

May 24, 2018

Mr. Daniel McNair  
Sr. Product Manager  
GE Transportation  
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Mr. McNair:

This letter responds to the GE Transportation (GE) request for a California Air Resources Board (CARB) locomotive verification for the GE Tier 4 Evolution Series locomotive (Evolution Series). GE, formerly known as GE Rail, a division of General Electric, is the manufacturer of the Evolution Series. In response to GE's request, CARB verifies that the Evolution Series achieves U.S. EPA Tier 4 Line-Haul exhaust emissions levels. This verification will be applicable to the locomotive models ET44AC (six axle) and ET44C4 (four axle) equipped with GE's GEVO-V12 diesel engine.

The Evolution Series includes the 4,500 horsepower GEVO-V12 diesel engine. The GEVO-V12 diesel engine integrates an upgraded control system, high pressure common rail fuel injection, two-stage turbocharging, and exhaust gas recirculation to meet the U.S. EPA Tier 4 standard.

The four test locomotives were operated by three Class 1 railroads and accumulated a range of in-use hours (4,000 to 10,000 hours) throughout the United States and a portion of Canada. Exhaust emission testing was conducted by GE and Southwest Research Institute. The four test locomotives are also certified by the U.S. EPA (Certificate # FGETG0958EFX-009).

Based on CARB staff's evaluation of the application, exhaust emission data, and additional information provided, CARB staff hereby verifies that this locomotive configuration and technology achieves U.S. EPA Tier 4 Line-Haul NO<sub>x</sub>, PM, CO, and HC exhaust emission levels.

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If you have any questions or comments, please contact Ajay Mangat, Manager, Freight System Section at (916) 324-2718 or via email at [ajay.mangat@arb.ca.gov](mailto:ajay.mangat@arb.ca.gov) or Mike Jaczola, Staff Air Pollution Specialist, Freight System Section at (916) 324-5607, or via email at [michael.jaczola@arb.ca.gov](mailto:michael.jaczola@arb.ca.gov).

Sincerely,



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