HYDROGEN FUELING PROTOCOLS

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NWCM INTERIM MEETING

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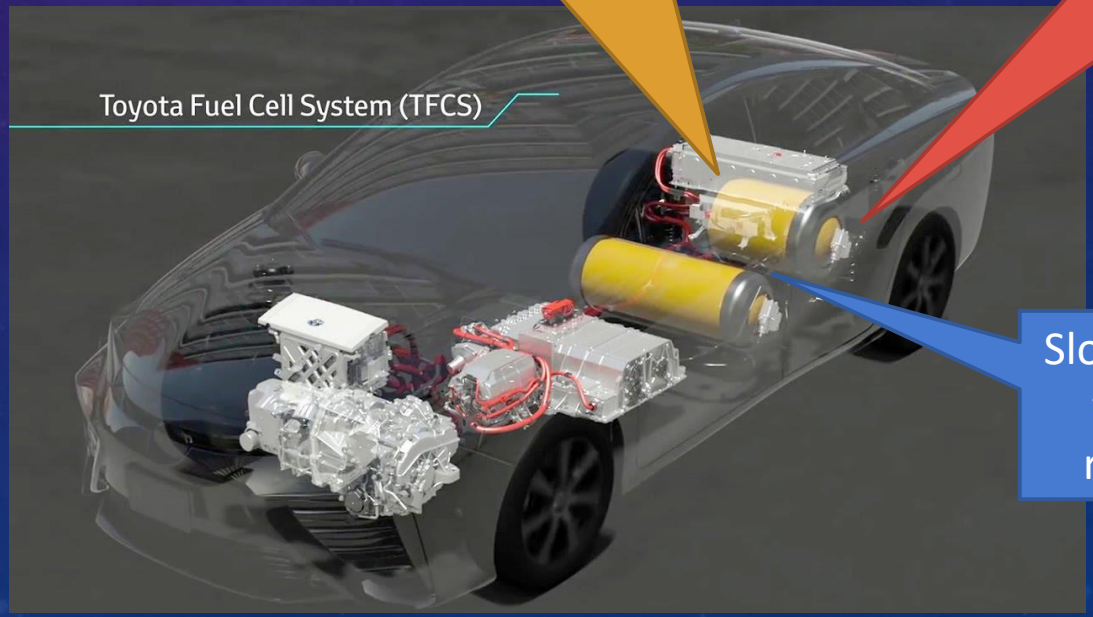
FUELING PROTOCOLS ENSURE HYDROGEN CARS ARE FUELED PROPERLY

- In contrast to CNG, hydrogen tanks heat up when fueling
- So, the fueling protocol is critical to ensuring safe, fast fueling



High flow rates or warm temperatures can overheat tanks

High flow rates or fluctuations can damage components

Slow flow rates or cold temperatures can result in overfilling

FUELING PROTOCOL STANDARDS

- SAE J2601 defines the fueling protocol
  - Takes into account existing tank and component standards
  - Defines constant pressure ramp rate, hydrogen temperatures/pressures limits and tolerances
- ANSI/CSA HGV 4.3 ensures the dispenser implements the fueling protocol correctly
  - Fault tests
  - Communication tests
  - Protocol tests
- CSA HGV 4.3 moving to a listing standard
  - Dispensers would be verified to confirm to HGV 4.3 by a third party and,
  - May have a sticker or other documentation proving validation

SAE J2601
Defines fueling protocol

ANSI/CSA HGV 4.3
Tests protocol implementation

HYDROGEN DISPENSING VALIDATION IN CALIFORNIA

- Currently, ~15K hydrogen vehicles, and >50 stations in California
- Validate being done by
  - Protocol: California Air Resources Board (ARB) CSA HGV 4.3 using Hystep device
  - W&M: California Dept of Food & Agriculture (CDFA) using mobile test unit
- Improper fueling protocols can damage test equipment and may affect measurement accuracy of flow meters

CA ARB Hystep Device

CDFA
W&M mobile test unit

WHY IS THIS PROPOSAL IMPORTANT?

- Ensures accurate measurements and protects vehicle (consumer), dispenser, and test equipment
- Future third party validation and labels will assist W&M personnel in identifying dispensers validated to HGV 4.3
- Request voting status or guidance on how to improve proposal
- Also recommend adding guidance to Examination Procedure Outline (EPO) 29 “Hydrogen Gas (H2Gas) Retail Vehicle Fuel Dispensers”

UR 3.8 Safety Requirement

All hydrogen gas-measuring devices subject to this code shall maintain verification of testing demonstrating conformance with the latest version of SAE J2601 Fuel Protocols for Light Duty Gaseous Hydrogen Surface Vehicles, as determined by the latest version of ANSI/CSA HGV 4.3 “Test Methods for Hydrogen Fueling Parameter Evaluation.
(Nonretroactive as of January 1, 10XX)