

2001 BMW X5

2000-2002 DRIVE AXLES Axle Shafts - X5

2000-2002 DRIVE AXLES

Axle Shafts - X5

MODEL IDENTIFICATION

2000-2002 MODEL & ENGINE IDENTIFICATION

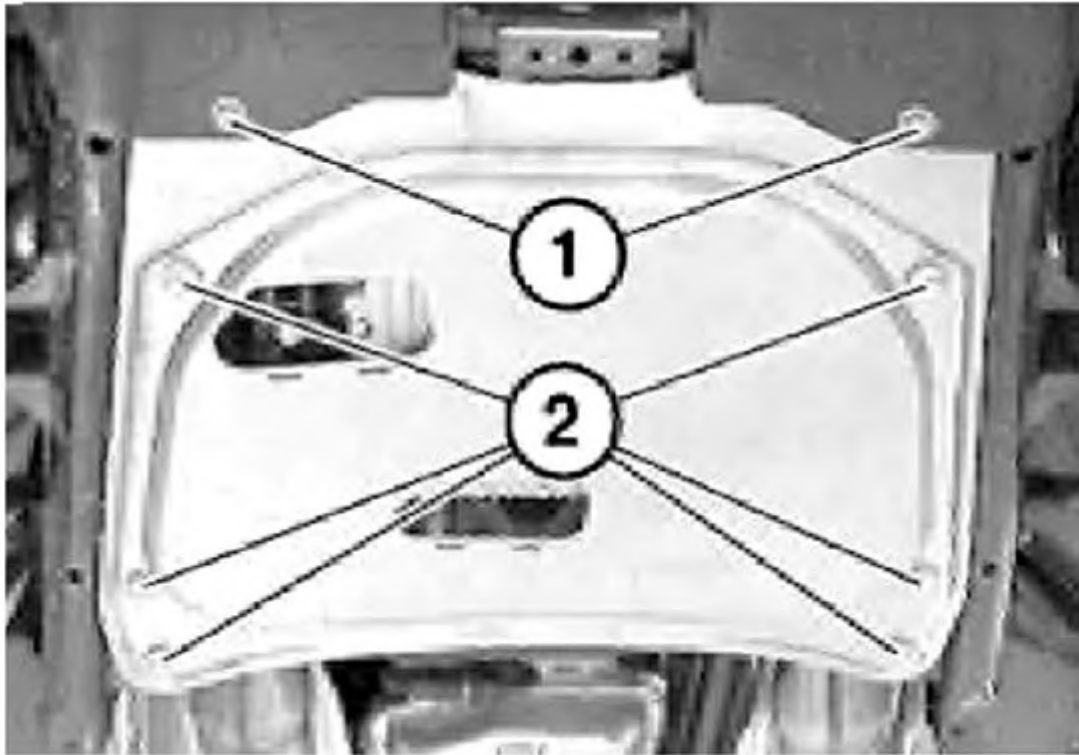
Model (Chassis Code)	Engine Size (Code)
2000-2002	
X5 (E53)	4.4L (M62)
2001-2002	
X5 (E53)	3.0L (M54)
2002	
X5 (E53)	4.6L (M62)

REMOVAL & INSTALLATION

AXLE SHAFTS (FRONT)

Removal

1. Remove reinforcement plate by removing bolts (1, 2). See **Fig. 1**.
2. Remove engine underguard at front.
3. Remove front wheel.
4. Open connector housing for ABS pulse generator, pull plug connector out of bracket and disconnect. See **Fig. 2**.
5. Release hexagon socket head cap screw (1), pull cable out of mounting on spring strut, and pull ABS pulse generator out. See **Fig. 3**.
6. Unscrew bolts (1), remove brake caliper and tie back. It is not necessary to remove brake hose. See **Fig. 4**.
7. Force steering tie rod off swivel bearing with special tool (32 3 090). See **Fig. 5**.
8. Unfasten screws and remove tension strut with guide joint from swivel bearing. See **Fig. 6**.
9. If guide joint is firmly seated, screw on nut a few turns so that guide joint does not slip off unchecked when forced off. Screw special tool 33 4 205 onto taper pin and drive out with special tool (33 4 200). See **Fig. 7**.
10. Press guide joint with special tool (31 2 240) out of tension strut. See **Fig. 8**.
11. Unfasten nut and press control arm off swivel bearing with special tool (31 2 240). See **Fig. 9**.
12. Press on brake and release collar nut on axle shaft. See **Fig. 21**.
13. Screw on special tools (33 2 111/116/117/150) with 5 wheel studs (1) and press axle shaft out of drive flange. Grip with tire iron (2). See **Fig. 10**.
14. Tilt swivel bearing to one side.
15. Press axle shaft with special tool (31 5 110) out of front axle differential and remove. See **Fig. 11**.



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Fig. 1: Removing Reinforcement Plate
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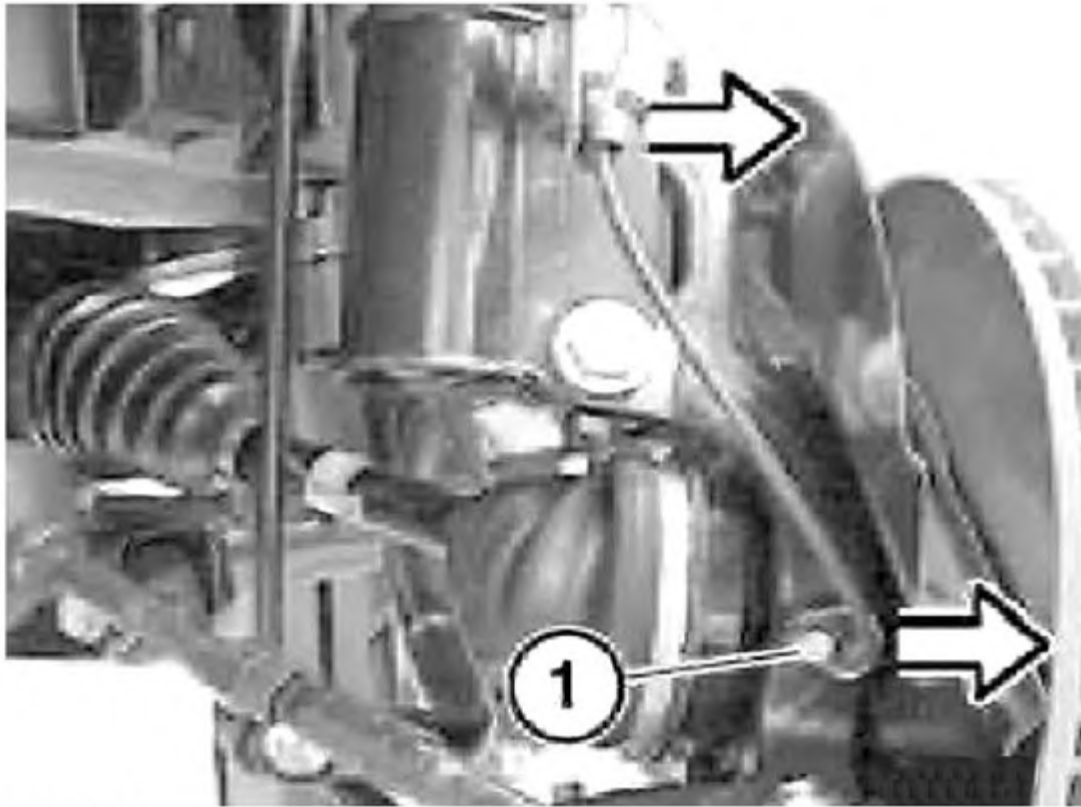
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Fig. 2: Pulling Plug Connector

Courtesy of BMW OF NORTH AMERICA, INC.

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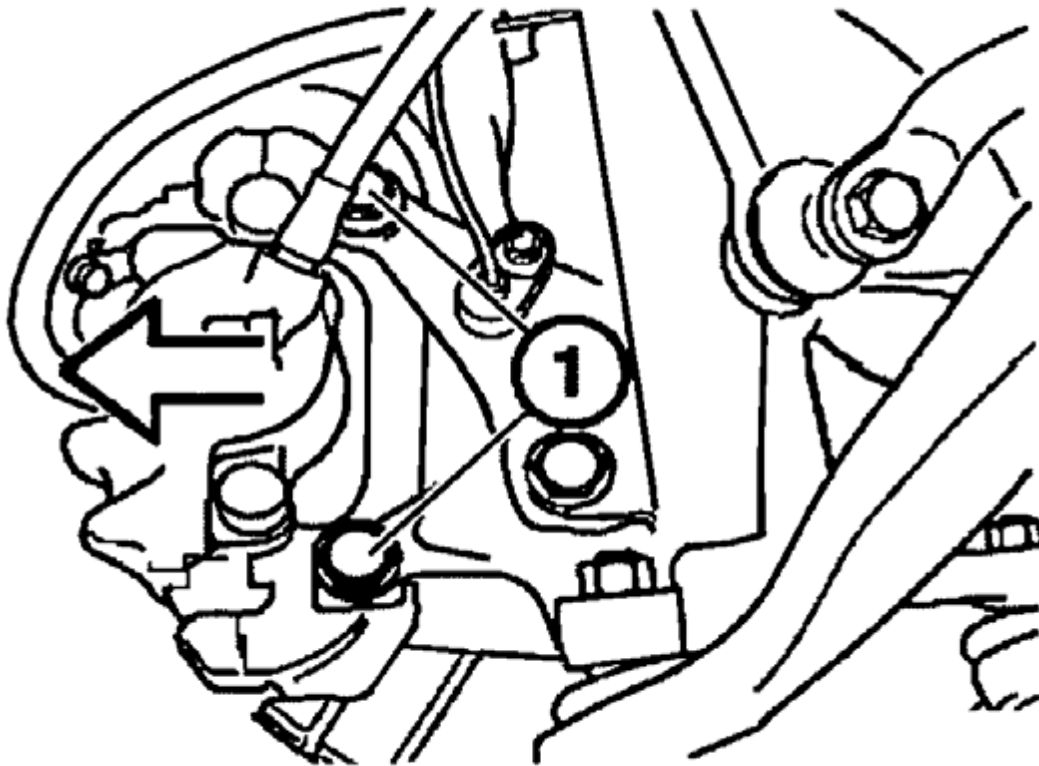
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Fig. 3: Removing Pulse Generator

Courtesy of BMW OF NORTH AMERICA, INC.



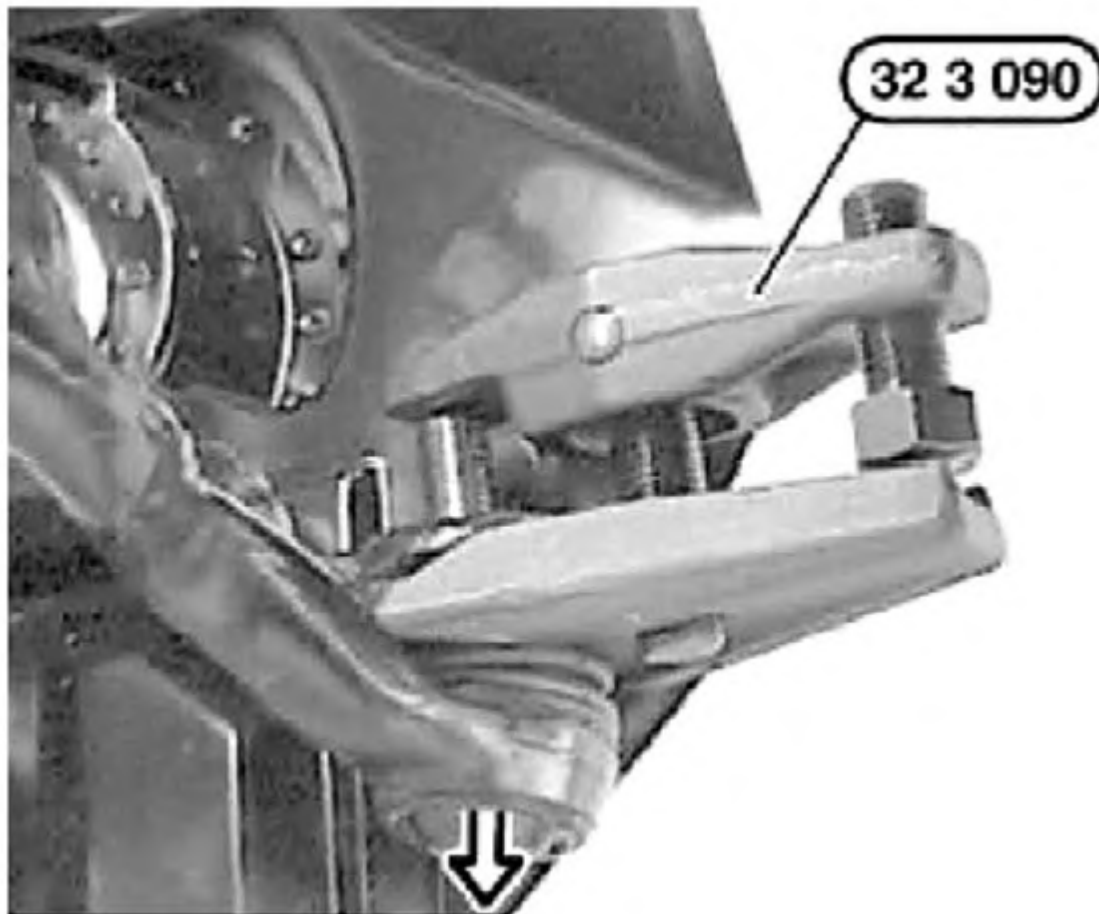
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Fig. 4: Removing Brake Caliper

Courtesy of BMW OF NORTH AMERICA, INC.

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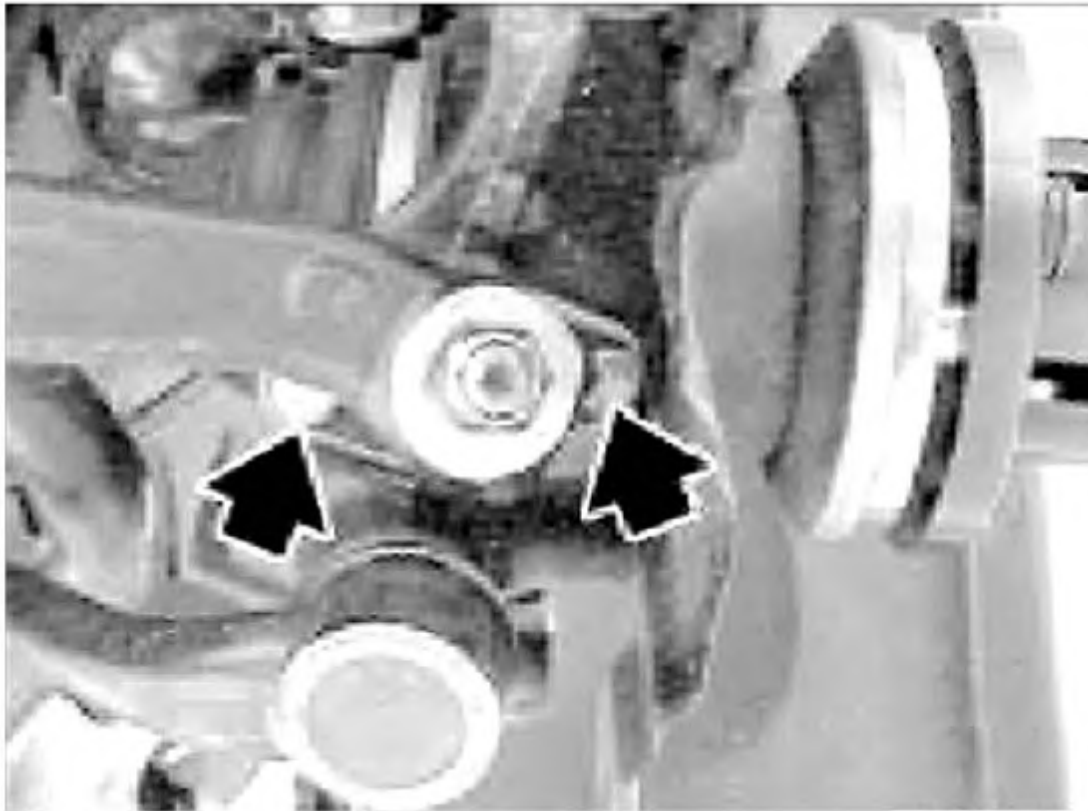
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Fig. 5: Pressing Off Tie Rod

Courtesy of BMW OF NORTH AMERICA, INC.

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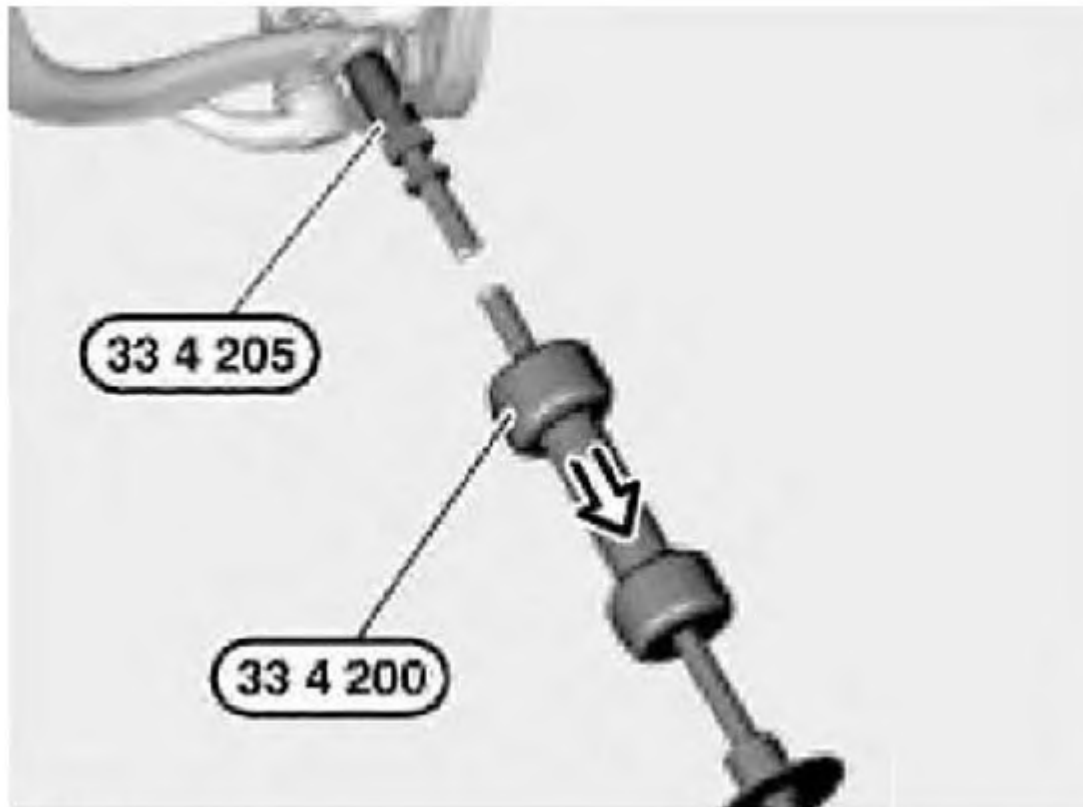
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Fig. 6: Removing Guide Joint

Courtesy of BMW OF NORTH AMERICA, INC.

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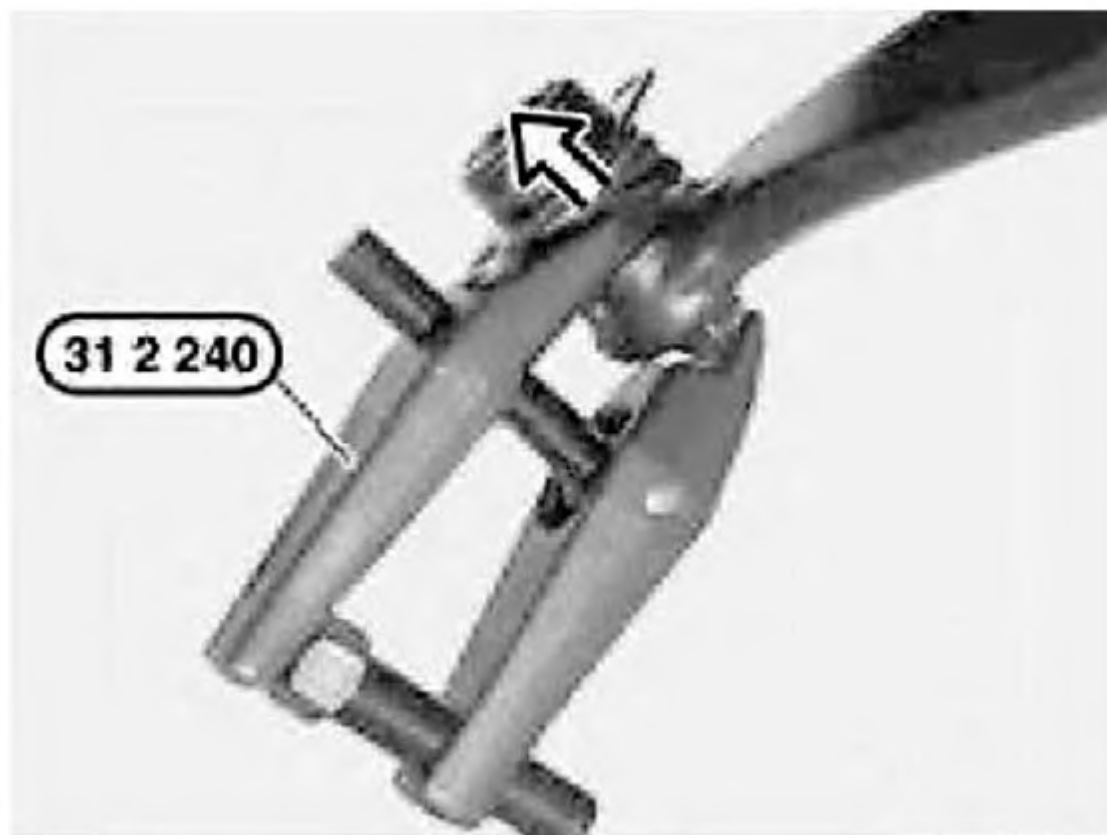
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Fig. 7: Using Special Tool 33 4 205

Courtesy of BMW OF NORTH AMERICA, INC.

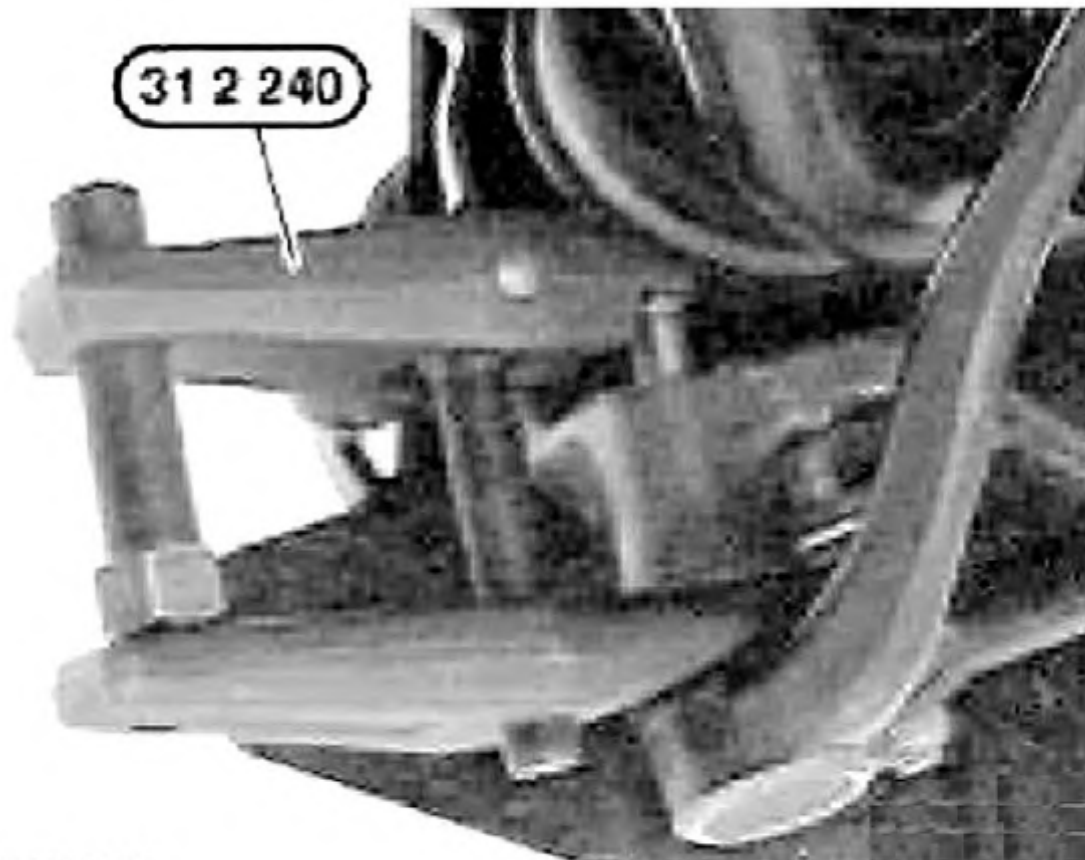


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Fig. 8: Using Special Tool 31 2 240
Courtesy of BMW OF NORTH AMERICA, INC.

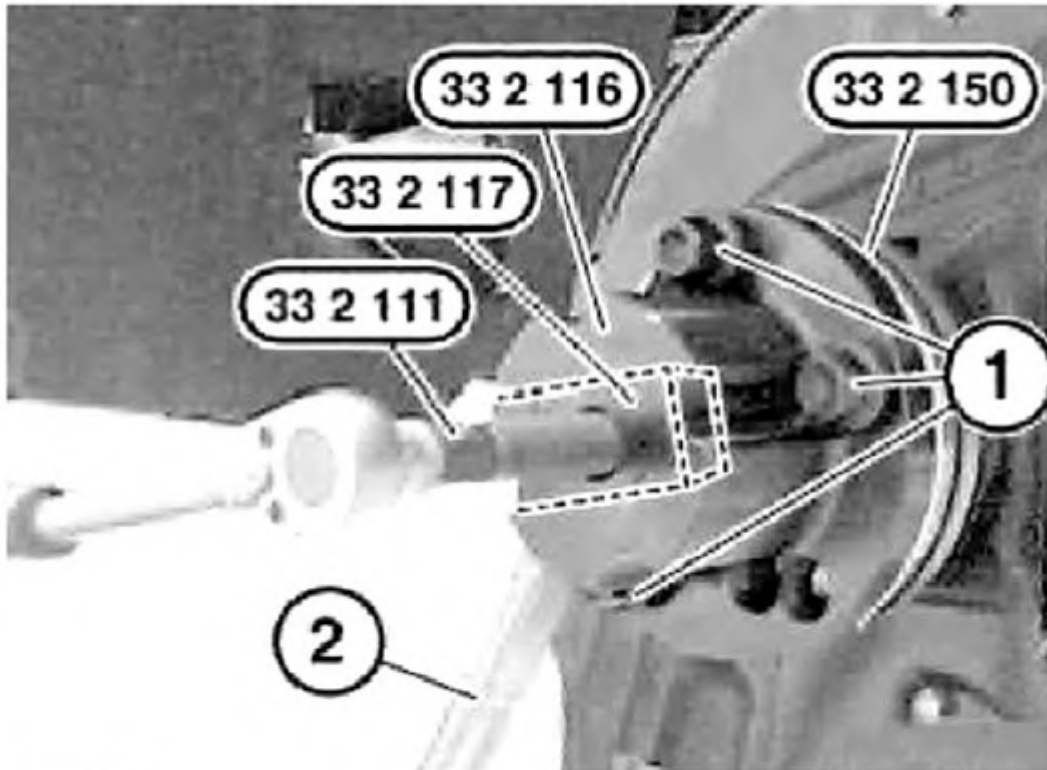
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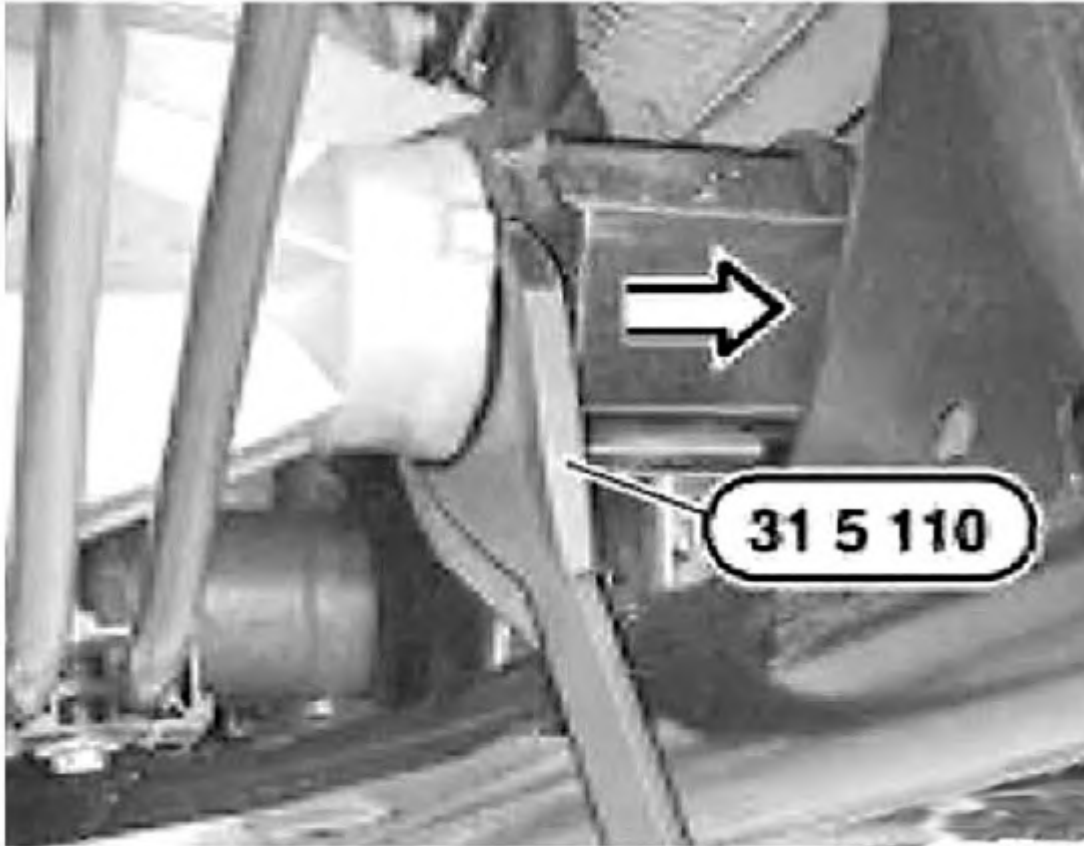
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Fig. 9: Removing Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 10: Pressing axle shaft Out Of Drive Flange
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 11: Removing Axle Shaft

Courtesy of BMW OF NORTH AMERICA, INC.

Installation

1. Always replace radial seal on axle shaft. See **RADIAL SEAL ON AXLE SHAFT** .
2. Install NEW retaining ring on axle shaft. See **Fig. 12** .
3. Push in axle shaft over resistance of retaining ring. Axle shaft coupling must snap audibly into place.
4. Tilt swivel bearing into place and tighten screws to specification. See **TORQUE SPECIFICATIONS** .
5. Lightly oil axle shaft splines and insert into drive flange splines. Screw on special tool 33 2 118.
6. Screw on special tools (33 2 116) and (33 2 150) with 5 wheel studs (1). Draw in axle shaft with special tool (33 2 115). Grip with tire iron. See **Fig. 13** .
7. Install new collar nut and tighten to specification. See **TORQUE SPECIFICATIONS** .
8. Lock collar nut by calking it at flat areas of axle shaft.
9. Be sure tapered spigot and bore of control arm are both free of grease. Install new self-locking nut and tighten to specification. See **TORQUE SPECIFICATIONS** .
10. Install tension strut and guide joint. Tighten screws to specification. See **TORQUE SPECIFICATIONS** .

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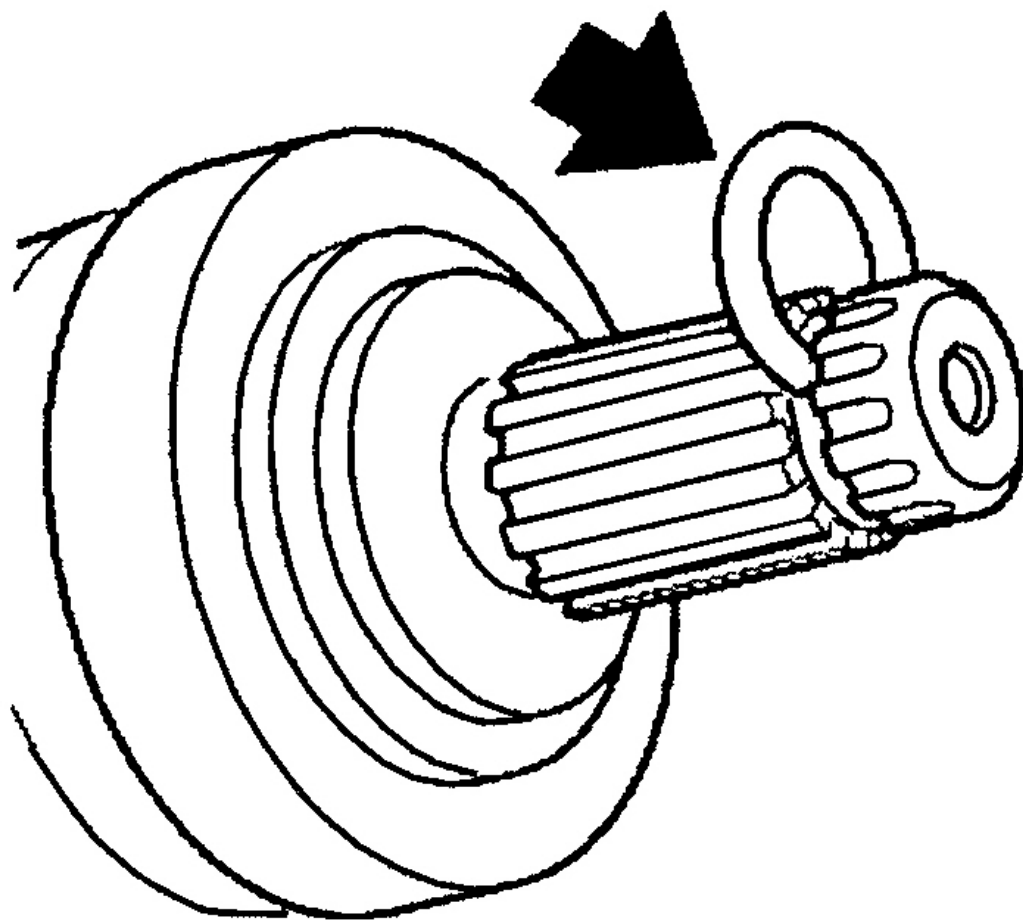
11. Be sure tapered spigot and bore of tie rod are both free of grease. Install new self-locking nut. Brace on hexagon socket if necessary and tighten nut to specification. See **TORQUE SPECIFICATIONS** .
12. Install brake caliper and tighten bolts to specification. See **TORQUE SPECIFICATIONS** .
13. Clean bore for ABS pulse generator and grease with Starburags NBU 12/K lubricant or equivalent. Tighten to specification. See **TORQUE SPECIFICATIONS** .
14. Ensure proper locking of plug connector and proper seating of rubber grommets.
15. Install front wheel(s).
16. Install engine undergaurd at front.

CAUTION: Driving without reinforcement plate is not permitted.

17. Install reinforcement plate and tighten bolts to specification. See **TORQUE SPECIFICATIONS** .

**CAUTION: Use only SAF-XLS or equivalent gear oil in this front axle differential.
Failure to comply with this requirement will result in serious damage
to the differential.**

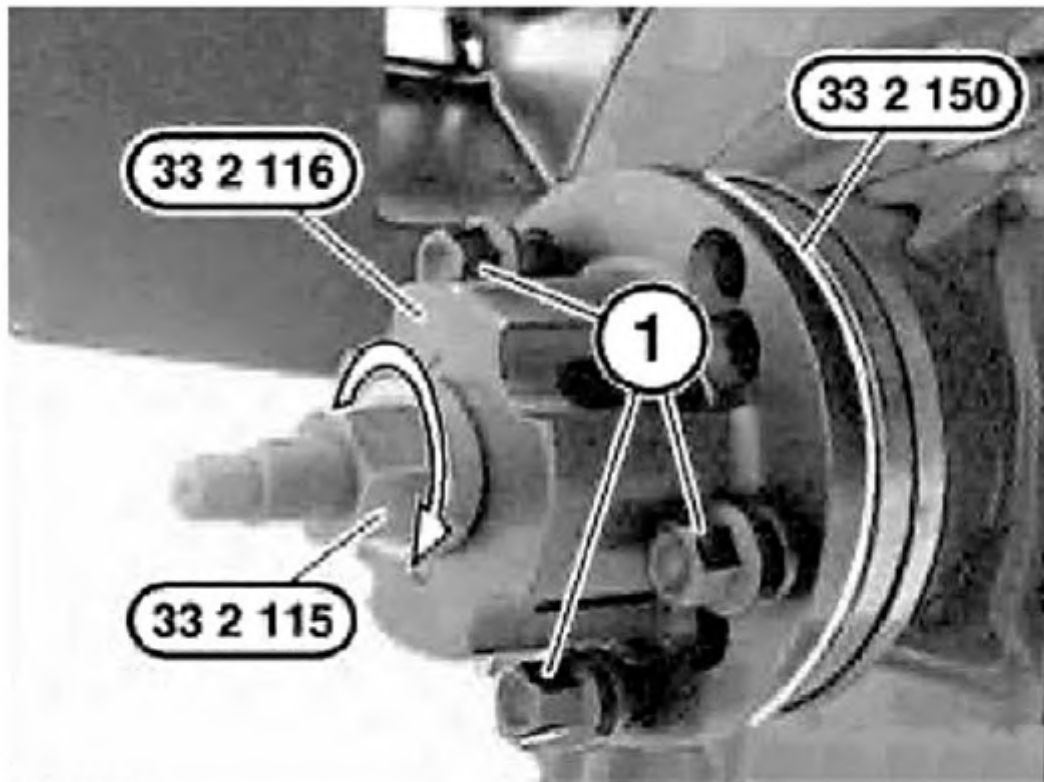
18. After completing work, open filler plug and check front axle differential fluid level. Fluid level should be up to lower edge of filler plug.



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Fig. 12: Locating Retaining Ring

Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 13: Drawing In Axle Shaft

Courtesy of BMW OF NORTH AMERICA, INC.

RADIAL SEAL ON AXLE SHAFT**Removal & Installation**

NOTE: If only replacing radial seal it is not necessary to press axle shaft out of drive flange. Axle shaft (1) and swivel bearing (2) remain together as a single unit during removal and installation. See [Fig. 14](#) .

1. Remove axle shaft. See [DRIVE AXLE SHAFTS \(FRONT\)](#) .
2. Use a screwdriver (2) to lever radial seal (1) out of front axle differential housing (3). See [Fig. 15](#) .

NOTE: New radial seal is equipped with a protective sleeve. This serves to protect the sealing lips against damage when the axle shaft is inserted into the front axle differential.

3. Remove protective sleeve (2) from new radial seal (1). See [Fig. 16](#) .

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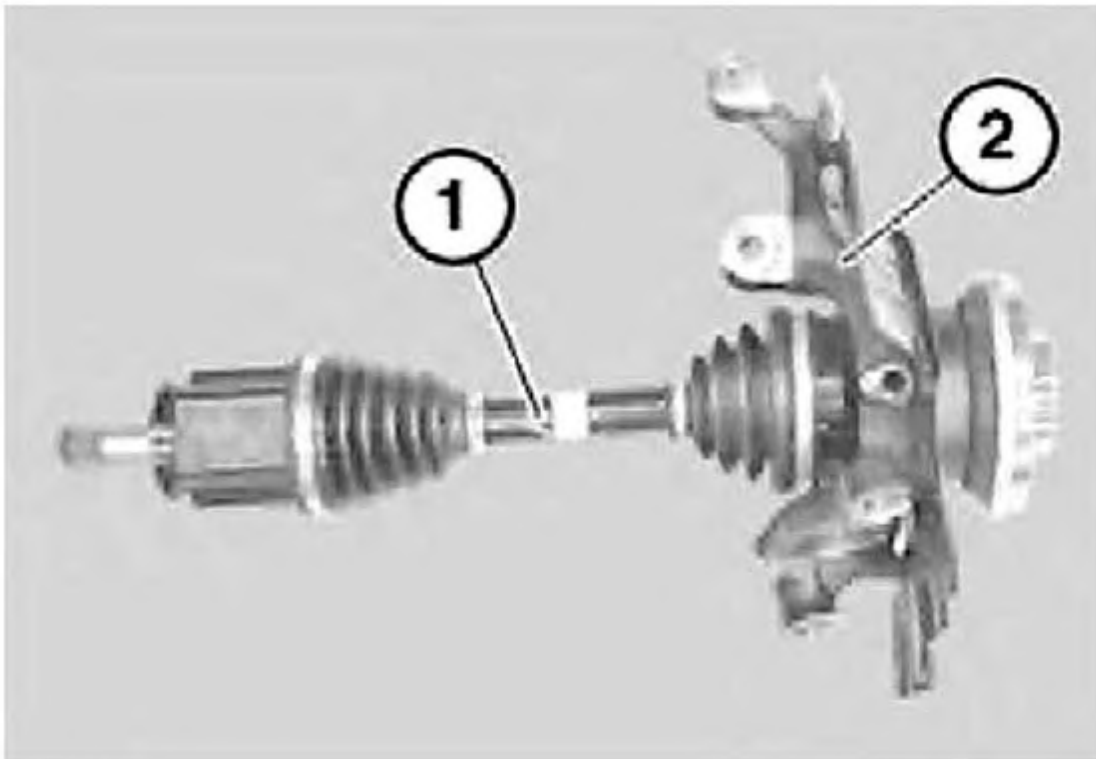
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NOTE: Coat sealing lips of new radial seal with gear oil.

4. Drive new radial seal firmly home with special tool 31 5 130. See **Fig. 17**.
5. Carefully insert protective sleeve into radial seal.
6. Insert axle shaft part way. Cut open protective sleeve and remove. Finish inserting axle shaft up to stop.

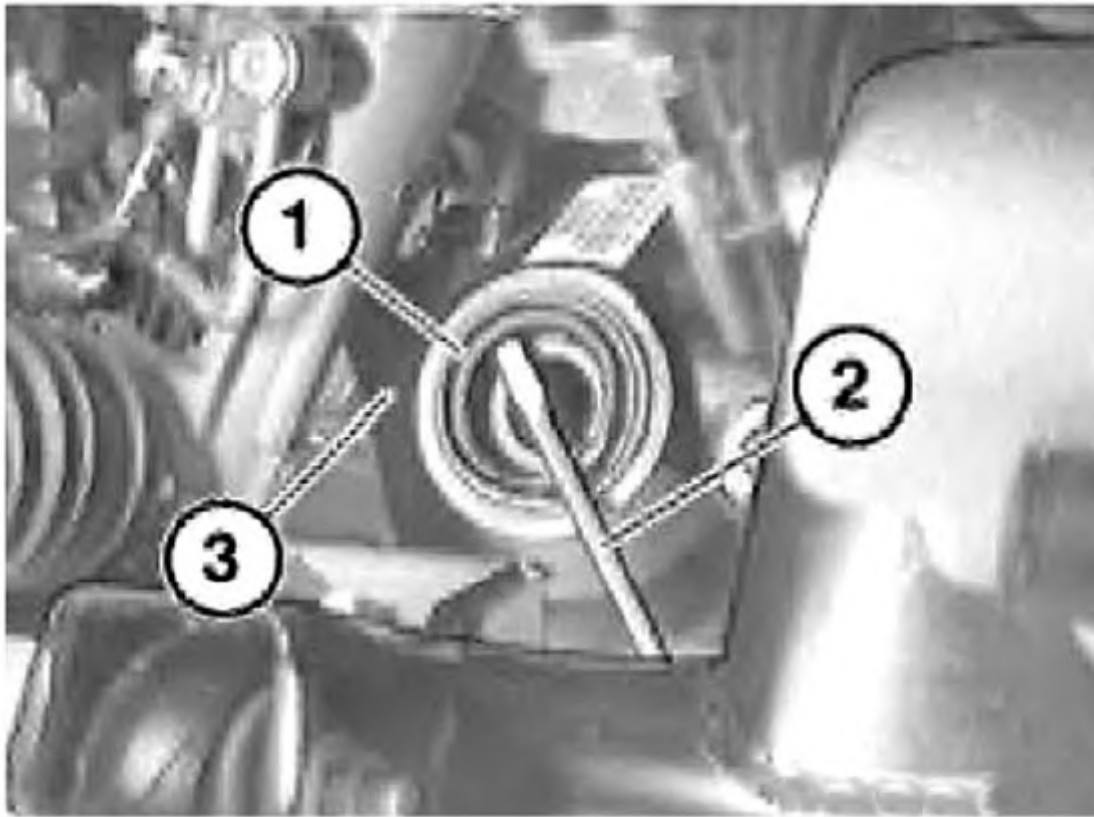
CAUTION: Use only SAF-XLS or equivalent gear oil in this front axle differential. Failure to comply with this requirement will result in serious damage to the differential.

7. After completing work, open filler plug and check front axle differential fluid level. Fluid level should be up to lower edge of filler plug.



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Fig. 14: Identifying Axle Shaft & Swivel Bearing Unit
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 15: Levering Radial Seal Out Of Differential Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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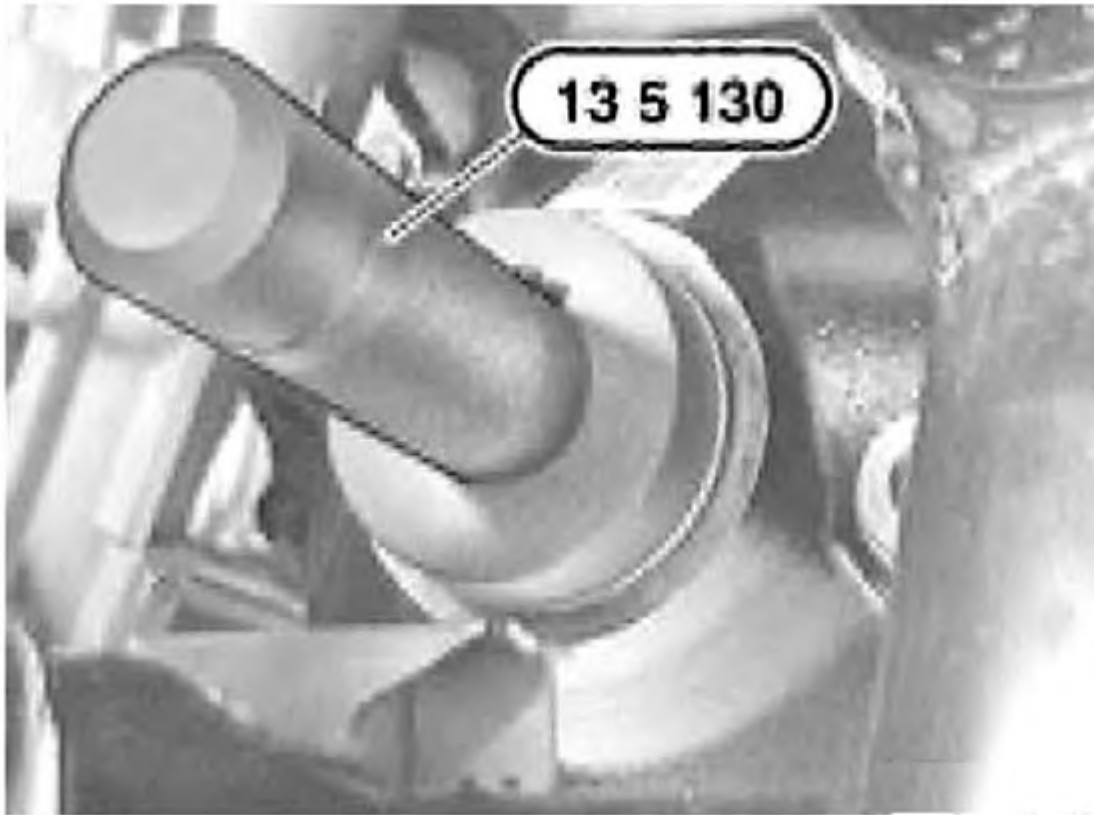
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Fig. 16: Removing Protective Sleeve

Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 17: Driving Radial Seal Home

Courtesy of BMW OF NORTH AMERICA, INC.

AXLE SHAFTS (REAR)

Removal

1. Raise and support vehicle. Remove rear wheel.

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

2. Release screws of rear muffler and detach rear muffler from intermediate muffler.
3. On models with one axle air spring, disconnect fuse on air supply system so that there is no unintentional system regulation.
4. On models with two axle air spring, lower axle with BMW diagnostic system in EHC2 program under menu item "Component activation." Carry out each activation 6 times.
5. On all models, remove axle CV joint-to-differential final drive flange bolts and washers. See **Fig. 18** .
6. To feed axle shaft in and out, raise wheel carrier (1) with special tool (00 2 030) (2) and a block of wood (3) about .8" (20 mm). See **Fig. 19** .

7. Release locking clip (1). See **Fig. 20** .
8. Remove axle hub collar nut, and discard. See **Fig. 21** .
9. Screw on special tools (33 2 111/116/117) with 5 wheel studs and press axle shaft out of drive hub. See **Fig. 22** .
10. Remove axle shaft.

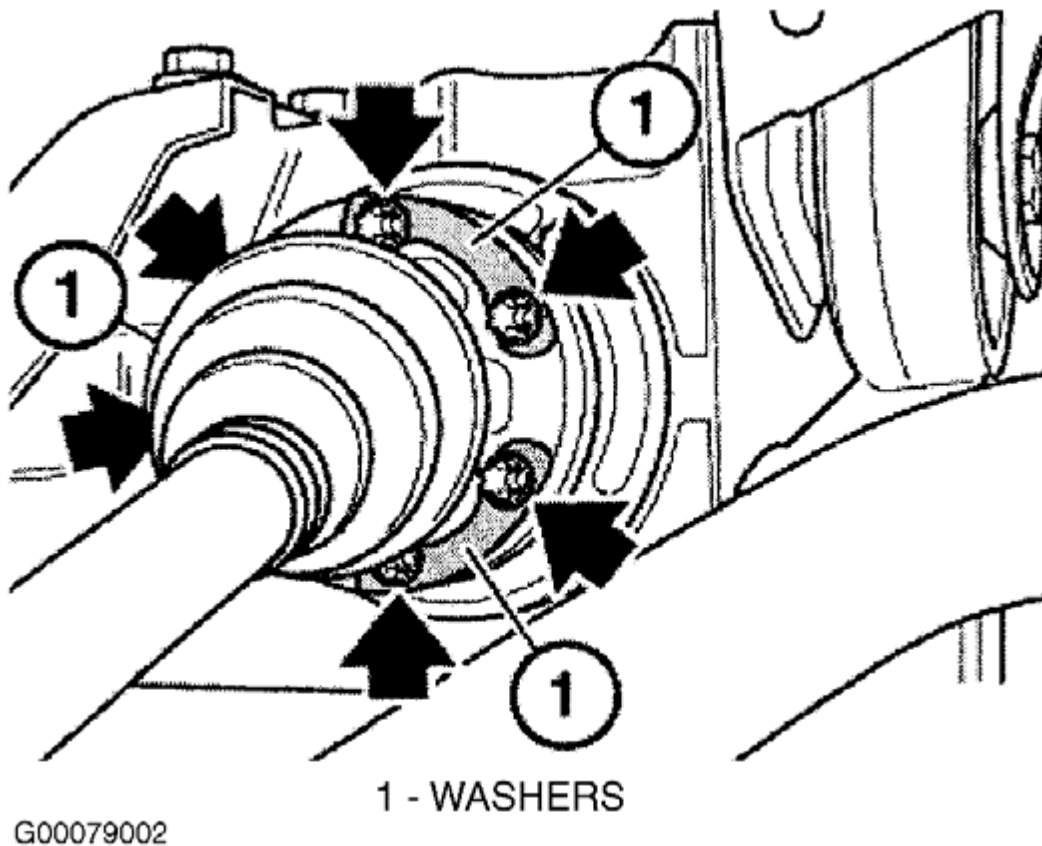
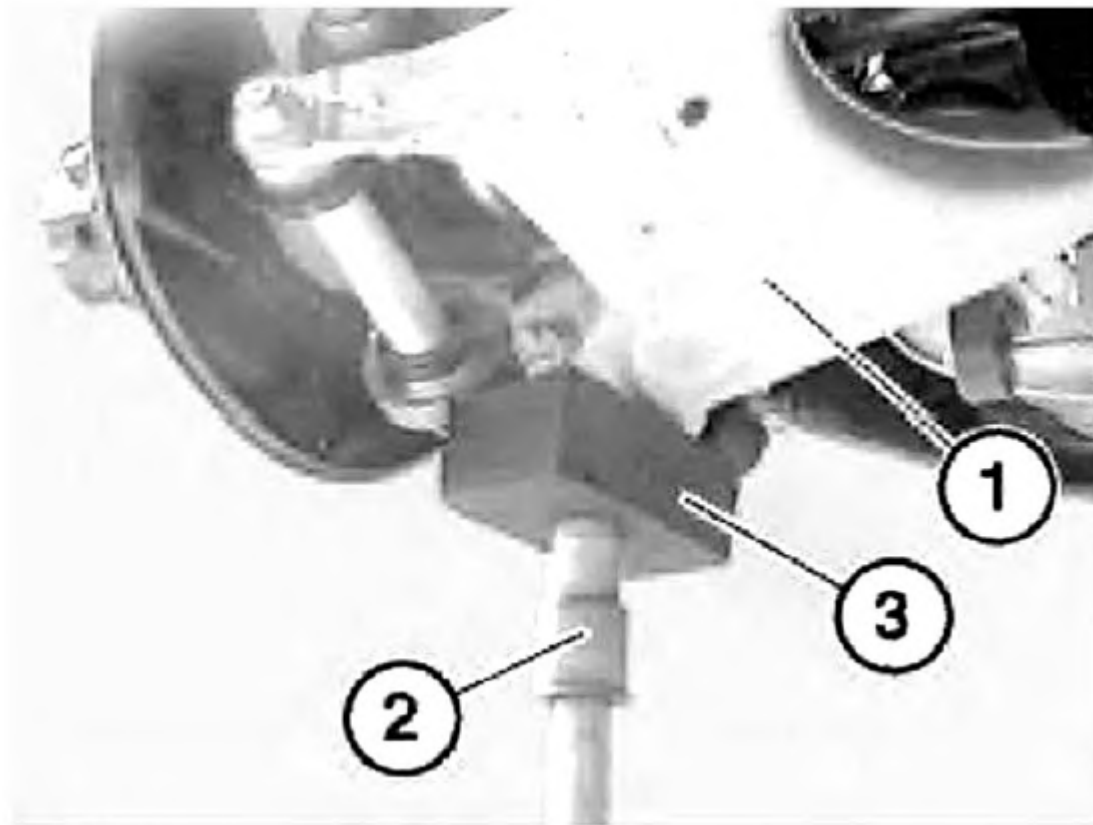


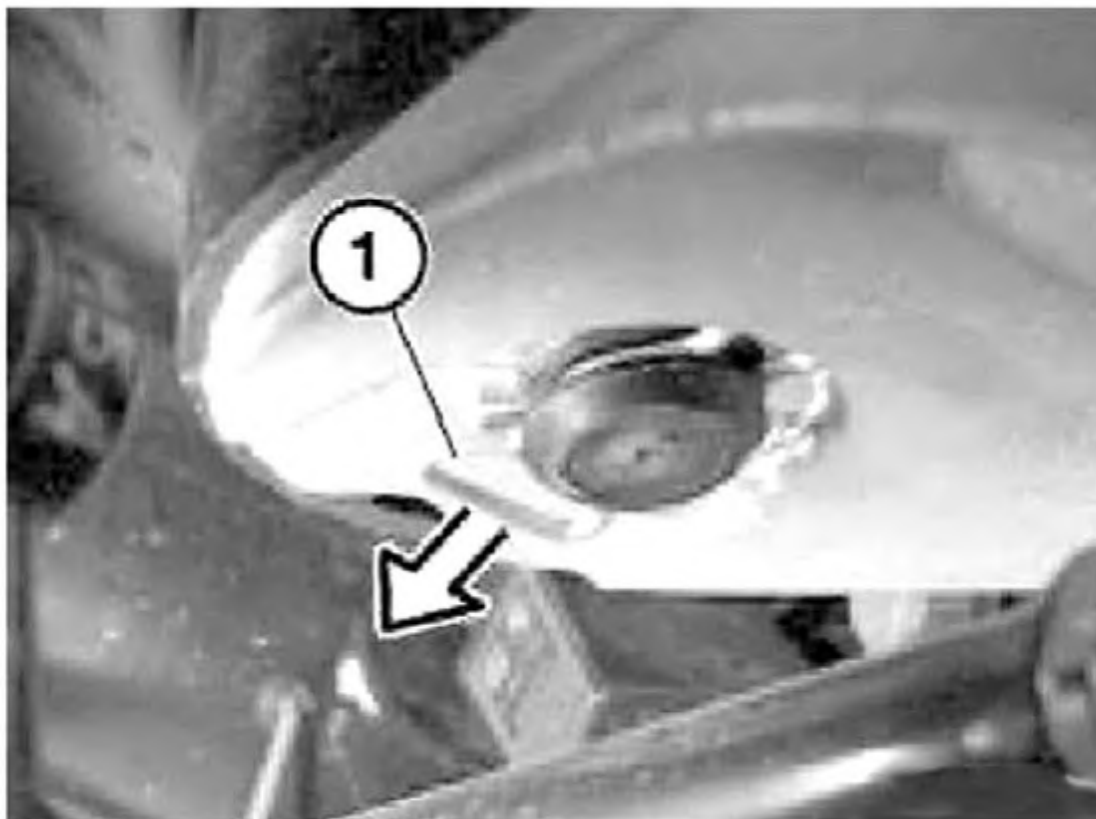
Fig. 18: Locating Axle-To-Final Drive Flange Bolts & Washers
Courtesy of BMW OF NORTH AMERICA, INC.



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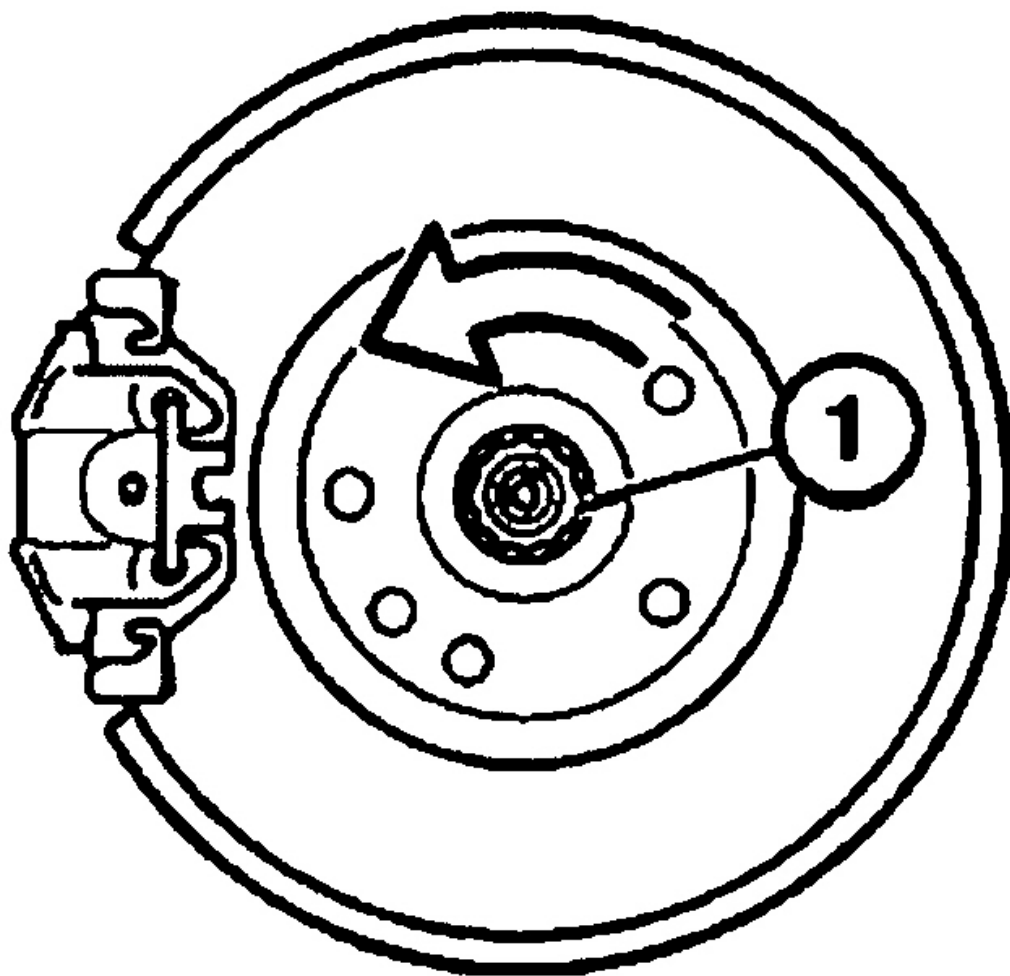
Fig. 19: Raising Wheel Carrier

Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 20: Releasing Locking Clip
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 21: Locating Collar Nut

Courtesy of BMW OF NORTH AMERICA, INC.

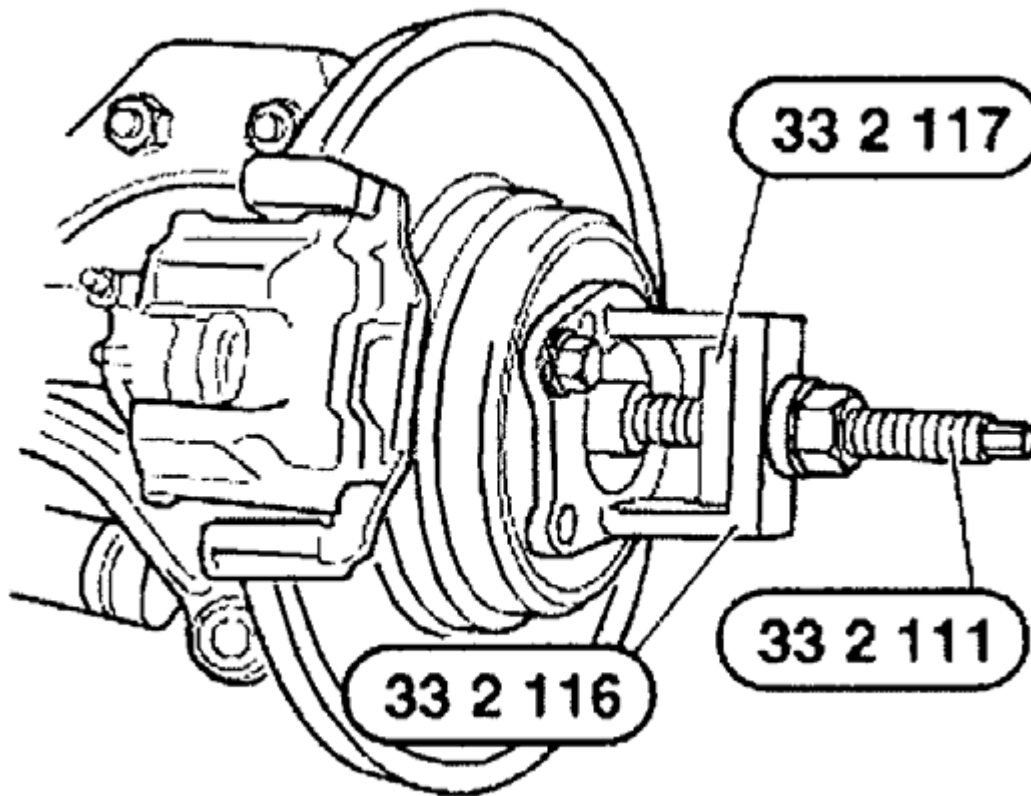


Fig. 22: Pressing Out Axle Shaft

Courtesy of BMW OF NORTH AMERICA, INC.

Installation

1. Lightly oil axle shaft splines and insert into drive flange splines.
2. Screw special tool (33 2 118) onto axle shaft. Screw on special tool (33 2 116) with 5 wheel studs. Install axle shaft with special tool (33 2 115). See **Fig. 23** .
3. Install new axle shaft collar nut. Tighten to specification. See **TORQUE SPECIFICATIONS** .
4. Secure by peening at flat areas on axle shaft. See **Fig. 24** .
5. Install locking clip.
6. To feed axle shaft in and out, raise wheel carrier (1) with special tool (00 2 030) (2) and a block of wood (3) about .8" (20 mm).
7. Fit washers and connect CV joint-to-differential final drive flange bolts and tighten to specification. See **TORQUE SPECIFICATIONS** .
8. Attach screws of rear muffler to intermediate muffler and tighten to specification. See **TORQUE SPECIFICATIONS** .

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9. Install wheel(s).
10. After repairs have been completed, the pneumatic suspension system of the car on the lifting platform must be refilled with air with the diagnostic program (Component activation, raise front and rear axles). Carry out each activation 6 times.
11. Lower car and adjust ride levels in accordance with diagnostic program and carry out ride level offset.

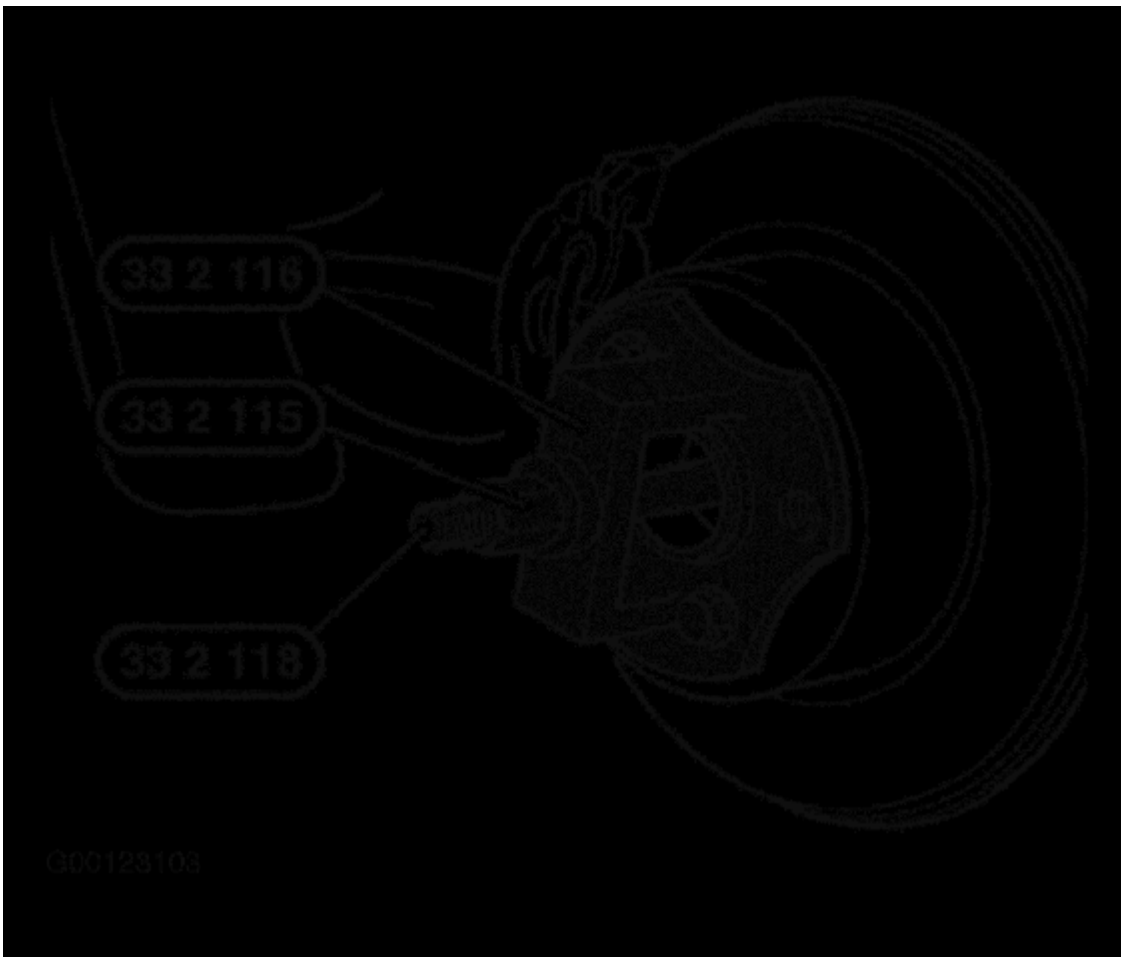
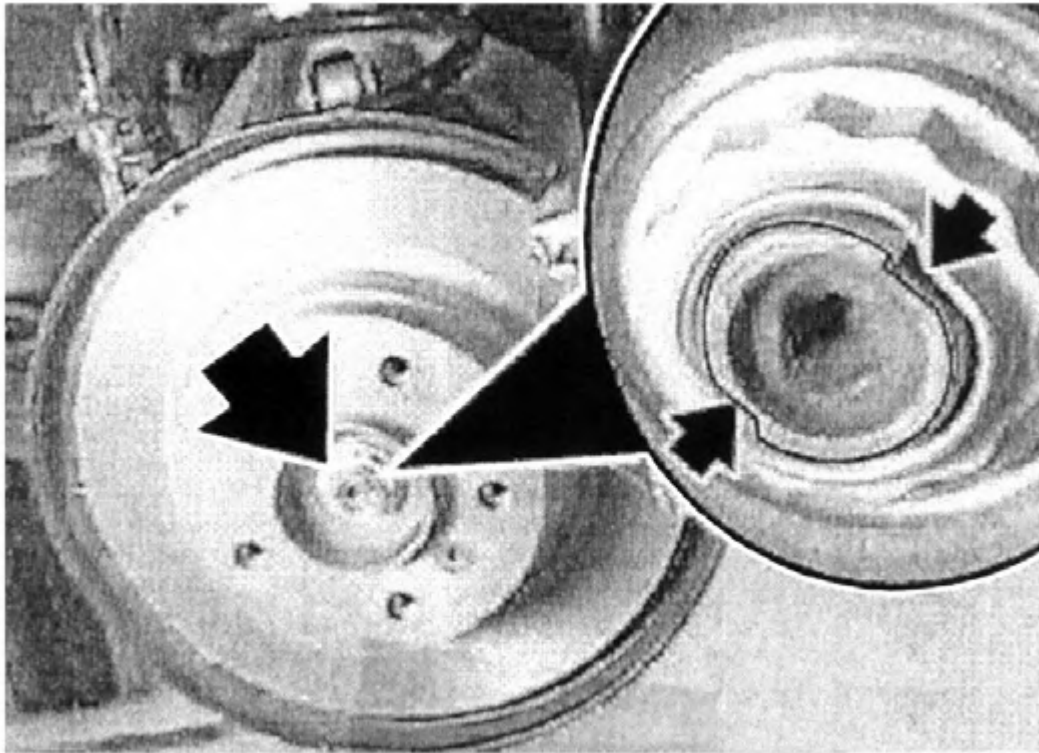


Fig. 23: Using Special Tool 33 2 118
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 24: Staking Axle Collar Nut

Courtesy of BMW OF NORTH AMERICA, INC.

RIGHT FRONT AXLE SHAFT BEARING PEDESTAL

Removal & Installation

NOTE: Do not press axle shaft out of drive flange. Axle shaft (1) and swivel bearing (2) remain together as a single unit during removal and installation. See Fig. 14 .

1. Remove axle shaft. See DRIVE AXLE SHAFTS (FRONT) .
2. Release screws and remove bearing block (1). See Fig. 25 .

NOTE: Lubricate NEW sealing ring with gear oil.

3. Install sealing ring (1) on bearing block (2). See Fig. 26 .
4. Attach bearing block and tighten screws to specification. See TORQUE SPECIFICATIONS .
5. Install axle shaft. See DRIVE AXLE SHAFTS (FRONT) .

CAUTION: Use only the approved gear oil in front axle differential. Failure to comply will result in serious damage to differential.

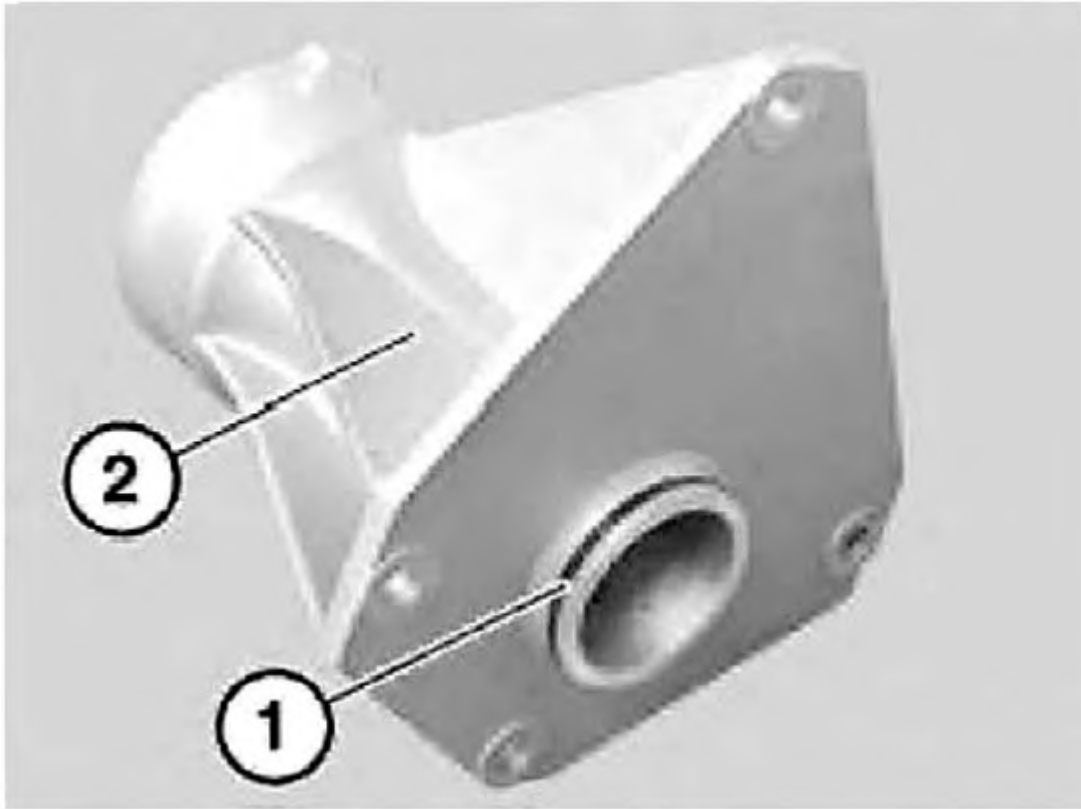
6. After completing work, open filler plug and check front axle differential fluid level. Fluid level should be up to lower edge of filler plug.



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Fig. 25: Removing Bearing Block

Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 26: Locating Sealing Ring On Bearing Block
Courtesy of BMW OF NORTH AMERICA, INC.

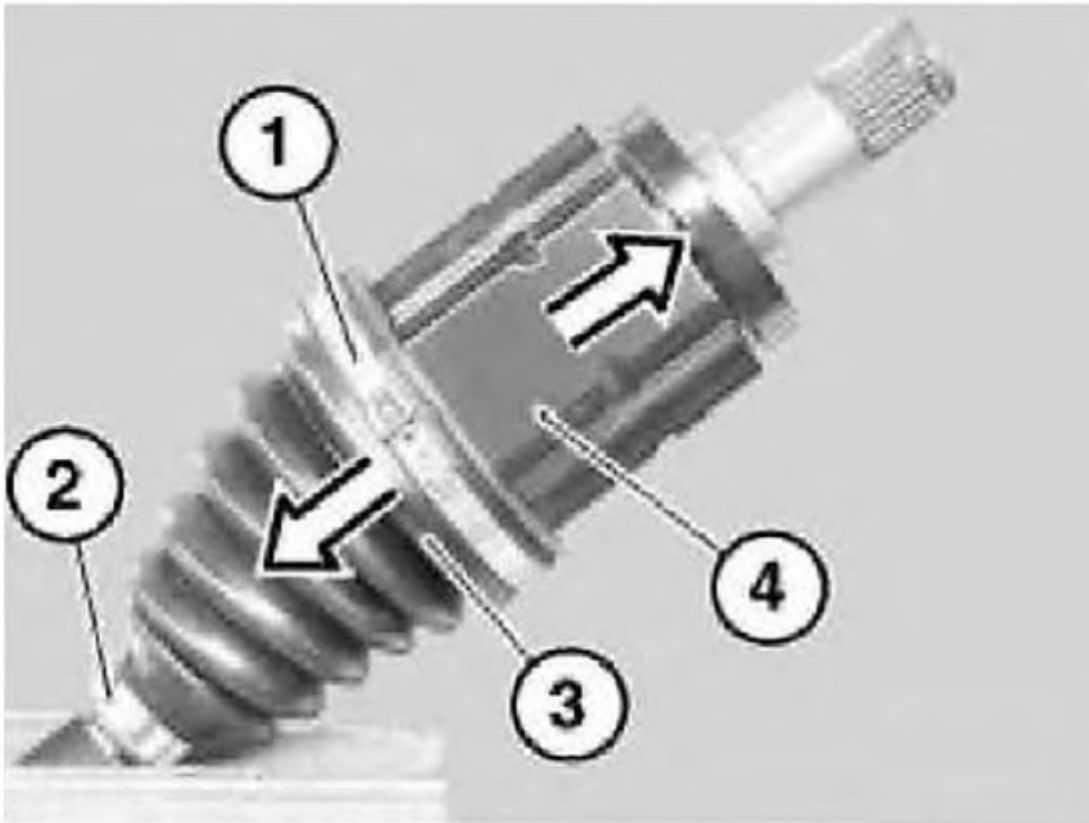
INNER CV JOINT BOOTS

NOTE: Use rubber boot repair kit.

Removal & Installation

1. Remove affected axle shaft. See **DRIVE AXLE SHAFTS (FRONT)** or **AXLE SHAFTS (REAR)** .
2. Release retainers (1 and 2). Pull back gaiter (3). Detach tulip element (4). See **Fig. 27** .
3. Remove retaining ring (1). Detach tripod star (2) from splined shaft (3). See **Fig. 28** .
4. Pull off rubber boot over splined shaft.
5. Carefully clean all parts with a cloth.
6. Installation is reverse of removal.
7. Before pushing boot onto splined shaft, assemble boot (1) and boot adapter (2). See **Fig. 29** .
8. Note installation position of tripod star (1). Install flat side (2) of tripod star (1) to retaining ring. See **Fig. 30** .
9. Install NEW retaining ring.

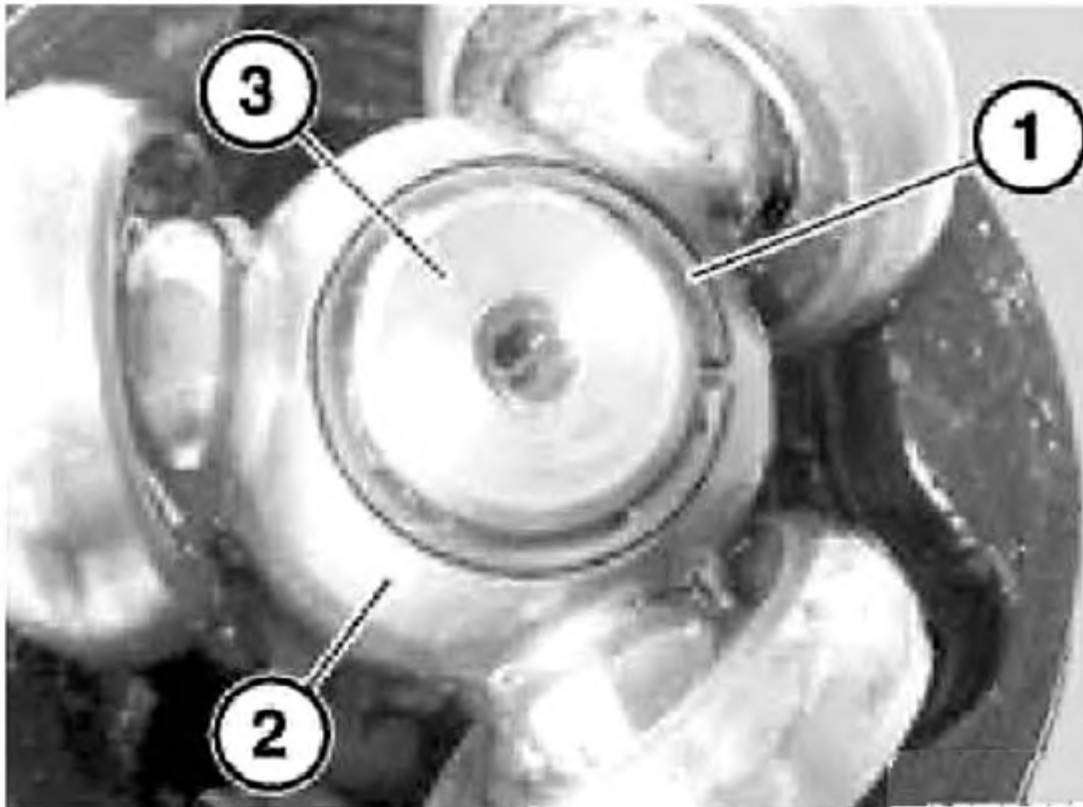
10. Regrease constant velocity joint with fresh grease from repair kit.



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Fig. 27: Locating Boot Components

Courtesy of BMW OF NORTH AMERICA, INC.

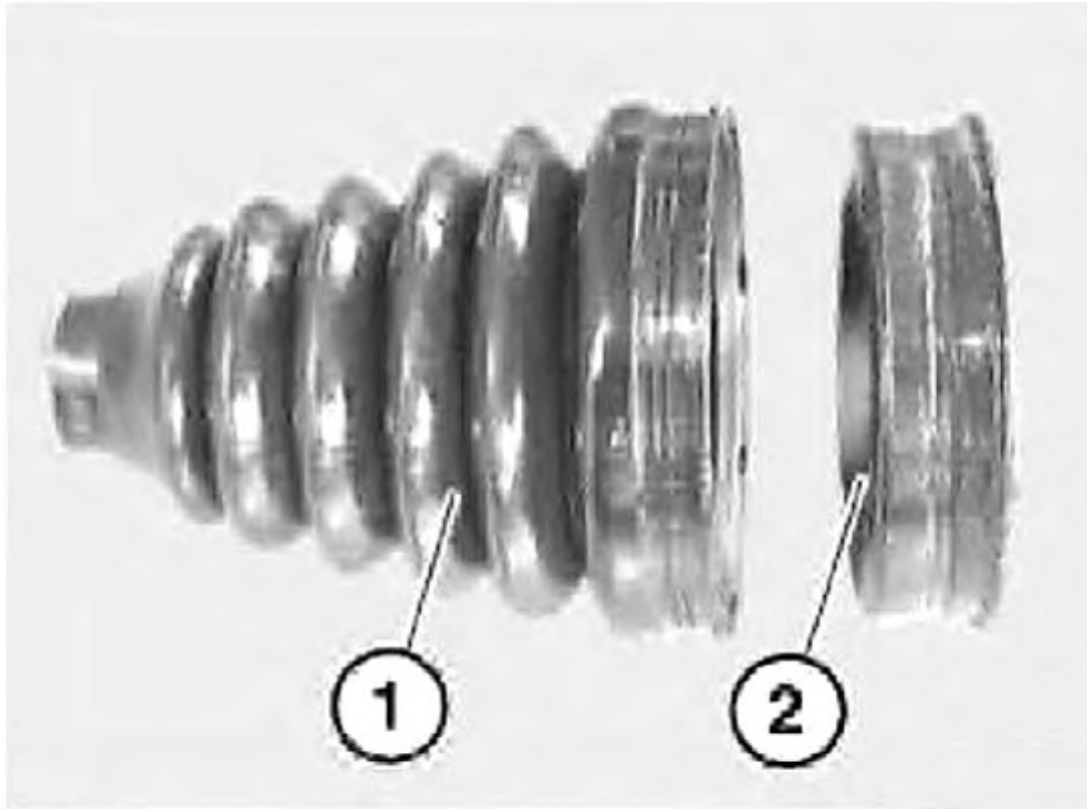


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Fig. 28: Locating Tripod Star Components
Courtesy of BMW OF NORTH AMERICA, INC.

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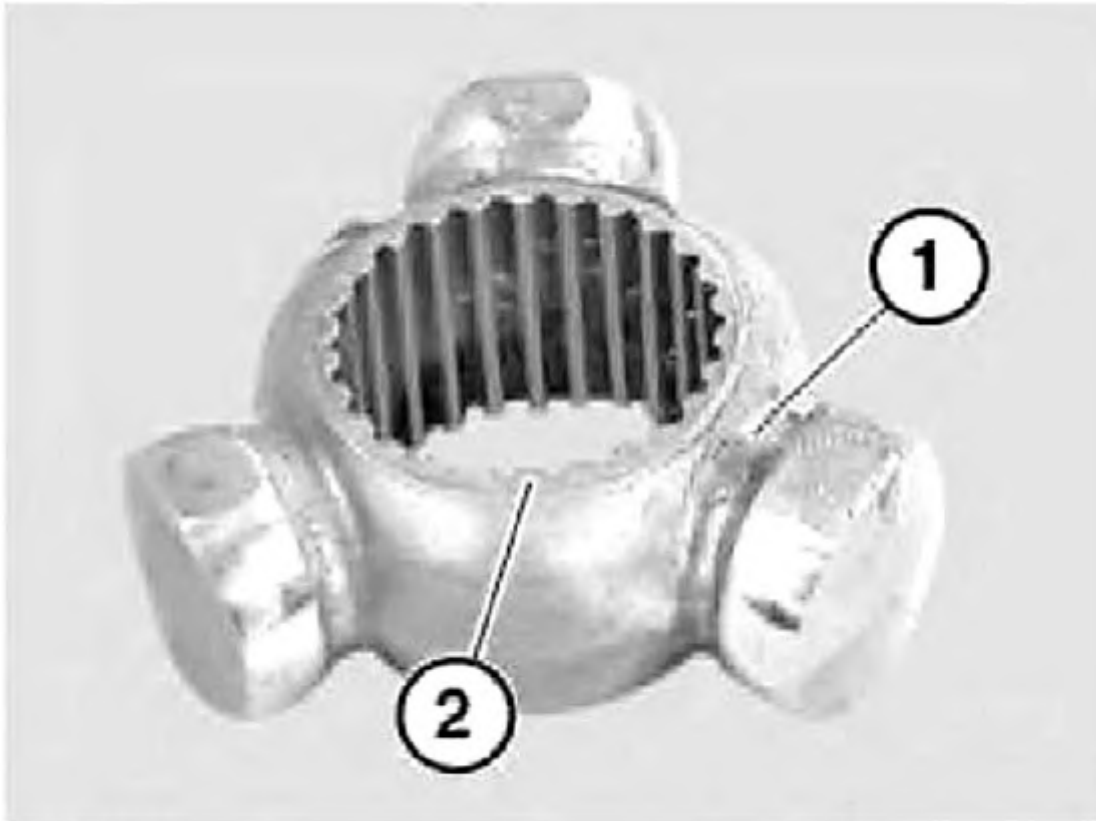
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Fig. 29: Identifying Boot & Adapter

Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 30: Locating Tripod Star Installation Position
Courtesy of BMW OF NORTH AMERICA, INC.

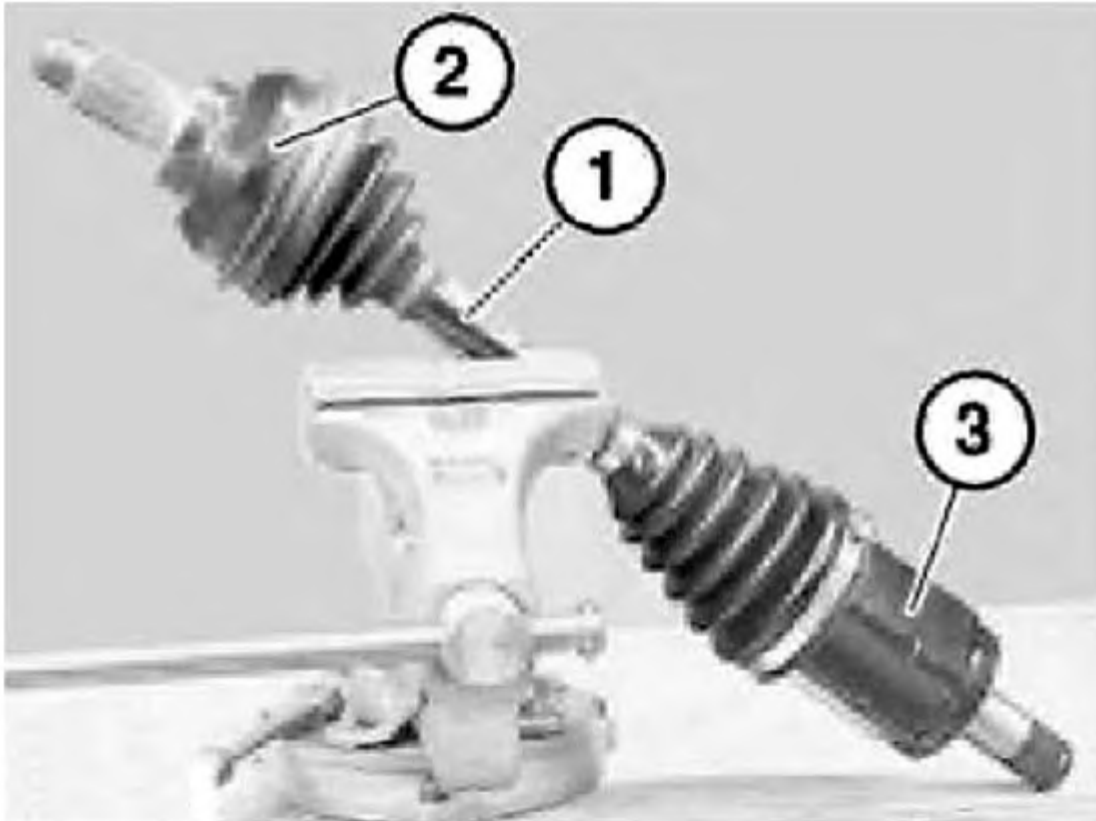
OUTER CV JOINT BOOTS

NOTE: Use rubber boot repair kit.

Removal & Installation

1. Remove affected axle shaft. See **DRIVE AXLE SHAFTS (FRONT)** or **AXLE SHAFTS (REAR)** .
2. Clean axle shaft.
3. Grip axle shaft (1) in vise with protective jaws. Joint (2) is wheel side and joint (3) is transmission side. See **Fig. 31** .
4. Release retainers (1 and 2) and pull back boot (3). See **Fig. 32** .
5. Press off joint (1) via contact pressure of retaining ring on shaft (2). See **Fig. 33** .
6. Lever out retaining ring (1). See **Fig. 34** .
7. Pull off boot (1) over splined shaft (2). See **Fig. 35** .
8. Carefully clean all parts with a cloth.
9. Installation is reverse of removal.

10. Regrease constant velocity joint with fresh grease from repair kit.
11. Install new retaining ring.
12. Push on joint until retaining ring can be heard to snap into place.



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Fig. 31: Locating Axle Shaft Components
Courtesy of BMW OF NORTH AMERICA, INC.

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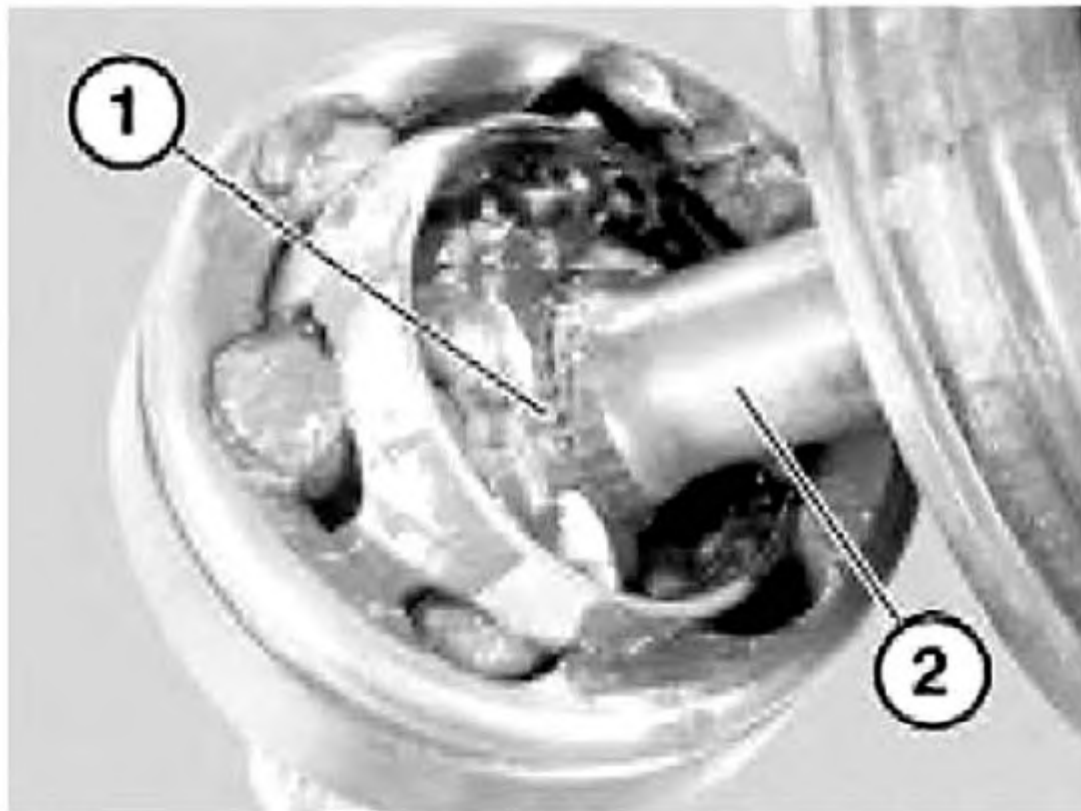
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Fig. 32: Locating Retainers

Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 33: Pressing Off Joint

Courtesy of BMW OF NORTH AMERICA, INC.

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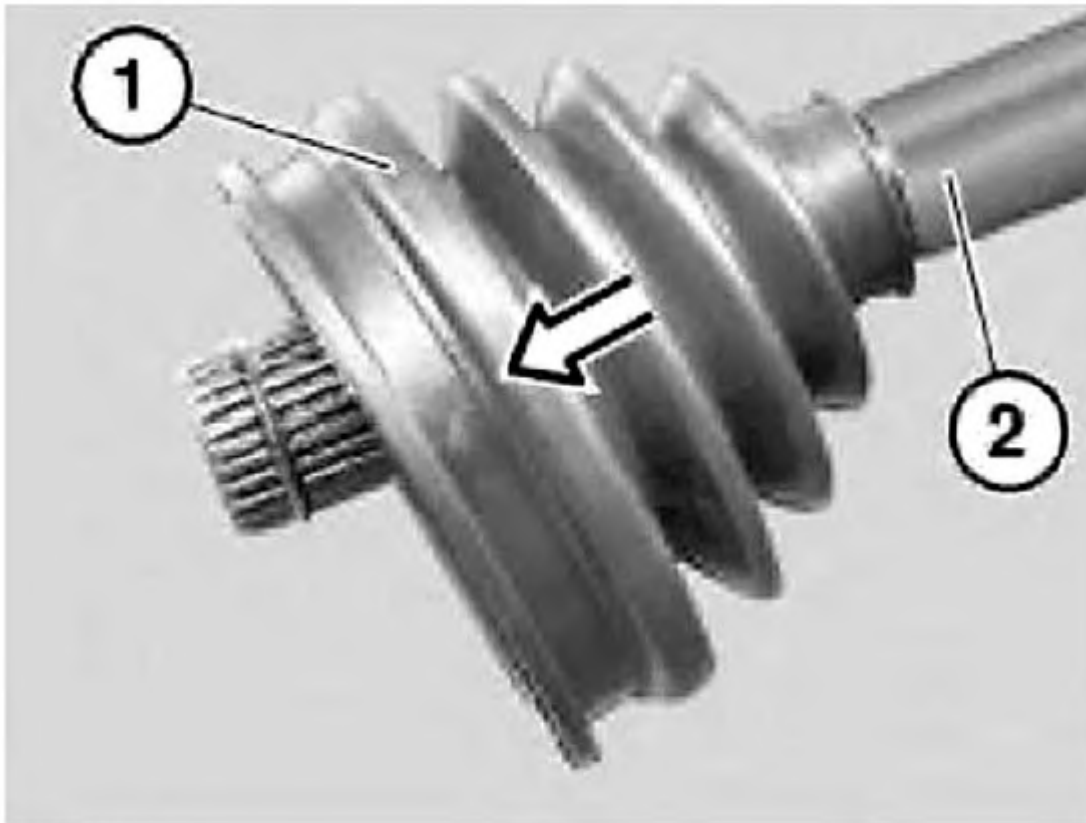
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Fig. 34: Locating Retaining Ring

Courtesy of BMW OF NORTH AMERICA, INC.

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Fig. 35: Pulling Off Boot

Courtesy of BMW OF NORTH AMERICA, INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

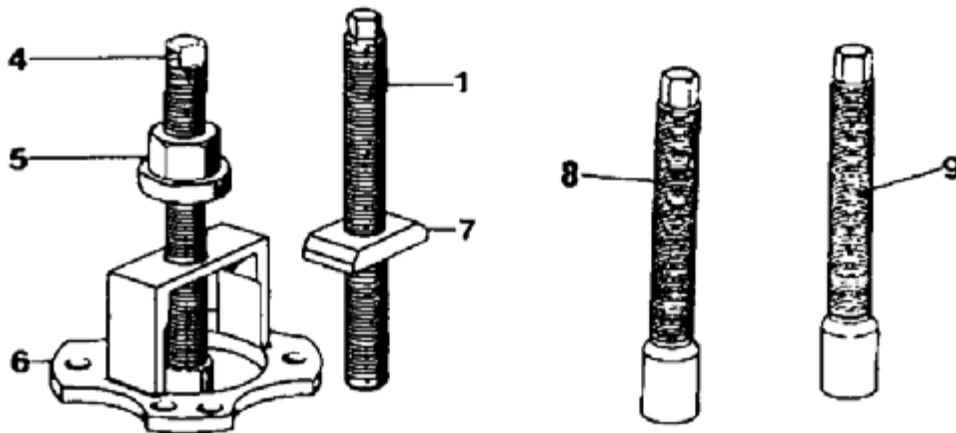
Application	Ft. Lbs. (N.m)
Axle Shaft Collar Nut	310 (420)
Axle Shaft Console To Engine Oil Sump	16 (22)
Axle Shaft To Final Drive Unit & Drive Flange	
8 mm With Ribbed Teeth	47 (64)
10 mm Black With Ribbed Teeth	74 (100)
10 mm Fillister or Torx Head	61 (83)
10 mm Silver With Ribbed Teeth	59 (80)
10 mm With Locking Teeth	71 (96)
12 mm With Ribbed Teeth	100 (135)
Brake Caliper To Steering Knuckle	81 (110)
Control Arm On Steering Knuckle/Swivel Bearing	59 (80)
Guide Joint To Swivel Bearing	59 (80)

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Guide Joint To Tension Strut	59 (80)
Rear Muffler To Intermediate Muffler	22 (30)
Reinforcement Plate To Front Axle Support/Engine Carrier	41 (56)
Spring Strut Shock Absorber To Pivot Mount	184 (250)
Tie Rod End Nut	59 (80)
Inch Lbs. (N.m)	
Pulse Generator To Swivel Bearing/Wheel Carrier	71 (8)

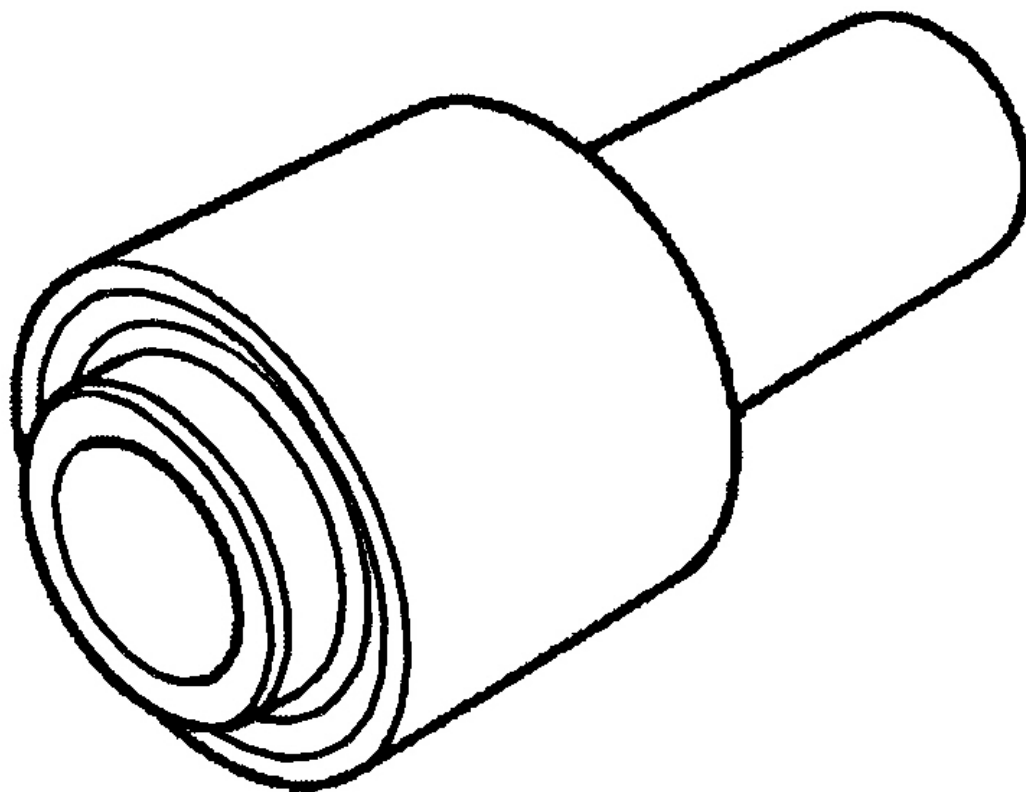
SPECIAL TOOLS



- 1 = 33 2 111 Pressure spindle 7 = 33 2 117 Threaded piece
4 = 33 2 114 Spindle 8 = 33 2 118 Spindle for fitting
5 = 33 2 115 Nut with bearing 9 = 33 2 119 Spindle
6 = 33 2 116 Bridge

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Fig. 36: Identifying Removal & Installation Tool (33 2 110)
Courtesy of BMW OF NORTH AMERICA, INC.

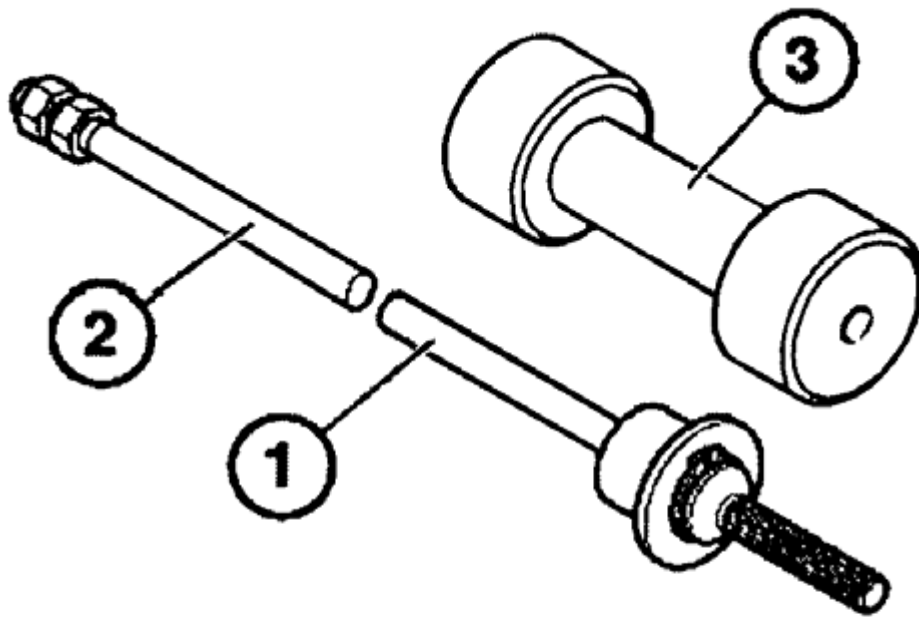


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Fig. 37: Identifying Set Of Impact Drifts (31 5 130)
Courtesy of BMW OF NORTH AMERICA, INC.

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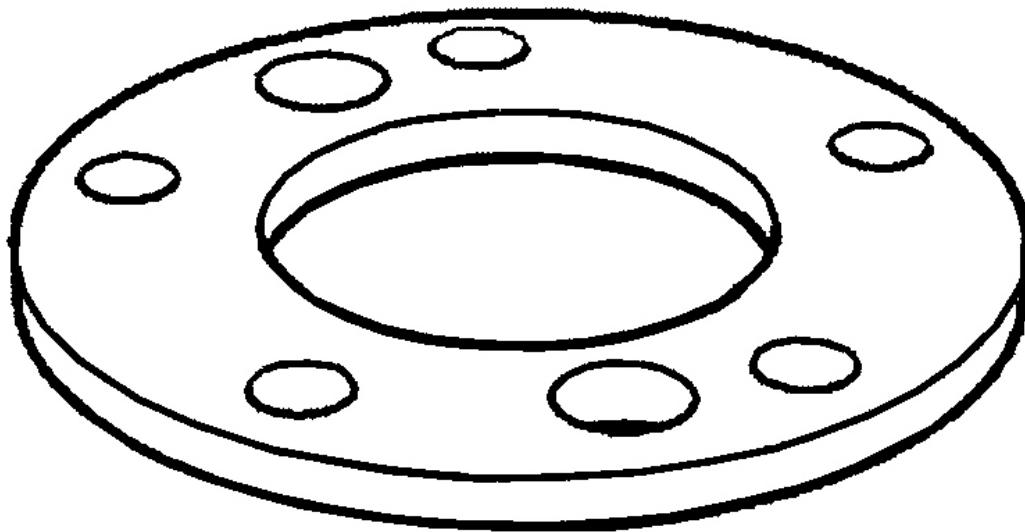
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- | | | |
|---|------------|------------------------------|
| 1 | = 33 4 201 | Striker rod with grip |
| 2 | = 33 4 202 | Striker rod |
| | | Note: With end piece and nut |
| 3 | = 33 4 203 | Weight |

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Fig. 38: Identifying Set Of Tools (33 4 200)
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 39: Identifying Spacer Ring (33 2 150)
Courtesy of BMW OF NORTH AMERICA, INC.