

LED L-858Y/R/L/B Light Tube Signs

Top and Bottom Light Tube
Size 1, 2, 3, 4 and, 5 Internally
Illuminated

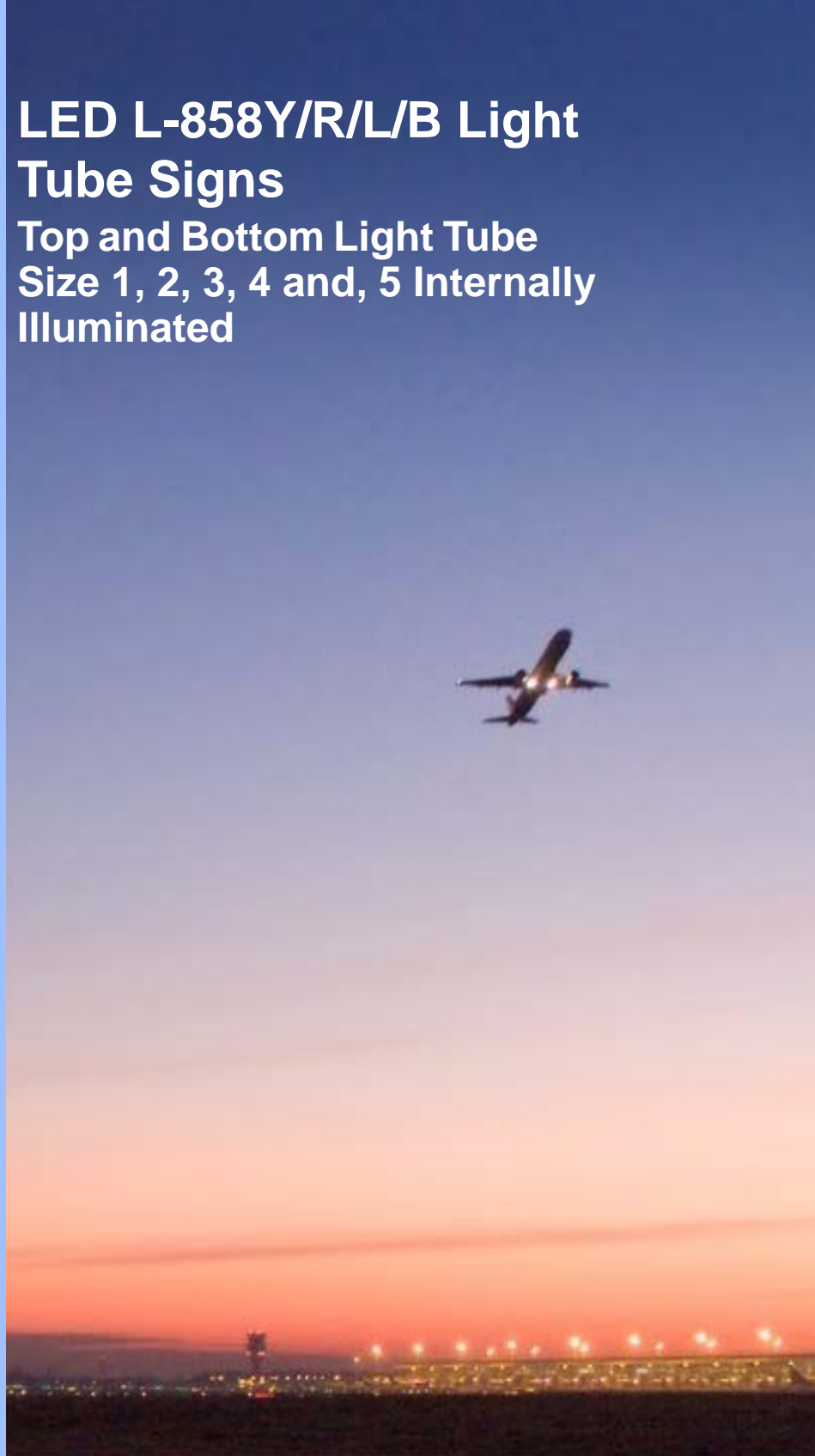
User Manual

96A0402

Retain for future use.

Rev. I, 1/8/13

ETL Certified to FAA Specification
L-858Y, L-858R, L-858L,
A/C 150/5345-44 (Current Edition)
FAA Engineering Brief No. 67
ETL Certified (pending)



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a.1 History of Change

PAGE	REV	DESCRIPTION	EC NO.	CHECKED	APPROVED	DATE
All	A	Released Manual	xxx	SA	GM	9/12/08
All	B	Added size 2 and 3 sign information		JK	GM	01/08/09
Diagrams and Parts	C	Added latest drawings and parts, Added size 4 and 5 signs	2365	JR	GM	08/07/09
4-3	D	Updated page 4-3		JR	DM	8/15/10
All	E	Updated parts and diagrams for APS	2987	JR	DM	11/17/10
All	F	Updated maintenance, parts and diagrams				
All	G	Updated schematics, maintenance and parts sections		DR	ER	12/09/11
All	H	Removed redundant info in the intro section, cleaned up parts section		DR	ER	01/12/12
All	I	New Title for sign manual		DM	ER	01/11/13

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1.0 Safety

This section contains general safety instructions for installing and using ADB Airfield Solutions equipment. Some safety instructions may not apply to the equipment in this manual. Task- and equipment-specific warnings are included in other sections of this manual where appropriate.

1.1 To use this equipment safely



WARNING

Read installation instructions in their entirety before starting installation.

- Refer to the FAA Advisory Circular AC 150/5340-26, Maintenance of Airport Visual Aids Facilities, for instructions on safety precautions.
- Observe all safety regulations. To avoid injuries, always disconnect power before making any wiring connections or touching any parts. Refer to FAA Advisory Circular AC 150/5340-26.
- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Read and carefully follow the instructions throughout this manual for performing specific tasks and working with specific equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.

1.1.1 Additional Reference Materials

- C22.1 Canadian Electrical Code (latest rev)
- NFPA 70B, Electrical Equipment Maintenance.
- NFPA 70E, Electrical Safety Requirements for Employee Workplaces.
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- OSHA 29 CFR, Part 1910, Occupational Health and Safety Standards.
- National and local electrical codes and standards.

1.1.2 Qualified Personnel

The term **qualified personnel** is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain and repair the equipment. It is the responsibility of the company operating this equipment to ensure that its personnel meet these requirements.

Always use required personal protective equipment (PPE) and follow safe electrical work practices.

1.1.3 Intended Use



WARNING

Using this equipment in ways other than described in this manual may result in personal injury, death or property and equipment damage. Use this equipment only as described in this manual.

ADB Airfield Solutions cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death or property and equipment damage. Unintended uses may result from taking the following actions:

- Making changes to equipment that are not recommended or described in this manual or using parts that are not genuine ADB Airfield Solutions replacement parts.
- Failing to make sure that auxiliary equipment complies with approval-agency requirements, local codes and all applicable safety standards.
- Using materials or auxiliary equipment that are inappropriate or incompatible with ADB Airfield Solutions equipment.
- Allowing unqualified personnel to perform any task.

1.1.4 Storage



CAUTION

If equipment is to be stored prior to installation, it must be protected from the weather and kept free of condensation and dust.

Failure to follow this instruction can result in injury or equipment damage.

1.1.4.1 Operation



WARNING

- Only qualified personnel, physically capable of operating the equipment and with no impairments in their judgment or reaction times, should operate this equipment.
- Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.

1.1.4.2 Material Handling Precautions



CAUTION

This equipment may contain electrostatic sensitive devices.

- Protect from electrostatic discharge.
- Electronic modules and components should be touched only when this is unavoidable e.g. soldering, replacement.
- Before touching any component of the cabinet you should bring your body to the same potential as the cabinet by touching a conductive earthed part of the cabinet.
- Electronic modules or components must not be brought in contact with highly insulating materials such as plastic sheets, synthetic fiber clothing. They must be laid down on conductive surfaces.
- The tip of the soldering iron must be grounded.
- Electronic modules and components must be stored and transported in conductive packing.

1.1.4.3 Action in the Event of a System or Component Malfunction



WARNING

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

1.1.4.4 Maintenance and Repair



WARNING

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.

- Only persons who are properly trained and familiar with ADB Airfield Solutions equipment are permitted to service this equipment.
- Disconnect and lock out electrical power.
- Always use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in the product manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved ADB Airfield Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Check interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.

1.1.4.5 Operation of Overloaded Regulators



WARNING

- Operation of a Regulator while overloaded at any step may result in equipment failure or equipment damage.

2.0 Introduction

The Light Tube signs are designed to guide pilots to a particular point on the field, identify holding positions, identify taxiway and runway intersections, and prohibit aircraft entry into designated areas.

2.1 Compliance with Standards

- L-858Y, L-858R L-858L and L-858B AC 150/5345-44 (Current Edition) and the FAA Engineering Brief No. 67 "Light Sources other than Incandescent and Xenon for Airport Lighting and Obstruction Lighting Fixtures." ETL Certified.

2.1.1 Uses

These signs are designed to guide pilots to a particular point on the field, identify holding positions, identify taxiway and runway intersections, and prohibit aircraft entry into designated areas. L-858B is used at 1,000-foot intervals adjacent to the runway edge in order to provide runway distance remaining information to pilots during take off and landing operations.

- L-858Y – Direction, Destination, and Boundary (Informational Sign).
- L-858R – Mandatory Sign.
- L-858L – Runway/Taxiway Location Sign.
- L-858B – Runway Distance Remaining Sign is used at 1,000-foot intervals adjacent to the runway edge in order to provide runway distance remaining information to pilots during takeoff and landing operations.

2.1.2 Electrical Supply

The L-858 signs are internally lighted. The signs are connected to a series circuit using the appropriately-sized 50 or 60Hz L-830 isolation transformer(s).

Table 1: Style No. and Power Source

2	4.8-6.6A (3-Step CCR)
3	2.8-6.6A (5-Step CCR)
5	5.5A (Dedicated sign circuit)

2.1.2.1 Sign Load & Transformer Requirements

In the table below, the number for the total VA load imposed on the CCR represents the actual load imposed on the regulator and accounts for power factor and load imposed by the transformer.

Sign Size	Sign No. of Modules	Transformer	Power Factor	Volt Amp VA Load
Style 2, 3-Step LED Signs				
1	1	200W	0.84	68
1	2	200W	0.84	86
1	3	200W	0.88	120
1	4	200W	0.90	138
2, 3	1	200W	0.82	84
2, 3	2	200W	0.91	92
2, 3	3	300W	0.91	189
2, 3	4	300W	0.91	227
4	1	200W	0.84	86
Style 3, 5-Step LED Signs				
1	1	200W	0.83	66
1	2	200W	0.84	86
1	3	200W	0.89	105
1	4	300W	0.88	146
2, 3	1	200W	0.82	83
2, 3	2	300W	0.88	118
2, 3	3	500W	0.85	206
2, 3	4	500W	0.88	234
4	1	200W	0.84	86
Style 5, Single-Step LED Signs				

Sign Size	Sign No. of Modules	Transformer	Power Factor	Volt Amp VA Load
1	1	100W	0.89	63
1	2	100W	0.88	84
1	3	100W	0.90	105
1	4	200W	0.90	124
2, 3	1	100W	0.83	71
2, 3	2	200W	0.90	101
2, 3	3	300W	0.86	166
2, 3	4	500W	0.87	205
4	1	100W	0.88	84

2.1.3 Operation

When a lamp fails, the sign will turn off.

To determine which lamp has failed see "Troubleshooting" on page 25.

2.2 Dimensions

See Figures 2-1 through 2-4 for Size 1, 2, 3, and 5 sign dimensions.

2.2.1 Sizes 1, 2, 3, and 5

Figure 1: L-858 Sign Dimensions (One-Module)

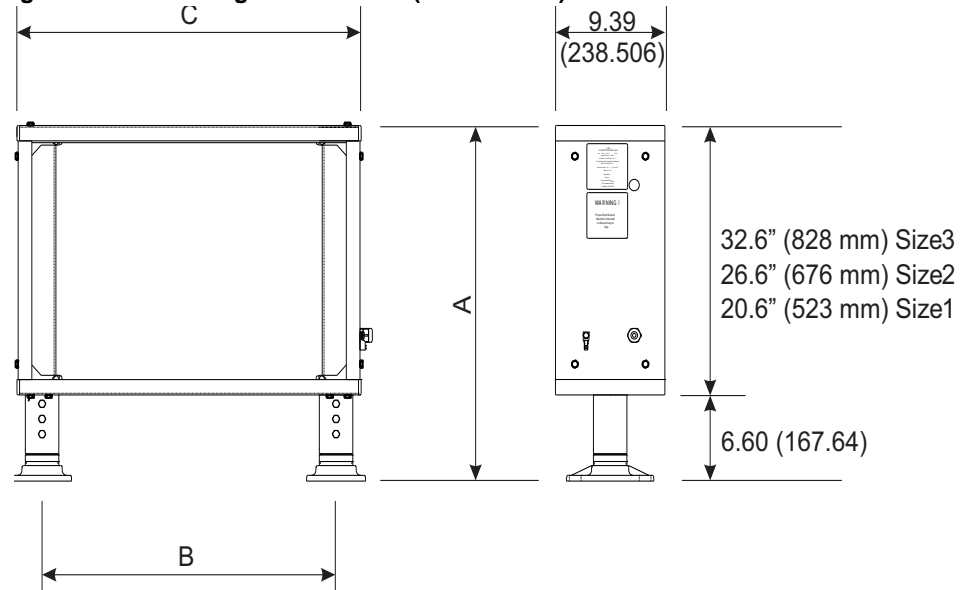


Table 2: L-858 Size 1 Sign Dimensions

Sign Size	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	Number of Lamps/Modules
Size 1, 1-Module	27.24 (691.9)	25.23 (640.8)	29.34 (745.23)	—	—	2
Size 1, 2 Module		—	58.62 (1489.00)	27.26 (692.4)	—	
Size 1, 3-Module		—	87.90 (2232.7)	27.26 (692.4)	29.28 (743.7)	
Size 1, 4-Module		—	117.17 (2976.1)	27.26 (692.4)	29.28 (743.7)	

Table 3: L-858 Size 2 Sign Dimensions

Sign Size	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	Number of Lamps/Module s
Size 2, 1-Module	33.24 (844.3)	31.73 (805.9)	35.84 (910.3)	—	—	2
Size 2, 2 Module		—	71.62 (1819.2)	33.76 (857.5)	—	2
Size 2, 3-Module		—	107.40 (2728.0)	33.76 (857.5)	35.79 (909.1)	2
Size 2, 4-Module		—	143.17 (3636.5)	33.76 (857.5)	35.79 (909.1)	2

Table 4: L-858 Size 3 Sign Dimensions

Sign Size	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	Number of Lamps/Module s
Size 3, 5, 1-Module	39.24 (996.7)	38.23 (971.0)	42.34 (1075.4)	—	—	2
Size 3, 2 Module		—	84.62 (2149.4)	40.26 (1022.6)	—	2
Size 3, 3-Module		—	126.90 (3223.3)	40.26 (1022.6)	42.28 (1073.9)	2
Size 3, 4-Module		—	169.17 (4296.9)	40.26 (1022.6)	42.28 (1073.9)	2

Table 5: Size 1, 2, and 3

Sign Type	Sign Size	Sign Face Height in. (mm)	Legend Height in. (mm)	Style Numbers	Class Numbers	Overall Mounting Height in. (mm)
L-858Y/R/L	1	18 (460)	12 (300)	2, 3, 5	1, 2	24-30 (610-760)
L-858Y/R/L	2	24 (610)	15 (380)	2, 3, 5	1, 2	30-36 (760-910)
L-858Y/R/L	3	30 (760)	18 (460)	2, 3, 5	1, 2	36-42 (910-1070)

NOTE: Sign depth is 9.39 in (23.85 cm).

Figure 2: L-858 Sign Dimensions (Size 4/One-Module)

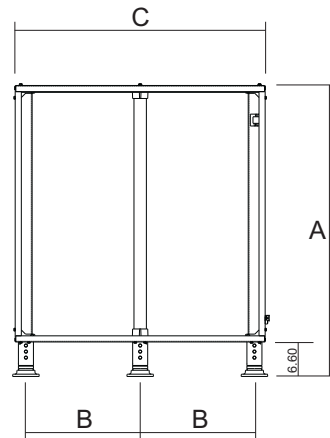


Table 6: L-858 Size 4 Sign Dimensions

Sign Size	A in. (cm)	B in. (cm)	C in. (cm)	Number of Lamps/Modules
Size 4, 1-Module	55.69 (141.45)	21.87 (55.55)	47.84 (121.51)	4

Figure 3: L-858 Size 1, 2, 3, and 5 Sign Dimensions (Two-module)

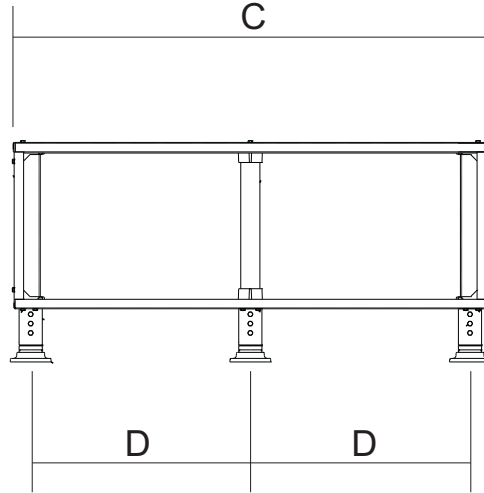


Figure 4: L-858 Size 1, 2, 3, and 5 Sign Dimensions (Three-module)

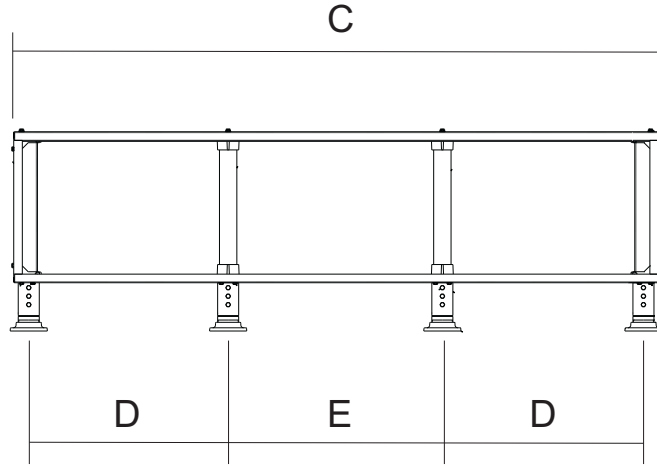
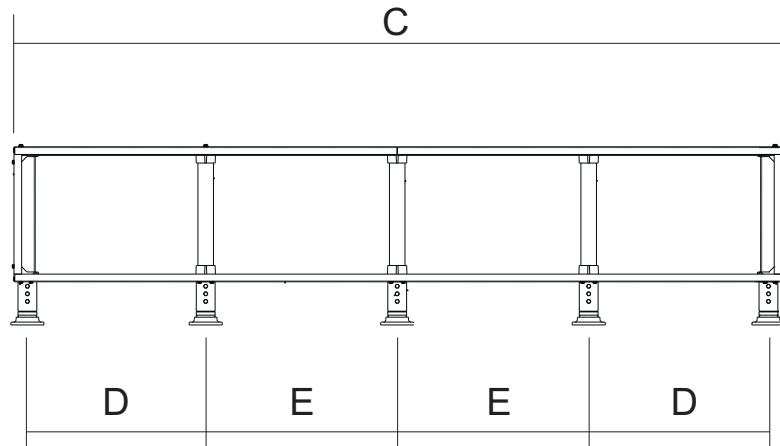


Figure 5: L-858 Size 1, 2, 3, and 5 Sign Dimensions (Four-module)



3.0 Installation



WARNING

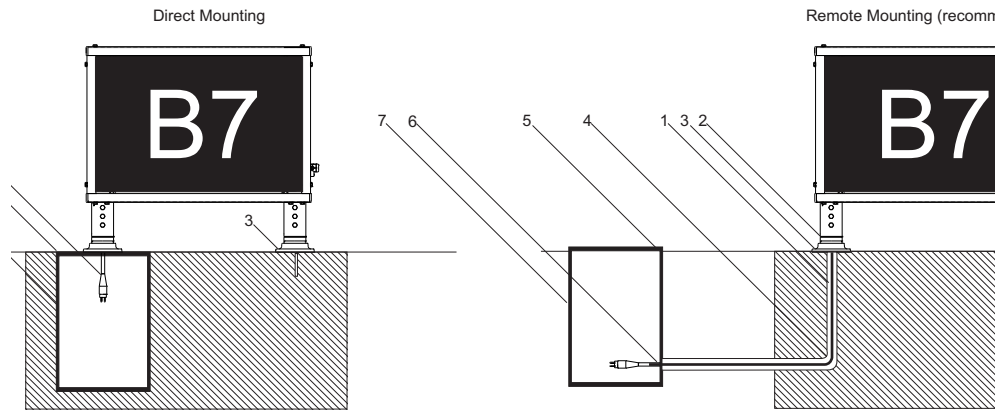
Read installation instructions in their entirety before starting installation.

- Refer to the FAA Advisory Circular AC 150/5340-26, Maintenance of Airport Visual Aids Facilities, for instructions on safety precautions.
- Observe all safety regulations. To avoid injuries, always disconnect power before making any wiring connections or touching any parts. Refer to FAA Advisory Circular AC 150/5340-26.
- Sign installation requires a flat mounting surface and the sign to be level to prevent legend panels from becoming distorted.
- Failure to install and level sign per the instruction manual will void the warranty

Each sign is furnished complete with mounting flanges for installation on a concrete pad, which is the recommended method of installation. Contact the ADB Sales Department for more information on sign installation hardware.

1. L-823 Cord Set (supplied with the sign)
2. Cable Clamp (supplied with the sign)
3. Floor Flange (supplied with the sign)
4. 2-inch Conduit Elbow (contractor supplied)
5. L-867 Blank Cover Plate with Gasket (purchased separately)
6. L-823 Extension Cord (purchased separately)
7. L-867 Base (purchased separately)
8. L-867 Base Plate (special - purchased separately)

Figure 6: Direct/Remote Mounting



This section provides instructions for installing L-858 taxiway and runway signs. Refer to the airport project plans and specifications for the specific installation instructions and FAA AC 150/5340-18.

3.1 Unpacking

The equipment is shipped ready for installation. Handle equipment very carefully to prevent component damage. Unpack the carton upon receipt and check the contents and their condition. Note any exterior damage to the carton that might lead to detection of equipment damage.

If you note any damage to any equipment, file a claim with the carrier immediately. The carrier may need to inspect the equipment.

3.2 Cord Set Installation

This subsection provides information for installing cord sets. It includes sign installation kit reference numbers for three power leg cord set installation locations and mounting configurations.

This subsection provides special cord set locations with parts and part numbers. See Figure 7 for the ordering code for the L-858 sign. Special cords set installation reference numbers are located in the ordering code.

3.2.1 Cord Set Installation Reference Number

3.2.1.1 Cord Set Exit Location #1

Figure 7 shows cord set location #1. Refer to Table 7 for cord set location #1 parts and part numbers.

Figure 7: Cord set Location #1 (Non-typical)

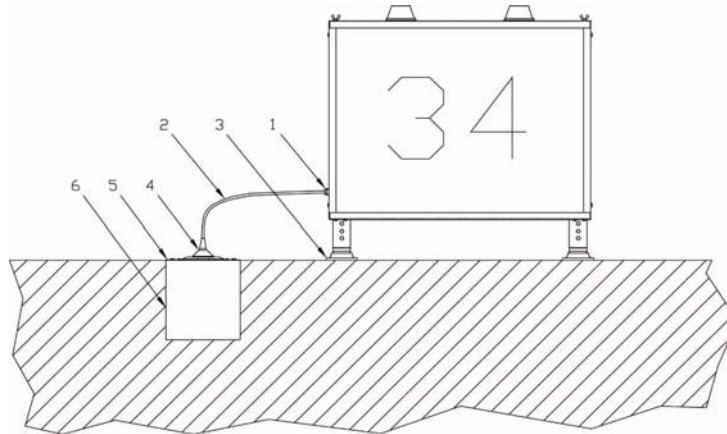


Table 7: Cord set Location #1 Parts

Item	Description	Supplier	Part Number	Note
1	Strain relief	ADB Airfield Solutions	77A0156	A
2	Cord set 16/2 SOW 600 V	ADB Airfield Solutions	Supplied with sign	B
3	Base flange	ADB Airfield Solutions	62A2142 or 62A2146	A
4	Connector plug	ADB Airfield Solutions	63B0550	C
5	2-in. (50.8-mm) L-867 base plate	ADB Airfield Solutions	1932	C
6	12 x 24 in. (304.8 x 609.6 mm) L-867B base	ADB Airfield Solutions	2124	C

NOTE: A: Shown for reference only. Part supplied with sign.
 B: Signs supplied with the following length external to the sign: Size 1 = 47 in. Size 2 = 41 in.
 Size 3 = 35 in. Size 4 = 18 in. Size 5 = 35 in. Any other external length requires a separate line on the purchase order specifying the external length required.
 C: Requires a separate line item on the purchase order.

3.2.1.2 Cord set Exit Location #2

Figure 8 shows cord set location #2. Refer to Table 8 for cord set location #2 parts and part numbers.

Figure 8: Cord set Location #2 (Non-typical)

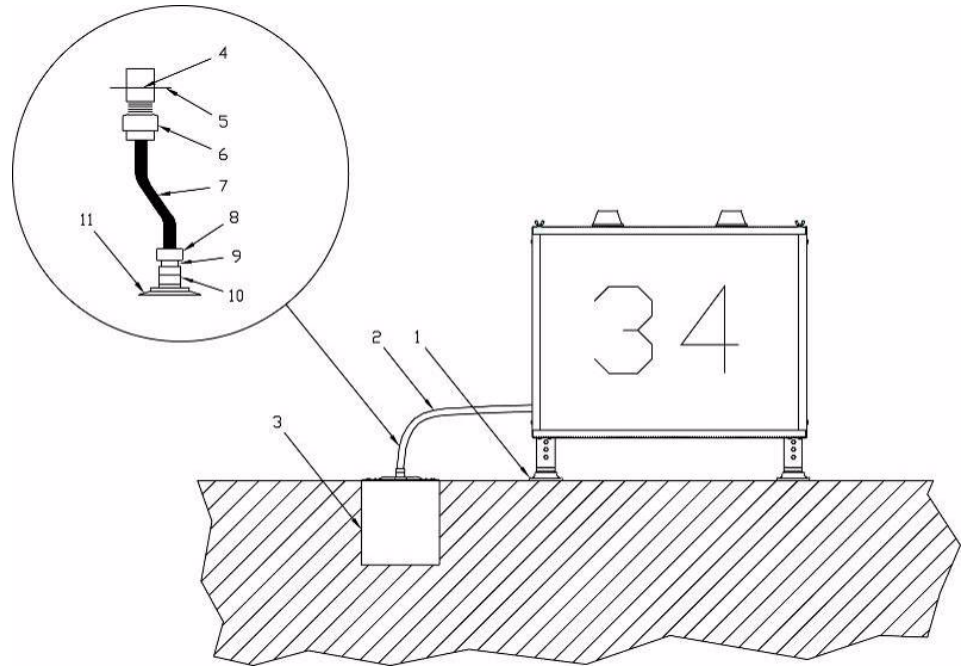


Table 8: Cord set Location #2 Parts

Item	Description	Supplier	Part Number	Note
1	Base flange	ADB Airfield Solutions	62A2142 or 62A2146	D
2	L-823 cord set 16/2 SOW 600 V	ADB Airfield Solutions	Supplied with sign	B
3	12 x 24 in. (304.8 x 609.6 mm) L-867B base	ADB Airfield Solutions	2124	C
7	Flexible conduit	Contractor	Not applicable	A
10	Frangible coupling	ADB Airfield Solutions	62B0499	C
11	2 in. (50.8 mm) L-867 base plate	ADB Airfield Solutions	1932	C

NOTE: A: Refer to Table 9 for flexible conduit connectors.
 B: Signs supplied with the following length external to the sign: Size 1 = 47 in. Size 2 = 41 in. Size 3 = 35 in. Size 4 = 18 in. Size 5 = 35 in. Any other external length requires a separate line on the purchase order specifying the external length required.
 C: Requires a separate line item on purchase order.
 D: Shown for reference only. Part supplied with sign.

Table 9: Flexible Conduit Connectors

Item	Description	Supplier
4	3/4-inch (44.45 mm) diameter hole	ADB Airfield Solutions
6	1-1/4 inch (31.75 mm) flexible conduit male connector	Contractor
7	1-1/4 inch (31.75 mm) flexible conduit	Contractor
8	1-1/4 inch (31.75 mm) flexible conduit male connector	Contractor
9	1-1/2 x 1-1/4-in. (38.1 x 31.75-mm) hex reducer bushing	Contractor

3.2.1.3 Cord set Exit Location #3

Figure 9 shows cord set location #3. Refer to Table 10 for cord set location #3 parts and part numbers.

Figure 9: Cord set Location #3 (Standard)

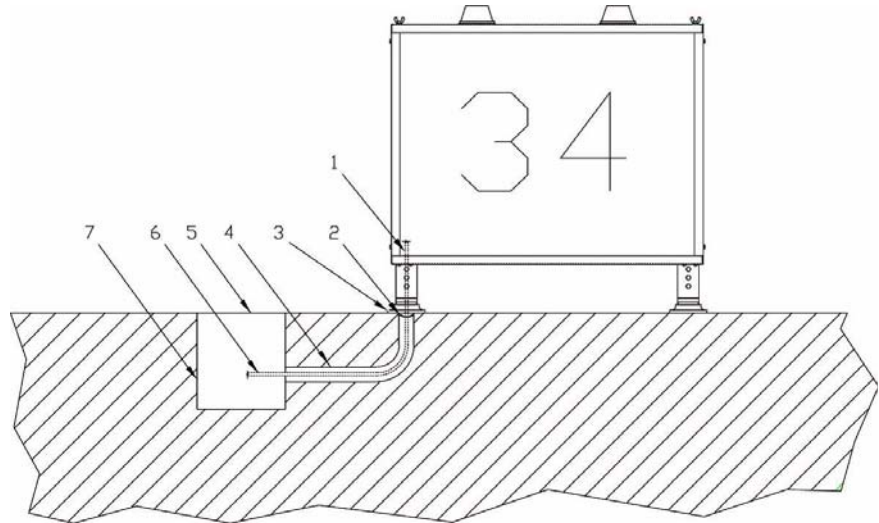


Table 10: Cord set Location #3 Parts

Item	Description	Supplier	Part Number	Note
1	Cord set 16/2 SOW 600 V	ADB Airfield Solutions	Not applicable	
2	Cable clamp	ADB Airfield Solutions	60A2851	B
3	Base flange	ADB Airfield Solutions	62A2142 or 62A2146	A
4	2-in. (50.8 mm) rigid conduit	ADB Airfield Solutions	Not applicable	
5	3/8 inch (9.53 mm) thick base plate	ADB Airfield Solutions	1000-6	
6	8-foot (2.44 m) extension cord	ADB Airfield Solutions	73A0109-8	C
7	12 x 24 in. (304.8 x 609.6 mm) L-867B base	ADB Airfield Solutions	2124	C
NS	Gasket	ADB Airfield Solutions	2052	B, D

NOTE: A: Shown for reference only. Part supplied with sign.
 B: Requires a separate line item on purchase order.
 C: Refer to *Cord sets and Extension Cords* in this section for extension cords available if different extension cord length is required.
 D: Gasket is sold separately.

3.2.1.4 Cord set Exit Location #4

Figure 10 shows cord set location #4. Refer to Table 11 for cord set location #4 parts and part numbers.

Figure 10: Cord set Location #4 (Standard)

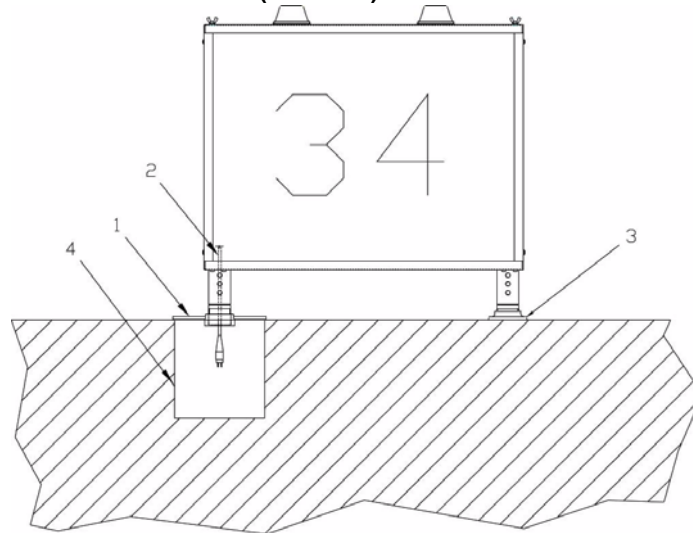


Table 11: Cord set Location #4 Parts

Item	Description	Supplier	Part Number	Note
1	12-inch heavy base plate, 2-1/2 NPT	ADB Airfield Solutions	1832-BSPLT	B
2	Cord set 16/2 SOW 600 V	ADB Airfield Solutions	73A0107/72	A
3	Base flange	ADB Airfield Solutions	62A2142 or 62A2146	A, C
4	12 x 24 in. (304 x 610 mm) L-867B base	ADB Airfield Solutions	2124	B

NOTE: A: Shown for reference only. Part supplied with sign.
 B: Requires a separate line item on the purchase order.
 C: Remove the base flange shipped with the sign when the leg is screwed into the base plate.

3.2.2 Cord set and Extension Cords

See Figure 11. Refer to Table 12 for cord set and extension cord types. Refer to Table 13 for cord set and cord parts.

Figure 11: L-823 Cord set and Extension Cords

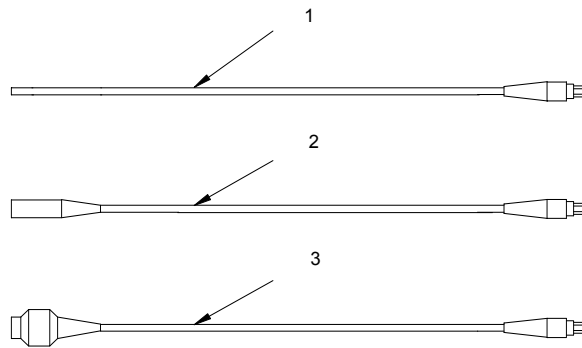


Table 12: Cord set and Extension Cord Length

Type	Part Number	Receptacle Style	Plug Style	Standard Length	Wire
1	73A0107-X	Not applicable	Type II, Class A, Style 1	4 ft. (1.22 mm) 6 ft. (1.83 mm)	16/2
2	73A0108-X	Type II, Class A, Style 7	Type II, Class A, Style 1	8 ft. (2.44 mm)	16/2
3	73A0109-X	Type II, Class A, Style 7	Type II, Class A, Style 1	8 ft. (2.44 mm)	16/2

Table 13: Cord set and Extension Cord Parts

Item	Description	Part Number	Note
1	L-823 cord set, 16/2 wire		A, B
	Cord set, standard size 4 ft. (1.22 mm)	73A0107-48	
	Cord set, standard size 6 ft. (1.83 mm)	73A0107-72	
2	L-823 cord set extension cord, 16/2 wire, standard size 8 ft. (2.44 mm)	73A0108-8	A, C
3	L-823 cord set extension cord, 16/2 wire, standard size 8 ft. (2.44 mm)	73A0109-8	A, D

NOTE: A: Other sizes require special order.
 B: A minimum of thirty inches (762 mm) of cord set length is required for internal sign connections. Usable exterior cord set length is equal to the cord set length minus a minimum of 30 inches (varies with sign size and cord set exit location).
 C: Receptacle may be connected to plug on 73A0107-X, 73A0109-8 cord set, or standard 31-inch (787.4 mm) L-823 cord set.
 D: Receptacle must be connected to plug on, Plug Type II, Class A, and Style 1, supplied with the sign.

3.3 General Guidelines



WARNING

- Signs must be grounded to a true earth ground. Failure to observe this warning may result in personal injury, death, or equipment damage.
- When installing signs, follow the guidelines covered in FAA AC 150/5340-30, Fig 126 for mounting pad design. Also see the following subsections for detailed information on sign pad and leveling of the sign.
- FAILURE TO INSTALL AND LEVEL THE SIGN AS DESCRIBED IN THE VARIOUS SUBSECTIONS BELOW WILL VOID THE WARRANTY

- Mount the signs on a concrete slab or concrete pedestals
- Do not allow concrete edges to protrude above grade.
- Provide power to the signs through breakaway cable connectors installed within the frangible coupling portion of the sign's mounting legs.
- Install auxiliary equipment, such as isolation transformers, in a light base embedded in the ground.

3.3.1 Overall Mounting Height

Install signs so that the overall height above the surrounding ground of the sign assembly, including mounting supports, does not exceed heights given in Table 2 thru Table 6 and the clearances of aircraft wings as specified in AC 150/5340-18. The sign must provide 12 inches (304.8 mm) of clearance between the top of the sign and any part of the most critical aircraft using, or expected to use, the airport when the aircraft's wheels are at the pavement edge. For overall mounting height, refer to AC 150/5345-44.

3.3.2 Sign Orientation

When orienting signs follow the guidelines below

- Orient the sign so that the face is perpendicular to the centerline of the taxiway or runway.
- NOTE:** Check site plans and specifications for the location of the power leg (leg where the L-823 cord set is located) in reference to the L-867 light base. Typically, the L-867 light base is immediately under the power leg or is at the same end, but not under the power leg. ADB Airfield Solutions' signs are shipped with the sign product label attached to the sign end where the power leg is located. In addition, verify that the sign legend is orientated correctly to the taxiway or runway per the site plans when the sign is installed on the pad. If the sign legend location is not correct, then the panels must be removed and reinstalled in the sign in the correct location.

3.3.3 Sign Distance from Pavement Edge

- For special situations refer to FAA AC 150/5340-18 for the correct orientation.

Refer to Table 14 for the distance of signs from the pavement edge. Refer to AC 150/5340-18 for more information on the location of different types of taxiway signs.

Table 14: Recommended Sign Distance from Pavement Edge

Sign Size	Distance from Pavement (ft.)	Distance from Pavement (m)
1	10-20	3.1-6.1
2	25-35	7.6-10.7
3	35-60	10.7-18.2
4	50-75	15.2-22.9
5	20-35	6.1-10.7

3.3.4 Sign Installation on a Concrete Pad

NOTE: Follow site plans and specifications for concrete dimensions.

3.3.4.1 Concrete Pouring

See FAA AC 150/5340-30, Figure 126, for concrete base design.

To pour a concrete pad, perform the following procedure:

1. Determine the sign size and number of modules.
2. Pour your concrete pad according to the following requirements:
 - A minimum of 30 inches (762 mm) wide, extending a minimum of 6 inches (152.4 mm) beyond the end of the supports. The sign pad needs to be flat and level in the area where

the sign mounting flanges are located. See FAA AC 150/5345-30, Figure 126. The mounting floor flange is nominally 5.0 wide x 7.50 long and the area beyond the flange can be tapered to the outside edge of the concrete pad to provide for pad drainage.

- A minimum of 4 inches (101.6 mm) depth, extending below the frost line to prevent frost heave.
 - Reinforce according to site plans and specifications.
3. Install a minimum of one 12-inch (304.8 mm) L-867B power base (1) according to the following guidelines:
- Install the base close to the sign in or near the concrete pad to provide easy access to the isolation transformer.

NOTE: When installing the base in the concrete pad, hold the L-867 base firmly in place during construction of the pad so that the upper surface of the base flange is level within ± 2 degrees and not more than 3/8 inch (9.525 mm) above the concrete surface.

- All other bearing surfaces on the pad for additional flange supports should be kept in the same horizontal plane as the L-867 base flange. The pad area where the sign mounting flanges will be located is to be flat **with no taper** to ensure that the sign will set level to prevent uneven loading on the frangible couplings. See FAA AC 150/5340-30, Figure 126 for pad design.
- For the Mode 2 and 3 signs.

Before the concrete sets, install two 1/2–13 anchor bolts into the concrete pad. The bolt hole centerline is on a 6-inch diameter bolt circle, 180 degrees apart as shown. Bolt slots are 0.62-inches wide x 1.0 long.

Overall width of flange is 5.0 inches and overall length is 7.5 inches. Bolts should be located perpendicular to the sign face.

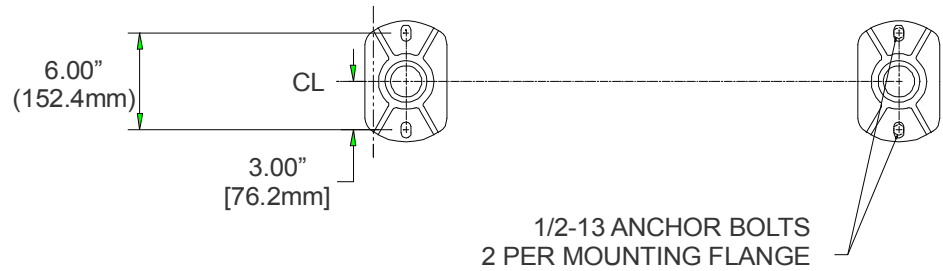
NOTE: A customer-supplied template is recommended to hold the bolts in position while the concrete sets. Anchor bolts (customer-supplied) must be a minimum of 1.25 inches (31.75 mm) above the top surface of the concrete pad to attach the mounting bases. Hilti Quick Bolts (wedge-bolt) or Red Head Trubolt Wedge Anchors are recommended for installing the flanges after the concrete sets (customer-supplied). Check with the manufacturer for their recommendations as applied to your airport site.

Example Hilti Kwik Bolt 3 Standard Thread 304 Stainless Steel

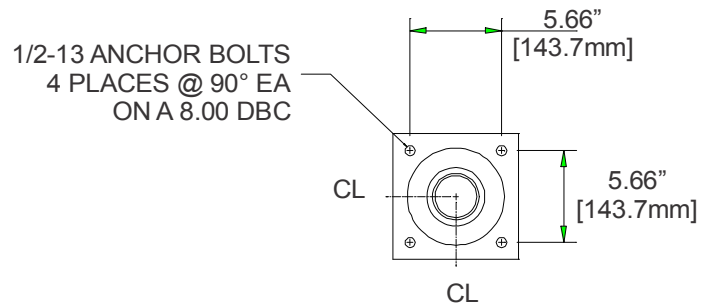


NOTE: With either anchoring system, the allowable load for any specific bolt is dependent upon several factors; type of concrete, depth of embedment, edge distance, anchor spacing, etc. ADB can advise the customer of various manufacturers of anchor bolts, but ADB cannot approve their specific installation.

**Figure 12: Mode 2 and 3 Frangible Coupling for Size 1 Signs,
Mode 2 Frangible Coupling for Size 2, 3, 4 and 5 Signs, Part number
62A2142**



**Figure 13: Mode 3 Frangible Coupling for Size 2, 3, 4 and 5, Hi Wind, Part Number
62A2146**



Installation

3.3.5 Sign Mounting

NOTE: Signs are totally assembled at the factory and are ready for direct installation. Mounting flanges may be removed to lubricate the threads of the frangible coupling with anti-seize compound before installing sign.

If male L-823 connector is routed through a leg, slide frangible coupling over male connector and insert into female connector in base plate, and then screw frangible coupling into base plate.

To mount the sign onto the concrete pad to insure the assembly is flat, perform the following procedure:

1. When the sign is ready to be bolted to the concrete pad set the sign assembly on the concrete pad and position the sign over the anchor bolts. Hand-tighten the bolts or nuts to fasten the mounting flanges to the concrete pad.
2. **To insure that the sign assembly is mounted flat on the concrete pad**, first loosen all three hex set screws found on each frangible coupling that are installed on the sign. See Figure 14. Once all the hex screws are loosened each of the sign legs will float free inside the frangible coupling that is screwed into the mounting flange. Second, use a bubble, digital, or laser level to verify that the assembly is flat and level. Adjustments to make the assembly flat and level can be made by raising or lowering one end of the sign assembly to make the assembly flat and level.

NOTE: Once the assembly is flat it may be necessary to block-up or hold the assembly in the flat position until all of the hex set screws can be re-tightened on each of the frangible couplings to secure the sign leg to the coupling. Once the sign is flat and level finish tightening the mounting bolts to their correct torque value.

If the sign pad is tapered in the area when the mounting flanges are located shims may need to be placed under the mounting flanges to ensure that the coupling frangibility characteristics are the same for each coupling. If in doubt, contact ADB Airfield Solutions Engineering.

Figure 14: Sign Frangible Coupling



Leg Set Screws



CAUTION

- Sign frangible couplings are uniquely designed for use on the sign size stamped on the coupling and can only be used for that particular size sign. If couplings must be replaced, make sure the sign size on the couplings matches the size sign on which they are to be installed.

3. Connect an AWG 12 (minimum) ground wire to the earth ground lug on the bottom of the sign.
Refer to Figure 18 thru Figure 19 for electrical connections for series circuit installation.



CAUTION

- Lock out power before making any electrical connections. Failure to observe this warning may result in personal injury, death, or equipment damage.

4. Install optional tether. Refer to *Optional Tethers* in this section.
5. Plug the cord set into the sign and the transformer.
6. Reinstall panels (if removed) and top lid (if removed).

3.3.6 Wiring

Refer to Figure 18 thru Figure 19 for wiring diagrams.

When installing cable, follow the guidelines below.

- Install all cable for direct earth burial or for placement in duct according to Item 108 or Item 110 of AC 150/5370-10 as appropriate.
- Operate the signs as a part of a series lighting system. The signs are connected into the series circuit by means of an isolation transformer, see "Electrical Supply" on page 3. If installation is to be independent of other lighting circuits, use current edition of AC 150/5340-24, *Runway and Taxiway Edge Lighting System*, for system reference and material needs.

3.3.7 Earth Ground Lug



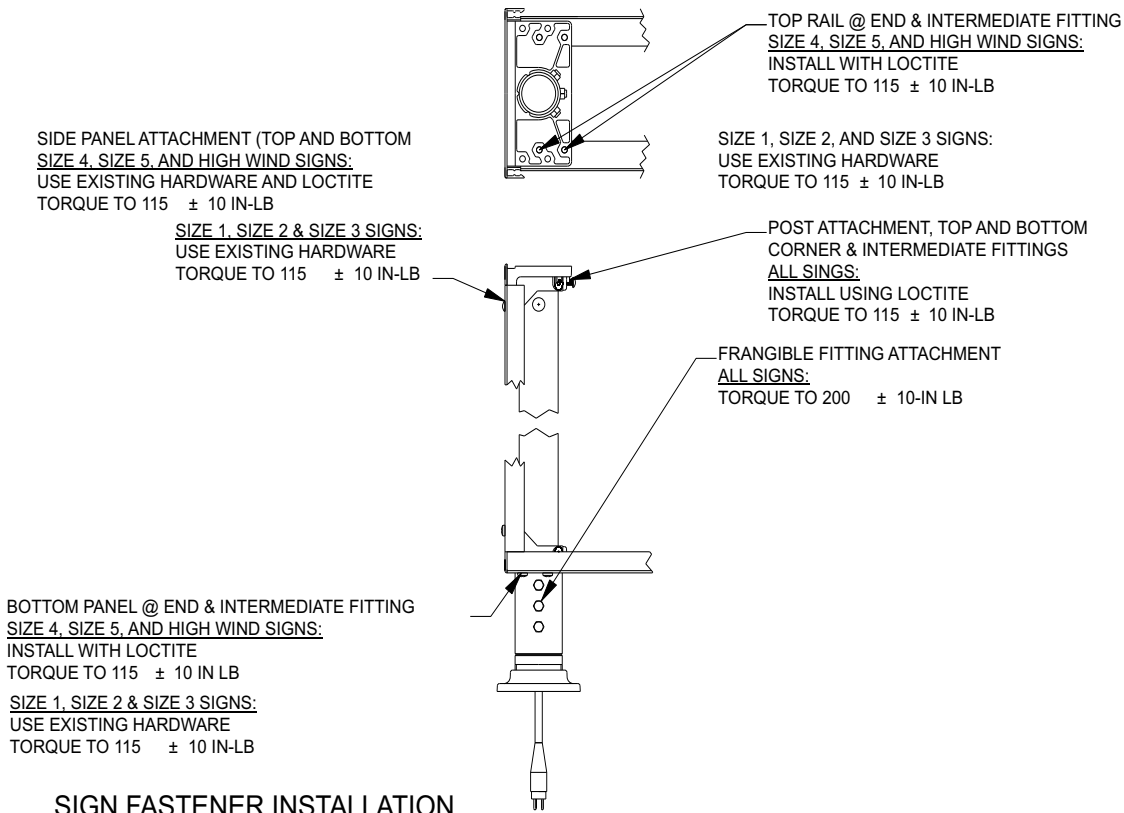
WARNING

- Signs must be properly grounded to true earth ground. Failure to observe this warning may result in personal injury, death, or equipment damage.

Attach the earth ground lug. The earth ground lug is located on the outside frame of the sign to permit easy connection of an AWG 12 (minimum) earth ground wire to the sign. If necessary, you may remove the ground lug from the outside and place it on the inside.



3.3.8 Sign Fastener Installation



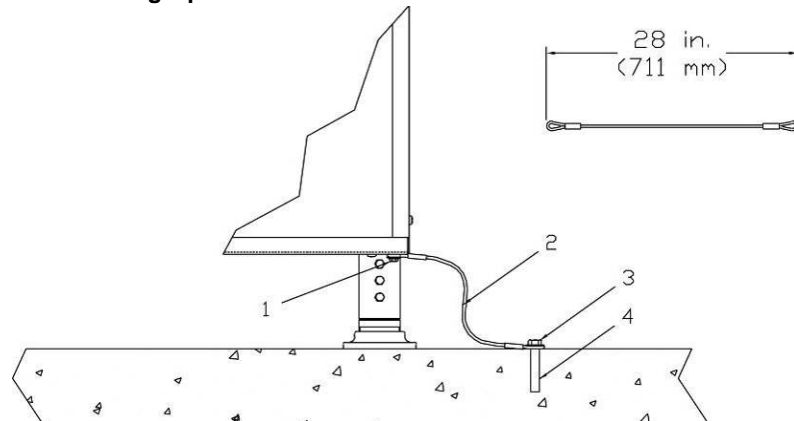
Installation

3.3.9 Optional Tethers

See Figure 15. Tethers are shipped installed on the sign sales order. Location and quantity of the tether are determined when the sales order is placed.

NOTE: In the tether installation procedure below, the customer supplies the mounting hardware to attach one end of the tether to the concrete pad. The customer also supplies the expansion anchor for the bolt.

Figure 15: Installing Optional Tether



1. Existing 5/16-18 x 3/4 in. Bolt
2. Tether
3. Mounting Hardware Attached to Expansion Anchor
4. Expansion Anchor for Bolt
5. To attach a tether, install the customer-supplied mounting hardware (3) to attach the tether to the expansion anchor (4) on the concrete pad

4.0 Maintenance and Repair

This section provides preventive maintenance for L-858 signs.

To keep the L-858 taxiway and runway signs operating efficiently, follow a preventive maintenance schedule. Refer to Table 15.

Table 15: L-858 Taxiway and Runway Sign Maintenance

Interval	Maintenance Task	Action
Daily	Check for burned-out LED assemblies.	Check circuit operation.
Monthly	Check for dirty panels.	Clean with mild soap and water.
	Check for vegetation covering panel.	Remove vegetation.
Semi-Annually	Check for loose wire connections.	Tighten wires.
	Check for cracked or deteriorated wires.	Replace wire.
Annually	Check for paint flaking off.	Repaint.
	Check for panels yellowing.	Clean with Formula 409 or similar cleaning agent.
	Check for deteriorated gaskets.	Replace gaskets.

25 W, 25 Ohm, 1% Resistor for size 1 signs with 1 module



CAUTION

This equipment may contain electrostatic sensitive devices.

- Protect from electrostatic discharge.
- Electronic modules and components should be touched only when this is unavoidable e.g. soldering, replacement.
- Before touching any component of the cabinet you should bring your body to the same potential as the cabinet by touching a conductive earthed part of the cabinet.
- Electronic modules or components must not be brought in contact with highly insulating materials such as plastic sheets, synthetic fibre clothing. They must be laid down on conductive surfaces.
- The tip of the soldering iron must be grounded.
- Electronic modules and components must be stored and transported in conductive packing.

4.1 Replacing the Power Supply

1. Remove the four #8-32 screws with lock washers installed in the PEM nuts of the power supply. Retain for future use. See Figure 16.
2. Apply the thermal compound to insure good heat transfer to the frame.
3. Locate the four threaded PEM nuts installed in the mounting bracket of the Power Supply and align the PEM nuts with the mating holes in the end panel of the sign.
4. Insert the four #8-32 screws with lock washers through the holes in the end panel and screw them into the PEM nuts. When tightening the screws, make sure the Power Supply is seated flat against the side of the sign.



CAUTION

- Be careful that the screws do not bind as you are tightening. This may give the impression that the power supply is firmly mounted when it is not!

4.1.1 Wiring the Power Supply

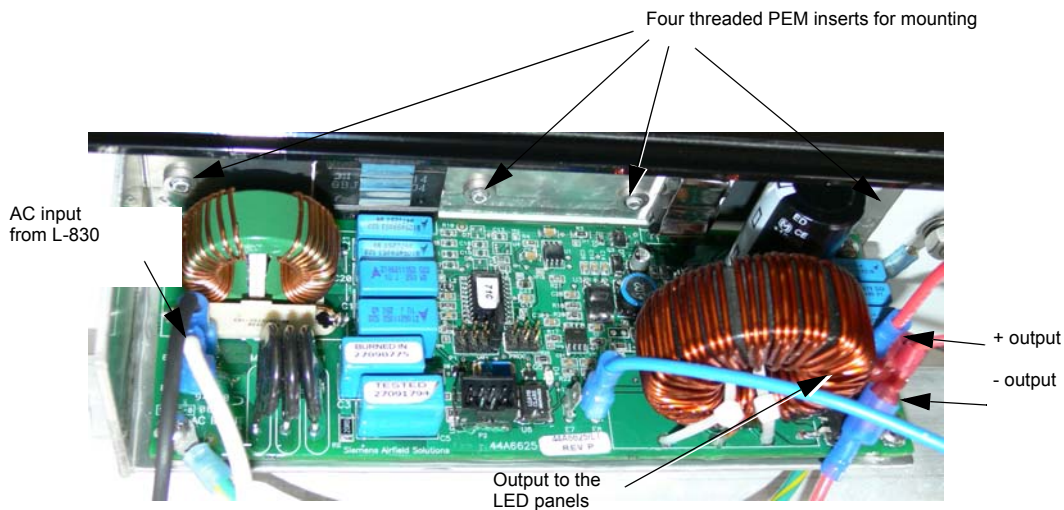
See the Wiring Diagrams, Figure 18 and Figure 19.

1. Locate the input power wires (from the L-830 secondary). Connect these wires to the Power Supply terminals labeled "AC INPUT". This is the isolated 6.6A input. Polarity does not matter.
2. Locate the wires that connected the DC Supply to the LED panels. Connect these wires to the Power Supply terminals labeled "OUTPUT".

NOTE: This is a DC current source, and **polarity does matter**.

3. Verify that the sign wiring matches the Wiring Diagram, Figure 18 and Figure 19.
4. You are now ready to apply power to the sign.

Figure 16: The LED Power Supply





WARNING

The only visual difference between the correct Power Supply and a 96 VDC Power Supply is a sticker in the center of the board, labeled (96Vdc)



This is the CORRECT power supply, it has a Rev P, Q, R ... sticker.

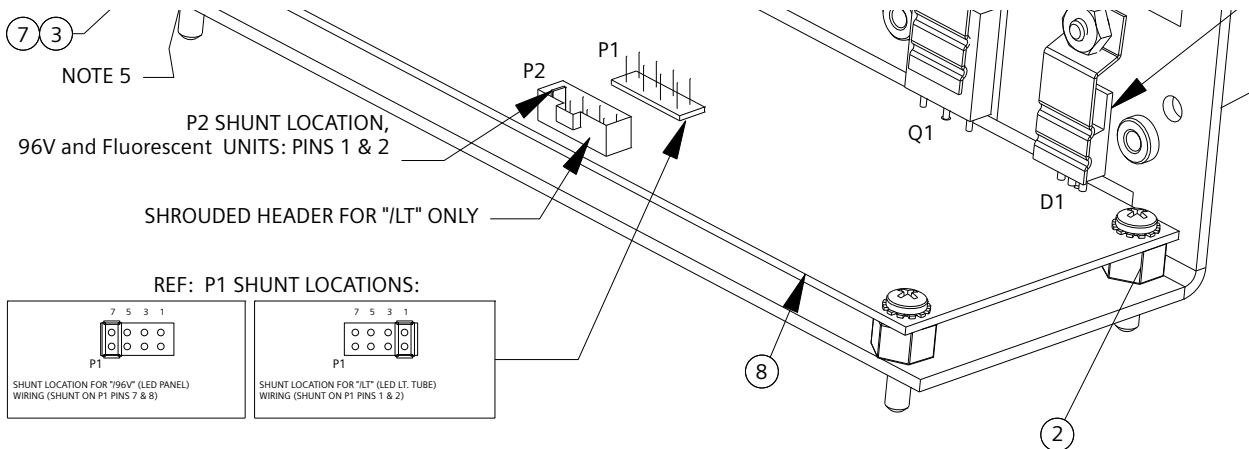


This is the WRONG power supply! This is a 96 Vdc Power supply -- **DO NOT USE** on this LED sign!

Power supply assembly 44A6631/LT consists of the PCB 44A6625/LT, the assembly frame and hardware

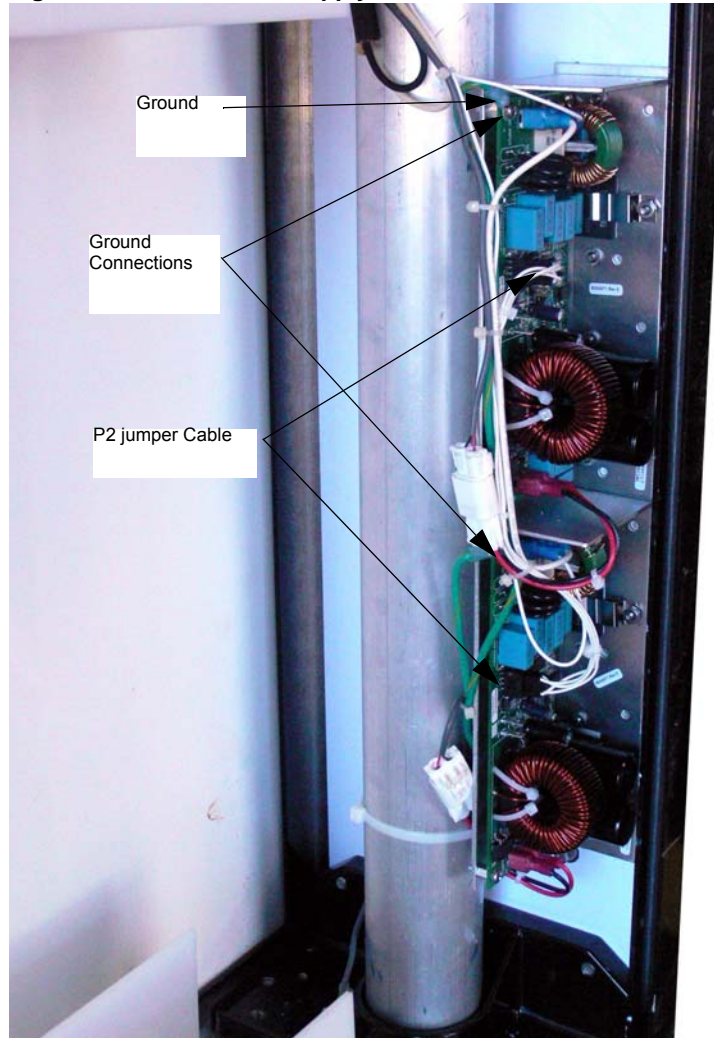
Note the positions of the jumpers on the Power Supply

See the wiring diagrams on pages 4-4 and 4-5



Maintenance

Figure 17: Dual Power Supply



4.2 Replacing an LED light tube

1. Turn off the power to the sign.
2. Remove the top cover.
3. Remove the sign face.
4. Disconnect the power connector from the LED light tube being replaced.
5. Remove cable ties or clips from light tube being replaced.
6. Note the orientation of light tube to be replaced in reference to male/female connectors.
7. Install the new light tube and replace the cable ties provided

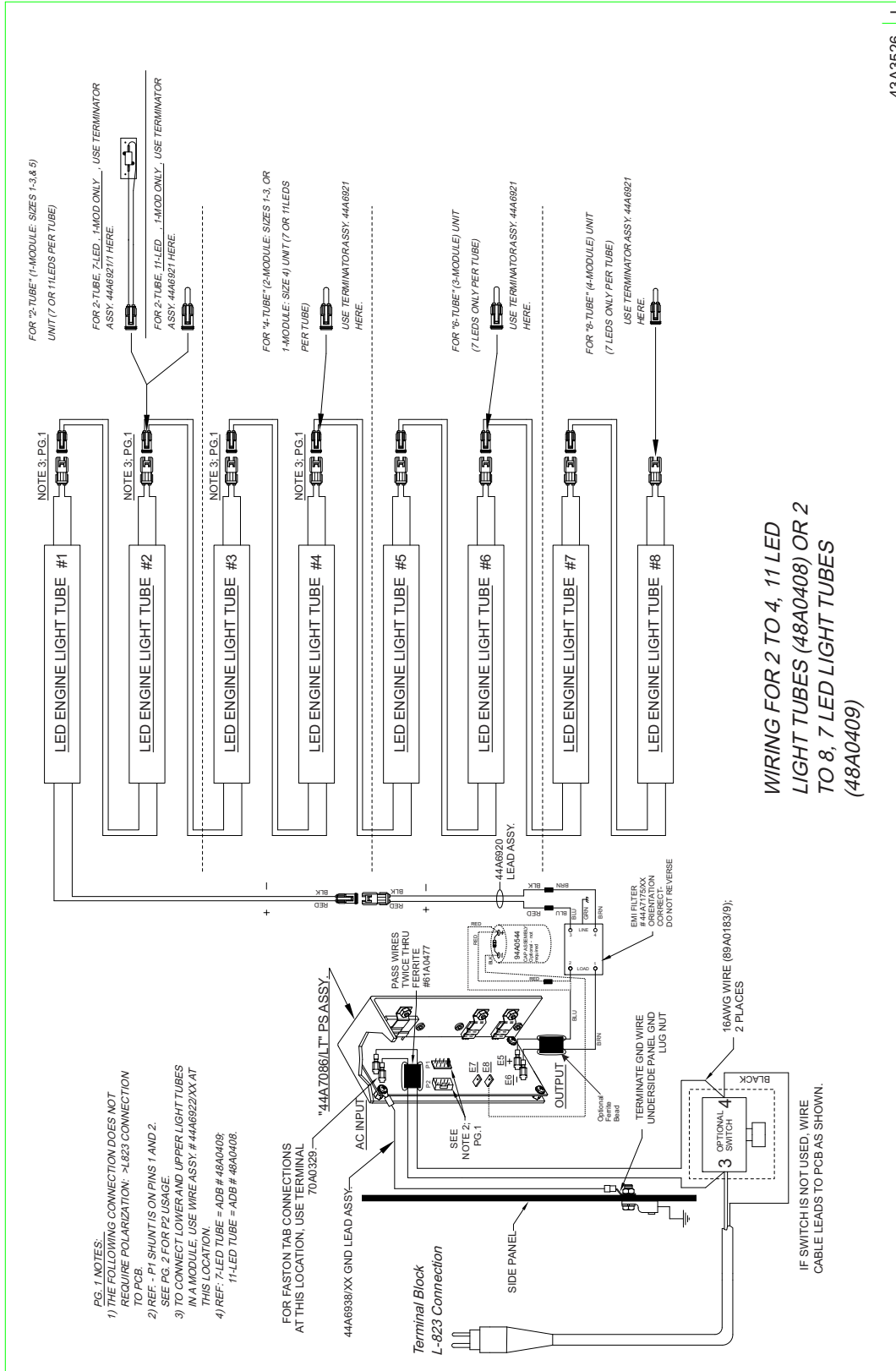


CAUTION

- This equipment contains electrostatic sensitive devices.
- Protect the LED light tube kit from electrostatic discharge.
 - Failure to secure light tube may result in equipment damage.

8. Check that all connections are tight and correct.
 9. Replace the panels, top cover and restore the power to the sign.
- See the LED light tube schematic diagram Figure 18 and Figure 19.

Figure 18: Wiring for 2 TO 8 LED Light Tubes



Maintenance

4.3 Troubleshooting

This section provides troubleshooting information for the L-858 taxiway and runway signs. The information covers only the most common problems. If you cannot solve the problem with the information given here, contact your local ADB Airfield Solutions representative for help.

Table 16: Standard LED Signs

Problem – LED Signs	Possible Cause	Corrective Action
All LEDs are out or not functioning correctly	Loose wires or connections	Tighten or replace wires. All LED are connected in series to a power supply. If there are any loose or open wires, all the LEDs connected to that power supply will go out. An open on the output of the power supply will cause the PCB LED D4 to turn on (green).
	No current or incorrect current coming into the sign	Verify correct current is coming into the sign using a true RMS ammeter. This would be 2.8 A to 6.6 A for a 5-step CCR; 4.8 A to 6.6 A for a 3-step CCR; 5.5 A for a dedicated sign circuit one-step CCR.
	Sign ON/OFF switch is closed (if present)	Check the Sign ON/OFF switch for proper operation. Replace if necessary.
	Power Supply fault	See Figure 18 thru Figure 19. With field current on, measure the voltage at E7 with respect to E8, see Figure 18 and Figure 19. E7 will be 10 VDC to 13 VDC on a properly operating power supply when powered. Check to insure that the jumper on the power supply is set properly. The jumper should be at P1 terminals 1 to 2. See Figure 18. Next, the power supply can be checked for operation by performing the following: Remove input power, disconnect the output LED load at E6 and E5. Connect a DC volt meter from E8 to E5. Look for a rising voltage to approximately 195 VDC within the first few seconds of powering on the board. This voltage will then drop to less than 50 VDC and the onboard LED (D4) will light within a few seconds. If the voltage was between 50-195 VDC during the first few seconds of applying power, then the power supply is likely good. Note: the voltage at E8-E5 will cycle again about 40 seconds after dropping to less than 50 VDC and repeat five times and will stabilize. The input power must be cycled off for about 1 minute to get the output to cycle on again. Follow the correct polarity when reconnecting the LED tube assemblies.

All LEDs are out or not functioning correctly	Dual Power Supply fault	<p>A fault in one part of the sign will shut down the entire sign.</p> <p>Per FAA specification requirements, if one section of the sign fails, the entire sign must shut off. There is wiring connected at P2 on each Power Supply that performs this function. Turn power off and unplug the connector at P2 on each power supply. Turn power on. One section of the sign should be On and the other Off. Troubleshoot the individual failing section according to the guidance in this table above.</p>
	Open in LED Tube Assembly	<p>The power supply PCB LED (D4) will light green when there is an open in the output LED string. Swap out a known good LED tube assembly until the bad LED tube assembly is found. Follow correct polarity when connecting.</p> <p>CAUTION: Never connect a single LED tube assembly directly to the power supply. The power supply is designed to have a load of at least two LED tube assemblies connected to it. See Figure 18 and Figure 19. Connecting only one LED tube assembly to a power supply will result in LED current being too high and will cause the LED tube to fail.</p>

5.0 Parts

Ordering Codes

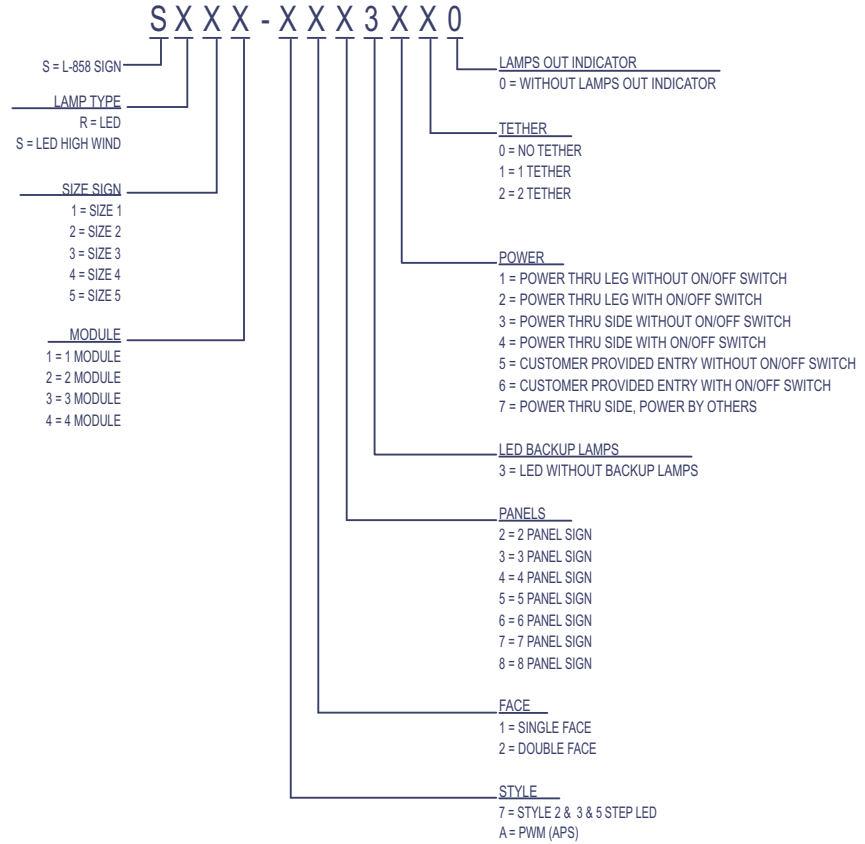
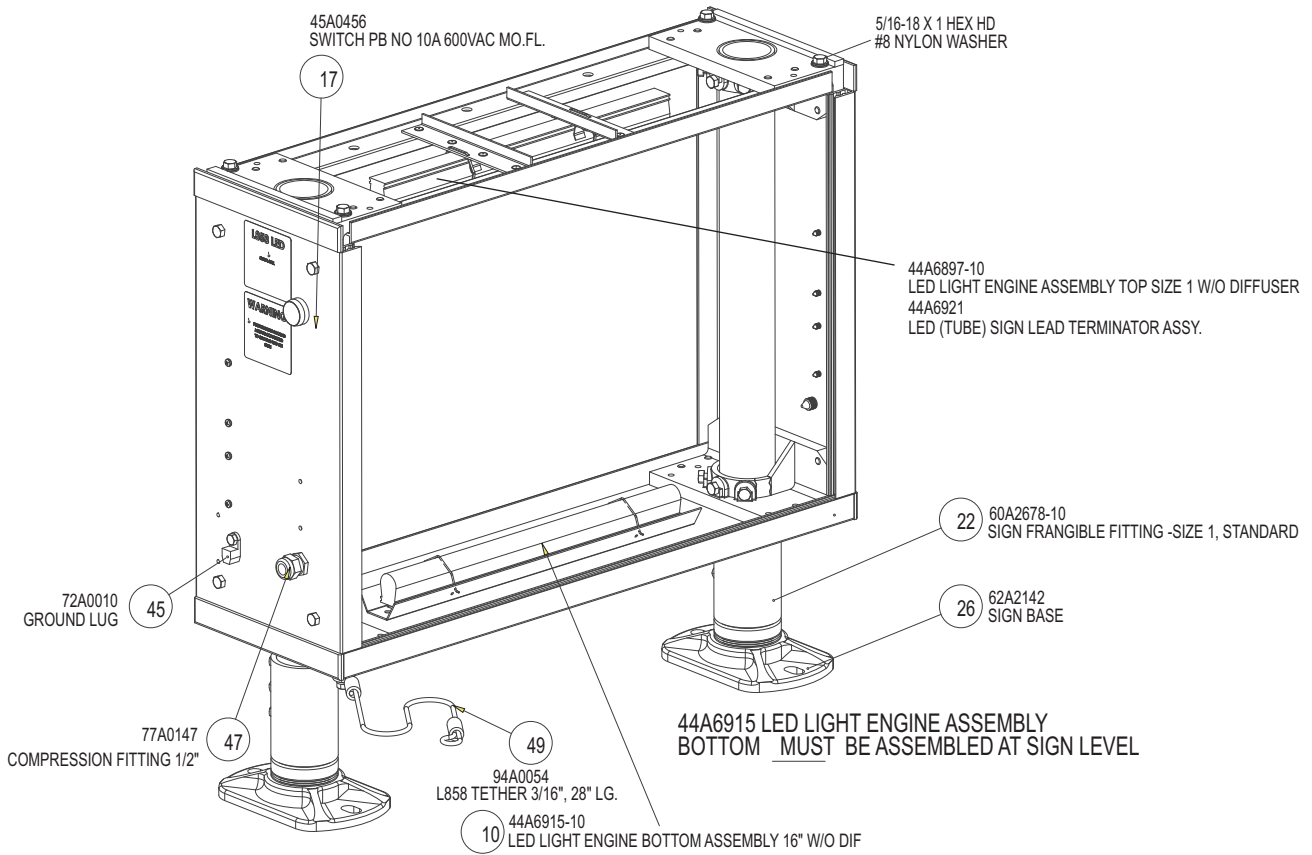


Figure 20: Size 1, Single Module Sign Parts

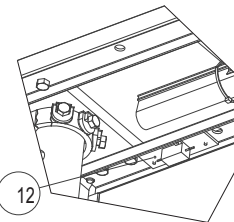


SR11-7123410

Figure 21: Size 1 / 1 Module Sign Resistor



12. 44A6921/1 is mounted under the top rail above the power supply secured with two 4-40x3/8" hardware with a thin layer of thermal compound. 67A0033 is to be applied between plate and top rail. Electrically connect to the top light engine, extend the wires to the opposite top rail and secure the wiring with a cable tie.



12
SR11-7XX3XX0 &
SS11-7XX3XX0 (ONLY)

Figure 22: Sign Parts

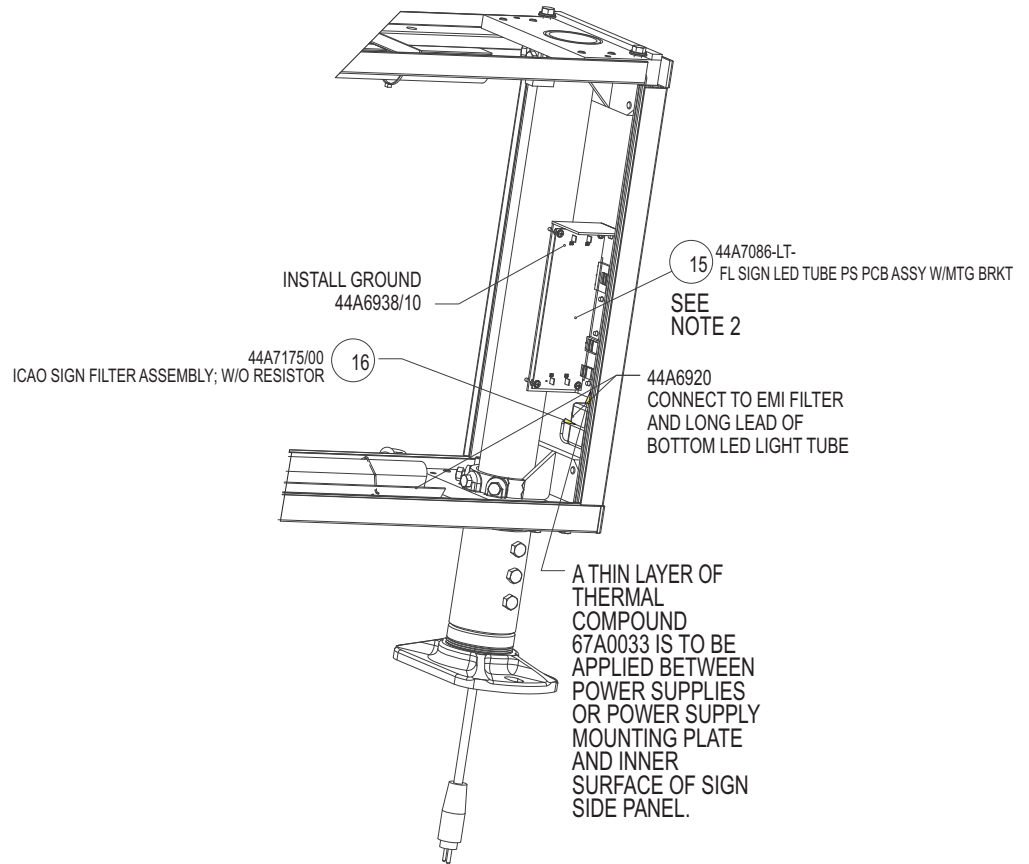


Figure 23: Sign Parts

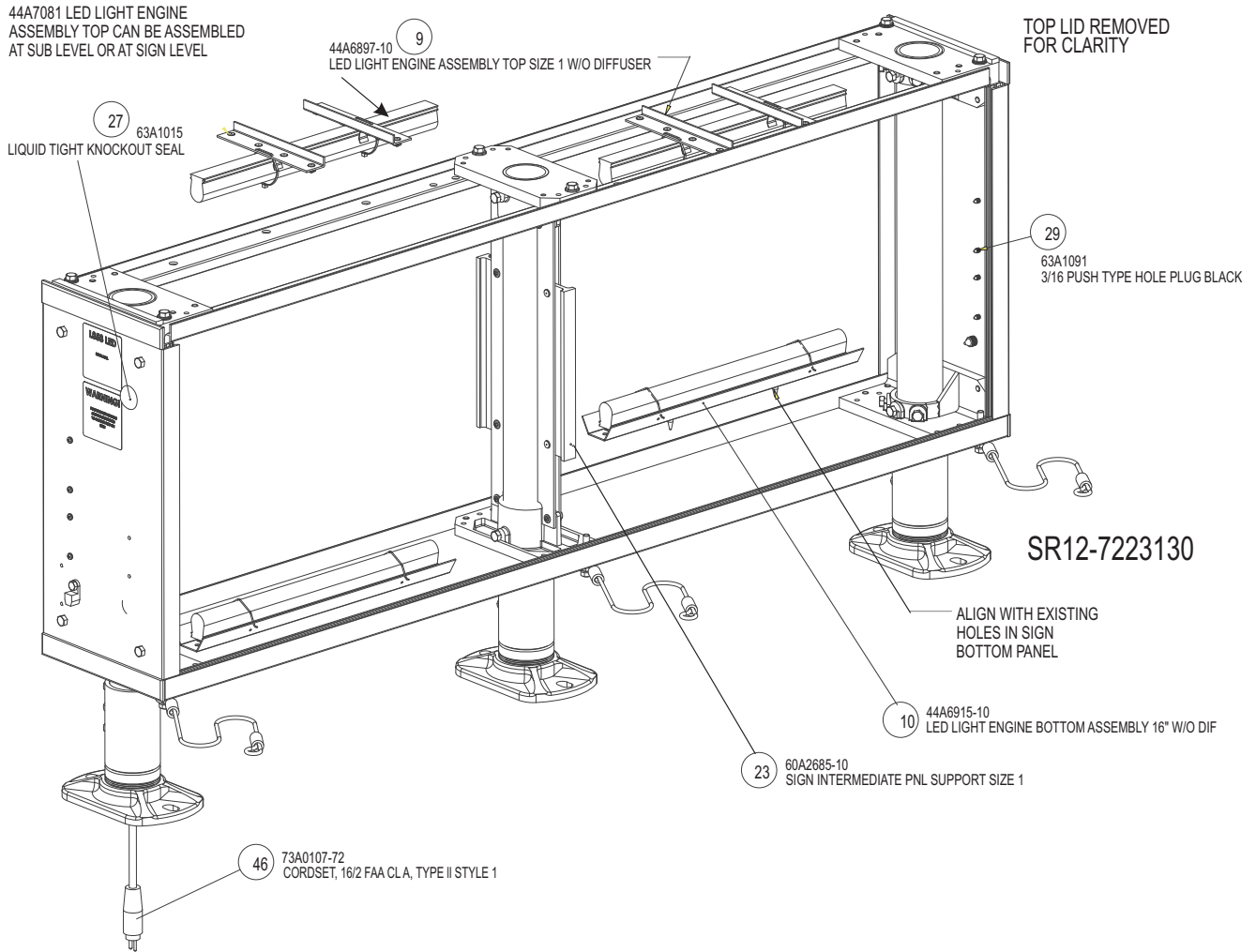
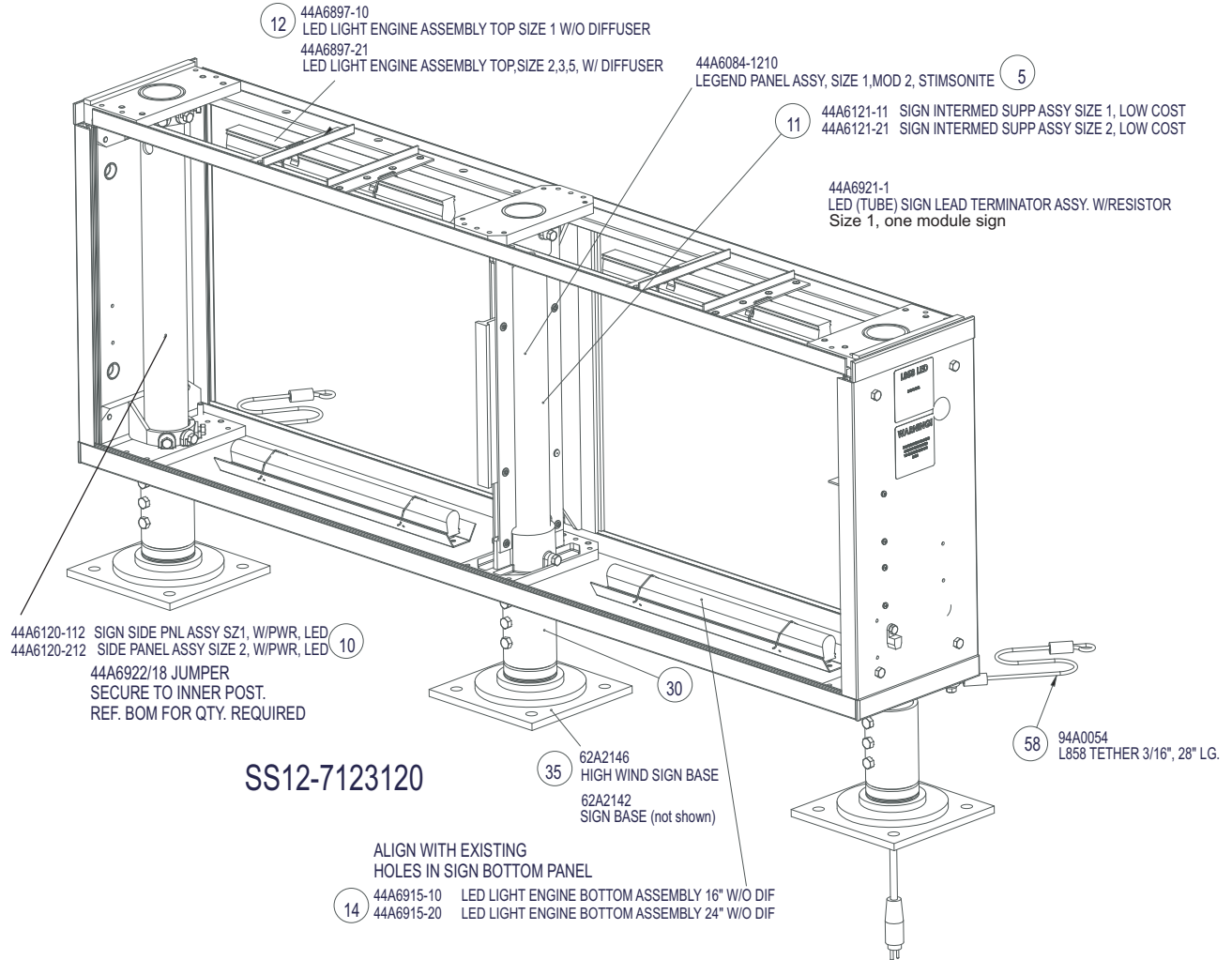


Figure 24: Sign Parts

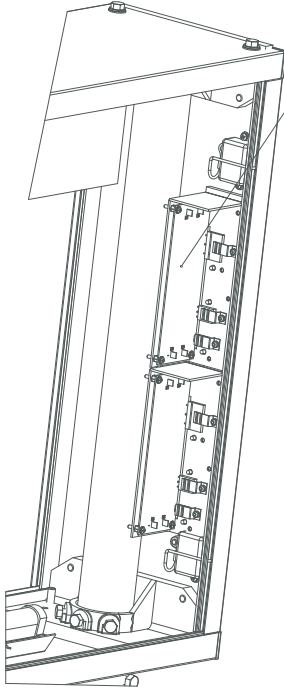


Maintenance

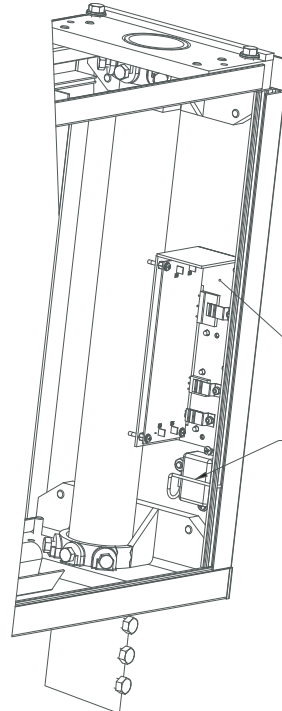
Figure 25: Sign Power Supply Associated Parts

- 44A6924
LED SIGN PS-TO-PS DISCRETE WIRE JUMPER ASSY.
- 44A6922-18
LED (TUBE) SIGN LEAD JUMPER ASSY 18" LG.
- 44A7088-10
SIGN LED LT. TUBE PS PCB ASSY W/MTG BRKT

25



SX23-7XX3XX0



- 44A7086-LT-
FL SIGN LED TUBE PS PCB ASSY W/MTG BRKT
- 44A6920
LED (TUBE) SIGN PWR SUPPLY LEAD ASSY.

15

16

- 44A6921
LED (TUBE) SIGN LEAD TERMINATOR ASSY.

SX11-7XX3XX0

**LED L-858Y/R/L/B Light Tube Signs
User Manual**

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