



Installation and Troubleshooting of the Airfield Series Circuit Field Lightning Arrestor

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1. Introduction

This service bulletin provides instructions for installing, troubleshooting and replacing the ADB Airfield Solutions Field Lightning Arrestor (FLA) assembly. The FLA is used to reduce the risk of lightning damage on an airfield series circuit.

The FLA can be inserted into the circuit at various locations in the 5kV primary series circuit. The FLA can be used on any airfield circuit (6.6A up to 30kW and 20A up to 70kW). The FLA is rated for a lightning current surge of 25,000A (8/20 microseconds). The FLA is waterproof and is rated NEMA 6P (IP 68). The insulation resistance of the FLA is >2G ohms. See Figures 1 thru 3 for part identification.

2. Tools and Equipment Required

Refer to Table 1 for the special tools and equipment required to install the Field Lightning Arrestor device.

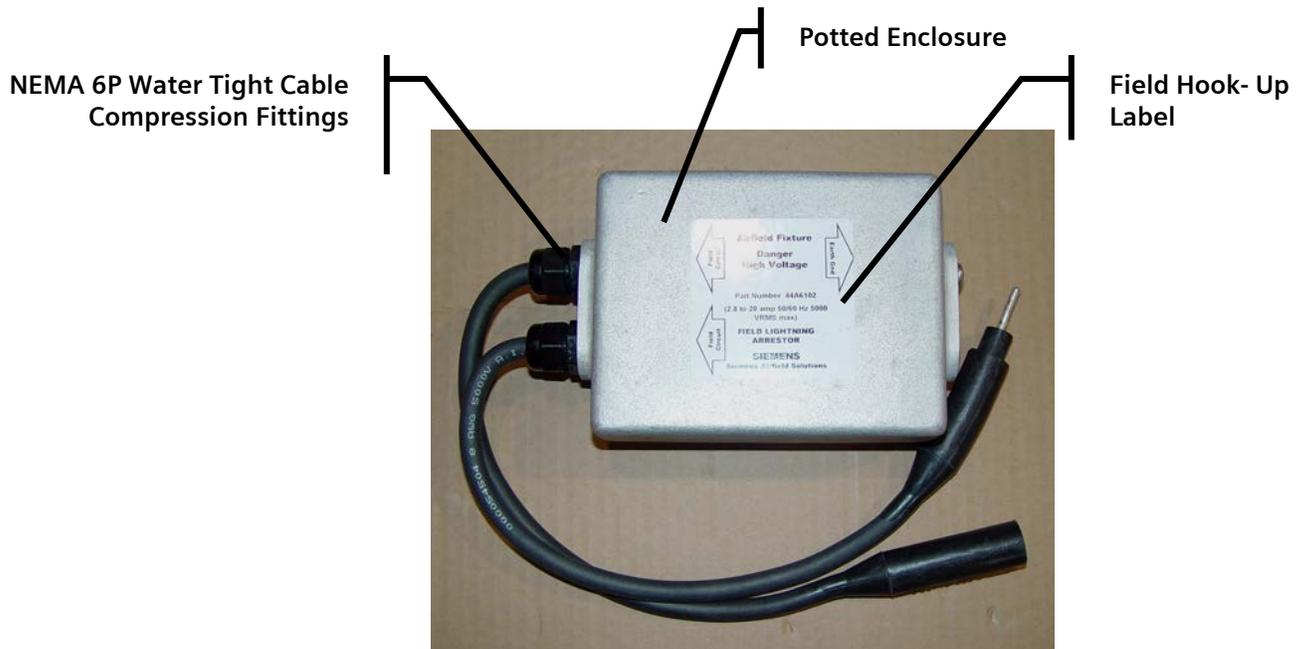
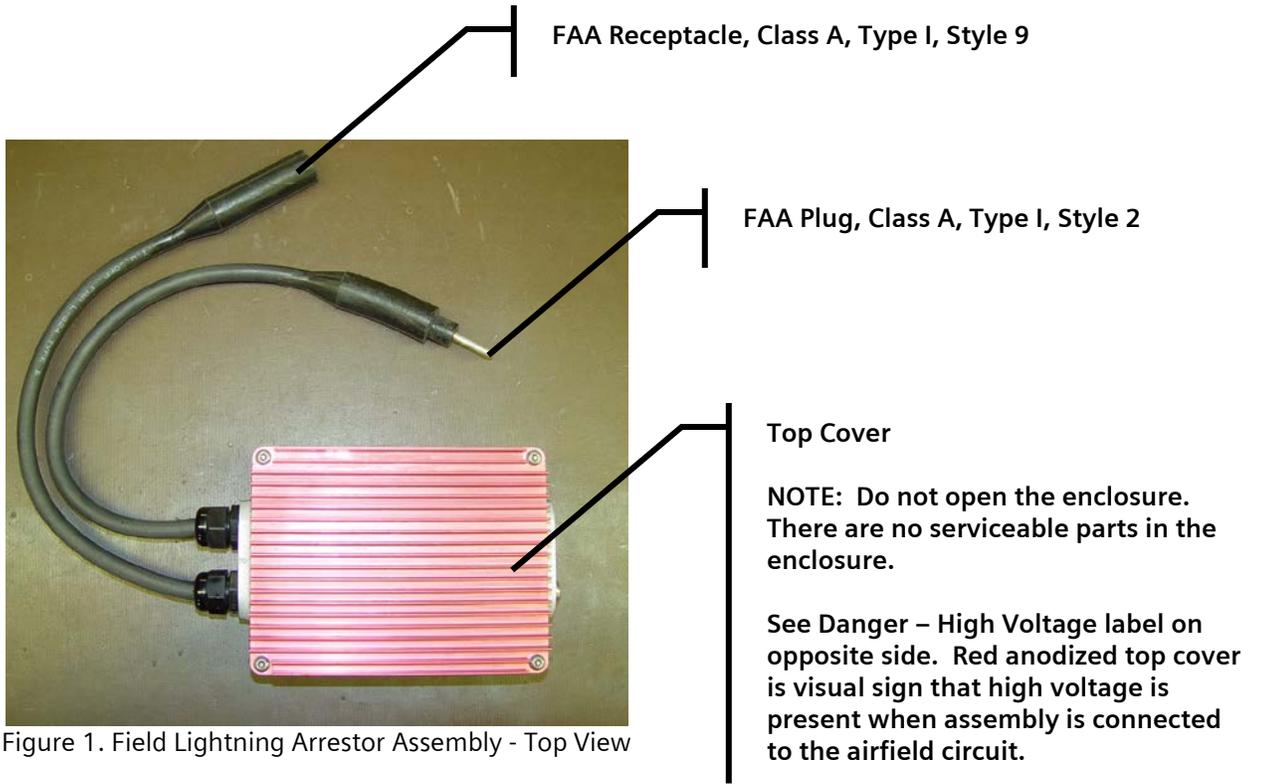
Table 1. Required Tools/Equipment Not Supplied

Description	Quantity
Assorted Hex sockets and a ratchet wrench	AR
Torque Wrench 0-200 in-lbs w/hex socket	1
5KV Heat Shrink	A/R
Ground Rod (if counterpoise wire is not available)	AR
4 AWG (max) Ground Wire	AR
Ring Terminal for ¼ screw (for one end of the grounding wire)	AR
Crimping Tool	1

Table 2. Required Tools/Equipment Supplied

Part Number	Description	Quantity
44A6102	Field Lightning Arrestor assembly	AR
ALN113	Service Bulletin	1

3. Part Identification



3. Part Identification

(contd.)

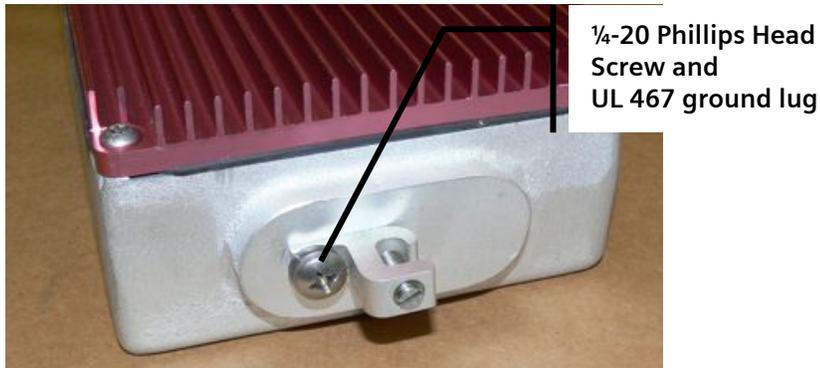


Figure 3 Field Lightning Arrestor Ground Screw

4. Installation Procedure



WARNING: Before installing the Field Lightning Arrestor, disconnect and lockout power to the airfield circuit.



WARNING: High voltage is present in the airfield circuit and in the installed Field Lightning Arrestor assembly. Failure to disconnect power may result in personal injury, death, or damage to equipment.

To install the Field Lightning Arrestor (FLA) into the series circuit, perform the following procedure:

1. Determine the specific location for the FLA to be installed in the circuit.

NOTE: It is recommended that the Field Lightning Arrestor assembly be installed approximately every 2000 feet around the series circuit starting at the first useable L867/L868 light base can outside the vault on each side of the series circuit. At the airport's option, Field Lightning Arrestors may be installed more frequently if it is desired to further reduce lightning risk.

2. Remove the light fixture from the L867/L868 light base can and disconnect one L-823 connection from the airfield series circuit. This could be from the L-830 isolation transformer or a splice found in the light base.

4. Installation Procedure – cont'd

3. Plug in the lightning arrestor as shown in the wiring diagram. See Figure 5 and hook-up label on enclosure.
4. After the connection has been made, reinstall heat shrink (in accordance with local heat shrinking practice).



WARNING: The Field Lightning Arrestor assembly must be grounded to a low resistance earth ground. Failure to ground the FLA assembly will result in no added protection to the circuit.

5. Check site plan drawings and specifications to verify the presence and location of the counterpoise lightning wire. Wiring intended to be connected to a safety ground should not normally be attached to the FLA. See FAA AC 150/5340-30 (current edition) for further discussion about lightning and safety grounds on series circuits.

IF COUNTERPOISE LIGHTNING WIRE IS PRESENT, connect a 4 AWG (minimum) copper grounding wire, to the ground screw on end of the FLA enclosure and attach the other end of the ground wire to the counterpoise wire using an appropriate attachment method.

IF COUNTERPOISE LIGHTNING WIRE IS NOT PRESENT, an 8 ft. (min) long copper clad steel grounding rod may have to be added in the vicinity of the FLA. It may be possible in some locations to add the ground rod through a pre-existing hole in the bottom of the light base can. Connect ground wire between the grounding screw on the enclosure using a UL 467 ground lug, or equivalent, and the grounding rod.

NOTE: Depending on the design of the counterpoise lightning system, connecting the FLA directly to a dedicated ground rod may provide more effective protection of the circuit.

6. After the FLA has been installed, reinstall the light fixture back onto the light base and torque the mounting bolts to the required torque specifications found in the equipment product manual.

5. Failure Mode Evidence And Troubleshooting



WARNING: High voltage is present in an airfield series circuit which may result in personal injury, death, or damage to the equipment.



WARNING: A failed Field Lightning Arrestor case may be live. **DO NOT** troubleshoot the Field Lightning Arrestor on a live field circuit. Failure to disconnect the power supply may result in personal injury, death, or damage to the equipment.

The FLA is connected between the series circuit and earth ground. If damage to any FLA is suspected, remove the series circuit wires from the output of the CCR and meg the entire series circuit. Compare this meg-ohm reading with previously recorded readings. If there has been a sudden, significant drop in the meg-ohm reading, a damaged FLA may be present. See FAA AC 150/5340-26, Chapter 5 for guidance on expected meg readings on new circuits and normal degradation of existing circuits. Isolate the suspected failed FLA using normal series circuit troubleshooting techniques. Note that the source of lowered insulation resistance may be due to existing series circuit wiring or isolation transformers. See FAA Advisory Circular 150/5340-26 (current edition) for series circuit troubleshooting guidance.

NOTE: Series circuit insulation resistance is normally tested using either 500Vdc or 1000Vdc. The insulation resistance of series circuits with Field Lightning Arrestors can be tested with voltages up to 5000Vac or 7070Vdc.

The following physical evidence may be present as a result of lightning strike(s):

- A section of the airfield circuit may be dim or not lit.
- Visual evidence of physical damage to either cordset or the FLA enclosure.
- Ground wire is missing (vaporized).
- Burnt smell is present.

The following troubleshooting may be performed on the FLA to further determine if the device has failed:

- Remove the FLA from the series circuit.
- Connect an ohmmeter from the male connector pin to the female connector pin. The measured resistance should be less than 2 ohms. If the resistance is significantly higher, the lead connectors have been damaged. If the resistance is infinity, there is an open in the cordset wiring. In either case, the FLA must be replaced.

- See Figure 4. Connect the FLA to some mating cordsets and drop the FLA in a bucket of water. Connect the positive (red) terminal of a meg-ohm meter to the cordset leads. Put the negative (black) terminal of the meg-ohm meter in contact with the water. This is typically done by attaching a wire to a metal plate and dropping the metal plate in the water. Bring the attached wire out of the water and connect it to the negative terminal of the meg-ohm meter. Meg the FLA at 1000VDC for 1 minute. At the end of 1 minute, the insulation resistance should be greater than 2G ohms. If the resistance is less than 2G ohms, replace the FLA.

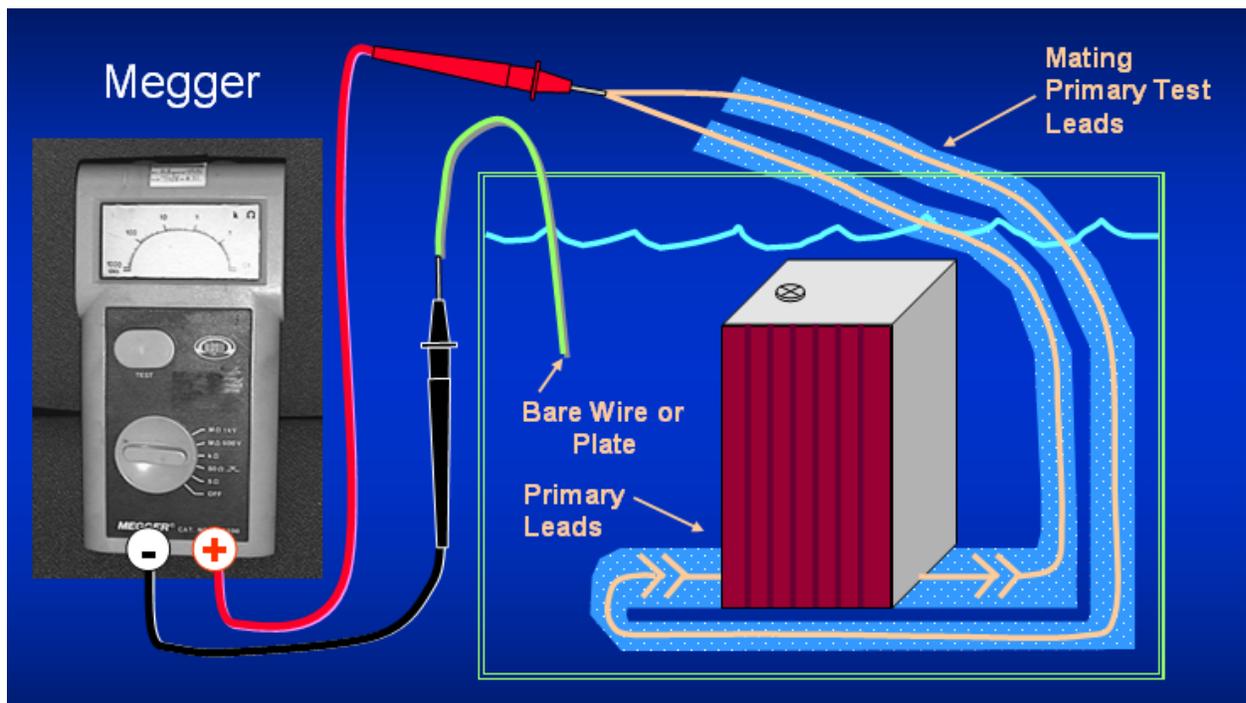


Figure 4. FLA Field Insulation Resistance Check

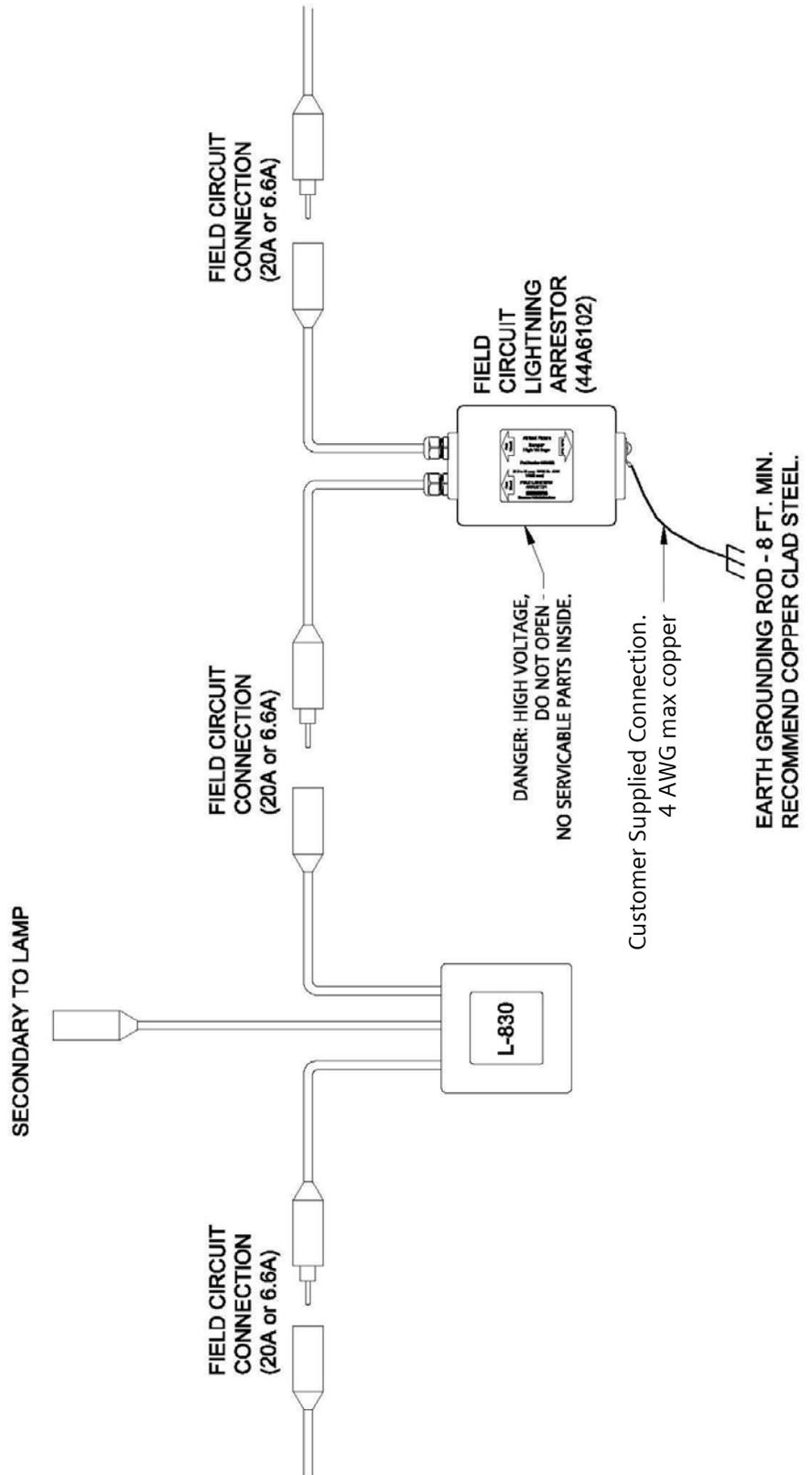


Figure 5. Typical Circuit Wiring Diagram