

# **ASM-LS**

# LSxxx Series High Power Loud Speaker



# **INSTALLATION AND OPERATION MANUAL**

**REV 1.20 May 2, 2022** 

Anodyne Electronics Manufacturing Corp. 100-966 Crowley Avenue Kelowna BC, Canada V1Y 0L1

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The status of this installation and operation manual is controlled by the revision shown on the title page. The status of each section is controlled by revision shown in the footer of each page. All revisions affecting sections of this manual have been incorporated.

	AEM MANUAL REVISIONS								
Section	Revision Number	Revision Description	Date						
2.7	Rev 1.20	ECO#1130: Re-entrant tip securing, added LS300-201, LS600-201	May 2, 2022						
2.3	Rev 1.11	RAS#708: Corrected Meeker PN's	October 4, 2017						
2.3	Rev 1.10	RAS#589: Updated Mechanical Installation section.	May 13, 2016						
All	Rev 1.00	Initial Release	April 24, 2015						

## **Table of Contents**

Section	Title	Page
1.0	Description	
1.1	Introduction	1-1
1.2	Product Description	1-1
1.3	Design Features	1-2
1.4	Specifications	1-2
1.4.1	Electrical Specifications	1-2
1.4.2	Physical Specifications	1-2
1.4.3	Environmental Specifications	1-2
1.5	System Configuration	1-3
2.0	Installation	
2.1	Introduction	2-1
2.2	Unpacking and Inspection	2-1
2.2.1	Warranty	2-1
2.3	Installation Procedures	2-1
2.3.1	Warnings	2-1
2.3.2	Cautions	2-2
2.3.3	Cabling and Wiring	2-2
2.3.4	Mechanical Installation	2-2
2.3.5	Post-Installation Checks	2-3
2.4	Accessories Required But Not Supplied	2-3
2.5	Continued Airworthiness	2-3
2.6	Speaker Location and Orientation	2-4
2.7	Installation Drawings	2-6
3.0	Operation	
3.1	Operation Specifics	3-1



## **Section 1.0 Description**

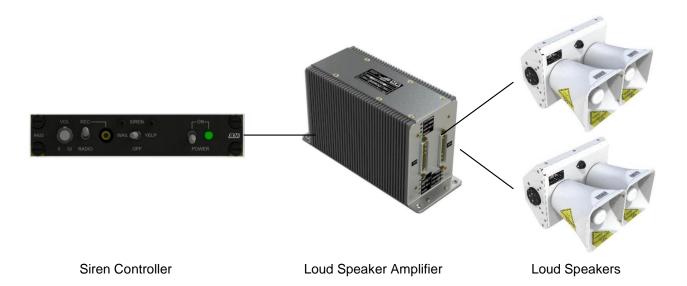
## 1.1 Introduction

Information in this section consists of product description, design features and specifications for the LSxxx Series High Power Loud Speakers.

Review all notes, warnings and cautions.

## 1.2 Product Description

The LSxxx Series Loud Speakers are high output power loud speakers for use in air-to-ground, air-to-sea, or ground-to-ground audible communication systems. The LSxxx Series speakers are intended for use with the LSA400 or LSA800 series amplifiers and a siren controller as a complete system.





## 1.3 Design Features

This series of speakers is available in a single or double bell configuration, which allows the user to vary the range and/or dispersal pattern depending on the mounting configurations.

The speaker drivers have been updated to provide much better conversion of electrical power (Watts) to sound pressure (SPL).

The LSxxx Series speakers are designed and qualified to meet many operational roles of current and future light, medium, and heavy helicopters as well as fixed wing aircraft.

## 1.4 Specifications

## 1.4.1 Electrical Specifications

Loudspeaker	Total Bell Configuration	Impedance	Rated Peak Power	Output Level @ 1m & Rated Peak Power	Weight
LS300-20x	1	5.5 Ω	300 Watts Peak	130dB	15 lbs [6 kg]
LS600-20x	2	2 Channels at 5.5 Ω each	600 Watts Peak	135dB	28 lbs [12.7 kg]

At the time of publication, performance information was available only for the speakers listed above. For details of other units, please contact the Product Support department at AEM.

### 1.4.2 Physical Specifications

See Mechanical Installation drawings (LSxxx-xxx-922-0) for speaker physical specifications (where x is the model reference of the specific unit under consideration, i.e. LS300-200-922-0)

## 1.4.3 Environmental Specifications

Temperature	-40 to +60°C (operating) -55 to +85°C (survival)
Altitude	+25,000 ft. (+7,620 m) max.
Humidity	95% Non-condensing
Shock	6g (any axis)
Vibration	DO-160G Category 'S' Curves B & M and Category 'U2' Curves F & F1
Magnetic Effect	DO-160G category 'B'



## 1.5 System Configuration

Loud Speaker	Total Bell Configuration	Amplifier	Input Power	Output Level @ 1m
LS300-20x	1	LSA400	28 Vdc	130dB
LS600-20x	2	LSA400	28 Vdc	135dB
LS600-20x	2	LSA800	28 Vdc	135dB
1 X LS300-20x 1 X LS600-20x	3	LSA800	28 Vdc	137dB
2 X LS300-20x	2	LSA800	28 Vdc	135dB
2 X LS600-20x	4	LSA800	28 Vdc	141dB

At the time of publication, performance information was available only for the speakers listed above. For details of other units, please contact the Product Support department at AEM.

End of Section 1.0



## Section 2.0 Installation

### 2.1 Introduction

Information in this section consists of: unpacking and inspection procedures, installation procedures, post-installation checks, and installation drawings.

## 2.2 Unpacking and Inspection

Unpack the equipment carefully. Inspect the unit visually for damage due to shipping and report all such claims immediately to the carrier involved. Note that each unit should have the following:

- LSxxx Series High Power Loud Speaker
- Product Information Card
- Certificate of Conformity or Release Certification

Verify that all items are present before proceeding and report any shortage immediately to your supplier.

## 2.2.1 Warranty

All Anodyne Electronics Manufacturing Corp. (AEM) products are warranted for 3 years. See the website www.aem-corp.com/warranty for complete details.

### 2.3 Installation Procedures

#### 2.3.1 Warnings

#### **WARNING:**

When the speaker is connected to an appropriate amplifier, the system is capable of producing high sound pressure levels. Proper personal protective equipment is required to prevent hearing damage.

Stand clear, this equipment operates at an intense sound level.

Personnel must be kept away from the direct loud speaker beam.



#### 2.3.2 Cautions

#### CAUTION:

Do not operate the equipment in a hangar or in confined areas.

Do not operate the equipment with snow, water or other foreign matter in the loud speaker horn.

Do not clean the loud speaker with compressed air.

Bundle and route the Speaker Output wires separately from low level Audio Input lines.

Always check ADF and compass calibration after installing external speakers or power amplifiers.

### 2.3.3 Cabling and Wiring

All wire shall be selected in accordance with the original aircraft manufacturer's Maintenance Instructions or AC43.13-1B Change 1, Paragraphs 11-76 through 11-78. Unshielded wire types shall qualify to MIL-W-22759 as specified in AC43.13-1B Change 1, Paragraphs 11-85, 11-86, and listed in Table 11-11. For shielded wire applications, use Tefzel MIL-C-27500 shielded wire with solder sleeves (for shield terminations) to make the most compact and easily terminated interconnect. Follow the interconnect drawing in Section 2.7 as required.

Allow 3" from the end of the shielded wiring to the shield termination to allow the connector hood to be easily installed. Refer to the interconnect drawing in Section 2.7 for shield termination details. Note that the hood is a "clamshell" hood, and is installed after the wiring is complete. Aircraft harnessing shall permit the unit to be removed for easy access to all adjustments.

Maintain wire segregation and route wiring in accordance with the original aircraft manufacturers Maintenance Instructions.

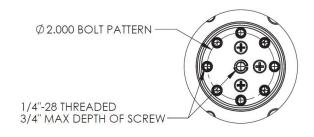
#### 2.3.4 Mechanical Installation

The installing agency is responsible for the design, engineering and installation of the mounting bracket for the LSxxx Series High Power Loud Speakers. Careful consideration should be given to the operating environment and the mechanical forces acting upon the LSxxx Series unit(s).

The guidelines used in the AC43.13-1B Advisory Circular should be used to provide general reference to the selection of hardware, torque values, etc. The specific references are contained in AC43.13-1B, Chapter 7, Table 7-1.

A minimum of five mounting 1/4"-28 bolts per side is recommended for the LS300-200 and LS600-200 speakers. The bolts should have a torque value of 50 – 70 inch lbs as per the AC43.13-1B. Refer to the following diagram for the mounting hole pattern.





MOUNTING HOLE PATTERN

The LSxxx-20x series of loud speakers, Rev 2.00 or later, can be mounted using the AFM-SB-XX series of Meeker Aviation mount brackets.

AEM Part Number	Required Meeker Aviation  Mounting Bracket			
LS300-20x	AFM-SB-1-1C			
LS600-20x	AFM-SB-1-1A			

For information and availability of the AFM-SB-XX series of mounting brackets contact Meeker Aviation:

#### **Meeker Aviation**

#206 19142 122nd Ave Pitt Meadows, BC Canada V3Y 2P9 PH: 604-644-1125

FAX: 760-758-9612 www.meekeraviation.com

#### 2.3.5 Post-Installation Checks

Ensure all connectors are tight and the speaker array mechanical installation is sound.

Ensure that the speakers are secure and adjusted with the line of sight focused towards the intended target. See section 2.6 for speaker location and orientation information.

When the PA system installation is complete, carry out a full performance test to ensure that all components of the system (including the loud speaker array) are functioning correctly.

## 2.4 Accessories Required But Not Supplied

LS300-IK LS300 and LS600 90° Sealed Screw Terminal Installation Kit LS300-201-IKC LS300-201 and LS600-201 90° Crimp Installation Kit

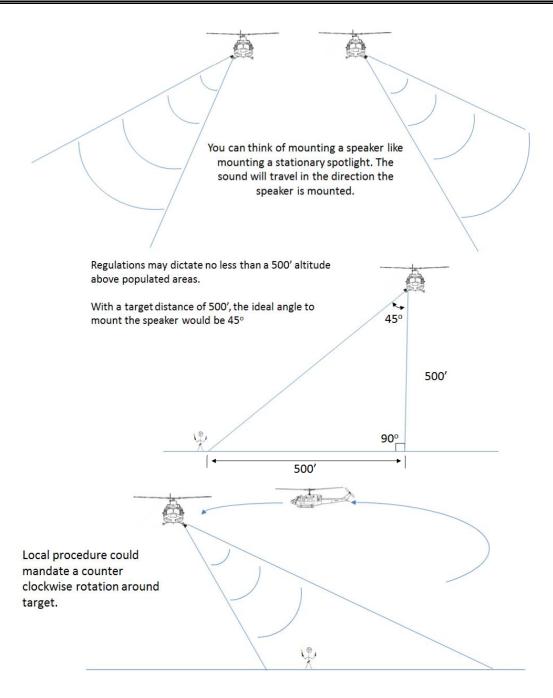
### 2.5 Continued Airworthiness

Maintenance of the LSxxx Series is 'on condition' only. Periodic maintenance of this product is not required.

May 2, 2022 Rev: 1.20 ENG-FORM: 805-0100.DOTX

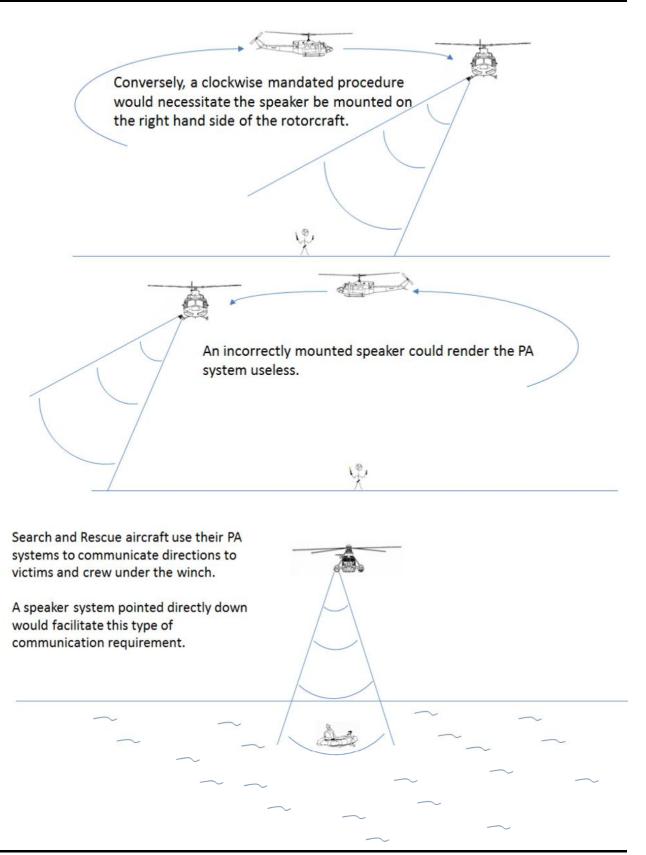


## 2.6 Speaker Location and Orientation



A speaker mounted on the left side of the helicopter would facilitate PA communications from helicopter to target.



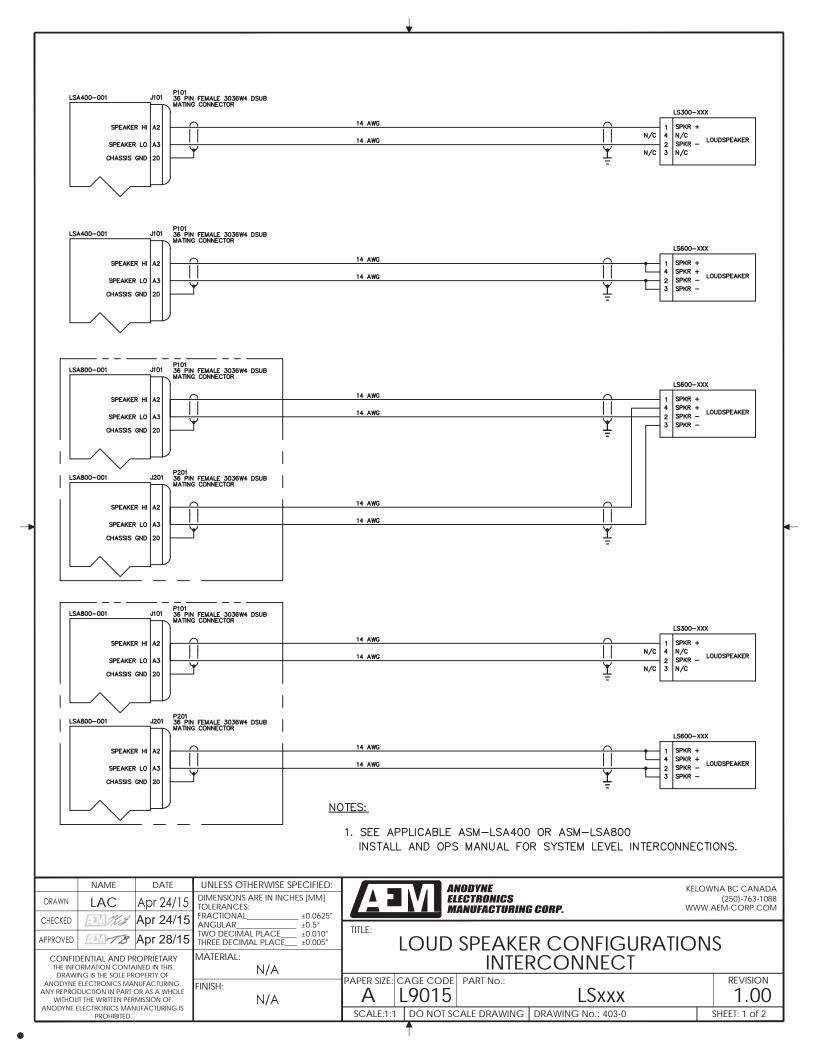


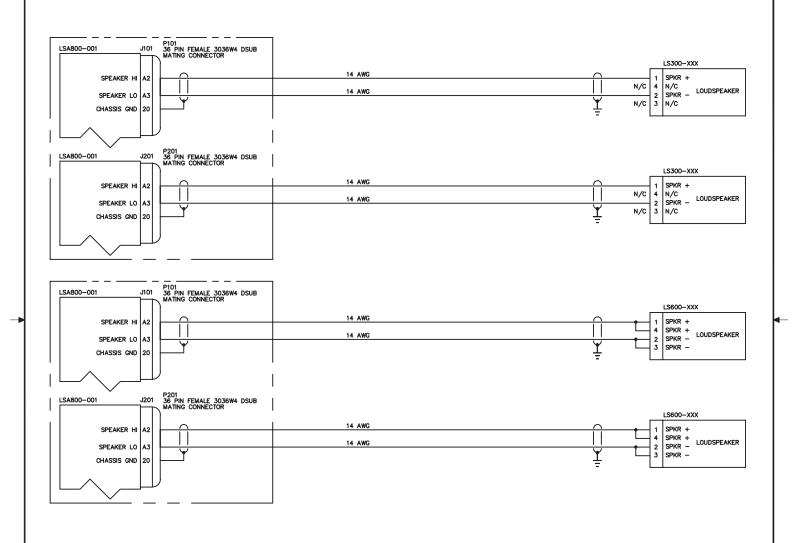


## 2.7 Installation Drawings

DRAWING	REV.	DESCRIPTION	TYPE	SERIAL NO.
LSxxx-403-0	1.00	Loud Speaker Configurations	Interconnect	All
LS300-405-0	2.00	Loud Speaker, LS300	Connector Map	1006 and up
LS300-405-0	1.00	Loud Speaker, LS300	Connector Map	Up to 1005
LS600-405-0	2.00	Loud Speaker, LS600	Connector Map	1006 and up
LS600-405-0	1.00	Loud Speaker, LS600	Connector Map	Up to 1005
LS300-200-922-0	2.20	Loud Speaker, LS300	Mechanical Installation	92177 and up
LS300-200-922-0	2.10	Loud Speaker, LS300	Mechanical Installation	60911 to 92176
LS300-200-922-0	2.00	Loud Speaker, LS300	Mechanical Installation	1006 to 60910
LS300-200-922-0	1.10	Loud Speaker, LS300	Mechanical Installation	Up to 1005
LS600-200-922-0	2.20	Loud Speaker, LS600	Mechanical Installation	97445 and up
LS600-200-922-0	2.10	Loud Speaker, LS600	Mechanical Installation	60915 to 97444
LS600-200-922-0	2.00	Loud Speaker, LS600	Mechanical Installation	1006 to 60914
LS600-200-922-0	1.00	Loud Speaker, LS600	Mechanical Installation	Up to 1005
LS300-201-405-0	1.00	LS300-201 Loud Speaker	Connector Map	87238 and up
LS300-201-922-0	1.10	Loud Speaker	Mechanical Installation	88461 and up
LS300-201-922-0	1.00	Loud Speaker	Mechanical Installation	87238 to 88460
LS600-201-405-0	1.00	LS600-201 Loud Speaker	Connector Map	87238 and up
LS600-201-922-0	1.10	Loud Speaker	Mechanical Installation	88461 and up
LS600-201-922-0	1.00	Loud Speaker	Mechanical Installation	87238 to 88460

Section 2.0 ends following the above documents



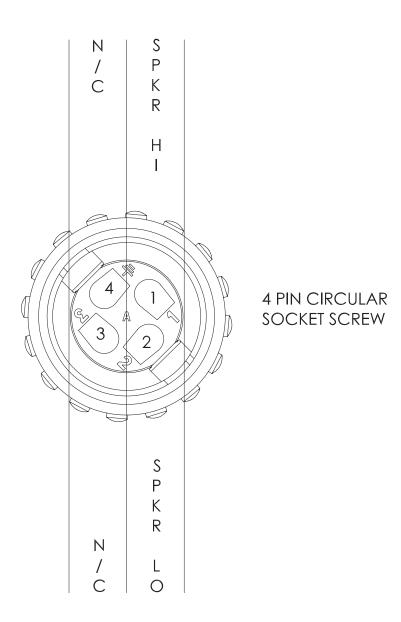


 SEE APPLICABLE ASM-LSA400 OR ASM-LSA800 INSTALL AND OPS MANUAL FOR SYSTEM LEVEL INTERCONNECTIONS.

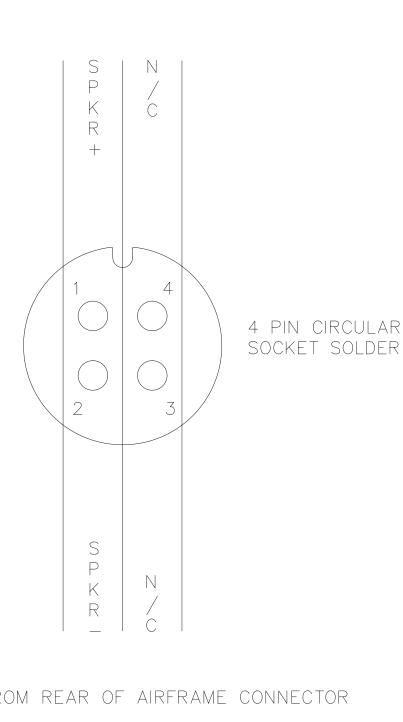
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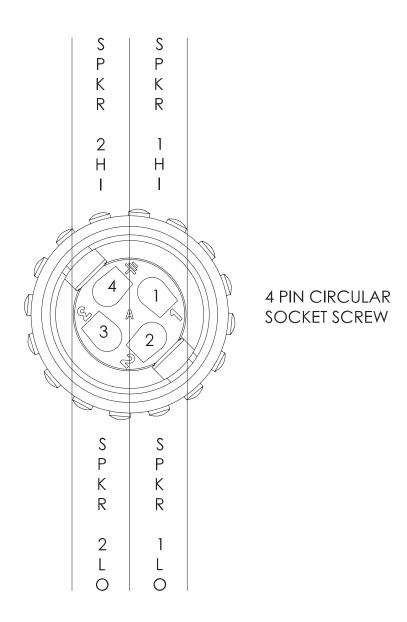


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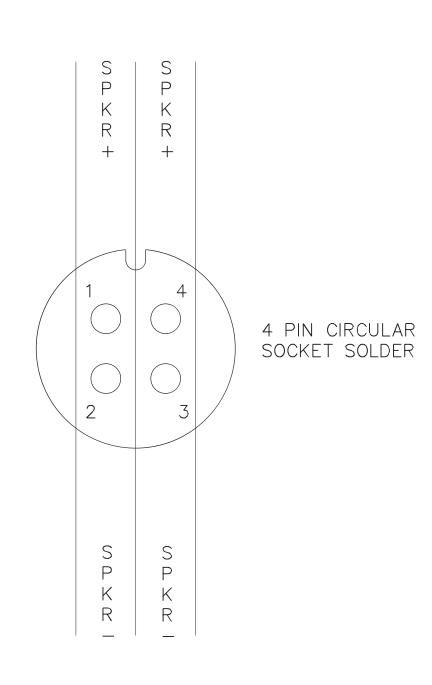


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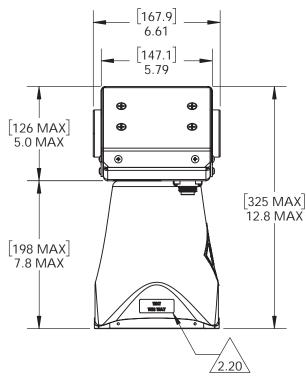
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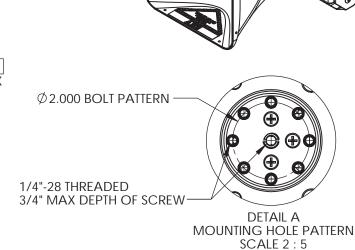


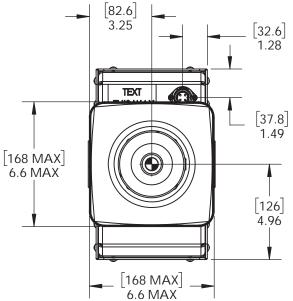
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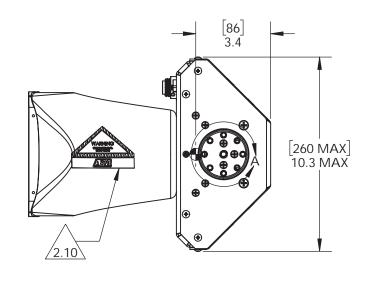
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2.20	ECO# 1130 - SECURING RE-ENTRANT TIPS, NEW WARNING LABEL.	08-Apr-22	DMF				

- 1. MASS 15 lb [6.8 kg] MAX.
- 2. DENOTES CENTER OF GRAVITY (est.)









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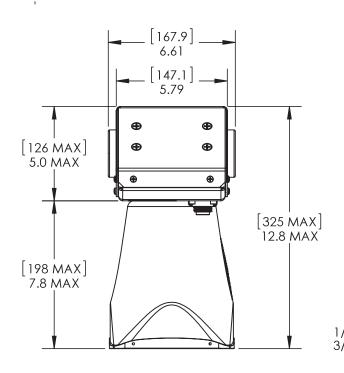
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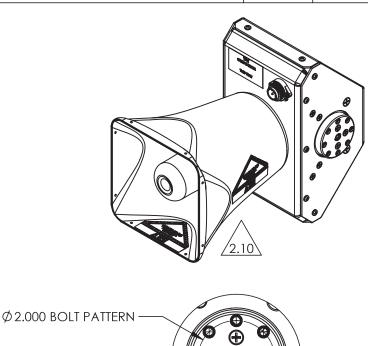
LOUD SPEAKER
MECHANICAL INSTALLATION

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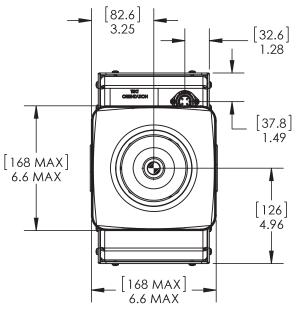
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2.10	ECO1042 - SOUND WARNING LABEL WAS REV 1.01.	08-Jun-15	LAC				

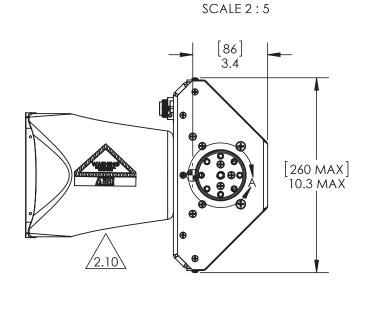
- 1. MASS 15 lbs [6.8 kg] MAX.
- 2.- DENOTES CENTER OF GRAVITY (est.)





1/4"-28 THREADED 3/4" MAX DEPTH OF SCREW DETAIL A MOUNTING HOLE PATTERN





DRAWING No.: 922-0

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> REVISION 2.10

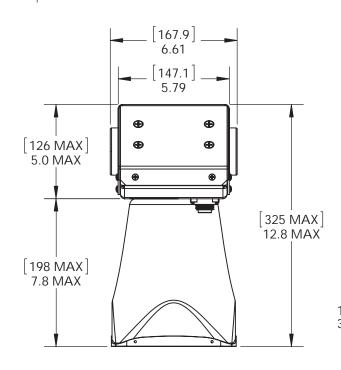
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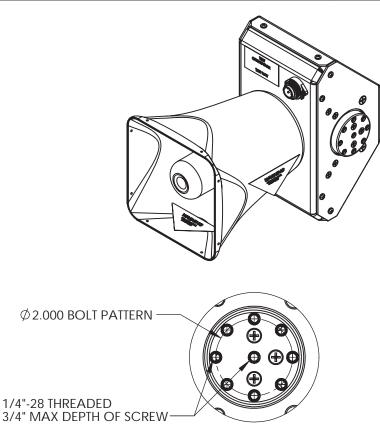
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ELECTRONICS	MANUFACTURING	IS PROHIBITED.		SCALE: 1:	5 DO NOT S	CALE DRAWING	DRAWING No.: 922-0	Т

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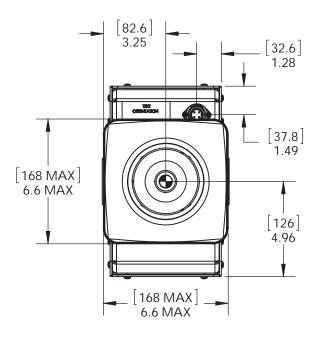
	REVISIONS						
REV.	DESCRIPTION	DATE	NAME				
2.00	ECO# 1037, NEW DESIGN AFTER VIBRATION TESTING	02-Mar-15	DMF				

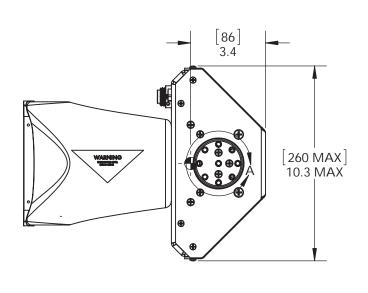
- 1. MASS 15 lbs [6.8 kg] MAX.
- 2. DENOTES CENTER OF GRAVITY (est.)





DETAIL A MOUNTING HOLE PATTERN SCALE 2 : 5

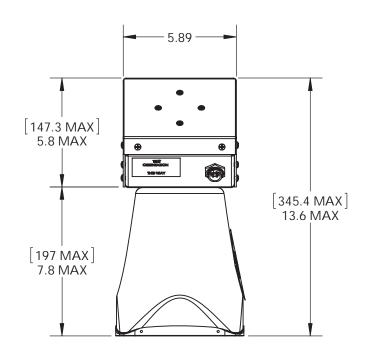


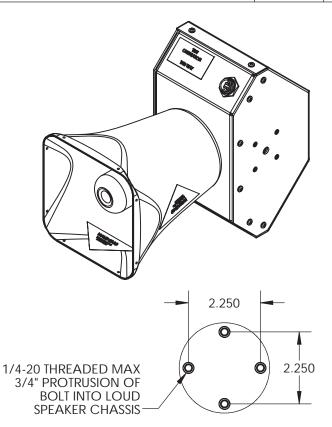


	NAME	DATE	UNLESS OTHERWISE SPECIFIED:		ANOL	TYNF			KIRSCHNER RD.
DRAWN	DMF	14-Nov-14	DIMENSIONS ARE IN INCHES [MM] TOLERANCES: ANGULAR ±0.5°	/	ELEC	TRONICS UFACTURINA CORI			WNA BC V1Y 4N7 (250)-763-1088
CHECKED	11/1/18	11-Mar-15	FRACTIONAL ±0.0625" ONE DECIMAL PLACE ±0.100"	TITLE:			*	VVVVVV	AEM-CORP.COM
APPROVED	13178	Apr 28/15		]		LOI	JD SPEAKER		
	CONFIDENTIAL AND PROPRIETARY THE INFORMATION CONTAINED IN THIS DRAWING		MATERIAL: N/A		M	IECHANI	CAL INSTALLATION		
	LE PROPERTY OF A		FINISH:	PAPER SIZE:	CAGE CODE	PART No. :			REVISION
ELECTRONICS MANUFACTURING. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ANODYNE		AS A WHOLE	N/A	Α	L9015		LS300-200		2.00
ELECTRONICS MANUFACTURING IS PROHIBITED.			SCALE: 1:	DO NOT S	CALE DRAWING	DRAWING No. : 922-0	SHEE	T: 1 OF 1	

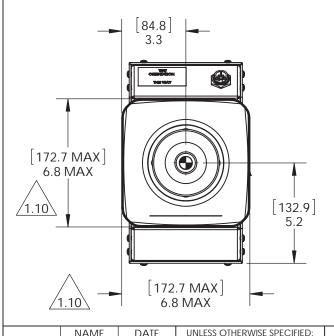
REVISIONS					
REV.	DESCRIPTION	DATE	NAME		
1.10	RAS# 379, ADDED 3/8-16 THREADED NOTE, UPDATED DIMENSION SIZES	17-Nov-14	DMF		

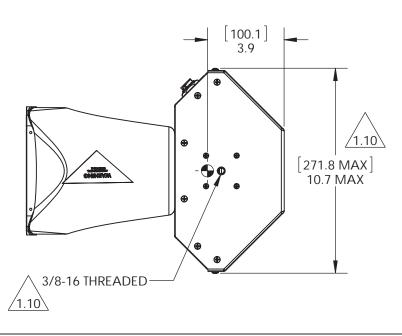
- 1. MASS 15 lbs [6 kg] MAX.
- 2. ⊕- DENOTES CENTER OF GRAVITY (est.)





SCALE 1: 3 DIAMOND MOUNTING PATTERN





	NAME	DATE
DRAWN	DMF	14-Nov-14
CHECKED	FIN P	14-Nov-14
APPROVED	13/1/8	Nov 17/14

UNLESS OTTLERWISE SI	LOILILD.
DIMENSIONS ARE IN INCHES	[MM]
TOLERANCES:	
ANGULAR	±0.5°
FRACTIONAL	±0.0625"
ONE DECIMAL PLACE	±0.100"
TWO DECIMAL PLACE	±0.030"
THREE DECIMAL PLACE	±0.010"
MATERIAI ·	

N/A

ANODYNE ELECTRONICS MANUFACTURINA CORP. 15-1925 KIRSCHNER RD. KELOWNA BC V1Y 4N7 (250)-763-1088 WWW.AEM-CORP.COM

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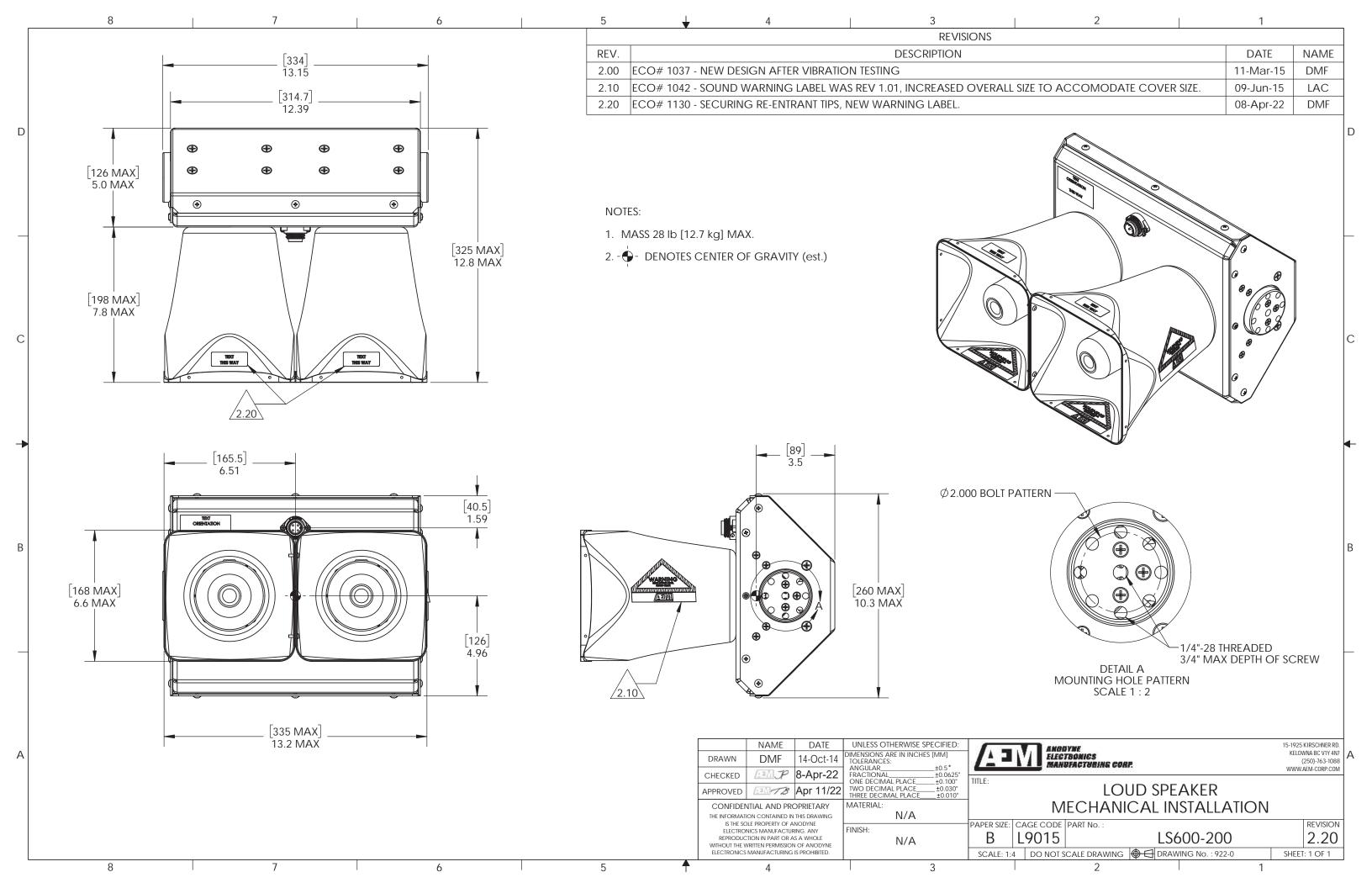
N/A
FINISH:

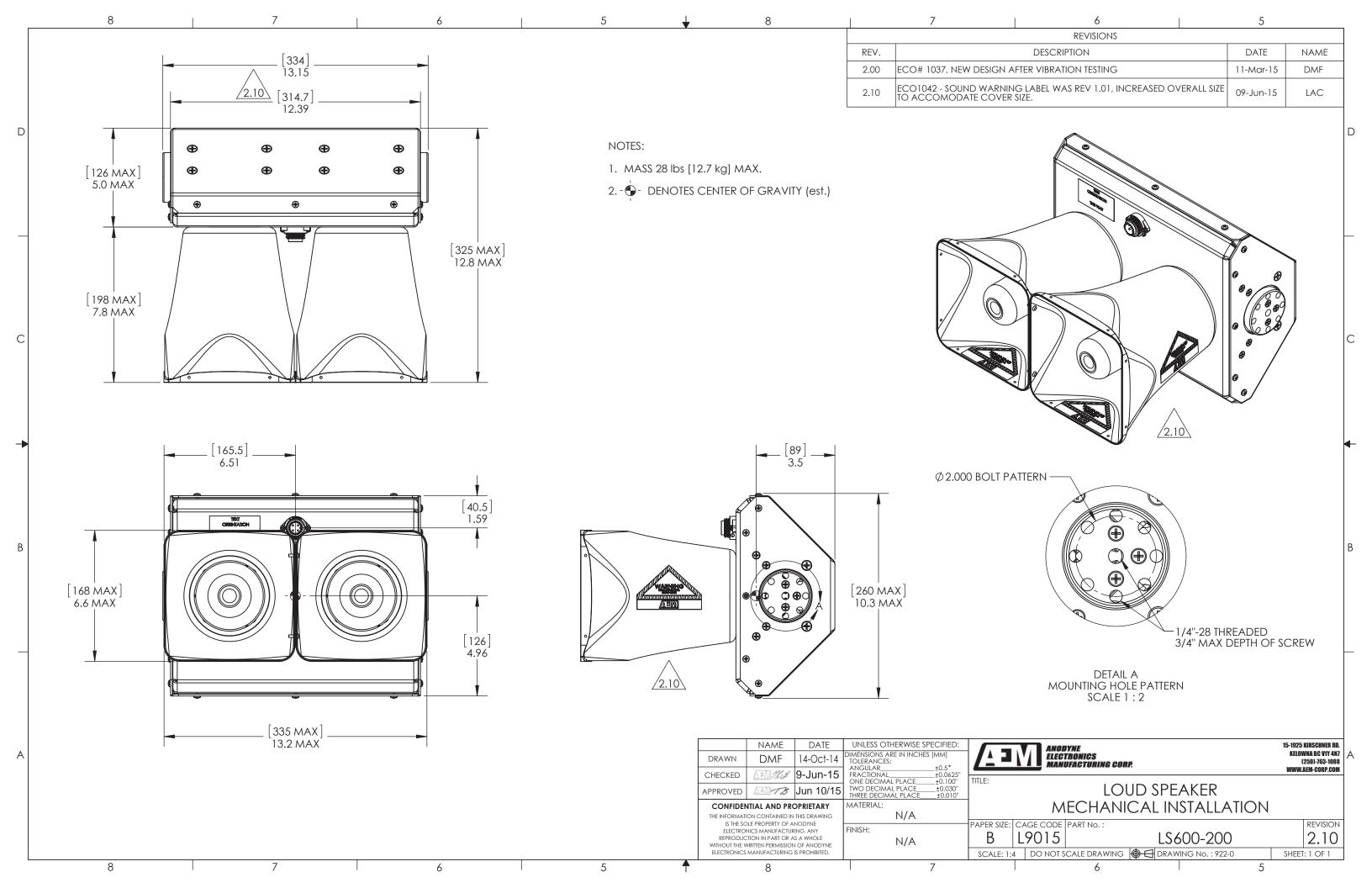
LOUD SPEAKER							
MECHANICAL I	INSTALLATION						

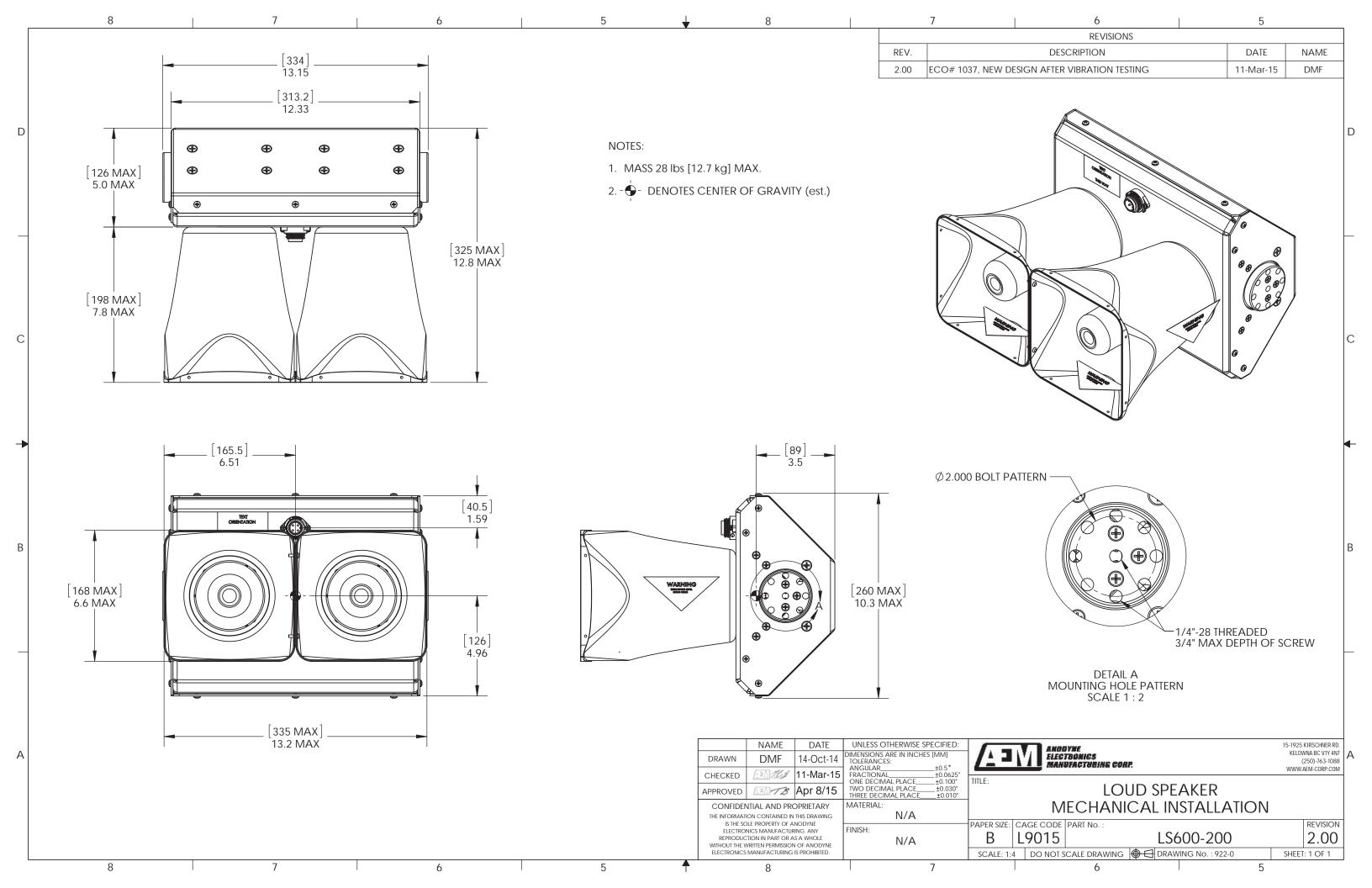
PAPER SIZE: CAGE CODE PART No.:

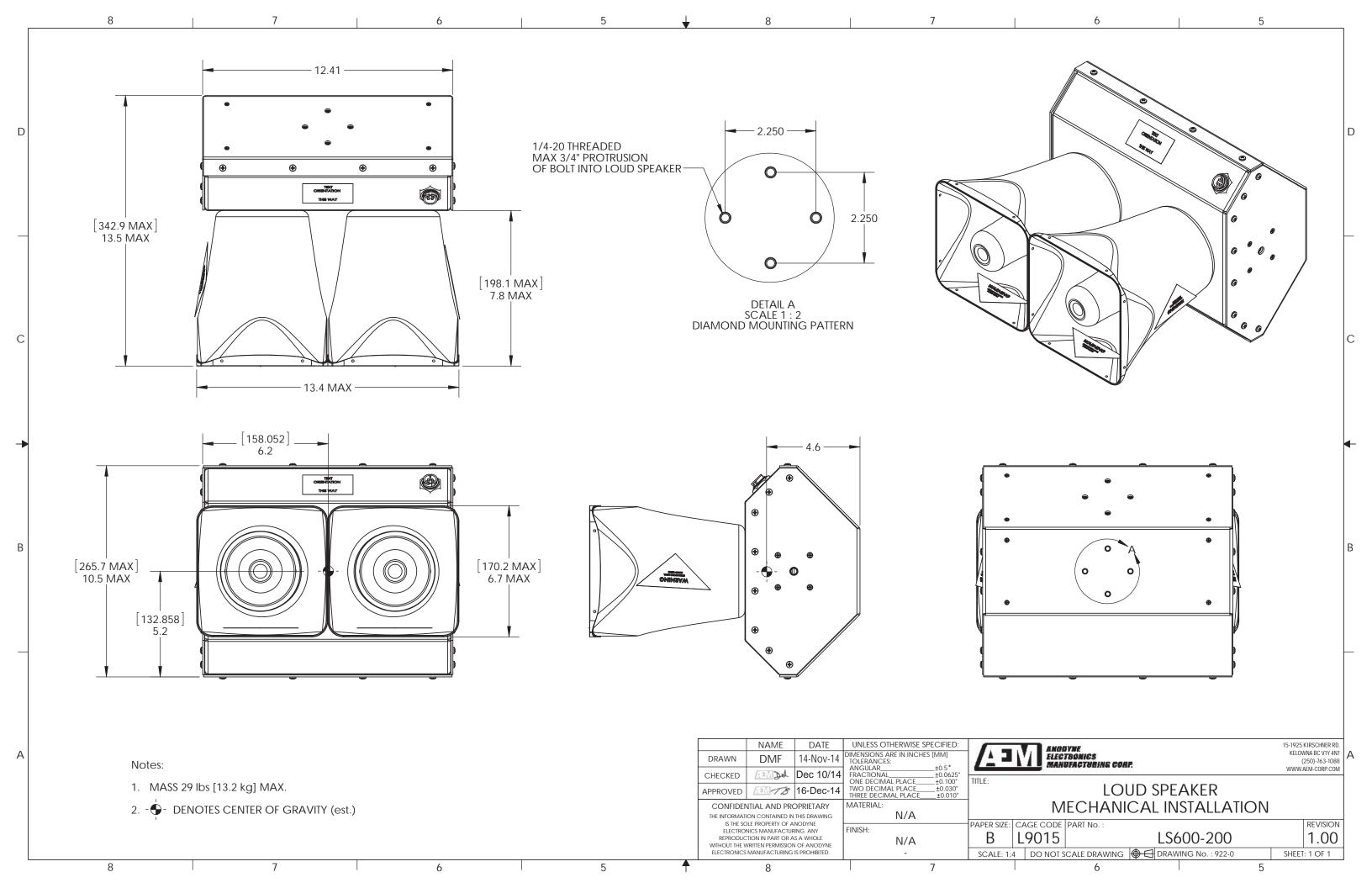
REVISION
L9015 LS300-200 1.10

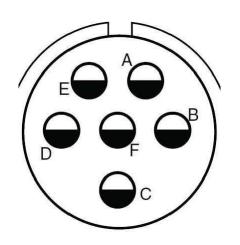
SCALE: 1:5 DO NOT SCALE DRAWING DRAWING No.: 922-0 SHEET: 1 OF 1











6 PIN CIRCULAR CONNECTOR, FEMALE CONTACTS

P1
MATING CONNECTOR
VIEW IS FROM REAR OF AIRFRAME CONNECTOR

PINOUT				
А	SPEAKER HI			
В	SPEAKER LO			
С	N/C			
D	N/C			
E	N/C			
F	N/C			

	NAME	DATE
DRAWN	RWN	20-Mar-20
CHECKED	La Del	Mar 25/20
APPROVED	121/18	Jun 12/20

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PROHIBITED.

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [MM]
TOLERANCES:
FRACTIONAL ±0.0625"
ANGULAR ±0.5°
TWO DECIMAL PLACE ±0.010"

MATERIAL:

NA

finish: NA

THREE DECIMAL PLACE



ANODYNE ELECTRONICS MANUFACTURING CORP. KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM

TITLE:

LS300-201 LOUD SPEAKER CONNECTOR MAP

PAPER SIZE: CAGE CODE PART No.:

LS300-201

revision 1.00

SCALE:NTS | DO NOT SCALE DRAWING | DRAWING No.: 405-0

SHEET:1 of 1

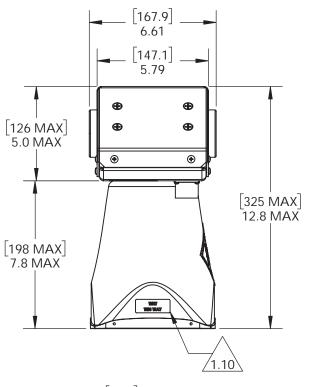
REVISIONS

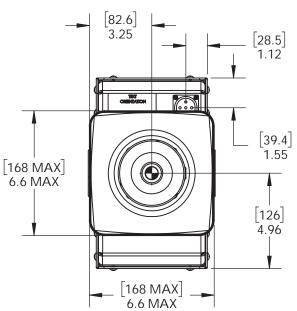
REV. DESCRIPTION DATE NAME

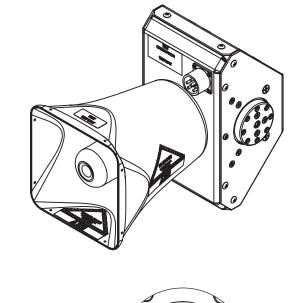
1.10 ECO# 1130 - SECURING RE-ENTRANT TIPS, NEW WARNING LABEL. 08-Apr-22 DMF

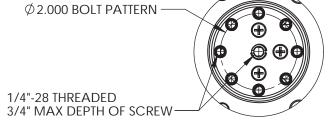
#### **NOTES:**

- 1. MASS 15 lb [6.8 kg] MAX.
- 2. DENOTES CENTER OF GRAVITY (est.)

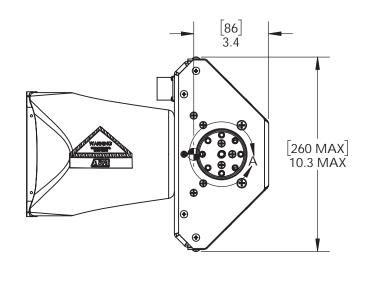








DETAIL A MOUNTING HOLE PATTERN SCALE 2 : 5



	NAME	DATE	
DRAWN	RWN	04-Mar-20	
CHECKED	P	8-Apr-22	
APPROVED	1311/8	Apr 11/22	

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UNLESS OTHERWISE SF	
DIMENSIONS ARE IN INCHES TOLERANCES:	[MM]
ANGULAR	±0.5°
FRACTIONAL	±0.0625
	10 1001

ANGULAR ±0.5 °
FRACTIONAL ±0.0625"
ONE DECIMAL PLACE ±0.100"
TWO DECIMAL PLACE ±0.030'
THREE DECIMAL PLACE ±0.010"

N/A

MATERIAL:

FINISH: N/A

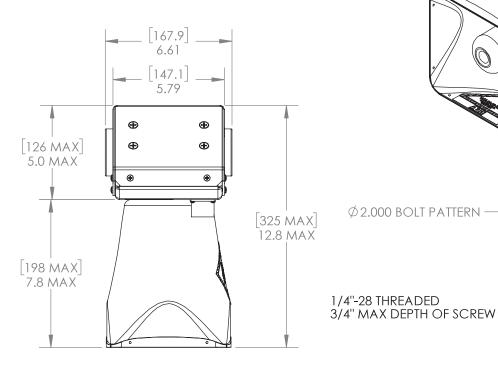
100				d
	-	V	Ļ	
TITLE:				
	TITLE:	TITLE:	A IV	ABM TITLE:

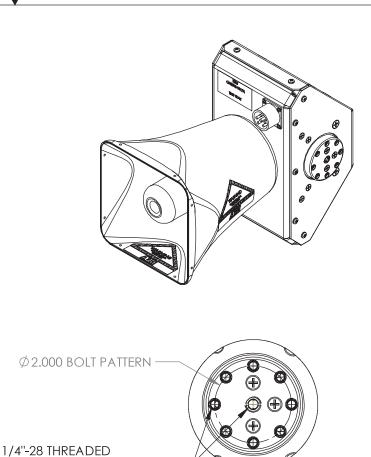
ANODYNE ELECTRONICS MANUFACTURING CORP. 15-1925 KIRSCHNER RD. KELOWNA BC V1Y 4N7 (250)-763-1088 WWW.AEM-CORP.COM

LOUD SPEAKER
MECHANICAL INSTALLATION

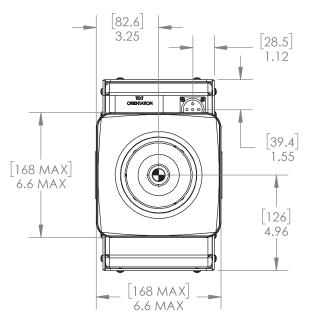
PAPER SIZE:	CAGE	CODE	PART No. :				REVISION
Α	L9(	215		LS300-201			1.10
SCALE: 1:5	5 D	O NOT S	CALE DRAWING	DRAWING No. : 922	-0	SHEET	: 1 OF 1

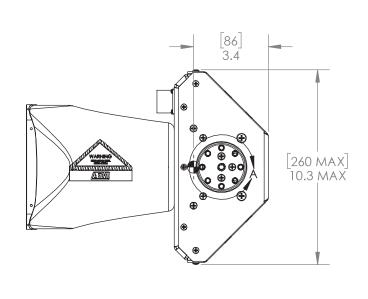
- 1. MASS 15 lbs [6.8 kg] MAX.
- 2. DENOTES CENTER OF GRAVITY (est.)



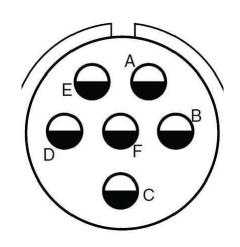


DETAIL A MOUNTING HOLE PATTERN SCALE 2 : 5





	NAME	DATE	UNLESS OTHERWISE SPECIFIED:		ANOL	TANE			KIRSCHNER RD.	
DRAWN	RWN	04-Mar-20		<b>│</b> / <u>↑</u> ∃	V ELEC	TRONICS UFACTURING CORP.		(	NNA BC V1Y 4N7 (250)-763-1088	
CHECKED	La Mal	Mar 12/20	ANGULAR ±0.5° FRACTIONAL ±0.0625" ONE DECIMAL PLACE +0.100"	TITLE:			•	www.	AEM-CORP.COM	
APPROVED	1311/18	May 14/20		111111111111111111111111111111111111111		LOL	JD SPEAKER			
CONFIDENTIAL AND PROPRIETARY THE INFORMATION CONTAINED IN THIS DRAWING			MATERIAL:		M	ECHANIC	CAL INSTALLATION			
IS THE SOLE PROPERTY OF ANODYNE ELECTRONICS MANUFACTURING, ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ANODYNE ELECTRONICS MANUFACTURING IS PROHIBITED.			FINISH: N/A	PAPER SIZE:	CAGE CODE L9015	PART No. :	LS300-201		REVISION 1.00	
				SCALE: 1:	5 DO NOT S	CALE DRAWING	DRAWING No. : 922-0	SHEET	Γ: 1 OF 1	



6 PIN CIRCULAR CONNECTOR, **FEMALE CONTACTS** 

P1 MATING CONNECTOR VIEW IS FROM REAR OF AIRFRAME CONNECTOR

PINOUT					
А	SPEAKER 1 HI				
В	SPEAKER 1 LO				
С	N/C				
D	SPEAKER 2 LO				
E	SPEAKER 2 HI				
F	N/C				

	NAME	DATE
DRAWN	RWN	26-Mar-20
CHECKED	[ 3 ] Dd	Mar 26/20
APPROVED	13178	May 27/21

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	UNLESS OTHERWISE SPE	ECIFIED:
	DIMENSIONS ARE IN INCHE TOLERANCES:	S [MM]
1	FRACTIONAL	±0.0625"
ı	ANGULAR	±0.5°
1	TWO DECIMAL PLACE	±0.010"
ı	THREE DECIMAL DLACE	. 0 005"

MATERIAL:

NA

FINISH: NA

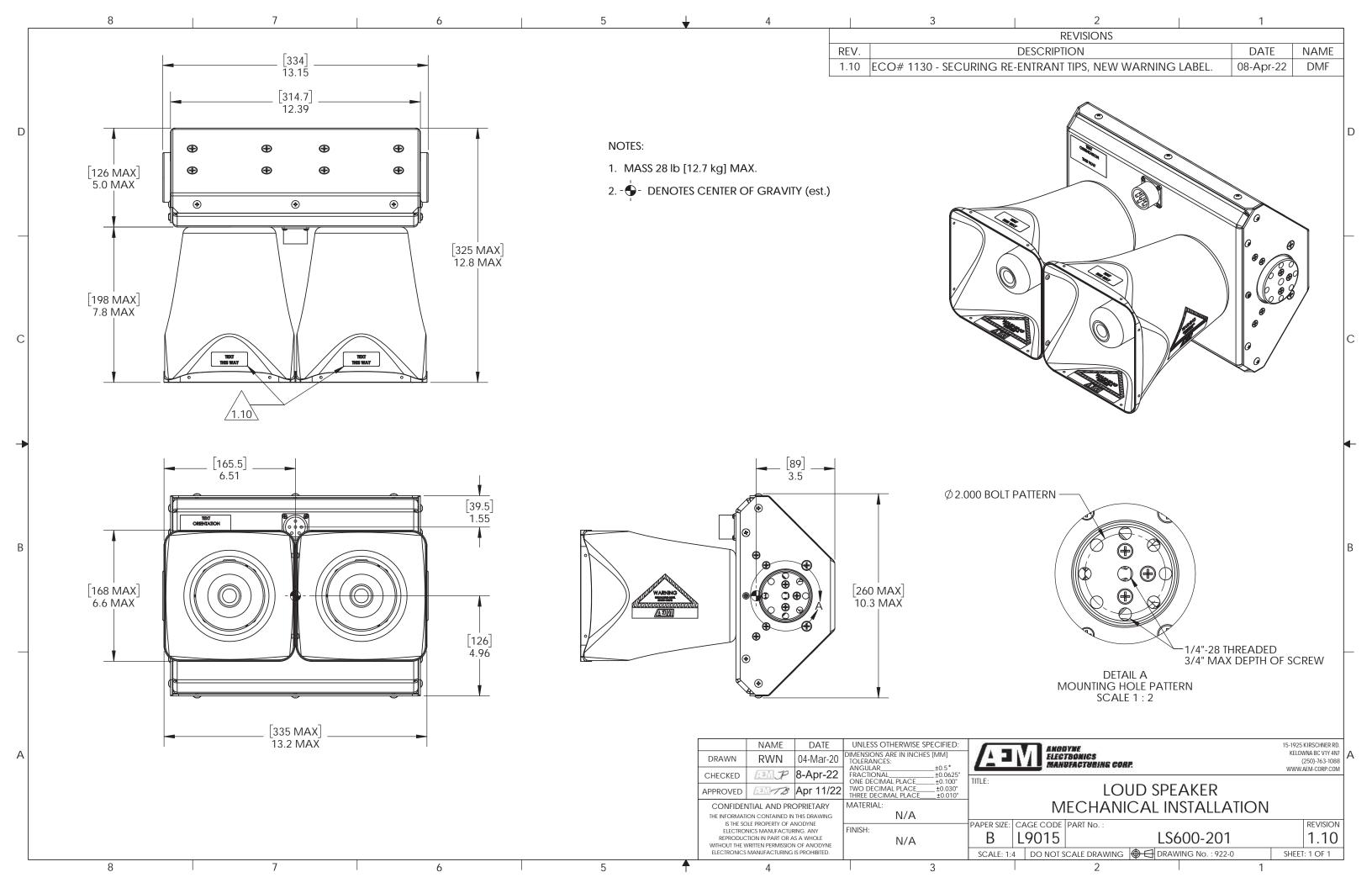
ANODYNE ELECTRONICS MANUFACTURING CORP.

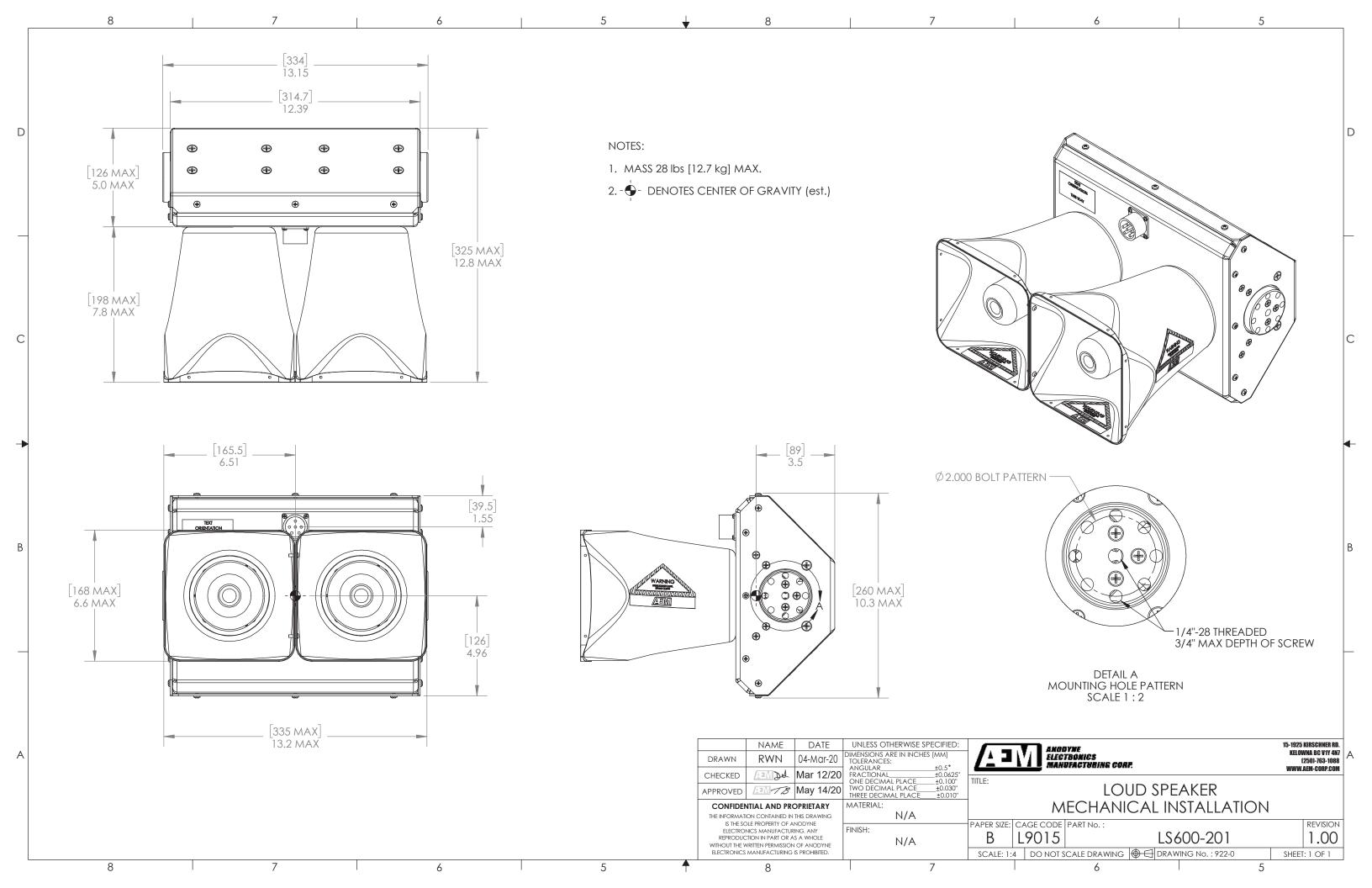
KELOWNA BC CANADA (250)-763-1088 WWW.AEM-CORP.COM

LS600-201 LOUD SPEAKER **CONNECTOR MAP** 

PAPER SIZE: CAGE CODE PART No.: L9015

REVISION LS600-201 1.00 SCALE:NTS | DO NOT SCALE DRAWING | DRAWING No.: 405-0 SHEET:1 of 1







# **Section 3.0 Operation**

## 3.1 Operation Specifics

The LSxxx Series High Power Loud Speaker has no normal user operational aspects.

End of Section 3.0