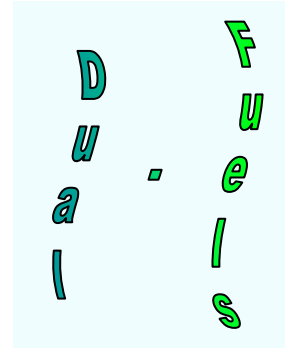


# HDDF power issues – draft proposals to GFV outcome of the GFV meeting

## Draft amendments to R85

# Definitions



- Add to definitions (definitions as agreed by GRPE in the R49 HDDDF related annexes)
- 2.8 Heavy Duty Dual Fuel (HDDDF) engine
- 2.9 Heavy Duty Dual Fuel (HDDDF) vehicle

## Note:

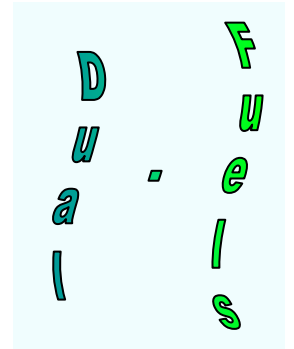
copy as appropriate the definitions from the R49 HDDDF Annexes related to types and modes

# Test to be performed in case of an HDDDF engine

D  
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A  
L  
F  
U  
E  
L  
S

- 5.2.1 reads currently
  - 5.2.1. The net power test shall consist of a run at full throttle for positive-ignition engines and at fixed full-load fuel injection pump setting for diesel engines, the engine being equipped as specified in Table 1 of Annex 5 to this Regulation.
- 5.2.1 shall be amended to read
  - 5.2.1. The net power test shall consist of a run at full-load, the engine being equipped as specified in Table 1 of Annex 5 to this Regulation.
  - 5.2.1.1 In case of a HDDDF Type 1B, HDDDF Type2B, or HDDDF Type 3, the test shall consist of a run on the Dual Fuel mode and of a run on the Diesel mode of that same engine

# Reference fuels to be considered in case of a HDDF engine



- No change in LPG ref fuels
  - Current text to read:
    - 5.2.3.2. For positive ignition engines fuelled with LPG:
  - To be amended and read:
    - 5.2.3.2. For positive ignition engines and HDDF engines fuelled with LPG:
- No change in NG ref fuels
  - Current text to read:
    - 5.2.3.3. For positive ignition engines fuelled with natural gas:
  - To be amended and read:
    - 5.2.3.2. For positive ignition engines and HDDF engines fuelled with natural gas:
- No change in Diesel ref fuel
  - Current text to read:
    - 5.2.3.4. For compression ignition engines:
  - To be amended and read:
    - 5.2.3.4. For compression ignition engines and **HDDF engines**:

# Reference fuel in case of HDDF fuelled with LNG

D  
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a  
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l  
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- Current section 5.2.3.3.5. to be renumbered 5.2.3.3.6.
- Current section 5.2.3.3.4. to be renumbered 5.2.3.3.5.
- Insert a new paragraph 5.2.3.3.4. to read
  - 5.2.3.3.4. In the case of an engine labelled for one specific LNG fuel composition: The fuel used shall be the fuel for which the engine is labelled. In case of dispute the fuel used shall be the reference fuel  $G_{20}$  specified in Annex 8 if the engine is labelled  $LNG_{20}$ , or the reference fuel  $G_R$  if the engine is labelled  $LNG_R$

# Tests to be performed in case of an HDDDF engine

D  
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- 5.2.3.5. Positive ignition engines of vehicles that can run either on petrol or on a gaseous fuel, are to be tested with both fuels, in accordance with the provisions in Paragraphs 5.2.3.1. to 5.2.3.3. The vehicles that can be fuelled with both petrol and a gaseous fuel, but where the petrol system is fitted for emergency purposes or starting only and of which the petrol tank cannot contain more than 15 litres of petrol will be regarded for the test as vehicles that can only run a gaseous fuel.
- Add a new 5.2.3.6 to read
  - 5.2.3.6. Dual fuel engines or vehicles that are certified to run either on a dual fuel or on a Diesel mode (HDDF Type 1B, HDDF Type 2B, and HDDF Type 3) are to be tested with both fuels, in accordance with the provisions set in Paragraphs 5.2.3.

# Indicated power in case of a HDDDF engine

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- 5.4. Interpretation of Results
  - The net power and the maximum 30 minutes power for electric drive trains indicated by the manufacturer for the type of drive train shall be accepted if it does not differ by more than  $\pm 2\%$  for maximum power and more than  $\pm 4\%$  at the other measurement points on the curve with a tolerance of  $\pm 2\%$  for engine or motor speed, or within the engine or motor speed range ( $X1 \text{ min}^{-1} + 2\%$ ) to ( $X2 \text{ min}^{-1} - 2\%$ ) ( $X1 < X2$ ) from the values measured by the technical service on the drive train submitted for testing.
- Add:
  - In case of a HDDDF **engine**, the net power indicated by the manufacturer shall be the one measured on the dual fuel mode of that engine