L-858 AGSF
Incandescent Airfield Guidance Signs FAA

User Manual

96A0286, Rev. AU, 2022/02/11

ADB SAFEGATE

A.0 Disclaimer / Standard Warranty

CE certification

The equipment listed as CE certified means that the product complies with the essential requirements concerning safety and hygiene. The European directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

ETL certification

The equipment listed as ETL certified means that the product complies with the essential requirements concerning safety and FAA Airfield regulations. The FAA directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

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Products manufactured by ADB SAFEGATE are guaranteed against mechanical, electrical, and physical defects (excluding lamps) which may occur during proper and normal use for a period of two years from the date of ex-works delivery, and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made.

Note

See your sales order contract for a complete warranty description.

Replaced or repaired equipment under warranty falls into the warranty of the original delivery. No new warranty period is started for these replaced or repaired products.

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ADB SAFEGATE LED products (with the exception of obstruction lighting) are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years from date of installation, per FAA EB67 (applicable edition). These FAA certified constant current (series) powered LED products must be installed, interfaced and powered with and through products certified under the FAA Airfield Lighting Equipment Program (ALECP) to be included in this 4 (four) year warranty. This includes, but is not limited to, interface with products such as Base Cans, Isolation Transformers, Connectors, Wiring, and Constant Current Regulators.

Note

See your sales order contract for a complete warranty description.

Replaced or repaired equipment under warranty falls into the warranty of the original delivery. No new warranty period is started for these replaced or repaired products.

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WARNING

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

ADB SAFEGATE cannot be held responsible for injuries or damages resulting from non-standard, unintended uses of its equipment. The equipment is designed and intended only for the purpose described in the manual. Uses not described in the manual are considered unintended uses and may result in serious personal injury, death or property damage.

Unintended uses, includes the following actions:

- Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ADB SAFEGATE replacement parts or accessories.
- Failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards if not in contradiction with the general rules.
- Using materials or auxiliary equipment that are inappropriate or incompatible with your ADB SAFEGATE equipment.
- Allowing unskilled personnel to perform any task on or with the equipment.

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1.0 Safety

Introduction to Safety

This section contains general safety instructions for installing and using ADB SAFEGATE 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 Safety Messages

HAZARD Icons used in the manual

For all HAZARD symbols in use, see the Safety section. All symbols must comply with ISO and ANSI standards.

Carefully read and observe all safety instructions in this manual, which alert you to safety hazards and conditions that may result in personal injury, death or property and equipment damage and are accompanied by the symbol shown below.

	WARNING Failure to observe a warning may result in personal injury, death or equipment damage.
	DANGER - Risk of electrical shock or ARC FLASH Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage. ARC Flash may cause blindness, severe burns or death.
	WARNING - Wear personal protective equipment Failure to observe may result in serious injury.
	WARNING - Do not touch Failure to observe this warning may result in personal injury, death, or equipment damage.
	CAUTION Failure to observe a caution may result in equipment damage.

Qualified Personnel

	Important Information 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 practice.

1.1.1 Introduction to Safety

CAUTION

Unsafe Equipment Use
This equipment may contain electrostatic devices, hazardous voltages and sharp edges on components

- Read installation instructions in their entirety before starting installation.
- 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.
- 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.

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

Additional Reference Materials

Important Information

- IEC - International Standards and Conformity Assessment for all electrical, electronic and related technologies.
- IEC 60364 - Electrical Installations in Buildings.
- FAA Advisory: AC 150/5340-26 (current edition), Maintenance of Airport Visual Aid Facilities.
- Maintenance personnel must refer to the maintenance procedure described in the ICAO Airport Services Manual, Part 9.
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- National and local electrical codes and standards.

1.1.2 Intended Use

CAUTION

Use this equipment as intended by the manufacturer
This equipment is designed to perform a specific function, do not use this equipment for other purposes

- 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.

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

1.1.3 Material Handling Precautions: Storage

CAUTION

Improper Storage
Store this equipment properly

- 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 equipment damage

1.1.4 Material Handling: Heavy Equipment

DANGER

Unstable load
Use caution when moving heavy equipment

- Use extreme care when moving heavy equipment.
- Verify that the moving equipment is rated to handle the weight.
- When removing equipment from a shipping pallet, carefully balance and secure it using a safety strap.

Failure to follow this instruction can result in death, serious injury, or equipment damage

1.1.5 Operation Safety

CAUTION

Improper Operation
Do Not Operate this equipment other than as specified by the manufacturer

- 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.

Failure to follow these instructions can result in equipment damage

1.1.6 Maintenance Safety

DANGER

Electric Shock Hazard
This equipment may contain electrostatic devices

- 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.

Failure to follow these instructions can result in death or equipment damage

1.1.7 Material Handling Precautions, ESD

CAUTION

Electrostatic Sensitive Devices
This equipment may contain electrostatic 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 shall 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.

Failure to follow this instruction can result in equipment damage

1.1.8 Arc Flash and Electric Shock Hazard

DANGER

Series Circuits have Hazardous Voltages
This equipment produces high voltages to maintain the specified current - Do NOT Disconnect while energized.

- Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.
- Only persons who are properly trained and familiar with ADB SAFEGATE equipment are permitted to service this equipment.
- An open airfield current circuit is capable of generating >5000 Vac and may appear OFF to a meter.
- Never unplug a device from a constant current circuit while it is operating; Arc flash may result.
- 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 SAFEGATE replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Check the 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 airfield electrical equipment.

Failure to follow these instructions can result in death or equipment damage

2.0 Halogen Signs

L-858 Taxiway & Runway Signs installation and maintenance manual.

2.1 About this manual

The manual shows the information necessary to:

- Install and maintain the L-858 Taxiway & Runway Signs.

  For information on the Obsolete Fluorescent Signs, see the ADB Product Center Web site for Obsolete Manuals.

2.1.1 How to work with the manual

1. Become familiar with the structure and content.
2. Carry out the actions completely and in the given sequence.

2.2 FAA Sign Introduction

See Figure 1 . This section describes the L-858 standard VA and low VA, taxiway and runway signs referred to in Table 1 .

Figure 1: L-858 Taxiway and Runway Sign (1-Module)

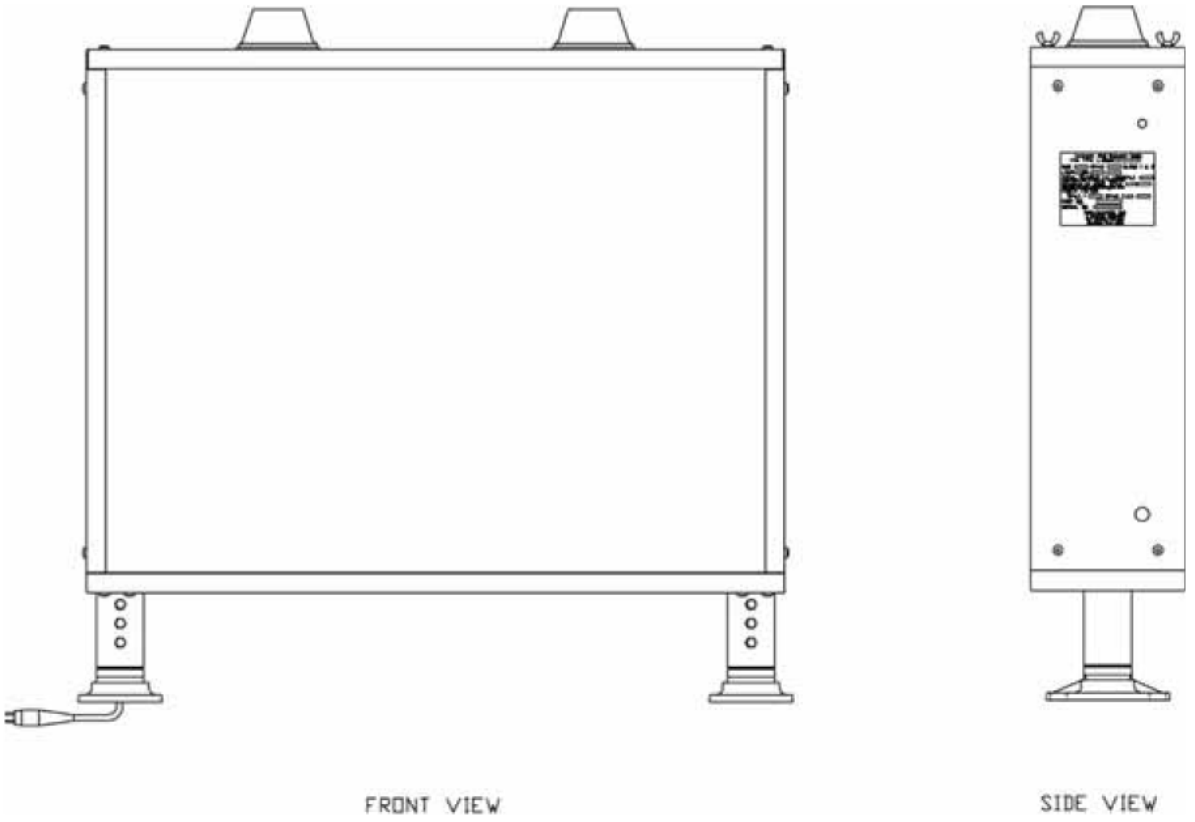


Table 1: L-858 Taxiway and Runway Signs

Sign Type	Purpose	Legend Color	Background Color
L-858Y	Taxiway, Direction, Destination, & Boundary	Black	Yellow
L-858R	Mandatory Sign	White	Red
L-858B	Runway Distance Remaining	White	Black
L-858L	Runway or Taxiway Location	Yellow	Black

The ADB Safegate L-858 taxiway and runway signs are used on airports:

- To guide pilots of aircraft to destinations in accordance with FAA AC 150/5340-18.
- To identify holding positions, intersecting runways and taxiways.
- To prohibit entry into a particular area.
- To provide runway distance remaining information to pilots during takeoff and landing operations.

The basic sign module accommodates two characters and can be single- or double-faced. The signs are available in all FAA classifications of various lengths depending on the number of modules combined. Each sign is furnished complete with lamp(s), connecting leads, legend panels, brightness control transformer(s), and mounting assemblies designed for installation on concrete pads.

2.2.1 FAA Incandescent Airfield Guidance Sign

Compliance with Standards

FAA:	L-858Y, L-858R, L-858L, and L-858B AC 150/5345-44 (Current Edition). ETL Certified.

Uses

FAA L-858Y Direction, Destination, and Boundary (Informational Sign)

FAA L-858R Mandatory Sign

FAA L-858L Runway/Taxiway Location Sign: 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.

FAA L-858B Runway Distance Remaining Sign: The 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 takeoff and landing operations.

Sign Legends

Type	Purpose	Legend Color	Background Color
L-858Y	Direction, Destination & Boundary	Black	Yellow
L-858R	Mandatory Sign	White with Black Outline	Red
L-858L	Runway/Taxiway Location	Yellow	Black
L-858B	Runway Distance Remaining	White	Black

Construction

Corrosion-resistant sign construction requires minimal maintenance.

- Aluminum housing
- Acrylic sign legend panels
- Stainless steel hardware
- Retroreflective sheeting
- Translucent plastic panel dividers

Operating Conditions

Class	Operating Temperature Range	Humidity	Wind Velocities*
2	-40 °F to +131 °F (-40 °C to +55 °C)	0 to 100%	200 mph 300 mph

Notes

* ADB Safegate Mode 2 signs withstand wind velocities up to 200 mph. ADB Safegate Mode 3 (high wind) signs withstand wind velocities up to 300 mph.

Power Supply

Informational, mandatory and location signs are available in three sizes. The runway distance remaining signs are available in two sizes. The signs are connected to a series circuit using the appropriately-sized 50 or 60 Hz L-830 isolation transformer(s).

Sign Size No.	Quartz Halogen, 6.6 A, 48 W Lamps Required
1	1 per Module
2	2 per Module
3	2 per Module
4	4 only
5	2 only

Packaging Data

Signs are shipped with L-823 cord set(s), frangible couplings, and floor flanges – ready for installation.

Description	Gross Weight		Carton Dimensions	
	(lb)	(kg)	(in)	(cm)
Size 1, Module 1	46	21	34 × 34 × 13	87 × 86.4 × 33
Size 1, Module 2	78	35	34 × 63 × 13	87 × 160 × 33
Size 1, Module 3	115	52	34 × 92 × 13	87 × 234 × 33
Size 1, Module 4	169	77	34 × 121 × 13	87 × 307 × 33
Size 1, Module 2	71	32	40 × 40 × 13	102 × 102 × 33
Size 2, Module 2	104	47	40 × 76 × 13	102 × 193 × 33
Size 2, Module 3	153	70	40 × 112 × 13	102 × 285 × 33
Size 2, Module 4	220[1]	100[1]	40 × 147 × 13	102 × 374 × 33
Size 3, Module 1	81	37	46 × 46 × 13	117 × 117 × 33
Size 3, Module 2	131	60	46 × 89 × 13	117 × 226 × 33
Size 3, Module 3	199	90	46 × 131 × 13	117 × 333 × 33
Size 3, Module 4	252	114	46 × 173 × 13	117 × 440 × 33

[1] Estimated weight

Sign Dimensions

Sign Heights						
Type	Sign Size No.	Sign Face Height in (cm)	Legend Height in (cm)	Sign Style No.	Sign Class No.	Overall Mounting Height in (cm)
L-858Y/R/L	1 1	18 (45.7)	12 (30.5)	2,3,5 2,3,5	1,2 1,2	29.7 (75.5)
L-858Y/R/L	2 2	24 (61)	15 (38.1)	2,3,5 2,3,5	1,2 1,2	35.7 (90.8)
L-858Y/R/L	3 3	30 (76.2)	18 (45.7)	2,3,5 2,3,5	1,2 1,2	41.7 (106)
L-858B	4 4	48 122)	40 (101.6)	2,3,5 2,3,5	1,2 1,2	58.2 (147.8)
L-858B	5 5	30 (76.2)	25 (63.5)	2,3,5 2,3,5	1,2 1,2	41.7 (106)

Sign Lengths - Inches (Centimeters)				
Size No.	**1 Module**	**2 Module**	**3 Module**	**4 Module**
1	29.4 (75)	58.6 (149)	87.9 (223)	117.2 (298)
2	35.9 (91)	71.6 (182)	107.4 (273)	143.2 (364)
3	42.4 (108)	84.6 (215)	126.9 (323)	169.2 (430)
4	47.9 (122)	N/A	N/A	N/A
5	42.4 (108)	N/A	N/A	N/A

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

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 L-830 transformer.

Low VA Halogen Lamps

Sign Size	No. of Modules	Trans-former	No. of Lamps	Sign Power Factor	Volt Amp VA Load
48 Watt Lamps — Style 2, 3-Step Signs (4.8 - 6.6 A)					
1	1	100 W	1	0.98	106
1	2	200 W	2	0.99	155
1	3	300 W	3	0.98	202
1	4	300 W	4	0.99	250
2, 3	1	200 W	2	0.99	155
2, 3	2	300 W	4	0.99	250
2, 3	3	500 W	6	0.98	340
2, 3	4	300 W (2)	8	0.97	450
4	1	300 W	4	0.99	250
5	1	200 W	2	0.99	155

Low VA Halogen Lamps

Sign Size	No. of Modules	Trans-former	No. of Lamps	Sign Power Factor	Volt Amp VA Load
48 Watt Lamps — Style 3, 5-Step Signs (2.8 - 6.6 A)					
1	1	200 W	1	0.97	105
1	2	300 W	2	0.98	145
1	3	500 W	3	0.98	190
1	4	500 W	4	0.98	233
2, 3	1	300 W	2	0.98	145
2, 3	2	500 W	4	0.98	233
2, 3	3	500 & 300 W	6	0.98	350
2, 3	4	500 W (2)	8	0.97	440
4	1	500 W	4	0.98	233
5	1	300 W	2	0.98	145

Low VA Halogen Lamps

Sign Size	No. of Modules	Trans-former	No. of Lamps	Sign Power Factor	Volt Amp VA Load
48 Watt Lamps — Style 5 Signs (5.5 A)					
1	1	45 W*	1	0.99	48
1	2	100W	2	0.99	96
1	3	200 W	3	0.99	144
1	4	200 W	4	0.99	192
2, 3	1	100 W	2	0.99	96
2, 3	2	200 W	4	0.99	192
2, 3	3	300 W	6	1.00	288
2, 3	4	500 W	8	0.98	384
4	1	200 W	4	0.99	192
5	1	100 W	2	0.99	96

Notes
* Substitute 65 W transformer when implementing an LED retrofit kit.

2.2.2 Optional Equipment

This subsection discusses optional equipment. Optional equipment includes the Lamps-Out Indicator and the On/Off switch.

2.2.2.1 Optional Lamps-Out Indicator (Halogen Signs Only)

The Lamps-Out Indicator (LOI) is an optional component used in conjunction with the Signature Series sign electronics to give a visual indication that a lamp has failed. This allows airport personnel to quickly find a sign with a failed lamp. The LOI flashes a small blue LED with a narrow field of view designed for direct viewing only from one side of the sign at eye level or from the seat of a truck so that pilots are not distracted.

During operation, the Signature Series sign electronics constantly monitors whether a lamp has failed. When a lamp fails, the sign electronics sends a signal to the LOI indicating that a lamp has failed. After the power is turned on, the LOI immediately starts charging its capacitors through the sign electronics. When the LOI has reached sufficient charge, the LED mounted on one side of the sign starts to flash at a rate of once every two seconds, with or without the sign being powered. At full charge (approximately

6 hours), the LOI flashes, without the sign being powered, for approximately 24 hours. The LOI continues to flash until the failed lamp has been replaced and the sign power is cycled from off to on.

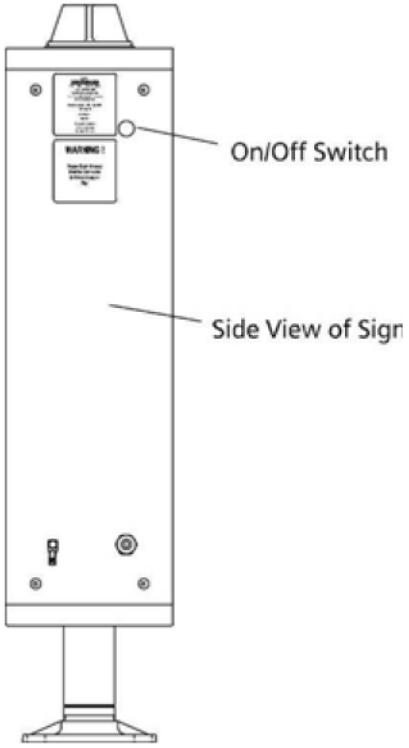
The LOI LED can be set to one of three intensity levels: Low, Medium, and High. The different levels are intended to cover a wide range of viewing conditions such as weather, night or day viewing, and distance.

For more information on installing and operating the Lamps-Out Indicator, refer to *Optional Lamps-Out Indicator Mounting* in the *Installation* section.

2.2.2.2 Optional On/Off Switch

See Figure 2 . The optional push button On/Off switch can be used to turn off the sign directly at the sign to service the sign on an active airfield circuit. In the Off position, the switch shorts the secondary of the isolation transformer. Refer to the *Parts* section for the part number.

Figure 2: Optional On/Off Switch



2.2.3 L-858 Signs: Required Equipment

Refer to Table 2 for required equipment that is supplied. Refer to Table 3 for required equipment that is not supplied.

Table 2: Required Equipment Supplied

Description	Quantity
L-858 sign	As required
Instruction manual	2 per order
L-858 tether assembly	As required

Table 3: Required Equipment Not Supplied

Description	Quantity
L-867 Base	1
L-830 Isolation Transformer	1
L-823 Primary Connectors	As required
Anchor bolts (two 1/2-13 bolts per foot)	As required
Anti-seize compound/petroleum jelly	As required
Level (spirit or digital)	1

3.0 Installation

WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

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 WILL VOID THE WARRANTY

See Sign Mounting for detailed instructions. Also see FAA AC 150/5340-30, Figure 126, for concrete base design.

3.1 Introduction

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.

3.2 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.

3.3 Sign Installation on Concrete Pad

Note

Follow site plans and specifications for concrete dimensions.

3.3.1 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 module.
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 inches wide x 7.50 inches 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.
   - 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 1 and 2 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 inch 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

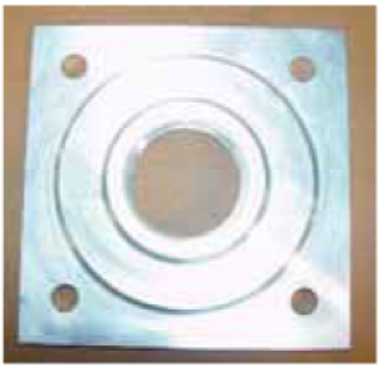
With either anchoring system, the allowable load for any specific bolt is dependent upon several factors; type of concrete, depth of embedment, edge distance, anchor spacing, etc. ADB can advise the customer of various manufacturers of anchor bolts, but ADB cannot approve their specific installation.

Figure 3: Mode 1 and 2 Frangible Couplings

- For the Mode 3

  Before the concrete sets, install four 1/2−13 anchor bolts into the concrete pad. The bolt holes are on an 8-inch-diameter bolt circle, 90 degrees apart as shown. Holes are 0.62 diameter. Overall size is 7.75 x 7.75 inches. Bolts should be located perpendicular to the sign face.

Figure 4: Mode 3 Frangible Couplings



Note

A customer-supplied setting fixture is recommended to hold the bolts in position while the concrete sets.

Note

Anchor bolts 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 are recommended for installing the flanges after the concrete sets.

3.3.2 Sign Mounting

Note

Signs up to four modules 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.

Note

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 8 . 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.

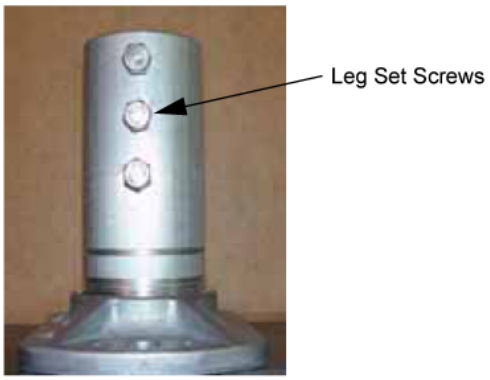
Note

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.

Note

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 the ADB Safegate Sales Department.

Figure 5: Sign Frangible Coupling



WARNING

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 Wiring . Refer to Schematics for electrical connections.

WARNING

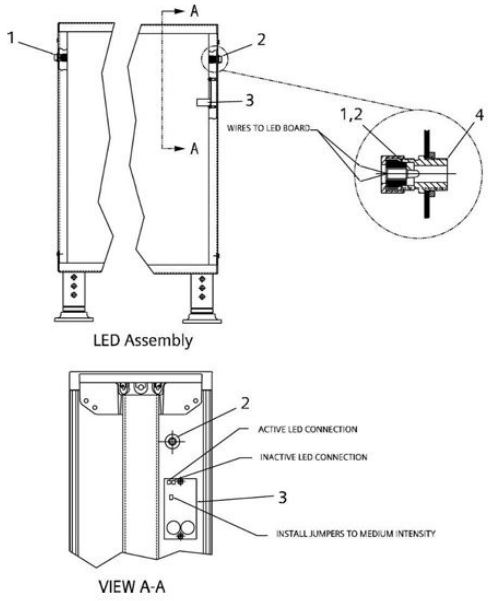
Lock out power before making any electrical connections. Failure to observe this warning may result in personal injury, death, or equipment damage.

4. Install optional tether. Refer to Optional Tethers .
5. Plug the cord set into the sign and the transformer.
6. Reinstall panels (if removed) and top lid (if removed). Refer to Repair for more information on installing the lid.

3.3.3 Optional Lamps-Out Indicator Mounting

See Figure 6 . Signs with optional Lamps-Out Indicator (LOI) are factory-installed and shipped with an LED mounted on one side of the sign. The LOI LED comes wired and is set at medium intensity. The LOI can be used only on halogen lamp Style 2 and Style 3 signs.

Figure 6: Lamps-Out Indicator Kit Assembly

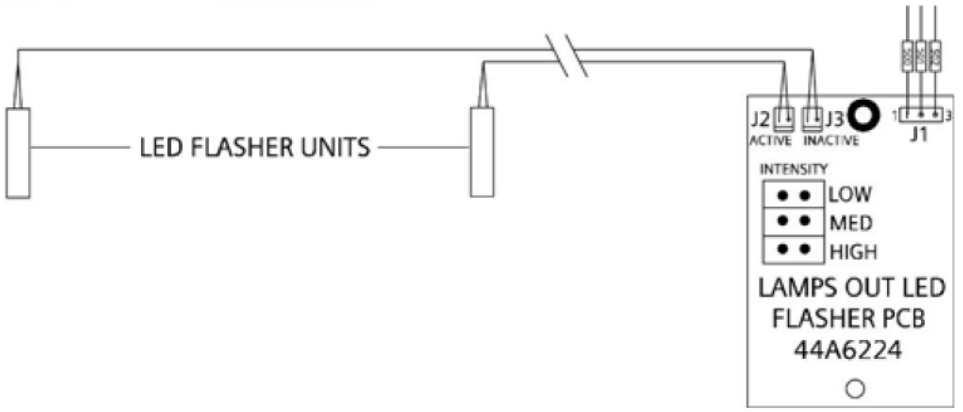


1. Lamps-Out Indicator LED Assembly, (190 Inch-Leads)	3. LED Lamps-Out Indicator PCB
2. Lamps-Out Indicator LED Assembly, (10 Inch-Leads)	4. ½-Inch Watertight Connector

See Figure 6 and Figure 7 . Once the sign is installed, it is possible to change the LED intensity and the side of the sign in which the LED is activated. To determine which LED to make active, open the sign and plug the desired LED connector onto the ACTIVE header on the LOI PCB.

The LOI LED intensity level (Low, Medium, and High) can be changed by opening the sign and moving the intensity jumper shunt on the LOI PCB to the desired level.

Figure 7: Lamps-Out Indicator Wiring



3.3.4 Wiring

Refer to Schematics 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 6.6 A (or 20 A) lighting system power supply. The signs are connected into the series circuit by means of an internal 5.5 A-6.2 A step-up isolation transformer for Style 5, Sizes 1, 3, 4, and 5 signs, or a 5.5 A-6.0 A step-up isolation transformer for Style 5, Size 2 sign. If installation is to be independent of other lighting circuits, use current edition of AC 150/5340-30, *Design and Installation Details for Airport Visual Aids* , for system reference and material needs.

3.3.5 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.

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.

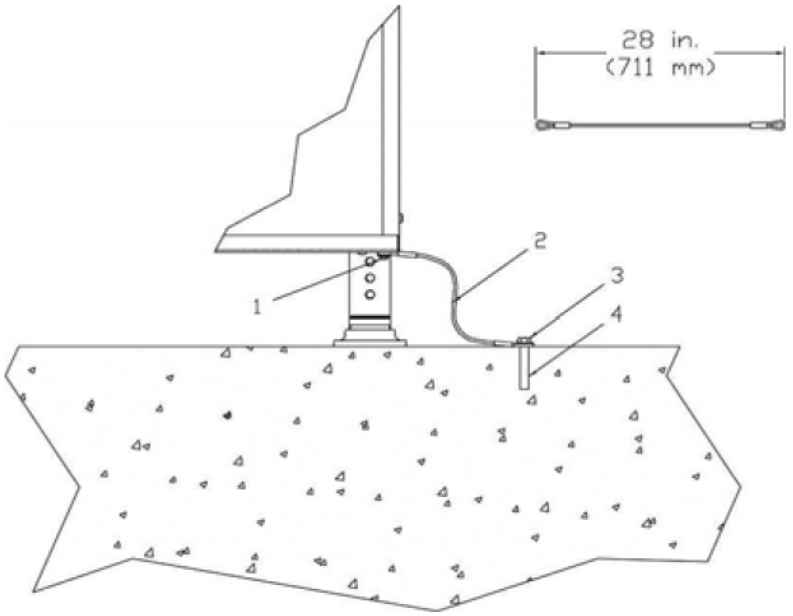
3.3.6 Optional Tethers

See Figure 9 . Tethers are shipped installed per 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 8: Installing Optional Tether



1. Existing 5/16-18 x ¾ in. Bolt
2. Tether
3. Mounting Hardware Attached to Expansion Anchor
4. Expansion Anchor for Bolt

   To attach a tether, install the customer-supplied mounting hardware (3) to attach the tether to the expansion anchor (4) on the concrete pad.

3.3.7 Series Wiring Isolation Transformers

The following section applies only to signs that require two isolation transformers and in some installations where it is desirable to replace one high-wattage isolation transformer with two lower-wattage isolation transformers.

For larger signs that require two isolation transformers for operation the two isolation transformers shall be wired in series to provide the total wattage required for operation. If unsure of the isolation transformer(s) required for the sign, refer to the Sign Load & Transformer Requirements section in this user manual.

When a high-wattage isolation transformer is required, it is permissible to use two lower-wattage isolation transformers instead. This can only be done if they are series-wired and provided the total wattage of the two isolation transformers equals the isolation transformer it is replacing. For example, you can replace the 500 W isolation transformer with series-wired 300 W and 200 W isolation transformers.

Note

On occasion, the windings in the Isolation Transformers may be wired differently. The result will be that the output voltage on the secondary of the isolation transformer will be out of phase when the two transformers are in series. This condition will result in improper operation of the sign. This situation is resolved by replacing the field splice kit on one of the transformer's secondary and reversing the wires.

See Table 4 for kits/parts required for series wiring isolation transformers. See Figure 9 for series wiring isolation transformer installation.

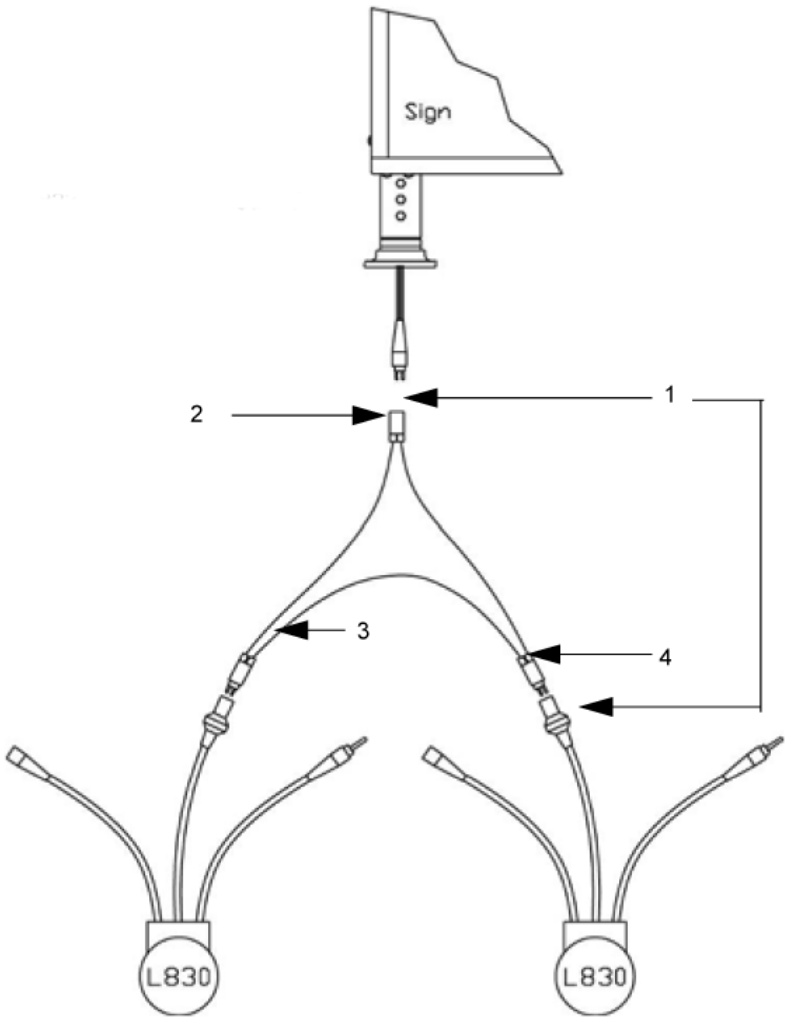
Table 4: Series Wiring Isolation Transformer Kits

Item	Description	Part Number	Quantity
1	L-830 series wire kit	94A0173	1
2	Style 11 receptacle kit	70A0046	1
3	Jumper wire	89A0154	6 feet
4	Style 4 plug kit	70A0045	2

Note

See above concerning phasing when transformers are in series.

Figure 9: Series Wiring Isolation Transformer Installation



Note

Male cord-set supplied with the sign.

3.4 Sign Mounting and Installation

WARNING

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

3.4.1 General Guidelines

When installing signs, follow the guidelines below

- **See 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.

3.4.2 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 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.

3.4.3 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 (the 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 Safegate' 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.

- For special situations where visibility would be improved, refer to FAA AC 150/5340-18 for the correct orientation.
- For signs identifying an instrument landing system (ILS) critical area, coordinate the location and orientation with the local FAA airway facilities personnel, and schedule installation with periodic ILS flight checks to ensure that signs do not cause interference with the ILS electronic signal.

3.4.4 Sign Distance from Pavement Edge

Refer to Table 5 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 5: 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

3.5 Cord set and Extension Cords

See Figure 10 . Refer to Table 8 for cord set and extension cord types. Refer to Table 7 for cord set and cord parts.

Figure 10: L-823 Cord set and Extension Cords

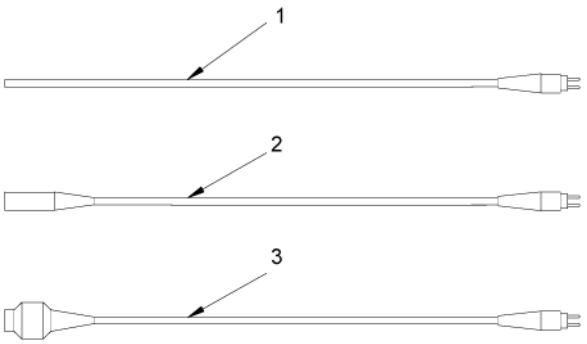


Table 6: Cord set and Extension Cord Length

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 7: 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.
NOTE 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).
NOTE 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.
NOTE D: Receptacle must be connected to plug on, Plug Type II, Class A, and Style 1, supplied with the sign.

3.6 Cord set Exit Location #4

Figure 11 shows cord set location #4. Refer to Table 8 for cord set location #4 parts and part numbers.

Figure 11: Cord set Location #4 (Standard)

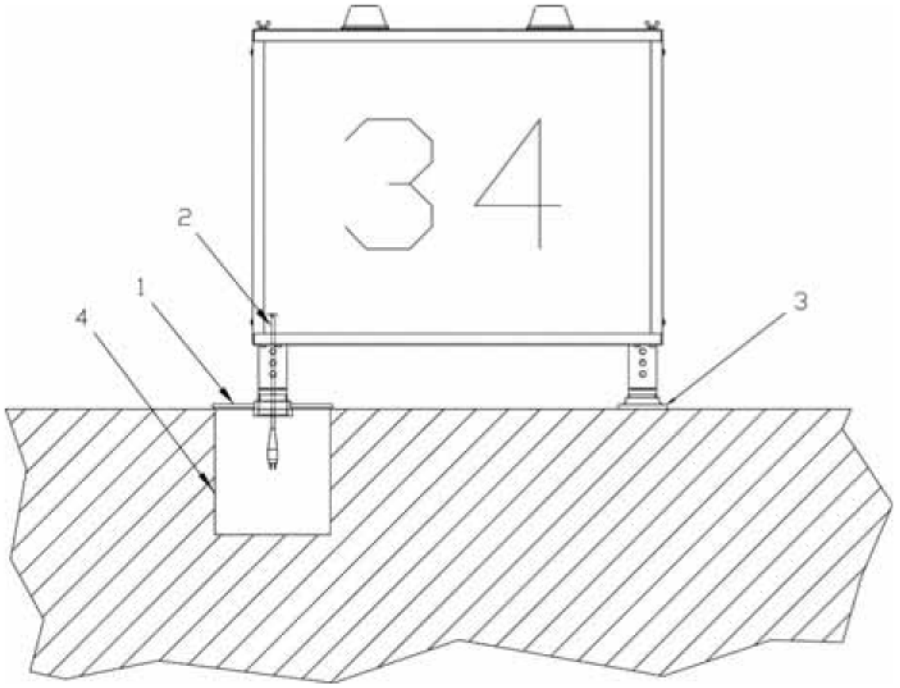


Table 8: Table 3-5 Cord set Location #4 Parts

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

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

3.7 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.

3.7.1 Cord set Installation Reference Numbers

This subsection provides special cord set locations with parts and part numbers. See Figure 12 for the ordering code for the L-858 sign. Special cord set installation reference numbers are located in the ordering code.

3.7.2 Cord set Exit Location #1

Figure 12 shows cord set location #1. Refer to Table 9 for cord set location #1 parts and part numbers.

Figure 12: Cord set Location #1 (Non-typical)

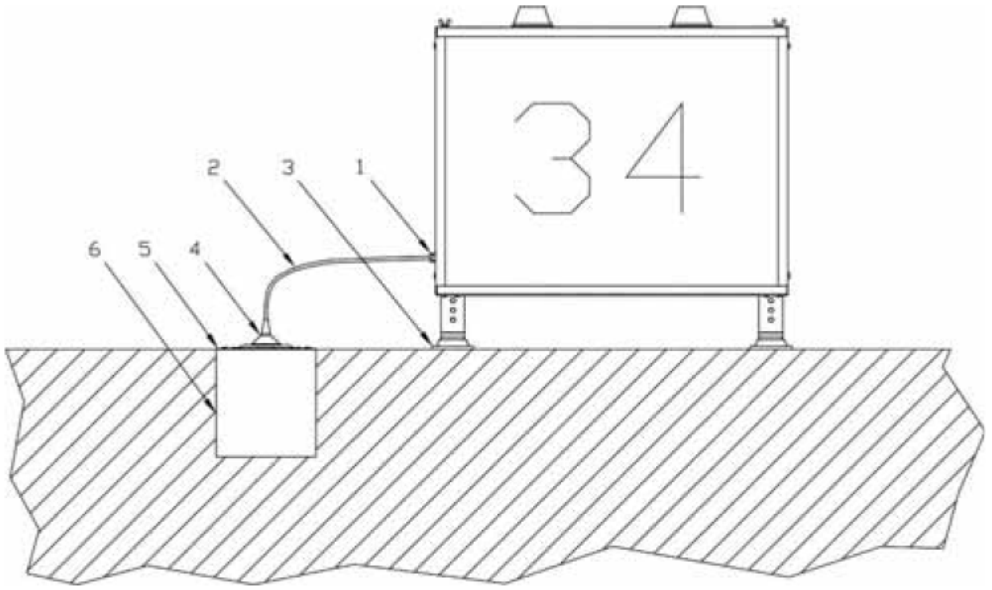


Table 9: Cord set Location #1 Parts

Item	Description	Supplier	Part Number	Note
1	Strain relief	ADB Safegate	77A0156	A
2	Cord set 16/2 SOW 600 V	ADB Safegate	Supplied with sign	B
3	Base flange	ADB Safegate	62A2142 or 62A2146	A
4	Connector plug	ADB Safegate	63B0550	C

Table 9: Cord set Location #1 Parts (Continued)

Item	Description	Supplier	Part Number	Note
5	2-in. (50.8-mm) L-867 base plate	ADB Safegate	1932	C
6	12 x 24 in. (304.8 x 609.6 mm) L-867B base	ADB Safegate	2124	C

Notes

1 NOTE A: Shown for reference only. Part supplied with sign.

2 NOTE 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.

3 NOTE C: Requires a separate line item on the purchase order.

3.7.3 Cord set Exit Location #2

Figure 13 shows cord set location #2. Refer to Table 10 for cord set location #2 parts and part numbers.

Figure 13: Cord set Location #2 (Non-typical)

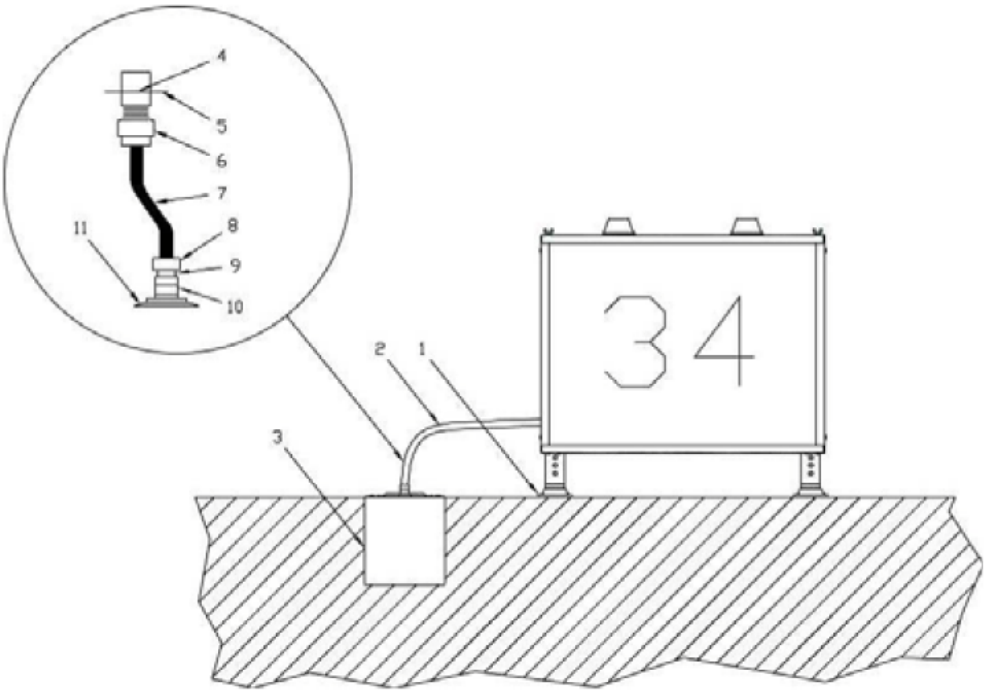


Table 10: Cord set Location #2 Parts

Item	Description	Supplier	Part Number	Note
1	Base flange	ADB Safegate	62A2142 or 62A2146	D
2	L-823 cord set 16/2 SOW 600 V	ADB Safegate	Supplied with sign	B
3	12 x 24 in. (304.8 x 609.6 mm) L-867B base	ADB Safegate	2124	C
7	Flexible conduit	Contractor	Not applicable	A
10	Frangible coupling	ADB Safegate	62A0711	C
11	2 in. (50.8 mm) L-867 base plate	ADB Safegate	1932	C

Notes

Table 10: Cord set Location #2 Parts (Continued)

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

Table 11: Flexible Conduit Connectors

Item	Description	Supplier
4	3/4-inch (44.45 mm) diameter hole	ADB Safegate
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

3.7.4 Cord set Exit Location #3

Figure 14 shows cord set location #3. Refer to Table 12 for cord set location #3 parts and part numbers.

Figure 14: Cord set Location #3 (Standard)

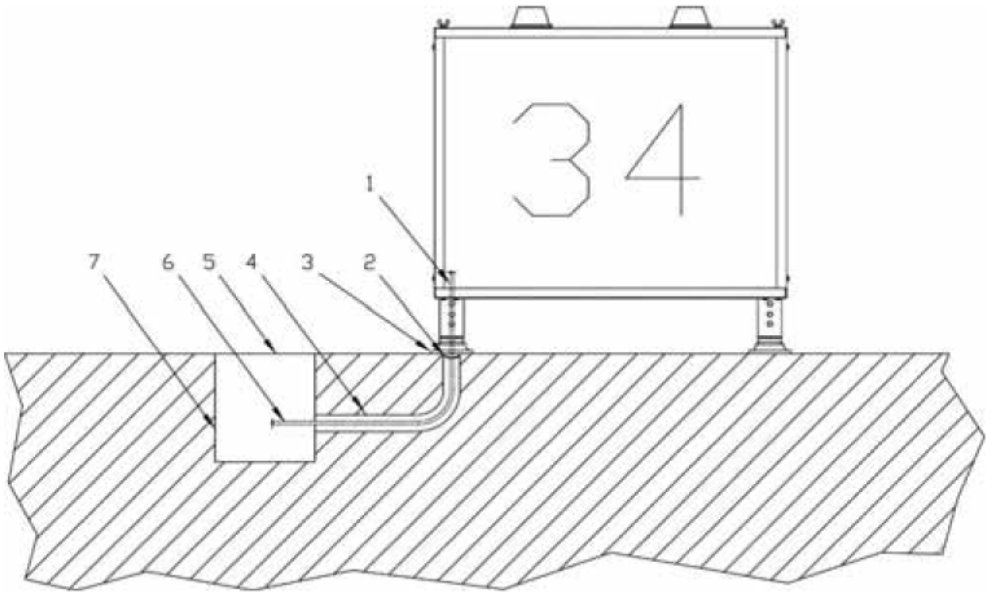


Table 12: Cord set Location #3 Parts

Item	Description	Supplier	Part Number	Note
1	Cord set 16/2 SOW 600 V	ADB Safegate	Not applicable	A
2	Cable clamp	ADB Safegate	60A2851	B
3	Base flange	ADB Safegate	62A2142 or 62A2146	A
4	2-in. (50.8 mm) rigid conduit		Not applicable	E

Table 12: Cord set Location #3 Parts (Continued)

Item	Description	Supplier	Part Number	Note
5	3/8 inch (9.53 mm) thick base plate	ADB Safegate	1000-6	C
6	8-foot (2.44 m) extension cord	ADB Safegate	73A0109-8	C
7	12 x 24 in. (304.8 x 609.6 mm) L-867B base	ADB Safegate	2124	C
NS	Gasket	ADB Safegate	2052	B, D

Notes

10 NOTE A: Shown for reference only. Part supplied with sign.

11 NOTE B: Requires a separate line item on purchase order.

12 NOTE C: Refer to Figure 12for extension cords available if different extension cord length is required.

13 NOTE D: Gasket is sold separately.

14 Note E: Supplied by others.

4.0 Maintenance

4.1 Introduction

This section provides preventive maintenance for L-858 signs.

4.2 Maintenance Schedule

To keep the L-858 taxiway and runway signs operating efficiently, follow a preventive maintenance schedule. Refer to Table 13 .

Table 13: L-858 Taxiway and Runway Sign Maintenance

Interval	Maintenance Task	Action
Daily	Check for burned-out lamps.	Replace burned-out lamps. 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 wire.	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.

4.3 Troubleshooting

WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Always remove input power to a sign before making any wiring connections. Failure to observe this warning may result in personal injury, death, or equipment damage.

4.3.1 Introduction

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 Safegate representative for help.

4.3.2 Troubleshooting Procedures

Problem – Halogen	Possible Cause	Corrective Action
All lamps are out or not functioning correctly.	Loose wires or connections	Tighten or replace wires. Check L830 for out of phase condition.
	Lamp(s) burned out	Replace lamp(s). Refer to Repair . **Note** If any burned-out lamp is near its maximum life, it is recommended that you replace all lamps.
	CCR circuit-shorted	Check circuit. Refer to AC 150/5340-26.

Problem – Halogen	Possible Cause	Corrective Action
All Lamps are out or not functioning correctly.	Loose wires or connections	Tighten or replace wires.
	CCR circuit-shorted	Check circuit operation.
	Sign ON/OFF switch is closed.	Check the Sign ON/OFF switch for proper operation. Replace if necessary.
	Power supply fault or CCR is not operating correctly	Remove the cover to observe the power supply board with two LEDs located near the notch where the wires enter the supply. LEDs are labeled D13 for Red and D12 for Green. When power is first applied, the green LED will flash (several times) first, followed by the Red LED flashing (several times) lasting about 10 seconds, followed by a regular green flashing "heartbeat" (at about a one blink per second rate). The initial x-times flash is for manufacturing purposes and may vary in number from board to board. When the regular green flashing "heartbeat" flashes, the red LED may flicker a couple of times until the circuit stabilizes but will extinguish quickly under normal operating conditions. If the green "heartbeat" is present and the red LED lights solidly, this indicates that the power supply is good but there is an open on the output of the power supply (likely either the interconnecting wires or one of the halogen lamps are burned out). If no status LEDs light or one or both lights solidly, and power is applied to the input, then the power supply needs to be replaced. [1]
Light Panels are too dim.	Power supply fault or CCR is not operating correctly [1]	Check the CCR's output current.
	Jumper P6 on Power Supply is set incorrectly or missing	Check the P6 jumper setting and compare to chart on Figure 15 to confirm or correct placement of the jumper. **CAUTION** Remove power prior to changing jumper settings.
Optional Lamps Out Indicator continues to flash after replacing lamps.	There may be another burnt out lamp.	Verify all lamps are tightly seated and not burnt out.
	Power to sign has not been cycled.	Remove power to sign for at least one minute and then power back up.

Notes

[1] If you have a Halogen Sign with the 44A6225/X top-mounted power supply, please see the manual 96A0286 Rev AG on our Web site. If you wish to migrate the old power supply to the new (44A7199/200) one used in this manual, please call your ADB representative.

Note

There is no jumper setting for changing between 50/60 hz.

There are no jumper settings for backup lamp use.

4.3.3 Checking the Halogen Lamp Sign Power Supply

[1] If you have a Halogen Sign with the 44A6225/X top-mounted power supply, please see the manual 96A0286 Rev AG on our Web site. If you wish to migrate the old power supply to the new (44A7199/200) one used in this manual, please call your ADB representative.

When power is applied...

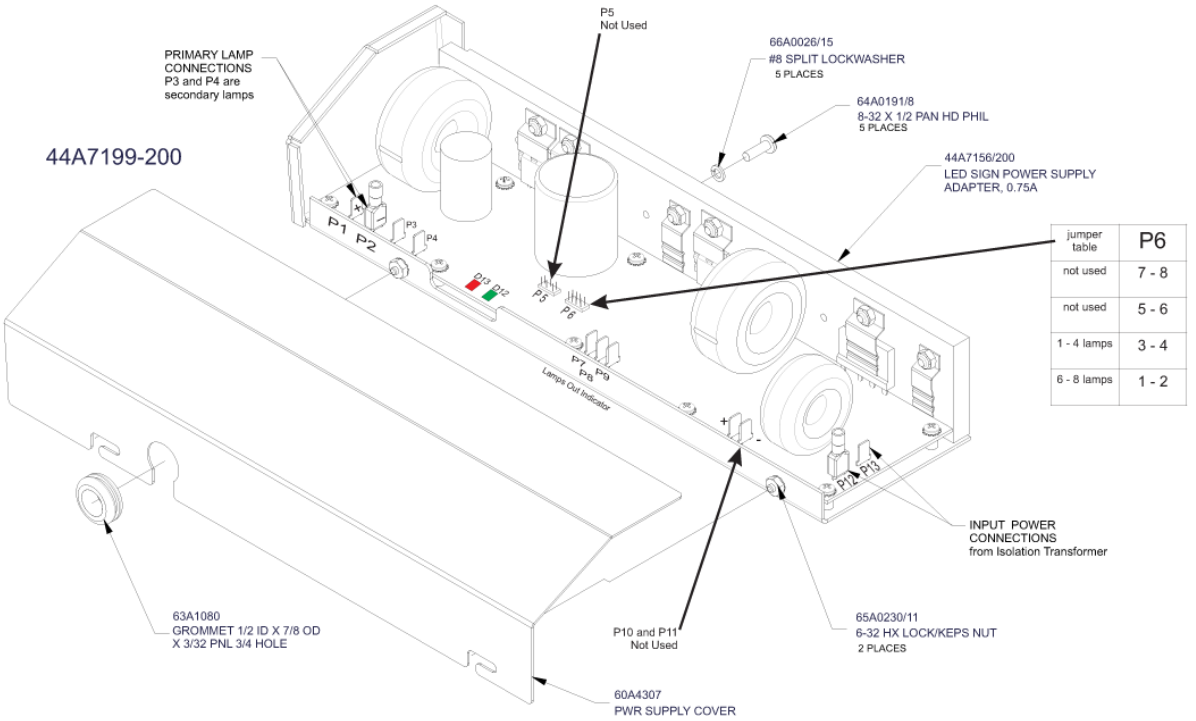
- All of the lamps should illuminate if all components are wired and functioning correctly.

> **Note**
> When the power is first applied, the Red and Green LEDs will blink several times for about 10 seconds while the sign performs internal PCB self-checks. The sign may turn off and on also during this testing period. When the testing is done the (D13) red LED should be off and the (D12) green LED should blink about once per second.

- If the lamps do not illuminate and the onboard Red LED (D13) comes on, there is an open in the output current loop to the lamps or a burnt out lamp. Remove the input power and check the output wiring for correct polarity and opens or shorts referring to Schematics .

- If the lamps do not illuminate and the onboard Green LED (D12) does not flash at a 1 second rate (heartbeat), then there is a fault on the power supply board or incoming power. Remove the input power and check the input wiring for opens or shorts.
- Make certain you replace the cover after you are done checking the power supply.

Figure 15: Halogen Sign Power Supply 44A7199-200 with Cover Removed



Refer to Table 14 for the power supply LEDs.

Table 14: Halogen Sign Power Supply LEDs

LED	Function
Green (D12)	Flashes at 120 beats per minute when power is applied to the power supply board.
Red (D13)	Indicates the power supply board assembly is not able to maintain a regulated lamp current. This also indicates that at least one lamp is burnt out.

4.3.4 Halogen Lamp Power Supply Connections

If you replace the power supply board, refer to Table 15 for the power supply board connections. See also Schematics . Refer to Checking the Halogen Lamp Sign Power Supply .

Table 15: Halogen Sign Power Supply Connections

This connector...	Connects to this device...
P1, P2	A string of up to eight 48 W primary lamps
P3, P4	A string of up to eight 48 W backup lamps
P12, P13	The output of a 6.6 A isolation transformer providing input power for the halogen sign
P7, P8, P9	Optional lamps-out indicator

4.4 Schematics

4.4.1 Halogen Sign Wiring

Figure 16: Halogen Wiring Diagram (43A02656 Sheet 1)

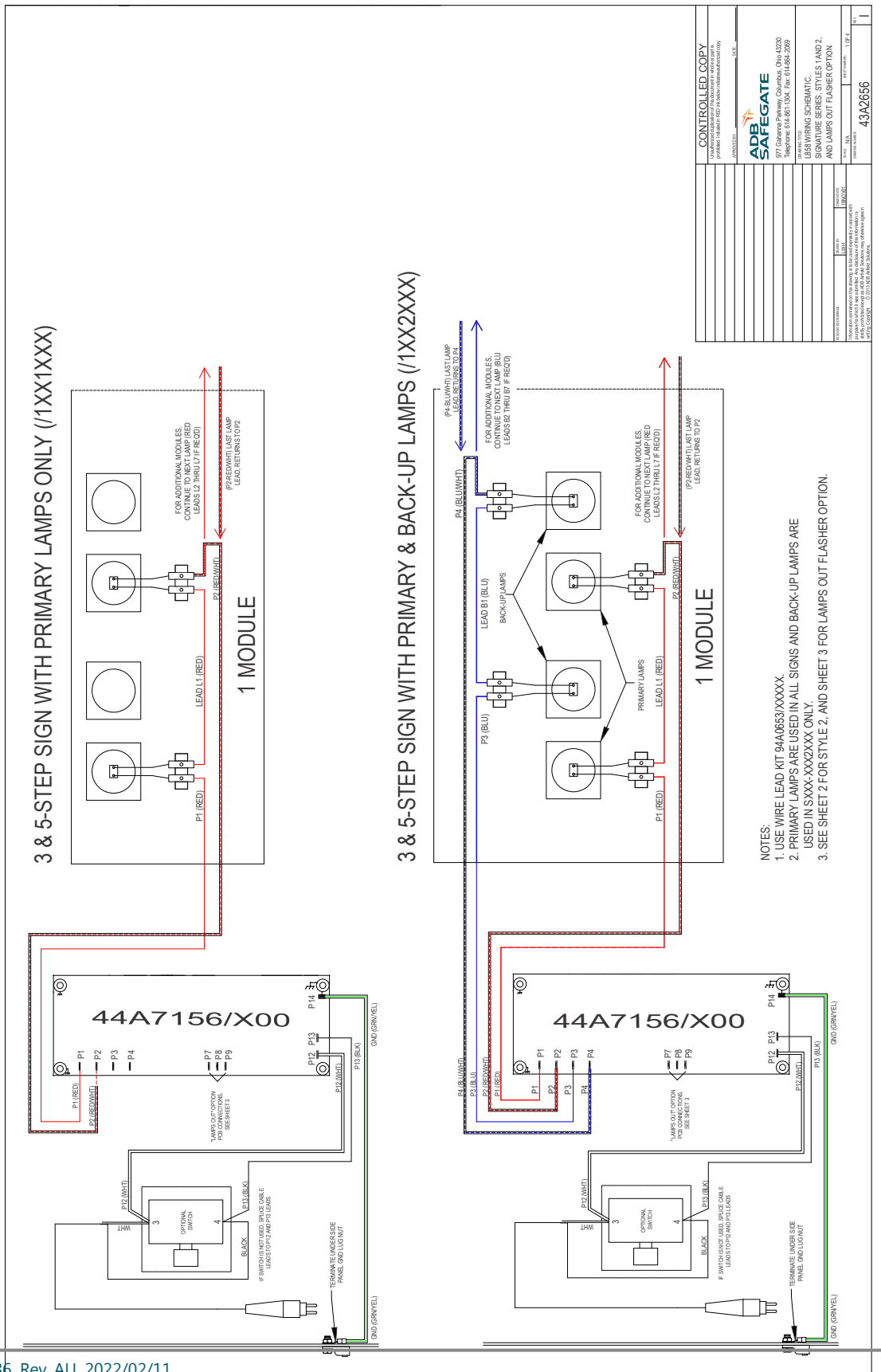


Figure 17: Halogen Wiring Diagram (43A02656 Sheet 2)

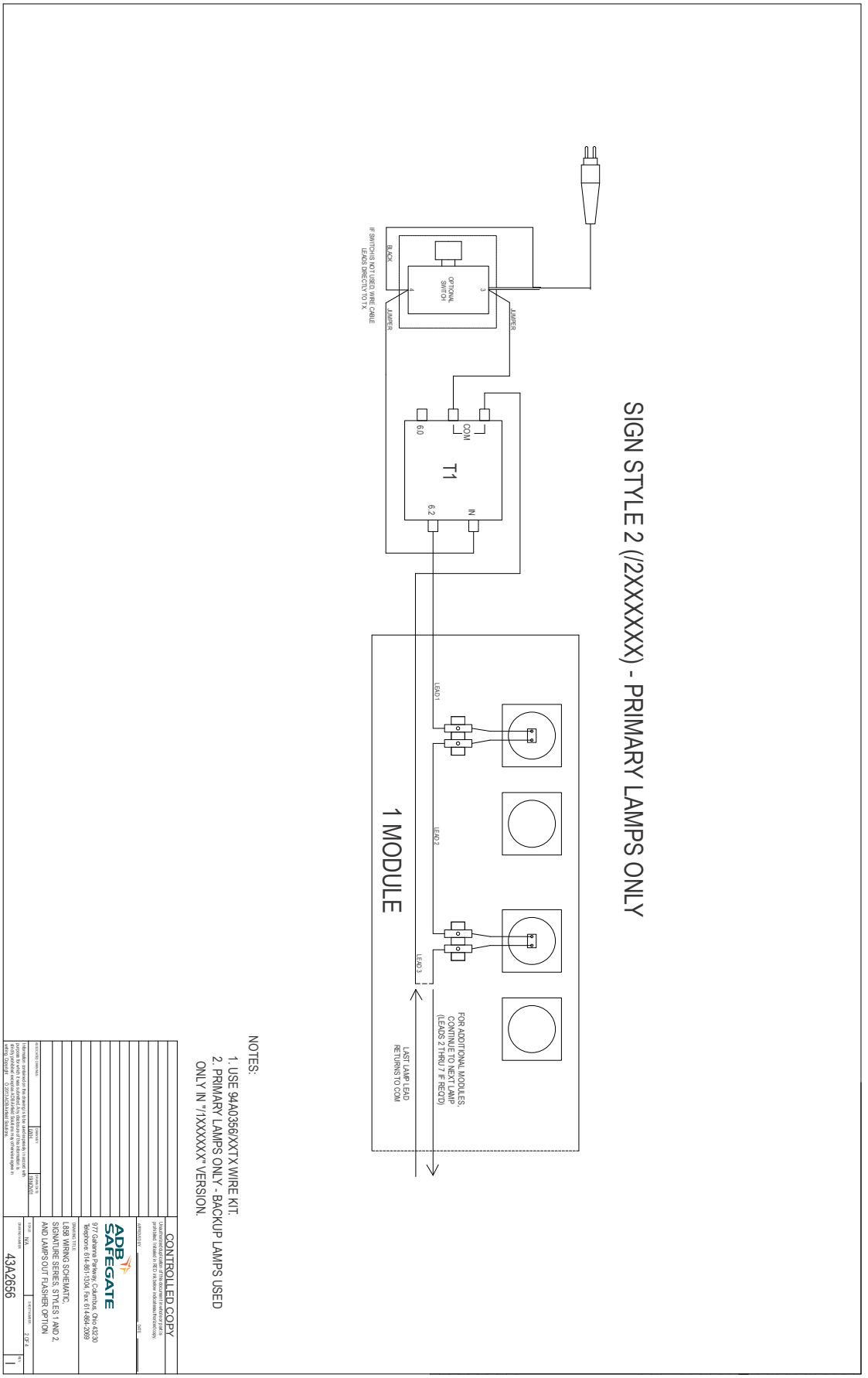


Figure 18: Halogen Lamps Out Monitoring Diagram (43A2656 Sheet 3)

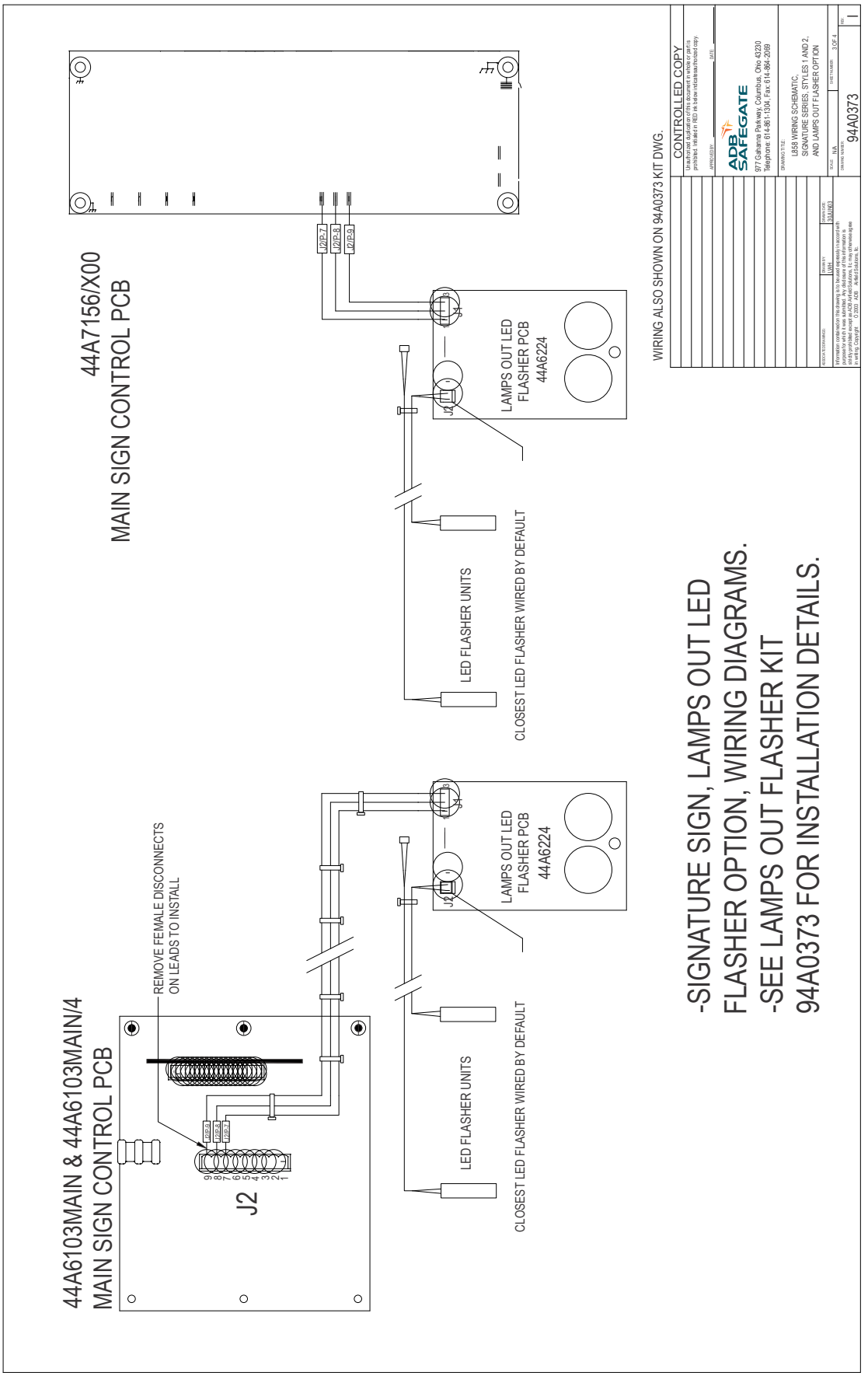
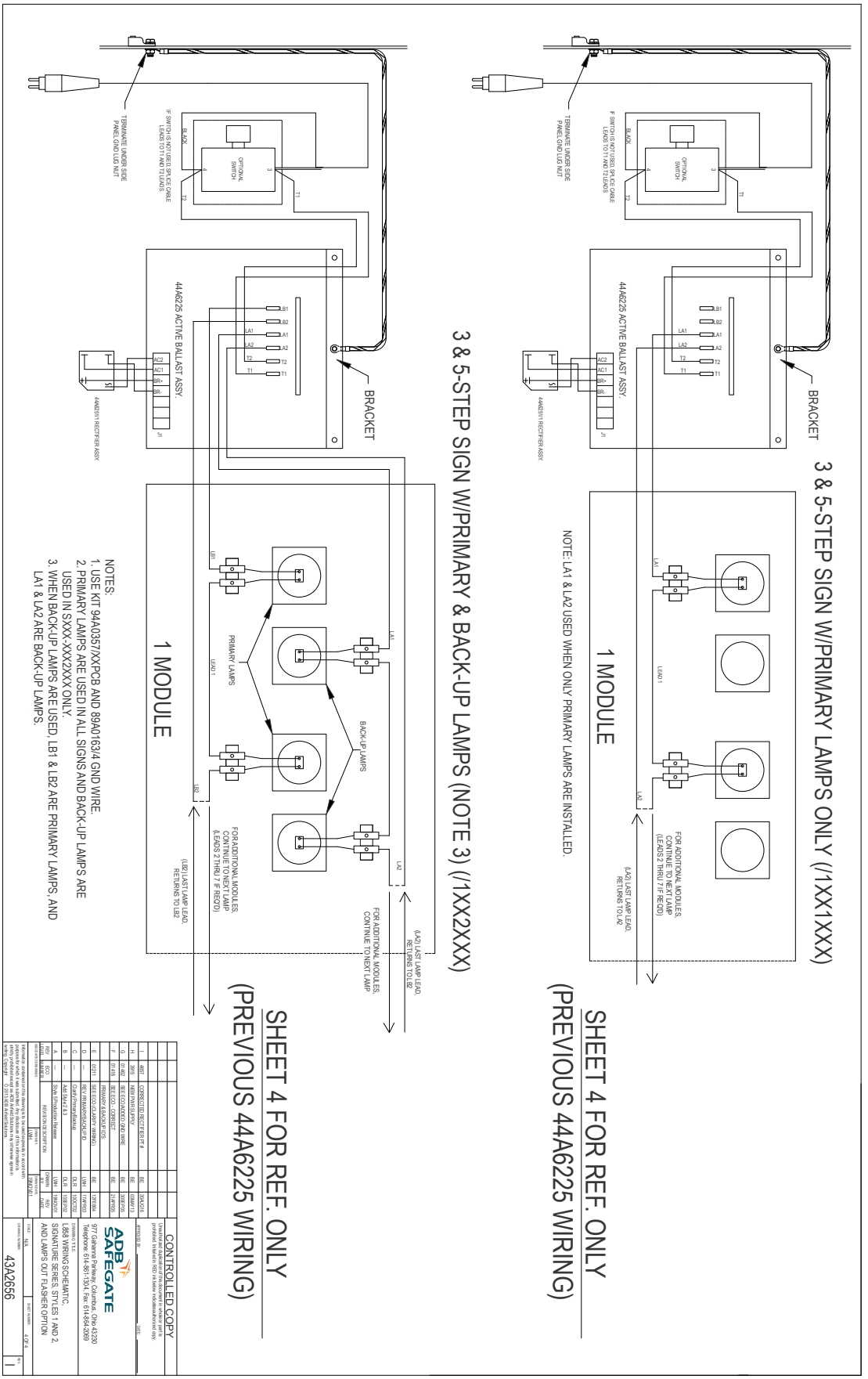


Figure 19: Halogen Wiring Diagram (old version) (43A2656 Sheet 4)



4.5 Repair

WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

This section provides procedures for replacing lamps and active ballast assembly.

4.5.1 Halogen Lamp Replacement

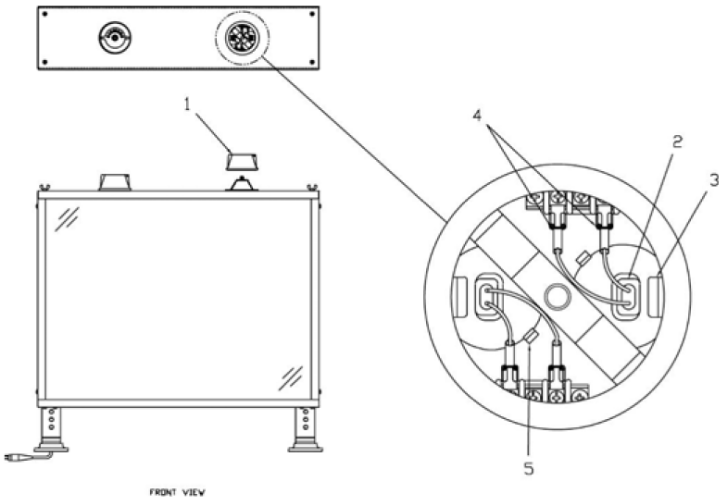
WARNING

Turn off the power to the sign before replacing lamps. Failure to observe this warning may result in personal injury, death, or equipment damage.

To replace lamp(s), perform the following procedure:

1. Turn off the power to the sign.
2. See Figure 20 . Remove the lamp cover (1) by rotating the lamp cover (1) counterclockwise.

Figure 20: Halogen Lamp Replacement (Shown with Backup Lamp)

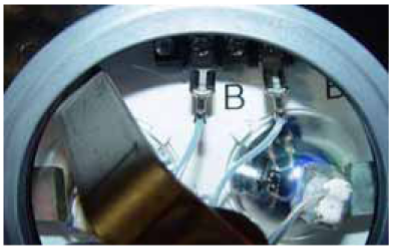


1. Lamp Cover	3. Lamp Retention Spring	5. Lamp Retention Tab
2. Lamp	4. Lamp Leads	

3. Disconnect lamp leads (4).

Note

The back-up lamp is identified by either a “B” or the words “Back-up Lamp” stamped next to the terminal block for the back-up lamp. See photographs on the next page.



4. Remove lamp(s) by sliding lamp toward lamp retention spring (3) and rotating past lamp retention tabs (5).
5. Install replacement lamps by reversing the removal process.

Note
Disregard lamp orientation arrow and associated note on the lamp. This note DOES NOT apply to halogen signs.

See Figure 20 . Replace the lamp cover (1) by rotating the lamp cover (1) clockwise until finger-tight, then turn one-half turn further to insure a watertight seal. Replace the gasket if worn or damaged.

5.0 Halogen Sign Parts

Ordering Code

S X X X - X X X X X X X

Lamp Type
H = Halogen
W = High Wind/Halogen[1]

Sign Size
1 = Size 1 (1 lamp per module)
2 = Size 2 (2 lamps per module)
3 = Size 3 (2 lamps per module)
4 = Size 4 (4 lamps only)
5 = Size 5 (2 lamps only)

Module
1 = 1 Module
2 = 2 Module
3 = 3 Module
4 = 4 Module

Style
1 = Low VA Halogen Style 2 & 3 (3- & 5-Step)
2 = Low VA Halogen Style 5 (5.5 A)

Face
1 = Single
2 = Double

Total Number of Panels:
X = To be determined by the Sales Department based on legend and module configurations.

Backup Lamps
1 = 48 W halogen without backup lamps
2 = 48 W halogen with backup lamps

Power
1 = Power through leg without ON/OFF switch
2 = Power through leg with ON/OFF switch
3 = Power through side without ON/OFF switch[3]
4 = Power through side with ON/OFF switch[3]
5 = Customer-provided entry without ON/OFF switch [2,3]
6 = Customer-provided entry with ON/OFF switch [2,3]
9 = Power through bottom without ON/OFF switch[3]
A = Power through bottom with ON/OFF switch[3]

Tether
0 = No tether[3]
1 = One tether on one end of sign
2 = Two tethers, one on each end
3 = One tether per leg

Lamps Out Indicator
0 = Without
1 = With

Sign Ordering Code Notes

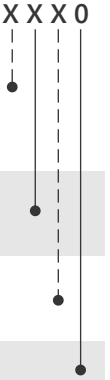
- Customer to provide legend information and power connection side. It is important to match power cord exit location with legend side.

[1] High wind signs are tested to a minimum wind load of 327 mph for Mode 3 application. High wind signs require four anchor bolts per floor flange except Size 1, which uses the standard 2-bolt foot.

[2] Cord set coiled up inside sign. Customer provides entry hole.

[3] Not ETL Certified.

STD Legend Panel Replacement 44A6084 - X X X 0



Size
1 = Size 1[1]
2 = Size 2
3 = Size 3 and 5
4 = Size 4

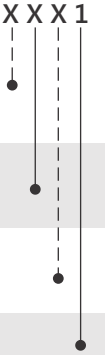
Number of Modules
1 = 1 module
2 = 2 modules

Panel Type
1 = With legend (retroreflective)
2 = Black

Sign Type
0 = Standard

Notes:
[1] For size 1 standard and high-wind signs use 44A6084-XXX0 standard legend panels.

HW Legend Panel Replacement 44A7777 - X X X 1



Size
2 = Size 2
3 = Size 3 and 5
4 = Size 4

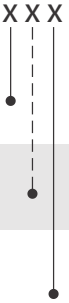
Number of Modules
1 = 1 module
2 = 2 modules

Panel Type
1 = With legend (retroreflective)
2 = Black

Sign Type
1 = High-Wind

Notes:
- For size 1 high-wind signs, use 44A6084-XXX0_standard legend panels.

Legend Panel Divider 44A6173 - X X X



Size
1 = Size 1
2 = Size 2
3 = Size 3 and 5

Paint Coverage
A = Solid (black only)[1]
C = Clear (paint top only)

Paint Color
R = Red
Y = Yellow
B = Black[1]

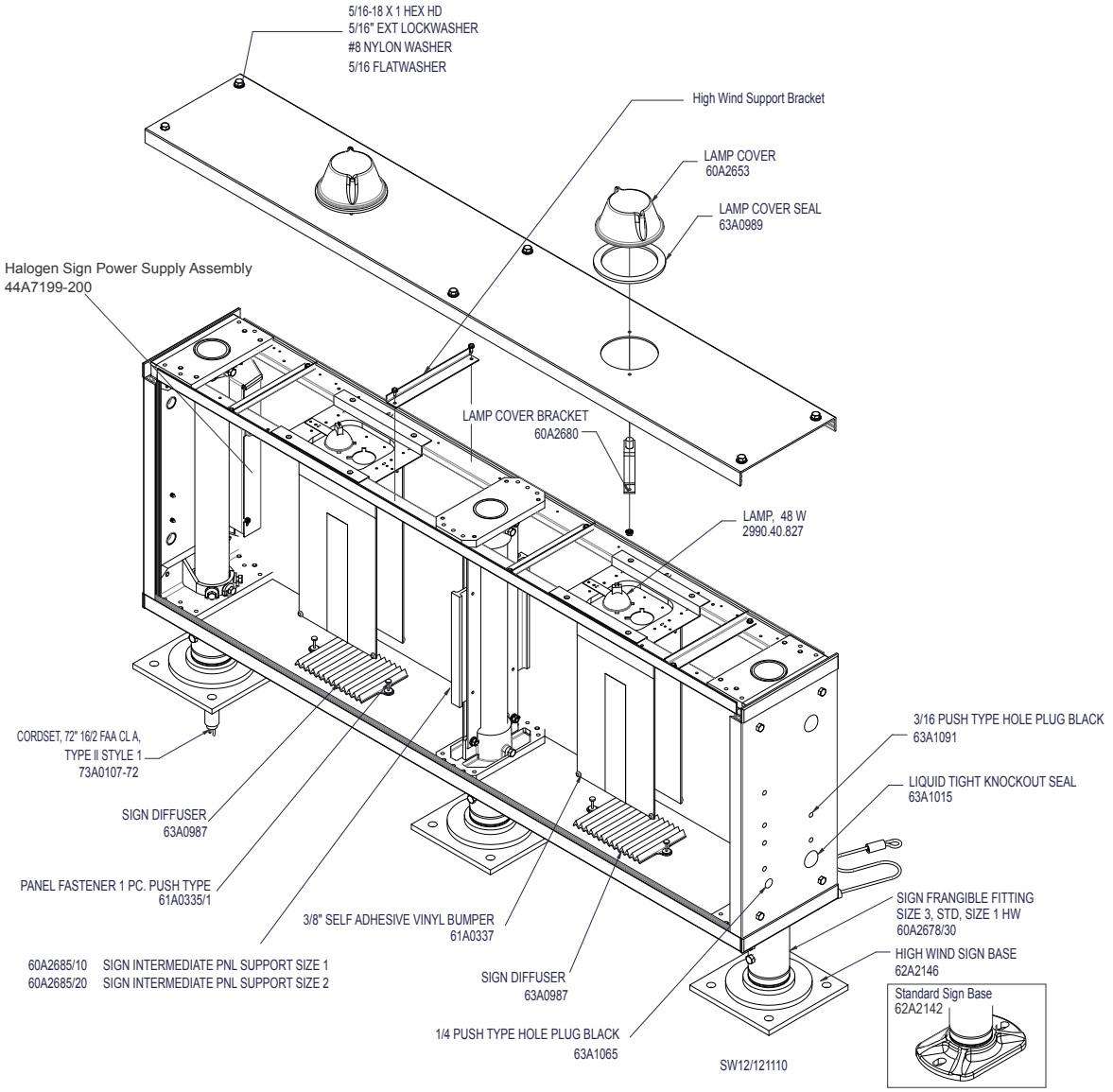
Notes:
[1] For option A (solid), customer must select option B (black). Option C (clear) can be paired with either red or yellow.

Optional Lamps-Out Indicator Kit 94A0373

Note: Used to add lamps-out indicator on existing tungsten halogen signs.

FAA Halogen Sign

Figure 21: Halogen Sign Parts Diagram (high wind shown)



Note

If you have a Halogen Sign with the 44A6225/X top-mounted power supply, please see the manual 96A0286 on our Web site. If you wish to convert the old power supply (44A6225/X) to the new power supply (44A7199/200), please call your ADB Safegate representative.

When servicing a power supply for a halogen guidance sign, ADB Safegate recommends the sign be retrofitted to LED using an LED retrofit kit (94A0628-XX0).

5.1 Spare Parts

Create a sufficiently large stock of spare parts to maintain the Halogen Sign in the field. Consider acquiring approximately 10% spare final assemblies (with a minimum quantity of 1) for the total amount of equipment in the field. This allows for repairs to be made in the shop. Components that are more likely to need replacement, such as gaskets and PCB sub-assemblies should be stocked in smaller quantities. For the Halogen Sign it is highly recommended for larger installations, at least 10% of the total units installed.

For the Halogen Sign, see the table below for spares.

- Consider acquiring 10% spares for critical components noted as (A) in the table below.

  If only a small number of units are installed, consider acquiring at least 1 of each of the components noted as (A) below.

- Also consider acquiring 1% spares for parts noted as (B) in the table below. If it is important to have a robust level of spare parts on hand, and only a small number of units are installed, consider acquiring 1 of each of the components noted as (B) below.

Table 16: Spare Parts

Part Number	Description	Location	Notes	Spares
44A7199/200S	Halogen Sign Power Supply Assembly	Figure 21		A
60A2653	Lamp Cover	Figure 21		A
63A0989	Lamp Cover Seal	Figure 21		A
2990.40.827	48W Lamp	Figure 21		A
73A0107/72	Cordset 72"	Figure 21		A
62A2146	High-Wind Mounting Flange, 4-BOLT	Figure 21		B
62A2142	Standard Mounting Flange, 2-Bolt	Figure 21		B
60A2678/10	Frangible Coupling size 1 signs mode 2	Figure 21		B
60A2678/20	Frangible Coupling size 2 signs mode 2	Figure 21		B
60A2678/30	Frangible Coupling size 3 and size 5 signs mode 2	Figure 21		B
60A2678/40	Frangible Coupling size 4 signs mode 2	Figure 21		B
60A2678/11	Frangible Coupling size 1 signs mode 3	Figure 21		B
60A2678/21	Frangible Coupling size 2 signs mode 3	Figure 21		B
60A2678/31	Frangible Coupling size 3 signs mode 3	Figure 21		B
60A2678/41	Frangible Coupling size 4 signs mode 3	Figure 21		B
60A2678/50	Frangible Coupling size 5 signs mode 3	Figure 21		B

5.2 LED Retrofit Kits for ADB Safegate L-858 Signs

LED Retrofit Kits for ADB Safegate L-858 Signs

Application

A retrofit kit is available to convert any existing ADB SAFEGATE FAA incandescent tungsten-halogen or fluorescent sign to an LED light source. The kit is available for all FAA Types: L-858Y, L-858R, L-858L and L-858B; all Sizes: Size 1 through 5; and all module lengths: up to 4 modules. Retrofitting a sign is fast and easy. It typically takes 20 minutes to retrofit a 2-module sign. The retrofit process converts the sign to the same type as an existing ADB SAFEGATE ETL-certified sign.

Reduced Maintenance Costs

An LED sign virtually eliminates runway shutdowns due to the long life LED light source. It eliminates relamping expenses and reduces ongoing maintenance costs. The LED optical design also creates a highly uniform distribution of light, eliminating hot spots and shadows. Also, the sign provides for improved safety because there is only a low, regulated DC voltage inside the sign.

Energy Savings

An LED sign provides greatly reduced energy consumption compared to existing types of signs. See table below for more information.

The LED sign operates on ferroresonant or thyristor CCRs that are designed in compliance with FAA requirements. The sign electronics are designed to operate on all steps of a 3-step or 5-step CCR and on a 5.5 A CCR.

See LED sign load chart on DS-3006: AGSF-L for sign loading and optimum sign transformer size. Note that the existing larger size transformer, if present, can be reused. Ask for Service Bulletin ALN158 for details on how to retrofit the sign.

LED Sign Retrofit Kit

94A0628 - X X 0

Size
1 = Size 1
2 = Size 2
3 = Size 3
4 = Size 4
5 = Size 5

Number of Modules
1 = 1 module
2 = 2 modules
3 = 3 modules
4 = 4 modules

LED and Halogen Sign Comparison Table

Sign Size	Style	No. of Modules	Isolation Transformer Size Required	LED Max. CCR VA Load [1]	Tungsten Halogen Max CCR VA Load [1]	Energy Savings
2,3	Style 2 (3-step)	3	500 W for T-H 100 W for LED	100	340	71%
1	Style 3 (5-step)	4	500 W for T-H 150 W for LED	100	233	57%

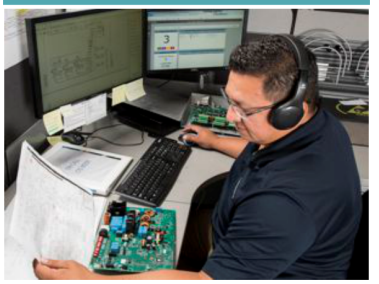
Notes
[1] CCR Load includes both sign and isolation transformer load.

Appendix A: SUPPORT

Our experienced engineers are available for support and service at all times, 24 hour/7 days a week. They are part of a dynamic organization making sure the entire ADB SAFEGATE is committed to minimal disturbance for airport operations.

ADB SAFEGATE Support

Live Technical Support - Americas
If at any time you have a question or concern about your product, just contact ADB SAFEGATE's technical service department. Trained in all areas of system issues, troubleshooting, quality control and technical assistance, our highly experienced Technical support specialists are available 24 hours a day, seven days a week to provide assistance over the phone.
ADB SAFEGATE **Americas Technical Service & Support (US & Canada): +1-800-545-4157**
ADB SAFEGATE Americas Technical Service & Support (International): +1-614-861-1304
During regular business hours, you can also Chat with a Service Technician. We look forward to working with you!



Before You Call
When you have an airfield lighting or system control system problem it is our goal to support airfield maintenance staff as quickly as possible. To support this effort we ask that you have the following information ready before calling.

- The *airport code*
- If not with an airport, then company name (prefer customer id number)
- Contact phone number and email address
- Product with part number preferable or product number
- Have you reviewed the product's manual and troubleshooting guide
- Do you have a *True RMS* meter available (and any other necessary tools)
- Be located with the product ready to troubleshoot

Note

For more information, see www.adbsafegate.com, or contact ADB SAFEGATE Support via email at support@adbsafegate.com or
Brussels: +32 2 722 17 11
Rest of Europe: +46 (0) 40 699 17 40
Americas: +1 614 861 1304. Press 3 for technical service or press 4 for sales support.
China: +86 (10) 8476 0106

A.1 ADB SAFEGATE Website

The ADB SAFEGATE website, www.adbsafegate.com, offers information regarding our airport solutions, products, company, news, links, downloads, references, contacts and more.

A.2 Recycling

A.2.1 Local Authority Recycling

The disposal of ADB SAFEGATE products is to be made at an applicable collection point for the recycling of electrical and electronic equipment. The correct disposal of equipment prevents any potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling. The recycling of materials helps to conserve natural resources. For more detailed information about recycling of products, contact your local authority city office.

A.2.2 ADB SAFEGATE Recycling

ADB SAFEGATE is fully committed to environmentally-conscious manufacturing with strict monitoring of our own processes as well as supplier components and sub-contractor operations. ADB SAFEGATE offers a recycling program for our products to all customers worldwide, whether or not the products were sold within the EU.

ADB SAFEGATE products and/or specific electrical and electronic component parts which are fully removed/separated from any customer equipment and returned will be accepted for our recycling program.

All items returned must be clearly labeled as follows:

- For *ROHS/WEEE* Recycling
- Sender contact information (Name, Business Address, Phone number).
- Main Unit Serial Number.

ADB SAFEGATE will continue to monitor and update according for any future requirements for *EU directives* as and when *EU member states* implement new *regulations* and or *amendments*. It is our aim to maintain our *compliance plan* and assist our customers.

Company Addresses

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Contact: Tel.: +49 (621) 87 55 76-0, Fax: +49 (621) 87 55 76-55	Email: marketing@adbsafegate.com Internet: www.adbsafegate.com

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