Zero-Emission Powertrain and Vehicle Certification Requirements

2019 Truck and Engine Manufacturers Association
Compliance Workshop
April 9-10, 2019
Optional Powertrain and Vehicle Certification Procedure

**Powertrain**
- Powertrain manufacturer
- Describe components
- Meet other requirements
- Powertrain EO

**Vehicle**
- Vehicle manufacturer
- Describe vehicle
- Meet other requirements
- Vehicle GHG EO

Identify certified powertrain

Optional
Optional Zero-Emission Powertrain Certification
Applicability of Zero-Emission Powertrain Certification

- Zero-Emission Powertrain (ZEP) certification starts with MY2021
- ZEP – HD battery electric and hydrogen fuel-cell
- Powertrains in HDV's and incomplete MDV’s
ZEP components

- Electric motor/generator
- Fuel-cell stack (if applicable)
- Energy storage system
- Battery/thermal management systems
- Interface to traditional mechanical components

Credit: TransPower
ZEP Certification Submission

- Applications submitted in DMS now
- Applications will be submitted to E-Cert
- Fuel cell stacks and battery packs are certified using powertrain families and subfamilies
- Criteria emissions and GHG certification levels are zero
Battery-Electric Powertrain Families

Substantially similar battery packs:

• Cell chemistry
• Module construction (e.g., cylindrical, prismatic, pouch)
• Battery management system
• Battery thermal management systems
Fuel-Cell Powertrain Families

Substantially similar fuel-cell stack type:
- Chemistry
- Hardware components of the stack

Different rated capacities may be grouped in one family:
- Identical components at a modular level
- Cell construction
- Thermal management strategies
- Battery management strategies
Fuel-Cell Powertrain Families

• Batteries integrated into the fuel-cell powertrain:
  • Plug-in chargeable: subject to requirements of battery-electric powertrains
  • Non-plug-in chargeable: no additional battery requirements

• Family naming convention
ZEP Application

• Letter of intent
• Description of powertrain configuration/components
• Battery capacity test results
  • SAE J1798 or
  • CARB approved alternative procedure
• Projected sales (US and CA)
ZEP Diagnostic Requirements

- Diagnostic connections and communication
  - Fault codes
  - On-board battery usage information
    - Cumulative battery throughput (energy usage)
    - Remaining battery capacity or vehicle range
    - Percentage rated battery energy capacity (battery state of health)
    - Resettable kilowatt-hour-per-mile meter (energy efficiency trip meter)
ZEP Diagnostic Requirements

• Generic scan tool compatibility or on-road display of information
  • Requires use of J1962 or J1939 diagnostic link connectors
  • Requires use of J1979 or J1939 communication protocols
Other ZEP Requirements

• Sample of powertrain family label
• Battery end-of-life plan
• Owner's manual
• Diagnostic and repair manual
• Warranty
• Third-party repair facility access to repair/diagnostic tools and service information
• Detailed application checklist to follow
ZEP Warranty & Recall

- Warranty requirement is 3 years or 50,000 miles, (design, materials, and workmanship)
- Recall at greater of 4% or 25 screened failures
- Notify fleets of recall and repair free of charge
CARB Certification of ZEP

• May be required by other zero-emission vehicle measures in the future (e.g., ZE Airport Shuttle Proposal)
• May be included in funding programs targeting more-mature zero-emission applications
• Manufacturers could use to show compliance as a selling feature
Optional Heavy-Duty Electric and Fuel-Cell Vehicle Certification
Applicability of HD Vehicle Certification
Battery-Electric and Fuel-Cell

• Medium- and heavy-duty vehicles
• Vehicles can optionally use a certified ZEP
Heavy-Duty Electric and Fuel-Cell Vehicle Certification

- Applications submitted in DMS now
- Applications will be submitted to E-Cert
- Vehicle description
  - Driveshaft
  - Transmission
  - Axles
- Powertrain EO
- Detailed application checklist to follow

Credit: TransPower