Drivetrain - Angle Gear Fluid Leakage

NO: 46-13
DATE: 4-18-2008
MODEL: 5cyl AWD S60 / S80 / V70 / V70 XC/XC70 / XC90
MODEL YEAR: See chart below
CHASSIS: See chart below
SUBJECT: 5 cylinder Angle gear leakage and resealing

REFERENCE: VIDA

Note! If this is a printed version of a TNN, first check for the latest online version.

Note! This TNN supersedes the previous TNN 46-13 dated 2-11-2008. Additional seals and labor operation code have been added to the repair and chassis ranges have been updated.

Description:
Oil leakage/moisture from the angle gear halves can be resolved by resealing the housing and replacing the seals. The angle gear itself does not normally need to be replaced.

There are two reasons an angle gear should not be resealed and instead should be replaced:

1.) There is angle gear noise/binding while driving.
2.) There is angle gear backlash, bearing damage, or excessive pinion shaft play found during disassembly.

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Model year</th>
<th>Chassis Range</th>
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<tr>
<td>S60</td>
<td>384</td>
<td>2002 - 2006</td>
<td>315000 - 502666</td>
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<td>S80</td>
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<td>2004 - 2006</td>
<td>335000 - 427722</td>
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<td>V70</td>
<td>285</td>
<td>2001 - 2006</td>
<td>000000 - 533030</td>
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<td>V70 XC / XC70</td>
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<td>2001 - 2006</td>
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<td>XC90</td>
<td>275</td>
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* Part of the standard for Commodities/Chromatics.
** Items will be used for noise less than 1 repair.
*** The 399 7089 breather plate will only be used if the angle gear does not already have the improved angle gear vent.
Service:
If the leak is only from the angle gear vent, only replace the vent with the new style vent. If the leak is from the angle gear halves, separate and reseal the angle gear housing according to the following procedure in conjunction with the removal and replacement procedures in VIDA.
1. Remove the angle gear according to VIDA.
2. Drain the oil from the angle gear.
3. Remove the axle seal, right side crown wheel shaft seal, and preload adjustment nut 0-ring from the angle gear according to VIDA under Sealing rings bevel gear, replacing.

Remove the pinion shaft seal according to VIDA under Pinion seal bevel gear, replacing. **Note!** The ring gear will be referred to as a crown wheel in this document. **Warning!** Use protective eyewear.

4. Clean the angle gear using isopropanol 1161721 around the mating flange. Blow clean with compressed air.

Remove the 10 screws and the cover. Carefully tap the cover using a plastic hammer to release it.
5. Remove the crown wheel.

Check the pinion gear and crown wheel teeth for abnormal wear or damage. Check pinion shaft for axial play or any kind of binding. Check the bearing races (1) in both halves of the angle gear.

If a bearing race is damaged the pinion shaft has play, there is abnormal gear wear, or if there is any kind of binding, replace the angle gear.

If OK, remove the left side crown wheel shaft seal (2) according to VIDA under sealing ring, crown wheel shaft, left-hand side, replace and continue with the Step 6 of the resealing method.
6. Measure 3 mm from the inside of the flange and make a line with a permanent marker. **Note!** This procedure can be made easier by making a template which can be reused for several repairs.

7. **Caution!** Care must be taken to avoid damage to the bearing race while filing. A coffee cup can be used to cover the bearing race. **Warning!** Use protective eyewear!

8. File off the inner edge of the cover as illustrated, following the marker line, using a file. The finished product should look like this.
9. After filing, polish the chamfer using a fine emery cloth so that scoring in the chamfer goes along the chamfered edge.

![Image of a polished chamfered edge](image1.png)

**Note!** Use the emery cloth radially, along the flange just as the arrows indicate.

10. Clean out filing swarf.

11. Clean the gasket from both flanges using gasket remover 1161847 and abrasive cloth 9511024. Cleaner H, 1161436 can be used as an alternative.

![Image of cleaned gasket](image2.png)

**Note!** Use the abrasive cloth radially, along the flange.

Clean the flange using isopropanol 1161721. Cleaner H, 1161436 can be used as an alternative.
12. Apply a 5mm bead of chemical gasket 1161771 approx. 1 mm from the chamfered edge.

**Note!** The next few steps should be done within 5 minutes so that the angle gear halves are torqued together while the sealant is still wet.

Pay close attention to the route of the sealant at **Note 1** in photo. This is for the opening on the opposite half of the angle gear case.
13. In order to aid in installation and to avoid affecting the silicone bead when reassembling the cover, set the cover over the locating pin marked "1" first, then carefully lay the cover down to lay flat on the flange.

Use new screws and tighten the 10 screws crosswise to 18 Nm (13.25 ft lbs).

Then angle tighten the 10 screws crosswise 85°.

Note! Some models may use studs in place of 3 of the screws.
Install the axle seal and preload adjustment nut 0-ring from the angle gear according to VIDA under Sealing rings bevel gear, replacing.

Install the pinion shaft seal according to VIDA under Pinion seal bevel gear, replacing.

Install new left side and right side crown wheel shaft seal according to VIDA under sealing ring, crown wheel shaft, left-hand side, replace.

**Note!** Be sure to lubricate the sealing ring lips with wheel bearing grease, P/N 1161689 before installation.
15. If the angle gear does not have the improved vent in place, as shown, install new bleeder pipe and filter.

**Note!** Some models may not use a vent.

16. Fill the angle gear with 0.65L of oil P/N 1161648. Install new drain plug gasket P/N 11998.

17. Install the angle gear according to VIDA.

**Note!** New screws must be used to install the angle gear to the transmission.

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<th>WARRANTY CLAIM INFORMATION</th>
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<tr>
<td><strong>LABOR OP</strong></td>
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Warranty Claim Information