SAE J1772™ Update for EPRI-IWC March 2012

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SAE J1772™ Revision 4 Status

- Revision 4 published 2/21 includes:
  - Normative
    - Editorial corrections
    - Technical corrections
    - EVSE compatibility test (new Appendix)
  - Informative
    - Charging configurations and ratings definitions
    - Illustration of Combo coupler
    - Reference to PLC communications for DC charge control

SAE J1772™ Revision 5 Plan

- Revision 5 will re-integrate DC charging
  - Coupler dimensional information
  - EVSE DC output interface definitions
  - System sequence diagrams and data messages
  - Additional requirements for DC charging
- Revision 5 will be formatted into 3 main sections:
  - General requirements for AC and DC charging
  - Specific requirements for AC charging
  - Specific requirements for DC charging

SAE J1772™ Revision 5 Plan

- PLC related information will located in the appropriate 2836/X, 2847/X and 2931/x documents
- As in Revision 4, additional clarifications and corrections will be made as time warrants

SAE J1772™ Revision 5 Plan

SAE Charging Configurations and Ratings Terminology

AC level 1
(SAE J1772™)

PEV includes on-board charger
120V, 1.4 kW @ 12 amp
120V, 1.9 kW @ 16 amp
Est. charge time:
PHEV: 7hrs (SOC* - 0% to full)
BEV: 17hrs (SOC – 20% to full)

AC level 2
(SAE J1772™)

PEV includes on-board charger (see below for different types)
240 V, up to 19.2 kW (80 A)
Est. charge time for 3.3 kW on-board charger
PEV: 3 hrs (SOC* - 0% to full)
BEV: 7 hrs (SOC – 20% to full)
Est. charge time for 7 kW on-board charger
PEV: 1.5 hrs (SOC* - 0% to full)
BEV: 3.5 hrs (SOC – 20% to full)
Est. charge time for 20 kW on-board charger
PEV: 22 min. (SOC* - 0% to full)
BEV: 1.2 hrs (SOC – 20% to full)

***DC Level 1**

EVSE includes an off-board charger
200-500 V DC, up to 40 kW (80 A)
Est. charge time (20 kW off-board charger):
PHEV: 22 min. (SOC* - 0% to 80%)
BEV: 1.2 hrs. (SOC – 20% to 100%)

***DC Level 2**

EVSE includes an off-board charger
200-500 V DC, up to 100 kW (200 A)
Est. charge time (45 kW off-board charger):
PHEV: 10 min. (SOC* - 0% to 80%)
BEV: 20 min. (SOC – 20% to 80%)

*In development
Voltages are nominal configuration voltages, not coupler ratings
Rated Power is at nominal configuration operating voltage and coupler rated current
Ideal charge times assume 90% efficient chargers, 150W to 12V loads and no balancing of Traction Battery Pack

Notes:
1) BEV (25 kWh usable pack size) charging always starts at 20% SOC, faster than a 1C rate (total capacity charged in one hour) will also stop at 80% SOC instead of 100%
2) PHEV can start from 0% SOC since the hybrid mode is available.

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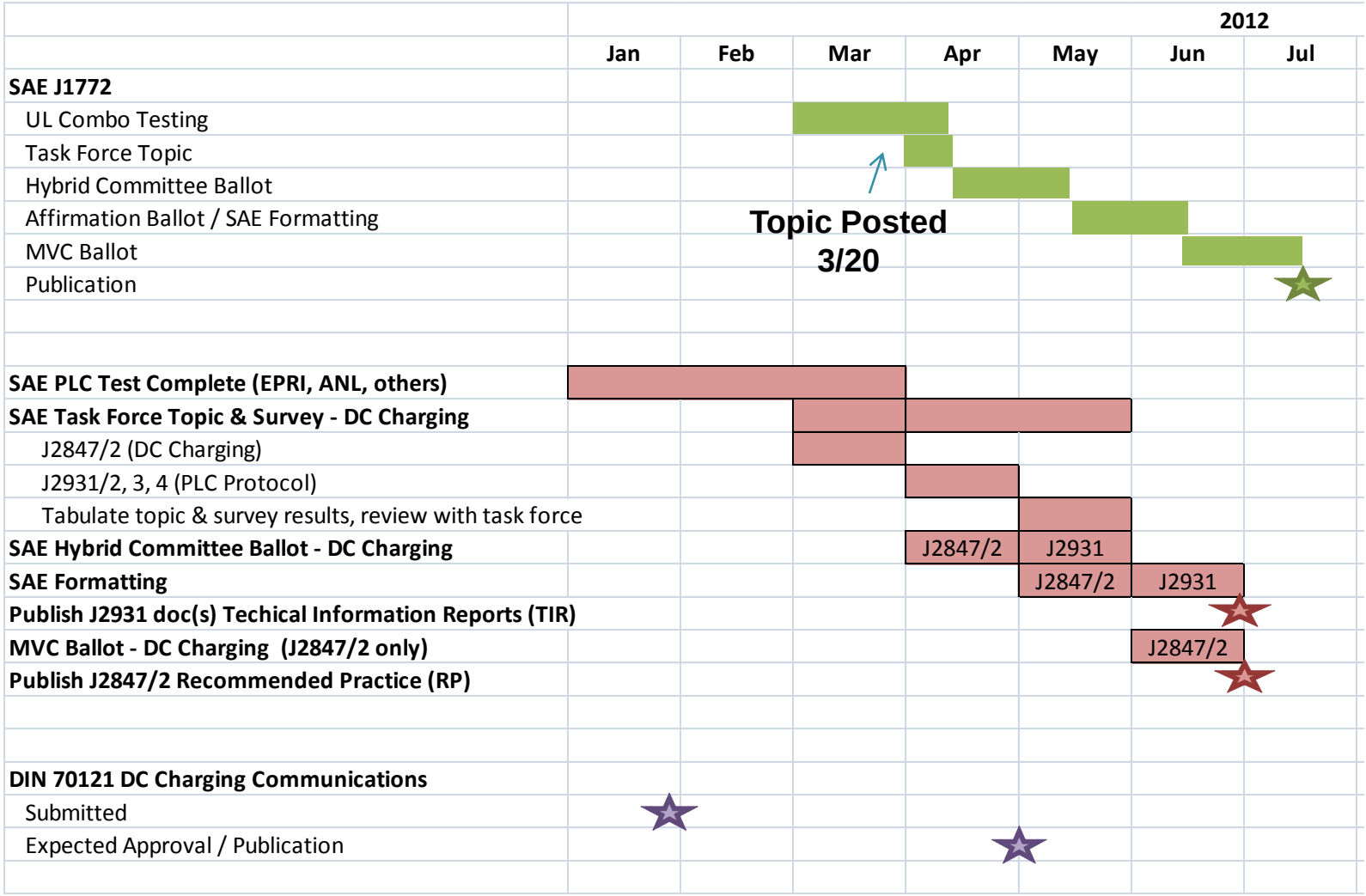
SAE J1772™ Revision 5 Plan



DC Coupler UL2251 Testing

- DC coupler will be tested to UL 2251 - Plugs, Receptacles and Couplers for Electric Vehicles
  - Testing to begin soon and be completed prior to J1772 Hybrid Committee ballot closure
- Testing will be limited to only those tests applicable to the interface specified in J1772
  - For example, tests related to material properties will not be ran as these are manufacture specific and not specified in J1772

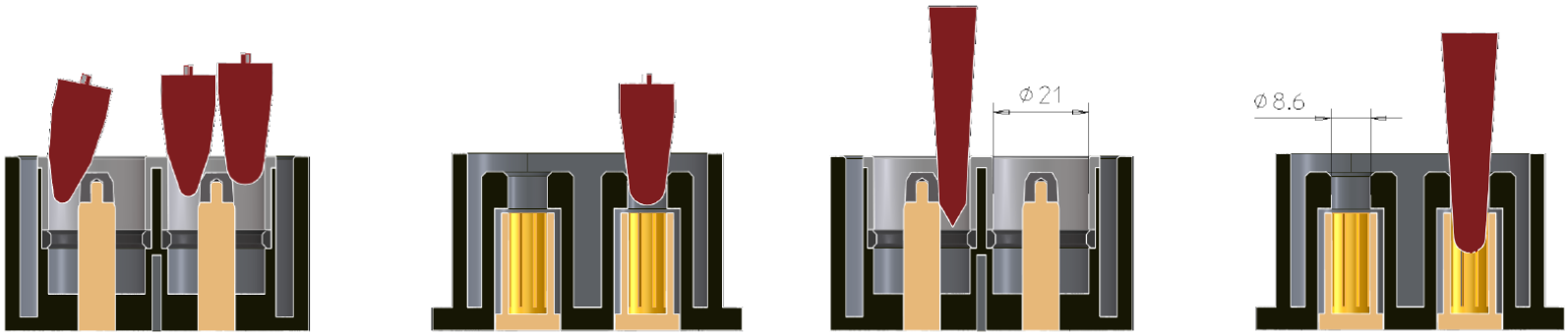
DC Coupler Design Status

- SAE is coordinating efforts to tool DC charge couplers
- REMA and Korea Electric Terminal (KET) are the suppliers involved in the effort
  - REMA
    - Began shipping couplers week of 2/6
  - KET
    - Have shipped parts since 12/11
    - Have temporally stopped shipping to correct durability issue of the Proximity terminal in plug
      - Expect shipping to resume mid April

DC Coupler Design Status

- Design revision needed to meet UL finger proof test
- Design complies to IEC finger proof test
- UL finger proof compliant parts available early/mid March (REMA)

Finger Probe According to IEC 60529 Finger Probe According to UL 2251



DC Coupler Design Status

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SAE J1772™ DC Development Team