

# Cummins and Partners Achieve Breakthrough in Hydrogen Internal Combustion Engine Technology for Commercial Vehicles

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**Cummins, in collaboration with key technology partners Johnson Matthey, PHINIA, and Zircotec, has successfully developed a 6.7-liter hydrogen internal combustion engine (H2-ICE) for medium-duty trucks and buses. This achievement, realized through the “Project Brunel” consortium, marks a significant advancement in zero-emission commercial vehicle technology.**

The project, match-funded by the UK government and facilitated by the Advanced Propulsion Centre UK (APC), leveraged Cummins’ established spark-ignited engine platform, integrating innovative hydrogen fuel injection technology from PHINIA, advanced after-treatment catalysts and metals chemistry from Johnson Matthey, and hydrogen barrier coatings from Zircotec.

The resulting H2-ICE delivers a more than 99% reduction in tailpipe carbon emissions and ultra-low NOx, compared to Euro VI diesel engines, utilizing zero-carbon hydrogen fuel. This technology offers a viable and familiar power solution for commercial vehicles without requiring extensive vehicle redesigns.

“Project Brunel highlights the power of collaboration between industry leaders and underscores our ongoing commitment to industry decarbonisation,” stated Jonathan Atkinson, Executive Director – Product Strategy at Cummins. “This is a major achievement for Cummins Darlington, and for the UK’s hydrogen technology leadership. We hope the Government recognizes this technology’s potential for commercial vehicles beyond 2035 and 2040, to align regulation with other major global markets.”

While the initial focus was on medium-duty applications, the engine design is scalable to heavy-duty vehicles, with Cummins already developing a 15-liter H2-ICE. This development builds upon Cummins’ recent £13 million investment in a new Powertrain Test Facility at its Darlington Campus, enhancing the company’s ability to test advanced powertrains across various fuel types. This project solidifies Cummins’

position as a leader in innovative and sustainable propulsion solutions for the commercial vehicle sector.