

ILLINOIS
IBEW
RENEWABLE ENERGY FUND



Electric Vehicle Fleet Charging
Maintenance

Electric Vehicle Charging Systems

Maintenance

- **After installation and inspection, periodic maintenance will be required for all fleet EVSE. Common issues include:**
 - Theft
 - Damaged cords and connectors
 - Corrosion
 - Communications
- **NFPA 70B Chapters 9 and 33 require visual, mechanical, and electrical inspection annually unless condition and use is documented and verified.**



NFPA 70B Standard Electrical Equipment Maintenance

- **2023 shifts from a “recommended practice” to a “Standard”.**
- **Contains mandatory language for the development, implementation and operation of an Electrical Maintenance Program (EMP).**



NFPA 70B Standard Electrical Equipment Maintenance

- What we need to know.....
 - **NFPA 70B requirements are considered the minimum consensus requirements for safe electrical maintenance work procedures.**
 - **NFPA 70B maintenance practices defers to manufacturers' published instruction manuals or data.**
 - **Systems and equipment covered are typical of those installed for industrial plants, institutional and commercial buildings, and large multifamily residential complexes.**
 - **Maintenance intervals are now a primary focus**



NFPA 70B Standard Electrical Equipment Maintenance

- Chapter 9 of NFPA 70B now provides mandatory scopes of work and maintenance intervals broken out by product type and based on an equipment condition assessment.**
- These requirements can be referenced in Table 9.2.2, which is in alphabetical order and provides the corresponding reference chapter for maintenance procedures specifics.**
- Prescribes maintenance intervals based on an equipment condition assessment.**

Table 9.2.2 Maintenance Intervals

Product	Scope of Work	Equipment Condition Assessment		
		Condition 1	Condition 2	Condition 3
All equipment	Infrared thermography	12 months	12 months	6 months
Battery ESSs	Visual inspection	60 months	36 months	12 months
	Cleaning	60 months	36 months	12 months
	Lubrication		Reserved	
	Mechanical servicing		Reserved	
	Electrical testing	60 months	36 months	12 months
Busways	Visual inspection	60 months	60 months	12 months
	Cleaning	60 months	36 months	12 months
	Lubrication	60 months	36 months	12 months
	Mechanical servicing	60 months	36 months	12 months
	Electrical testing	60 months	36 months	12 months
	Special	60 months	36 months	12 months
Cable trays	Visual inspection	12 months	12 months	6 months
	Cleaning	60 months	36 months	12 months
	Lubrication	60 months	36 months	12 months
	Mechanical servicing	60 months	36 months	12 months
	Electrical testing	60 months	36 months	12 months
Electric vehicle power transfer systems	Visual inspection	60 months	36 months	12 months
	Mechanical inspection	60 months	36 months	12 months
	Electrical testing	60 months	36 months	12 months

NFPA 70B Standard Electrical Equipment Maintenance

- NFPA 70B Chapter 33 – Electric Vehicle Power Transfer Systems and Associated Equipment.
- 33.2 – Performed in accordance with the frequencies in Chapter 9.
- Documentation
- Visual Inspection



NFPA 70B Standard Electrical Equipment Maintenance

- Electric vehicle power transfer system equipment shall be visually inspected in accordance with Table 33.4.1.1

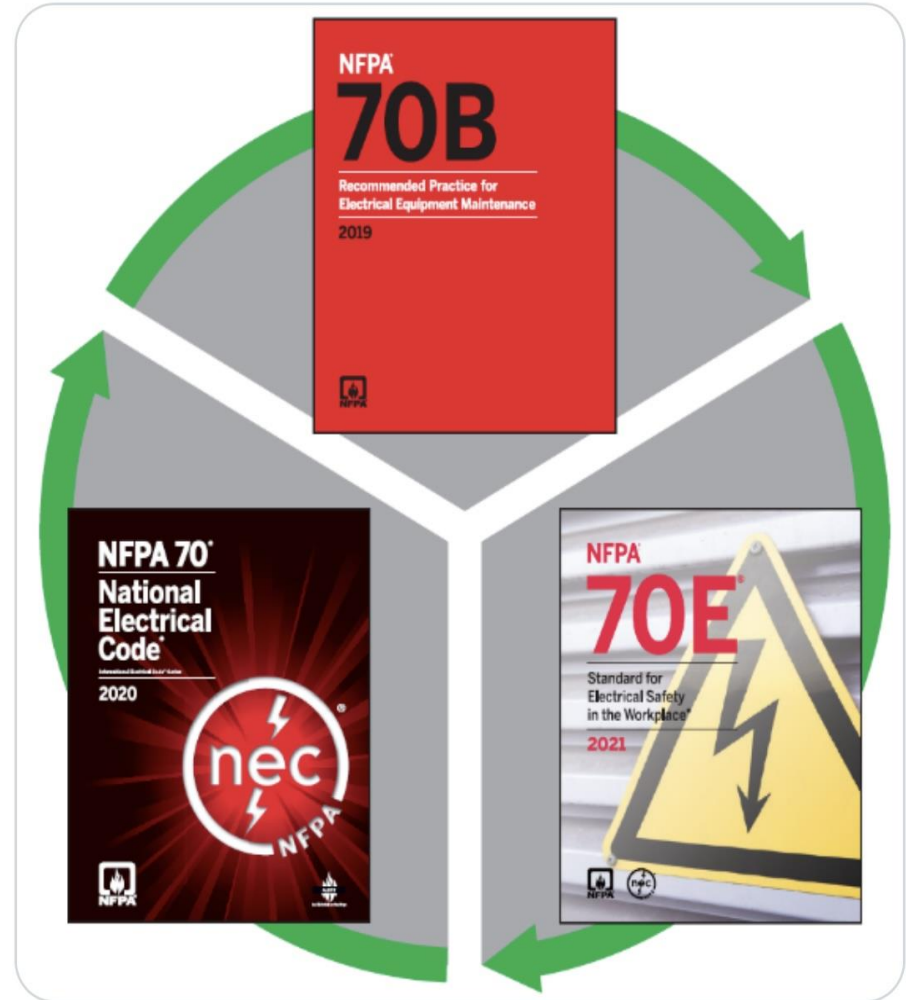
Table 33.4.1.1 Electric Vehicle Power Transfer System Equipment Visual Inspections

No.	Task	Test Type*	Notes
1	Inspect doors and latches for fit, dents, corrosion, and missing hardware	1 or 2	Damage or deterioration, supports or restraints.
2	Inspect wiring, bus, and connections for damaged insulation, broken leads, tightness of connections, crimping, and overall general condition including corrosion	1 or 2	Excessive tension, signs of overheating, multiple sources, hazard, or other warning labels.
3	Inspect grounding/bonding	1 or 2	Damage, missing or loose terminations, clearance from energized parts, protection from physical damage.
4	Inspect cables	1 or 2	Damage, deterioration, supports, bending radius, excessive tension, cable ID, discoloration, cable jacket abrasion or wear when exposed, or evidence of overheating.
5	Inspect raceway/cable tray	1 or 2	Damage or deterioration, cable jacket abrasion or wear when exposed, continuity, tight joints, missing or loose bonding jumpers, corrosion.
6	Inspect barriers, guards, and assemblies	1 or 2	Damage or signs of deterioration, arcing, tracking, supports and mounting hardware.

*Types specified in accordance with Section 8.3, as follows: Type 1 = online standard test; Type 1A = online enhanced test; Type 2 = offline standard test; Type 2A = offline enhanced test.

NFPA 70B Standard Electrical Equipment Maintenance

- **Other Considerations**
 - **NFPA 70 National Electrical Code**
 - **NFPA 70E Standard for Electrical Safety in the Workplace**
 - **UL Listings**



NFPA 70 National Electrical Code

110.3(B) – Installation and Use.

Equipment that is listed, labeled or both or identified for a use shall be installed and used in accordance with any instructions included in the listing, labeling or identification.

625.6 – Listed

Electric vehicle power transfer system equipment for the purposes of charging, power export, or bidirectional current flow shall be listed.

Both will apply to all repair and replacement of components.



Electric Vehicle Charging Systems

Listing and Labeling

- **EVSE are listed to several UL standards:**
 - **UL 2022: EVSE (AC to DC)**
 - **UL 2594: EVSE (AC to AC)**
 - **UL 2750: WPTE**
 - **UL 9741: EVPE**
 - **UL 2263: EV Charging Cables**
 - **UL 2251: EV Plugs, Receptacles, and Connectors**
 - **UL 2231: EVSE Personal Protective Systems**
 - **UL 3202: EVSE Paired with ESS.**
(In development)

