EPRI | ELECTRIC POWER RESEARCH INSTITUTE

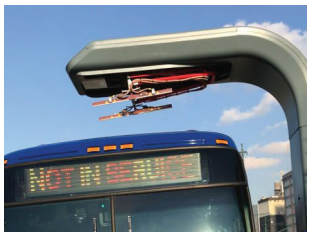
SAE International Working Group Publishes Recommended Practices for Automated, Mechanized Conductive EV Charging Systems for Buses

January 2020 – After a four year effort, the Society of Automotive Engineers (SAE) and its Medium and Heavy Duty Vehicle Conductive Charge committee, led by EPRI Technical Executive Mark Kosowski, published four new recommended practices, *SAE J-3105™*, *J-3105-1™*, *J-3105-2™*, and *J-3105-3™*, which provide the requirements for the general physical, electrical, functional, testing, and performance of mechanized, automatic, conductive power transfer systems primarily for transit buses using an automated connection.

The new recommended practices address the multiple areas required to ensure consistent power delivery for DC charging and operations of electric buses as the U.S. electric bus market expands. They allow for the behind-the-scenes safety, communications, and power transfer to help the market scale. While there currently are only three physical connectors available today, having all three comply with this standard helps ensure future interoperability, and backwards compatibility, regardless of number of connectors on the market. The recommended practices provide a roadmap for the safe, reliable, and resilient development of infrastructure for bus developers, transportation planners, and others who have a stake in the electric bus market. Kosowski says, "these publications are important to EPRI and its members because they provide a roadmap for scalability and interoperability among fleets and utilities to prepare for an electrified future."

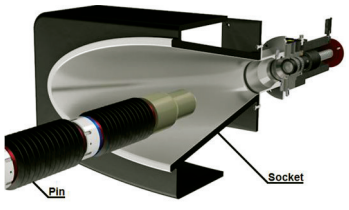
According to the SAE *press release*, the publication of SAE J-3105™ is accompanied by three supporting documents that detail the connections in J-3105™:

- **SAE J3105/1™**: Infrastructure-Mounted Cross Rail Connection covers the connection interface relevant requirements for an electric vehicle power transfer system using a conductive automated charging device based on a cross-rail design.
- **SAE J3105/2™**: Vehicle-Mounted Pantograph Connection covers the connection interface relevant requirements for an electric vehicle power transfer system using a conductive automated charging device based on a bus-up design.
- **SAE J3105/3™**: Enclosed Pin and Socket Connection covers the main safety and interoperability relevant requirements for an electric vehicle power transfer system using a conductive automated charging device based on an enclosed pin and socket design.



SAE J-3105-1
Infrastructure-mounted cross rail connection

SAE J-3105-2
Vehical-mounted pantograph connection



SAE J-3105-3
Encolsed pin and socket connection

More information on SAE J-3105 and each recommended practice is available at:

- SAE J-3105: www.sae.org/standards/content/j3105_202001/
- Infrastructure-Mounted Cross Rail Connection: www.sae.org/standards/content/j3105/1_202001/
- Vehicle-Mounted Pantograph Connection: www.sae.org/standards/content/j3105/2_202001/
- Enclosed Pin and Socket Connection: www.sae.org/standards/content/j3105/3_202001/

CONTACT INFORMATION

Principal Investigator:
Mark Kosowski, Technical Executive, PDU,
mkosowski@epri.com, 248.421.7124

3002019515

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Electric Power Research Institute
3420 Hillview Avenue, Palo Alto, California 94304-1338 • PO Box 10412, Palo Alto, California 94303-0813 USA • 800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com