

NFPA 70® -2011

National Electrical Code®

TIA Log No. 1037

Reference: 625.13

Comment Closing Date: September 9, 2011

Submitter: Gery Kissel, General Motors Corp.

1. *Revise 625.13 as follows:*

625.13 Electric Vehicle Supply Equipment Connection. Electric vehicle supply equipment shall be permitted to be cord and plug connected to the premises wiring system in accordance with one of the following:

- (A) Electric vehicle supply equipment intended for connection to receptacle outlets rated at 125 volts, single phase, 15 and 20 amperes.
- (B) Electric vehicle supply equipment that is rated 250 volts maximum and complies with all of the following:
 - (1) It is ~~installed indoors and~~ or part of a system identified and listed system as suitable for the purpose and meeting the requirements of 625.18, 625.19, and 625.29 ~~shall be permitted to be cord and plug connected.~~
 - (2) It is intended for connection to receptacle outlets rated no more than 50 amperes.
 - (3) It is installed to facilitate any of the following:
 - a. Ready removal for interchange
 - b. Facilitate maintenance and repair
 - c. Repositioning of Portable, movable, or EVSE fastened in place
 - (4) Power supply cord length for electric vehicle supply equipment fastened in place is limited to 6 ft (1.8 m).
 - (5) Receptacles are located to avoid physical damage to the flexible cord.

All other electric vehicle supply equipment shall be permanently connected to the premises wiring system ~~and fastened in place.~~ This The electric vehicle supply equipment shall have no exposed live parts.

Submitter's Substantiation: This TIA was created by a task group of CMP 12 that was chaired by Gery Kissel. The other task group members were Tom Brown, Tom Hedges, Jeff Holmes, John Kovacik, Todd Lottman, Jose Salazar, David Sher, and Lori Tennant. The introduction of commercially available electric vehicles from major automobile manufacturers has accelerated the deployment of electric vehicle infrastructure. With the electrification of vehicles being a national initiative, it is imperative that the *NEC* keep up with the latest technology and clearly address the electrical safety requirements in order to facilitate the safe, efficient, and reliable installation of electric vehicle infrastructure across the country. The *National Electrical Code* serves a key role in the national deployment of electric vehicles. Safety is the paramount goal of the *NEC*, but it also serves a much more significant role than at first glance.

The *NEC* retains its fundamental principle of safeguarding persons and property from hazards arising from the use of electricity through clear, concise, and enforceable language across all jurisdictions. At the center of this mission is ensuring that the rules are clear so communities can easily and consistently enforce the same requirements across jurisdictions. The electrical infrastructure for EVs must be uniform for users and installers across the country.

NEC 625.13 is currently being interpreted differently by the electrical industry and by electrical inspectors across the country. Even a review of the *NEC* archives on this topic presents a quandary of how it should be interpreted. When the original language went into the *NEC* in 1999, the permitted cord and plug connection is documented as being for "portable" electric vehicle supply equipment (EVSE) equipment. Because of a response to a particular comment in the 2011 *NEC* cycle, it appears to some that the *NEC* committee may have taken a different view, but the language remained unchanged in the Code. In order to address the acceptance of cord and plug connected EVSE, the 2011 *NEC* is in need of revision to ensure it is enforced the same from city to city and state to state. Having cord and plug connected EVSE accepted in some states and not in others is an unnecessary speed bump for rolling out EVs and will cause confusion among automobile dealers trying to help customers purchase EVs along with the appropriate charging equipment.

The language in NEC 625.13 can be interpreted incorrectly to prohibit cord and plug connection of EVSE rated at 250V. Jurisdictions that interpret the current NEC 625.13 to prohibit cord and plug connection for EVSE will place an undue hardship on the owners or potential owners of electric vehicles, electrical contractors, and electrical distributors.

625.13(A) The section has been restructured to ensure clear and enforceability language for cord and plug connected EVSE. Item (A) addresses 125V charging and item (B) addresses 250V charging. The present language permits a 125V, 20A rated EVSE. The language is being change to align with the receptacle outlet ratings of 15 and 20A in NEC 625.18 and .19.

625.13(B) There are no voltage or amperage restrictions on cord and plug connected EVSE rated over 125V, permitting up to 600V and unlimited amperage, which creates a public safety concern for vehicle charging. Plug and cord connected equipment for public interaction is typically limited to 250V with a 50A receptacle for appliances such as ranges. Extending cord and plug connection beyond this voltage and amperage for the general public and in residential applications establishes a safety concern.

625.13(B)(2) Since the electric vehicle charging load is considered continuous in NEC 625.14, the maximum rated EVSE that could be installed on a 50A circuit is 40A rated equipment. Therefore, this proposal restricts plug and cord connection of EVSE to a receptacle outlet rated no more than 50A at 250V.

625.13(B)(3) Confusion around the enforcement of the current language could also drive inconsistent permission in the utilization of cord as a substitute for fixed a wiring system. Without clarification, NEC 400.7 can be cited to completely prohibit the use of cord connected EVSE. The introduction of 625.13(B)(3) addresses this acceptance concern.

625.13(B)(4) & (5) There currently is no restriction to limit the length of the cord supplying the EVSE. Permitting cord lengths longer than 6 ft opens the opportunity for damage to the cord and provides justification for the inspector to utilize NEC 400.8 as a means to prohibit the use of the cord. The personnel protection system that is required is not a substitute to permit an unlimited cord supply in place of a permanent wiring method. A number of sections in the *NEC* address cord length restrictions and receptacle location.

- NEC 422.16 establishes cord lengths based on the appliance for frequent interchange that vary from 18 in. to 4 ft.
- NEC 422.16 also requires the receptacle to be located to avoid physical damage to the flexible cord.
- NEC 210.50 also provides guidance on the 6 ft restriction because it requires an appliance receptacle to be located within 6 ft of its intended location.
- The 6 ft length restriction also aligns with the permitted length of traveler cable in NEC 620.44(b) to be used beyond a fixed point on the car or hoist way car where a permanent wiring method could then be used.

Therefore, the proposed text restricts the supply cord to 6 ft and provides enforceable language to ensure the receptacle is located to further avoid physical damage to the EVSE supply cord.

Emergency Nature: The introduction of commercially available electric vehicles from major automobile manufacturers has accelerated the deployment of electric vehicle infrastructure. With the electrification of vehicles being a national initiative, it is imperative that the NEC keep up with the latest technology and clearly address the electrical safety requirements in order to facilitate the safe, efficient, and reliable installation of electric vehicle infrastructure across the country. The National Electrical Code serves a key role in the national deployment of electric vehicles. Safety is the paramount goal of the NEC, but it also serves a much more significant role than at first glance.

The NEC retains its fundamental principle of safeguarding persons and property from hazards arising from the use of electricity through clear, concise, and enforceable language across all jurisdictions. At the center of this mission is ensuring that the rules are clear so communities can easily and consistently enforce the same requirements across jurisdictions. The electrical infrastructure for EVs must be uniform for users and installers across the country.

Anyone may submit a comment by the closing date indicated above. To submit a comment, please identify the number of the TIA and forward to the [Secretary, Standards Council](#), 1 Batterymarch Park, Quincy, MA 02169-7471.