

FORD MOTOR COMPANY (FORD) RESPONSE TO RQ24-008 Supplemental IR Request 10Request 10

As part of Ford's Response to Request #13 of the Initial Information Request dated June 21, 2024, a figure titled "Figure 1: Potential Cracked Injector Fuel Leak Path" was provided.

- a) Are there any differences (fuel leak path, leaked fuel volume, fuel leak obstructions, or other) between a cracked fuel injector nearest to the cylinder head drain compared to a cracked fuel injector further from the cylinder head drain?; and
- b) Does any leaked fuel remain within the engine cylinder head space following a fuel leak, or does all of the leaked fuel exit the engine through the drain tube to the roadway below?

Answer

- a) Ford believes the location of the cracked fuel injector relative to the cylinder head drain does not affect nature of the fuel leak (path, volume, etc.).

The leak path is consistent between cylinder locations and involves no fuel spray because the fuel injector cracking occurs in the valve body of an injector, which is surrounded by a modular power unit interface as shown in slide 3 of the included file "RQ24-008 Supplemental IR Request 10 Leak Path Detail.pdf". This packaging configuration results in leaked fuel travelling into the cylinder head valley as shown in slide 4 of the file. The modular power unit interface packaging also prevents fuel spray in the engine bay pre- and post- failure mode effect management (FMEM) triggering. The included video "Engine Bay with Cracked BB Injector and No FMEM.MOV" captures the vehicle's engine operating with a cracked BB-injector without FMEM; no fuel spray is visible. Leaked fuel in the cylinder head valley exits the valley via the drain hole as shown in slide 5 of the included file, regardless of which injector the leaked fuel originated from. There are no differing obstruction conditions between injector locations.

Ford has leak tested cracked injectors recovered from all cylinder locations in vehicle and observed no statistically significant difference in leak volume between the injectors from different locations.

- b) The cylinder head space is designed to drain all fluid that enter it. In the event a minimal amount of fuel remains, the surface temperature of this space is controlled by engine coolant temperature, resulting in a surface temperature in the range of 100 degrees C. This surface temperature would quickly evaporate any remaining fluid but is not high enough to present an ignition and propagation risk.