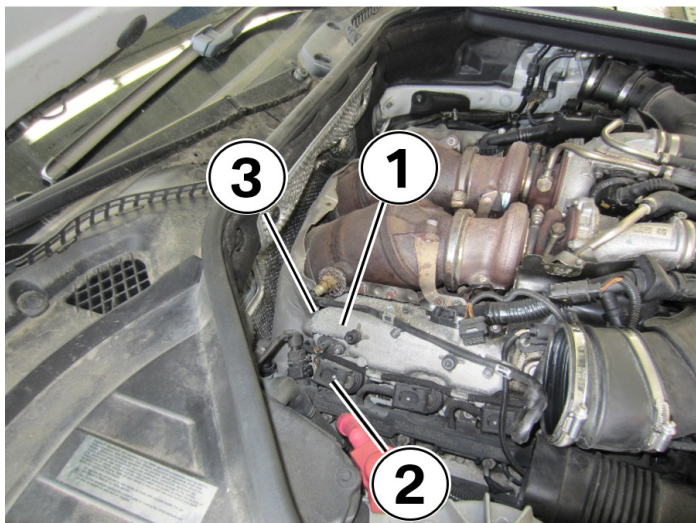
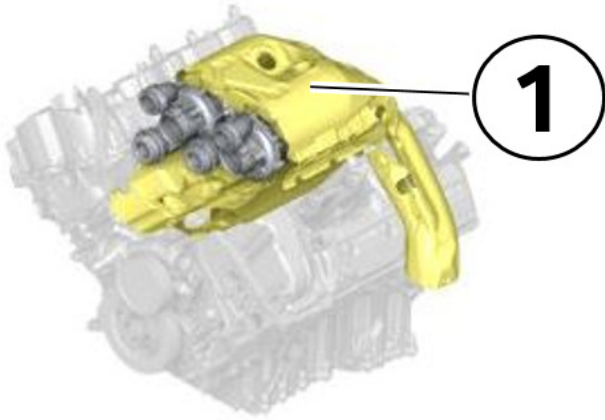


Engine Oil Leak Diagnosis and Repair Procedure

1. Remove the heat shield (1) to diagnose the engine oil leak.

Refer to Repair Instruction 11 65 180
Removing and installing/replacing heat shield at top.

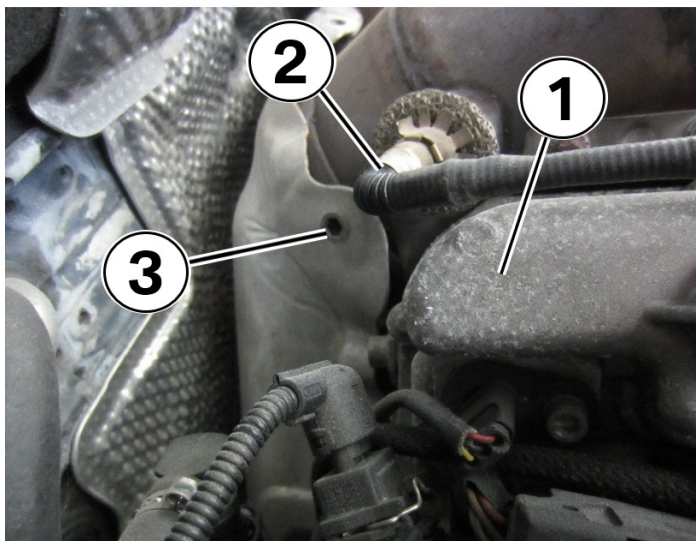


2. The illustration shows an overview of the components found on cylinder bank 1.

Cylinder head cover (1)

Cylinder # 4 (2)

Inspection location (3)



3. The illustration shows an overview of the components found on cylinder bank 1.

Cylinder head cover (1)

Bank 1 post O2 sensor (2)

Heat shield mounting hole (3)



4. Preparing for the inspection:

Bore scope specifications:

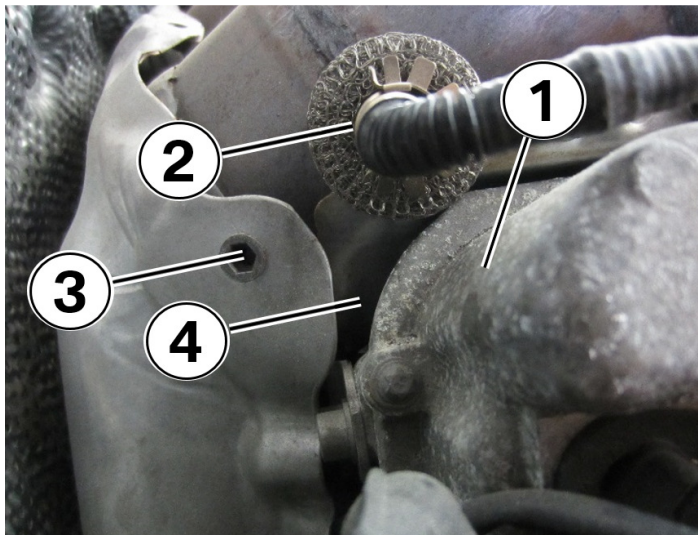
The recommended diameter of the fiber optic cable (imager) should not be greater than 5.5 mm. The 8 mm fiber optic cable (imager) will work but it is very tight and damage may occur to the larger cable and imager.

The recommended borescope and imager can be found at www.centersolutions.com or refer to SI B04 19 15 for more information about the BMW Equipment Program.

Equipment Program Part Numbers:

107 - BK5000 - SNAP ON Video Scope

107- BK8000 – 5.5 mm Dual View Side Imager



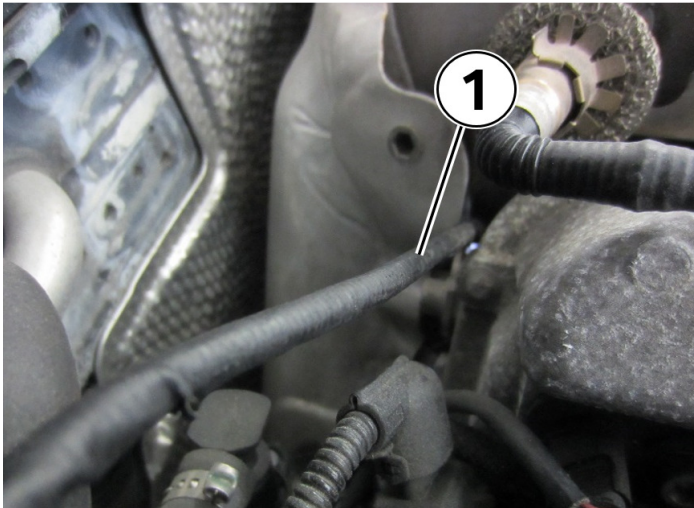
5. The illustration shows an overview of the components found on cylinder bank 1.

Cylinder head cover (1)

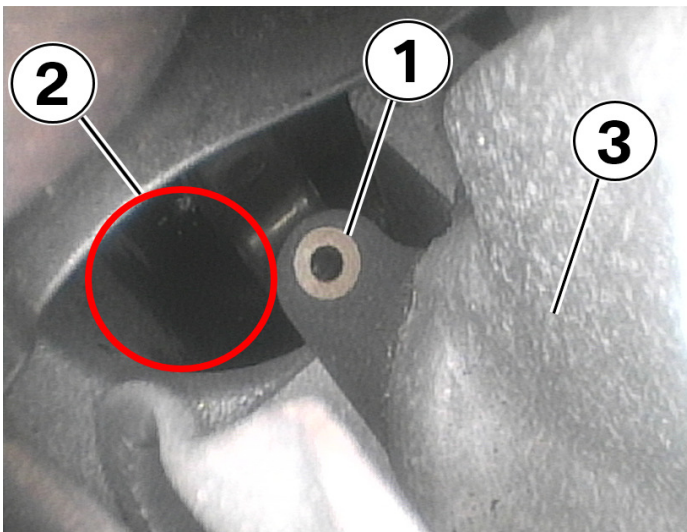
Bank 1 post O2 sensor (2)

Heat shield mounting hole (3)

Insert bore scope here (4) on an angle downward.



6. Approach angle of the bore scope (1) is approximately 45 degrees.



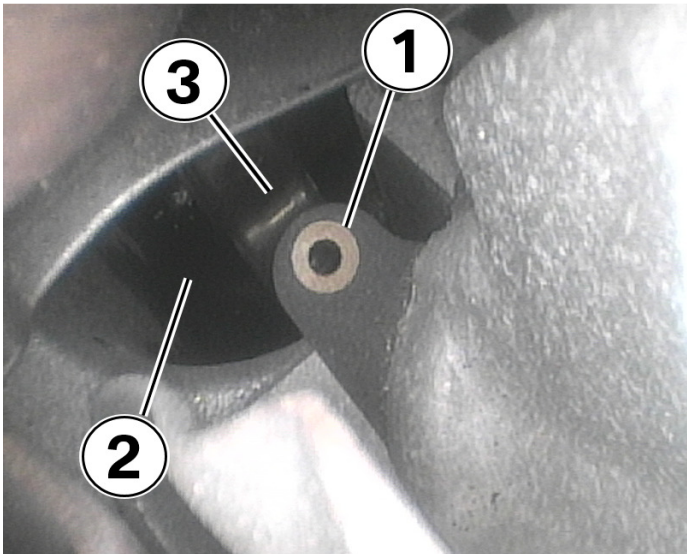
7. After inserting the bore scope you must locate the cylinder head gasket tab. (1).

The tab is approximately 135 mm straight down from original entry point.

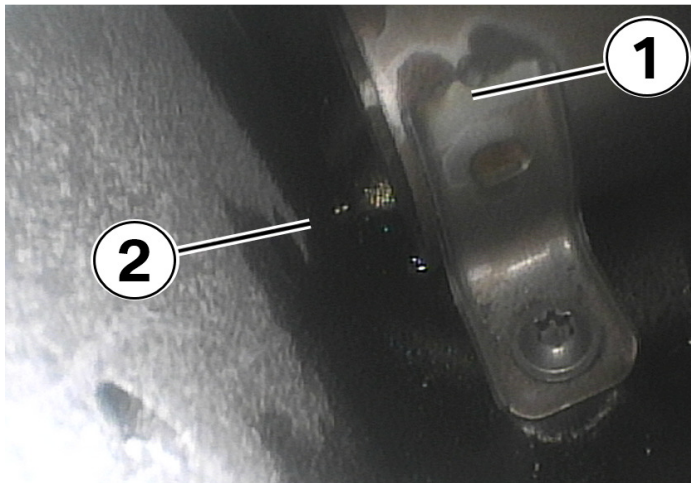
Cylinder head gasket tab (1)

Gap in heat shields (2)

Cylinder head (3)



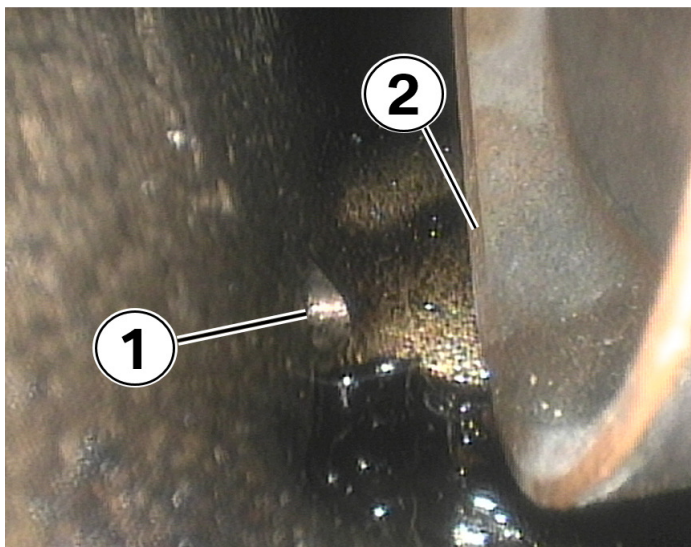
8. Feed the bore scope past the left side (1) of the cylinder head gasket tab (2) towards the vacuum reservoir (3).



9. Continue to push the bore scope towards the vacuum reservoir (1). The engine valley drain hole is location is just to the left of the vacuum reservoir (2).

Metal vacuum reservoir shown in photo.

As the bore scope approaches the drain hole it will become more apparent.



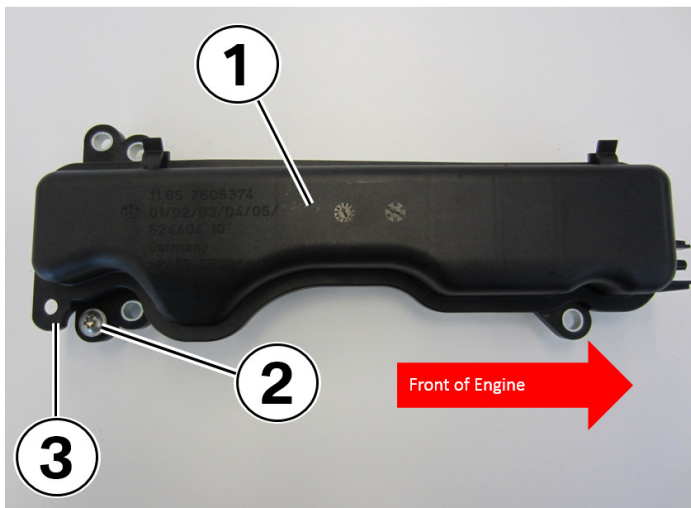
10. Inspect the surrounding area of the engine valley drain hole (1).

Engine valley drain hole (1)

Metal vacuum reservoir (2) shown.

This is a clean picture. No oil can be seen in the oil drain hole (1).

The dark material at the bottom of the photo is dust and dirt. This material appears to be reflective but it is dry.

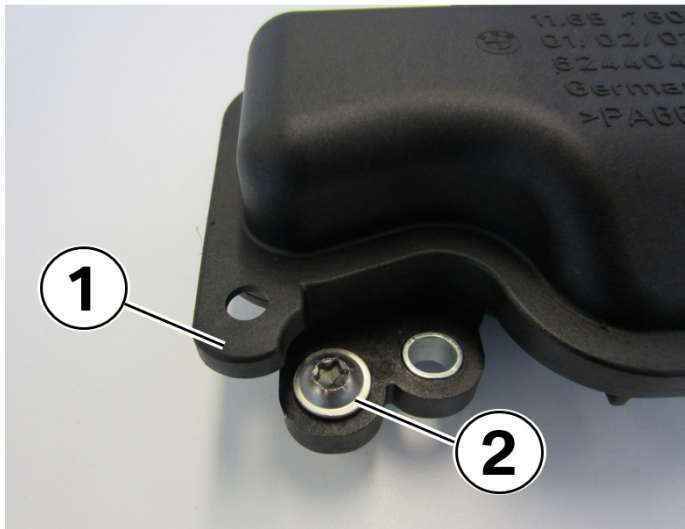


It is possible that a black plastic vacuum reservoir (1) is installed. This illustration provides an overview of the entire component and specific points of the component.

Reservoir (1)

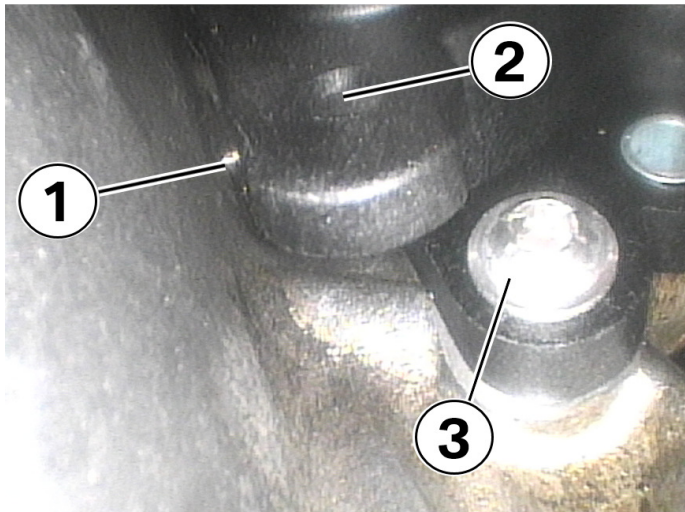
Reservoir mounting screw (2)

Plastic vacuum reservoir tab (3)



Plastic vacuum reservoir tab (1)

Mounting screw (2)



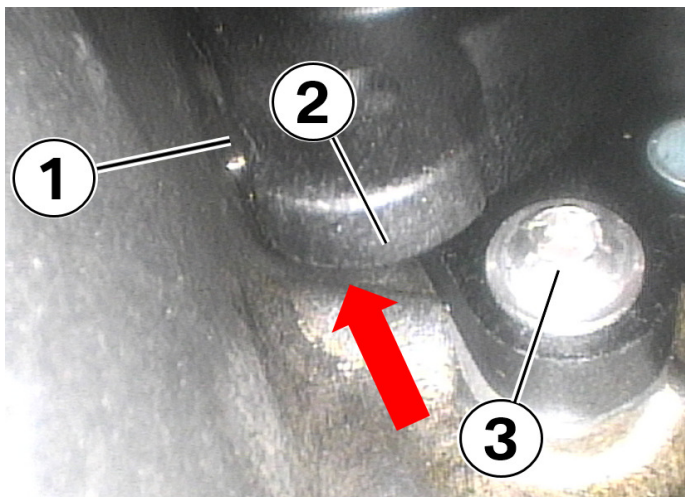
Diagnosis in the vehicle:

It may be more difficult to position the bore scope but it will only take a few minutes more to make the diagnosis.

Engine valley drain hole (1)

Plastic vacuum reservoir tab (2)

Reservoir mounting screw (3)



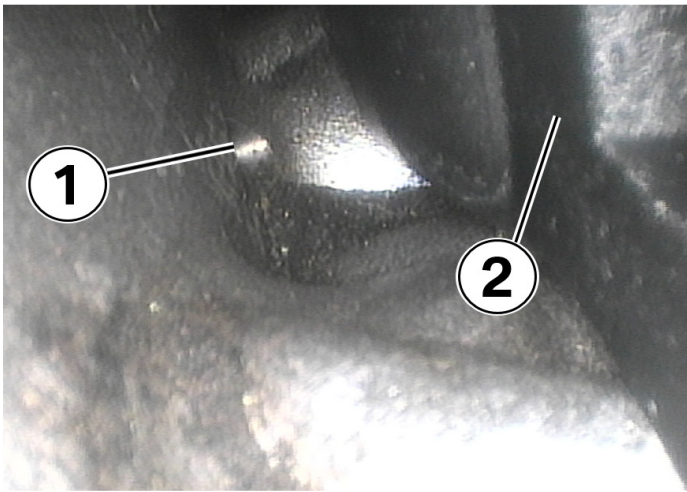
Continue to push bore scope down ward towards the plastic vacuum reservoir tab (2).

The bore scope needs to be moved towards the direction of the red arrow and under the tab (2) to have the best viewing angle of the engine valley drain hole (1).

Engine valley drain hole (1)

Plastic vacuum reservoir tab (2)

Reservoir mounting screw (3)



Once the bore scope has gone under the plastic reservoir tab then the engine valley drain hole (1) and surrounding area can be clearly inspected.

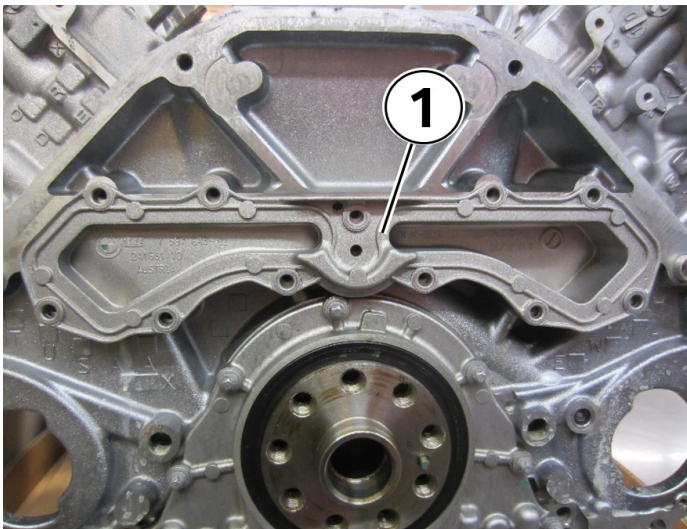
The dark material at the bottom of the photo is dust and dirt. This material appears to be reflective but it is dry.

Engine valley drain hole (1)

Plastic vacuum reservoir (2)

11. If engine oil is found in this area then the root cause of the engine oil leak resides in the components on top of the engine i.e. turbocharger oil lines, turbo charger, etc. Further basic diagnosis will be needed to find the root cause this engine oil leak. Do not remove the transmission from the vehicle.

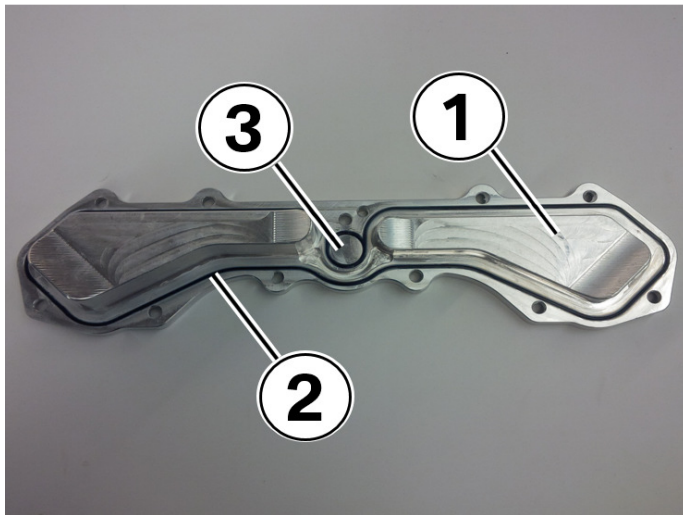
If no engine oil residue is found at the engine valley drain hole then the root cause of the engine oil leak will be inside the transmission bellhousing. The most likely cause will be a leaking engine oil galley plug located behind the engine cover, rear and or the crankshaft rear seal. Continue to step 12.



12. Drain the coolant from the engine. Refer to Repair Instruction 17 00 005 Draining and adding coolant.

Refer to Repair Instruction 11 14 250 Removing and installing/sealing rear engine cover.

Rear engine cover (1)



P/N 11 14 2 246 298 Updated End Cover, Rear Kit overview.

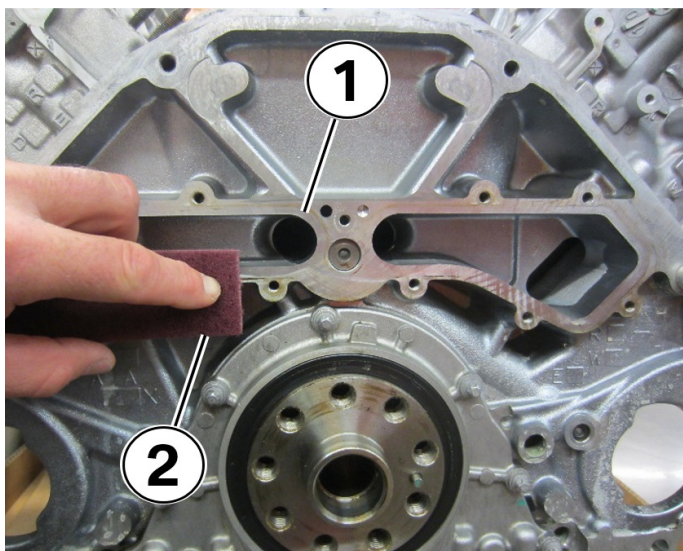
Billet aluminum housing (1)

Integrated Viton seal (2)

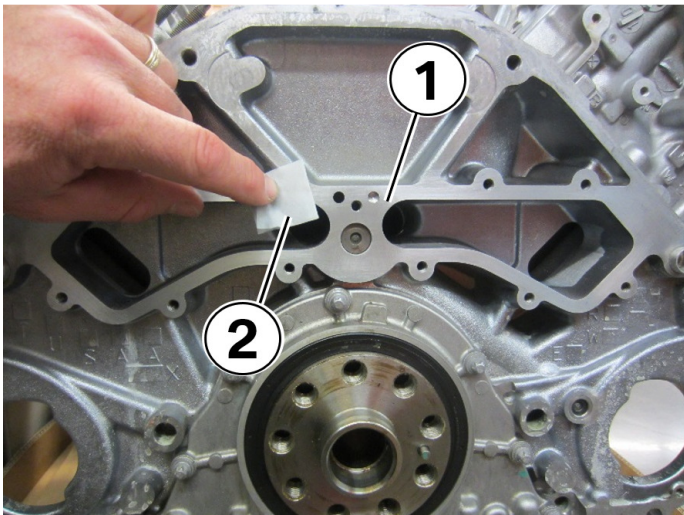
Additional sealed surfaced (3) to encapsulate the leaking engine oil galley plug.



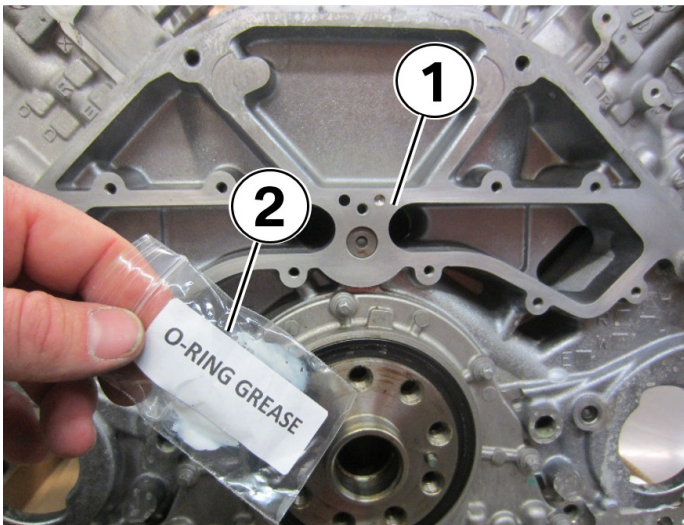
Included in the kit is a Scotch Brite cleaning pad, alcohol preparation pad and O-ring grease.



13. Clean the engine crankcase sealing surface (1) using the Scotch Brite cleaning pad (2) included with the new cover kit P/N 11 14 2 246 298.



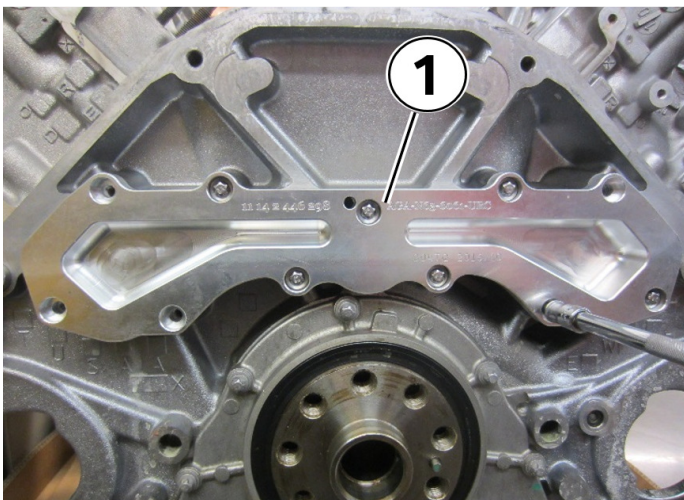
14. Remove all residual oils from the sealing surface (1) using the alcohol preparation pad (2) included with the new cover kit.



15. Lubricate the sealing surface (1) with the O-ring grease (2) supplied in the new cover kit.

Apply a thin film of grease over the entire sealing area.

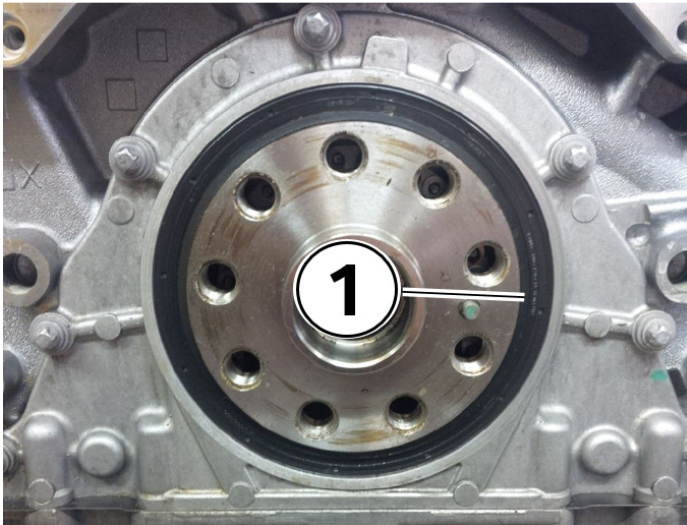
The new cover already has O-ring grease applied to the sealing area. Do not remove the grease from the cover.



16. Install the new cover (1).

Refer to Repair Instruction 11 14 250 Removing and installing/sealing rear engine cover for the proper torque and assembly procedures.

Reuse the original M6 bolts and torque them to **10 Nm**.



17. Replace the crankshaft rear seal and seal housing (1).

Refer to Repair Instruction 11 41 151 Replacing crankshaft radial seal on transmission side.

Always enter the vin number into ETK to receive the proper part number. **UPDATE!**

18. Reassemble the vehicle as per the applicable Repair Instructions in ISTA/D.

Refill the coolant to the specified level found in Repair Instruction 17 00 005 Draining and adding coolant.