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SSIT-1001(e)1 Lamp Voltage

Purpose

These instructions describe the lamp voltage tests required at grade crossing warning systems to verify they are operating within their specifications.

Test Intervals

Tests are performed when installed, as required, and at least once every twelve (12) months as prescribed in *SSIT-7 Signal System Inspection and Test Intervals*.

Rail Safety

Employee shall ensure the site is safe for employees, the public, vehicular traffic and train operations as defined in *SSIT-8 Protecting Train Operations* prior to performing tests and inspections.

Equipment Manuals

A copy of the solid state driver manufacturer's manual may be required to be referenced for maintenance and testing when solid state drivers are in use.

Data Recording

The following information is required to be recorded for each of the situations as outlined below:

- → Installation: AC ON and AC OFF readings as adjusted at each lamp, taken at lamp terminals.
- → Annual Test: AC ON and AC OFF readings at furthest lamp for each assembly.
- → Incident Response: AC ON readings at each lamp upon arrival.

Replacing Incandescent Light Units

10 Volt, 18 Watt Incandescent bulbs may be in use on masts and cantilevers at existing grade crossing locations. New light installations and replacements shall be updated with LED lighting. Refer to Transport Canada's Grade Crossing Standards (Appendix A) for more details on LED criteria. Lighting circuits shall not contain a combination of incandescent and LED lamps on masts or cantilevers.

Voltage Readings

Voltage readings must be taken at lamp at time of installation. Voltage readings may be taken at the base of the mast for subsequent maintenance tests.

Voltage readings must be taken at gate arm bulbs at time of installation. Voltage readings may be taken at the gate mechanism for subsequent maintenance tests.

Procedure

The following tests are to be performed at each crossing warning system location:

Step	Procedure
1. Check Initial State	• Check bungalow has AC power upon arrival. **If AC disconnected:** Restore AC power or deploy generator. Report outage to the ONR S&C Supervisor and note in site Log Book.

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Step	Procedure
2. Activate Warning System	• Open Test Switch. **If crossing not activated:** Protect crossing until resolved. Report to the ONR S&C Supervisor. Record in site Log Book.
3. Check Lamp Voltages (AC ON)	• Using voltmeter, test the voltage at each lamp. • Check voltage is within 95% of rated voltage at time of installation. → Check voltage is within 90% of rated voltage in subsequent tests.
4. Adjust Voltages for Solid State Controller (if applicable)	• If using a digital meter, add the following adjustment value to the measured AC ON values where solid state controllers are in use: ○ 2.2V for 10 NiCad batteries ○ 2.7V for 11 NiCad batteries ○ 1.5V for 6 VRLA or Lead Acid batteries ○ 2.6V for 7 VRLA or Lead Acid batteries • If using an analog meter, add the following adjustment value to the measured AC ON values where solid state controllers are in use: ○ 1.1V for 10 NiCad batteries ○ 2.4V for 11 NiCad batteries ○ 0.7V for 6 VRLA or Lead Acid batteries ○ 2.1V for 7 VRLA or Lead Acid batteries
5. Perform Battery Load Test	• Battery load test shall be performed as outlined in *SSIT-1001(e)2 Battery Load Test* prior to proceeding with AC OFF lamp voltage tests.
6. Check Lamp Voltages (AC OFF)	• Using voltmeter, test the voltage of each lamp. → Check voltage has not fallen below minimum operating value. **If voltage below minimum:** Check for faulty battery or power supply.
7. Adjust Voltages for Solid State Controller (if applicable)	• If using a digital meter add the following adjustment value to the measured AC OFF values where solid state controllers are in use: ○ 1.1V for 10 NiCad batteries ○ 2.0V for 11 NiCad batteries ○ 0.9V for 6 VRLA or Lead Acid batteries ○ 2.3V for 7 VRLA or Lead Acid batteries • If using an analog meter, add the following adjustment value to the measured AC OFF values where solid state controllers are in use: ○ 0.5V for 10 NiCad batteries ○ 0.9V for 11 NiCad batteries ○ 0.4V for 6 VRLA or Lead Acid batteries ○ 1.2V for 7 VRLA or Lead Acid batteries
8. Restore AC Power	• Turn AC power back on.
9. Check AC/DC Lit (if applicable)	→ Check AC lamp voltage is close to but does not exceed maximum operating voltage. **If voltage exceeds maximum voltage**: Adjust lighting transformer taps.
10. Restore Warning System	• Close Test Switch.

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Step	Procedure
11. Update Log Book	• Add AC ON and AC OFF voltages. • Add any notes of issues observed, or adjustments made.
12. Complete Test Form	• Record the test as completed on Grade Crossing Warning System Test Form.