

# Overview of SAE J2600 / J2601 / J2601-2 revisions

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PRHYDE Webinar

# SAE J2600 revision

# Highlights of changes

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# SAE J2600 Revision

- Main changes:
  - Harmonization of content with latest version of ISO 17268 (*tests, P, T*)
  - Addition of H35HF (high flow) geometry and language
  - Recommendation to mechanically lock out LDV fueling at HDV dispensers
  - Alignment of definitions with definitions in ISO 19880-1
  - Inclusion of receptacle blow off/disconnect test (*at 1 MPa*)
  - Addition of requirements for nozzle/receptacle material hardness
  - Locating all receptacle & nozzle specific drawing in appendices
  - Guidance on H70HF geometry

# Items for Future Revision

- Seals testing (SAE J2600 section 4.2.6.4, ISO 17268 section 4.5)
  - ISO should align and include reference to a harmonized test
- Large pressure value for receptacle not aligned with system components such as compressor, PRDs and dispenser component maximum pressures (SAE section 4.3.7.4 & 4.5.2.2, ISO section 7.16)

# Changes to SAE J2601

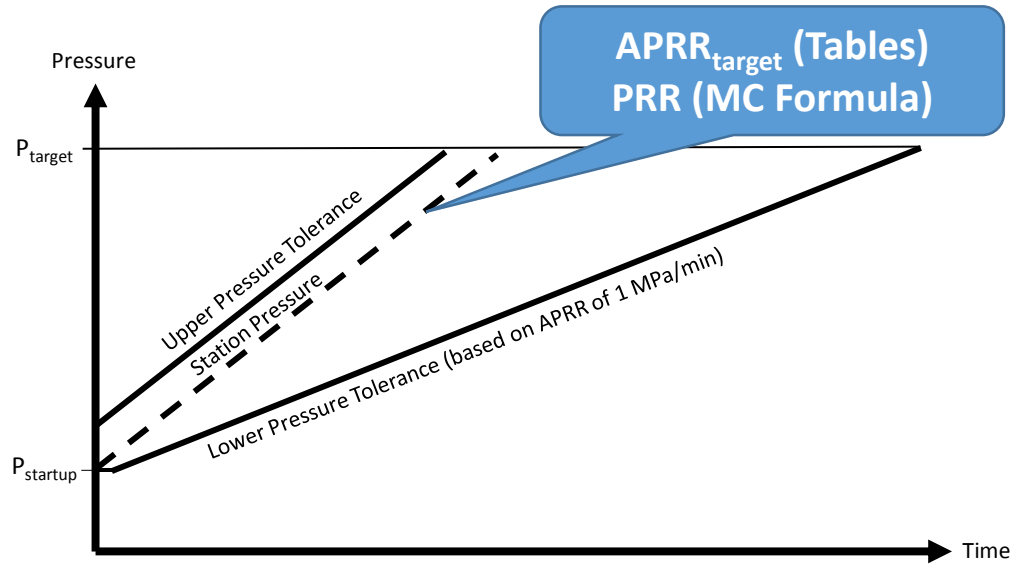
Steve Mathison

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# Changes To 2020 Version of SAE J2601

- J2601 has passed FCSC ballot – next is MVC and then publish (~ May)
- Main changes to J2601:
  - Clarification to terms, definitions, and symbols, including Figure 1
  - Requirement for a minimum startup time
  - Cold Dispenser fueling is now only applicable to Communications Fueling
  - Relaxed some requirements for exceeding the pressure corridor
  - Relaxed some requirements for fuel delivery temperature cool-down
  - MC Formula – now allows interpolation of t-final based on CHSS volume
  - **Added a new CHSS Capacity Category D for both table-based and MC Formula**
    - **Category D allows stations to utilize J2601 to fill vehicles with CHSS volumes > 250 L (10 kg)**

# CHSS Capacity Category D



Pressure Class	Total amount of hydrogen in CHSS at 100% SOC (kg)	Water volume of CHSS (liters)	CHSS Capacity Category Identifier
H35	1.19 to 2.39	49.7 to 99.4	A
H35	2.39 to 4.18	99.4 to 174.0	B
H35	4.18 to 5.97	174.0 to 248.6	C
H70	2.00 to 4.00	49.7 to 99.4	A
H70	4.00 to 7.00	99.4 to 174.0	B
H70	7.00 to 10.00	174.0 to 248.6	C
H70	> 10.00	> 248.6	D

## Table-Based

IF CHSS Capacity Category = D

$$APRR_{calculated} = 28.5 \times \frac{V_{station\_D}}{V_{CHSS}}$$

$$APRR_{target} = \text{Minimum}(APRR_{calculated}, APRR_{actual})$$

From Category D  
lookup Tables

Where

- $V_{station\_D}$  is a volume set by the station to be a value between 137 to 174 in liters
- $V_{CHSS}$  is the volume of the CHSS being fueled in liters
- $APRR_{actual}$  is the APRR value from the applicable **CHSS Capacity Category D look-up table**

## MC Formula

IF  $P_{initial} < 5 \text{ MPa}$

$$\text{Set } t_{final\_min\_D} = 222 \times \left( \frac{V_{CHSS}}{248.6} \right)$$

ELSE IF  $P_{initial} \geq 5 \text{ MPa}$

$$\text{Set } t_{final\_min\_D} = 210 \times \left( \frac{V_{CHSS}}{248.6} \right)$$

IF  $CHSS_{capacity\_category} = D$ ,  $t_{final\_small} = t_{final\_248.6}$ ,  
 $t_{final\_large} = t_{final\_248.6}$ ,  $t_{final\_min} = t_{final\_min\_D}$

No modifications to coefficient tables is necessary.

# Status SAE (TIR) J2601-2

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# SAE (TIR) J2601-2 (2014)

- Re-affirmation coming up – end of April 2020
- Main challenges J2601-2:
  - Technical Information Report, not full standard
    - But: *only* (?) guidance document on topic of HD fueling
  - Mostly used for fueling in return-to-base and behind fence transit bus fleet setting
  - Does not include H70 fueling
  - Limited involvement of HDV OEMs, mainly LDV OEMs
    - Involvement of HD H2 infra providers & HD fleet operators
- Allows for flexibility - prescriptive protocols restrict new concepts & innovation