Threaded Oil Gallery Plug Installation for Detroit Diesel / Mercedes Benz 4000 Series Diesel Engines

The AERA Technical Committee offers the following information on threaded oil gallery plug installation for Detroit Diesel/Mercedes Benz 4000 series diesel engines. This information should be considered anything engine failure analysis or block repair is being performed.

A new service kit (Part #23536501) is now available to install two threaded plugs in place of cup plugs in the rear oil gallery on MBE 4000 engines. To eliminate the possibility of the original equipment, freeze plug moving during engine operation the service kit and following installation procedure was created. This procedure may be done within the truck cab, but, it is most certainly easier accomplished with the engine removed.

![Figure 1. Two Rear Oil Gallery Plugs](image)

**Notice:** This kit should only be used on engine serial number range 0460817468 through 0460840294. You MUST use tapping tool kit J-47485. Under no circumstances should any other tapping tool or procedure be used or warranty coverage may be denied.

Follow the steps listed below to remove old plugs and install new threaded plugs for these six-cylinder diesel engines.

1. Remove the two rear cup plugs using the following procedure. Make sure to not damage the plug bores in the cylinder block. See Figure 1 for location of cup plugs.
   a) Use a punch or chisel to hit the bottom of the cup plug near one side to turn it sideways.
   b) After turning the plug sideways 180°degress, use pliers to grab the plug.
   c) Carefully pull the cup plug from the cylinder block.
2. Using a dry shop towel, clean both cylinder block plug bores so they are clean and dry. Ensure all gasket material is removed from the rear face of the cylinder block and the surface is clean and dry.

3. Install adaptor block and tapping tool J-47485-1(6) unto the face of the block. using the two M10 x 1.5 attaching bolts. Only tighten the bolts finger tight now.

4. Install the Air Fitting Adapter (J-47485-3) in the top hole and the Centering Adapter (J-47485-4) in the bottom hole of the Adaptor Block (J-47485-1). The Air Fitting and Centering Adapters will help center the Adapter Block to the cup plug bores. See Figure 3.
5. Finger tighten the two set screws. See Figure 5.
6. Tighten the two M10 x 1.5 attaching bolts to 24 FT/LBS (33 Nm).
7. Loosen the Centering Adapter (J-47485-4) set screw and remove the adapter from the bottom hole, but leave the Air Fitting Adapter (J-47485-3) in place.
8. Clean and inspect the tap before using. Spare tap is included in kit.
9. Apply a light coat of clean engine oil to the shaft of the Tap (J-47485-5) and install the Tap Guide. Assembly (J-47485-6) into the bottom hole of the Adaptor Block (J-47485-1). See Figure 4.

10. Fully seat the Tap Guide (J-47485-2) into the Adaptor Block (J-47485-1) and tighten the set screw.

Caution: To avoid injury from flying debris, wear a face shield or goggles.
Notice: Air Pressure is used to keep as many chips as possible out of the oil galley. The air pressure will blow the chips past the cutting flutes. Keep any sensitive areas covered.

Tapping Lower Plug Bore

- Connect regulated and filtered air supply at 15 psi to the Air Fitting Adapter (J-47485-3).
- Using light force, start the tapping process. Ensure the tap is well lubricated always. Back the tap off every ¼ turn. The tap will bottom out on the tap stop.
- Turn off shop air and loosen tap guide assembly set screw. Remove the Tap Guide Assembly (J-47485-6) from the Adapter Block (J-47485-1).
- Check and clean the newly tapped hole.
- Check the front face of the tapped hole for burrs. If burrs are present, lightly stone the surface.
- Disconnect shop air from the Air Fitting Adaptor (J-47485-3).

Tapping Top Plug Bore

- Loosen the Air Fitting Adapter (J-47485-3) set screw.
- Move the Air Fitting Adapter (J-47485-3) to the bottom plug bore and tighten set screw.
- Clean and inspect tap for damage before tapping top hole. Spare tap is included in kit.
- Apply a light coat of clean engine oil to the shaft of the Tap (J-47485-5) and install the Tap Guide Assembly (J-47485-6) into the top hole of the Adaptor Block (J-47485-1).
- Fully seat the Tap Guide (J-47485-2) into the Adaptor Block (J-47485-1) and tighten the set screw.
- Connect regulated and filtered air supply at 15 psi to the Air Fitting Adapter (J-47485-3).
- Using light force, start the tapping process. Ensure the tap is well lubricated.
- Back the tap off every ¼ turn. The tap will bottom out on the tap stop.
- Turn off shop air and loosen the tap guide assembly set screw. Remove Tap Guide Assembly (J-47485-6) from the Adapter Block (J-47485-1).
- Check and clean the newly tapped hole.
- Check the front face of the tapped hole for burrs. If burrs are present, lightly stone the surface.
- Disconnect shop air from the Air Fitting Adaptor (J-47485-3).
- Loosen the two M10 x 1.5 attaching bolts and remove the Air Fitting Adaptor (J-47485-3) and Adaptor Block (J-47485-1) from the cylinder block.

Installation of Threaded Plugs

Clean the newly tapped holes by spraying brake cleaner or similar cleaner down the main oil gallery towards the oil pan. Test the condition of the tapped holes by installing a threaded plug by hand. If the plugs bind or stop prematurely, inspect and make any necessary repairs to the threads.

After you’re assured the block and oil gallery are cleaned thoroughly, apply Loctite 640 or 680 on the treads of the plugs and install them into the newly created thread and torque to 110 FT/LBS (150 Nm).
Figure 5. Plug 23536499 and Gasket 000000001073