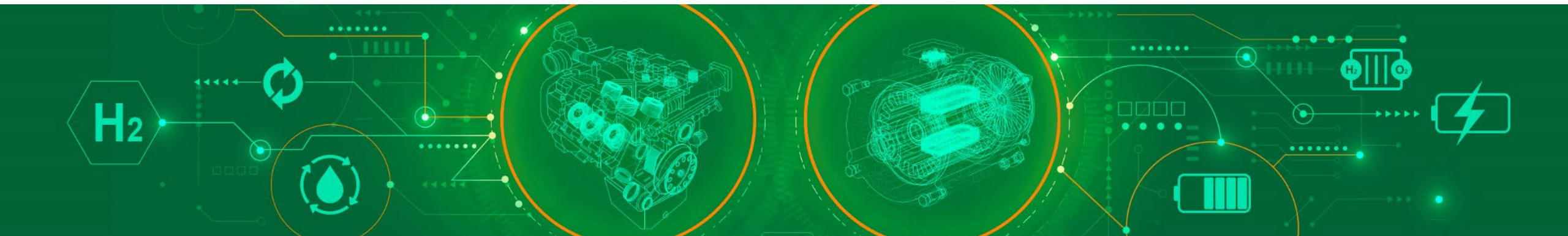


# EUROMOT proposal to amend UN R96 and R120

Submitted to 90<sup>th</sup> GRPE Session January 2024

EUROMOT Task Force for the Type Approval of Carbon Free and Low Carbon Fuels



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# Guiding principles - recap

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- **Objective:** Allow type approval of hydrogen combustion engines for NRMM, agricultural and forestry tractors.
- Preserve the outcome of EU/OICA amendments to R49.
- Maintain a “lean approach” to the proposal – minimum necessary changes to allow type approval of hydrogen internal combustion engines.
- Only include technical concepts that have been accepted in R49.

Whilst also:

- Respecting the differences between R96 and R49.
- Being conscious of international developments in NRMM emission calculations for alternative carbon free and low net carbon fuels.

# Document register

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- Previous sessions:
  - **GRPE-86-06:** Declaration of intent to modify R96 and R120
  - **GRPE-89-08:** Explanation of informal documents GRPE-89-09 to GRPE-89-12
  - **GRPE-89-09:** Informal document to amend R96: Inclusion of H<sub>2</sub>.
  - **GRPE-89-10:** Informal document to amend R96: Administrative + typographic amendments.
  - **GRPE-89-11:** Informal document to amend R120: Inclusion of H<sub>2</sub>.
  - **GRPE-89-12:** Informal document to amend R120: Administrative + typographic amendments.
- 90<sup>th</sup> Session:
  - **ECE/TRANS/WP.29/GRPE/2024/16**
    - Consolidation of GRPE-89-09, GRPE-89-10.
    - Small modifications to address comments received at 89<sup>th</sup> session.
  - **ECE/TRANS/WP.29/GRPE/2024/17**
    - Consolidation of GRPE-89-11, GRPE-89-12.
  - **GRPE-90-13**
    - Informal document to update ECE/TRANS/WP.29/GRPE/2024/17.
    - Single addition to improve alignment of R120 with R85.
    - Alignment of format and footnotes of reference fuel table with R96 and R49

# Updates since 89<sup>th</sup> Session: R96

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- Meeting held with contracting parties that had raised comments or questions:
  - Annex 3: Fuel Type Codes.
    - Original proposal: All hydrogen engines code T.
    - Revised: Align with R49: T for SI engine w/ gaseous H<sub>2</sub>, TD for CI engine w/ gaseous H<sub>2</sub>, U for SI engine w/ liquified H<sub>2</sub>, UD for CI engine w/ liquified H<sub>2</sub>.
  - Annex 4: Zirconia sensor for measurement of AFR
    - Added text to align with R49 and ISO 8178: “To fulfil the accuracy specified above, the sensor shall be calibrated as specified by the instrument manufacturer”
  - General paragraph numbering corrections.
- Other minor amendments made to R96 proposal:
  - Annex 6: Hydrogen reference fuel specification table.
    - Table format and footnotes aligned with R49.
- All changes are incorporated in ECE/TRANS/WP.29/GRPE/2024/16

# Updates since 89<sup>th</sup> Session: R120

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- Modifications to align with R85:
  - Paragraph 5: Power Correction factor
    - “When a turbocharged engine is fitted with a system which allows compensating the ambient conditions temperature and altitude, at the request of the manufacturer, the correction factor  $\alpha_a$  shall be set to the value of 1.”
    - Additional option to prevent double correcting power of engines that can already compensate for temperature and altitude.
- Modifications to align with R49 and R96:
  - Annex 7: Hydrogen reference fuel specification table and footnotes.
- Changes are incorporated in GRPE-90-13 which modify ECE/TRANS/WP.29/GRPE/2024/17

# Further Actions

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- EUROMOT is continuing to engage with other stakeholders on development of a globally harmonised universal solution to facilitate testing of non-road, rail, marine and stationary applications using a wider range of low and net zero carbon fuels and technologies. It will bring relevant further proposals to GRPE when this development matures.

**30**  
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**EUROMOT**

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