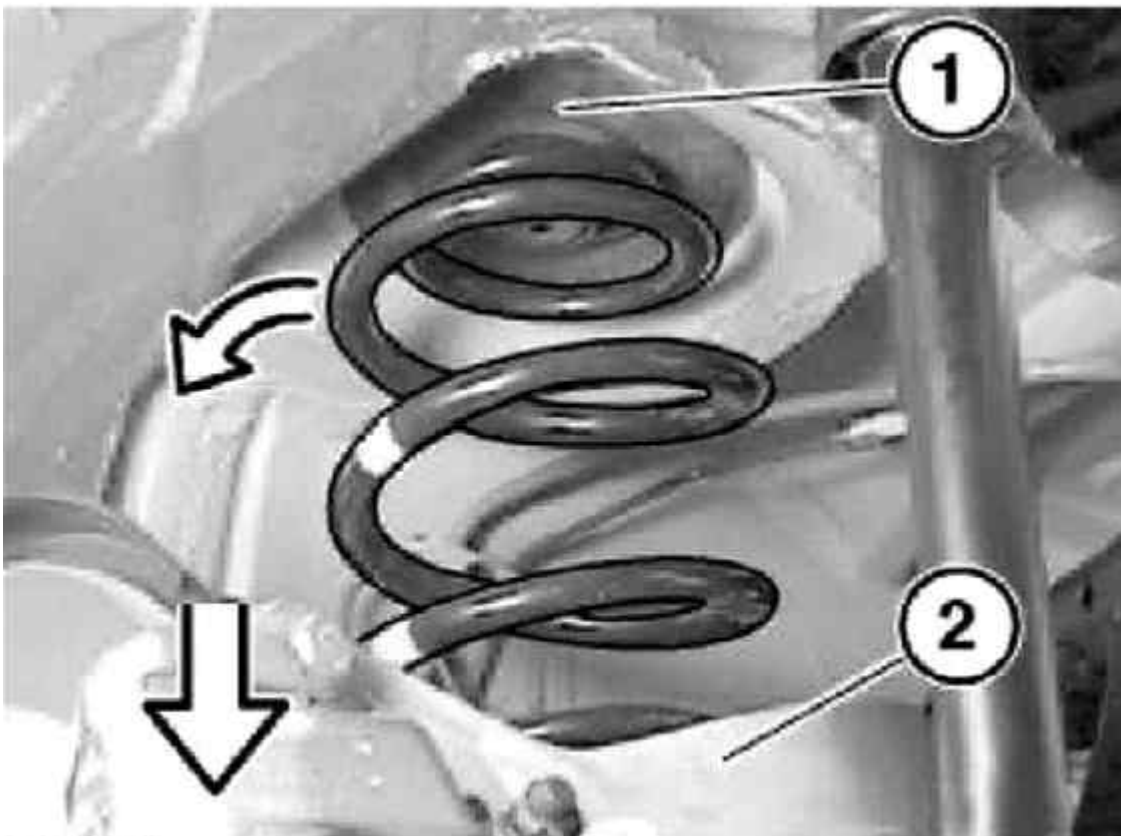
Removal

1. Raise and support vehicle. Remove rear wheel.

2. Remove output shaft from final drive. See **AXLE SHAFTS** under REMOVAL & INSTALLATION in DRIVE AXLES article in DRIVELINE/AXLES.
3. Remove stabilizer bar from rear axle carrier on side to be replaced.

CAUTION: The brake line must not be exposed to traction loads.

4. Unfasten bracket for brake line on trailing arm. See **Fig. 5** .
5. Support trailing arm with a lifter (1). Release bolt and lower lift. See **Fig. 14** .
6. Press wheel suspension down and remove coil spring out to one side. See **Fig. 20** .



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Fig. 20: Removing Coil Spring

Courtesy of BMW OF NORTH AMERICA, INC.

Installation

NOTE: On the rough road package version, the top spring pad (1) is .6" (14.5 mm) thick. See **Fig. 20** .

1. Check lower (2) and upper (1) spring pads for damage. Replace if necessary.

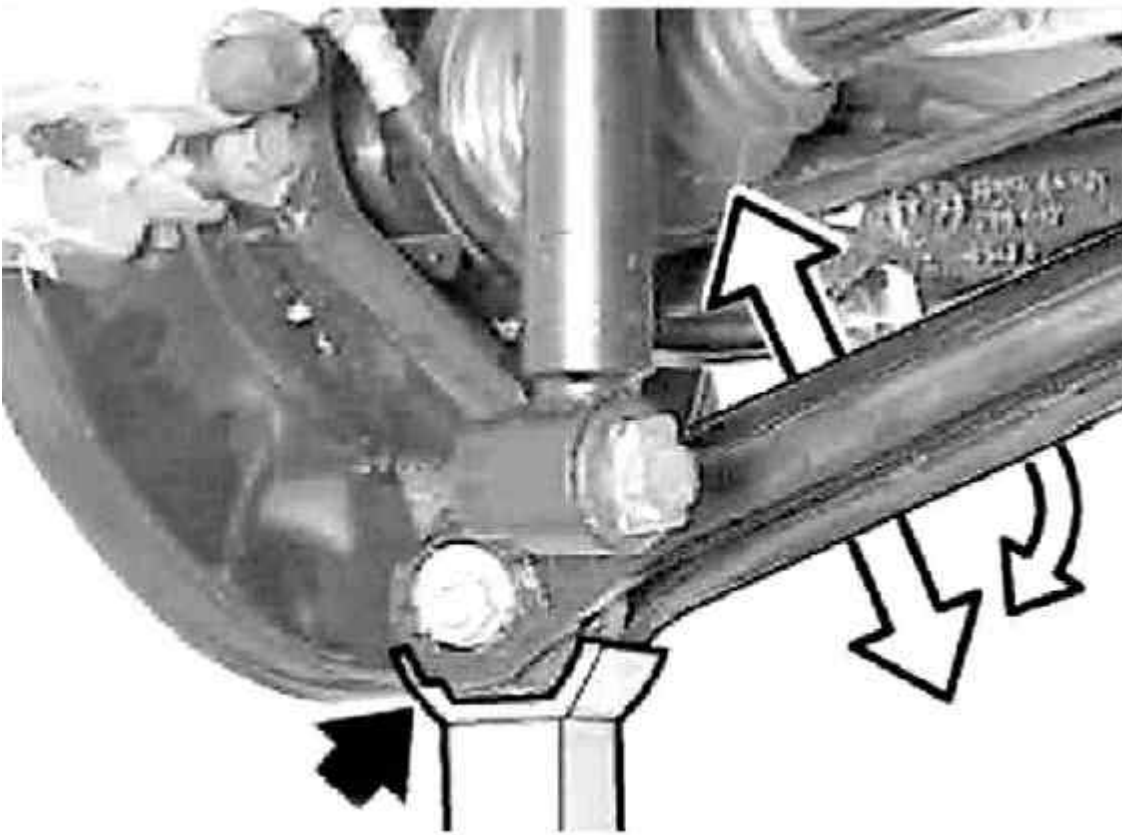
2. Press spring pad at bottom into control arm.
3. Insert top spring pad in spring.
4. Place spring on spring pad installed in control arm and position spring pad at top on body. The spring pads must be positively seated in the body and the control arm. Otherwise, there is a risk the coil spring will jump out of the centering mount and cause noises.
5. To complete installation, reverse removal procedure. Thrust washer (2) on rubber mount must point to bolt head. See **Fig. 14** . Tighten bolt to specification. See **TORQUE SPECIFICATIONS** .

LOWER CONTROL ARM

NOTE: **Numbers in text refer to numbers in figures.**

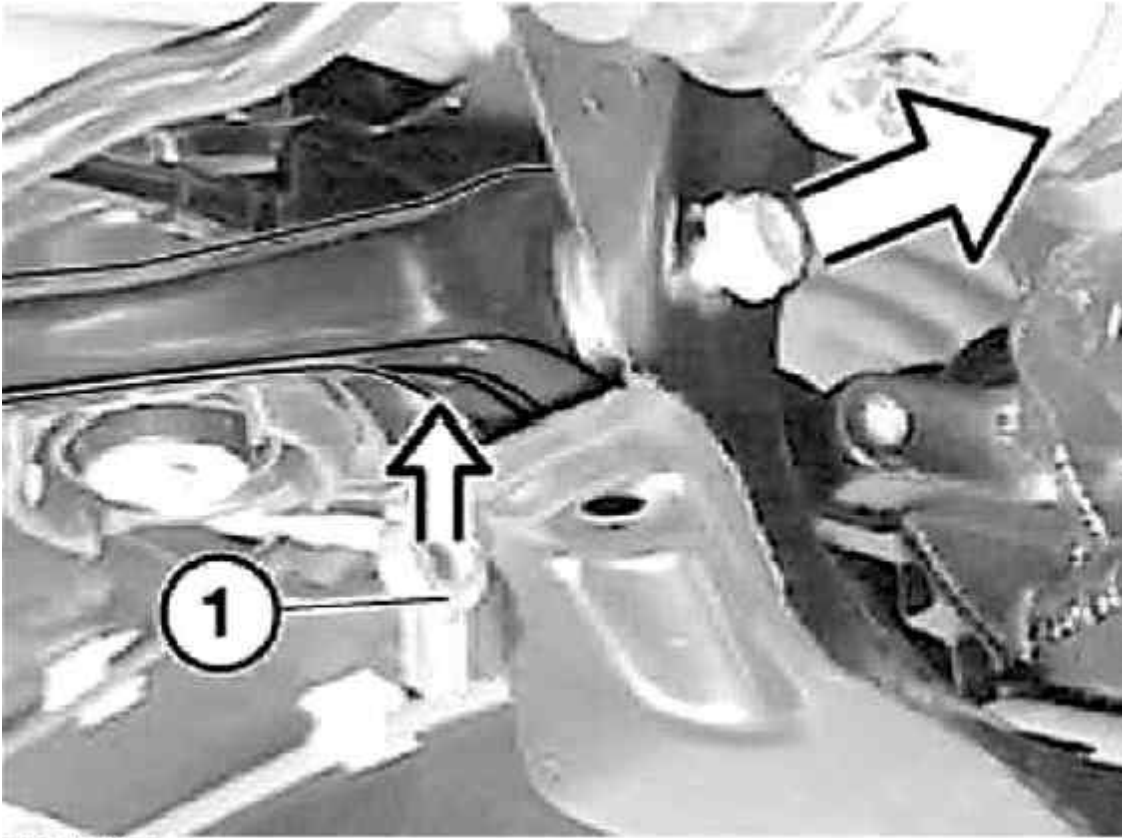
Removal & Installation

1. Remove wheel. Support trailing arm from underneath using a workshop jack. Spread plastic panel and remove from control arm. See **Fig. 21** .
2. Mark position of eccentric bolt (1) to control arm with center punch marks (2). This simplifies subsequent camber adjustment. See **Fig. 6** .
3. Release nut (1) on trailing arm on left and right and remove eccentric bolt. See **Fig. 7** . For right lower control arm, remove output shaft from final drive. See **AXLE SHAFTS** under REMOVAL & INSTALLATION in DRIVE AXLES article in DRIVELINE/AXLES.
4. For either lower control arm, release bolt on rear axle carrier and remove. See **Fig. 22** .
5. Take off control arm.
6. To install, reverse removal procedure. Welded seam of control arm must face upward. See **Fig. 23** . Insert threaded plate (1) into opening in rear axle carrier. See **Fig. 22** .
7. Insert eccentric bolt on trailing arm in direction (F) of travel. Fit eccentric washer (2). See **Fig. 7** .
8. Tighten all fasteners to specification. See **TORQUE SPECIFICATIONS** .
9. Install opening in plastic panel upwards.
10. Perform chassis alignment check. See **SPECIFICATIONS & PROCEDURES** in WHEEL ALIGNMENT article.



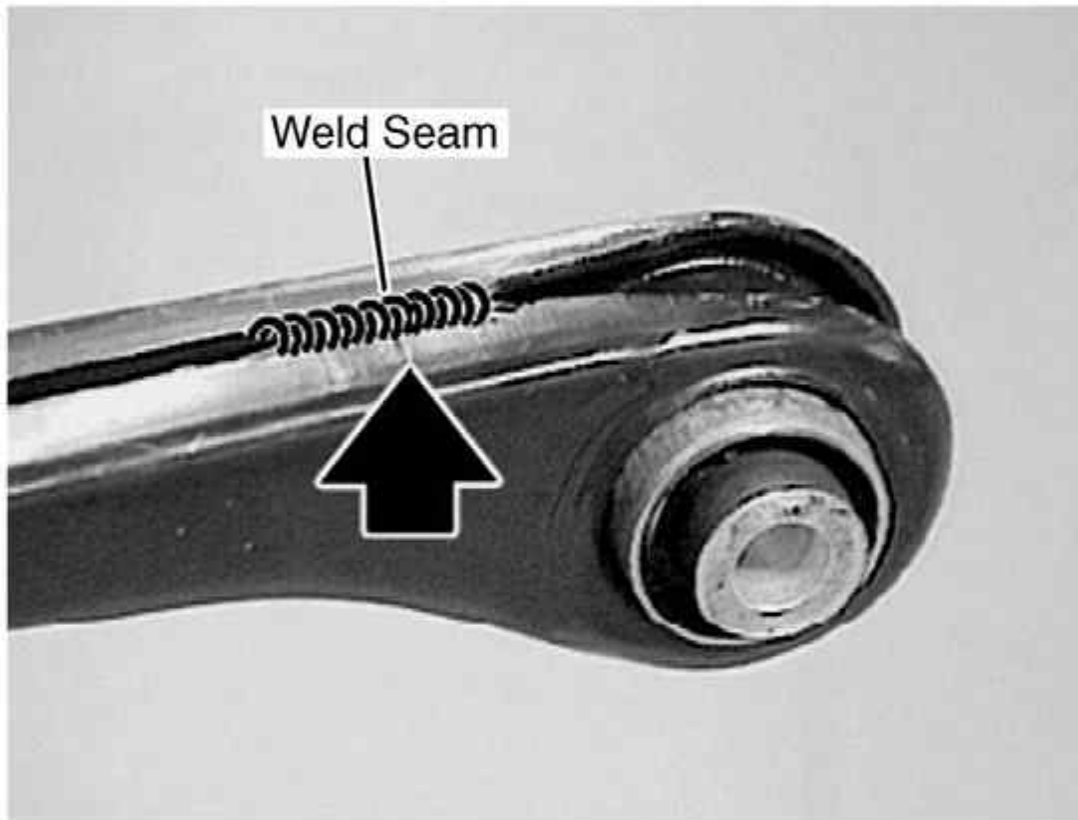
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Fig. 21: Supporting Trailing Arm
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 22: Removing Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.



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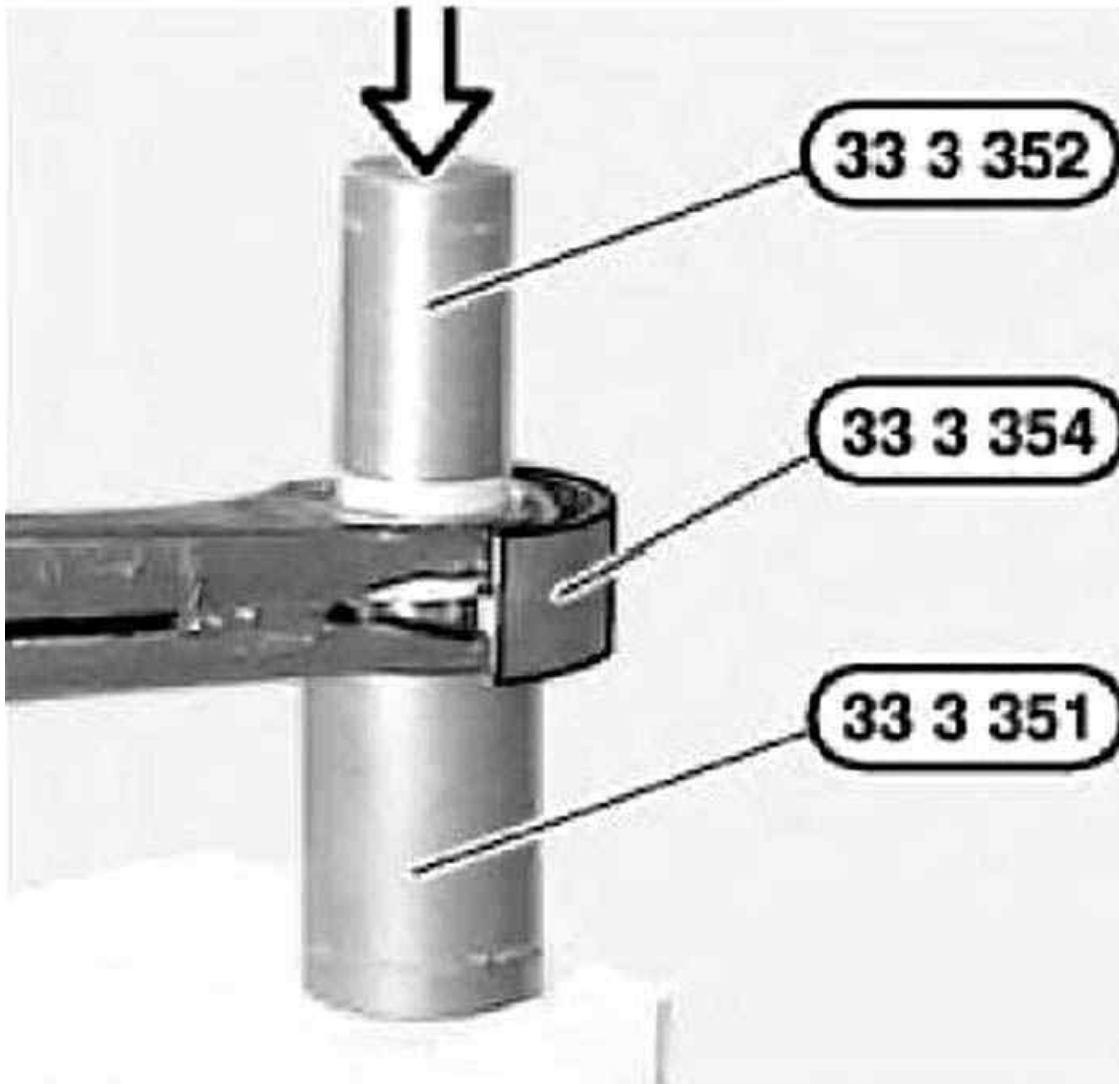
Fig. 23: Identifying Welded Seam On Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

LOWER CONTROL ARM RUBBER MOUNT

NOTE: Numbers in text refer to numbers in figures.

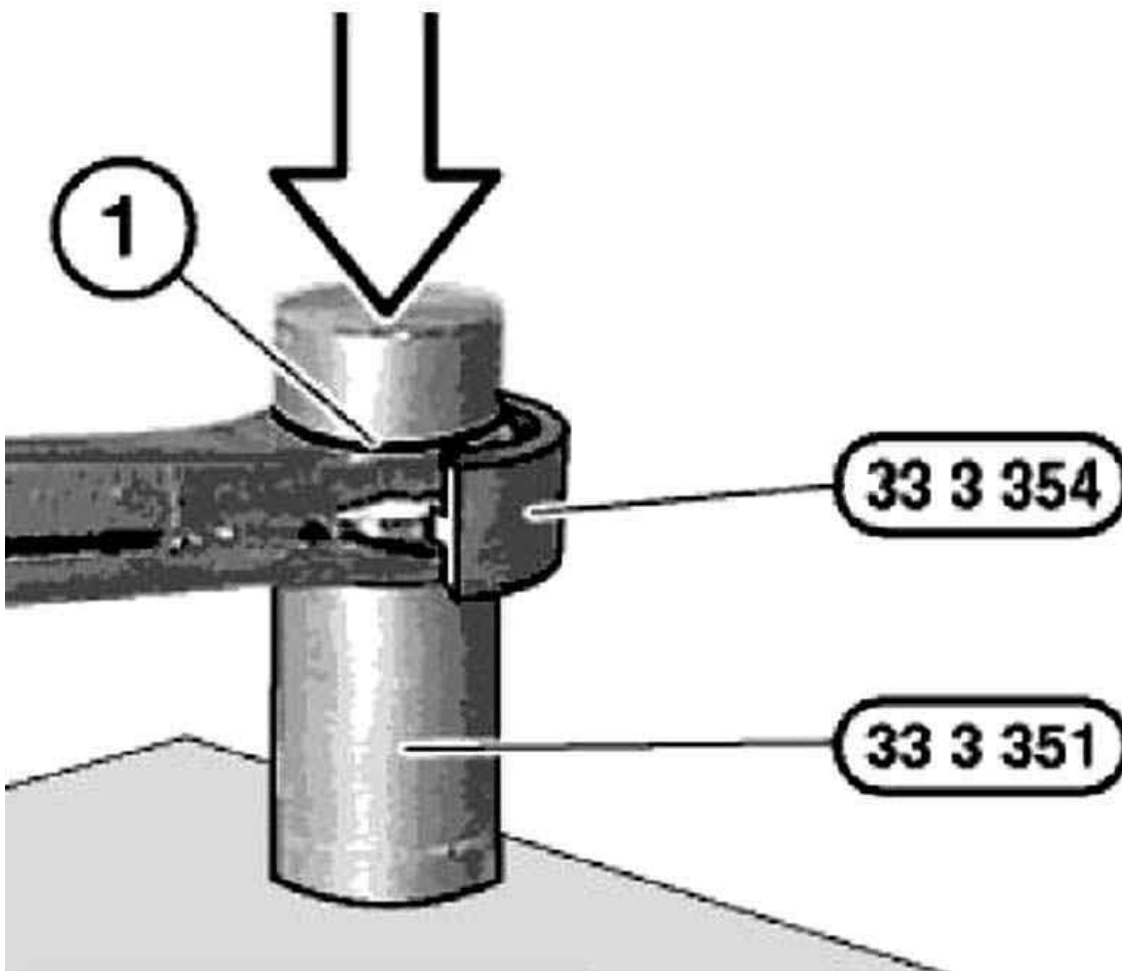
Removal & Installation

1. Remove lower control arm. See **LOWER CONTROL ARM** .
2. Attach Special Tool (33 3 354) between both control arms.
3. Press out rubber mount with Special Tool (33 3 351/352). See **Fig. 24** .
4. Press in new rubber mount (1) with Special Tool (33 3 351/353/354). See **Fig. 25** .
5. Install lower control arm. See **LOWER CONTROL ARM** .



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Fig. 24: Pressing Out Rubber Mount On Lower Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 25: Pressing In Rubber Mount For Lower Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

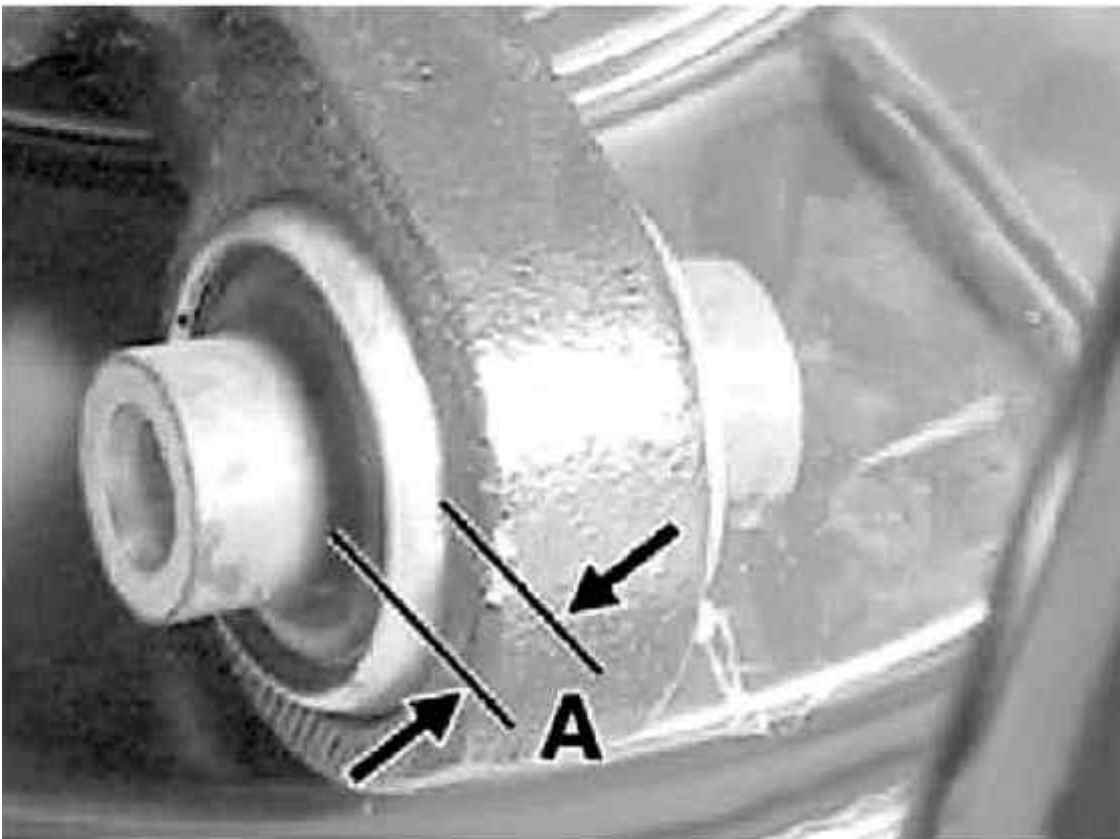
LOWER CONTROL ARM RUBBER MOUNT TO TRAILING ARM

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

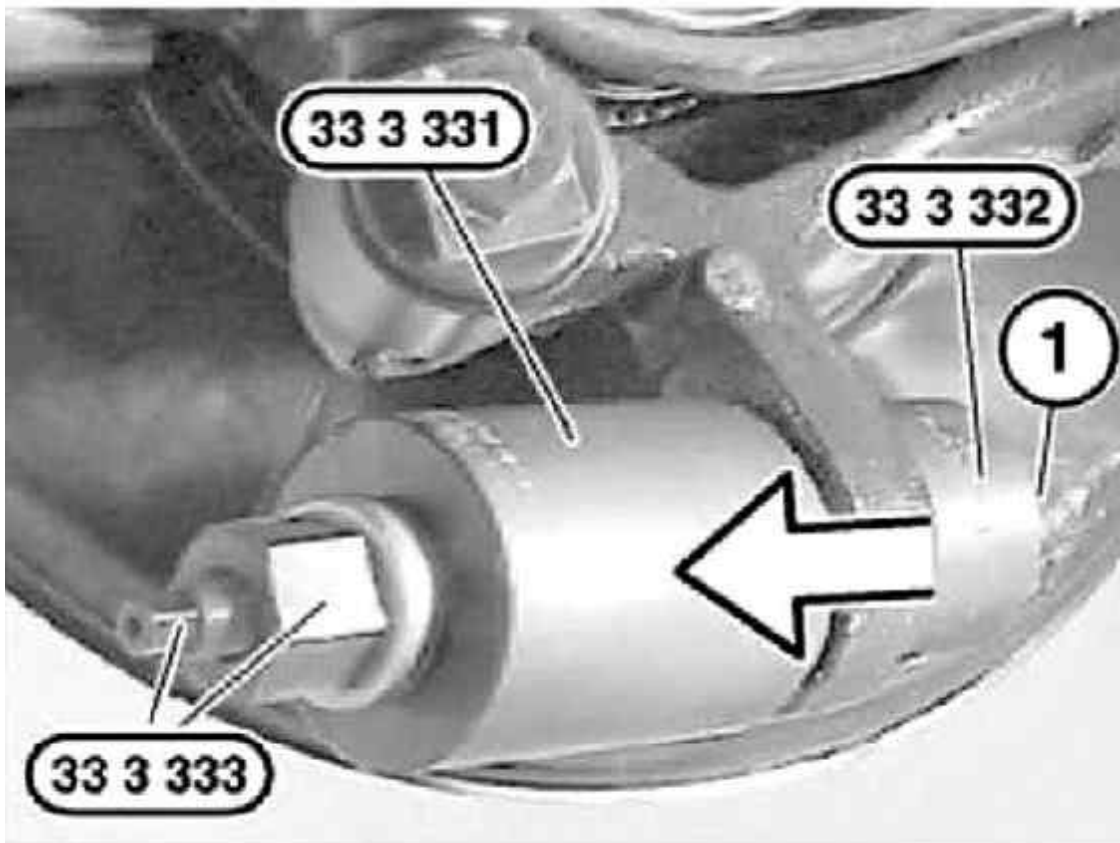
1. Remove wheel.
2. Support trailing arm from underneath using a workshop jack. Mark position of eccentric bolt (1) to control arm with center punch marks (2). This simplifies subsequent camber adjustment. See **Fig. 6** .
3. Release nut (1) on trailing arm and remove eccentric bolt. See **Fig. 8** .
4. Measure and note protrusion (A) of old rubber mount. See **Fig. 26** .
5. Pull out rubber mount with Special Tool (33 3 331/332/333). Use commercially available 12 mm nut (1). See **Fig. 27** .

6. Pull in new rubber mount (1) as far as the previously measured protrusion (A) using Special Tool (33 3 332/333/334). See **Fig. 28** .
7. Fit eccentric washer (2). Observe bolt insertion direction opposing direction of travel (F). See **Fig. 7** . Tighten eccentric bolt nut to specification. See **TORQUE SPECIFICATIONS** .
8. Perform wheel alignment check. See **WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES** under ADJUSTMENTS.



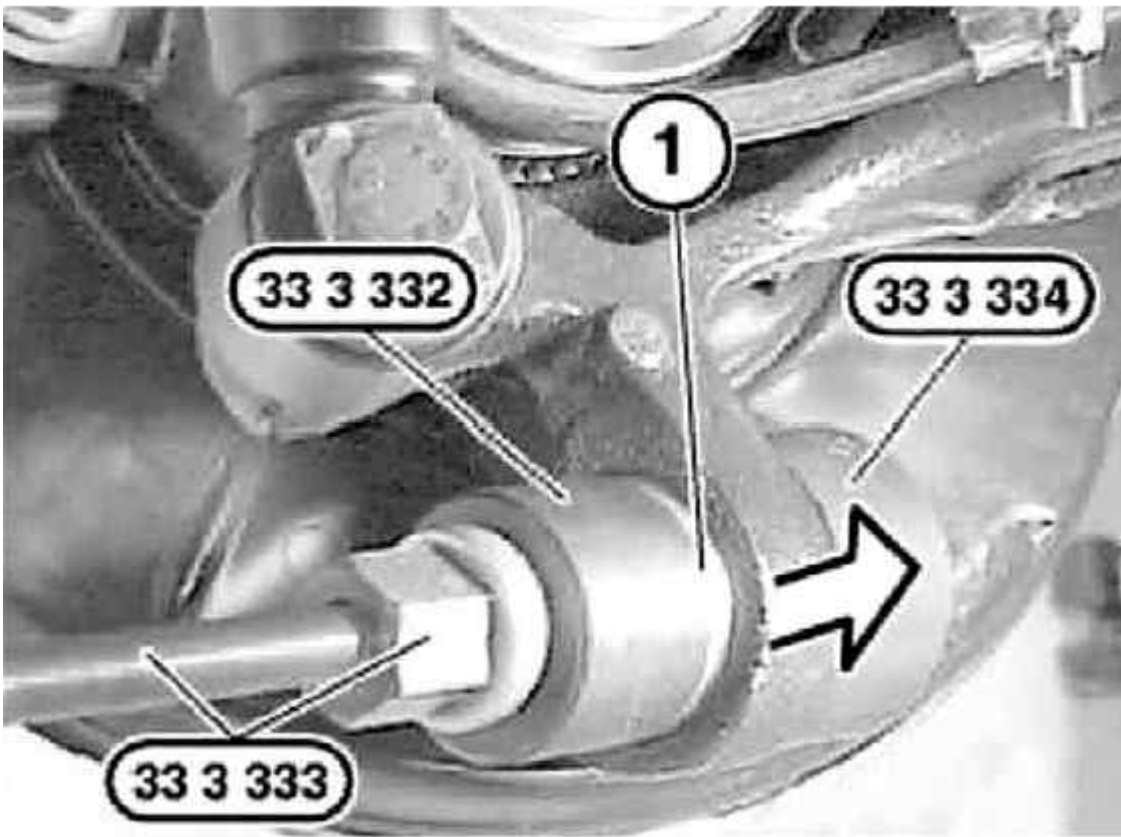
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Fig. 26: Measuring Protrusion Of Old Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 27: Pulling Out Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.



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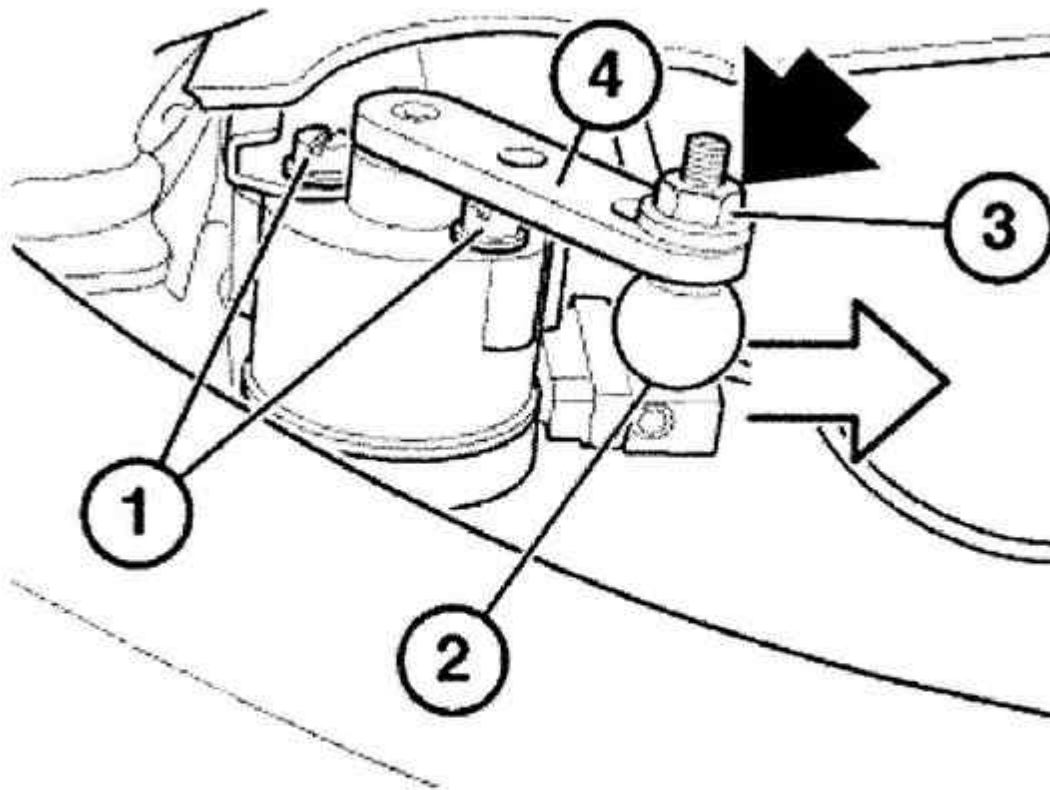
Fig. 28: Pulling In New Rubber Mount
Courtesy of BMW OF NORTH AMERICA, INC.

REAR RIDE HEIGHT SENSOR

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

Disconnect ride height harness electrical connector (2). Remove nut (3) and disconnect control rod. Remove screws (1) and remove ride height sensor. See **Fig. 29** . To install, reverse removal procedure. Ensure lever (4) points outward.



1. Screws
2. Plug
3. Nut
4. Lever

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Fig. 29: Removing Rear Ride Height Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

SHOCK ABSORBER

NOTE: Numbers in text refer to numbers in figures.

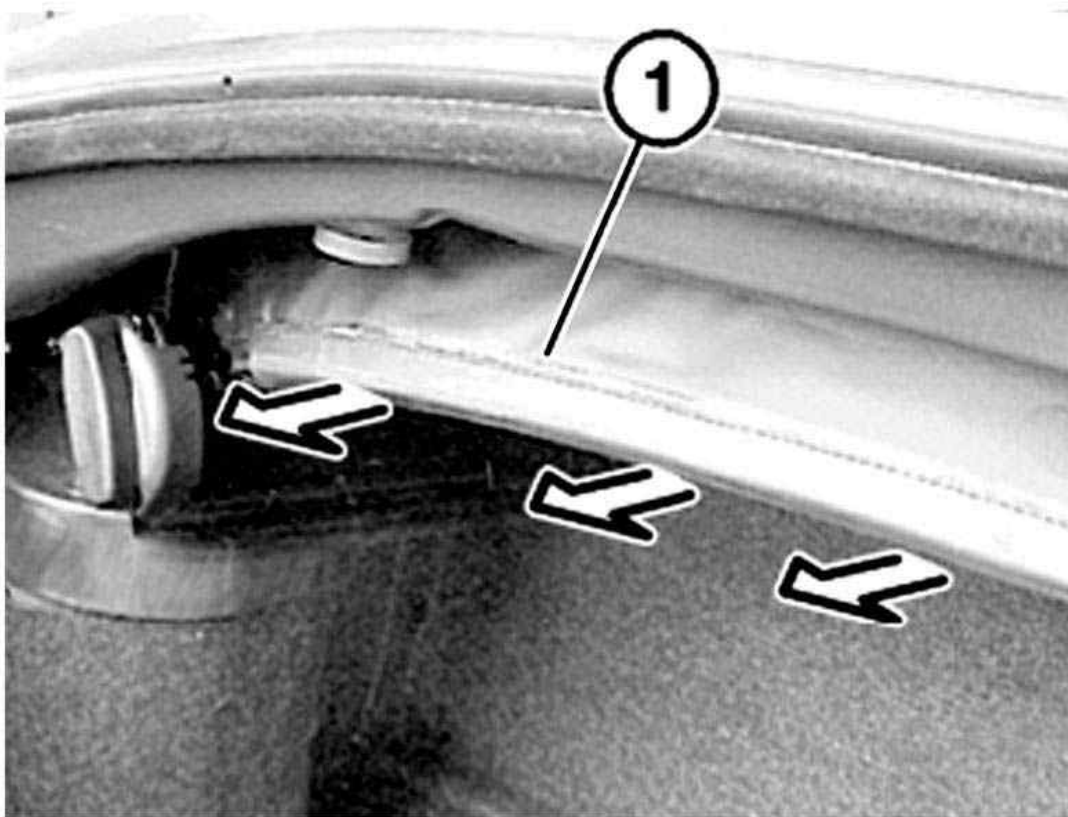
CAUTION: The shock absorber has the function of an arrester band. To prevent damage to the axle shaft, do not remove the support or raise the vehicle.

Removal & Installation

1. Close convertible top. Open rear lid. Move convertible top compartment floor downwards. Feed cover (1)

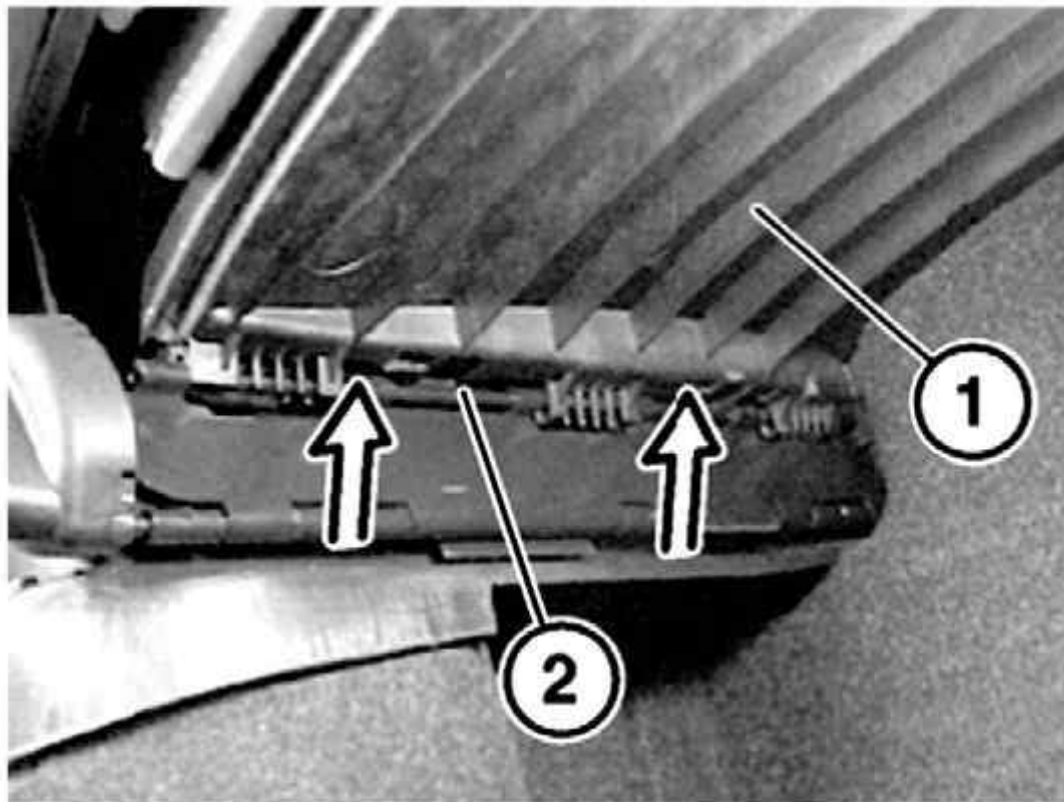
out of convertible top compartment floor toward rear. See **Fig. 30** . Unclip convertible top compartment floor (1) upward mounting (2). See **Fig. 31** . Feed convertible top compartment floor (1) out of center mount (2) toward rear. See **Fig. 32** .

2. Remove screws (1, 2) and remove expansion rivet (3). See **Fig. 33** . Feed mounting out toward top rear over spring strut cap. See **Fig. 34** .
3. Support trailing arm on workshop lifter (1) and remove bolt. Remove upper shock nuts. See **Fig. 14** .
4. To install, reverse removal procedure. Ensure thrust washer (2) on rubber mount points to screw head. See **Fig. 14** . Replace self-locking nuts and tighten all fasteners to specification. See **Fig. 35** and **Fig. 36** . See **TORQUE SPECIFICATIONS** . For convertible top, move mounting (2) downward. Position convertible top compartment floor (1). Move mounting (2) upward. Clip in convertible top compartment floor (1). Feed in mounting under funnel.



1. Cover

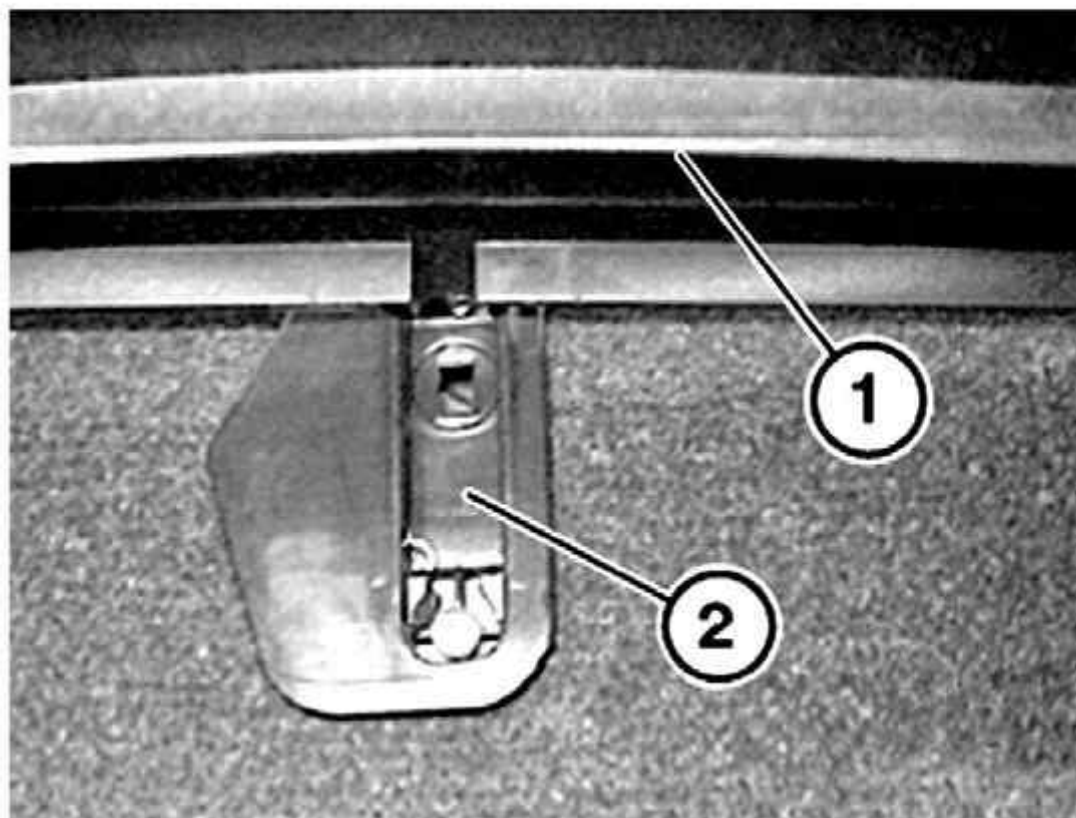
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1. Convertible Top Compartment Floor
2. Mounting

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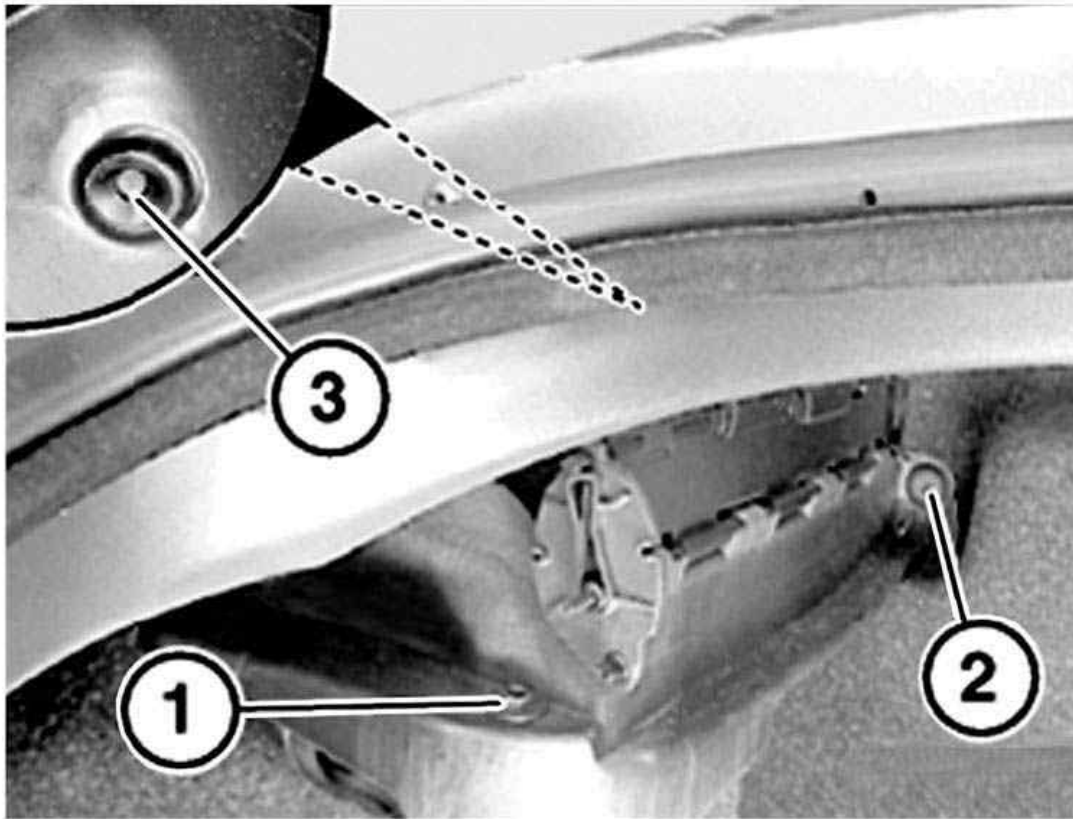
Fig. 31: Unclipping Convertible Top Compartment Floor Upward Mounting
Courtesy of BMW OF NORTH AMERICA, INC.



1. Convertible Top Compartment Floor
2. Center Mount

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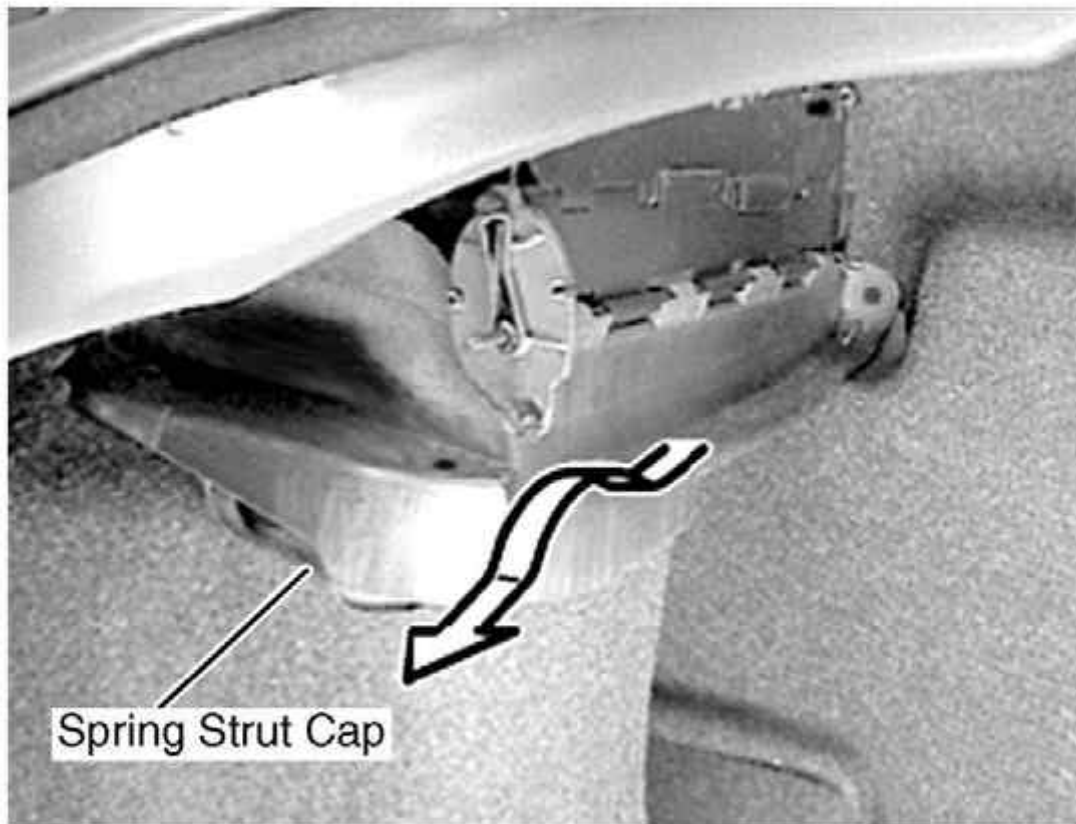
Fig. 32: Feeding Convertible Top Compartment Floor Out Of Center Mount
Courtesy of BMW OF NORTH AMERICA, INC.



- 1. Bolt
- 2. Bolt
- 3. Expansion Rivet

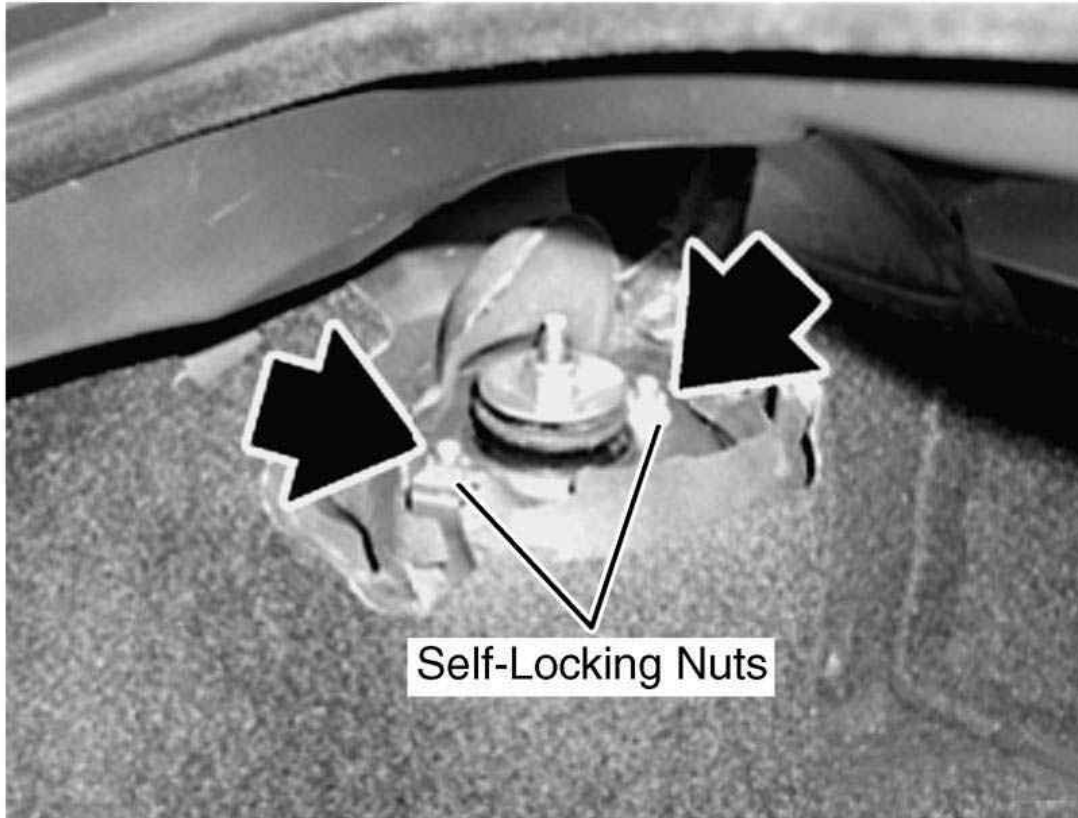
G00316667

Fig. 33: Removing Screws & Expansion Rivet
Courtesy of BMW OF NORTH AMERICA, INC.



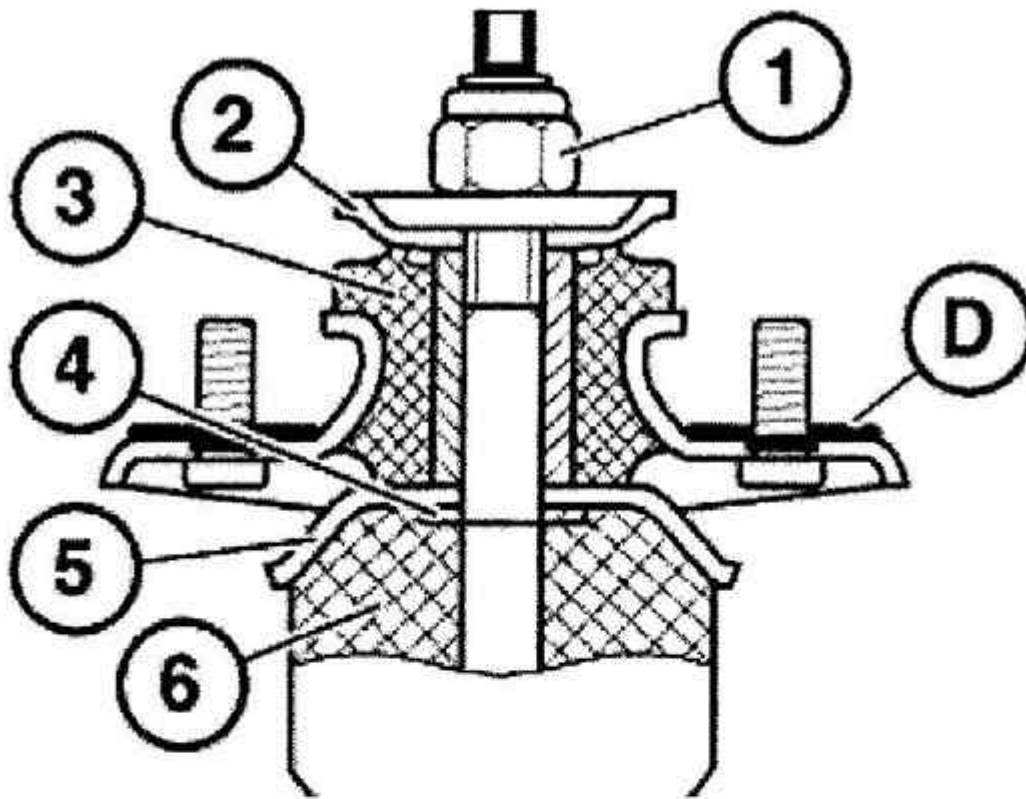
G00316668

Fig. 34: Feeding Out Mounting Toward Rear Top Over Spring Strut Cap
Courtesy of BMW OF NORTH AMERICA, INC.



G00316669

Fig. 35: Identifying Self-Locking Nuts
Courtesy of BMW OF NORTH AMERICA, INC.



1 = Nut

2 = Joint seat

3 = Support bearing

4 = Supporting ring

5 = Support element

6 = Auxiliary spring

D = Seal

Fig. 36: Identifying Shock Installation

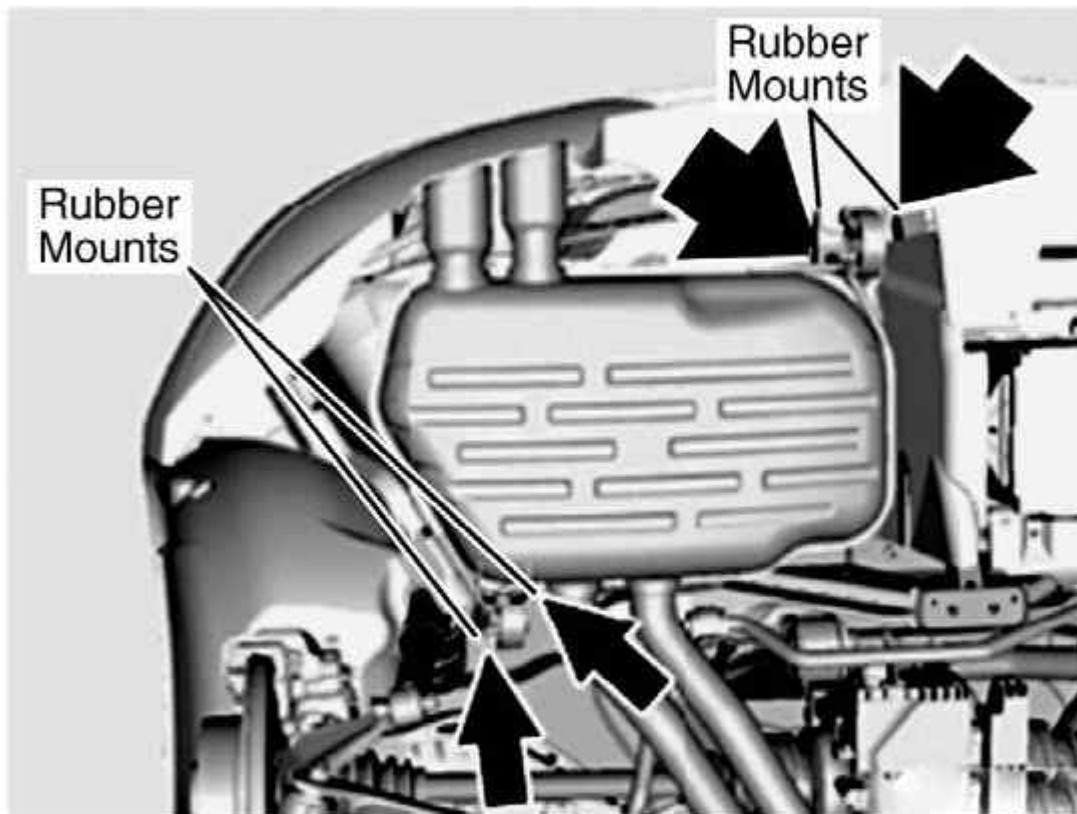
Courtesy of BMW OF NORTH AMERICA, INC.

STABILIZER BAR

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

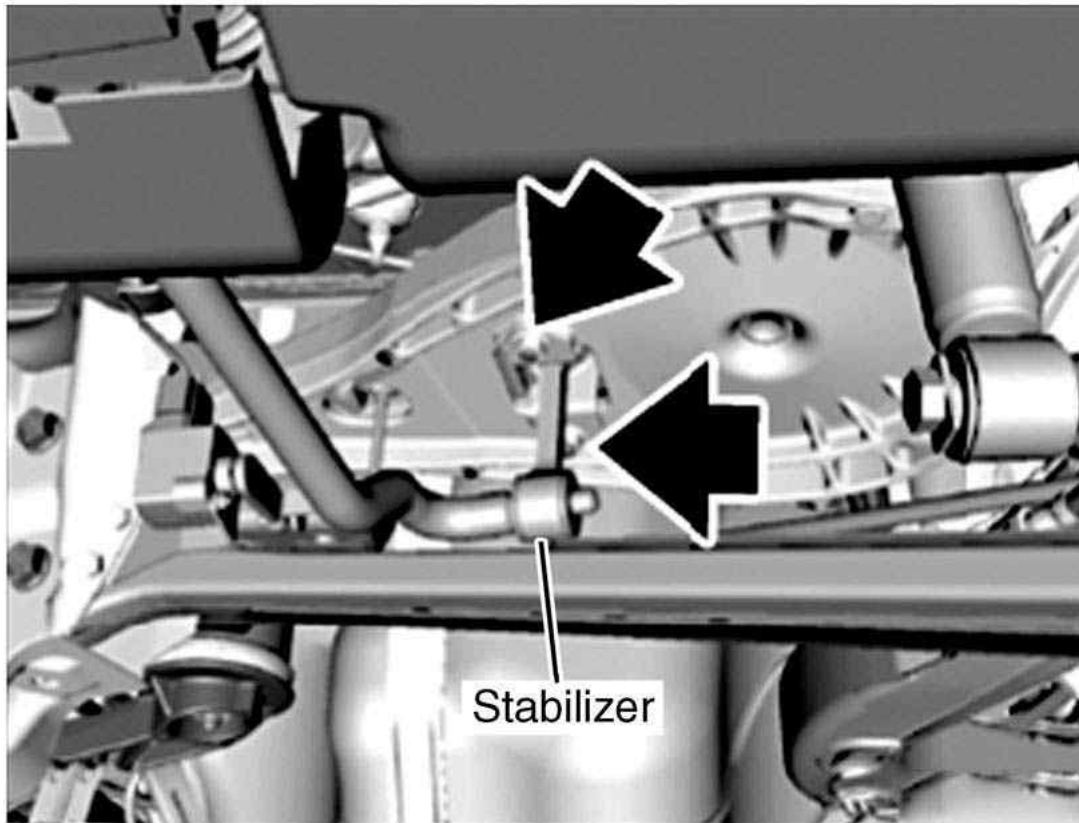
1. Remove heat shield at rear. Remove left and right tension struts. See **TENSION STRUT FOR REAR AXLE** . Open both rear rubber mounts of exhaust system. See **Fig. 37** . Remove stabilizer on left and right from control arm. Remove stabilizer from rear axle carrier and feed out to right. See **Fig. 38** .
2. To install, reverse removal procedure. Ensure stabilizer bar and rubber mounts are free of grease. See **Fig. 39** . Coat retaining bracket with Circolight. Tighten all fasteners to specification. See **TORQUE SPECIFICATIONS** .



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Fig. 37: Identifying Exhaust System Rubber Mount Locations

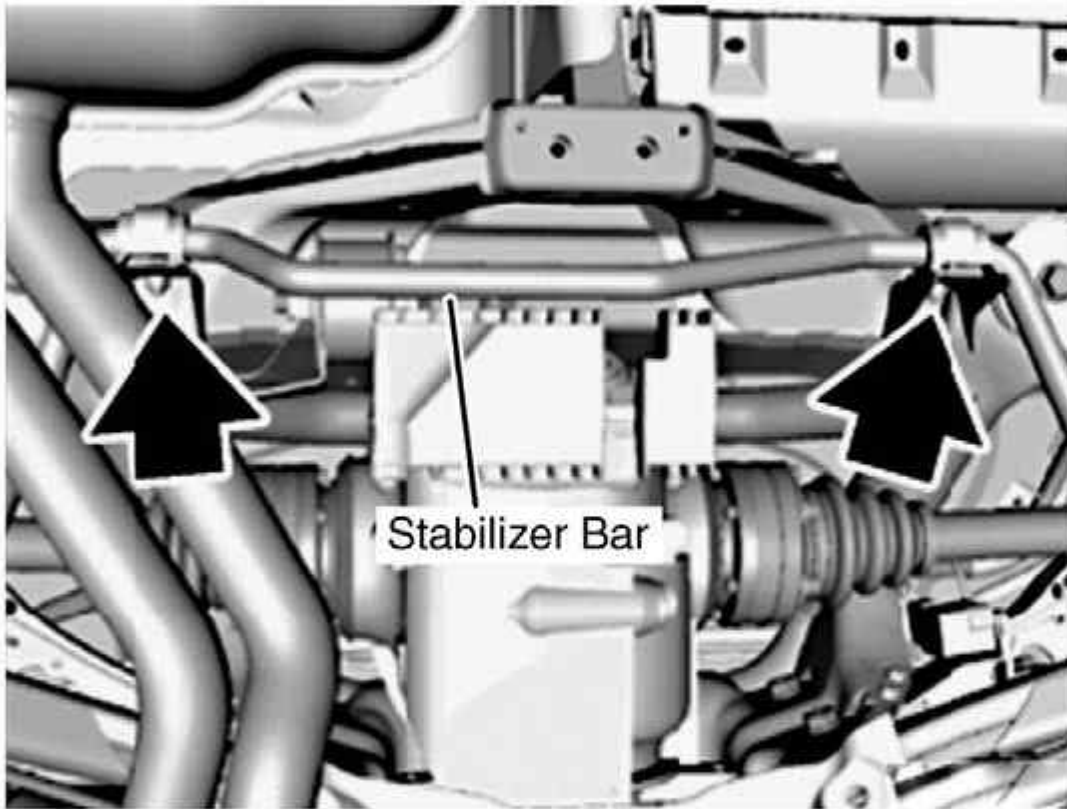
Courtesy of BMW OF NORTH AMERICA, INC.



G00316672

Fig. 38: Removing Stabilizer

Courtesy of BMW OF NORTH AMERICA, INC.



G00316673

Fig. 39: Identifying Stabilizer Bar Rubber Mount Locations
Courtesy of BMW OF NORTH AMERICA, INC.

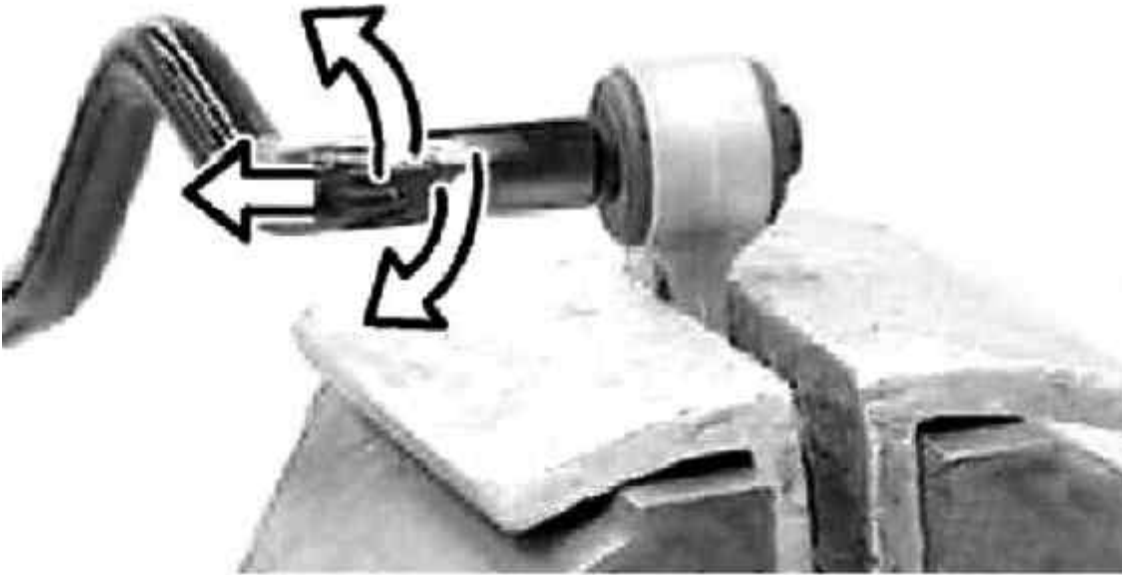
STABILIZER BAR LINK

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

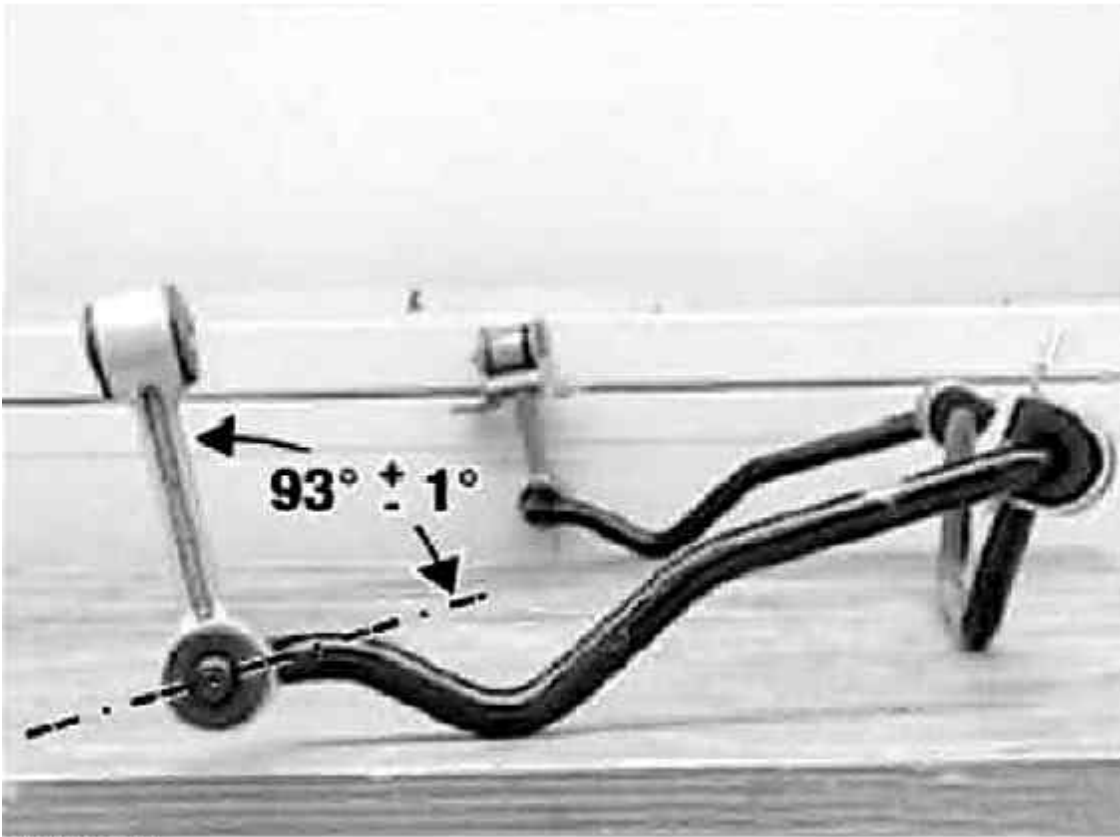
1. Remove stabilizer bar with links. See **STABILIZER BAR** .
2. Clamp stabilizer bar link in a soft jaw vise. Rotate stabilizer bar and pull out of link. See **Fig. 40** .
3. If rubber mount remains on stabilizer bar, cut through rubber with a knife and remove.
4. Clamp NEW stabilizer link in soft jaw vise. Coat end of stabilizer bar and inside rubber mount with Circolight mounting agent. Press stabilizer bar as far as possible into stabilizer link with rotary motions.
5. Immediately rotate stabilizer link into position. Once mounting agent (Circolight) has evaporated, stabilizer link can no longer be rotated. See **Fig. 41** .

6. To complete installation, reverse removal procedure.



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Fig. 40: Removing Stabilizer Bar From Link
Courtesy of BMW OF NORTH AMERICA, INC.



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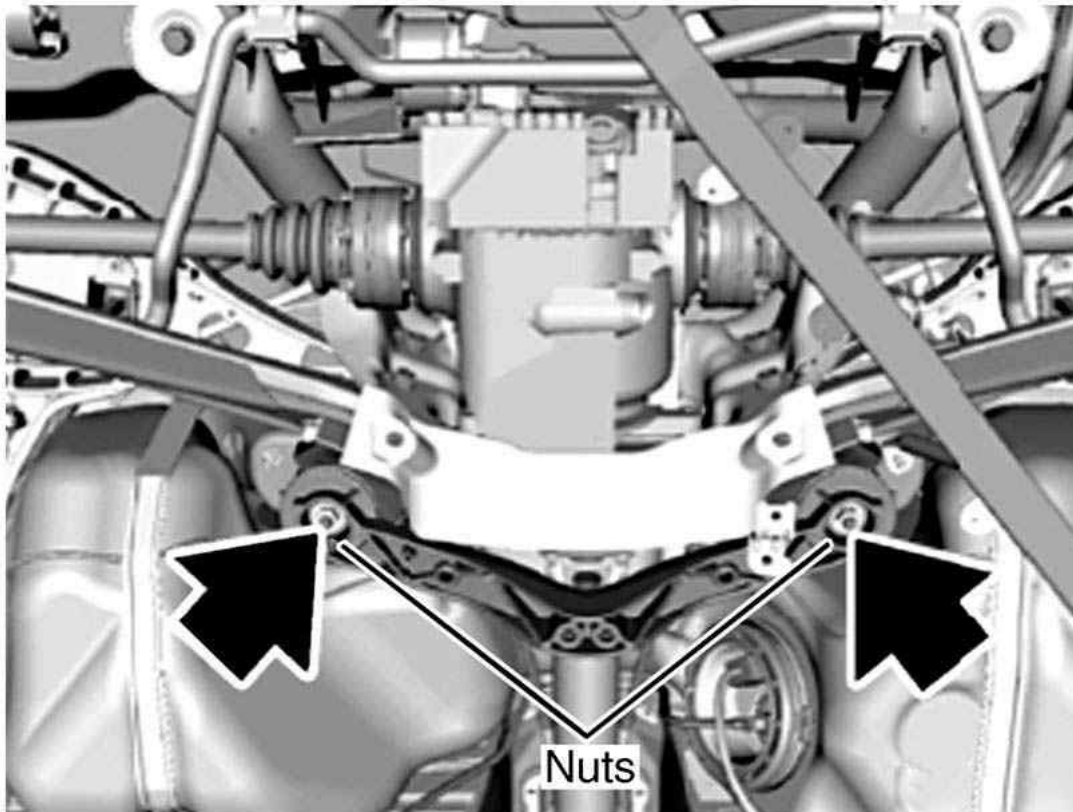
Fig. 41: Locating Stabilizer Link Position
Courtesy of BMW OF NORTH AMERICA, INC.

TENSION STRUT FOR REAR AXLE CARRIER

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

Remove left tension strut. See **TENSION STRUT FOR REAR AXLE** . Remove exhaust system. See **EXHAUST SYSTEM** under REMOVAL & INSTALLATION in AXLE SHAFTS article in DRIVELINE/AXLES. Remove tunnel thermal insulation. Remove nuts and compression/tension strut for rear axle carrier. See **Fig. 42** . To install, reverse removal procedure.



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Fig. 42: Removing Tension Strut For Rear Axle Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

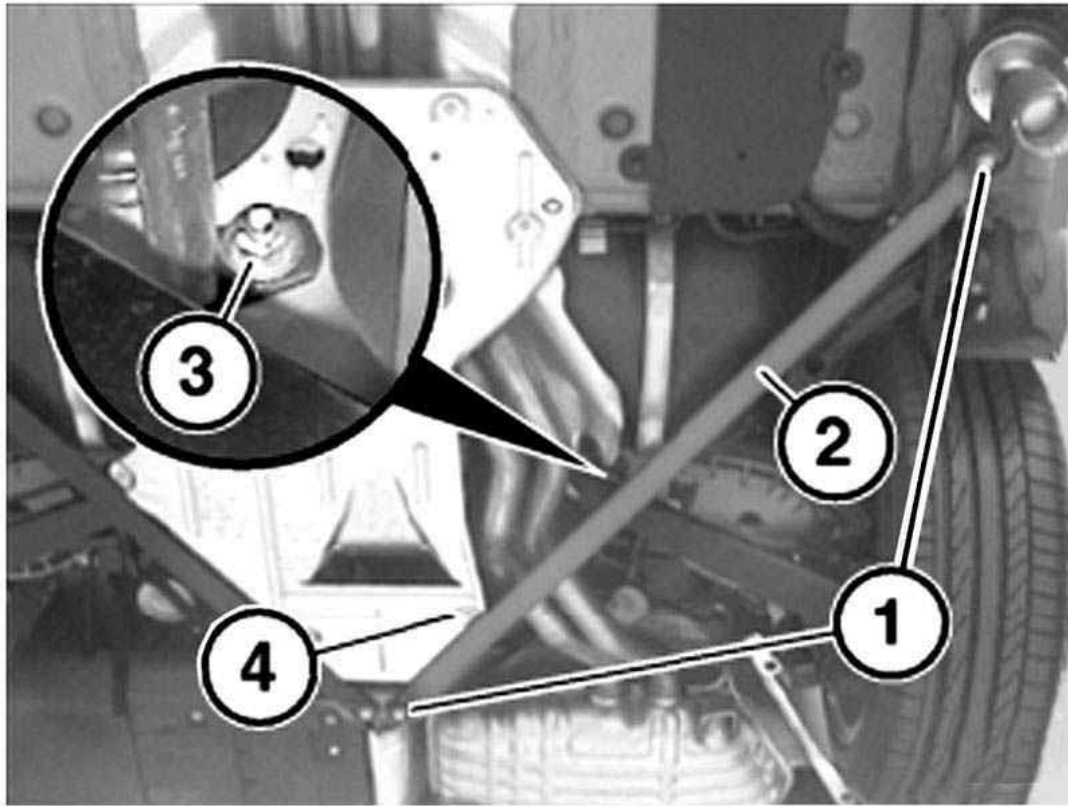
TENSION STRUT FOR REAR AXLE

NOTE: Numbers in text refer to numbers in figures.

CAUTION: Vehicles must not be driven without tension struts. Driving without tension struts may damage the vehicle body. Tension strut bolts must be tightened to torque and then tightened down with Special Tool (00 9 120).

Removal & Installation

Remove bolts (4). Remove bolts (1) and nut (3) and remove tension strut. See **Fig. 43** . To install, reverse removal procedure. Replace bolt (1) and nut (3). Tighten bolts (1) to specification, then to rotation. Tighten nut (3) to specification. See **TORQUE SPECIFICATIONS** . Tighten screws (4).



- | | |
|----------|---------|
| 1. Bolts | 3. Nut |
| 2. Strut | 4. Bolt |

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Fig. 43: Removing & Installing Left Or Right Tension Strut On Rear Axle
Courtesy of BMW OF NORTH AMERICA, INC.

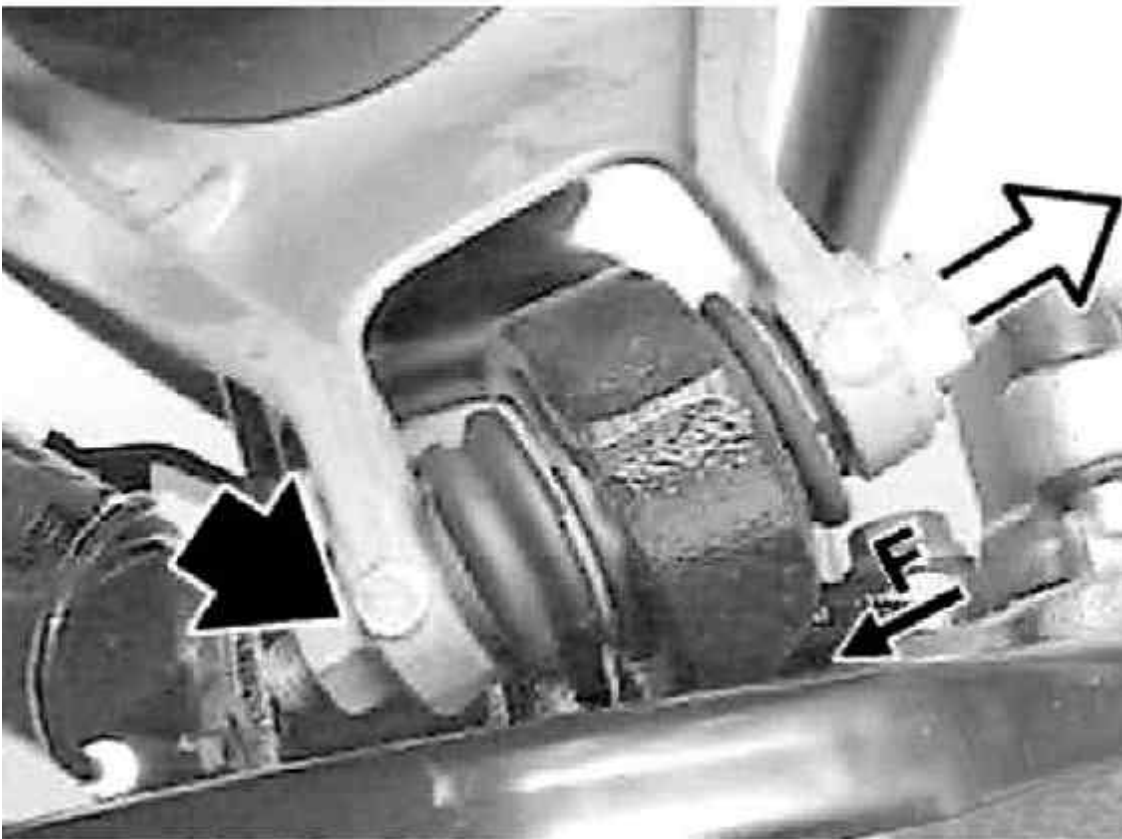
TRAILING ARM

NOTE: Numbers in text refer to numbers in figures.

Removal

1. Remove coil spring. See **COIL SPRING**.
2. Press axle shaft out of drive flange. See **AXLE SHAFTS** under REMOVAL & INSTALLATION in AXLE SHAFTS article in DRIVELINE/AXLES.
3. Disconnect handbrake cable from the wheel brake. See **PARKING BRAKE SHOES** under REMOVAL & INSTALLATION in DISC article in BRAKES.

4. Disconnect ABS pulse sensor connector. If necessary, disconnect brake lining wear indicator sensor connector. Disconnect brake lines from trailing arm. Remove brake caliper and tie back. See **CALIPER ASSEMBLY** under REMOVAL & INSTALLATION in DISC article in BRAKES.
5. Mark position of eccentric bolt (1) to control arm with center punch marks (2). This simplifies subsequent camber adjustment. See **Fig. 6** .
6. Release nut (1) on trailing arm on left and right and remove eccentric bolt. See **Fig. 7** .
7. Unfasten nut and remove bolt. See **Fig. 44** .
8. Mark position of bearing pedestal (1) to body (2) with colored mark (3) on left and right. This simplifies subsequent toe-in adjustment. Unfasten screws. See **Fig. 8** .



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Fig. 44: Removing Control Arm Bolt

Courtesy of BMW OF NORTH AMERICA, INC.

Installation

1. To install, reverse removal procedure. Damaged threads in bushings on body side can be repaired with Helicoil thread inserts. These inserts must be fitted flush with the original thread. Replace self-locking fasteners and tighten to specification. See **TORQUE SPECIFICATIONS** .
2. When installing control arm to trailing arm bolt, note direction of travel (F). See **Fig. 44** .
3. When installing eccentric bolt on trailing arm, note insertion direction of bolt. F is direction of travel. See

Fig. 7 . Tighten bolt to specification. See **TORQUE SPECIFICATIONS** .

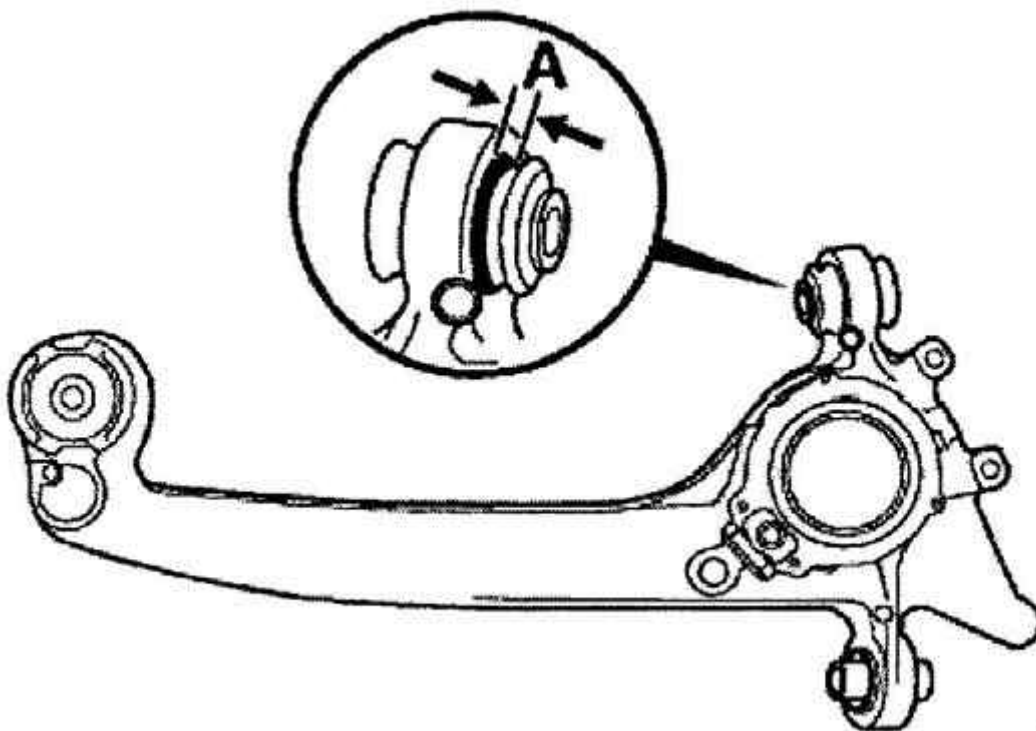
4. Perform wheel alignment check. See **WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES** under ADJUSTMENTS.

TRAILING ARM BALL JOINT

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

1. Remove trailing arm. See **TRAILING ARM** .
2. Measure and note protrusion (A) of old ball joint. See **Fig. 45** .
3. Pull out ball joint with Special Tool (33 3 331/332/333). See **Fig. 46** .
4. Pull in new ball joint (1) as far as the previously measured protrusion (A) using Special Tool (33 3 332/333/334). See **Fig. 47** .
5. Install trailing arm. See **TRAILING ARM** .



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Fig. 45: Measuring Protrusion On Ball Joint
Courtesy of BMW OF NORTH AMERICA, INC.

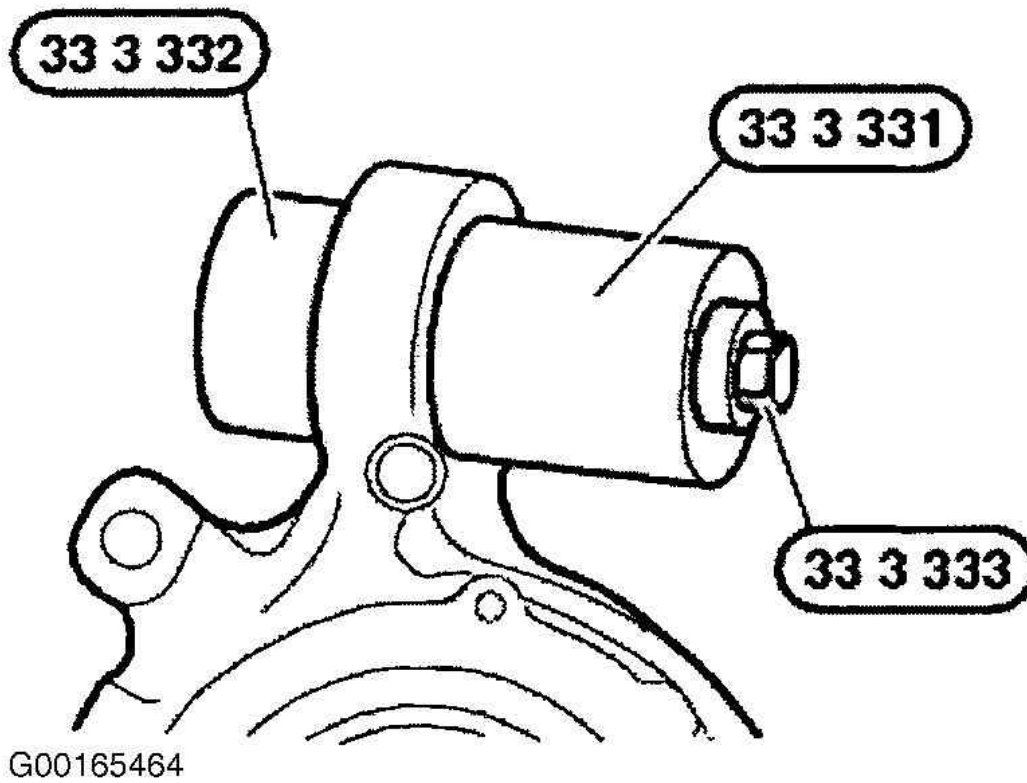


Fig. 46: Pulling Out Ball Joint
Courtesy of BMW OF NORTH AMERICA, INC.

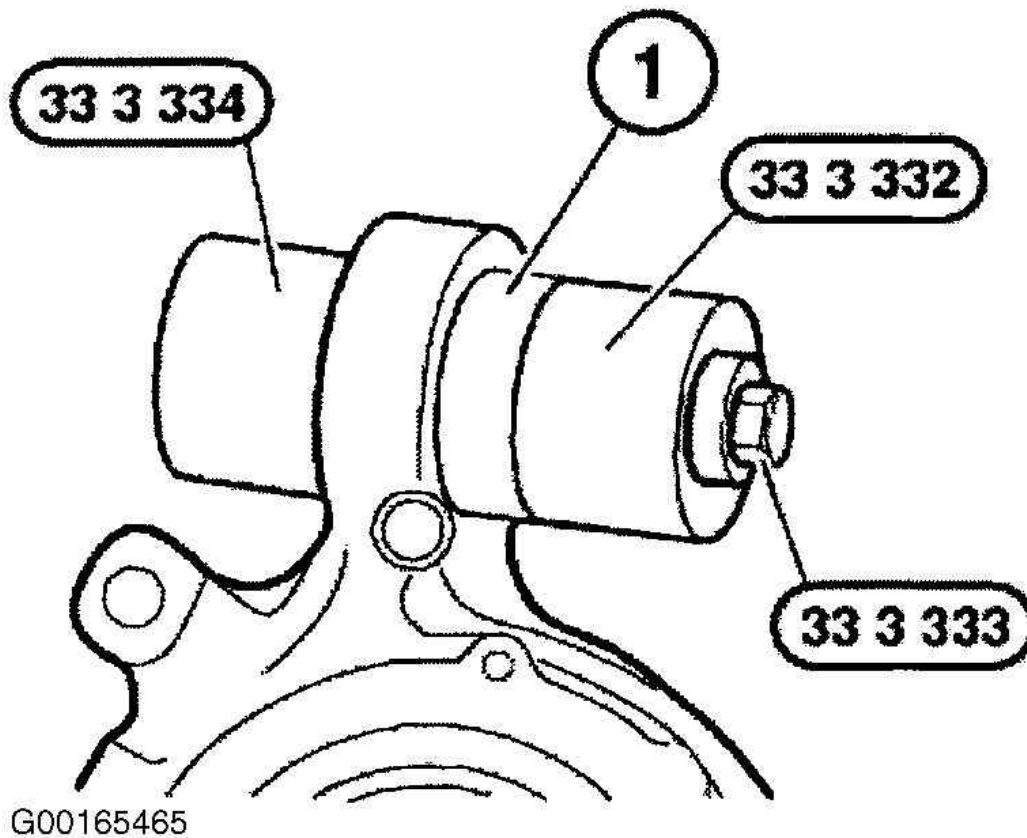


Fig. 47: Pulling In Ball Joint

Courtesy of BMW OF NORTH AMERICA, INC.

TRAILING ARM FRONT RUBBER MOUNT

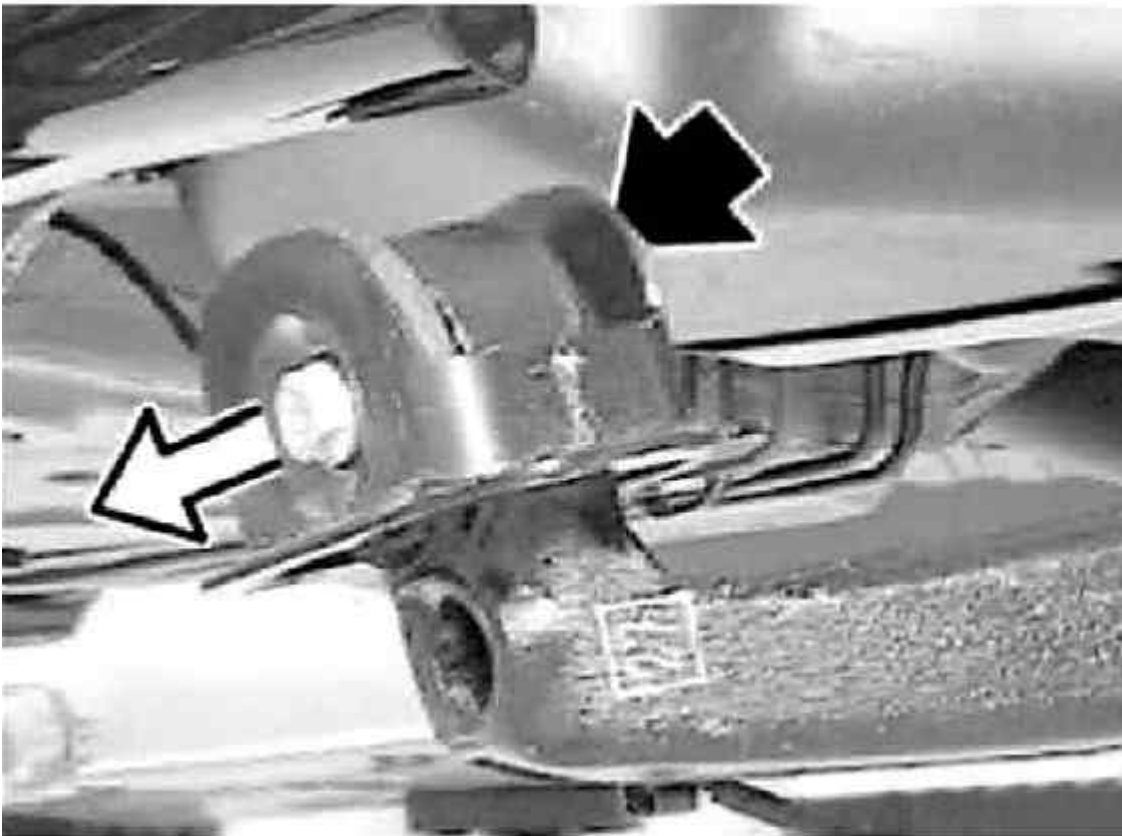
NOTE: Numbers in text refer to numbers in figures.

Removal

CAUTION: The brake hose must not be exposed to traction loads.

1. Remove wheel. Disconnect ABS harness connector. If necessary, disconnect wear indicator connector.
2. Detach bracket for brake hose on trailing arm. Unclip cable on trailing arm. See **Fig. 5**.
3. Mark position of bearing pedestal (1) to body (2) with colored mark (3) on left and right. This simplifies subsequent toe-in adjustment. Unfasten bolts. See **Fig. 8**.

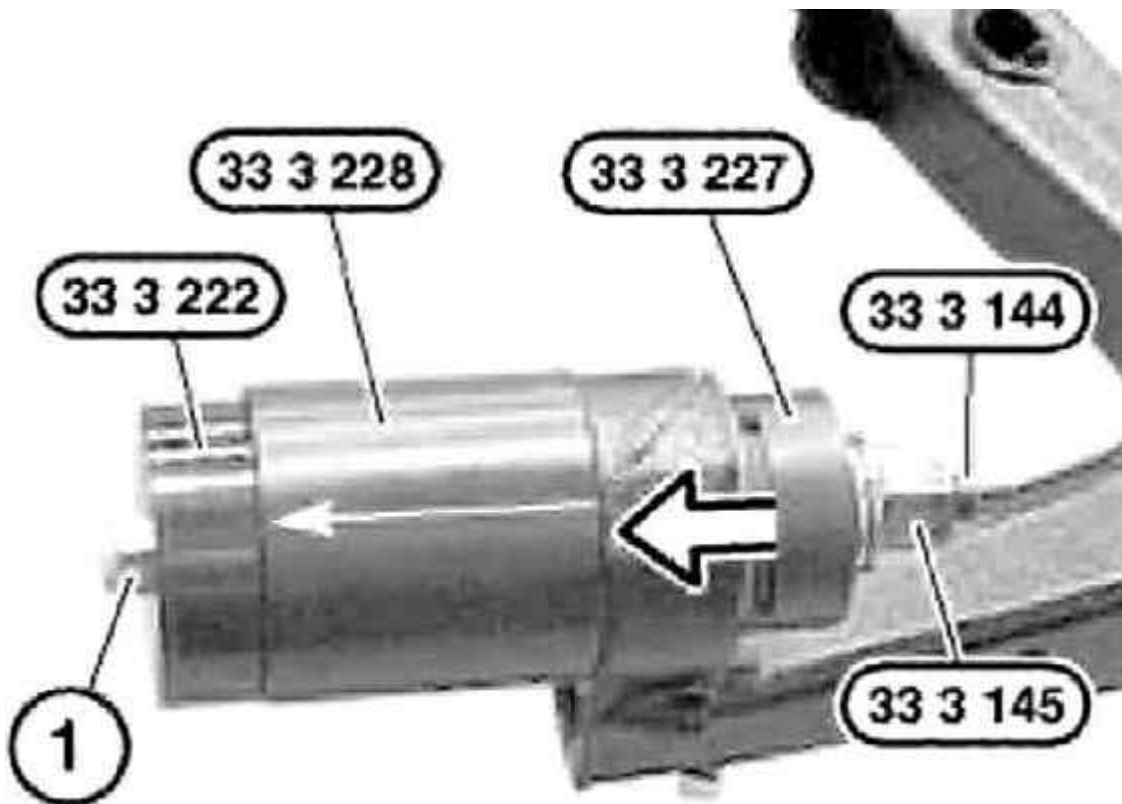
4. Support trailing arm from underneath using a workshop lifter. Release bolts, lower lifter and pull trailing arm downwards.
5. Release nut, unscrew bolt and remove bearing pedestal. See **Fig. 48** .
6. Pull out rubber mount with Special Tool (33 3 144/145/222/227/228) and 12 mm nut (1). Position Special Tool (33 3 228) so that arrow on special tool points in withdrawal direction. See **Fig. 49** .
7. Mark trailing arm eye with dot of paint (K). See **Fig. 50** .



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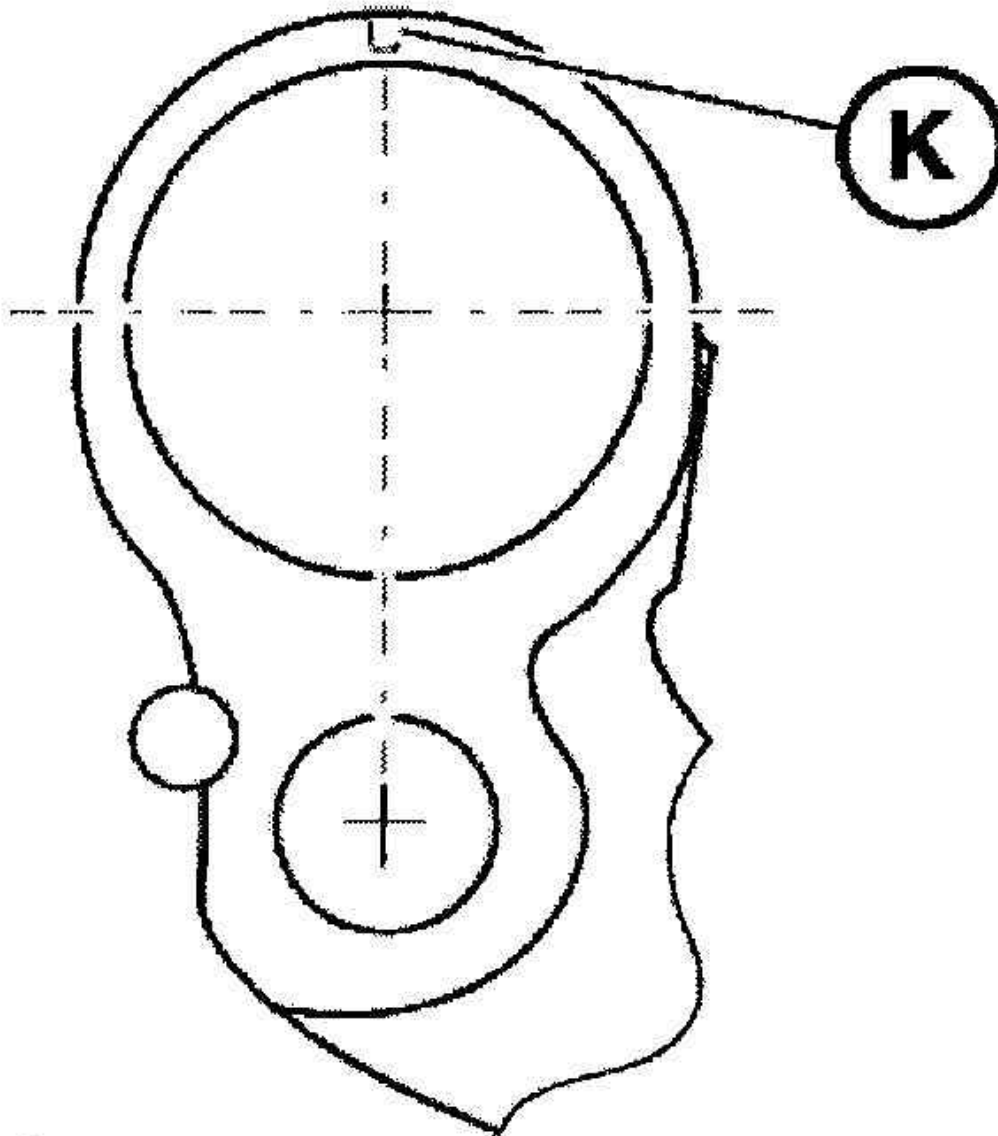
Fig. 48: Removing Bearing Pedestal

Courtesy of BMW OF NORTH AMERICA, INC.



G00165444

Fig. 49: Pulling Out Rubber Mount With Slot
Courtesy of BMW OF NORTH AMERICA, INC.



G00165445

Fig. 50: Marking Trailing Arm Eye
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

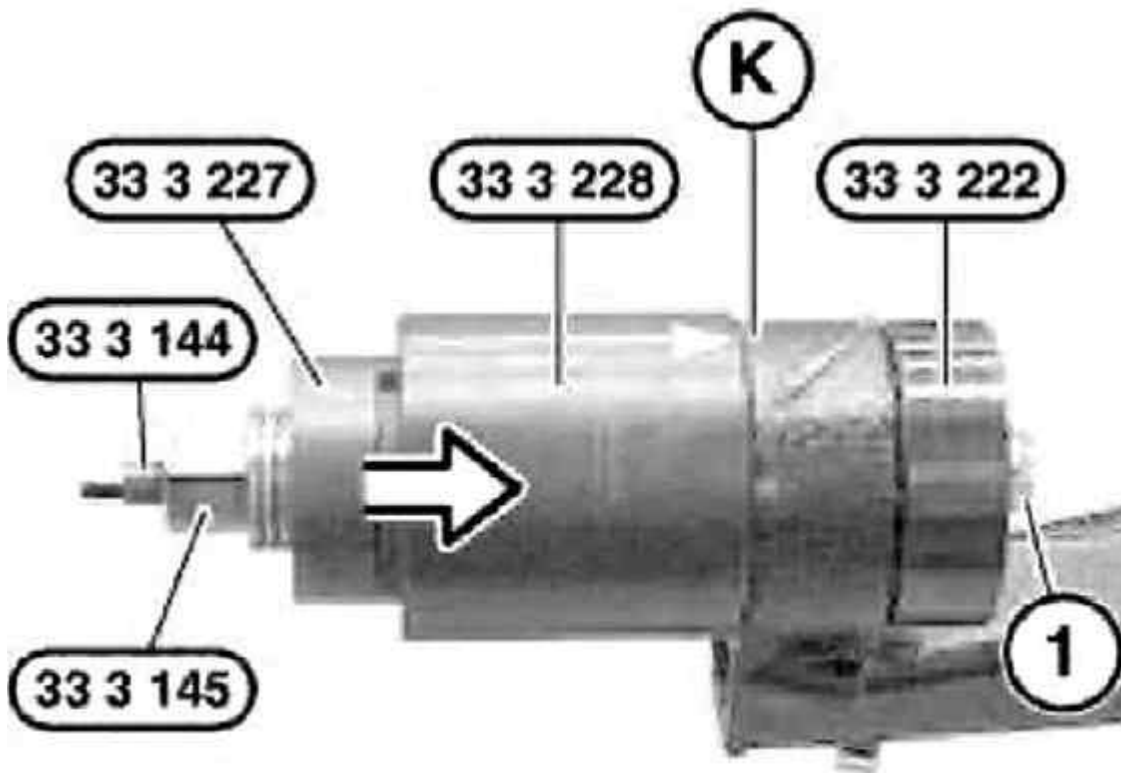
1. Ensure rubber mount and trailing arm eye are free of grease. One slot in the rubber mount must line up with the end of the arrow on special tool. Insert rubber mount in Special Tool (33 3 228). See **Fig. 51**.

2. Arrow on special tool must point to colored spot (K). Draw in rubber mount with Special Tool (33 3 144/145, 33 3 222/227/228 and 12 mm nut (1) until Special Tool (33 3 228) is slack. See **Fig. 52** .
3. Remove special tool. Draw in rubber mount so distance between arrows is 2.5 mm. See **Fig. 53** .
4. Secure Special Tool (33 3 280) to bearing pedestal with a screw and align to wheel center. See **Fig. 54** .
5. To install without special tool, Place a tube (1) (500 mm) long and (16 mm) diameter flat against bearing pedestal. Secure, if necessary, with screw clamp and align center of tube to center of wheel. See **Fig. 55** .
6. Screw bearing pedestal down in this position. Tighten to specification. See **TORQUE SPECIFICATIONS** .
7. To complete installation, reverse removal procedure. Damaged threads on body side can be repaired with Helicoil thread inserts. The inserts must be fitted flush with the original thread. Tighten all bolts to specification. See **TORQUE SPECIFICATIONS** .



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Fig. 51: Inserting Rubber Mount In Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 52: Drawing In Rubber Mount With Slot
Courtesy of BMW OF NORTH AMERICA, INC.

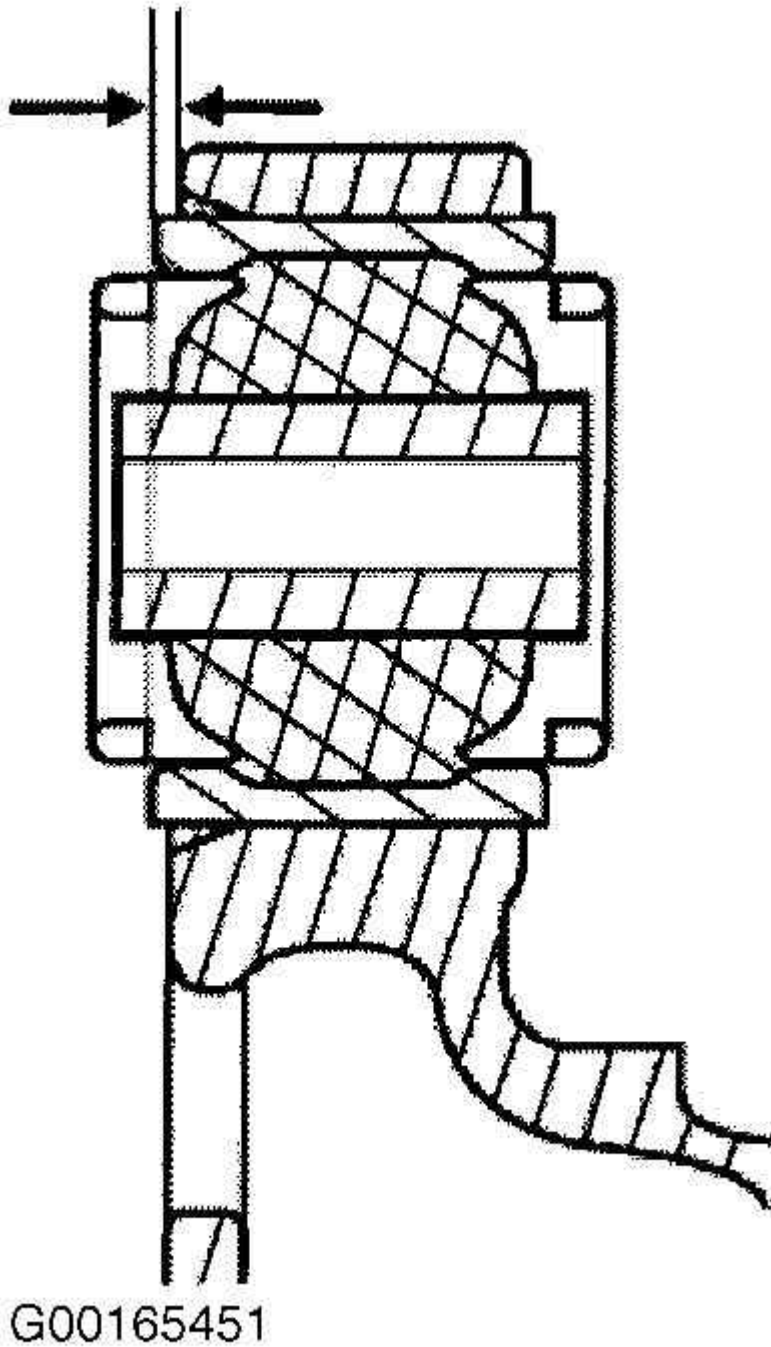
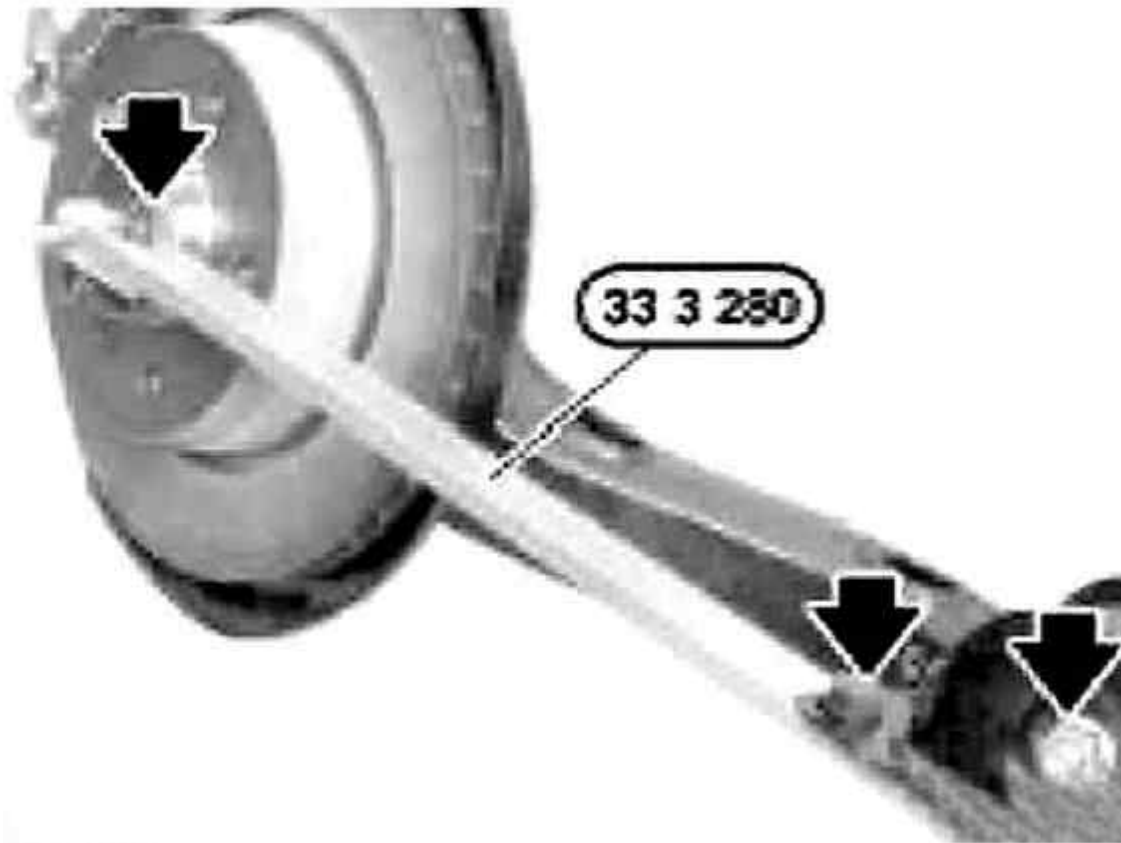


Fig. 53: Locating Rubber Mount Distance

Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 54: Using Special Tool (33 3 280)

Courtesy of BMW OF NORTH AMERICA, INC.

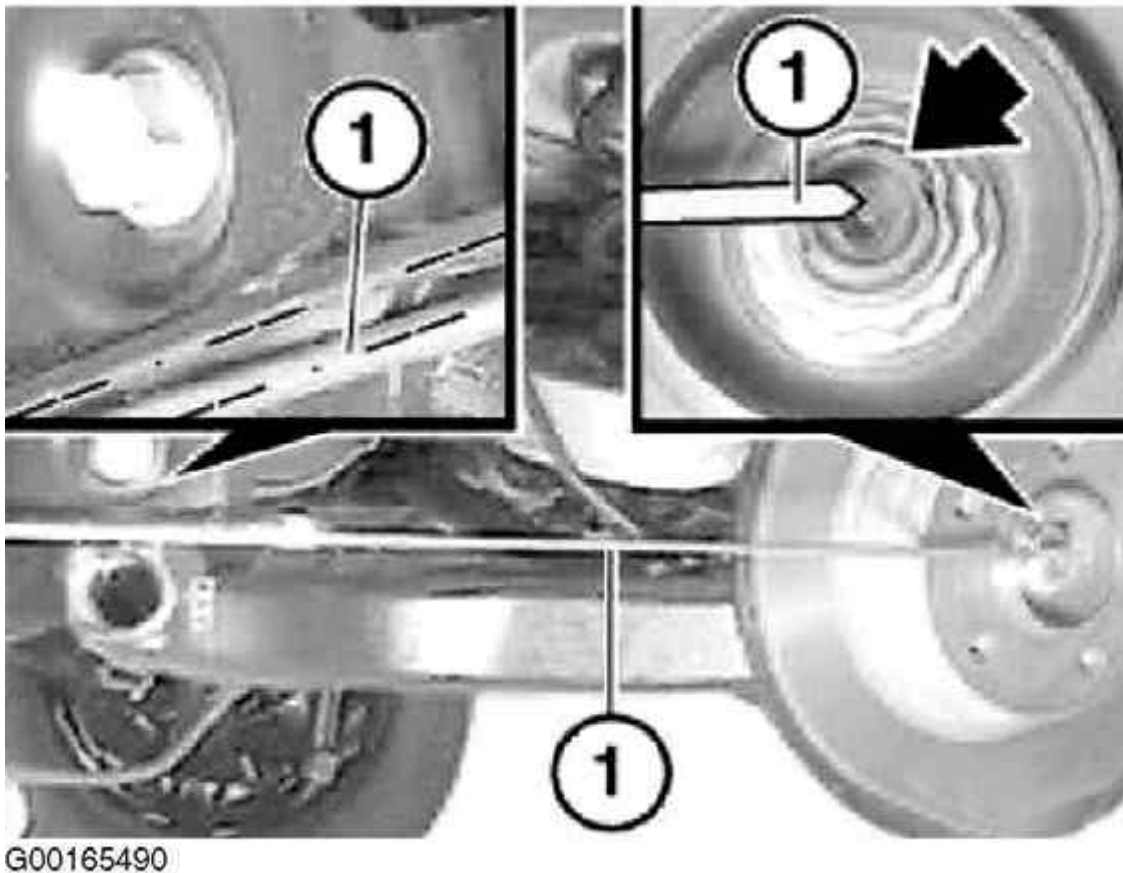


Fig. 55: Determining Bearing Pedestal Position Without Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.

UPPER CONTROL ARM

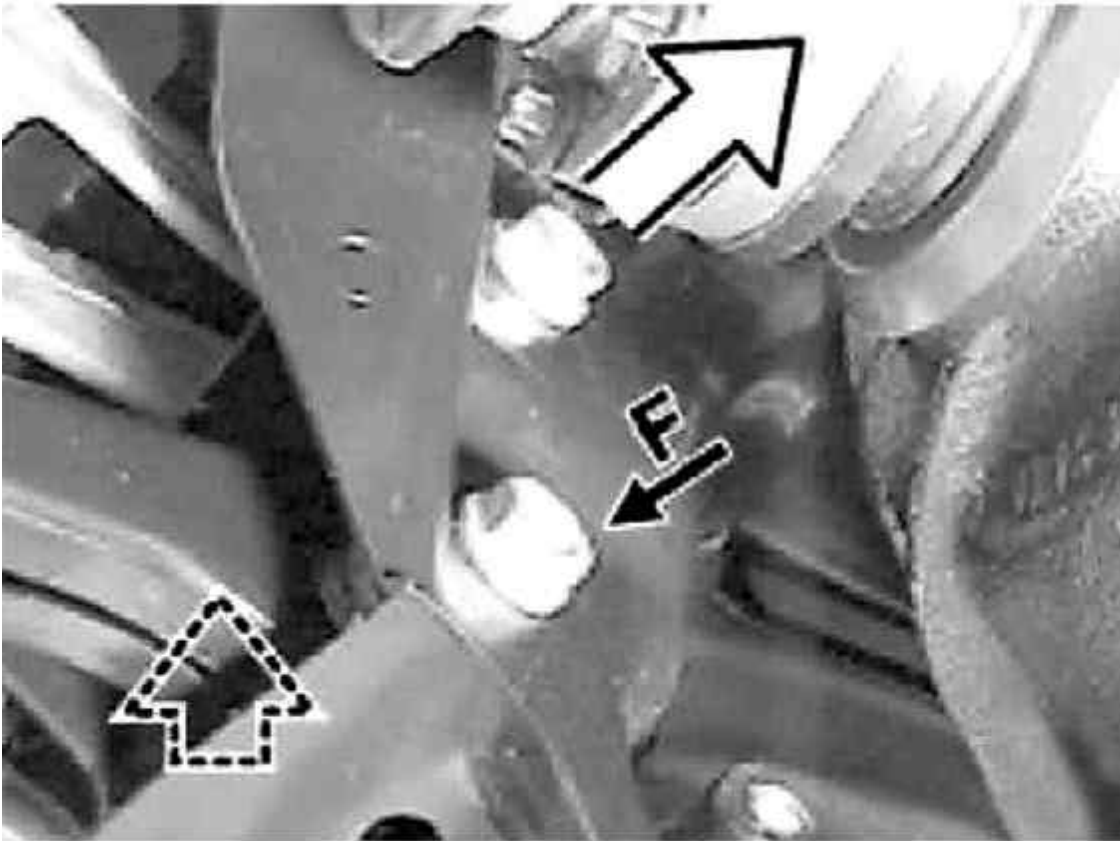
NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

1. Remove coil spring. See **COIL SPRING** .
2. For upper right control arm, remove stabilizer bar support from control arm at top. Remove ride level sensor. For upper left control arm, remove final drive/differential. See appropriate DIFFERENTIALS article in DRIVELINE/AXLES.
3. On all vehicles, unfasten nut for control arm to trailing arm bolt and remove bolt. See **Fig. 44** .
4. On left control arm, remove bolt on rear axle carrier and remove. On right control arm, remove axle shaft from final drive. See **AXLE SHAFTS** under REMOVAL & INSTALLATION in DRIVE AXLES article in DRIVELINE/AXLES.
5. To install, reverse removal procedure. Replace self-locking fasteners and tighten all to specification. See **TORQUE SPECIFICATIONS** .
6. When installing bolt on rear axle carrier, observe bolt insertion direction in direction of travel (F). See

Fig. 56 .

7. When installing bolt on control arm to trailing arm, observe bolt insertion direction in direction of travel (F). See **Fig. 44** .
8. Perform wheel alignment check. See **WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES** under ADJUSTMENTS.



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Fig. 56: Installing Bolt On Rear Axle Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

UPPER CONTROL ARM RUBBER MOUNT

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

1. Remove upper control arm. See **UPPER CONTROL ARM** .
2. Press out rubber mount with Special Tool (33 3 351/352). See **Fig. 57** .
3. Place new rubber mount at chamfered end of control arm bore. Longer collar (A) of rubber mount must point upwards. Distance (A) is .7 inches (17 mm). See **Fig. 58** .
4. Press in rubber mount with Special Tool (33 3 351/352) so that it is flush.

5. Install upper control arm. See UPPER CONTROL ARM .

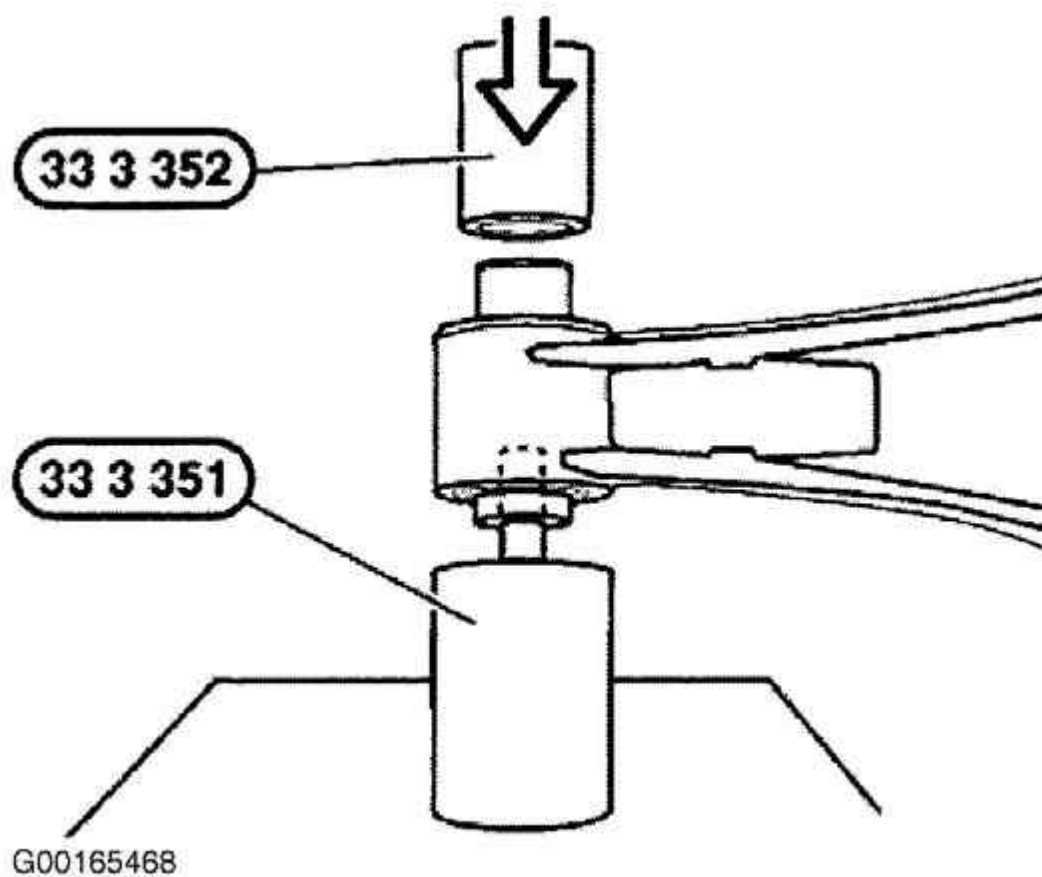


Fig. 57: Pressing Out Rubber Mount Of Upper Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

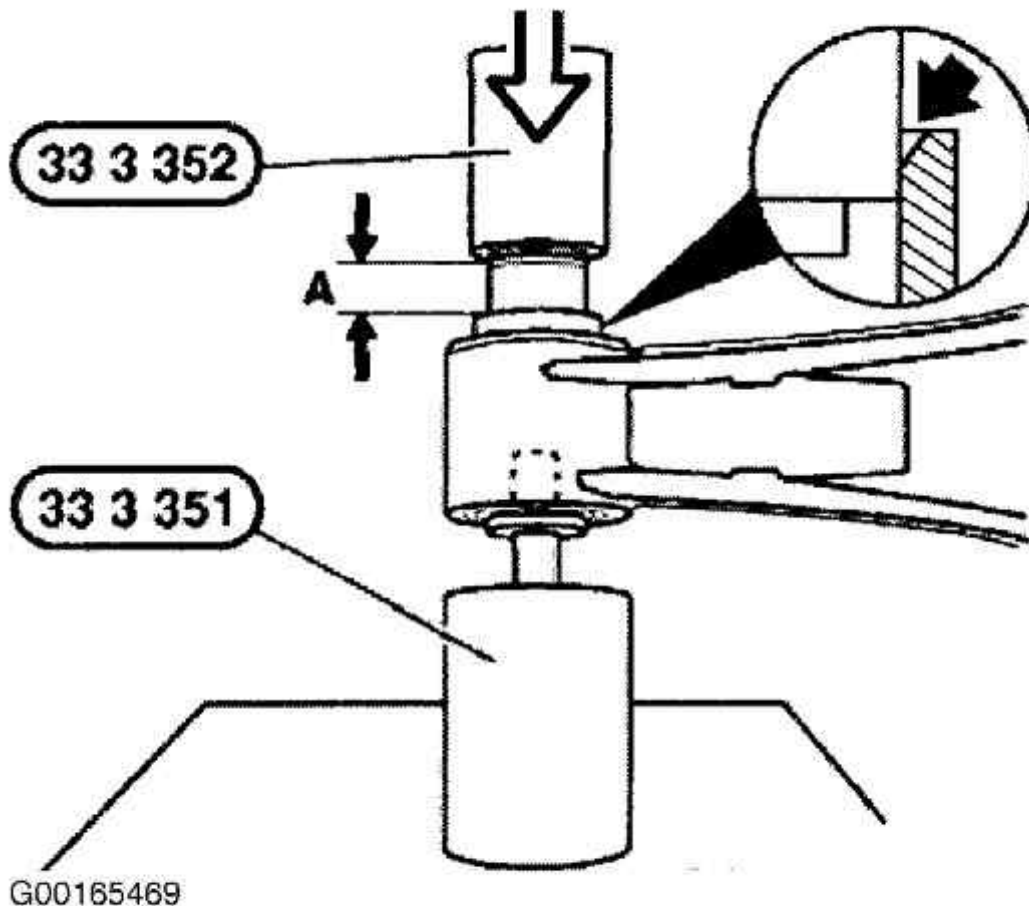


Fig. 58: Pressing In Rubber Mount Of Upper Control Arm
 Courtesy of BMW OF NORTH AMERICA, INC.

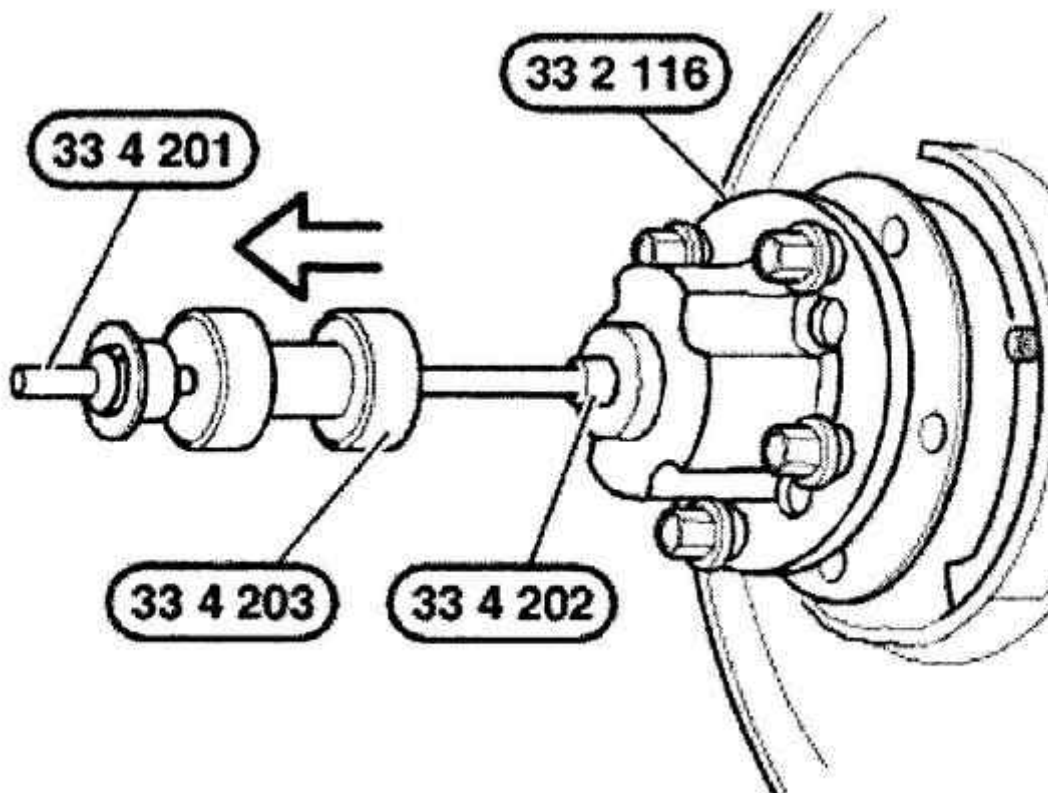
WHEEL BEARING

NOTE: Numbers in text refer to numbers in figures.

Removal & Installation

1. Remove axle shaft. See **AXLE SHAFTS** under REMOVAL & INSTALLATION in AXLE SHAFTS article in DRIVELINE/AXLES. Remove brake disc. See **BRAKE DISC** under REMOVAL & INSTALLATION in DISC article in BRAKES. Remove ABS sensor.
2. Screw on Special Tool (33 2 116) with 5 wheel studs to drive flange. Drive out drive flange with Special Tools (33 4 201/33 4 203). See **Fig. 59** . If necessary, detach wheel bearing inner race from drive flange. Remove circlip (1). See **Fig. 60** . Pull out wheel bearing with Special Tools (33 4 031/33 4 041/33 4 042/33 4 043/33 4 048). See **Fig. 61** .

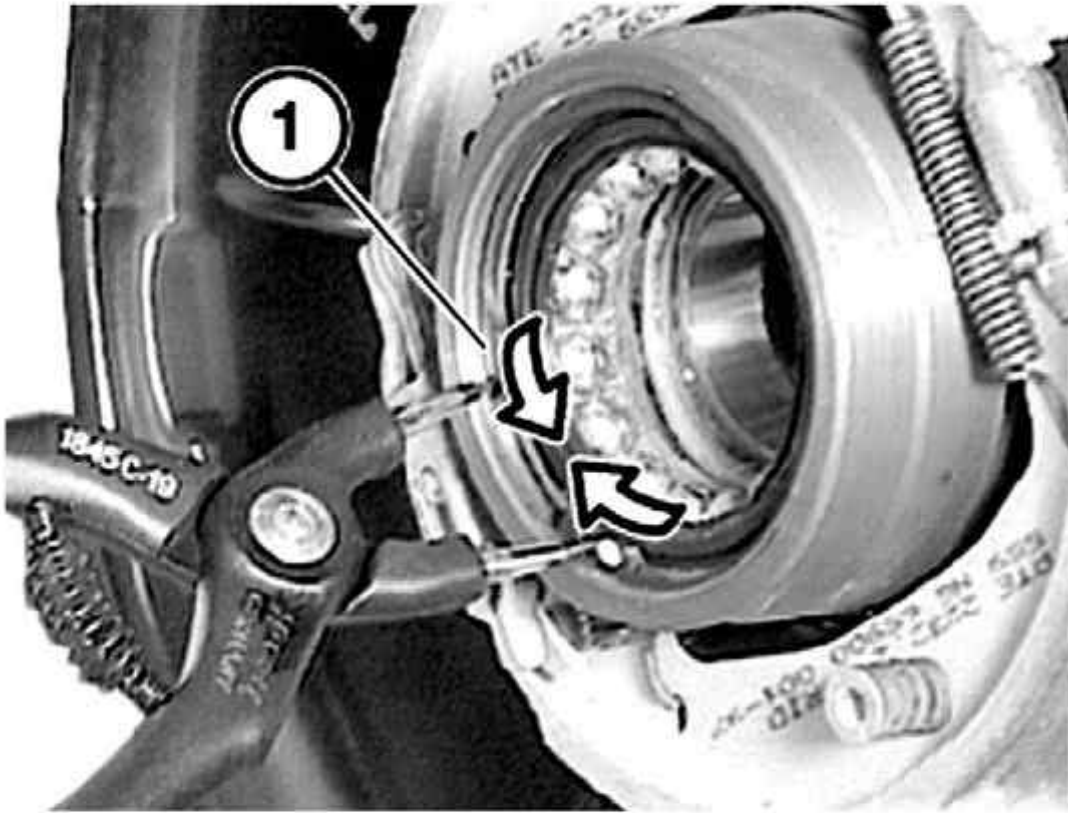
3. To install, reverse removal procedure. Install new wheel bearing with Special Tools (33 4 041/33 4 042/33 4 043/ 33 4 047/33 4 049). See **Fig. 62** . Do not reuse old wheel bearing. Replace expanded or damaged circlip (1). Install drive flange with Special Tools (33 4 041/33 4 042/33 4 043/33 4 045/33 4 048). See **Fig. 63** .



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Fig. 59: Removing Drive Flange

Courtesy of BMW OF NORTH AMERICA, INC.

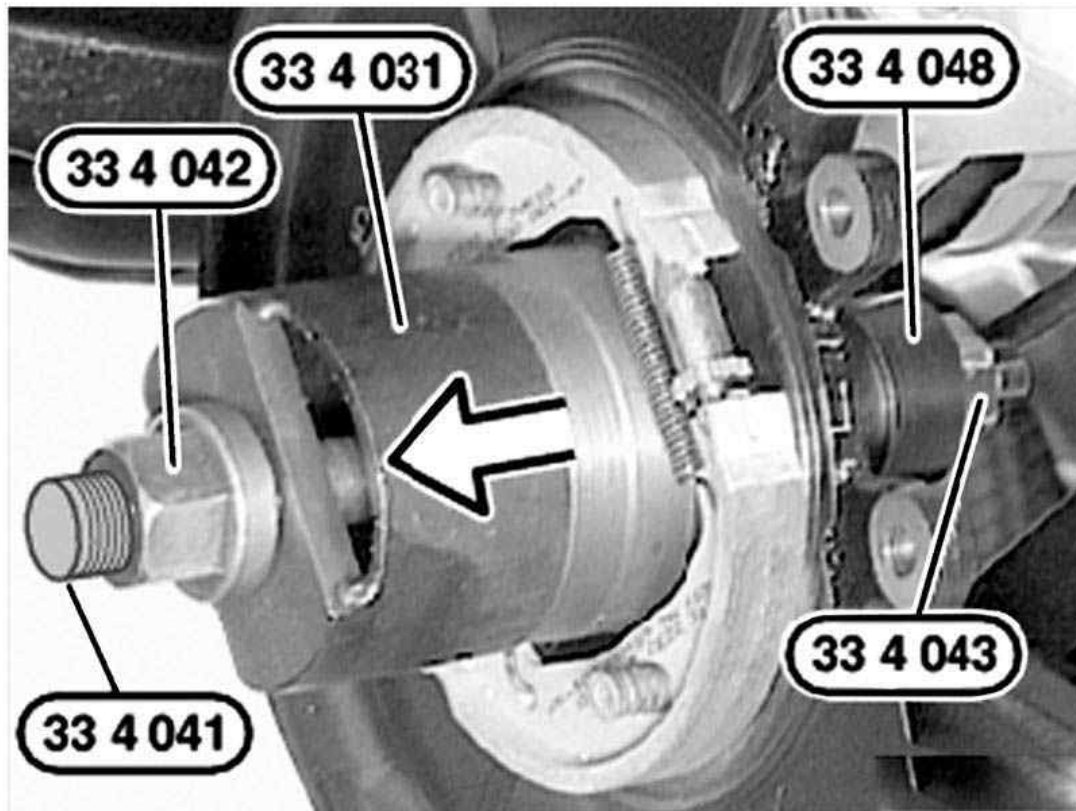


1. Circlip

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Fig. 60: Removing Circlip

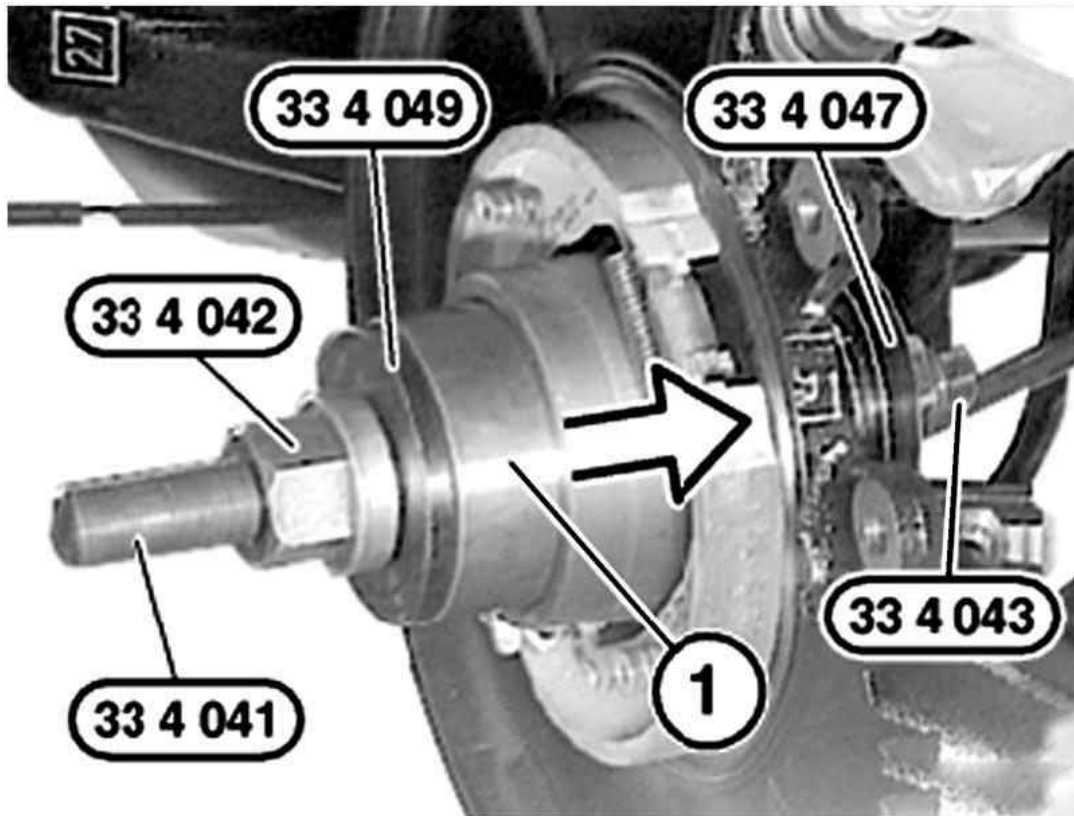
Courtesy of BMW OF NORTH AMERICA, INC.



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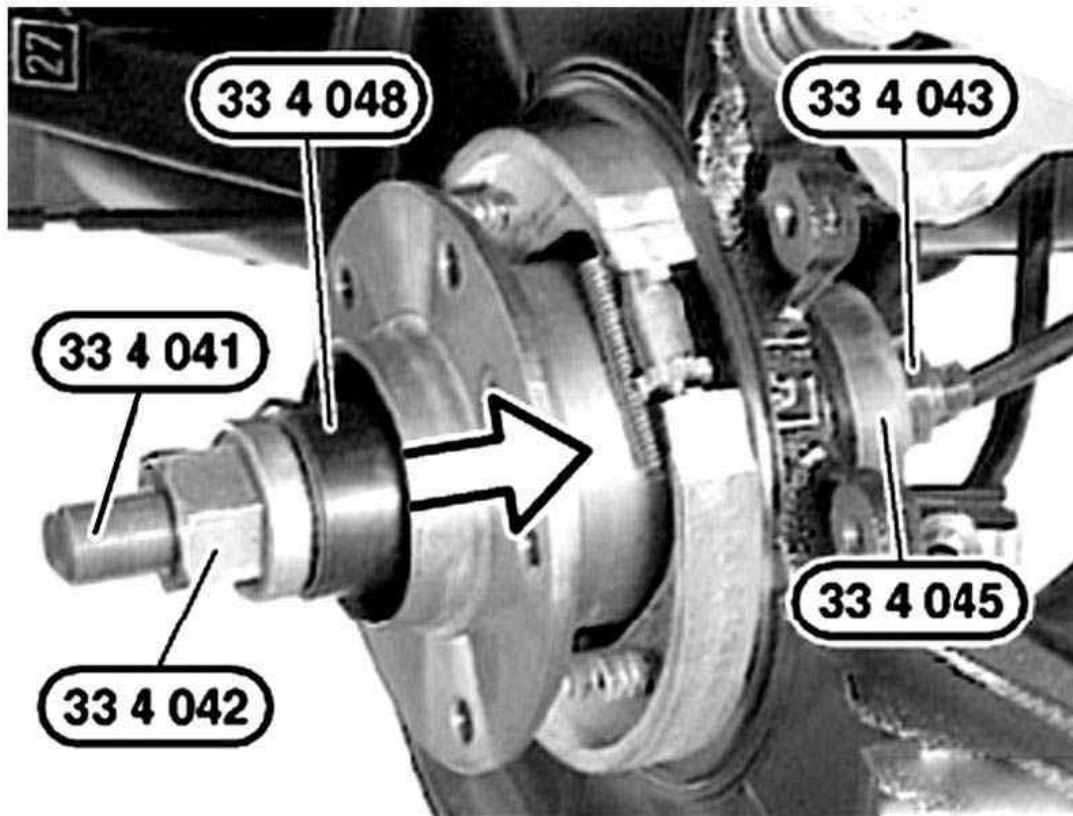
Fig. 61: Removing Wheel Bearing

Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 62: Installing Wheel Bearing
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 63: Installing Drive Flange

Courtesy of BMW OF NORTH AMERICA, INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Axle Carrier-To-Body	57 (77)
Bearing Pedestal Nut	74 (100)
Brake Hose Coupling	10 (14)
Control Arm-To-Rear Axle Carrier	⁽¹⁾ 57 (77)
Control Arms-To-Trailing Arm	⁽¹⁾ 81 (110)
Lower Control Arm-To-Trailing Arm Bolt	57 (77)
Rear Axle Carrier Tension Strut Nut	57 (77)
Rear Axle Tension Strut	

2005 BMW Z4

2003-05 SUSPENSION Rear - Z4

Screw (1) ⁽²⁾	44 (59)
Nut (3) ⁽²⁾	18 (24)
Shock Absorber-To-Trailing Arm	74 (100)
Shock Absorber Support On Body	21 (28)
Stabilizer Bar-To-Rear Axle Support	16 (22)
Stabilizer Link-To-Bracket	16 (22)
Stabilizer Link-To-Upper Control Arm Bracket	16 (22)
Stud To Body	66 (90)
Tension Strut/Reinforcing Plate-To-Rear Axle	⁽³⁾ 44 (59)
Trailing Arm Console To Body	57 (77)
Trailing Arm To Console	74 (100)
Upper Control Arm-To-Trailing Arm Bolt	74 (100)
Wheel Lug Bolt	103 (140)

(1) Tighten in empty weight or normal position. Always replace antifatigue bolts with combination bolts and washers.

(2) For screw and nut identification, see **Fig. 43** .

(3) Tighten an additional 90 degrees.