



TMC 2023

ATA'S TECHNOLOGY & MAINTENANCE COUNCIL

FALL MEETING & National Technician Skills Competitions



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<http://tmcfall.trucking.org>

#TMCFall23



Electric Vehicle Test Procedure

Discussion

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9/19/2023



-
- Technology & Maintenance Council

... Turning Experience Into Practice

ATTENTION PLEASE

- In accordance with TMC Board Policy, all personal phones without a silent feature must be turned off during business sessions.
- If you must use your phone —please leave the room!



ATTENTION PLEASE

- This is an open meeting of the Technology & Maintenance Council, held in accordance with ATA Antitrust Guidelines which are listed in your meeting packet.
- Audio or video recordings are not permitted at this session. However, photography is permissible.
- The opinions expressed in this meeting are those of the individual and not necessarily the opinion of his/her company nor of TMC unless stated otherwise.

ANTITRUST/PATENT DISCLOSURE

- To minimize the possibility of antitrust problems, the guidelines detailed in your registration packet should be followed at all TMC meetings, task force and study group sessions.
- All participants in any group involved in the development of standards or recommended practices shall disclose, as stated in the antitrust/patent disclosure guidelines in your registration packet, all patents or patent applications that are owned, controlled or licensed by the Participant or Participant's employer when the Participant reasonably believes such patent or patent application may become material to the standard or RP development process.

Constructive Comments Are Always Appreciated!

- TMC welcomes your comments, but please make certain that they are constructive and appropriate before you turn in your evaluation sheet!
- *Thank You for Your Cooperation!*

Study Group Agenda

- General Discussion
- New Procedure- Not an Update to Existing RP
- Call for Volunteers
- Test Procedure for EV Specifics
- Charging Options and Considerations
- How to Compare to Gas/Diesel
- Safety
- Closing

S.11 EV Testing Procedure

- Existing procedures
- SAE J1711 for Hybrid EVs
- Dyno test measuring Fuel Economy / Emissions



S.11 EV Testing Procedure

- Existing procedures
- SAE J1634 for Battery EVs
- EPA follows procedure to measure energy consumption and range testing (MPG equivalency)



Figure 1. Chassis dyno with EV under test.

S.11 EV Testing Procedure- Nomenclature

- | Measurement | Unit |
|--------------------------------|----------------|
| • Battery Ampere-Hour Capacity | DC Amp Hours |
| • Discharge Energy | DC Watt Hours |
| • DC Discharge Amp-Hours | DC Amp Hours |
| • Power Outlet Voltage | AC Volts (RMS) |
| • AC Recharge Energy | AC Watts Hours |
| • DC Recharge Amp-Hours | DC Amp Hours |
- Electrical measurements made for EV MPG equivalency by US EPA

S.11 EV Testing Procedure

- Topics for Consideration
- How to measure battery regen from;
- Braking
- Solar panels
- Coasting downhill with speed control

S.11 EV Testing Procedure

- Topics for Consideration
- Accessory motors must be operated the same for both vehicles
- A/C motor
- Power steering motor (driver affects)
- Water pump load
- Electric heater load



S.11 EV Testing Procedure

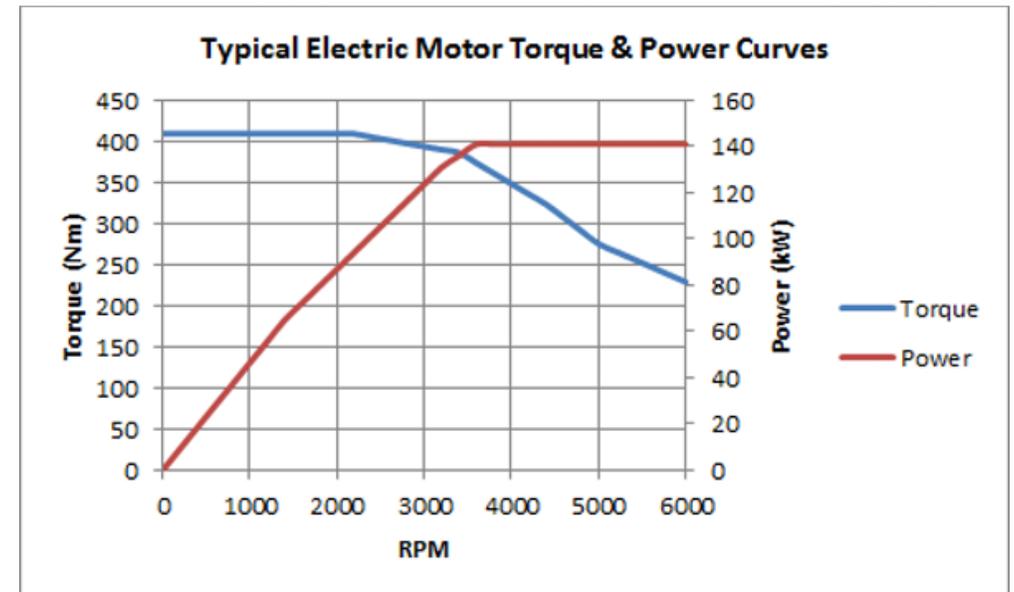
- Topics for Consideration
- Battery charge level at SOT, how to measure
- Test route- Brake application affects re-gen
- Re-Gen capability on one vehicle may be much more efficient than other vehicle.

S.11 EV Testing Procedure

- Topics for Consideration
- Battery condition throughout test.
- Degradation begins at first charge
- Degradation is affected by use / abuse
- Degradation is affected by time

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- Topics for Consideration
- What portions of previous fuel economy procedures apply equally to EVs and Hybrids
- Tires
- Weather
- Drive cycle
- Driver skill



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- Topics for Consideration
- Are battery differences enough to show one vehicle is more efficient?
- Same with drive motors?
- The GRID...?

S.11 EV Testing Procedure

- We are at phase 1 of this new and exciting S.11 procedure
- Please sign up to be a part of the development

S.11 EV Testing Procedure

- Open discussion on this RP Development

Questions? Comments?

S.11 EV Testing Procedure

- Closing Comments

Thank you!!!!

- Please sign **volunteer sheet for this update.** These are **your** procedures and **your** participation is always welcome!
- Email- Brian.Wilson@SwRI.org

SAVE THE DATE

TMD24

**ANNUAL MEETING
& Transportation Technology Exhibition**

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save the date!