

## Rear Differential

All rear differential work requires some method of raising the car and supporting it securely while the work is performed. Jack stands and a floor jack can easily be used, but use extreme caution when working beneath the car. See ⇒ [010 General](#).

### **Note:**

*Removal of rear subframe (differential carrier) is covered in ⇒ [330 Rear Suspension](#).*

## Rear differential oil, checking and filling

### **Note:**

*BMW supplies the E46 rear differential with lifetime lubricant.*

⚠ To check rear differential oil level:

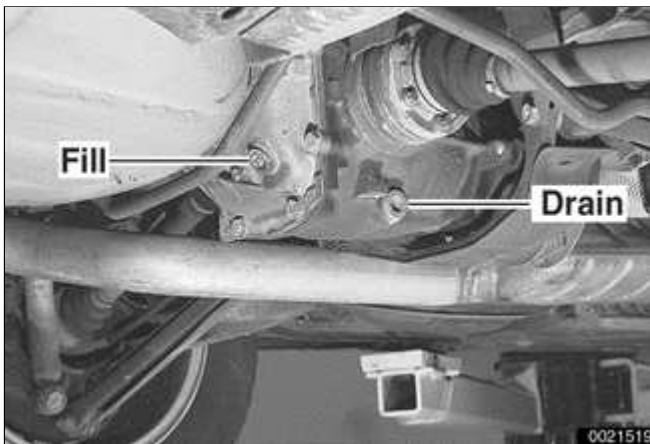
- ◆ Remove oil filler plug.
- ◆ Insert finger into fill hole. If finger is wetted from oil, level is correct.

### **Note:**

*Use a 14 mm Allen socket to remove the fill or drain plug. Alternatively, cut approximately 30 mm (1.2 in) from an Allen key and use a box end wrench on the key stub.*

- If necessary, fill differential with appropriate type and quantity of lubricant.

### **Note:**



*The differential fluid level is correct when the fluid begins to spill from the fill plug.*

- Install and tighten fill plug.

<b>Differential oil</b>	
Differential oil capacity	
Rear wheel drive	0.9 liter (0.95 US qt.)
All wheel drive	1.0 liter (1.06 US qt.)
Oil specification	BMW SAF-XO synthetic oil

<b>Tightening torques</b>	
Differential drain or fill plug	70 Nm (52 ft-lb)

## Rear differential, removing and installing

- Raise rear end of car and support it securely on jack stands.

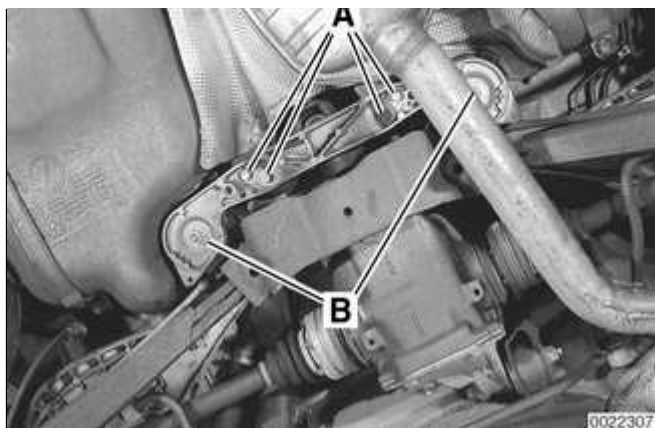
### **WARNING!**

***Make sure that the car is firmly supported on jack stands designed for the purpose. Place the jack stands beneath a structural chassis point. Do not place jack stands under suspension parts.***

- Remove rear drive axles.
- If necessary, drain differential oil.



- Remove rear suspension reinforcement brace:



- ◆ Remove heat shield between reinforcement brace and exhaust pipe.
- ◆ Remove bolts (A) mounting brace to undercarriage.
- ◆ Remove nuts (B) mounting brace and front of rear subframe to undercarriage.
- ◆ Lower and remove reinforcement.

**Note:**

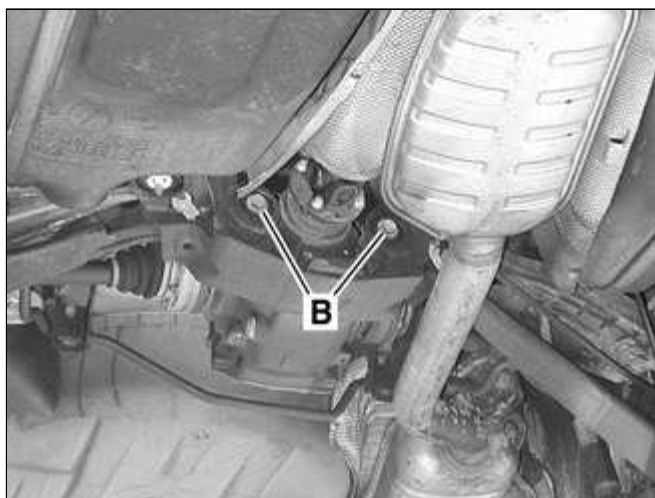
*If necessary, tilt rear half of exhaust system down. Support exhaust system securely.*

- Detach driveshaft from differential input shaft flange and suspend. See ⇒ [260 Driveshaft](#).

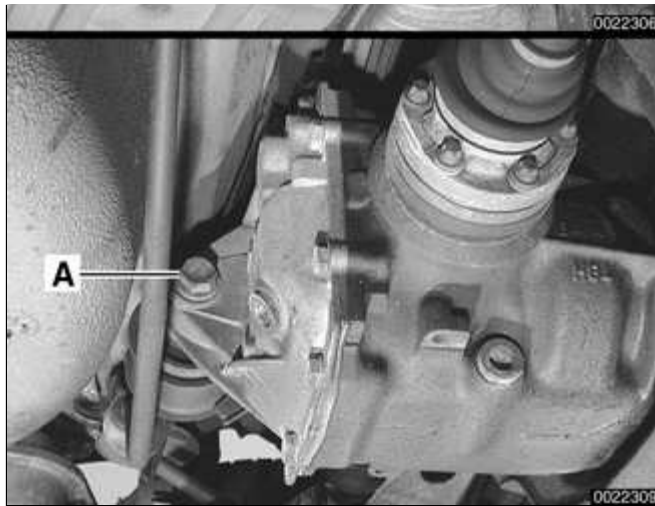
**CAUTION!**

***Suspend the detached drive axle from the car body with a stiff wire hook to prevent damage to the outer CV joint.***

- Remove rear stabilizer bar.



- ⚠ Support differential with transmission jack. Remove rear (A) and front (B) mounting bolts at subframe.
  - Slowly lower differential unit and remove toward rear.
  - Installation is reverse of removal. In order to prevent excess vibration and noise, follow sequence for tightening



differential mounting bolts:

- ◆ Install bolts finger tight.
- ◆ Tighten front bolts (**B**).
- ◆ Tighten rear bolt (**A**).

<b>Tightening torques</b>	
Differential drain or fill plug	70 Nm (52 ft-lb)
Differential to rear subframe	
Front mount (M12 bolts)	95 Nm (70 ft-lb)
Rear mount (M14 bolt)	174 Nm (128 ft-lb)
Drive axle to differential flange	
M10x20 mm Torx bolt	83 Nm (61 ft-lb)
M10x46 mm bolt (black)	100 Nm (74 ft-lb)
M10x46 mm bolt (silver) (always replace)	80 Nm (59 ft-lb)
Driveshaft to differential flange	
M10 compression nut	64 Nm (47 ft-lb)
M10 Torx bolt	85 Nm (63 ft-lb)
Rear suspension reinforcement to undercarriage	
M12 self-locking nut	77 Nm (57 ft-lb)
M8 bolt 8.8 grade	21 Nm (15 ft-lb)
M8 bolt 10.9 grade	30 Nm (22 ft-lb)

- Be sure to refill differential.

<b>Differential oil</b>	
Differential oil capacity	
Rear wheel drive	0.9 liter (0.95 US qt)
All wheel drive	1.0 liter (1.06 US qt.)
Oil specification	BMW SAF-XO synthetic oil

## Differential mounting bushings

- If rear differential mounting bushing are worn, damaged or oil soaked:
  - ◆ Remove differential from rear subframe.
  - ◆ Working at subframe, use bushing press tools to remove old bushings and install new ones.
  - ◆ Carefully note installation marks (arrows) on new bushings.

### **Note:**

*BMW uses bushings from different manufacturers in the course of production. Always check with an authorized BMW dealer for the latest information on suspension bushings.*

Copyright © 2006 Robert Bentley, Inc. All rights reserved.