

2007-08 SUSPENSION**Rear Axle - Repair Instructions - X5****00 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.

00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN**Danger of injury!**

Contact with eyes or skin may result in injury!

Possible symptoms are:

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

Protective measures/rules of conduct:

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

First aid measures:

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

NOTE: Do not use solvents/thinners.

00 SAFETY INSTRUCTIONS FOR HANDLING OIL

WARNING: See 00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN and 00 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.

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

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

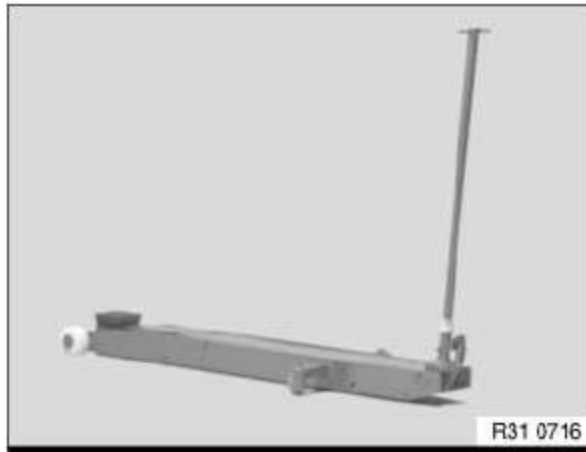


Fig. 1: Identifying Trolley Jack
Courtesy of BMW OF NORTH AMERICA, INC.

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

1. Car jacking point
2. Side car jacking points
3. Rear differential

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

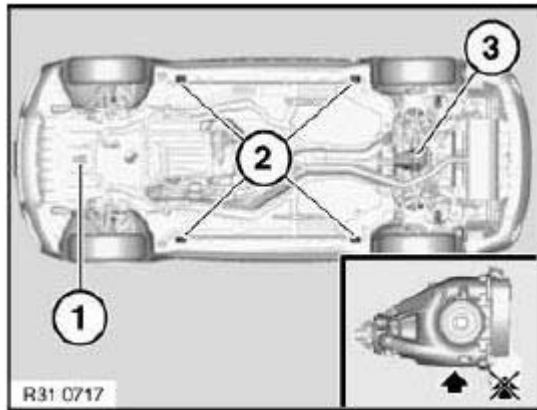
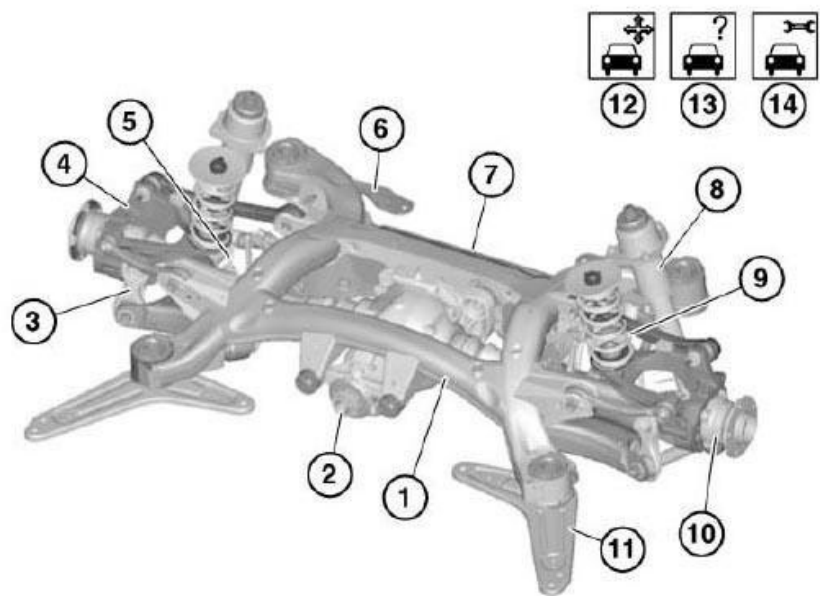


Fig. 2: Identifying Car Jacking Point
Courtesy of BMW OF NORTH AMERICA, INC.

33 . . . REAR AXLE LAYOUT

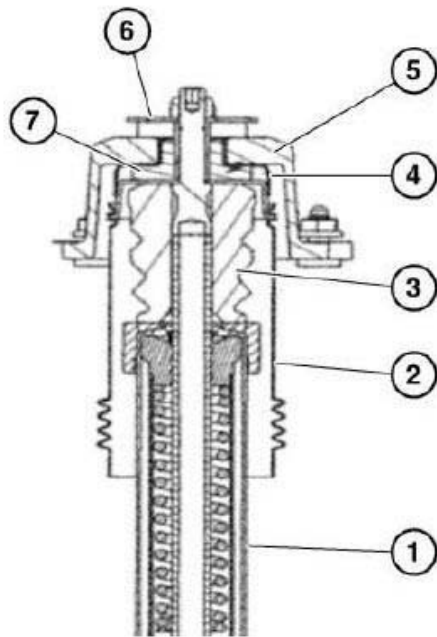


R33 0656

1	Overview, rear axle carrier with rubber mount	11	Compression strut, front
2	Overview of rear differential/output shafts	12	Adjustment work
3	Overview of steering links	13	Troubleshooting
4	Wheel carrier	14	Testing
5	Stabilizer link		
6	Compression strut, rear		
7	Stabilizer / rubber mount		
8	Shock absorber		Overview of ride-height control system
9	Coil spring		Overview, Dynamic Drive
10	Wheel bearing / drive flange		Overview, vertical dynamics management

Fig. 3: Identifying Rear Axle Components
Courtesy of BMW OF NORTH AMERICA, INC.

33 ... LAYOUT OF SHOCK ABSORBER



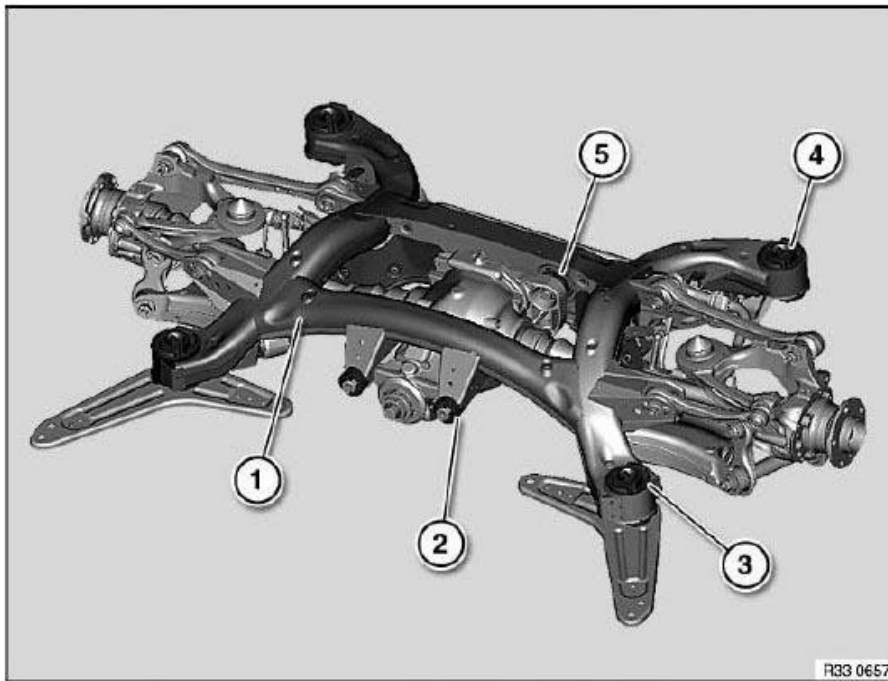
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- | | | | |
|---|-------------------------|---|------------------------|
| 1 | <u>Shock absorber</u> | 5 | Support bearing flange |
| 2 | <u>Protective tube</u> | 6 | Joint seat |
| 3 | <u>Auxiliary damper</u> | 7 | <u>Thrust bearing</u> |
| 4 | Support pot | | |

Fig. 4: Layout Of Shock Absorber

Courtesy of BMW OF NORTH AMERICA, INC.

33 ... OVERVIEW OF REAR AXLE CARRIER WITH RUBBER MOUNTS

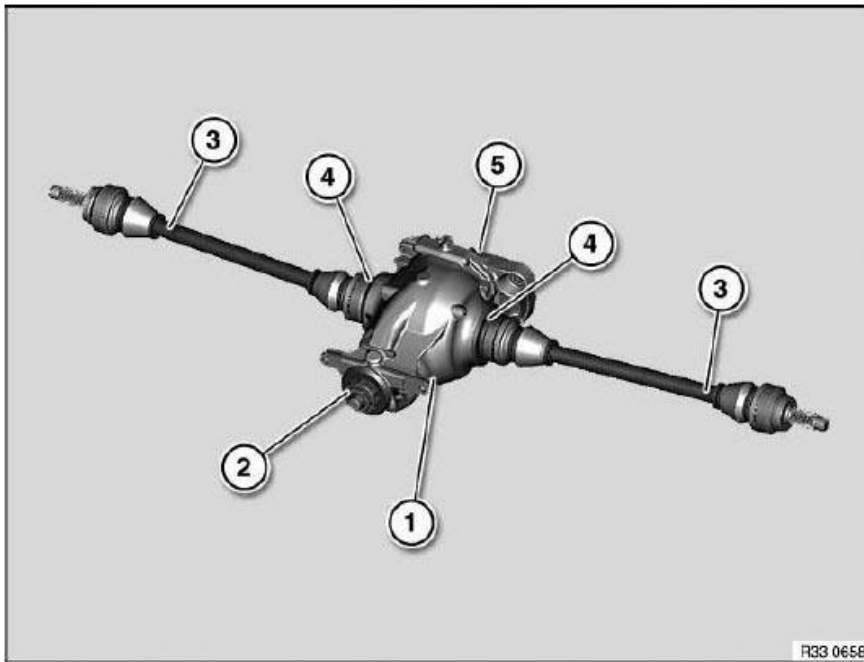


- | | | |
|---|--|---|
| 1 | <u>Rear axle carrier</u> | 4 |
| 2 | <u>Rear differential rubber mount, front</u> | 5 |
| 3 | <u>Rear axle carrier rubber mount, front</u> | |

- | |
|---|
| <u>Rear axle carrier rubber mount, rear</u> |
| <u>Rear differential rubber mount, rear</u> |

Fig. 5: Overview Components Of Rear Axle Carrier With Rubber Mounts
 Courtesy of BMW OF NORTH AMERICA, INC.

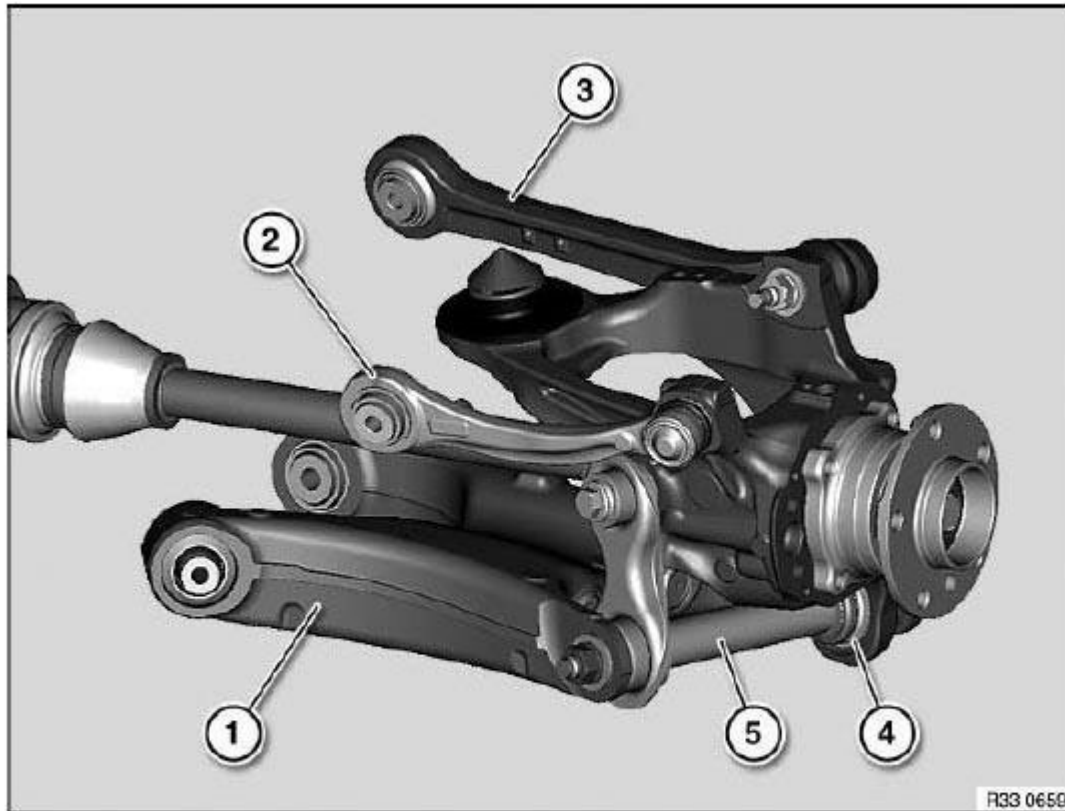
33 ... OVERVIEW OF REAR DIFFERENTIAL/OUTPUT SHAFTS



- | | | | |
|---|----------------------------------|---|------------------------------------|
| 1 | <u>Rear differential</u> | 4 | <u>Shaft seal</u> |
| 2 | <u>Shaft seal</u> | 5 | Cover (incl. <u>cover gasket</u>) |
| 3 | <u>Output shaft (left/right)</u> | | |

Fig. 6: Overview Components Of Rear Differential/Output Shafts
 Courtesy of BMW OF NORTH AMERICA, INC.

33 ... OVERVIEW OF STEERING LINKS



- 1 Swinging arm
- 2 Traction strut
- 3 Control arm

- 4 Ball joint
- 5 Integral link

Fig. 7: Overview Components Of Steering Links

Courtesy of BMW OF NORTH AMERICA, INC.

33 00 ... INFORMATION ON REPLACING SHOCK ABSORBERS

Facts:

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.

E32, E34, E38, E39 : In the case of rear spring struts with ride-height control, there is always a slight oil spillage on the piston rod. These spring struts are permitted to be wet with oil over a maximum of half the shock absorber length on the outer tube, i.e. they are permitted to "sweat".

Consequence:

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

Procedure:

Shock absorbers may be replaced on one side only until they have completed 50 000 km service.

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

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

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

33 00 ... NOTES ON REPAIRING THREADS

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

NOTE: Damaged threads in the frame side member may be repaired with Helicoil thread inserts. Comply with the procedure described in the example. See 31 00 ... NOTES ON REPAIRING THREADS .



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

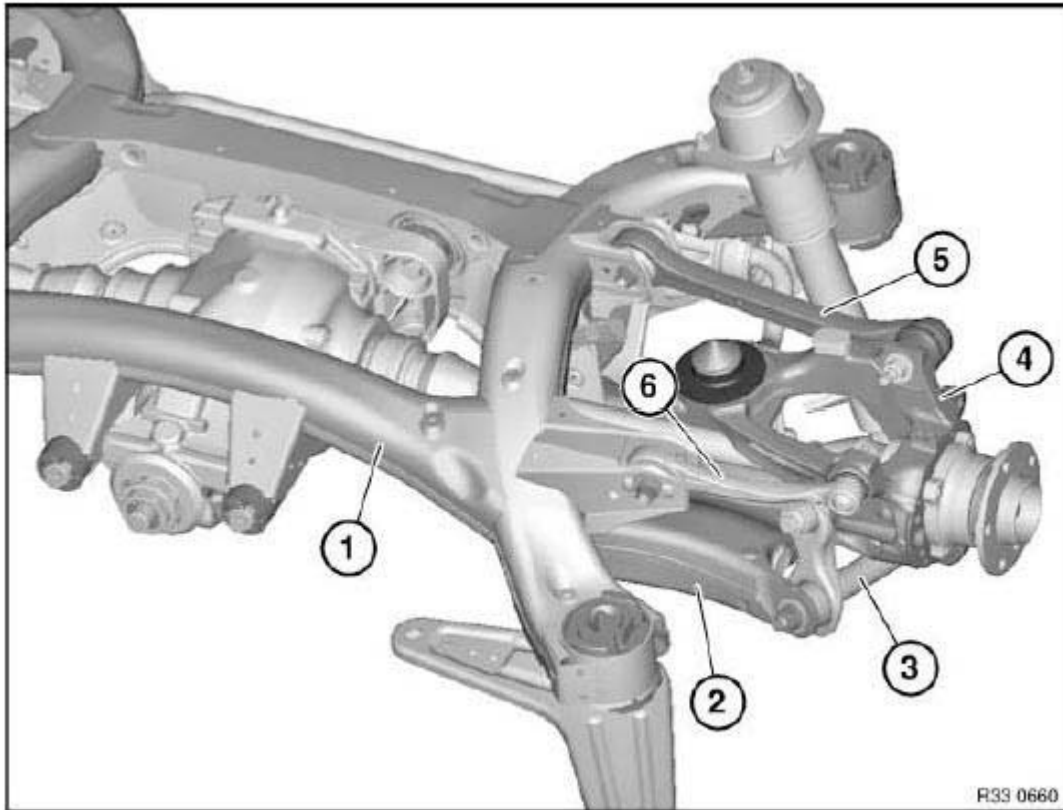
33 00 ... REAR AXLE: WHEEL/CHASSIS ALIGNMENT CHECK MUST BE CARRIED OUT AFTER THE FOLLOWING WORK

Fig. 9: Identifying Rear Axle Wheel/Chassis Alignment Components
Courtesy of BMW OF NORTH AMERICA, INC.

A wheel/chassis alignment check (see **32 00 ... CHASSIS/WHEEL ALIGNMENT CHECK PROCEDURE**) must be carried out after the following work:

- Release of following screw/bolt connections:
 - Swinging arm, front/rear, to rear axle carrier
 - Swinging arm to integral link / wheel carrier
 - Integral link to wheel carrier
 - Guide arm to rear axle carrier
 - Control arm to rear axle carrier
- Replacement of following parts:
 1. Rear axle carrier
 2. Swinging arm
 3. Integral link
 4. Wheel carrier / ball joint

5. Control arm
6. Guide arm

51 71 505 MOUNT SECURING FIXTURE FOR VEHICLE ON LIFTING PLATFORM**Special tools required:**

- 00 2 261
- 00 2 262

WARNING: Danger to life!

Mount securing fixture for vehicle on lifting platform to prevent the vehicle from slipping off or tilting down.

Observe the following directions and instructions when handling the special tool:

- 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. Keep special tools dry, clean and free of grease.**
- 5. Impact screwdrivers may not be used!**

IMPORTANT: Risk of corrosion!

Touch up paintwork damage.

Re-establish wax layer.

Remove vehicle jack fixture with a suitable tool from side frame.

Installation:

Check fixture for damage, replace if necessary.

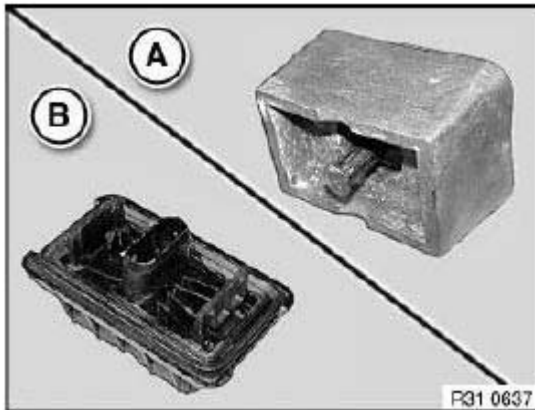


Fig. 10: Identifying Vehicle Jack Fixture
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Following states can be selected on special tool 00 2 261 .

- A. Vehicle unsecured
- B. Vehicle secured (after special tool is lashed to lifting platform arm)

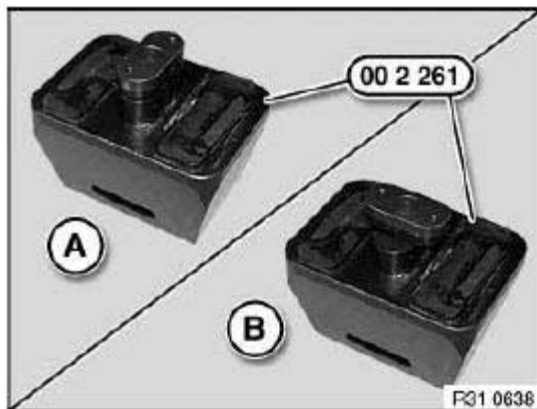


Fig. 11: Identifying Vehicle Jack Fixture And Special Tool (00 2 261)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: The following procedure must always be carried out on the left and right sides.

Insert special tool 00 2 261 into opening in side frame with 3/8" extension and secure ratchet to body. To do so, turn lock through 90° up to stop.

WARNING: Danger to life!

Check stopping of special tool 00 2 261 on side frame, correct attachment if necessary.

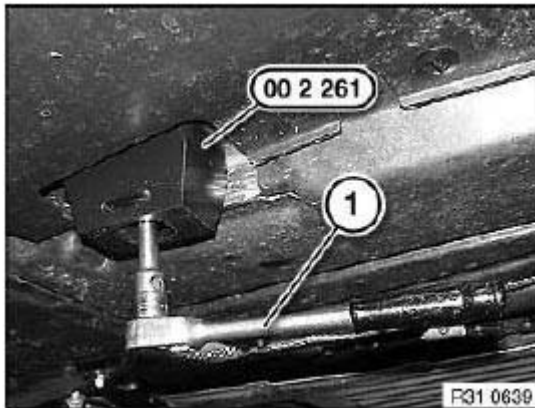


Fig. 12: Identifying Special Tool (00 2 261)

Courtesy of BMW OF NORTH AMERICA, INC.

Lash special tool 00 2 261 with tensioning strap 00 2 262 crosswise (as pictured) to lifting platform arm.

WARNING: Danger to life!

Carry out tensile and visual inspection of tensioning strap 00 2 262 , correct position if necessary.

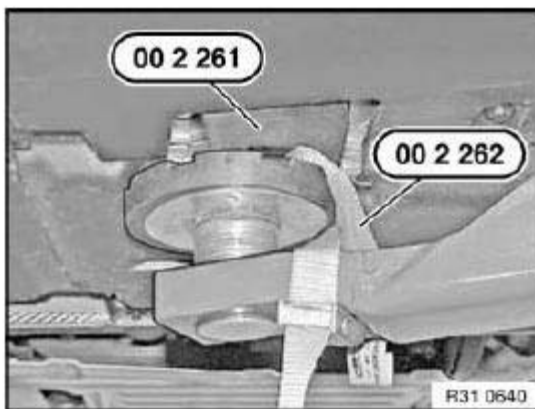


Fig. 13: Identifying Special Tool (00 2 261) And (00 2 262)

Courtesy of BMW OF NORTH AMERICA, INC.

10 FINAL DRIVE

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

WARNING: See 00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN and 00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN.

To avoid serious damage to the rear differential, it is essential to use only approved transmission oils in the rear differential. See AUTOMATIC TRANSMISSION - 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:

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

Tightening torque. See REAR AXLE - TIGHTENING TORQUES .

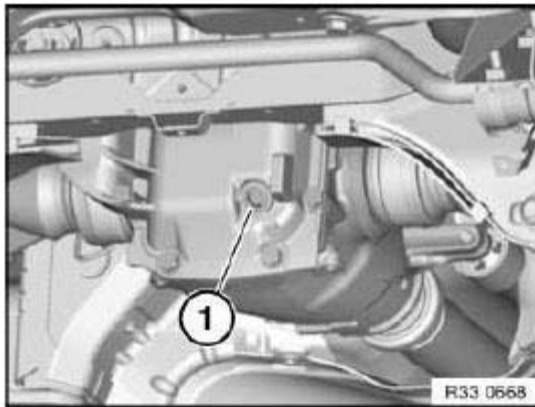


Fig. 14: Identifying Oil Filler Plug

Courtesy of BMW OF NORTH AMERICA, INC.

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

WARNING: See 00 DANGER OF POISONING IF OIL IS INGESTED/ABSORBED THROUGH THE SKIN and 00 RISK OF INJURY IF OIL COMES INTO CONTACT WITH EYES AND SKIN.

IMPORTANT: Risk of damage!

To avoid serious damage to the rear differential, it is essential to use only approved transmission oils in the rear differential. See AUTOMATIC TRANSMISSION - OPERATING FLUIDS .

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

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

Recycling:

Observe country-specific waste-disposal regulations

Undo oil filler plug (1).

Drain and dispose of differential oil.

Add differential oil up to lower edge of opening for oil filler plug (1); if necessary, refill oil.

Installation:

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

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

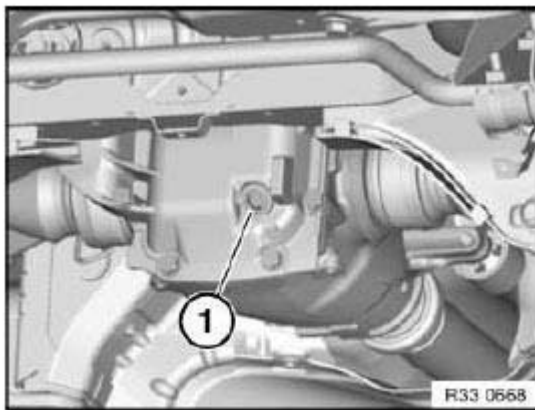


Fig. 15: Identifying Oil Filler Plug

Courtesy of BMW OF NORTH AMERICA, INC.

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

REAR DIFFERENTIAL ASSIGNMENT

Model series	Engine	Rear differential	Remark
E70	N52	188K / 188L / 188LW	
	N62TU, M57T2 (3.0d)	188L / 188LW	without S233A
	N62TU, M57T2 (3.0d)	215L / 215LW	with S233A
K Compact			
L Light-running			
LW Light-running, efficiency-optimized			

33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL

Special tools required:

- 33 5 120
- 33 5 122
- 33 5 125
- 33 5 200
- 33 5 206

WARNING: Danger of injury!

Rear differential must be lashed with tightening strap 33 5 206 to prevent it falling out when the output shafts are forced off.

Necessary preliminary tasks:

- Remove propeller shaft on rear differential . See **26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY** .

Position special tool 33 5 200 on workshop jack.

Support rear differential with special tool 33 5 200 .

Lash rear differential with tightening strap 33 5 206 to special tool 33 5 200 .

IMPORTANT: Tightening strap 33 5 206 must be pass through between output shafts and rear differential cover!

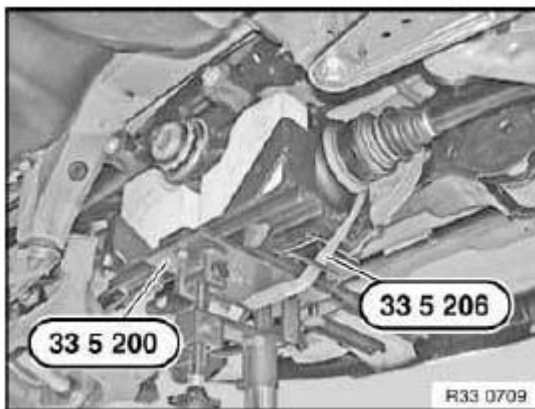


Fig. 16: Identifying Special Tool (33 5 200) And (33 5 206)
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

To prevent the rubber mounts from overstretching when the bolts are pulled out, ensure the bolts remains in the rubber mounts.

Installation:

Adhere to the installation sequence at the end of the document in order to prevent distortion of the rear differential during installation and thereby avoid potential complaints about noise.

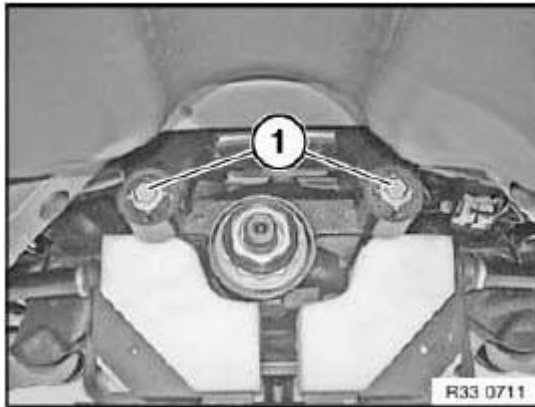


Fig. 17: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Release nut and remove bolt (1) towards front.

Installation:

Adhere to the installation sequence at the end of the document in order to prevent distortion of the rear differential during installation and thereby avoid potential complaints about noise.

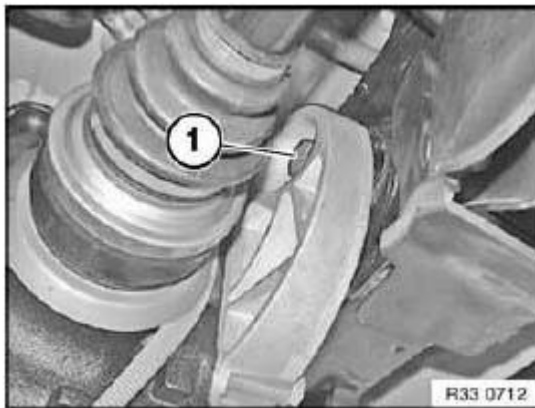


Fig. 18: Identifying Bolt

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

Output shafts must not under any circumstances rest on swinging arms.

330 of 3160

Tape off output shafts or place a cloth on swinging arm.

Lower rear differential slowly with aid of workshop jack and press to one side.



Fig. 19: Identifying Output Shafts

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!

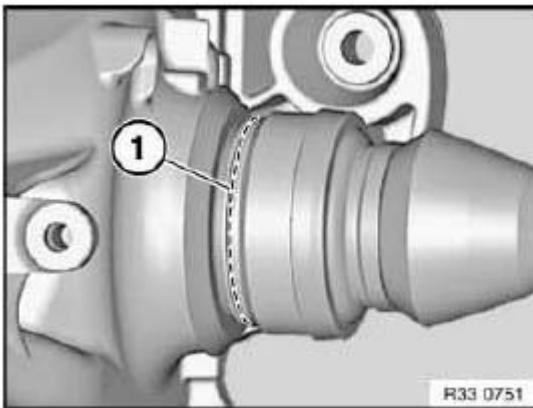


Fig. 20: Identifying All-Round Slot On Output Shaft

Courtesy of BMW OF NORTH AMERICA, INC.

Press output shaft by jerks and jolts with special tool 33 5 120 out of rear differential. Here, thrust piece of bolt 33 5 122 must rest on rear differential.

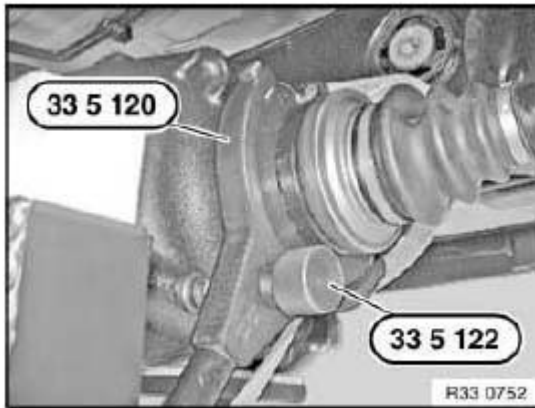


Fig. 21: Identifying Special Tools (33 5 120) And (33 5 122)

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: In order to ensure correct locking of the output shaft in the rear differential, make sure when driving in the output shaft that the tightening strap 33 5 206 is not located between the rear differential and the dust plate!

Installation:

Drive output shaft with special tool 33 5 125 and a rubber mallet into rear differential.

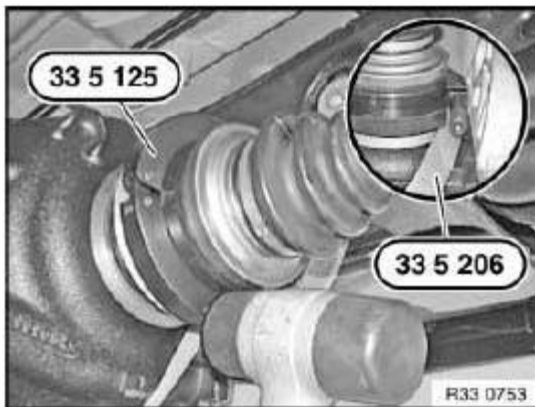


Fig. 22: Identifying Special Tools (33 5 125) And (33 5 206)

Courtesy of BMW OF NORTH AMERICA, INC.

Feed output shaft out of rear differential and tie up.

Installation:

Replace shaft seal(s) for output shaft(s) . See **33 10 021 REPLACING SHAFT SEAL(S) FOR OUTPUT SHAFT(S), REAR AXLE DIFFERENTIAL.**

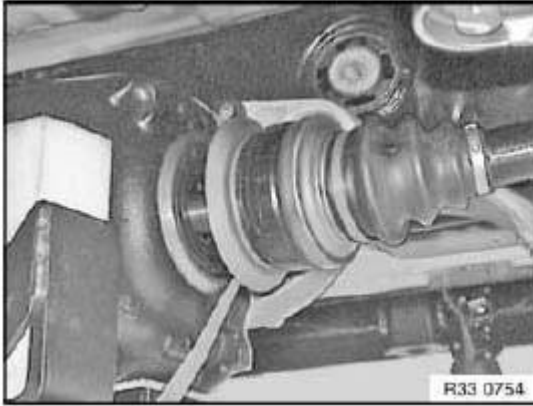


Fig. 23: Identifying Output Shaft Of Rear Differential
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: High installation forces indicate that the output shaft spline teeth are damaged or deformed!

Installation:

Check spline teeth, replaced damaged parts if necessary.

Check dust plate (1) for damage, replace if necessary.

Replace retaining ring (2).

Coat highlighted contact surface (3) of output shaft with approved rear differential oil . See **REAR AXLE - OPERATING FLUIDS** .

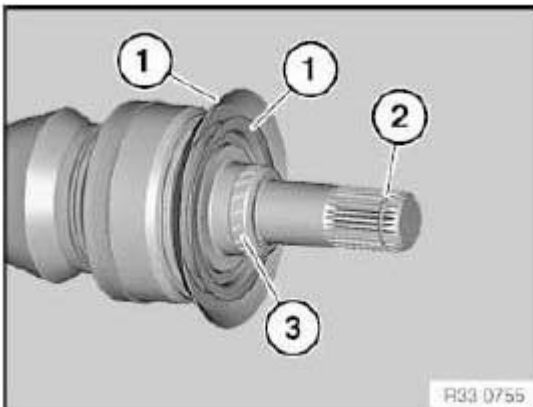


Fig. 24: Identifying Dust Plate, Retaining Ring And Contact Surface
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Insert output shaft into rear differential.

Pull out assembly protection ring at lug (1) until one of the two programmed rupture points gives.

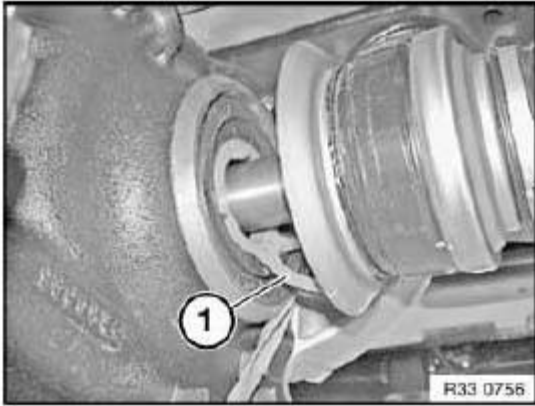


Fig. 25: Identifying Ring At Lug

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Repeat procedure on the other side, remove rear differential with a second person helping from special tool and set down on a suitable surface.

Installation sequence:

1. Install rear differential with workshop lifter and special tool 33 5 200 in rear axle carrier
2. Insert bolts (1) (do not tighten down)
3. Insert bolt from rear and replace nut (2) (do not tighten down)
4. Release tightening strap, lower special tool 33 5 200 and move away
5. Tighten down bolts (1)

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

6. Tighten nut (2)

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

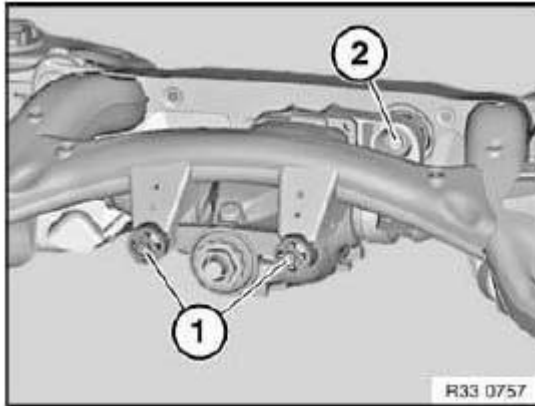


Fig. 26: Identifying Bolts And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check rear differential oil level , correct if necessary. See **00 11 ... CHECKING/TOPPING UP OIL LEVEL IN REAR DIFFERENTIAL** .

33 10 021 REPLACING SHAFT SEAL(S) FOR OUTPUT SHAFT(S), REAR AXLE DIFFERENTIAL

Special tools required:

- 00 5 010
- 32 1 060
- 33 1 308
- 33 5 130
- 33 5 140

Necessary preliminary tasks:

- Remove rear differential . See **33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL**.

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

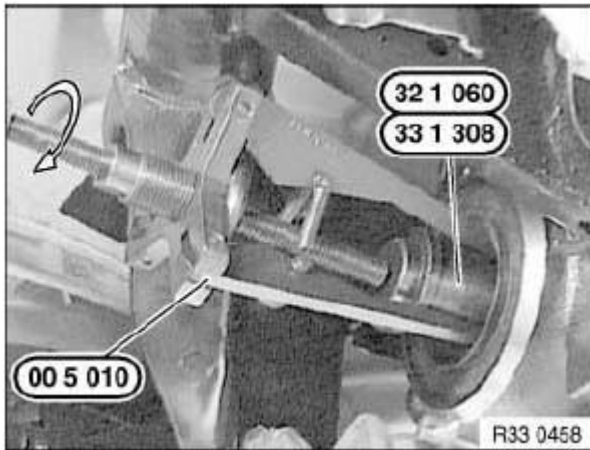


Fig. 27: Identifying Special Tools (00 5 010), (32 1 060) And (33 1 308)
 Courtesy of BMW OF NORTH AMERICA, INC.

Installing new shaft seal:

NOTE: The installation protective ring (1) serves to protect the sealing lips on shaft seal (2) when the output shaft is being installed.

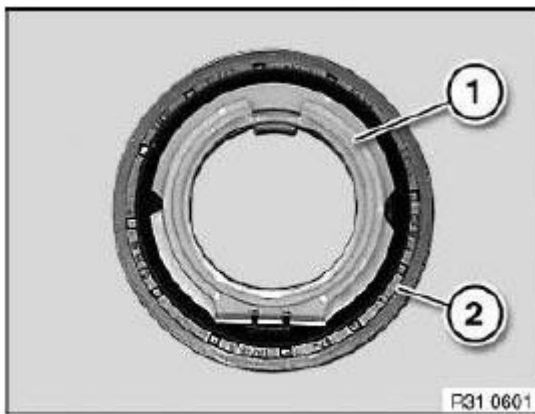


Fig. 28: Identifying Protective Ring And Shaft Seal
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Installation protective ring must not slip out of shaft seal!

Coat housing plate flange of shaft seal with approved rear differential oil . See **REAR AXLE - OPERATING FLUIDS** .

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

33 5 140: 215L/LW - 100x50x10

Carefully remove special tool.

Open installation protective ring (1).

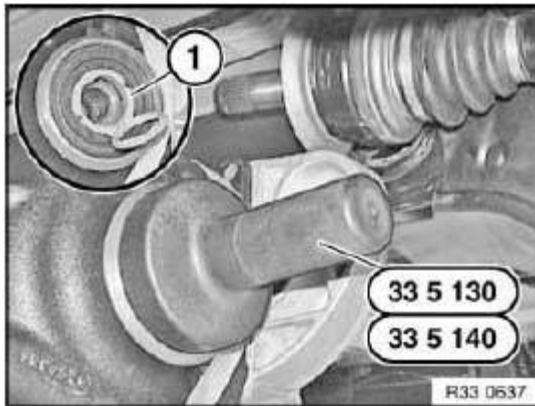


Fig. 29: Identifying Protective Ring And Special Tools

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check rear differential oil level , correct if necessary. See **00 11 ... CHECKING/TOPPING UP OIL LEVEL IN REAR DIFFERENTIAL** .

11 FINAL DRIVE WITH COVER

33 10 021 REPLACING SHAFT SEAL(S) FOR OUTPUT SHAFT(S), REAR AXLE DIFFERENTIAL

Special tools required:

- 00 5 010
- 32 1 060
- 33 1 308
- 33 5 130
- 33 5 140

Necessary preliminary tasks:

- Remove rear differential . See **33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL**.

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

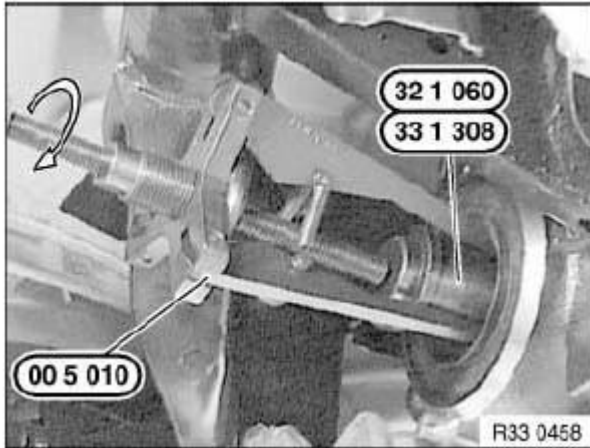


Fig. 30: Identifying Special Tools (00 5 010), (32 1 060) And (33 1 308)
 Courtesy of BMW OF NORTH AMERICA, INC.

Installing new shaft seal:

NOTE: The installation protective ring (1) serves to protect the sealing lips on shaft seal (2) when the output shaft is being installed.

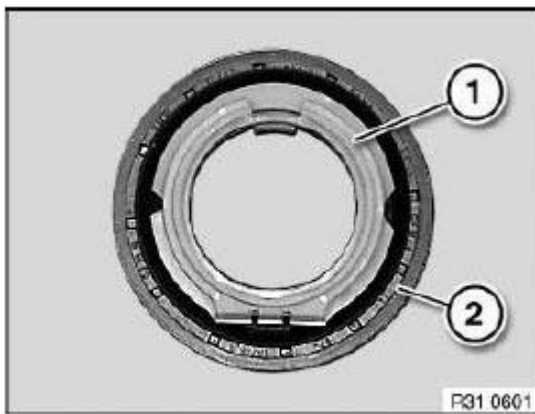


Fig. 31: Identifying Protective Ring And Shaft Seal
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Installation protective ring must not slip out of shaft seal!

Coat housing plate flange of shaft seal with approved rear differential oil . See **REAR AXLE - OPERATING FLUIDS** .

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

33 5 140: 215L/LW - 100x50x10

Carefully remove special tool.

Open installation protective ring (1).

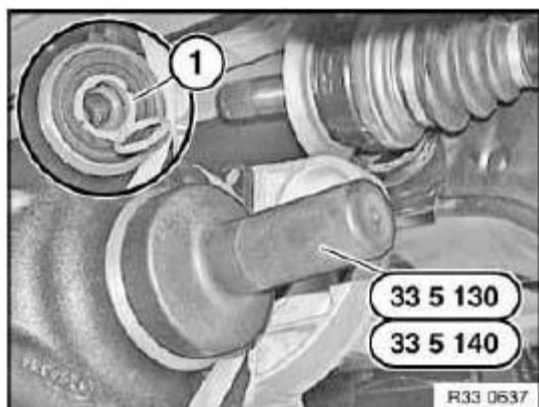


Fig. 32: Identifying Protective Ring And Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check rear differential oil level , correct if necessary. See **00 11 ... CHECKING/TOPPING UP OIL LEVEL IN REAR DIFFERENTIAL** .

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

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

Release screws (1).

Tightening torque (M10x75) 33 11 1AZ .

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

Unscrew screws (2).

Tightening torque (M10x25) 33 11 1AZ .

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

Remove cover.

If necessary, remove remnants of liquid gasket with scraper.

Clean sealing face on cover and rear differential.

Installation:

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

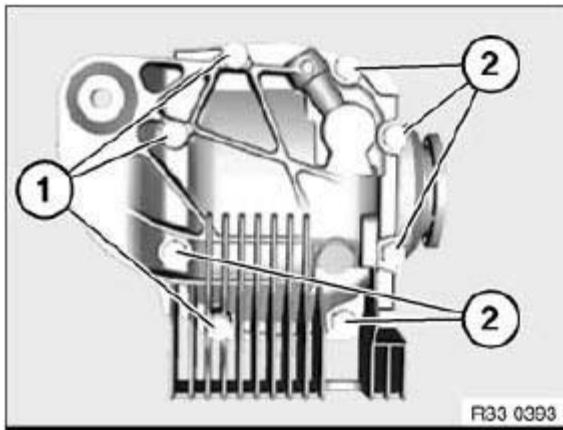


Fig. 33: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

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

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

Release screws (1).

Tightening torque (M10x60) 33 11 1AZ .

Tightening torque. See REAR AXLE - TIGHTENING TORQUES .

Unscrew screws (2).

Tightening torque (M10x25) 33 11 1AZ .

Tightening torque. See REAR AXLE - TIGHTENING TORQUES .

Remove cover.

If necessary, remove remnants of liquid gasket with scraper.

Clean sealing face on cover and rear differential.

Installation:

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

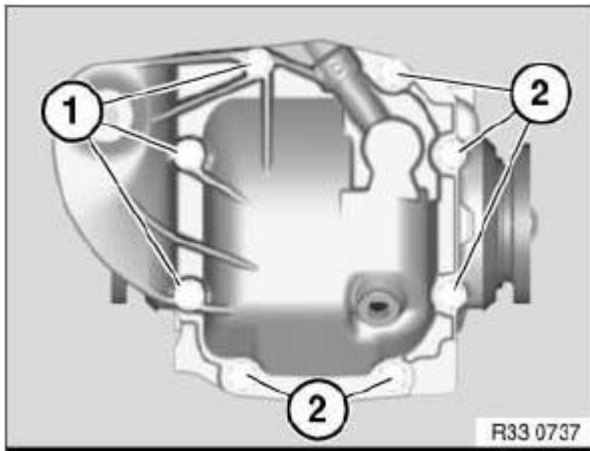


Fig. 34: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

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

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

Unscrew screws (1) and (2).

Tightening torque (M10x75) 33 11 1AZ .

Tightening torque (M10x25) 33 11 1AZ .

Tightening torque. See REAR AXLE - TIGHTENING TORQUES .

Remove cover.

If necessary, remove remnants of liquid gasket with scraper.

Clean sealing face on cover and rear differential.

Installation:

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

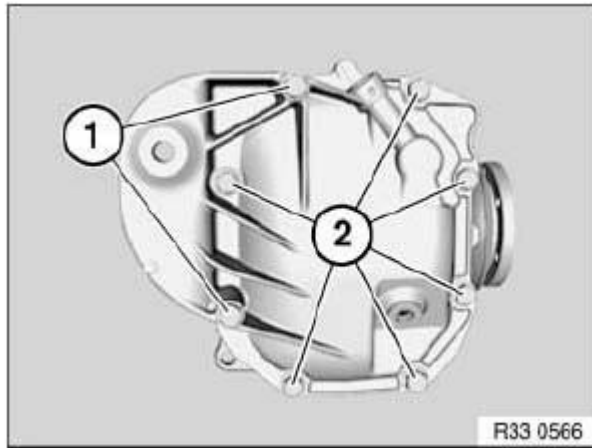


Fig. 35: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

33 11 021 REPLACING SHAFT SEAL FOR DRIVE FLANGE ON REAR DIFFERENTIAL (INSERTED PROPELLER SHAFT)

Special tools required:

- 00 5 010
- 33 5 050
- 33 5 060
- 33 5 070
- 33 5 080

IMPORTANT: Use only approved gear oils .

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

Necessary preliminary tasks:

- Remove propeller shaft . See **26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY** .

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

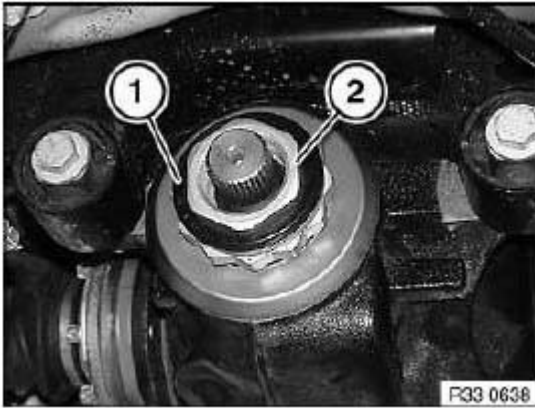


Fig. 36: Identifying Retaining Clip And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

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

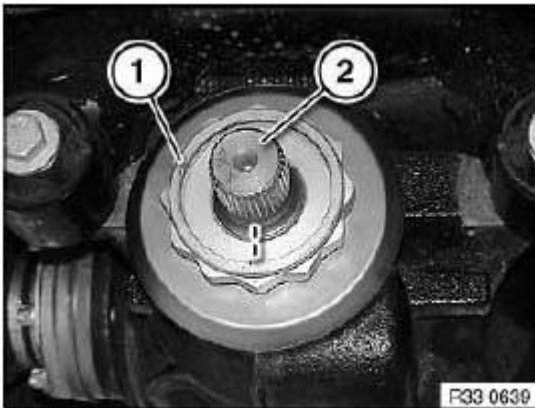


Fig. 37: Identifying Flange Nut And Bevel Pinion
Courtesy of BMW OF NORTH AMERICA, INC.

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

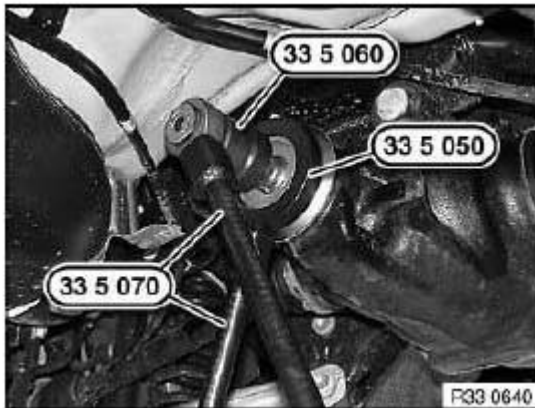


Fig. 38: Identifying Special Tools (33 5 050),(33 5 070) And (33 5 0 60)
 Courtesy of BMW OF NORTH AMERICA, INC.

Withdraw shaft seal with special tool 00 5 010 .

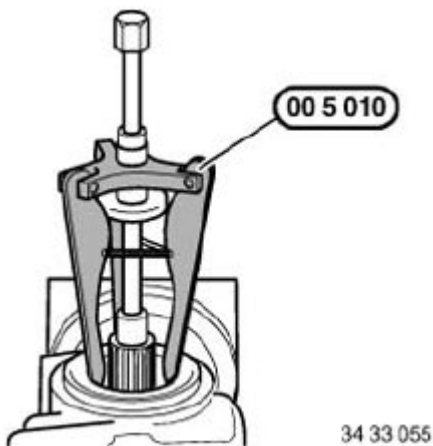


Fig. 39: Identifying Shaft Seal With Special Tool (00 5 010)
 Courtesy of BMW OF NORTH AMERICA, INC.

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

Drive in shaft seal with special tool 33 5 080 .

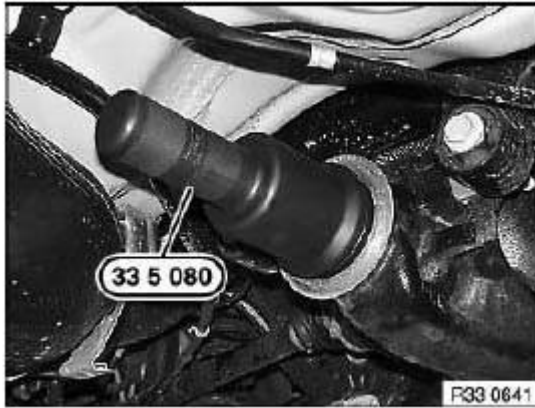


Fig. 40: Identifying Special Tool (33 5 080)

Courtesy of BMW OF NORTH AMERICA, INC.

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



Fig. 41: Identifying Bevel Pinion

Courtesy of BMW OF NORTH AMERICA, INC.

Check dust cover for damage, replace if necessary.

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

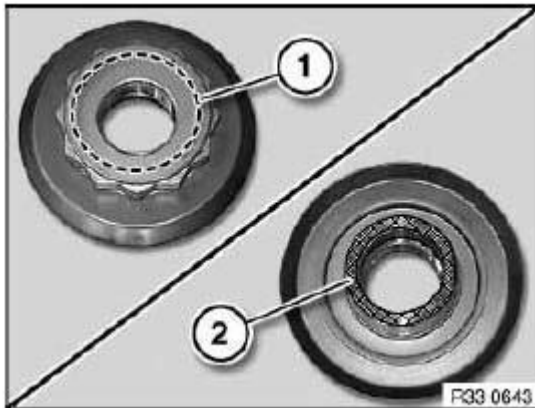


Fig. 42: Identifying Collar Insert And Shaded Area Of Flange Nut
Courtesy of BMW OF NORTH AMERICA, INC.

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

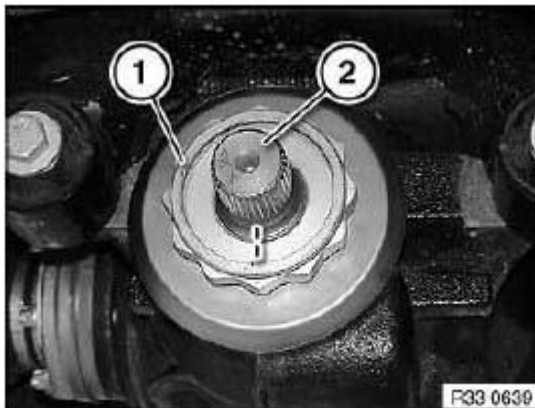


Fig. 43: Identifying Flange Nut And Bevel Pinion
Courtesy of BMW OF NORTH AMERICA, INC.

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

Install retaining clip (1).

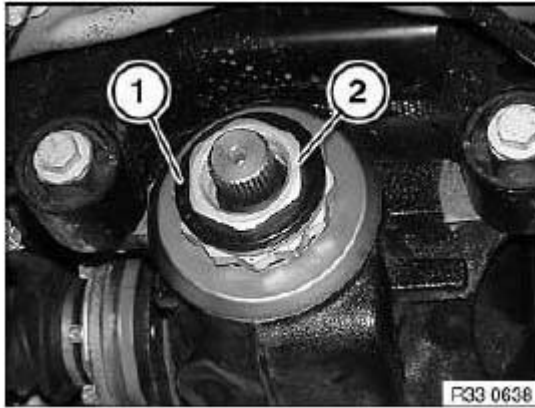


Fig. 44: Identifying Retaining Clip And Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Correct rear differential fluid level.

33 11 271 REPLACING REAR COVER GASKET ON REAR DIFFERENTIAL

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

Necessary preliminary tasks:

- Drain and catch or draw off rear differential oil . See 00 11 259 OIL CHANGE IN REAR DIFFERENTIAL INCL. USED OIL DISPOSAL .
- Remove rear differential . See 33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL .

NOTE: Read and comply with document "Rear differential: Assignment to model series" . See 33 10 ... REAR DIFFERENTIAL: ASSIGNMENT TO MODEL SERIES .

Select rear differential:

- 188K
- 188L / 188LW
- 215L / 215LW (with increased trailer weight)

After installation:

- Add rear differential oil . See REAR AXLE - OPERATING FLUIDS .

33 17 004 REPLACING ALL FRONT RUBBER MOUNTS FOR REAR DIFFERENTIAL MOUNTING**Special tools required:**

- 33 4 465
- 33 4 466
- 33 5 105
- 33 5 161
- 33 5 162
- 33 5 163
- 33 5 164
- 33 5 165
- 33 5 166

WARNING: Danger to life!

Mount securing fixture for vehicle on lifting platform to prevent the vehicle from slipping off or tilting down. See 51 71 505 MOUNT SECURING FIXTURE FOR VEHICLE ON LIFTING PLATFORM .

IMPORTANT: Lower the rear axle carrier to avoid over elongating the new rubber mount when sliding in the screw.

Necessary preliminary tasks:

- Remove rear differential . See **33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL**.
- Lower rear axle carrier . See **33 31 503 LOWERING/RAISING REAR AXLE CARRIER (SPECIAL TOOL SWZ00-2040)** or **33 31 503 LOWERING/RAISING REAR AXLE CARRIER (UNIVERSAL LIFTER)**.

Withdraw 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: Milled recess of special tool 33 5 162 must point outwards to rear axle carrier. Use ratchet ring wrench 33 5 105 .

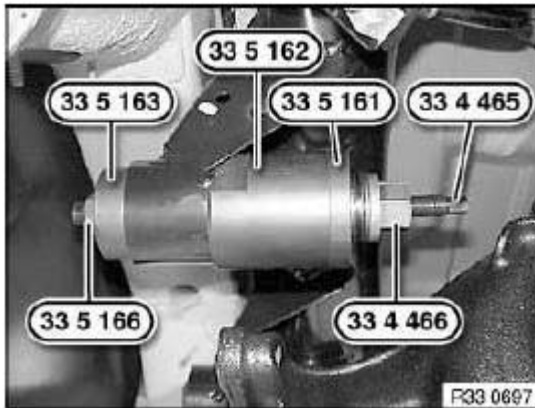


Fig. 45: Identifying Special Tools (33 5 166), (33 5 163), (33 5 162) And (33 4 465)
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Coat bearing bushing in rear axle carrier and rubber mount with Circolight (refer to BMW Parts Service).

Rubber mount must be aligned by way of slots (1) to vehicle transversal direction.

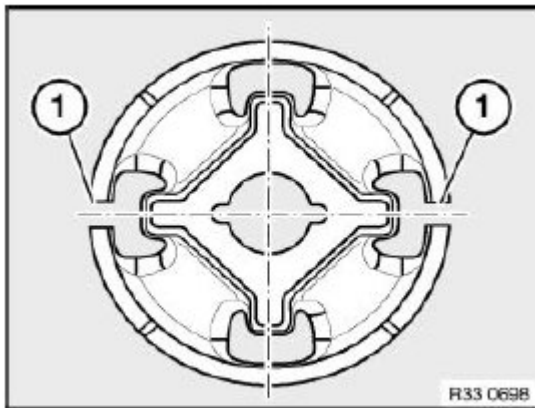


Fig. 46: Identifying Rubber Mount Aligning With Slots
 Courtesy of BMW OF NORTH AMERICA, INC.

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 wrench 33 5 105 .

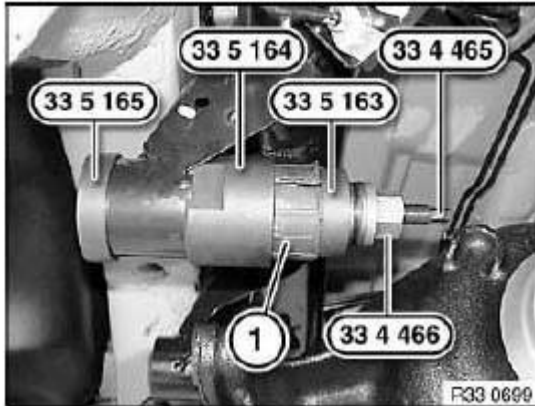


Fig. 47: Identifying Rubber Mount And Special Tools

Courtesy of BMW OF NORTH AMERICA, INC.

33 17 005 REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR

Special tools required:

- 33 3 103
- 33 3 104
- 33 5 105
- 33 5 151
- 33 5 152
- 33 5 153
- 33 5 154
- 33 5 155
- 33 5 156

Necessary preliminary tasks:

- Remove rear differential . See **33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL**.

Withdraw rubber mount with special tools 33 5 153 , 33 5 152 , 33 5 151 , 33 3 103 and 33 3 104 .

NOTE: **Make sure special tool 33 5 152 contacts rear axle carrier correctly.**
Use ratchet ring wrench 33 5 105 .

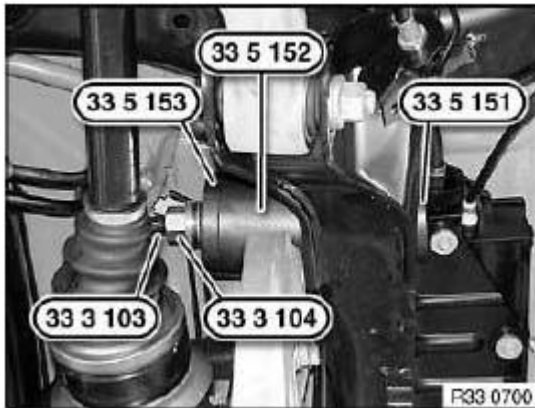


Fig. 48: Identifying Special Tools (33 5 153), (33 5 152), (33 5 151), (33 3 103) And (33 3 104)
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Coat bearing bushing in rear axle carrier and new rubber mount with Circolight (refer to BMW Parts Service).

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

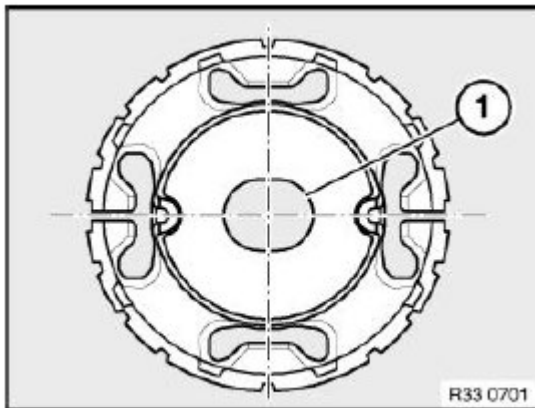


Fig. 49: Identifying Rubber Mount Aligning Elongated Hole
 Courtesy of BMW OF NORTH AMERICA, INC.

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 carrier correctly.
 Use ratchet ring wrench 33 5 105 .

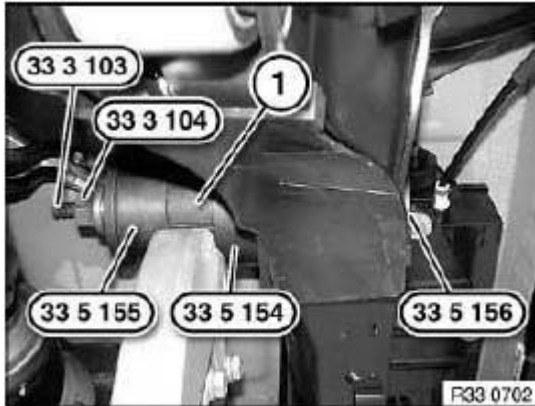


Fig. 50: Identifying Rubber Mount And Special Tools (33 5 155), (33 5 154) (33 5 156) And (33 3 104)
 Courtesy of BMW OF NORTH AMERICA, INC.

21 OUTPUT SHAFTS

33 21 ... PRESSING OUTPUT SHAFT OUT OF DRIVE FLANGE AND DRAWING IN (OUTPUT SHAFT REMOVED FROM REAR DIFFERENTIAL)

Special tools required:

- 33 2 111
- 33 2 115
- 33 2 116
- 33 2 117
- 33 2 118
- 33 2 119
- 33 2 160
- 33 2 201
- 33 2 202
- 33 2 203
- 33 2 205
- 33 2 206
- 33 2 207
- 33 5 070

WARNING: Risk of injury!

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

IMPORTANT: Risk of damage!

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

IMPORTANT: To avoid damaging the dust sleeve, use special tool 33 2 160 to press out and draw in the output shaft after removing the brake disk.

NOTE: Rounded inside edge of special tool 33 2 160 must point to drive flange.

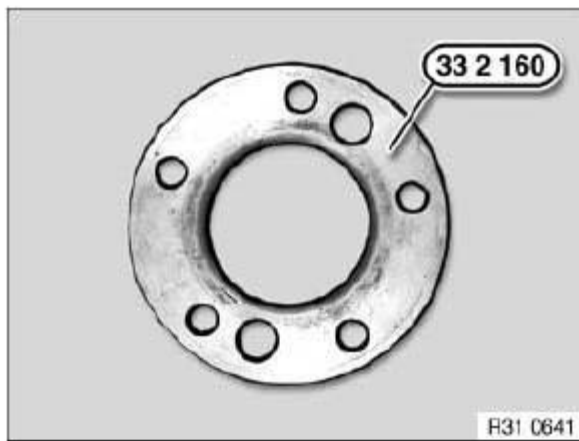


Fig. 51: Identifying Special Tool (33 2 160)
Courtesy of BMW OF NORTH AMERICA, INC.

Special tool 33 2 200:

Secure output shaft against falling out.

Screw on special tool 33 2 203 , 33 2 207 and 33 2 201 with all wheel studs to drive flange.

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

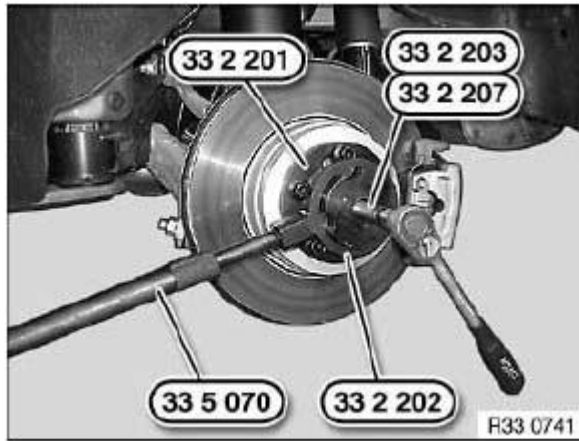


Fig. 52: Identifying Special Tools (33 2 203), (33 2 207) And (33 2 201)
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: No oil permitted on shaft journal thread!

Lightly oil spline teeth of output shaft.

Insert output shaft into drive flange.

Screw special tool 33 2 205 / 33 2 206 onto output shaft.

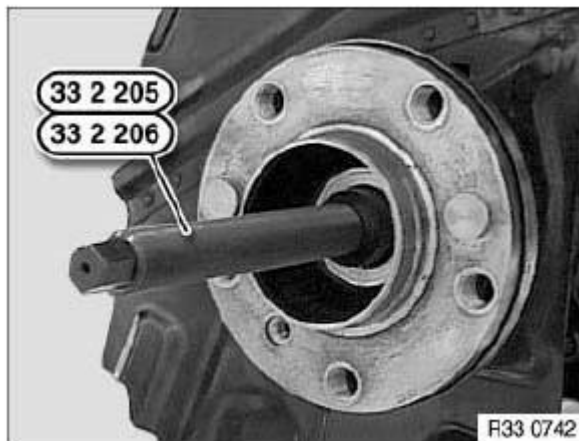


Fig. 53: Identifying Special Tools (33 2 205) And (33 2 206)
Courtesy of BMW OF NORTH AMERICA, INC.

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

Draw in output shaft with special tool 33 2 205 up to stop; in so doing, grip basic body 33 2 201 with special tools 33 2 202 and 33 5 070 .

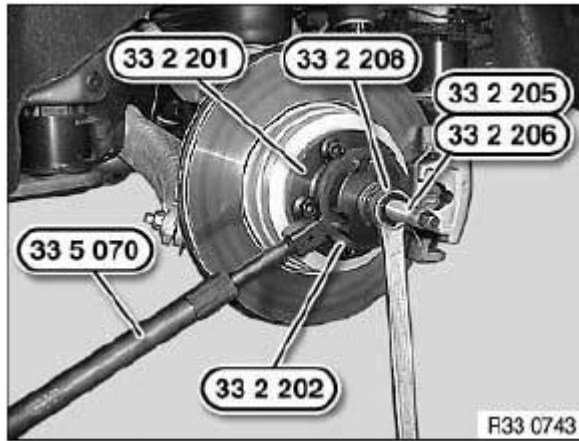


Fig. 54: Identifying Special Tools (33 2 201), (33 2 205) And (33 5 070)
Courtesy of BMW OF NORTH AMERICA, INC.

Special tool 33 2 100:

Secure output shaft against falling out.

Screw on special tool 33 2 111 , 33 2 117 and 33 2 116 with all wheel studs to drive flange.

Press output shaft out of drive flange; in so doing, grip basic body 33 2 116 with special tools 33 2 202 and 33 5 070 .

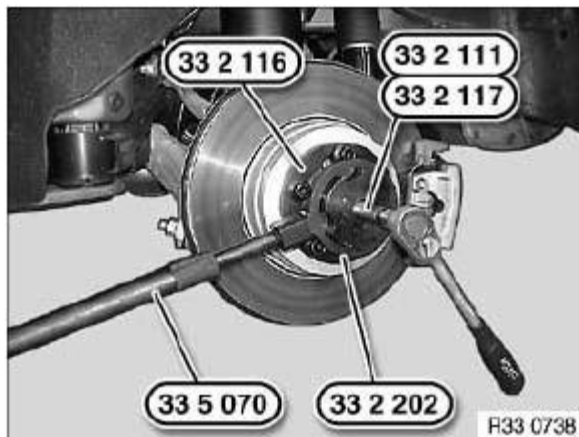


Fig. 55: Identifying Special Tools (33 2 111), (33 2 117) And (33 2 116)
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: No oil permitted on shaft journal thread!

Lightly oil spline teeth of output shaft.

Insert output shaft into drive flange.

Screw special tool 33 2 118 / 33 2 119 onto output shaft.

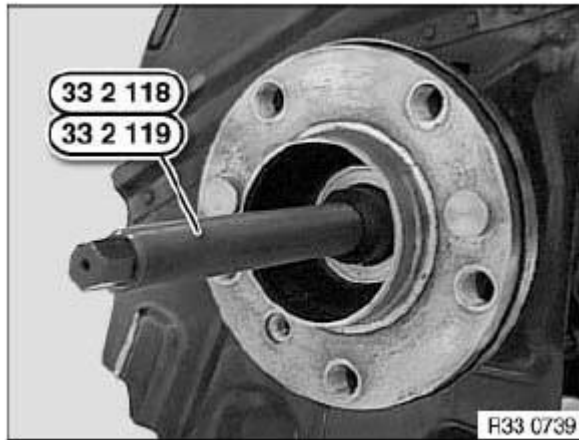


Fig. 56: Identifying Special Tools (33 2 116) And (33 2 119)
Courtesy of BMW OF NORTH AMERICA, INC.

Mount special tool 33 2 116 with three wheel studs to drive flange.

Draw in output shaft with special tool 33 2 115 up to stop; in so doing, grip basic body 33 2 116 with special tools 33 2 202 and 33 5 070 .

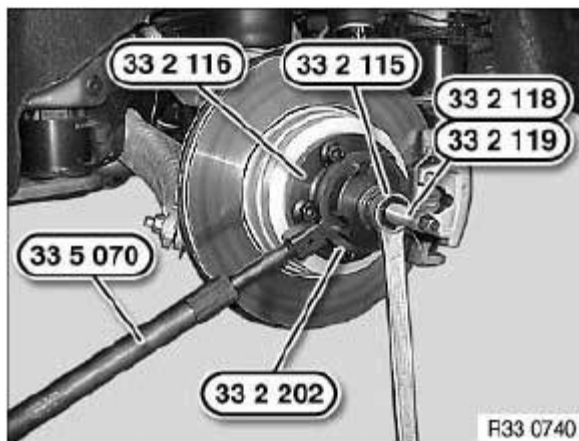


Fig. 57: Identifying Special Tools (33 2 116), (33 2 115) And (33 5 070)
Courtesy of BMW OF NORTH AMERICA, INC.

33 21 000 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT OUTPUT SHAFT

Remove rear wheel.

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

Release collar nut (1), activate parking brake for this purpose.

Installation:

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

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

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

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

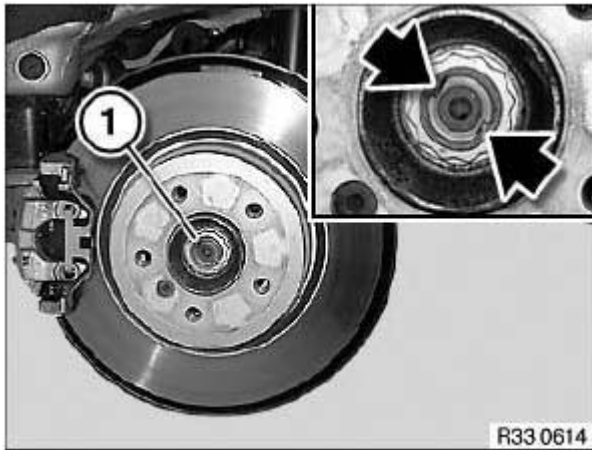


Fig. 58: Identifying Collar Nut

Courtesy of BMW OF NORTH AMERICA, INC.

Remove rear axle differential . See **33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL**.

IMPORTANT: Secure output shaft against falling out.

Do not damage dust covers (1, 2) when setting down output shaft.

Press output shaft out of drive flange and remove towards center of vehicle. See **33 21 ... PRESSING OUTPUT SHAFT OUT OF DRIVE FLANGE AND DRAWING IN (OUTPUT SHAFT REMOVED FROM REAR DIFFERENTIAL)**.

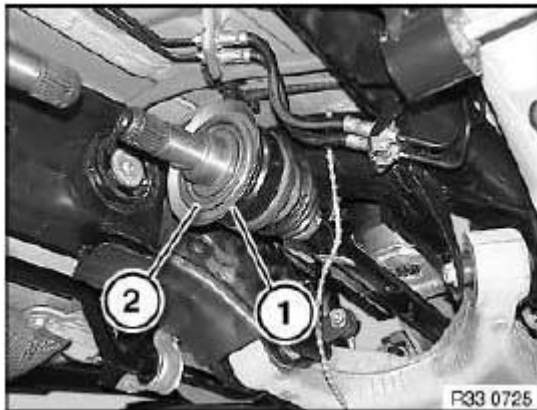


Fig. 59: Identifying Dust Covers

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check rear differential oil level , correct if necessary. See **00 11 ... CHECKING/TOPPING UP OIL LEVEL IN REAR DIFFERENTIAL** .

31 REAR SUB-FRAME

33 31 000 REMOVING AND INSTALLING COMPLETE REAR AXLE CARRIER

Special tools required:

- 00 2 030
- 31 5 250
- 31 5 253
- 31 5 256

WARNING: Danger to life! See **51 71 505 MOUNT SECURING FIXTURE FOR VEHICLE ON LIFTING PLATFORM** to prevent the vehicle from slipping off or tilting down.

Necessary preliminary tasks:

- Mount securing fixture for vehicle on lifting platform . See **51 71 505 MOUNT SECURING FIXTURE FOR VEHICLE ON LIFTING PLATFORM**.
- Remove rear wheels
- Tension both coil springs (and leave on vehicle). See **33 53 000 REMOVING AND INSTALLING / REPLACING REAR LEFT OR RIGHT COIL SPRING**.
- Remove propeller shaft . See **26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY** .

- Expose cable for emergency release up to rear axle carrier . See **34 41 280 REMOVING AND INSTALLING/REPLACING ACTUATING UNIT WITH CONTROL UNIT FOR PARKING BRAKE (EMF)** .
- Disconnect plug connection on actuating unit (EMF) . See **34 41 280 REMOVING AND INSTALLING/REPLACING ACTUATING UNIT WITH CONTROL UNIT FOR PARKING BRAKE (EMF)** .
- Unclip lines for pulse generator, brake pad sensor or shock absorber above rear axle carrier from holders
- Disconnect plug connection at both ride-height sensors
- Remove both rear shock absorbers on wheel carrier (release retainers for brake hose). See **33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER**.

Version with ride-height control:

Deactivate and drain air spring/suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .

IMPORTANT: Do not use any tools to remove the lower section of the air spring (1).

Tilt lower section of air spring (1) by hand towards front/side.

Installation:

Press lower section of air spring (1) by hand into wheel carrier until it can be seen and heard to snap into place.

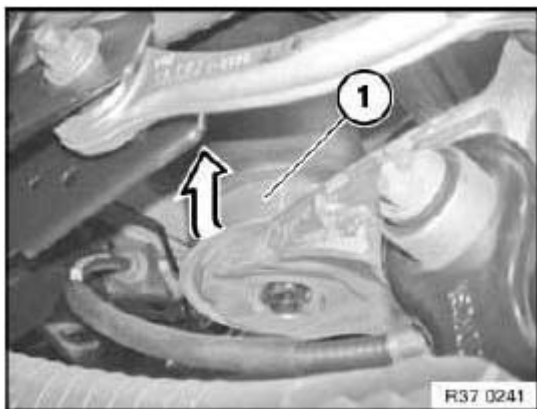


Fig. 60: Removing Lower Section Of Air Spring
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: The plug connections on the right side are shown.

Partially detach rear wheel arch cover . See **51 71 041 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT WHEEL ARCH COVER**.

Only on right side: Detach plug connection (1) for brake pad wear sensor and expose line up to control arm.

Detach plug connection (2) for pulse generator and expose lines up to control arm.

Version with Vertical Dynamics Management: Detach both plug connections (3) for shock absorber and expose lines up to control arm.

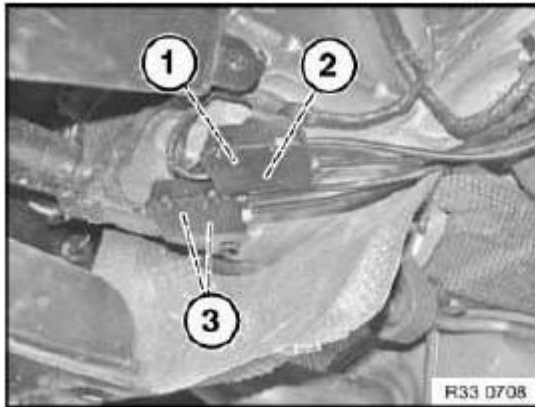
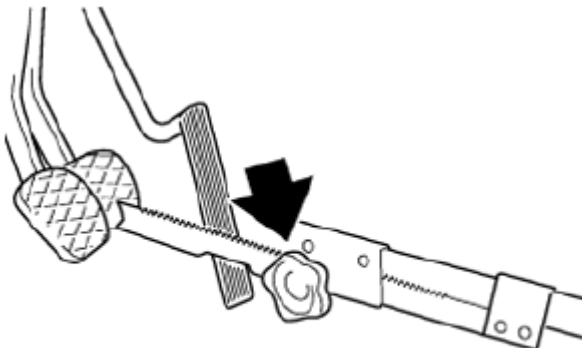


Fig. 61: Identifying Plug Connections

Courtesy of BMW OF NORTH AMERICA, INC.

Press clutch pedal down to floor and secure with pedal support.

IMPORTANT: To prevent brake fluid from escaping from the expansion tank when the brake lines are opened, do not remove the pedal support until the brake lines have been reconnected.



31 34 021

Fig. 62: Locating Brake Pedal Support Knob

Courtesy of BMW OF NORTH AMERICA, INC.

Position an oil tray underneath to catch brake fluid.^{360 of 3160}

Release banjo bolts (1), gripping brake hoses (2) at square head in the process.

Disconnect brake hoses (2) and seal off with plugs.

Installation:

Make sure brake hose is laid without tension and with sufficient spacing to adjoining components.

Tightening torque. See REAR AXLE - TIGHTENING TORQUES .

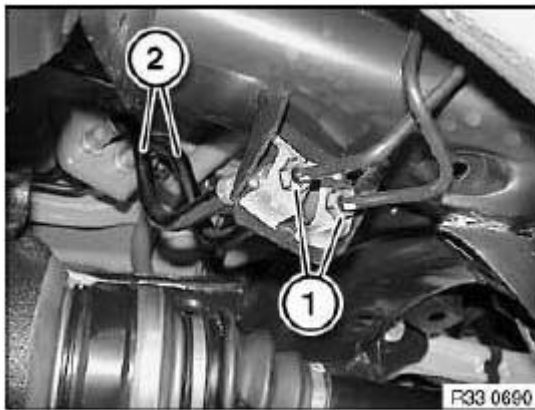


Fig. 63: Identifying Banjo Bolts And Brake Hoses
Courtesy of BMW OF NORTH AMERICA, INC.

Engage special tool 31 5 250 with a 2nd person helping completely on workshop jack 00 2 030 .

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

NOTE: In a profile rail pair two profile rails are connected to each by tothing.
Insert special tools 31 5 256 in telescopic supports of other profile rail pair.

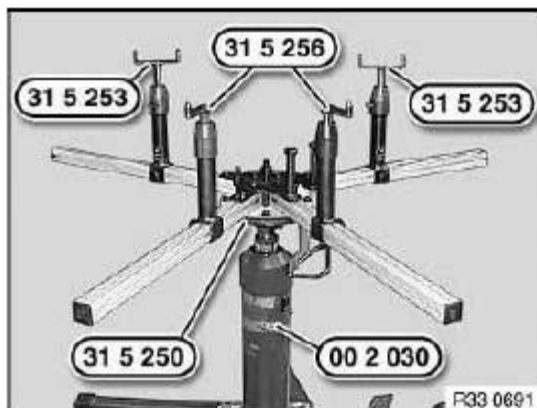


Fig. 64: Identifying Special Tools (31 5 250) And (00 2 030)
Courtesy of BMW OF NORTH AMERICA, INC.

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

Align special tool 31 5 256 to opening in rear axle carrier.

Align special tools 31 5 253 to cross-member arms on rear axle carrier.

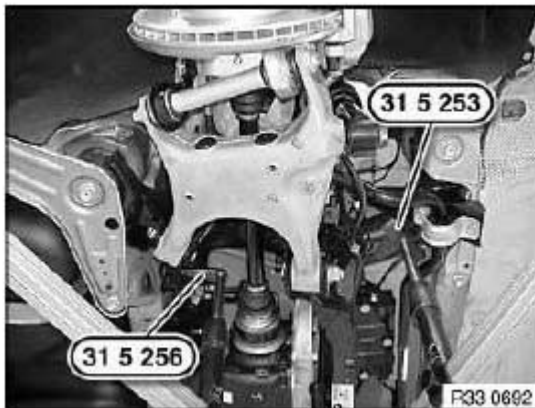


Fig. 65: Identifying Special Tools (31 5 253) And (31 5 256)
Courtesy of BMW OF NORTH AMERICA, INC.

Version with Dynamic Drive:

Remove underbody panelling (rear section) . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

IMPORTANT: Pay attention to control lines (2) when lowering and raising. Hydraulic lines must not be kinked/tensioned/bent!

Release banjo bolts (1).

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

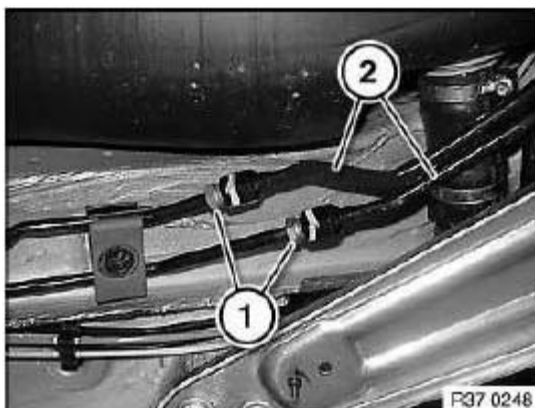


Fig. 66: Identifying Banjo Bolts And Control Lines

Courtesy of BMW OF NORTH AMERICA, INC.

Remove front and rear compression struts and carefully lower rear axle carrier. See **33 32 153 REMOVING AND INSTALLING/REPLACING FRONT COMPRESSION STRUT** and **33 32 155 REMOVING AND INSTALLING/REPLACING REAR COMPRESSION STRUT**.

After installation:

- Activate and fill air suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .
- Bleed braking system . See **34 00 050 BLEEDING BRAKE SYSTEM WITH DSC** .
- Carry out initial Dynamic Drive operation . See **37 10 001 INITIAL OPERATION WITH TEST RUN OF DYNAMIC DRIVE** .

IMPORTANT: If the pedal support is removed or slips before the brake lines are connected, it will be necessary to bleed the brake system at front and rear!

33 31 011 REPLACING REAR AXLE CARRIER

WARNING: Danger to life! See **51 71 505 MOUNT SECURING FIXTURE FOR VEHICLE ON LIFTING PLATFORM** to prevent the vehicle from slipping off or tilting down.

Necessary preliminary tasks:

- Remove rear differential . See **33 10 010 REMOVING AND INSTALLING/REPLACING REAR DIFFERENTIAL**.
- Remove rear axle carrier and if necessary with other workers assisting set down on a suitable surface. See **33 31 000 REMOVING AND INSTALLING COMPLETE REAR AXLE CARRIER**.

Remove brake lines.

Remove stabilizer bar . See **33 55 000 REMOVING AND INSTALLING/REPLACING REAR STABILIZER** or **37 12 220 REMOVING AND INSTALLING/REPLACING REAR ACTIVE STABILIZER** .

Version with Dynamic Drive: Disconnect control lines for oscillating motor of rear axle from rear axle carrier.

Remove actuating unit (EMF) . See **34 41 280 REMOVING AND INSTALLING/REPLACING ACTUATING UNIT WITH CONTROL UNIT FOR PARKING BRAKE (EMF)** .

Remove both brake discs . See **34 21 320 REMOVING AND INSTALLING OR REPLACING BOTH REAR BRAKE DISCS** .

Remove ride-height sensor(s) . See **37 14 512 REPLACING REAR RIDE-HEIGHT SENSOR** .

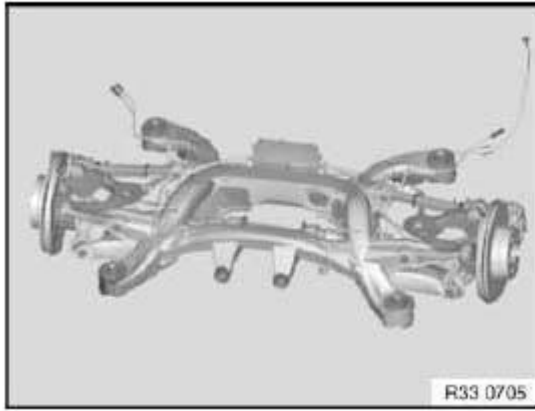


Fig. 67: Identifying Control Lines Of Rear Axle
Courtesy of BMW OF NORTH AMERICA, INC.

Remove both swinging arms on rear axle carrier . See **33 32 064 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWINGING ARM**.

Remove both control arms on rear axle carrier . See **33 32 071 REPLACING ONE UPPER CONTROL ARM**.

Remove both guide arms on rear axle carrier . See **33 32 091 REPLACING A GUIDE ARM**.

Remove both wheel carriers with output shaft, swinging arm and suspension arms.

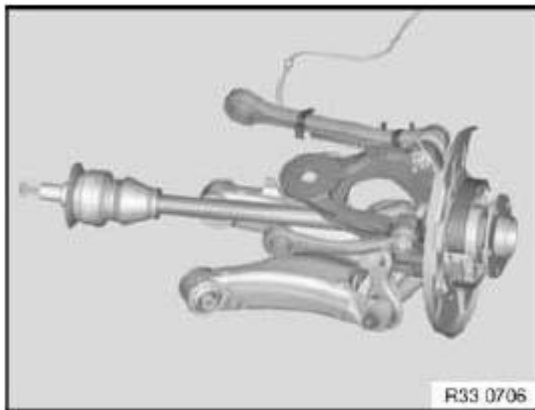


Fig. 68: Identifying Wheel Carriers With Output Shaft, Swinging Arm And Suspension Arms
Courtesy of BMW OF NORTH AMERICA, INC.

Take rear axle carrier down from special tool with assistance of a 2nd person and set down on a suitable surface.

Use previous rear axle carrier as a template for modifying or replacing small parts.

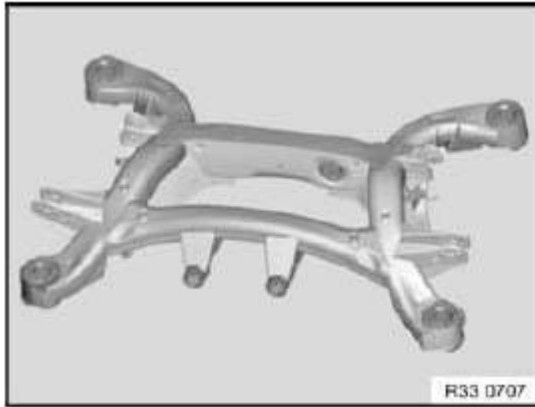


Fig. 69: Identifying Rear Axle Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Activate and fill air suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .
- Carry out ride-height-calibration . See **37 12 012 CARRYING OUT RIDE-HEIGHT-CALIBRATION** .
- Bleed braking system . See **34 00 050 BLEEDING BRAKE SYSTEM WITH DSC** .
- Perform **CHASSIS ALIGNMENT CHECK**
- If necessary, carry out initial Dynamic Drive operation . See **37 10 001 INITIAL OPERATION WITH TEST RUN OF DYNAMIC DRIVE** .

33 31 503 LOWERING/RAISING REAR AXLE CARRIER (SPECIAL TOOL SWZ00-2040)

Special tools required:

- 00 2 030
- 00 2 040
- 33 5 181
- 33 5 182

WARNING: Danger to life! See **51 71 505 MOUNT SECURING FIXTURE FOR VEHICLE ON LIFTING PLATFORM** to prevent the vehicle from slipping off or tilting down.

Necessary preliminary tasks:

- Mount securing fixture for vehicle on lifting platform.

- Remove rear wheels
- Tension both coil springs (and leave on vehicle). See **33 53 000 REMOVING AND INSTALLING / REPLACING REAR LEFT OR RIGHT COIL SPRING**.
- Remove complete exhaust system and partially detach rear heat insulation. See **18 00 020 REMOVING AND INSTALLING COMPLETE EXHAUST SYSTEM (N52K)**.
- Disconnect plug connection on actuating unit (EMF) . See **34 41 280 REMOVING AND INSTALLING/REPLACING ACTUATING UNIT WITH CONTROL UNIT FOR PARKING BRAKE (EMF)**.
- Unclip lines for pulse generator, brake pad sensor or shock absorber above rear axle carrier from holders
- Disconnect plug connection at both ride-height sensors

Version with ride-height control:

Deactivate and drain air spring/suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM**.

IMPORTANT: Do not use any tools to remove the lower section of the air spring (1).

Tilt lower section of air spring (1) by hand towards front/side.

Installation:

Press lower section of air spring (1) by hand into wheel carrier until it can be seen and heard to snap into place.

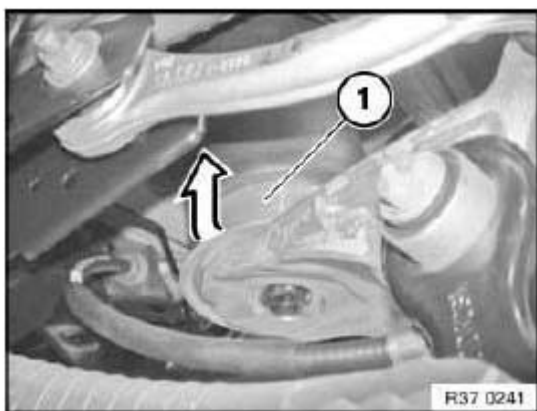
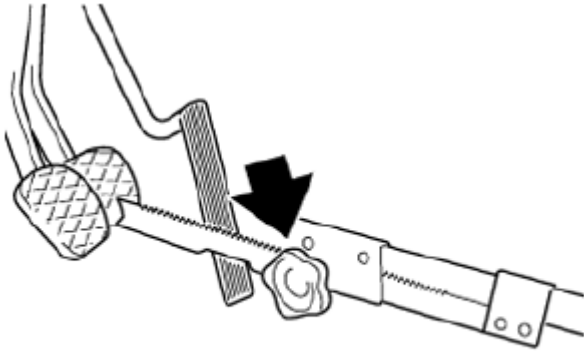


Fig. 70: Removing Lower Section Of Air Spring
Courtesy of BMW OF NORTH AMERICA, INC.

Press clutch pedal down to floor and secure with pedal support.

IMPORTANT: To prevent brake fluid from escaping from the expansion tank when the brake lines are opened, do not remove the pedal support until the brake lines have been reconnected.



31 34 021

Fig. 71: Locating Brake Pedal Support Knob
 Courtesy of BMW OF NORTH AMERICA, INC.

Position an oil tray underneath to catch brake fluid.

Release banjo bolts (1), gripping brake hoses (2) at square head in the process.

Disconnect brake hoses (2) and seal off with plugs.

Installation:

Make sure brake hose is laid without tension and with sufficient spacing to adjoining components.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

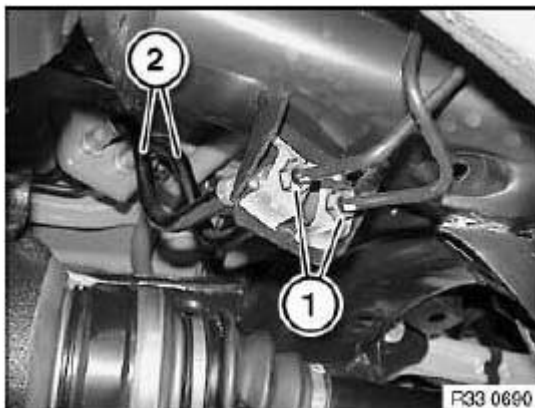


Fig. 72: Identifying Banjo Bolts And Brake Hoses
 Courtesy of BMW OF NORTH AMERICA, INC.

If necessary, position special tool 00 2 040 with a 2nd person helping on workshop jack 00 2 030 .

367 of 3160

Insert special tools 33 5 181 and 33 5 182 into corresponding mountings of special tool 00 2 040 .

Lower special tool 33 3 274.

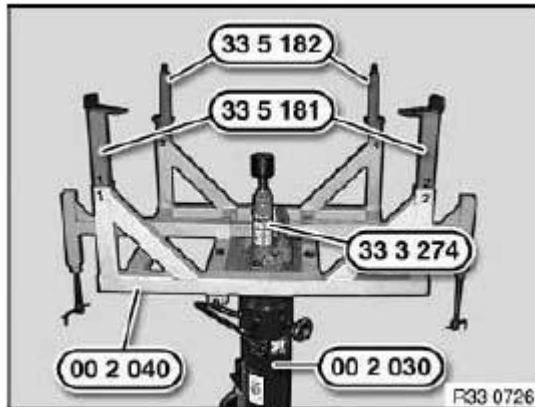


Fig. 73: Identifying Special Tools (00 2 040), (00 2 030), (33 5 182) And (00 2 040)
 Courtesy of BMW OF NORTH AMERICA, INC.

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

Align special tools 33 5 181 and 33 5 182 to front axle carrier.

Support front axle carrier by operating workshop jack 00 2 030 .

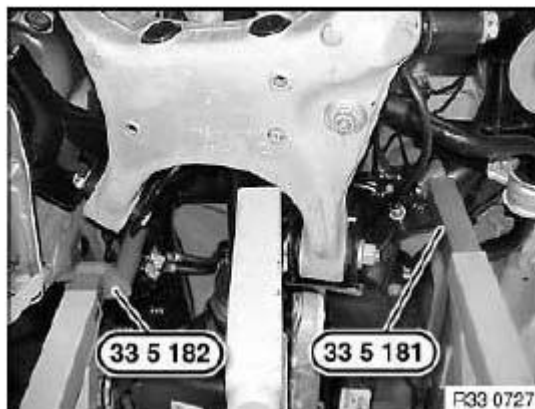


Fig. 74: Identifying Special Tools (33 5 181) And (33 5 182)
 Courtesy of BMW OF NORTH AMERICA, INC.

Version with Dynamic Drive:

Remove underbody panelling (rear section) . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

IMPORTANT: Pay attention to control lines (2) when lowering and raising. Hydraulic lines must not be kinked/tensioned/bent!

1 = Banjo bolts

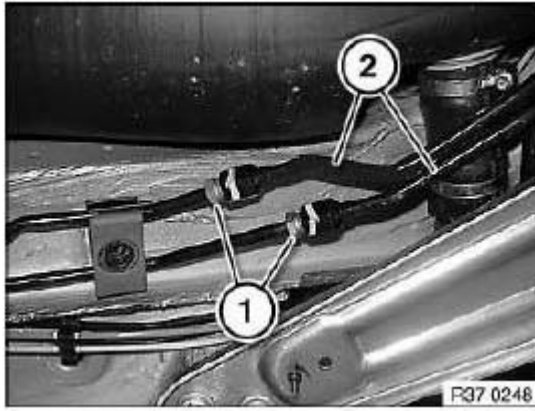


Fig. 75: Identifying Banjo Bolts And Control Lines
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Lower rear axle carrier only until such stage that the rubber mounts can be changed.

Remove front and rear compression struts and carefully lower rear axle carrier approx. 50 mm. See 33 32 153 REMOVING AND INSTALLING/REPLACING FRONT COMPRESSION STRUT or 33 32 155 REMOVING AND INSTALLING/REPLACING REAR COMPRESSION STRUT.

After installation:

- Activate and fill air suspension system . See 37 00 100 DRAINING/FILLING AIR SPRING SYSTEM .
- Bleed braking system . See 34 00 050 BLEEDING BRAKE SYSTEM WITH DSC .

IMPORTANT: If the pedal support is removed or slips before the brake lines are connected, it will be necessary to bleed the brake system at front and rear!

33 31 503 LOWERING/RAISING REAR AXLE CARRIER (UNIVERSAL LIFTER)

Special tools required:

- 00 2 030
- 31 5 250
- 31 5 253
- 31 5 256

WARNING: Danger to life! See 51 71 505 MOUNT SECURING FIXTURE FOR VEHICLE ON LIFTING PLATFORM to prevent the vehicle from slipping off or tilting

down.

Necessary preliminary tasks:

- Mount securing fixture for vehicle on lifting platform.
- Remove rear wheels.
- Tension both coil springs (and leave on vehicle). See **33 53 000 REMOVING AND INSTALLING / REPLACING REAR LEFT OR RIGHT COIL SPRING**.
- Remove complete exhaust system and partially detach rear heat insulation. See **18 00 020 REMOVING AND INSTALLING COMPLETE EXHAUST SYSTEM (N52K)**.
- Disconnect plug connection on actuating unit (EMF) . See **34 41 280 REMOVING AND INSTALLING/REPLACING ACTUATING UNIT WITH CONTROL UNIT FOR PARKING BRAKE (EMF)** .
- Unclip lines for pulse generator, brake pad sensor or shock absorber above rear axle carrier from holders
- Disconnect plug connection at both ride-height sensors

Version with ride-height control:

Deactivate and drain air spring/suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .

IMPORTANT: Do not use any tools to remove the lower section of the air spring (1).

Tilt lower section of air spring (1) by hand towards front/side.

Installation:

Press lower section of air spring (1) by hand into wheel carrier until it can be seen and heard to snap into place.

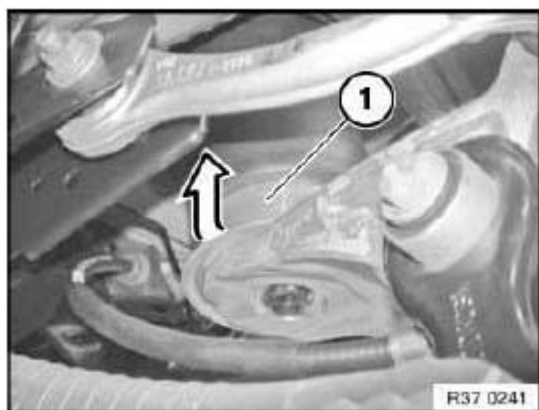
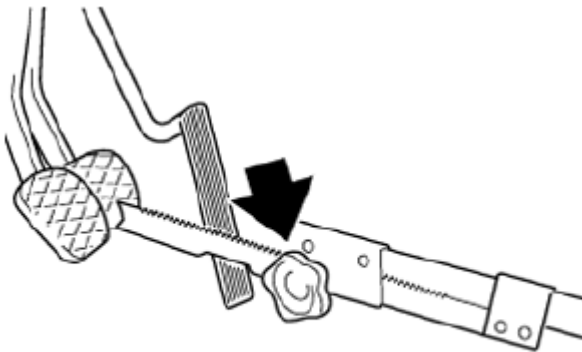


Fig. 76: Removing Lower Section Of Air Spring
 Courtesy of BMW OF NORTH AMERICA, INC. 970 of 3160

Press clutch pedal down to floor and secure with pedal support.

IMPORTANT: To prevent brake fluid from escaping from the expansion tank when the brake lines are opened, do not remove the pedal support until the brake lines have been reconnected.



31 34 021

Fig. 77: Locating Brake Pedal Support Knob
Courtesy of BMW OF NORTH AMERICA, INC.

Position an oil tray underneath to catch brake fluid.

Release banjo bolts (1), gripping brake hoses (2) at square head in the process.

Disconnect brake hoses (2) and seal off with plugs.

Installation:

Make sure brake hose is laid without tension and with sufficient spacing to adjoining components.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES**.

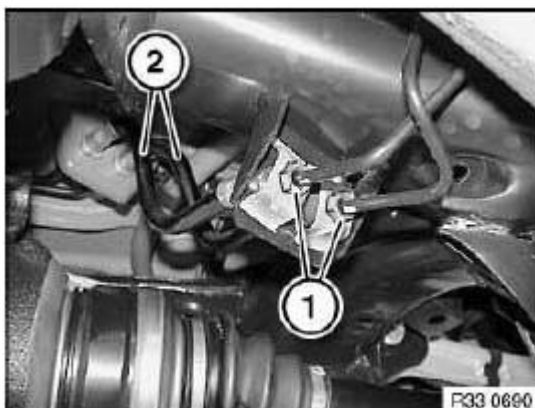


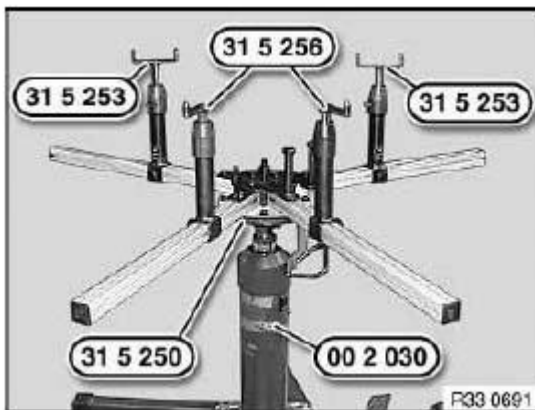
Fig. 78: Identifying Banjo Bolts And Brake Hoses

Courtesy of BMW OF NORTH AMERICA, INC.

Engage special tool 31 5 250 with a 2nd person helping completely on workshop jack 00 2 030 .

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

NOTE: In a profile rail pair two profile rails are connected to each by tothing.
Insert special tools 31 5 256 in telescopic supports of other profile rail pair.

**Fig. 79: Identifying Special Tools (31 5 250) And (00 2 030)**

Courtesy of BMW OF NORTH AMERICA, INC.

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

Align special tool 31 5 256 to opening in rear axle carrier.

Align special tools 31 5 253 to cross-member arms on rear axle carrier.

**Fig. 80: Identifying Special Tools (31 5 253) And (31 5 256)**

Courtesy of BMW OF NORTH AMERICA, INC.

Version with Dynamic Drive:

Remove underbody panelling (rear section) . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

IMPORTANT: Pay attention to control lines (2) when lowering and raising. Hydraulic lines must not be kinked/tensioned/bent!

1 = Banjo bolts

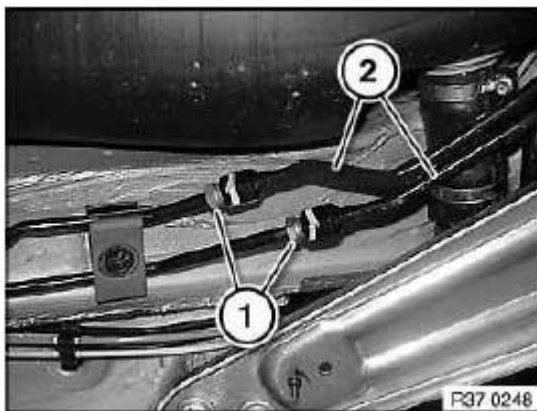


Fig. 81: Identifying Banjo Bolts And Control Lines
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Lower rear axle carrier only until such stage that the rubber mounts can be changed.

Remove front and rear compression struts and carefully lower rear axle carrier approx. 50 mm. See **33 32 153 REMOVING AND INSTALLING/REPLACING FRONT COMPRESSION STRUT** and **33 32 155 REMOVING AND INSTALLING/REPLACING REAR COMPRESSION STRUT**.

After installation:

- Activate and fill air suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .
- Bleed braking system . See **34 00 050 BLEEDING BRAKE SYSTEM WITH DSC** .

IMPORTANT: If the pedal support is removed or slips before the brake lines are connected, it will be necessary to bleed the brake system at front and rear!

32 CONTROL ARMS AND STRUT

33 32 051 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT PUSH ROD/INTEGRAL LINK

NOTE: If the integral link is detached from the wheel carrier or swinging arm, it is necessary after reinstallation to carry out a wheel/chassis alignment check.

Necessary preliminary tasks:

- Remove rear wheel.
- Tension coil spring (and leave on vehicle). See **33 53 000 REMOVING AND INSTALLING / REPLACING REAR LEFT OR RIGHT COIL SPRING**.
- Version with ride-height control: Deactivate and drain air spring system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .

Release nut (1) and remove screw.

Release screw (2) and remove integral link (3).

Installation:

Replace self-locking nut.

First install swinging arm hand-tight, then tighten down screw (2).

Tighten screw/bolt connections in normal position .

Tighten bolt and nut.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

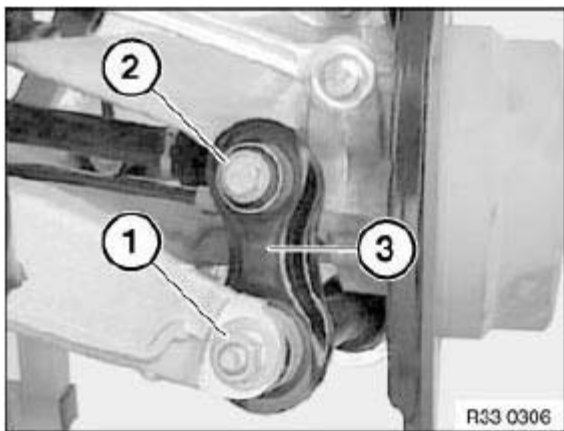


Fig. 82: Identifying Nut, Screw And Integral Link
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Activate and fill air suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING**

SYSTEM .

- Perform **CHASSIS ALIGNMENT CHECK**

33 32 064 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SWINGING ARM

NOTE: If the swinging arm is detached from the integral link/wheel carrier or rear axle carrier, it is necessary after reinstallation to carry out a wheel/chassis alignment check.

Necessary preliminary tasks:

- Remove rear wheel.
- Deactivate and empty air spring system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .
- Remove stabilizer link from swinging arm . See **33 55 040 REPLACING STABILIZER LINKS FOR STABILIZER**.

Release expansion rivets (1).

Remove cover (2) from rear axle carrier.

Mark position of eccentric screw (3) to rear axle carrier.

Installation:

Replace faulty expander rivets.

Make sure cover is correctly positioned.

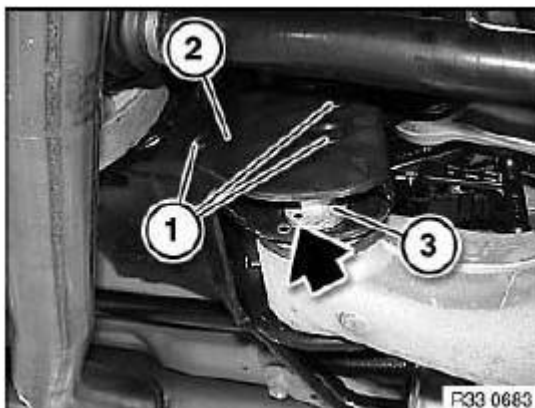


Fig. 83: Identifying Expansion Rivets, Cover And Eccentric Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nut (1).

Remove jointed rod (2) from swinging arm.

Installation:

Sensor lever (3) must point from ride-height sensor to respective rear wheel.

Replace self-locking nut.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

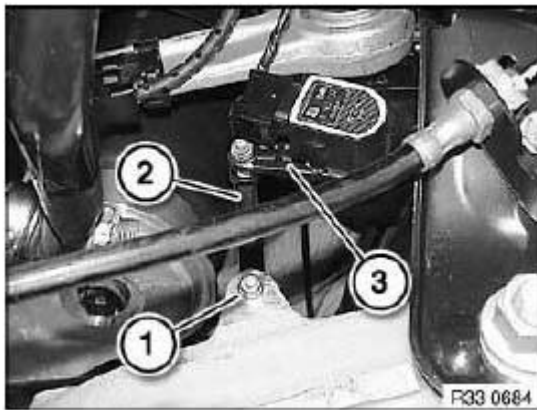


Fig. 84: Identifying Nut, Jointed Rod And Sensor Lever
Courtesy of BMW OF NORTH AMERICA, INC.

Support wheel carrier with workshop jack.

Release nuts (1, 2) and remove screw (3).

Remove rear shock absorber from swinging arm . See **33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER**.

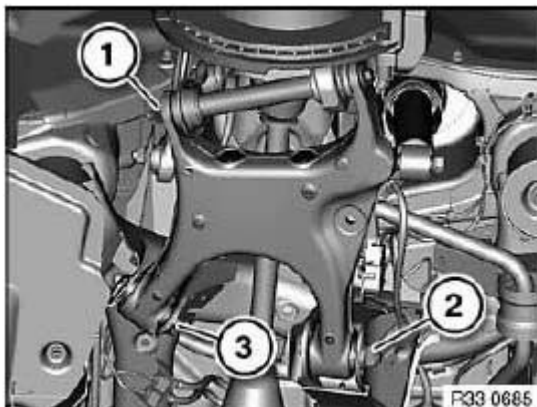


Fig. 85: Identifying Nuts And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nut (1).

Remove bolt (2) towards rear.

Installation:

Replace self-locking nut.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

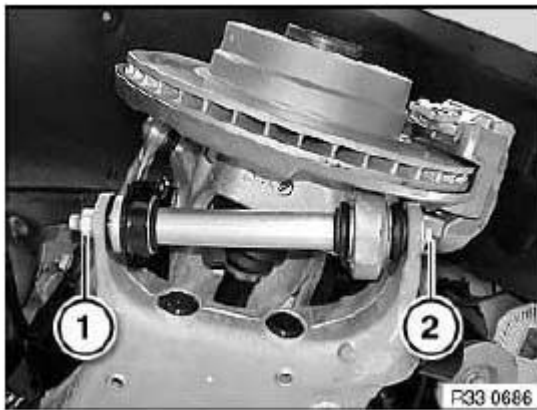


Fig. 86: Identifying Nut And Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1), remove eccentric washer (2) and pull out eccentric screw (3) towards front.

Installation:

Note insertion direction of eccentric screw.

Align eccentric screw by means of marking to rear axle carrier.

Refit eccentric washer.

Replace self-locking nut.

Tighten bolt connection in normal position .

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

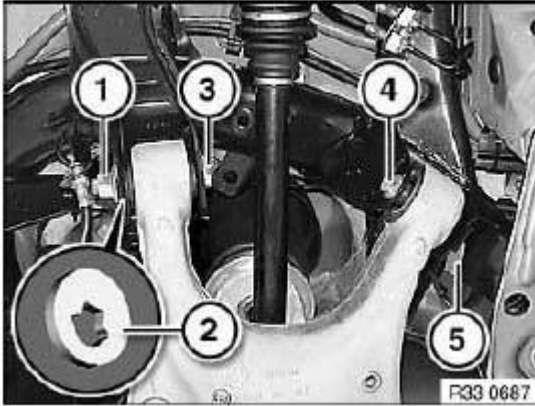


Fig. 87: Identifying Nut, Eccentric Washer, Eccentric Screw And Locking Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (4) and remove locking nut (5).

Installation:

Replace locking nut.

Tighten bolt connection in normal position .

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

After installation:

- Check that output shaft is correctly seated in rear differential.
- Activate and fill air suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .
- Carry out ride-height-calibration . See **37 12 012 CARRYING OUT RIDE-HEIGHT-CALIBRATION** .
- Perform **CHASSIS ALIGNMENT CHECK**

33 32 071 REPLACING ONE UPPER CONTROL ARM

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

Necessary preliminary tasks:

- Remove rear wheel.
- Deactivate and empty air spring system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .

Shown on vehicle at rear right:

Remove holders (1) from control arm.

Installation:

Replace faulty holder.

2 = Lead for pulse generator

3 = Only on right side: lead for brake pad sensor

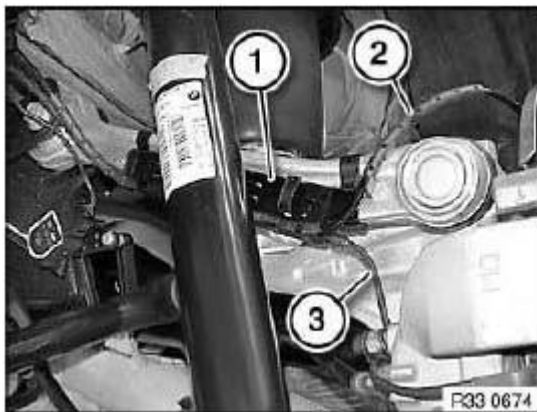


Fig. 88: Identifying Holders And Lead For Pulse Generator
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nut (1).

Remove control arm (2) from wheel carrier.

Installation:

Keep control arm to wheel carrier connection clean and free from oil and grease.

Replace self-locking nut.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

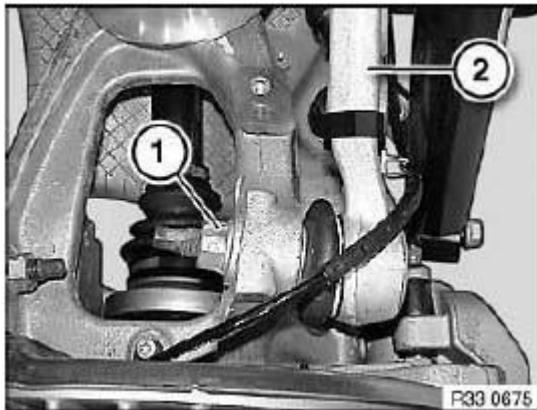


Fig. 89: Identifying Nut And Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nut (1).

Release bolt (2) and remove control arm (3).

Installation:

Note insertion direction of bolt.

Replace self-locking nut.

Tighten bolt connection in normal position .

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

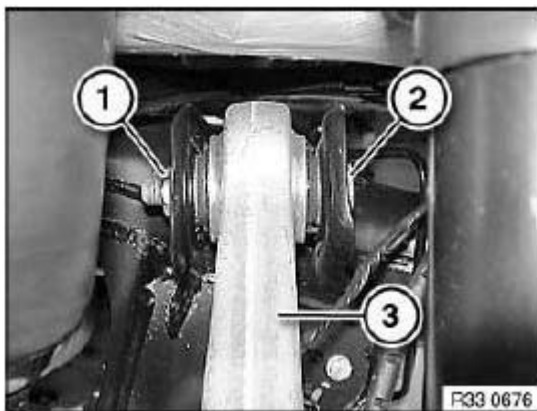


Fig. 90: Identifying Nut, Bolt And Control Arm
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Perform **CHASSIS ALIGNMENT CHECK**

33 32 091 REPLACING A GUIDE ARM

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

Necessary preliminary tasks:

- Remove rear wheel.
- Deactivate and empty air spring system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .

Unscrew nut (1).

Remove guide arm (2) from wheel carrier.

Installation:

Keep guide arm to wheel carrier connection clean and free from oil and grease.

Replace self-locking nut.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

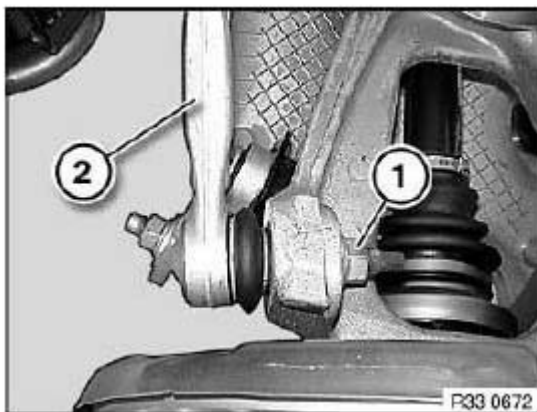


Fig. 91: Identifying Nut And Guide Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Mark position of eccentric screw (4) to rear axle carrier.

Release nut (1) and remove eccentric washer (2).

Pull out eccentric screw (4) and remove guide arm (3).

Installation:

Refit eccentric washer.

Replace self-locking nut.

Align eccentric screw by means of marking to rear axle carrier.

Tighten bolt connection in normal position .

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

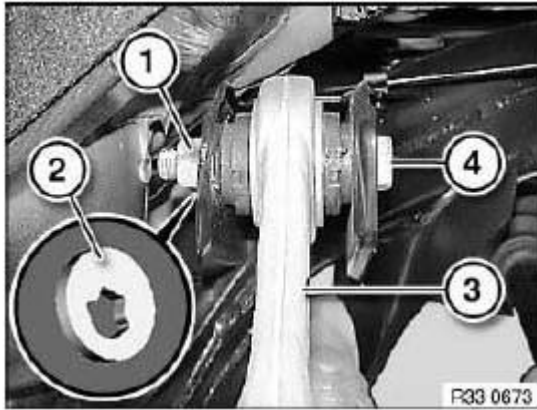


Fig. 92: Identifying Nut, Eccentric Washer, Guide Arm And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Perform **CHASSIS ALIGNMENT CHECK**

33 32 125 REPLACING A BALL JOINT IN LOWER STEERING KNUCKLE / WHEEL CARRIER**Special tools required:**

- 33 3 333
- 33 4 191
- 33 4 192
- 33 4 193
- 33 4 194

Necessary preliminary tasks:

- Remove integral arm . See **33 32 051 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT PUSH ROD/INTEGRAL LINK.**

- Remove stabilizer link from swinging arm . See **33 55 040 REPLACING STABILIZER LINKS FOR STABILIZER.**
- Remove shock absorber from swinging arm . See **33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.**

Reconditioning special tool:

Cut highlighted area out of special tool 33 4 191 and then deburr.

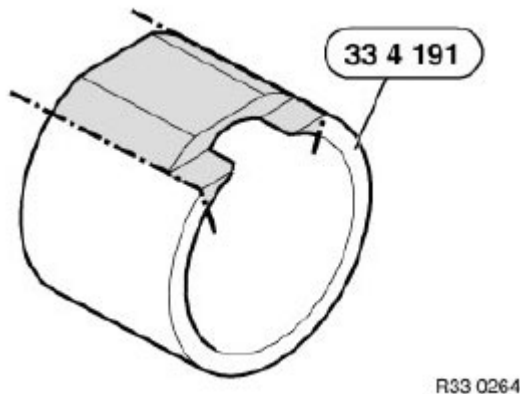


Fig. 93: Identifying Cutting Highlighted Area
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove circlip (1).

Pull out ball joint with special tools 33 4 193, 33 4 191, 33 4 192 and 33 3 333 . Slotted side of special tool 33 4 191 must point to wheel carrier.

Installation:

Install new circlip (1).

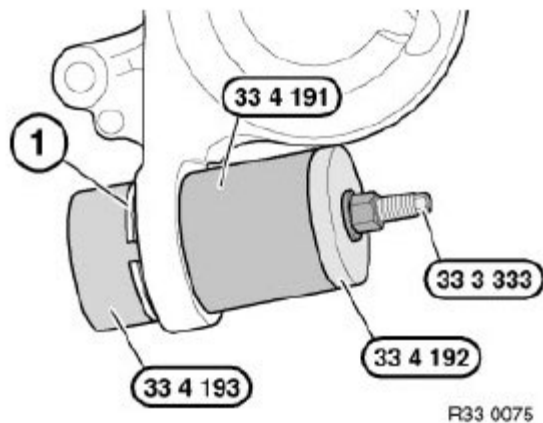


Fig. 94: Identifying Circlip And Special Tools (33 4 193)

Courtesy of BMW OF NORTH AMERICA, INC.

Draw in new ball joint (1) with special tools 33 3 333, 33 4 192 , 33 4 191 and 33 4 194 as far as it will go.

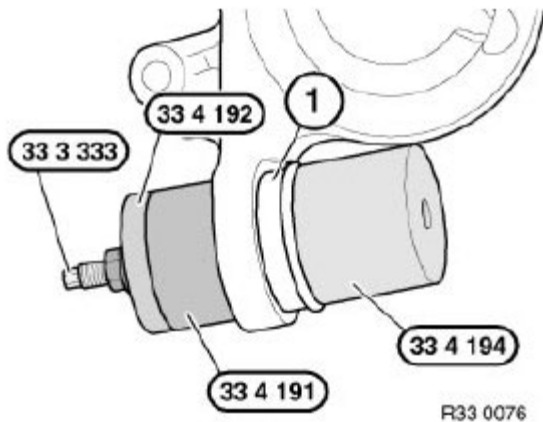


Fig. 95: Identifying Ball Joint And Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Perform **CHASSIS ALIGNMENT CHECK**

33 32 131 REMOVING AND INSTALLING / REPLACING A STEERING KNUCKLE / WHEEL CARRIER

Remove rear wheel.

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

Release collar nut (1), activate parking brake for this purpose.

Installation:

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

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

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

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

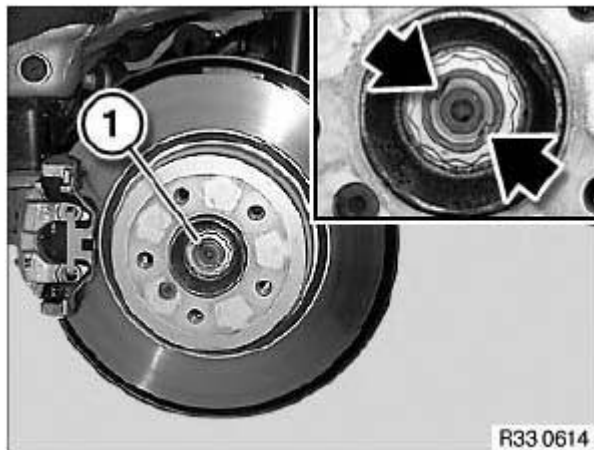


Fig. 96: Identifying Collar Nut

Courtesy of BMW OF NORTH AMERICA, INC.

Remove expander lock for handbrake shoes . See **34 41 250 REMOVING AND INSTALLING/REPLACING EXPANDER LOCK FOR HANDBRAKE SHOES** .

Remove handbrake Bowden cable from wheel carrier (see **34 41 280 REMOVING AND INSTALLING/REPLACING ACTUATING UNIT WITH CONTROL UNIT FOR PARKING BRAKE (EMF)**).

Remove wheel bearing (do not pull out drive flange). See **33 41 151 REPLACING LEFT OR RIGHT WHEEL BEARING ON REAR AXLE SHAFT**.

Remove pulse generator from wheel carrier . See **34 52 535 REPLACING A REAR PULSE GENERATOR** .

Tension rear coil spring and leave on vehicle at rear. See **33 53 000 REMOVING AND INSTALLING / REPLACING REAR LEFT OR RIGHT COIL SPRING**.

Version with ride-height control:

Deactivate and drain air spring/suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .

IMPORTANT: Do not use any tools to remove the lower section of the air spring (1).

Tilt lower section of air spring (1) by hand towards front/side.

Installation:

Press lower section of air spring (1) by hand into wheel carrier until it can be seen and heard to snap into place.

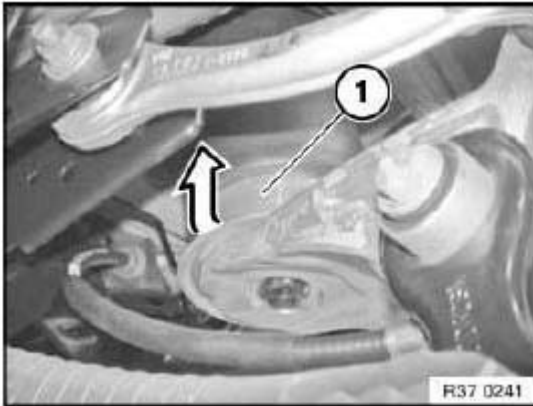


Fig. 97: Removing Lower Section Of Air Spring
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Secure wheel carrier against falling out.

Remove integral link . See **33 32 051 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT PUSH ROD/INTEGRAL LINK**.

Remove guide arm from wheel carrier . See **33 32 091 REPLACING A GUIDE ARM**.

Remove upper control arm from wheel carrier . See **33 32 071 REPLACING ONE UPPER CONTROL ARM**.

Remove wheel carrier.

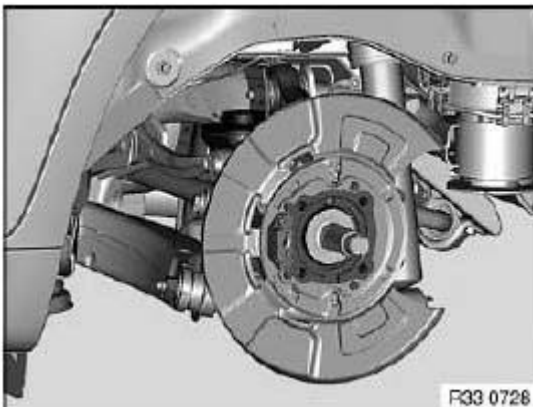


Fig. 98: Identifying Wheel Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Modify brake carrier/brake guard plate . See **34 21 169 REMOVING AND INSTALLING / REPLACING A BRAKE CARRIER / BRAKE GUARD AT REAR** .

IMPORTANT: Make sure spring pad is correctly installed in order to prevent the coil spring from jumping out.

Modify lower spring pad (1). To do so, lever out upper section (2) with a suitable tool.

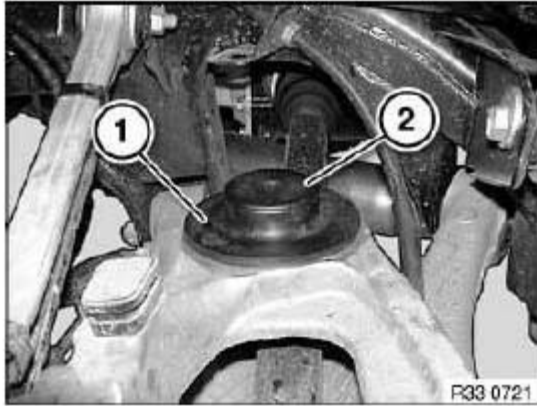


Fig. 99: Identifying Lower Spring Pad And Upper Section
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Activate and fill air suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .
- Adjusting parking brake . See **34 41 006 ADJUSTING PARKING BRAKE** .
- Replacement only: Perform **CHASSIS ALIGNMENT CHECK**

33 32 153 REMOVING AND INSTALLING/REPLACING FRONT COMPRESSION STRUT

IMPORTANT: Observe safety when raising the vehicle.
Driving without compression struts is not permitted!

Necessary preliminary tasks:

- Remove underbody panelling (rear section) . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

Release screws (1).

Release screw (3).

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

Release screw (2) and remove compression strut (4)

Secure rear axle carrier by inserting screw (2).

Installation:

Check threads for damage; if necessary, repair with Helicoil thread inserts.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

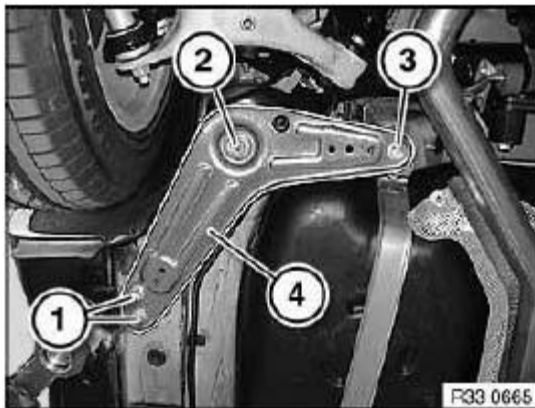


Fig. 100: Identifying Screws And Compression Strut
Courtesy of BMW OF NORTH AMERICA, INC.

33 32 155 REMOVING AND INSTALLING/REPLACING REAR COMPRESSION STRUT

IMPORTANT: Observe safety when raising the vehicle.
Driving without compression struts is not permitted!

Release screw (1).

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

Release screw (3) and remove compression strut (2).

Secure rear axle carrier by inserting screw (3).

Installation:

Check threads for damage; if necessary, repair with Helicoil thread inserts.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

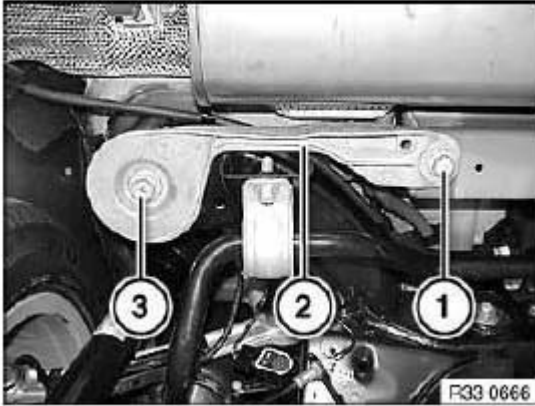


Fig. 101: Identifying Screws And Compression Strut
Courtesy of BMW OF NORTH AMERICA, INC.

33 AXLE MOUNTING

33 32 153 REMOVING AND INSTALLING/REPLACING FRONT COMPRESSION STRUT

IMPORTANT: Observe safety when raising the vehicle.
Driving without compression struts is not permitted!

Necessary preliminary tasks:

- Remove underbody panelling (rear section) . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

Release screws (1).

Release screw (3).

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

Release screw (2) and remove compression strut (4).

Secure rear axle carrier by inserting screw (2).

Installation:

Check threads for damage; if necessary, repair with Helicoil thread inserts.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

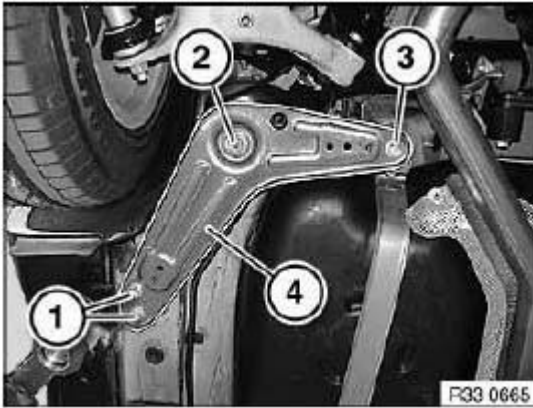


Fig. 102: Identifying Screws And Compression Strut
 Courtesy of BMW OF NORTH AMERICA, INC.

33 32 155 REMOVING AND INSTALLING/REPLACING REAR COMPRESSION STRUT

IMPORTANT: Observe safety when raising the vehicle.
Driving without compression struts is not permitted!

Release screw (1).

Release screw (3) and remove compression strut (2).

Secure rear axle carrier by inserting screw (3).

Installation:

Check threads for damage; if necessary, repair with Helicoil thread inserts.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

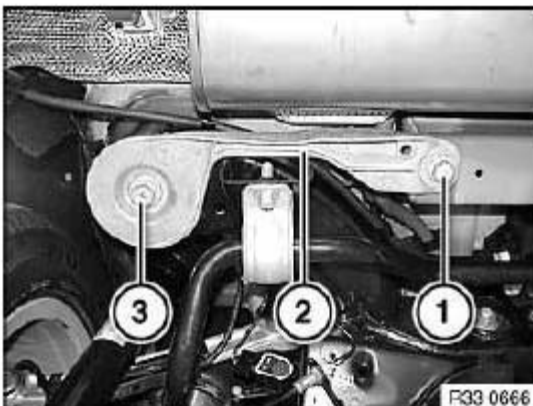


Fig. 103: Identifying Screws And Compression Strut
 Courtesy of BMW OF NORTH AMERICA, INC.

33 33 111 REPLACING ALL RUBBER MOUNTS FOR REAR AXLE CARRIER**Special tools required:**

- 33 4 140
- 33 4 155
- 33 4 156
- 33 5 171
- 33 5 172
- 33 5 173

WARNING: Danger to life! See 51 71 505 MOUNT SECURING FIXTURE FOR VEHICLE ON LIFTING PLATFORM to prevent the vehicle from slipping off or tilting down.

Necessary preliminary tasks:

- Lower rear axle carrier

WARNING: Danger of explosion!
Do not point air jet from hot air blower at fuel tank!

Withdraw rubber mount using special tools 33 4 140, 33 4 155 , 33 4 156 and 33 5 171 from rear axle carrier sleeve.

NOTE: Make sure special tool 33 5 171 is correctly positioned in relation to rubber mount.
Make sure special tool 33 4 140 is correctly supported on rear axle carrier sleeve.
Using a hot air blower, heat bearing bushing at max. 600°C outlet temperature for approx. 2 minutes.

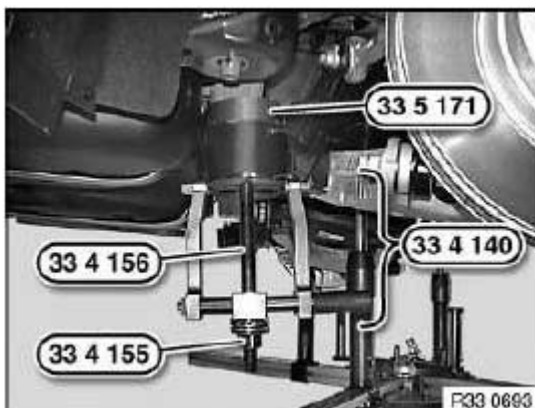
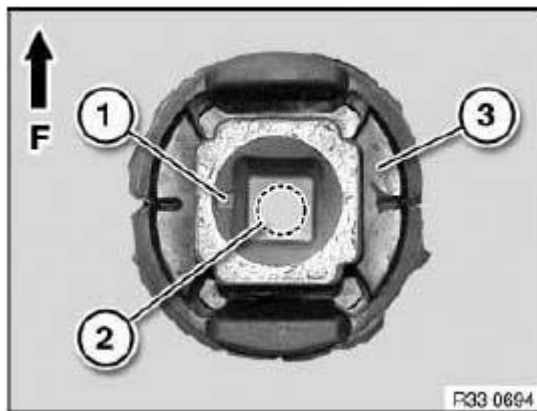


Fig. 104: Identifying Special Tools (33 4 140), (33 4 155) And (33 5 171)

Courtesy of BMW OF NORTH AMERICA, INC.

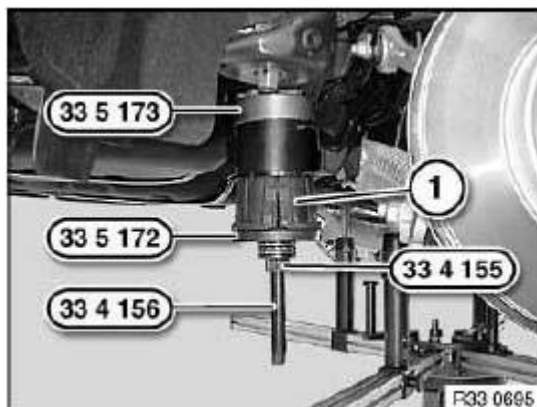
IMPORTANT: Applicable to front rubber mount:**Notch (1) must point to vehicle longitudinal axis and round rubber mount opening (2) must point downwards.****Applicable to rear rubber mount:****Notch (1) must point outwards from vehicle longitudinal axis and round rubber mount opening (2) must point downwards.**

Coat rubber mount (3) with Circo Light.

**Fig. 105: Identifying Notch, Round Rubber Mount Opening And Rubber Mount**

Courtesy of BMW OF NORTH AMERICA, INC.

Draw in rubber mount (1) with special tools 33 5 173, 33 5 172 , 33 4 155 and 33 4 156 as far as it will go into rear axle carrier sleeve.

**Fig. 106: Identifying Rubber Mount And Special Tools (33 5 173), (33 5 172)**

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Activate and fill air suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .
- Bleed braking system . See **34 00 050 BLEEDING BRAKE SYSTEM WITH DSC** .

IMPORTANT: If the pedal support is removed or slips before the brake lines are connected, it will be necessary to bleed the brake system at front and rear!

41 WHEEL BEARINGS

33 41 000 REPLACING DRIVE FLANGE ON LEFT/RIGHT REAR AXLE SHAFT

Special tools required:

- 33 2 116
- 33 2 160
- 33 2 201
- 33 4 200

Remove rear wheel.

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

Release collar nut (1), activate parking brake for this purpose.

Installation:

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

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

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

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

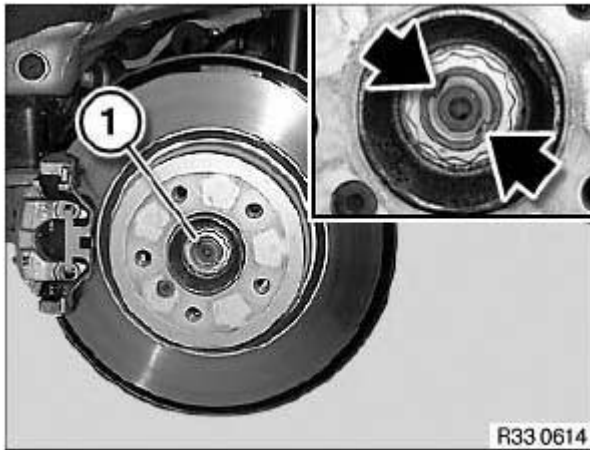


Fig. 107: Identifying Collar Nut

Courtesy of BMW OF NORTH AMERICA, INC.

Remove brake disk . See **34 21 320 REMOVING AND INSTALLING OR REPLACING BOTH REAR BRAKE DISCS** .

Force drive flange with special tools 33 2 116 / 33 2 201, 33 2 160 , 33 4 200 and 5 wheel bolts out of wheel bearing.

NOTE: **Rounded inside edge of special tool 33 2 160 must point to drive flange.**

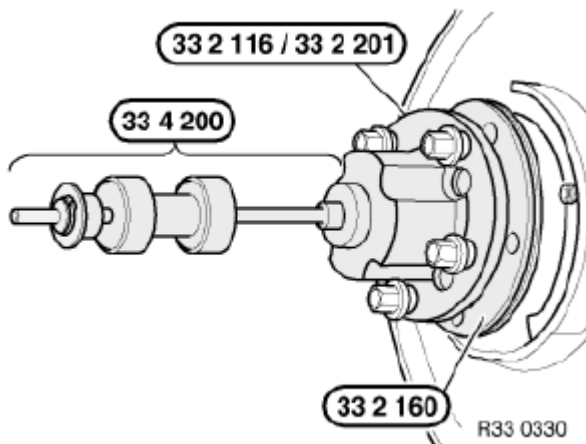


Fig. 108: Identifying Special Tools (33 2 116), (33 2 201) And (33 4 200)

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The wheel bearing is destroyed when the drive flange is removed and cannot be reused!

Replace wheel bearing . See **33 41 151 REPLACING LEFT OR RIGHT WHEEL BEARING ON REAR AXLE SHAFT** .

Installation:

Oil drive flange lightly and attach to splines of output shaft.

Draw drive flange into wheel bearing . See **33 21 ... PRESSING OUTPUT SHAFT OUT OF DRIVE FLANGE AND DRAWING IN (OUTPUT SHAFT REMOVED FROM REAR DIFFERENTIAL).**

After installation:

- Adjusting parking brake . See **34 41 006 ADJUSTING PARKING BRAKE** .

33 41 151 REPLACING LEFT OR RIGHT WHEEL BEARING ON REAR AXLE SHAFT

IMPORTANT: Do not damage multipole impulse ring.

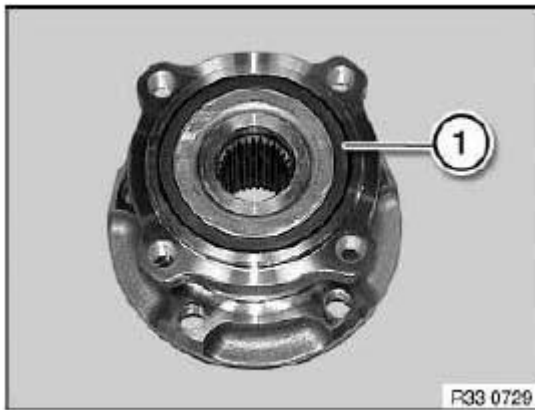


Fig. 109: Identifying Multipole Impulse Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks:

- Remove drive flange for rear axle shaft . See **33 41 000 REPLACING DRIVE FLANGE ON LEFT/RIGHT REAR AXLE SHAFT.**

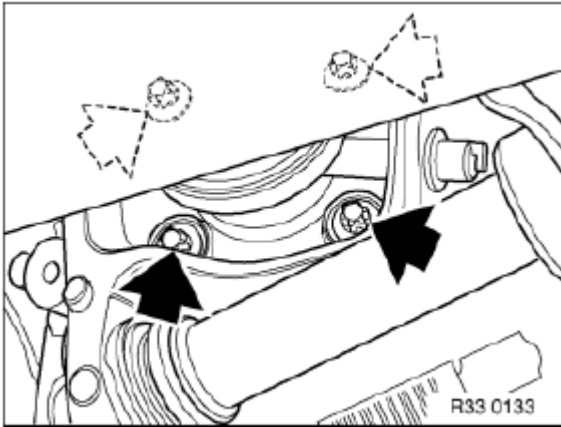
Release screws.

Remove wheel bearing.

Installation:

Stick in screws again / replace.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

**Fig. 110: Locating Screws**

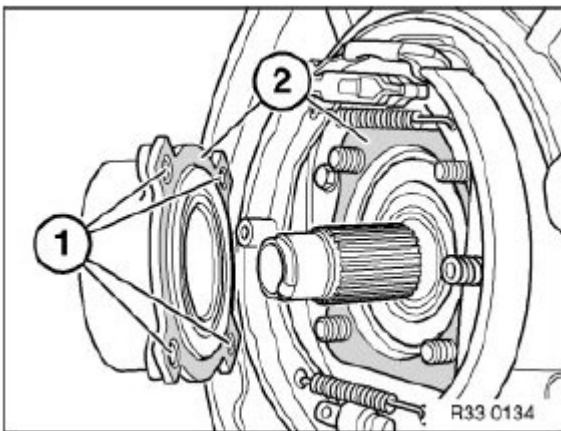
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Keep contact surface (2) of wheel bearing/wheel carrier clean and free from oil and grease.

Except when replacing: Recondition tapped holes (1).

Install new wheel bearing.

**Fig. 111: Identifying Tapped Holes And Contact Surface Of Wheel Bearing/Wheel Carrier**

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Adjusting parking brake See **34 41 006 ADJUSTING PARKING BRAKE** .

52 SHOCK ABSORBER

33 00 ... INFORMATION ON REPLACING SHOCK ABSORBERS**Facts:**

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.

E32, E34, E38, E39: In the case of rear spring struts with ride-height control, there is always a slight oil spillage on the piston rod. These spring struts are permitted to be wet with oil over a maximum of half the shock absorber length on the outer tube, i.e. they are permitted to "sweat".

Consequence:

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

Procedure:

Shock absorbers may be replaced on one side only until they have completed 50 000 km service.

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

33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER

NOTE: **Read and comply with Information on replacing shock absorbers . See 33 00 ... INFORMATION ON REPLACING SHOCK ABSORBERS.**

Version with Vertical Dynamics Management:

IMPORTANT: Handle the spring strut with care so as to avoid damaging the control unit (1) and control valve (2).

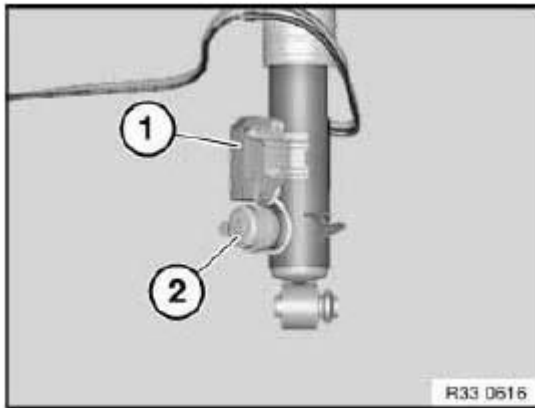


Fig. 112: Identifying Control Unit And Control Valve
 Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks:

- Remove rear wheel.
- Tension both coil springs (and leave on vehicle). See **33 53 000 REMOVING AND INSTALLING / REPLACING REAR LEFT OR RIGHT COIL SPRING.**
- Version with ride-height control: Deactivate and drain air spring system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .

Version with Vertical Dynamics Management:

NOTE: **The plug connections on the right side are shown.**

Partially detach rear wheel arch cover . See **51 71 041 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT WHEEL ARCH COVER** .

Detach both plug connections (3) and expose lines up to shock absorber.

1. Plug connection for brake pad wear sensor
2. Plug connection for pulse generator

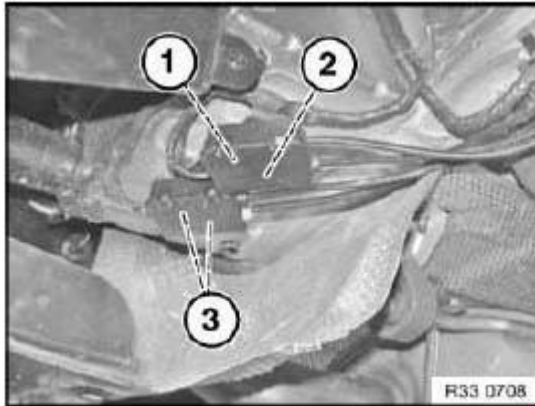


Fig. 113: Identifying Plug Connections
 Courtesy of BMW OF NORTH AMERICA, INC.

Release retainer (1) and remove brake hose (2) from shock absorber (4).

Installation:

When installing the shock absorber, ensure that the holder for the brake hose (2) points to the middle of the vehicle.

Ensure correct seating in guide.

Retainer must be felt and heard to snap into place.

Unscrew bolt (3).

IMPORTANT: Secure shock absorber against falling out.

Remove shock absorber (4) from swinging arm and tie back.

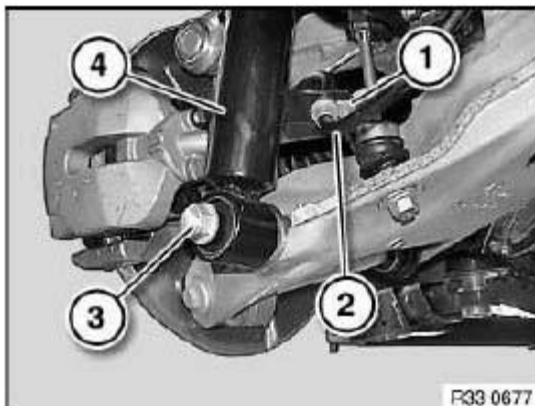


Fig. 114: Identifying Retainer, Brake Hose, Bolt And Shock Absorber
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Before tightening screw/bolt connection, check that shock absorber pin is correctly positioned in swinging arm.
Screw must not be used as an aid to installing the shock absorber!

Installation:

Replace screw.

Tighten bolt in normal position .

Tightening torque. See REAR AXLE - TIGHTENING TORQUES .

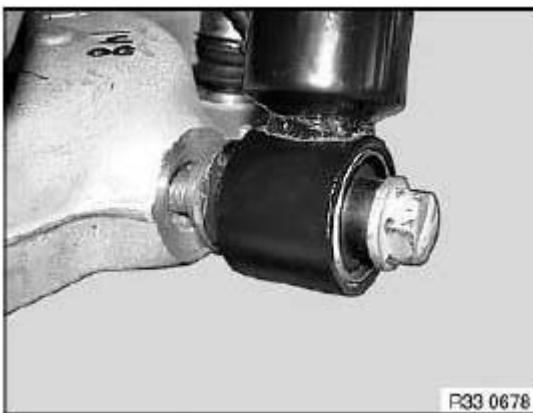


Fig. 115: Identifying Shock Absorber Pin In Swinging Arm
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

Do not pull expanding clips with luggage compartment tray out of lashing rail.

Release expanding clips (1).

Press luggage compartment tray (2) to one side.

Installation:

Replace damaged expanding clips.

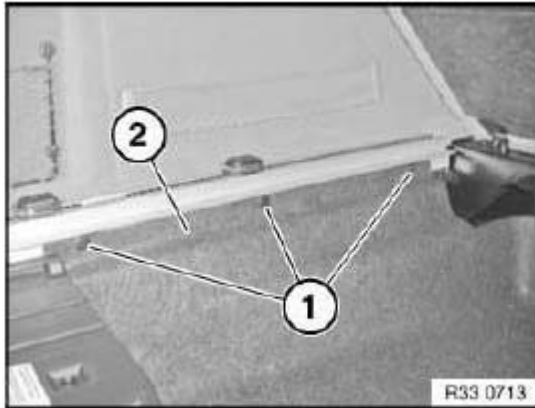


Fig. 116: Identifying Expanding Clips And Luggage Compartment Tray
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Pictured: the support pot for steel spring suspension or 5-seater with ride-height control up to 09/2007, both for conventional shock absorbers and controlled shock absorbers. From 09/2007 this support pot will only be fitted in vehicles with steel spring suspension.

Unscrew nuts (1).

Installation:

Replace self-locking nuts.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

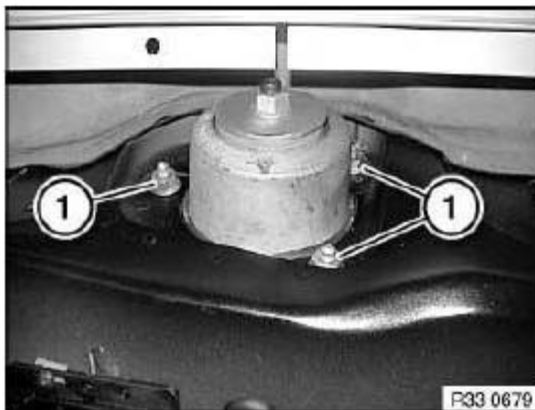


Fig. 117: Identifying Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Remove shock absorber if necessary with connecting lines in downward direction.

Installation:

Clean body contact surface for support bearing flange all round.



Fig. 118: Identifying Shock Absorber With Connecting Lines
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Replace faulty sealing washer (1).
 Refit sealing washer (1).

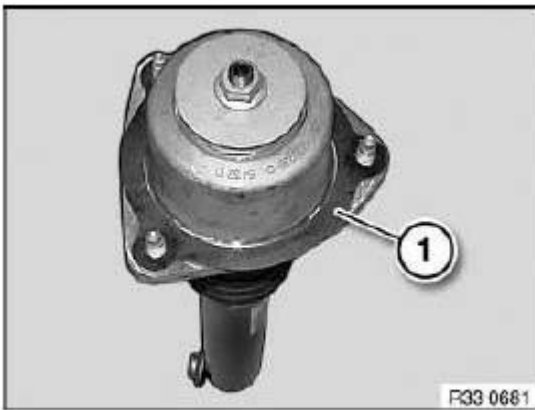


Fig. 119: Identifying Sealing Washer
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Modify support bearing . See **33 52 161 REPLACING REAR LEFT OR RIGHT THRUST BEARING FOR SPRING STRUT/SHOCK ABSORBER**.

Modify auxiliary damper (1) and protective tube (2) incl. support pot ().

Installation:

Check auxiliary damper (1) and protective tube (2) for damage, replace if necessary.

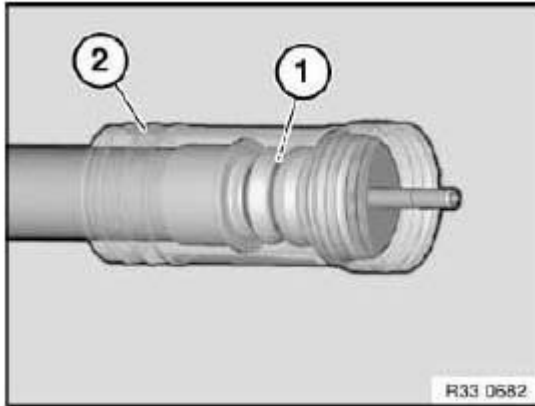


Fig. 120: Identifying Auxiliary Damper And Protective Tube
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Activate and fill air suspension system . See **37 00 100 DRAINING/FILLING AIR SPRING SYSTEM** .
- Replacement only: Code shock absorber with DIS Tester and check software status
- Replacement only: Carry out vertical acceleration sensor adjustment . See **37 PERFORMING VERTICAL ACCELERATION SENSOR ADJUSTMENT (VERTICAL DYNAMICS MANAGEMENT)** .

33 52 161 REPLACING REAR LEFT OR RIGHT THRUST BEARING FOR SPRING STRUT/SHOCK ABSORBER

Necessary preliminary tasks:

- Remove rear shock absorber . See **33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER**.

Unscrew nut (1).

Remove joint disc (2), support bearing upper section (3) and support bearing flange (4).

Installation:

Insert support bearing upper section (3) correctly in support bearing flange (4).

Replace self-locking nut.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

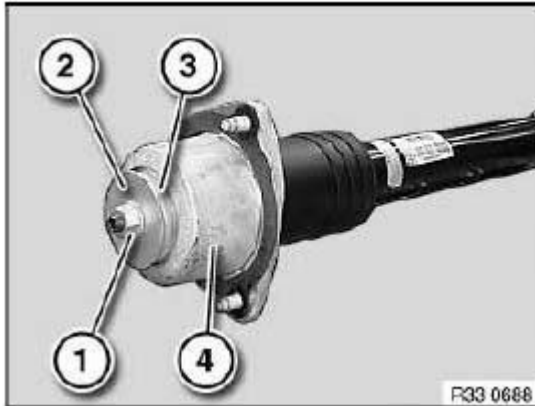


Fig. 121: Identifying Nut, Joint Disc, Support Bearing Upper Section And Support Bearing Flange
Courtesy of BMW OF NORTH AMERICA, INC.

Remove spacer sleeve (1) with support bearing lower section (2).

Check protective tube (3) for damage, replace if necessary.

Installation:

Insert spacer sleeve (1) correctly in support bearing lower section (2).



Fig. 122: Identifying Spacer Sleeve, Support Bearing Lower Section And Protective Tube
Courtesy of BMW OF NORTH AMERICA, INC.

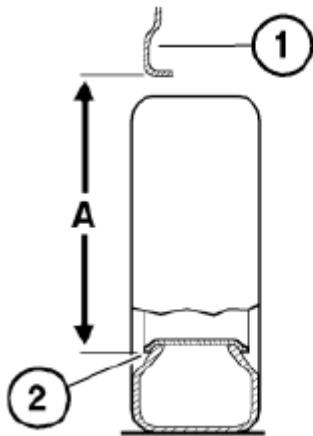
53 SPRINGS WITH SUSPENSION

33 53 ... MEASURING RIDE-LEVEL HEIGHT OF VEHICLE

Necessary preliminary tasks:

- Move vehicle into normal position . See 32 00 ... MOVING VEHICLE INTO NORMAL POSITION .

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



R31 0177

Fig. 123: Identifying Ride Height (A)

Courtesy of BMW OF NORTH AMERICA, INC.

33 53 000 REMOVING AND INSTALLING / REPLACING REAR LEFT OR RIGHT COIL SPRING

Special tools required:

- 33 5 100
- 33 5 101
- 33 5 102
- 33 5 103
- 33 5 104
- 33 5 105

IMPORTANT: Use spring tensioner 33 5 100 to remove and install the coil spring in order to avoid over elongating the rubber mounts (control arm, guide arm, swinging arm).

WARNING: Observe the following instructions to avoid any risk of injury by the coil springs.

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 free of grease.

7. Do not compress coil spring to full extent.
8. Observe manufacturer's instructions.

IMPORTANT: Both coil springs on the relevant axle must be replaced only in the event of corrosion breakage!
Avoid damaging the coil spring coating.

Necessary preliminary tasks:

- Remove rear wheel.
- Remove stabilizer link from swinging arm . See **33 55 040 REPLACING STABILIZER LINKS FOR STABILIZER.**
- Remove rear shock absorber from swinging arm (remove brake hose). See **33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.**
- Lower workshop jack and place to one side

Removal:

Lever conical cover (1) with a suitable tool out of lower spring pad.

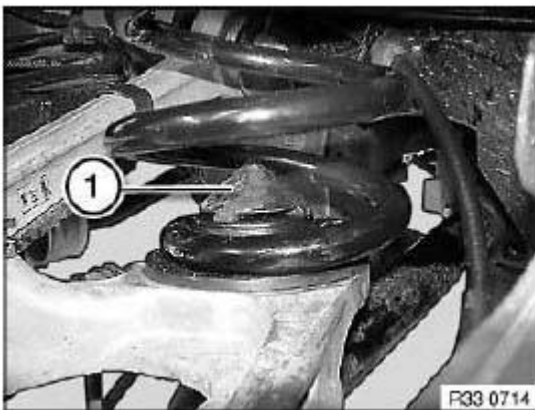


Fig. 124: Identifying Conical Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Feed spindle 33 5 103 into coil spring and turn thrust piece 33 5 104 downwards.

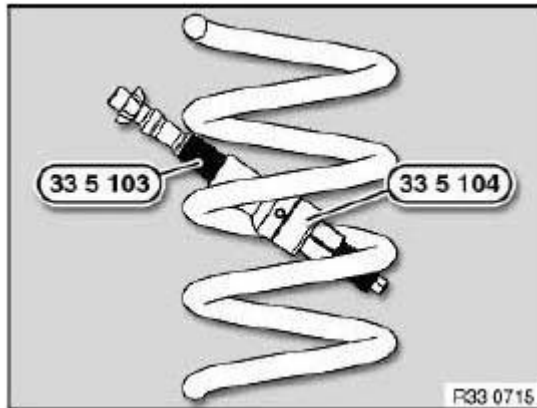


Fig. 125: Identifying Spindle (33 5 103) And (33 5 104)
 Courtesy of BMW OF NORTH AMERICA, INC.

Insert lower spring retainer 33 5 102 into coil spring and turn downwards over spindle 33 5 103 .

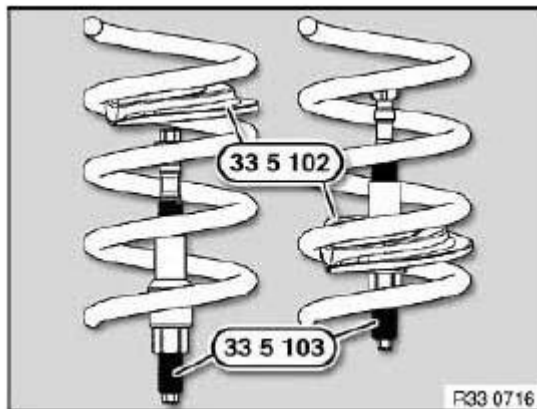


Fig. 126: Identifying Lower Spring Retainer (33 5 102) And (33 5 103)
 Courtesy of BMW OF NORTH AMERICA, INC.

Insert upper spring retainer 33 5 101 sideways into coil spring and turn fully upwards.

WARNING: Danger of injury!

Align spring tensioner 33 5 100 centrally in order to obtain the largest possible contact surface on the coil spring.
Make sure hexagon cap (1) is correctly seated in upper spring retainer 33 5 101 .

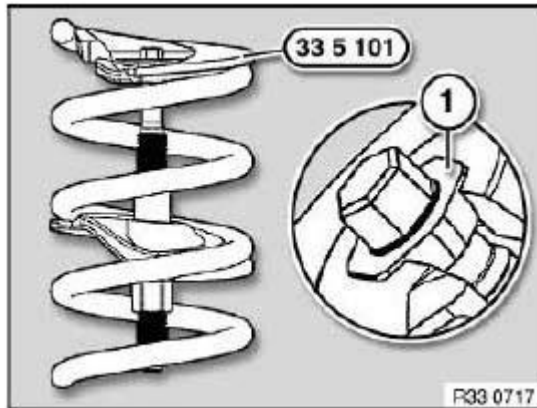


Fig. 127: Identifying Hexagon Cap And Upper Spring Retainer (33 5 101)

Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: Danger of injury!
Make sure coil spring is correctly positioned in spring plates.

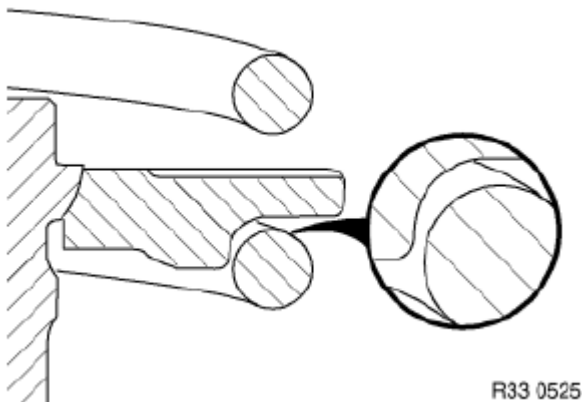


Fig. 128: Identifying Coil Spring Position In Spring Plates

Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: Danger of injury!
Make sure detent pin (1) is correctly positioned in recesses of lower spring retainer 33 5 102 .

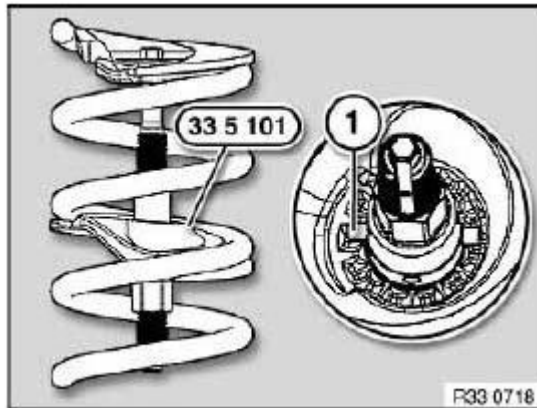


Fig. 129: Identifying Detent Pin And Lower Spring Retainer (33 5 102)

Courtesy of BMW OF NORTH AMERICA, INC.

Check installation position of spring tensioner (33 5 100), correct if necessary.

NOTE: Make sure there is sufficient clearance ($A = 7 \text{ cm}$) between spindle 33 5 103 and lower spring pad.

Tension coil spring using special tool 33 5 105; if necessary, grip coil spring.

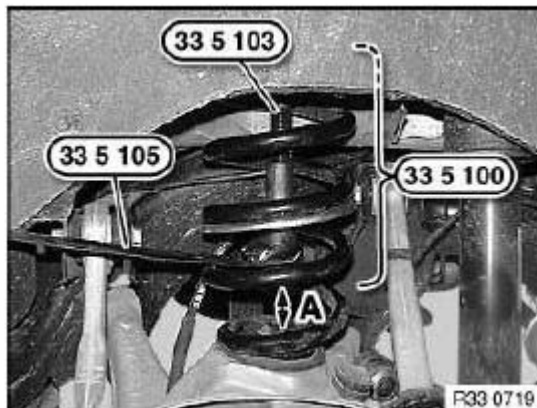


Fig. 130: Identifying Clearance Between Spindle (33 5 103) And Lower Spring Pad

Courtesy of BMW OF NORTH AMERICA, INC.

Turn coil spring through $A = 30^\circ$ in counterclockwise direction.

Press wheel carrier downwards a little and remove coil spring sideways.

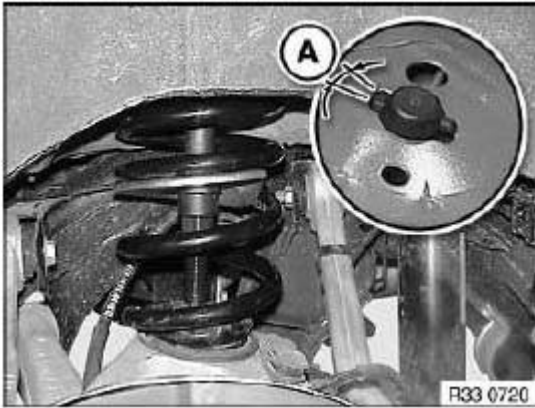


Fig. 131: Turning Coil Spring

Courtesy of BMW OF NORTH AMERICA, INC.

Remove upper spring pad (1) from coil spring, check for damage and replace if necessary.

If necessary, relieve tension on coil spring.

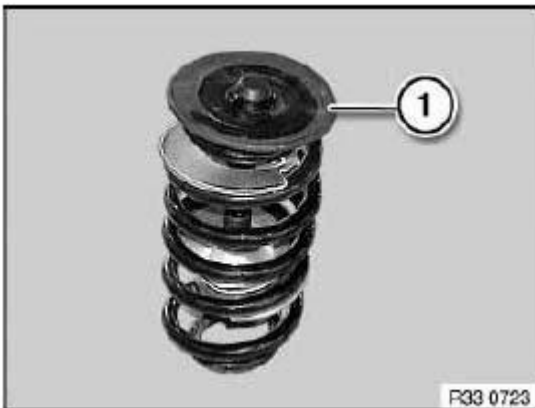


Fig. 132: Identifying Upper Spring Pad And Upper Section

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check lower spring pad (1) for damage.

IMPORTANT: Make sure spring pad is correctly installed in order to prevent the coil spring from jumping out.

If necessary, lever out upper section (2) with a suitable tool and replace spring pad with upper section.

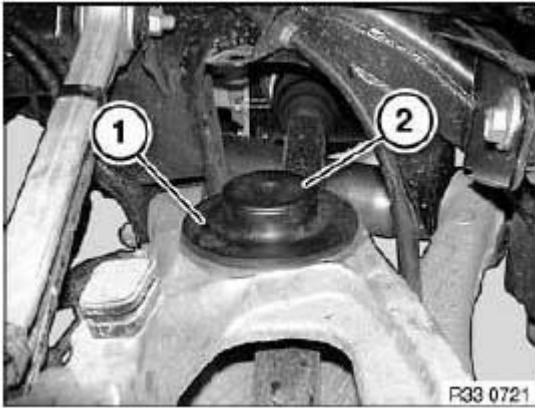


Fig. 133: Identifying Lower Spring Pad And Upper Section
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Make sure spring pad is correctly installed in order to prevent the coil spring from jumping out.

Install upper spring pad (1) in locator or frame side member and turn clockwise as far as it will go.

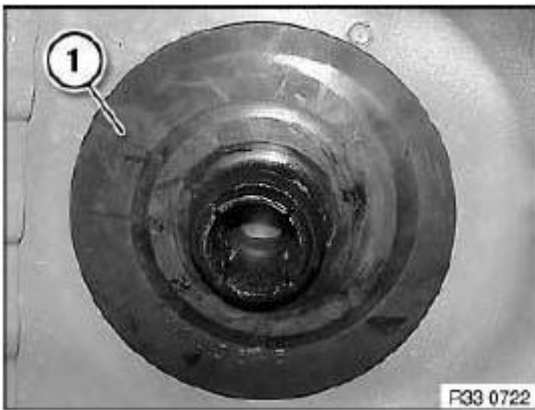


Fig. 134: Identifying Spring Pad
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Make sure coil spring is correctly seated in spring pads.

Insert coil spring with spring tensioner 33 5 100 between upper and lower spring pads and relieve tension.

Relieve tension on spring tensioner 33 5 100 and remove.

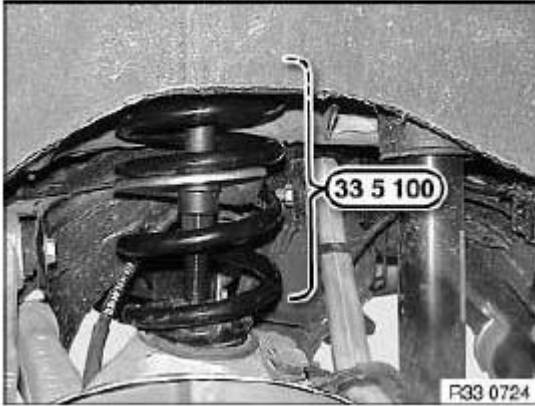


Fig. 135: Identifying Spring Tensioner (33 5 100)
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Check headlight adjustment , correct if necessary. See **63 10 004 ADJUSTING HEADLIGHTS** .

55 STABILIZER BAR

33 55 000 REMOVING AND INSTALLING/REPLACING REAR STABILIZER

Necessary preliminary tasks:

- Remove both stabilizer links from stabilizer . See **33 53 000 REMOVING AND INSTALLING / REPLACING REAR LEFT OR RIGHT COIL SPRING**.

Release screws (1).

Replacement only: Remove both rubber mounts from stabilizer . See **33 55 021 REPLACING BOTH RUBBER MOUNTS FOR STABILIZER MOUNTING**.

Turn stabilizer (2) and remove sideways.

Installation:

Check both rubber mounts for damage , replace if necessary. See **33 55 021 REPLACING BOTH RUBBER MOUNTS FOR STABILIZER MOUNTING**.

Align stabilizer centrally.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

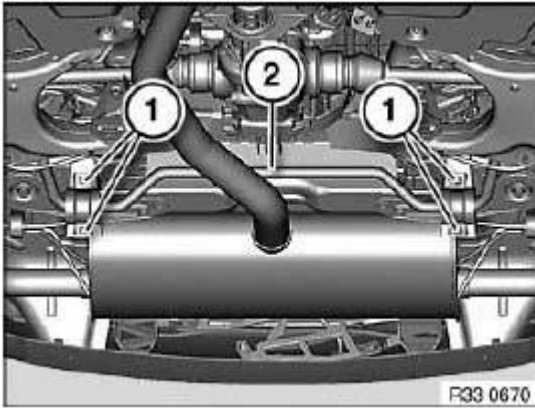


Fig. 136: Identifying Screws And Stabilizer

Courtesy of BMW OF NORTH AMERICA, INC.

33 55 021 REPLACING BOTH RUBBER MOUNTS FOR STABILIZER MOUNTING

Necessary preliminary tasks:

- Remove stabilizer from rear axle carrier . See **33 55 000 REMOVING AND INSTALLING/REPLACING REAR STABILIZER.**

IMPORTANT: Circo Light must not be used between stabilizer and rubber mount!

Remove retaining bracket (1) and rubber mount (2) from stabilizer.

Installation:

Coat rubber mount with Circo Light to install retaining bracket.

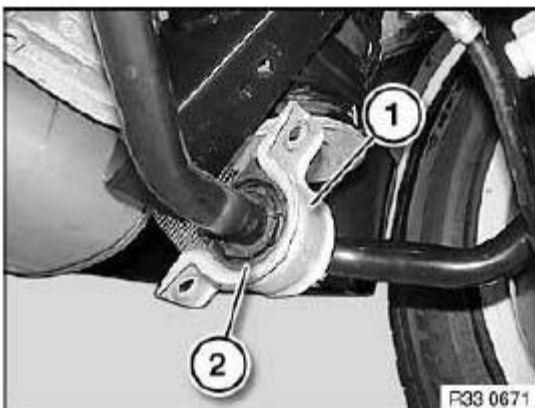


Fig. 137: Identifying Retaining Bracket And Rubber Mount

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Keep stabilizer clean and free of oil and grease.

Mount rubber mount (1) by way of slot (2) as pictured on stabilizer.

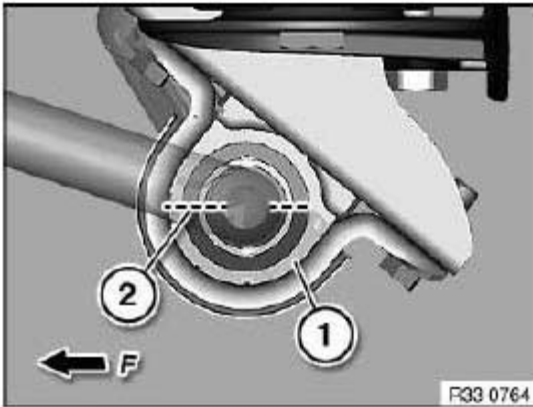


Fig. 138: Identifying Rubber Mount Aligning Slot
Courtesy of BMW OF NORTH AMERICA, INC.

33 55 040 REPLACING STABILIZER LINKS FOR STABILIZER

IMPORTANT: Observe safety when raising the vehicle

Unscrew nuts (1).

Remove stabilizer link (2).

Installation:

Replace self-locking nuts.

Tightening torque. See **REAR AXLE - TIGHTENING TORQUES** .

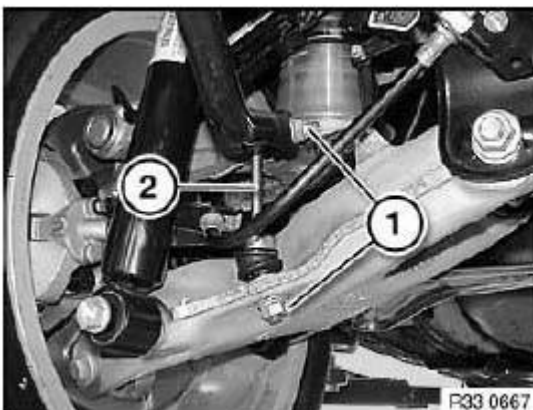


Fig. 139: Identifying Nuts And Stabilizer Link

Courtesy of BMW OF NORTH AMERICA, INC.

90 TROUBLESHOOTING

33 90 ... REAR AXLE TROUBLESHOOTING

TROUBLESHOOTING CHART FOR SHOCK ABSORBERS

Fault	Cause	Remedy
Grinding noise (only when cornering)	Troubleshoot brake system.	
	Wheel bearings faulty	Replace wheel bearings . See 41 WHEEL BEARINGS.
Vibration (90-160 km/h)	Wheel imbalance	Balance wheels
	Radial/lateral rim runout	Check rims, replace if necessary
	Radial tire runout	Match or replace tires
	Imbalance in output shaft	Replace output shaft . See 33 21 000 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT OUTPUT SHAFT.
Drumming	Rubber mount of final drive suspension faulty	Replace rubber mount . See 33 17 004 REPLACING ALL FRONT RUBBER MOUNTS FOR REAR DIFFERENTIAL MOUNTING or 33 17 005 REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR.
	Rubber mount of rear axle carrier faulty	Replace rubber mount . See 33 17 004 REPLACING ALL FRONT RUBBER MOUNTS FOR REAR DIFFERENTIAL MOUNTING or 33 17 005 REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR.
	Imbalance in propeller shaft	Replace propeller shaft . See 26 11 000 REMOVING AND INSTALLING PROPELLER SHAFT (INSERTED) COMPLETELY .
Rattling noise	Refer to TROUBLESHOOTING FOR SHOCK ABSORBERS.	
	Stabilizer link loose or defective	Check screw connection, replace stabilizer link if necessary. See 33 55 040 REPLACING STABILIZER LINKS FOR STABILIZER.
	415 of 3160 Rubber mount of rear axle	Check seat, replace rubber mount if

2008 BMW X5 48i

2007-08 SUSPENSION Rear Axle - Repair Instructions - X5

	carrier loose or faulty	necessary. See 33 17 004 REPLACING ALL FRONT RUBBER MOUNTS FOR REAR DIFFERENTIAL MOUNTING or 33 17 005 REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR.
Poor straight-running stability (steering wheel inclination)	Rubber mount of rear axle carrier faulty	Replace rubber mount . See 33 17 004 REPLACING ALL FRONT RUBBER MOUNTS FOR REAR DIFFERENTIAL MOUNTING or 33 17 005 REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR.
	Rubber mount/ball joint of control or guide arm faulty	Replace control or guide arm . See 33 32 091 REPLACING A GUIDE ARM.
	Ball joint in wheel carrier faulty	Replace ball joint . See 33 32 125 REPLACING A BALL JOINT IN LOWER STEERING KNUCKLE / WHEEL CARRIER.
	Rubber mount of swinging arm faulty	Replace swinging arm . See 33 17 004 REPLACING ALL FRONT RUBBER MOUNTS FOR REAR DIFFERENTIAL MOUNTING or 33 17 005 REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR.
	Rear axle alignment incorrectly adjusted	Carry out chassis/wheel alignment check , align rear axle if necessary. See 32 00 ... CHASSIS/WHEEL ALIGNMENT CHECK PROCEDURE .
Unsteady taking of curves due to self-steering or poor rear end track stability	Rubber mount of rear axle carrier faulty	Replace rubber mount . See 33 17 004 REPLACING ALL FRONT RUBBER MOUNTS FOR REAR DIFFERENTIAL MOUNTING or 33 17 005 REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR.
	Rubber mount of final drive suspension faulty	Replace rubber mount . See 33 17 004 REPLACING ALL FRONT

2008 BMW X5 48i**2007-08 SUSPENSION Rear Axle - Repair Instructions - X5**

		<u>RUBBER MOUNTS FOR REAR DIFFERENTIAL MOUNTING or 33 17 005 REPLACING RUBBER MOUNT FOR REAR DIFFERENTIAL MOUNTING AT REAR.</u>
	Refer to <u>TROUBLESHOOTING FOR SHOCK ABSORBERS.</u>	
Excessive tire wear	Front or rear axle alignment incorrectly adjusted	Carry out chassis/wheel alignment check , align rear axle if necessary. See <u>32 00 ... CHASSIS/WHEEL ALIGNMENT CHECK PROCEDURE</u>

33 90 ... TROUBLESHOOTING SHOCK ABSORBER

Read and comply with Information on replacing shock absorbers . See **33 00 ... INFORMATION ON REPLACING SHOCK ABSORBERS.**

TROUBLESHOOTING CHART FOR SHOCK ABSORBERS

Fault	Cause	Remedy
Wheel knocking (bottoming)	Auxiliary damper faulty	Visually inspect auxiliary dampers for cracking, replace auxiliary dampers . See <u>33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.</u>
	Shock absorber leaking (oil/gas)	Replace shock absorber . See <u>33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.</u>
Rattling noise	Shock absorber mounting loose	Tighten shock absorber.
	Support bearing loose	Secure support bearing . See <u>33 52 161 REPLACING REAR LEFT OR RIGHT THRUST BEARING FOR SPRING STRUT/SHOCK ABSORBER.</u>
	Support bearing defective (cracked)	Visually inspect for cracking, replace support bearing . See <u>33 52 161 REPLACING REAR LEFT OR RIGHT THRUST BEARING FOR SPRING STRUT/SHOCK ABSORBER.</u>
	Protective tube defective/failed 417 of 3160	Visually inspect protective tube for cracking, replace protective tube . See <u>33 52 000 REMOVING AND</u>

2008 BMW X5 48i**2007-08 SUSPENSION Rear Axle - Repair Instructions - X5**

		<u>INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.</u>
	Shock absorber leaking (gas/oil)	Replace shock absorber . See <u>33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.</u>
Worn down areas (flattened areas) on tire profile	Shock absorber leaking (gas/oil)	Replace shock absorber . See <u>33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.</u>
Long after-swinging of body after driving over rough road	Shock absorber leaking (insufficient shock absorber effect)	Replace shock absorber . See <u>33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.</u>
Building-up of body in case of successive uneven surfaces	Shock absorber leaking (insufficient shock absorber effect)	Replace shock absorber . See <u>33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.</u>
Wheels jumping even on normal road surfaces	Shock absorber leaking (insufficient shock absorber effect)	Replace shock absorber . See <u>33 52 000 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SHOCK ABSORBER.</u>