

# Preventative Maintenance for Electric School Bus Chargers



## Introduction

As school bus fleets make the switch to electric, it is important to properly maintain vehicles and chargers to ensure longevity and dependability. Electric school bus (ESB) chargers, like most electrical equipment, require maintenance to prevent failure. Unreliable chargers create operational bottlenecks that impact downtime, costs, vehicle serviceability, and safety. The solution? Routine maintenance and proper planning — both of which can improve charger reliability and help ensure school districts meet their fleet's operational and financial goals.

## What Is Preventative Maintenance?

Properly operated ESBs and charging equipment will require less-frequent maintenance and repair than their diesel counterparts, but preventative maintenance (PM) remains essential. PM refers to a regularly scheduled service (monthly, bimonthly, quarterly, biannually, or annually) on equipment that could prevent future equipment failure or unsafe conditions and helps maintain system performance. Each charger manufacturer and original equipment manufacturer has recommended PM procedures to help the vehicle run safely and efficiently.

## Recommended best practices:

- Keep a report or PM log, documenting dates of service, condition of equipment, specific tasks performed, parts repaired or replaced, and any technician notes. Note in the PM log when any corrective action is needed. Photo documentation is recommended.
- Before performing maintenance, lockout/tagout the equipment. This means the equipment is de-energized or disconnected from the power source and secured and labeled to ensure the equipment is not re-energized while maintenance is being performed. Proper lockout/tagout procedures can be found in NFPA 70e. Proper personal protective equipment (PPE) is also required for any maintenance or repair work.
- Clean equipment, both outside and inside (e.g., blowing out dust/dirt).
- Secure equipment, ensuring enclosures or cabinets are closing tightly and torquing or tightening screws, bolts, or fasteners.
- Visually inspect inside for signs of excessive water, dirt, or other foreign items.



## Preventative Maintenance Tip

For school bus fleets, it can be difficult to add additional maintenance tasks into already-busy schedules, but a general rule of thumb is to perform PM at least once every spring and fall.

- Visually inspect electrical connections and contactors and general condition of items such as output cables and connectors to ensure the equipment is reliable and safe for use.
- Change or clean air filters, coolant service, or other such wear items as applicable. Note in PM report of action taken.
- Test electric vehicle supply equipment (EVSE) for proper operation, including charging initiation, HMI (display), RFID reader (if applicable), and network connection. Note in PM report.
- Repair minor items such as burned-out lights or indicators. Note in PM report.
- Keep an inventory of spare parts and their conditions.

In addition to these biannual PM activities, operators should also perform basic cleaning and visual inspections on a regular basis, such as before operation at the beginning of the day. Recommended cleaning and inspection activities include:

- Wipe down cables, connectors, and cabinets;

- Blow dust or dirt out of the connector head;
- Untangle and properly store cables;
- Visually inspect the unit and record and report any damage or necessary repairs; and
- If any damage or necessary repair is identified, lockout/tagout the EVSE until repairs have been completed.

These activities do not require lockout/tagout processes or PPE, unless damage or a necessary repair is identified. Doing these simple PM activities regularly can help extend the life of the equipment and flag damage or wear and tear before it negatively impacts operations.

Failing to perform PM can result in unexpected technology outages requiring “reactive” maintenance, resulting in unplanned downtime and more-expensive repairs. Emergency repairs are often the result of more-extensive damage than would be found through PM and can require rush deliveries, rush service, overtime fees, and additional repairs. Beyond the cost of the repair, the cost of EVSE downtime has a ripple effect on operations. Even after a charger is repaired, it takes time to recharge batteries, especially if there are no spare or back-up chargers onsite.

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