

331 Final Drive

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GENERAL

This repair group covers basic service to the final drive, including removal and installation of the complete unit. Internal repairs and final drive disassembly are not covered in this manual.

The final drive is mounted to the rear suspension crossmember and is easily removed using ordinary hand tools. There are three oil seals in the final drive housing that can be replaced with unit installed in the car. Replacement of the final drive rubber mounts requires removal of the unit.

FINAL DRIVE SERVICE

Final drive service 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 and lowering the final drive.

Final drive oil, draining and filling

- Drive car to warm final drive fluid.
- Raise rear of car.

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.

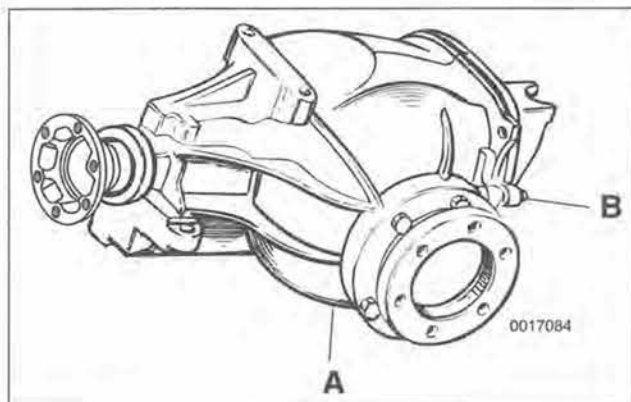
NOTE—

The car should be level when draining final drive oil.

- Place a drain pail below final drive and remove drain plug (A) and fill plug (B) from final drive.

NOTE—

Use a 14 mm allen bit socket to remove the drain plug. Alternatively, cut approximately 30 mm (1.2 in.) from an allen key and use an open end wrench on the key stub.



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- Reinstall and tighten drain plug.

Tightening torque

- Final drive oil drain plug to final drive housing 70 Nm (52 ft-lb)

- Fill final drive with appropriate type and quantity of lubricant. Install and tighten fill plug. The final drive fluid level is correct when the fluid begins to spill from the fill plug.

Tightening torque

- Final drive oil fill plug to final drive housing 70 Nm (52 ft-lb)

Final Drive Drain and Fill

- Oil specifications
w/o limited slip Castrol SAF-XO
with limited slip BMW Synthetic Final Drive Oil
- Final drive oil capacity 1.9 liters (2.0 qt.)

NOTE—

To identify the type of differential (limited slip vs. open), locate the sheet metal data tag on the left-hand rear side of the final drive unit. This tag identifies the type and final drive ratio. For example S 3.10 means that it is a limited slip differential (S) with a 3.10 final ratio.

Final drive, removing and installing

The final drive unit is supported at three points on the suspension crossmember through rubber bushings. New self-locking nuts should always be used when re-attaching the driveshaft to the final drive.

- Raise rear of car.

WARNING—

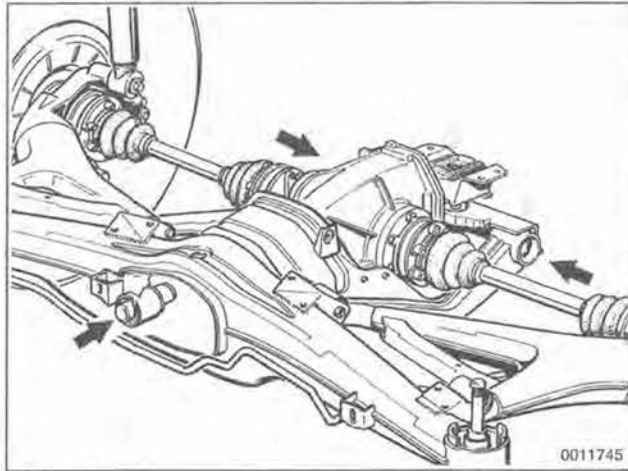
Make sure that the car is firmly supported on jack stands designed for the purpose. Place the jack stands beneath a structural chassis point. Do not place jack stands under suspension parts.

- Drain oil from final drive unit, as described earlier.
- Make matching marks on driveshaft and final drive input flange. Remove bolts and nuts that hold driveshaft to final drive. Push driveshaft forward slightly and suspend from body with stiff wire.

CAUTION—

Do not let the driveshaft or drive axles hang unsupported. Damage to the driveshaft center bearing or drive axle outer CV joint could result.

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- Disconnect drive axles from final drive and suspend from body with stiff wire. See **330 Rear Suspension**.
- Place jack beneath final drive unit and support weight of unit.
- Disconnect wires for vehicle speed sender and remove wiring harness and connector from final drive housing.
- Remove final drive mounting bolts (arrows). Lower final drive.
- Installation is reverse of removal.
 - Position final drive in place against its mounts and loosely install front mounting bolt to locate unit. Then install left and right rear bolts.
 - Use new self-locking nuts when reconnecting driveshaft and align marks made during removal.
 - Torque nuts, while holding bolts.
 - Check final drive oil level and add or fill as necessary.

CAUTION—

Do not reuse self-locking nuts. These nuts are designed to be used only once and should be replaced whenever they are removed.

NOTE—

When installing a new or BMW remanufactured final drive unit, special break-in procedures apply. During the first 1,000 Km (620 miles), the car should be driven at different engine and road speeds, but never exceeding $\frac{2}{3}$ of the maximum speed.

Tightening Torques

- Drive axle to final drive
 - M10 83 Nm (61 ft-lb)
 - M10 with locking teeth (always replace bolts and washers) 96 Nm (70 ft-lb)
- Driveshaft to final drive flange See **260 Driveshaft**
- Final drive to rubber mounts 77 Nm (57 ft-lb)
- Final drive to subframe 123 Nm (91 ft-lb)
- Oil drain and fill plug 70 Nm (52 ft-lb)
- Vehicle speed sender to final drive . . . 10 Nm (89 in-lb)

Final drive rubber mounts (final drive unit removed)

Replacement of the rubber bushings for the final drive requires special bushing press tools. The three bushings (front, left and right rear) are accessible after removing the final drive unit from the car. Note the installation direction of the bushings before removing them.

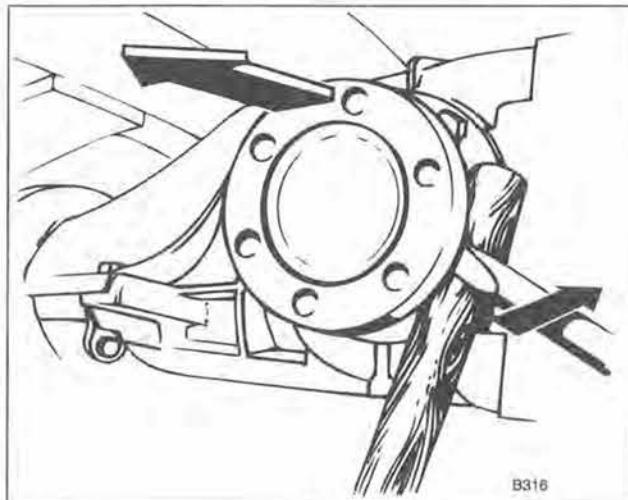
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Final drive oil seals

Low oil level caused by a faulty final drive oil seal may be the cause of noisy operation or limited-slip chatter. The drive flange (side) oil seals can be replaced while the final drive is installed. The input shaft (front) oil seal can only be replaced once the final drive unit is removed.

NOTE—

Do not mistake leaking CV joints for flange seal leaks. It may be helpful to degrease the final drive to pinpoint the source of the leak prior to replacing seals.



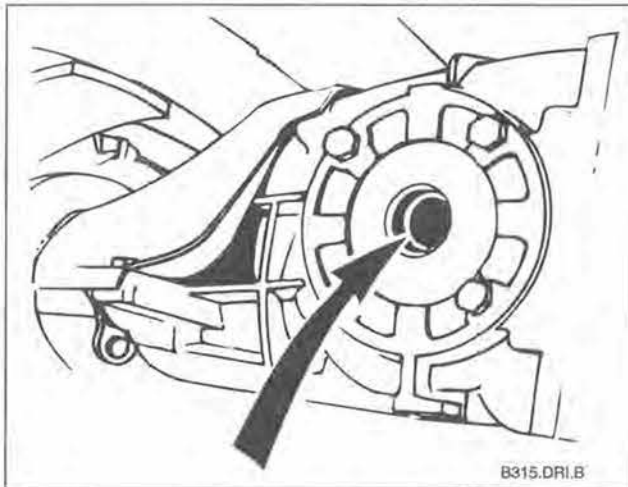
Final drive flange oil seal, replacing

- ◀ Detach drive axle(s) from final drive. See 330 Rear Suspension.

CAUTION—

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

- Pry drive flange from final drive using a wooden dowel and pry bar.



- ◀ Remove snap ring from final drive opening (arrow).

NOTE—

Inspect flange at the point where the oil seals rides on the shaft. Replace the flange assembly if there is a groove worn in the shaft.

- Pry old oil seal from its recess using a hooked seal removal tool, or a large screwdriver.

CAUTION—

Be careful not to mar the final drive housing when removing the seal.

- Dip new seal in final drive lubricant and drive seal into place until fully seated.

NOTE—

Before driving new seal into place, check drive flange shaft for a wear groove where the old seal contacted on the shaft. If any wear is present, try to install the seal at a slightly different depth so that the new seal does not ride on the wear groove.

- Install new snap ring in groove of final drive housing. Make sure both ends of ring are fully seated in groove.
- Install drive flange by pressing it in by hand until snap ring engages. It may be necessary to turn drive flange slightly while pushing.

- Attach drive axle and tighten bolts.

Tightening Torque

- Drive axle to final drive
M10. 83 Nm (61 ft-lb)
M10 with locking teeth (always
replace bolts and washers). 96 Nm (70 ft-lb)

Final drive input shaft oil seal, replacing

- Drain oil and remove final drive as described earlier.
- Drain oil from final drive.
- ◀ Make matching marks on input shaft and input shaft collar nut.
- Pry lockplate from nut and then hold input flange and remove collar nut. If necessary, use a puller to remove input flange.
- Pry faulty seal from its recess using a hooked seal removal tool or a large screwdriver. Dip new seal in final drive lubricant and drive seal into position.

CAUTION—

Be careful not to mar the housing when removing the seal.

NOTE—

Before driving new seal into place, check drive flange shaft for a wear groove where the old seal contacted on the shaft. If any wear is present, try to install the seal at a slightly different depth so that the new seal does not ride on the wear groove.

- Lightly lubricate input shaft and press input flange back on. Install collar nut and slowly tighten until matching marks line up, coming as close as possible to specified torque.

NOTE—

If the input flange nut torque is exceeded, the crushable collar sleeve behind the flange will need to be replaced. This operation requires disassembly of the final drive unit.

Tightening Torques

- Final drive input shaft flange to pinion
20 pinion thread diameter. 85 Nm (137 ft-lb)
(or until matching marks line up)

- Install a new lockplate. Install final drive unit and driveshaft.

