

Battery manufacturers input to specifications

- Group consensus answers to the questions relating to the battery connection are as follows:
 - Q: Battery connections must be designed to prevent electrical access when connected, but limited access for diagnostics is required?
 - A: Access for diagnostics should not be a requirement in the specification but should be possible if the vehicle OEMs want it.
 - Q: Will a family of battery connection sizes be needed based on battery current/time profiles? Need to discuss how many and current carrying capacity of each connection.
 - A: Yes – number should be determined by the connection suppliers
 - Q: Should centerline distances between battery connections be standardized for various battery current ranges?
 - A: No
 - Q: Should pigtail connections be allowed on the battery?
 - A: Pigtailed connections are not recommended
 - Q: Should battery connection and disconnection be accomplished without tools? (Tool-less connection is desirable. If a tool is needed, it must not be able to make a conductive path.)
 - A: Don't care – if environmental/physical specifications can be met
 - Q: Should battery terminals be male or female?
 - A: Male – however, the flex member should be on the harness side. The conductor in the battery will most likely have to transition to a copper based terminal.
 - Q: Should there be separate positive and negative connectors or a single unit for simultaneous attachment of both terminals?
 - A: Separate connectors for both positive and negative
 - Q: Is there a need to index the connection to assure that only one type of battery technology is used in a given vehicle? (e.g., vehicle is designed for an AGM battery and an attempt is made to install a Lithium Polymer battery)
 - A: Indexing is necessary
 - Q: Connector to battery terminal engage/disengage force?
 - A: No specifications established at this time.
 - Action item: Battery manufacturers will provide engage/disengage requirements for current product:**
 - Q: Nominal current resistance (voltage drop)?
 - A: Will design to vehicle OEM requirements. Measurement points and method must be defined.
 - Q: Maximum current capability including time functionality?
 - A: Will design to vehicle OEM nominal requirements. Much discussion was held on short circuit battery capability of future batteries. Suggestion was made to go with a multiple of the CCA rating.
 - Action item: Tom Keim will convene a separate telephone conference call next Tuesday, January 11, 2000 at 3 pm to make a recommendation on this issue. Norm Traub will send Tom the e-mail distribution list for the workgroup so Tom can notify all of the details.**
 - Q: Maximum current allowed when disconnecting?
 - A: Not a battery issue – connection people will have to determine capability
 - Q: Vibration/mechanical shock?

A: Dell Crouch will provide a copy of today's battery specification (SAEJ537). Jim Jones will provide additional information that is being considered for a DIN specification. Vibration/shock may be different for the connection than the battery. We need to see what the connection suppliers would recommend.

Q: Thermal shock?

A: Battery thermal shock will not be as severe as connection thermal shock. The connection specification will dominate.

Q: Sealed?

A: Not required in the initial specification. Sealing will be determined by the ability of the connection system to meet the environmental specifications

Q: Temperature/humidity cycling?

A: Will defer to the connection specification

Discussion:

- Performance under salt spray will need to be specified also.
- Sealing at the battery will need to protect the battery conductor (lead?) to terminal (copper based) interface. Both vented acid and salt spray must be kept away. This will be a requirement on the battery; however, and not on the connection system.
- Since we do not test today's battery connection for acid exposure, assume no test is need for the new 36 V connection.
- Concerning round vs. rectangular male terminal preference, all things being equal, the battery manufacturers would prefer a round male pin because of its non-orienting feature.