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Document Information

Location: Powertrain

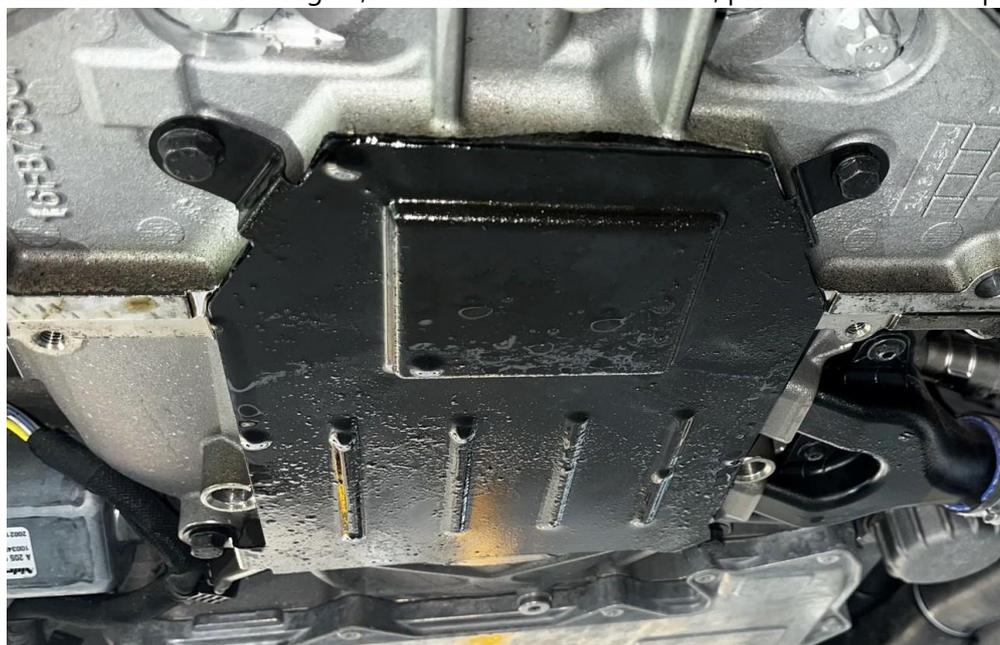
Topic: McLaren Artura Oil Leak Diagnosis Guide - Rear of Engine

Condition: Permanent

Diagnostic Trouble Codes: N/A

Measure

If an Artura is found to have oil traces on the underside of the powertrain at the rear, specifically the rear interface between the engine, transmission and e – motor, please follow the steps below



1. Raise vehicle on ramp as per MSP instructions

2. Remove engine underfloor
3. Capture images prior to any cleaning (before and after removing transmission NVH cover), clearly showing the leaking area. Label images: "Pre-Cleaning"

Care Point: Include images of both sides of the transmission NVH cover before cleaning

4. Take picture of engine number and label image "Engine Number"
5. Clean area thoroughly using degreaser/solvent
6. Add engine oil dye to the engine - Please refer to latest update of KA-01458

(<https://retailerportal.mclaren.com/en-US/kbarticlelist/article/KA-01458>) for correct dye and torch to use

Care Point: Do Not use leak detector spray / chalk spray

7. Start engine and run at increased idle speed (3,000 rpm) using engine oil check procedure until procedure is complete (this will ensure that the engine oil temperature reaches 90°C)
8. Turn off engine and allow vehicle to stand for 20 minutes on the ramp in preparation for inspection
9. Inspect engine. Capture images and label images "Cycle 1", clean area again thoroughly, capture images and label images "Post Cycle 1"

Care Point: If there is a clear and active leak after step 9, please stop the warm up cycles and submit a TR with supporting images/video

10. Complete warm up/cool down cycle and inspection a further 4 times capturing images. Name image folders respectively:

- "Cycle 2" & "Post Cycle 2 (after cleaning)"
- "Cycle 3" & "Post Cycle 3 (after cleaning)"
- "Cycle 4" & "Post Cycle 4 (after cleaning)"
- "Cycle 5" & "Post Cycle 5 (after cleaning)"

Care Point: In case of uncertainty on final assessment, please update TR with supporting images correctly labelled

Care Point: If no further oil leak is observed, then the initial oil residue is potentially due to excessive oil used in the build process

11. If there is obvious evidence of an oil leak from the rear of the engine after the 5 cycles please submit a Technical Request with clear pictures showing the leak. If no leak is present, carry out a road test (including EV mode) and recheck for leaks. Capture images and label "Post Road Test" (before cleaning)

Care Point: If no further oil leak is observed, then the initial oil residue found previously is due to excessive oil used in the build process - No further action required

12. Identify the location of the leak using a UV light Engine side = Engine oil identified by UV light

- Transmission side = Transmission oil
- E motor = Dielectric oil - this is different to engine oil and transmission oil, please take pictures and label "Dielectric Oil"

13. If a leak is identified, please submit a TR for further instruction to remove the transmission **Transmission Removed:**

- Complete a visual inspection of the area with the transmission removed identify the leak location
- Capture images Label as "Transmission removed"
- If engine oil leak is identified from the rear of the engine, drain the engine oil fully, follow MSP instructions for oil drain procedure

Care Point - If a transmission leak is identified, please submit/update TR with images labeled as "Transmission Leak"

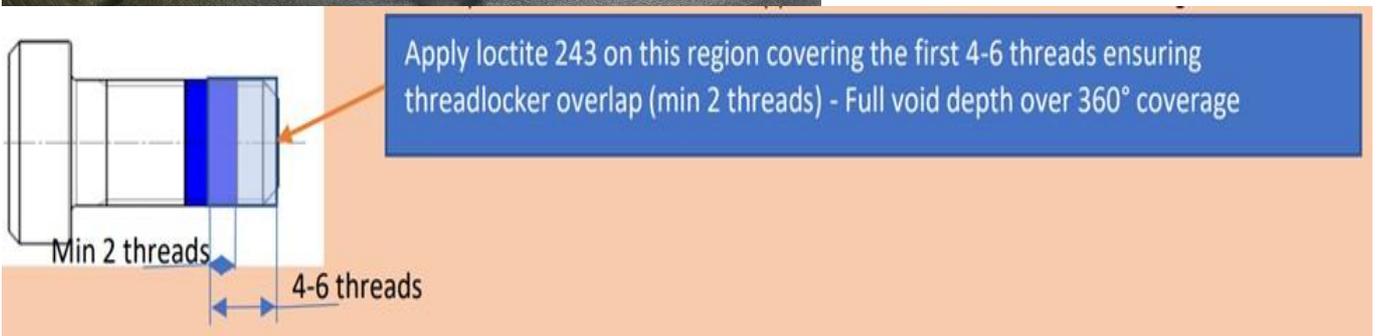
Flywheel Removed:

Care Point: Carefully remove the flywheel to preserve the oil on any components, this will help with identification. Do not clean any parts at this stage

- Remove and inspect each flywheel bolt for signs of oil one at a time, starting from 12 O'clock position labeling the bolts in the order of removal (clockwise) and lay down each bolt on a piece of white A4 paper with the bolt head down (threads pointing up). If oil present on bolts, capture images of the oily

bolts and their respective bolt holes on the crankshaft flange – label as “Oil Presence on Flywheel Bolt and Crankshaft Flange threaded hole”

- Capture images immediately of the flywheel, label as “Flywheel Inspection” and inspect. If oil is centralized around the flywheel on the surface this indicates the flywheel bolts are potentially the cause of the leak and new flywheel bolts with added Loctite 243 to the top threads will rectify this



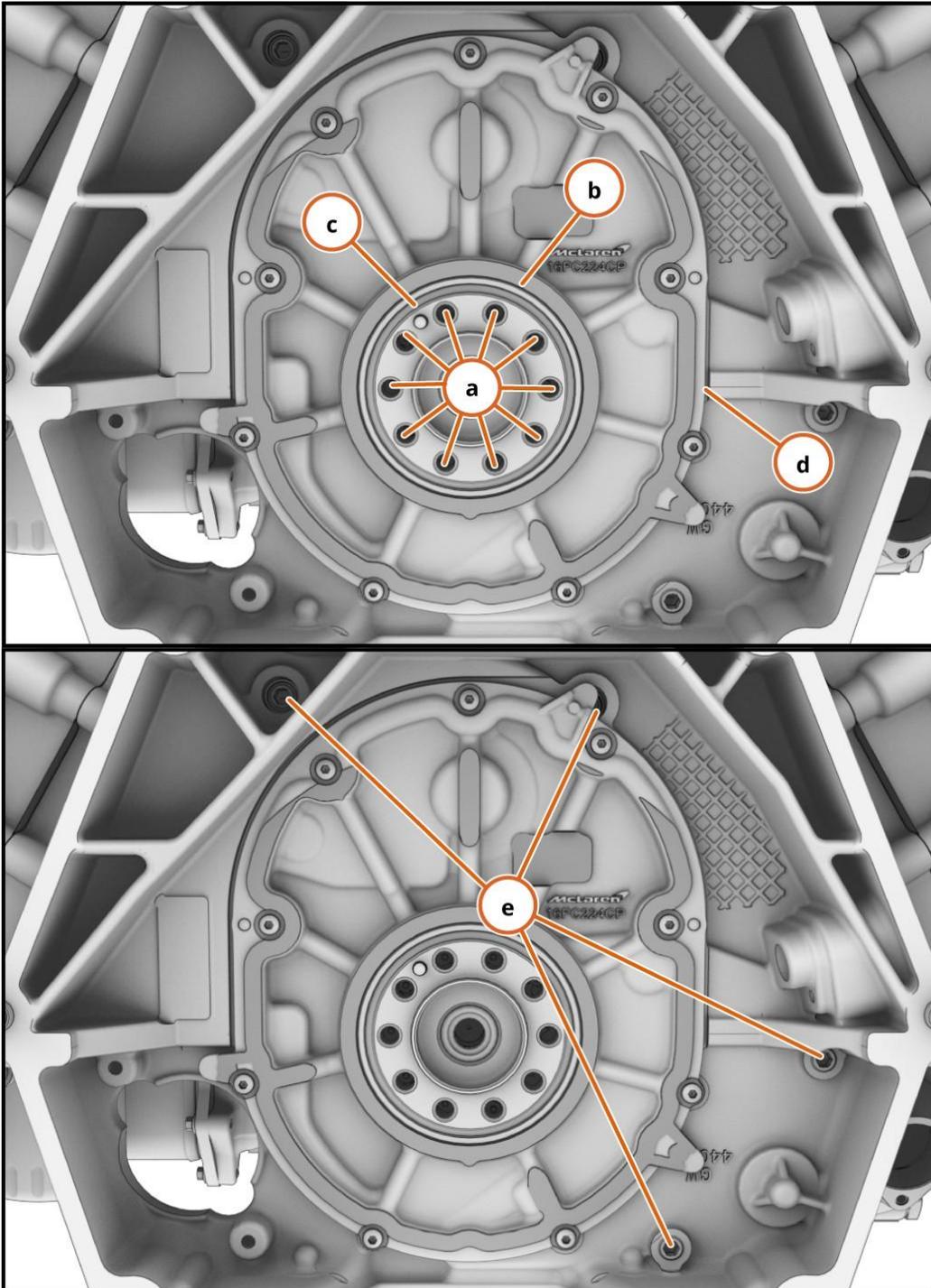
Final inspection:

Care Point: Do not clean engine behind flywheel, capture images of leaking areas and label as “Rear cover of engine”

- Identify leaking area of the rear of the engine
 - a. Flywheel threaded bolt holes (crankshaft flange)
 - b. Rear crank seal OD
 - c. Rear crank seal ID

d. Rear cover (RTV Seal - identify exact location)

e. M14 Pins – Tensioner (escalate with images)



If the leak cannot be

obviously diagnosed follow pressure test procedure

(<https://mclarenps.blob.core.windows.net/images/Knowledge%20Base%20Articles/KA-01626/P16%20Engine%20Leak%20Test%20Procedure.pdf?sv=2021-10-04&st=2023-06-07T15%3A01%3A07Z&se=2050-01-08T16%3A01%3A00Z&sr=b&sp=r&sig=baFw70qOp362MMyYZVzNIDC2dZ3Qfx09OovDxvPMGDE%3D>)

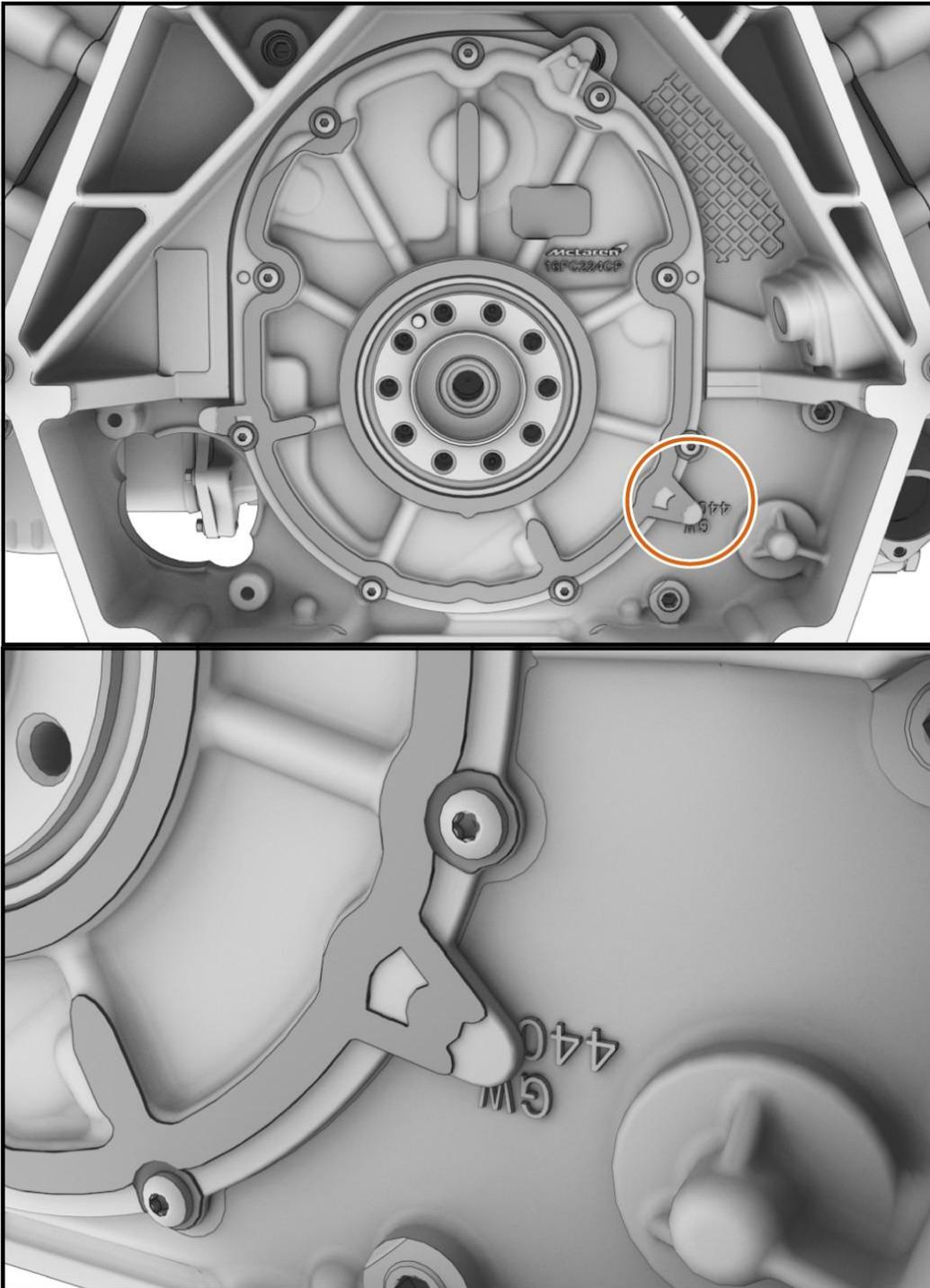
Care Point: Inner diameter of rear crank seal will exhibit a leak. This seal is a dynamic seal, the object of the leak test is to determine if another area at the rear of the engine is leaking also. If another area is found to be leaking this will likely be the root cause of the failure and this issue should be addressed

Repair:

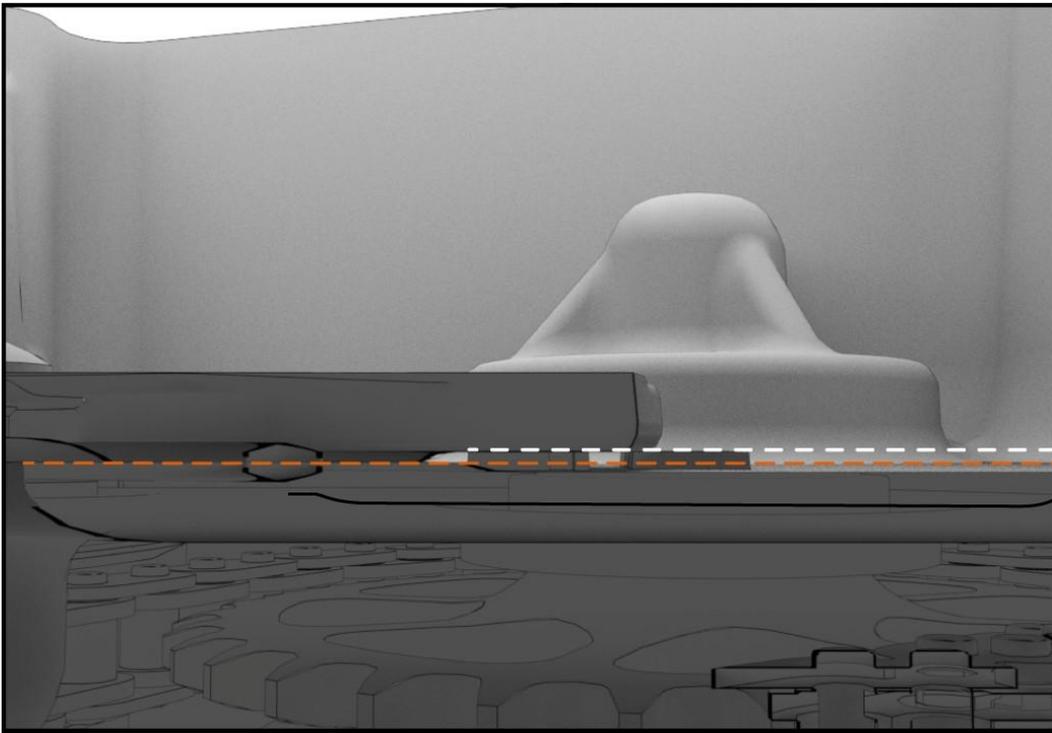
- If it is determined that the outer diameter of the crank seal or the RTV joint of the rear cover is leaking then replacement of the whole rear cover assembly with pre-fit rear seal is required

Care Point: Seal not to be pressed in on the engine

- Check if the rear cover has a tab that clashes with the cylinder block part marking



If the Part Marking on the Cylinder Block is present and not machined down, check if the top surface of the lettering is protruding the rear cover sealing surface on the cylinder block



If the Part Marking protrudes, proceed with the tab removal to resolve the potential hard clash of the rear cover which would create a leak path



- Use alignment pins referenced in MSP used for fitment of the rear cover to remove the rear cover to avoid further damage to the rear seal assembly. Do not remove rear crank seal from the rear cover to avoid any damage to the seal
- Follow MSP instructions for correct cleaning, alignment and RTV application when fitting the new rear cover assembly,
- During replacement of the rear cover, it is essential the crankshaft rear seal expander cone PN 16FC663CP and the guide pins are used during this process to slide the seal onto the crank shaft when

fitting the new rear cover assembly

- All other alignment, cleaning, and RTV processes in the MSP repair instructions are correct and should be adhered to when fitting the cover

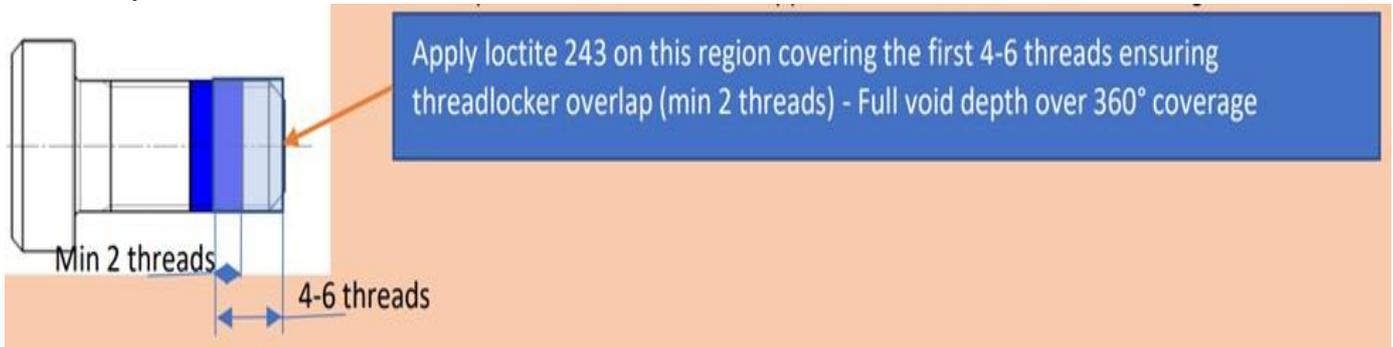
Flywheel Bolts:

When fitting the Flywheel, clean the bolt hole threads (crankshaft flange) from residual thread locker (from the original bolt fitment) without pushing any debris into the engine (through holes)

Clean with standard automotive degreaser/solvent ensuring a thorough clean of the leak area

Capture Images: label "Clean Crankshaft-Flywheel Interface pre final assembly" Apply Loctite

243 radially to the first 4-6 threads as follows:



Follow MSP instructions to install the Flywheel using the bolts applied with Loctite 243

Care Point: Once the Flywheel is installed, allow the Loctite 243 activated by the mechanical interaction of the threads to cure for min. 6 hours before filling the engine with oil

This step will prevent the oil from reaching the thread locker and interfering with the curing process and potentially impacting the sealing performance of the thread locker

Once the min 6 hours (required for the thread locker curing process) have passed, follow the MSP procedure to fill the system with oil and rebuild the Powertrain up to the point where you can start the engine

Repair Validation:

With the floor panel removed, follow Steps 1 to 9 to validate that no leak is present anymore

Once this test has been successfully completed (no oil leaks), rebuild the vehicle as per MSP instructions After performing the engine health checks, HYCU adaption and a road test, return the vehicle on the ramp and inspect for any leakages

Remove the engine underfloor to check and confirm that the repaired area has remained dry

Parts Information

N/A

Attachments

N/A

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