

Internal Diesel Engine Damage or Oil Sludge Formation

Topic number	LI01.10-N-079275
Version	1
Function group	01.10 - Complete engine
Date	6/6/25
Validity	All 907's with Diesel Engines (OM654, OM642, OM651)
Reason for change	

Complaint

Customer reports that the vehicle will not start, is difficult to start, or is making unusual noises.

Inspection Findings:

Upon inspection, engine bearings—including crankshaft, connection rod, and camshafts—exhibit significant signs of wear. Engine oil shows evidence of sludging, characterized by the presence of thick, gel-like, or semi-solid deposits within the engine. This condition is indicative of oil degradation and/or contamination.

Cause

Internal engine wear and starting issues are a result of oil sludging. This sludging occurs due to oil degradation and/or contamination. Common contributing factors include:

- Failure to perform maintenance on time as indicated by the ASSYST PLUS system
- Use of non-OEM (aftermarket) parts or fluids
- Addition of incorrect fluids (e.g., AdBlue, washer fluid, coolant) to the engine oil, which can severely compromise lubrication and engine operation

Important: Under no circumstances should any non-engine fluids—such as AdBlue, washer fluid, or coolant—be added to the engine oil or crankcase. The introduction of these fluids, even in small amounts, can cause severe engine damage. This damage is not covered under warranty. Always verify that only approved engine oil and additives are used during service.

Remedy

To thoroughly diagnose internal engine wear or oil sludging, follow these guidelines:

Maintenance History

- **Verify maintenance intervals:** Check that all maintenance has been performed on schedule as indicated by the ASSYST PLUS system in the Instrument Cluster and according to WIS. (Refer to Attachments)
- **Review records:** Examine the vehicle's service history using resources like VMI, CarFax, and any documentation provided by the customer.
- **Validate parts and fluids:** Confirm all maintenance was carried out using OEM-approved parts and fluids as specified in the Owner's Manual and Maintenance Booklet.

XENTRY Tips

•Inspect oil filter: Remove and examine the engine oil filter. If aftermarket, measure and compare the height, width, and inside diameter to OEM specifications. (Refer to Attachments)

Engine Oil Contamination

•Oil specification: Verify that the engine oil meets Mercedes-Benz Approval List requirements:

•OM642/OM651: 228.51, 229.31, 229.51, 229.52

•OM654: 228.51, 229.31, 229.51, 229.52, 229.71 (Note: For optimal fuel economy, use the lowest SAE viscosity grade approved. Be aware of any specific viscosity restrictions.)

•Sample and inspect oil: Take a sample, inspect for debris, discoloration, or separation. If unsure, send samples to ALS or Armstrong Forensic Laboratory for analysis. (Refer to Attachment)

Further Steps

If you need assistance identifying the cause of failure, open a TIPS Case directed to the Powertrain inbox and provide:

•Current Quick Test, CDI Control Unit logs, and CDI & CPC Performance data in .CSV format

•Copies of maintenance records (including CarFax report, service receipts, or VMI report)

•Oil and fuel samples, with notes on:

•Color, clarity, separation, odor, and photos for review

•If uncertain about fluid failure, send samples to ALS or Armstrong Forensic Laboratory and attach reports.

•Allow oil samples to sit in a clean glass container for 24 hours, then document any separation.

•Photos of the current oil filter and housing. If aftermarket, compare with a new OEM filter and provide measurements.

•Photos of the engine air filter and inside the air filter housing. Also, document the turbocharger (inlet/outlet) and charge-air system (intercooler, pipes), noting any oil, water, or debris.

•Borescope images of the cylinder walls, valves, piston tops, and injector tips.

If the engine turns over:

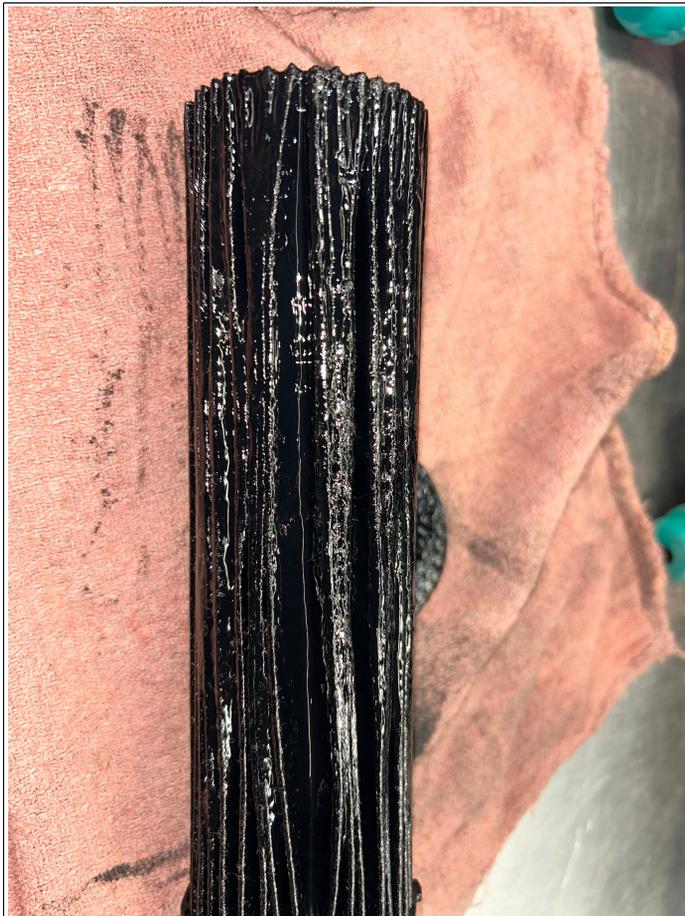
•Conduct manual compression and cylinder leak tests, and provide the results. If a leak is found, identify the source (e.g., oil cap, intake manifold, exhaust). Refer to WIS Doc AH01.00-P-1300-02KOA to determine the pressure loss at the cylinder.

Warranty Information

•Inform the customer that the Mercedes-Benz warranty does not cover engine damage resulting from missed or incomplete maintenance as specified by the ASSYST PLUS system.

•Inform the customer that the Mercedes-Benz warranty does not cover engine damage caused by the use of aftermarket parts (including oil filters or incorrect oil) or by contamination with incorrect fluids.

Attachments	
File	Description
OM654 Oil Filter.JPG	OM654 Oil Filter



OM642 Aftermarket Oil Filter.JPG

OM654 Aftermarket Oil Filter



OM654 Oil Filter and Level Sensor.JPG

OM654 Oil Filter and Level Sensor



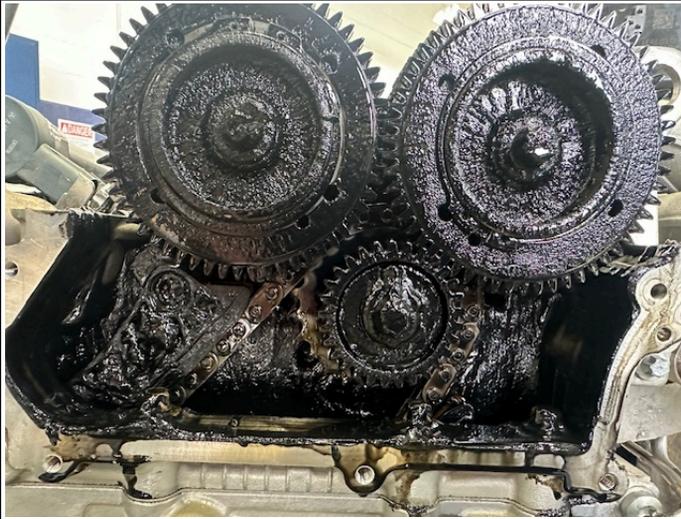
OM654 Oil Pan.JPG

OM654 Oil Pan



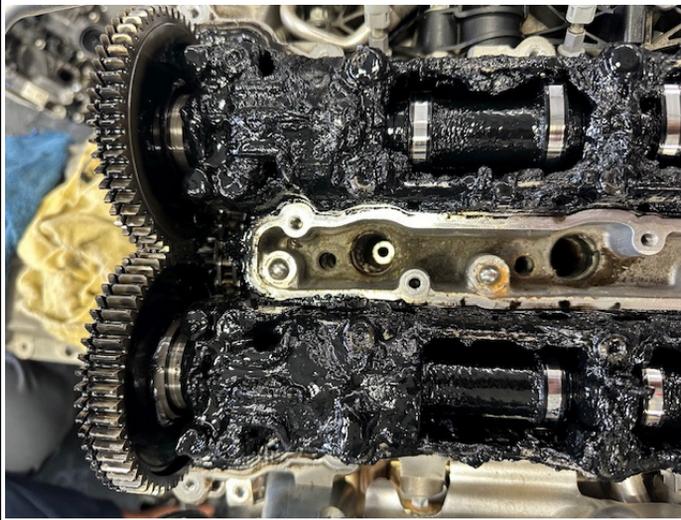
OM654 Cam Gears and Timing Chain.jpg

OM654 Cam Gears and Timing Chain



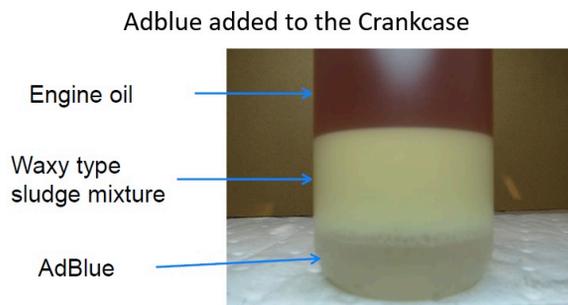
OM654 Cam Gears.jpg

OM654 Cam Shafts



Adblue added to the Crankcase.jpg

Adblue added to the Crankcase



Adblue found in Oil Filter.png

Adblue found in the Oil Filter

XENTRY Tips



Adblue in the Oil Pan.png

Adblue in the Oil Pan

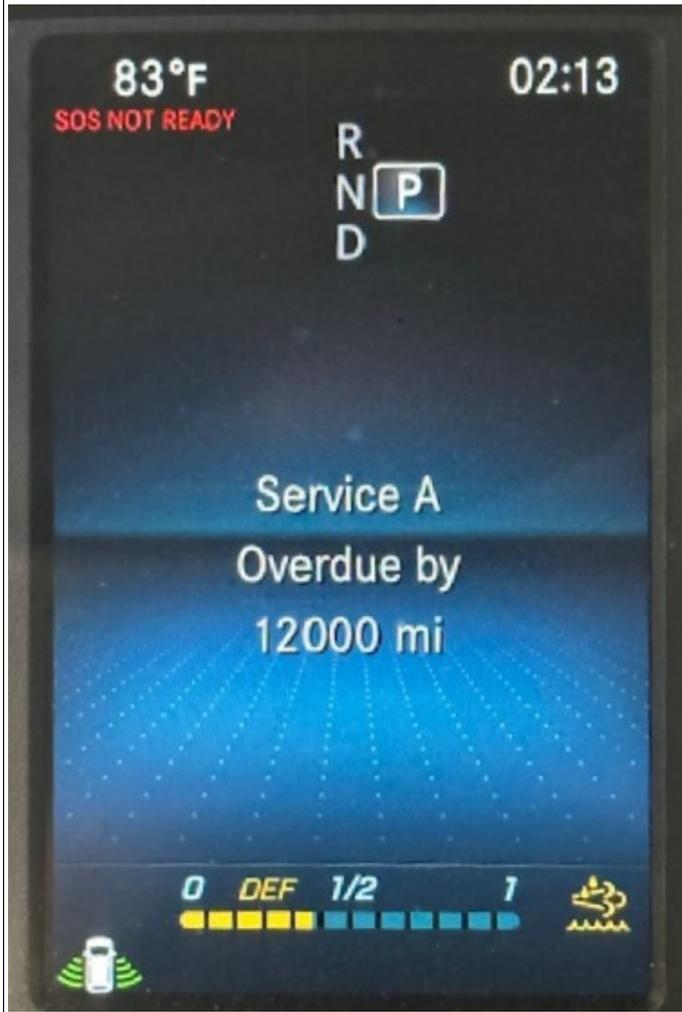
Oil pan

Oil pickup tube



Service Overdue.JPG

Service Overdue



Disclaimer

NOTE: The information contained in this document is intended for use by trained, professional technicians with the knowledge to properly and safely perform diagnosis and repairs on Mercedes-Benz vehicles, using Mercedes-Benz approved tools and equipment. It informs service technicians about conditions that could occur in certain vehicles and provides information that could assist in proper vehicle diagnosis, service, or repair. It does not indicate that a defect is present in any vehicle referenced in this document nor does it imply warranty coverage. DO NOT assume that a symptom or condition, or a described cause of a symptom or condition, affects any particular vehicle or groups of vehicles, or that a described repair applies to any particular vehicle or groups of vehicles. There can be multiple causes resulting in the same or similar symptoms or conditions described in this document, and trained professional service technicians must use their diagnostic skills to make evaluations on a case-by-case basis. The information contained in this document does not guarantee warranty coverage nor does it extend the vehicle's warranty in any way.

Symptoms
Power generation > Engine management > Engine running > Stalls/goes out
Power generation > Engine management > Engine running > Surges
Power generation > Engine management > Engine running > RPM too high/low
Power generation > Engine noise > Noise
Power generation > Engine lubrication/oil cooling > Function > No oil pressure
Power generation > Engine lubrication/oil cooling > Function > Oil pressure too low
Power generation > Engine lubrication/oil cooling > Function > High oil consumption
Power generation > Engine lubrication/oil cooling > Indicator lamp > Engine oil pressure indicator lamp > lit
Power generation > Engine lubrication/oil cooling > Display message > Oil sensor message
Overall vehicle > Maintenance > Active Service System Plus ASSYST PLUS > Premature indication
Power generation > Engine management > Engine start/stop > Malfunction, engine start/stop
Power generation > Engine management > Engine start/stop > Long starting time
Power generation > Engine management > Engine start/stop > Does not start
Power generation > Engine management > Engine performance > No/poor output

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note