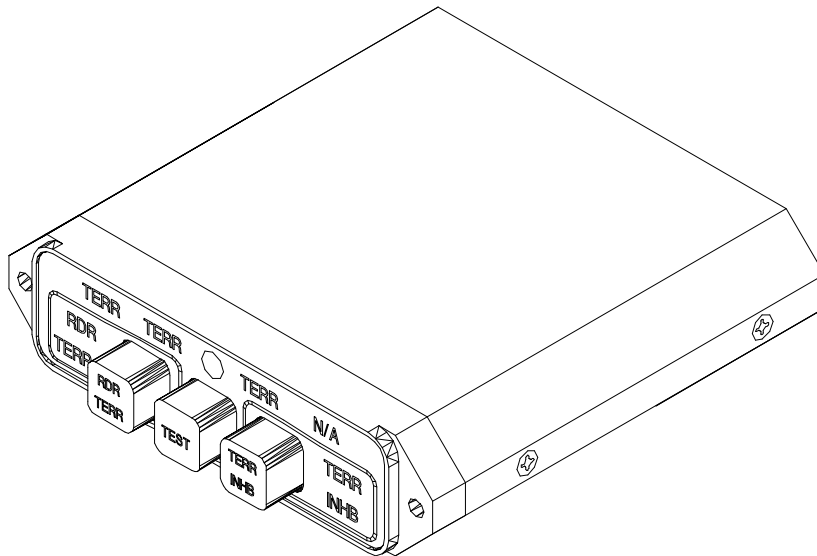




## INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

### MD41-1300 Series Terrain Awareness Annunciation Control Unit for Honeywell KGP 560 EGPWS Systems

MD41-1308	28vdc	Horizontal Mount
MD41-1318	28vdc	Vertical Mount (shown on page 9)



Mid-Continent Instruments and Avionics  
9400 E. 34<sup>th</sup> Street N., Wichita, KS 67226 USA  
Phone 316-630-0101 • Fax 316-630-0723

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## Revision Detail

<u>Rev.</u>	<u>Date</u>	<u>Detail</u>
N/R	10/02/00	Complete issue
A	06/26/03	Added MD41-1318, -1308(5v), -1318(5V)

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### APPENDIX

ENVIRONMENTAL QUALIFICATION FORM

## SECTION 1 GENERAL DESCRIPTION

### 1.1 INTRODUCTION

The MD41-1308, -1318, -1308(5V), -1318(5V) is a compact, self-contained Annunciation and Control unit. The fully integrated, control unit provides annunciation and mode selection for both TAWS (Terrain Awareness Warning System) and EGPWS (Enhanced Ground Proximity Warning system). It combines all the necessary functions required to interface a wide range of TAWS systems for FAA approval.

Other features include dual 20,000 hour lamps used for all annunciations, internally lighted selection switches and choice of manual or automatic photocell dimming. A external annunciation dimming adjustment is provided for balancing low level light conditions.

### 1.2 SPECIFICATIONS, TECHNICAL

#### 1.2.1 PHYSICAL CHARACTERISTICS

Mounting:	Panel
Width:	3.25 Inches
Height:	.80 Inches
Depth:	3.20 Inches
Weight:	0.50 lbs.

#### 1.2.2 ENVIRONMENTAL CHARACTERISTICS

PMA Compliance:	PQ3738CE
Applicable Documents:	RTCA DO-160C
Operating Temperature Range:	-55°C to +70°C
Humidity:	95% Non-Condensing
Altitude Range:	0 to 55,000 ft.
Vibration:	Cat. M and N
Operational Shock:	Rigid Mounting, 6 G Operational 15 G Crash Safety

### 1.2.3 SPECIFICATIONS, ELECTRICAL

Design	All Solid State
MD41-1308, -1318	0.30 Amps
MD41-1308(5V), -1318(5V)	0.30 Amps

### 1.2.4 FRONT PANEL CONTROLS AND ANNUNCIATIONS

#### 1.2.4.1 CONTROLS

RDR/TERR	Momentary Switch, when pressed, will select TWAS info on the radar or MFD.
TEST	Momentary switch, when pressed, will activate the TWAS computer self-test.
TERR/INHB	Alternate action switch, when pressed, will place TWAS/EGPWS computer in standby mode.

#### 1.2.4.2 ANNUNCIATIONS

TERR/NA	Terrain information is not available.
TERR (amber)	Terrain is very near or above the aircraft altitude.
TERR (red)	Terrain is well above aircraft altitude.
TERR/ INHB	TWAS/EGPWS system has been placed in standby mode.
RDR/ TERR	This indicates if TWAS information is selected or deselected to be viewed on the radar indicator.

## SECTION 2 INSTALLATION CONSIDERATIONS

### 2.1 COOLING

No direct cooling is required. As with any electronic equipment, overall reliability may be increased if the MD41-1308, -1318, -1308(5V), -1318(5V) is not located near any high heat source or crowded next to other equipment. Means of providing a gentle airflow will be a plus.

### 2.2 EQUIPMENT LOCATION

The MD41-1300 series ACU must be mounted as close to the pilot's field of view as possible. Please reference the EGPWS installation manual for approved locations. The unit depth, with connector attached, must also be taken into consideration.

### 2.3 ROUTING OF CABLES

Care must be taken not to bundle the MD41-1300 series ACU logic and low level signal lines with any high energy sources. Examples of these sources include 400 HZ AC, Comm, DME, HF and transponder transmitter coax. Always use shielded wire when shown on the installation print.

Avoid sharp bends in cabling and routing near aircraft control cables.

## SECTION 3 INSTALLATION PROCEDURES

### 3.1 GENERAL INFORMATION

This section contains interconnect diagrams, mounting dimensions and other information pertaining to the installation of the MD41-1308, -1318, -1308(5V), -1318(5V). After installation of cabling and before installation of the equipment, ensure that power is applied only to the pins specified in the interconnect diagram.

### 3.2 UNPACKING AND INSPECTING EQUIPMENT

When unpacking equipment, make a visual inspection for evidence of damage incurred during shipment. The following parts should be included:

1. MD41-1308 (28V) Horiz. Mount or  
MD41-1318 (28V) Vert. Mount  
MD41-1308(5V), (28volt) 5 volt button lighting Horiz. Mount or  
MD41-1318(5V), (28volt) 5 volt button lighting Vert. Mount
2. J1 Connector Kit (25 pin). MCI P/N 7014517
3. Installation Manual. MCI P/N 9011644

### 3.3 MOUNTING THE MD41-( )

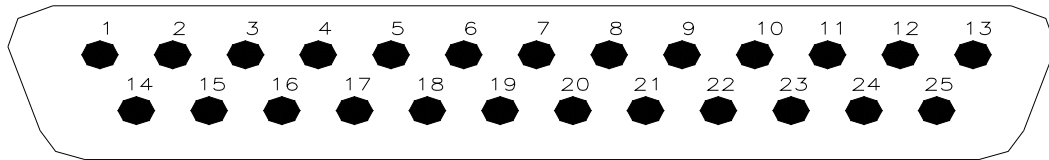
Avoid mounting close to heater vents or other high heat sources. Allow a clearance of at least 3 inches from back of unit for plug removal.

The indicator is secured in place behind the panel since it is designed for rear mount only. Make a panel cutout as shown in Figure 3-2. Secure the indicator in place with two 4-40 x 3/8 flat head phillips screws.

### 3.4 INSTALLATION LIMITATIONS

Wire the aircraft harness according to figure 3-3 or 3-4. Use at least 24 AWG wire for all connections. Avoid sharp bends and routing cable near high-energy sources. Care must be taken to tie the harness away from aircraft controls and cables.

# J1 CONNECTOR

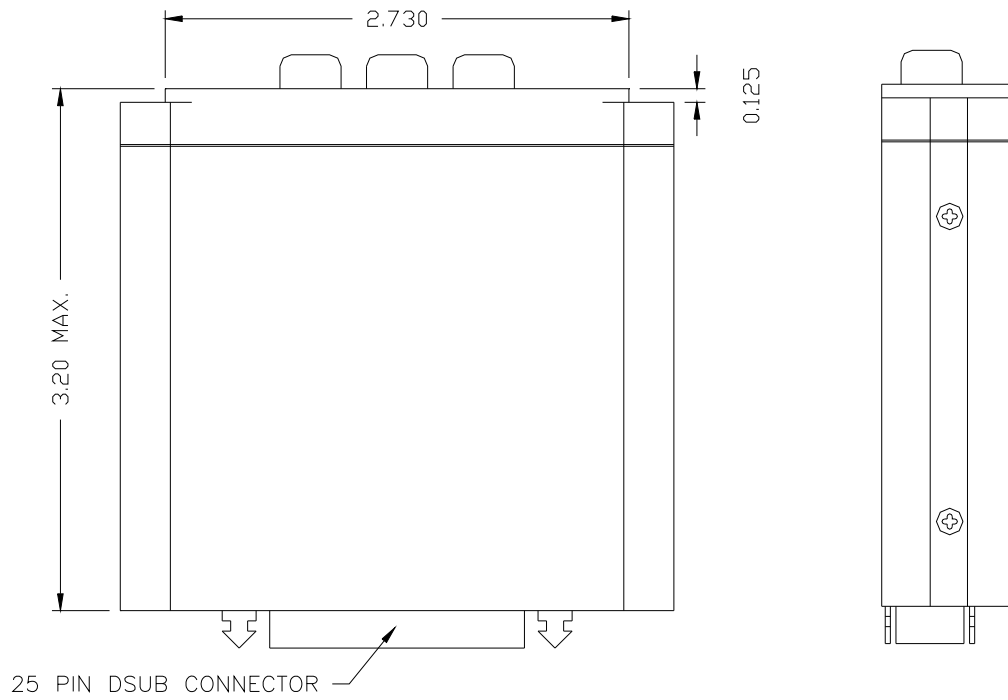


REAR VIEW OF J1 (bottom) CONNECTOR

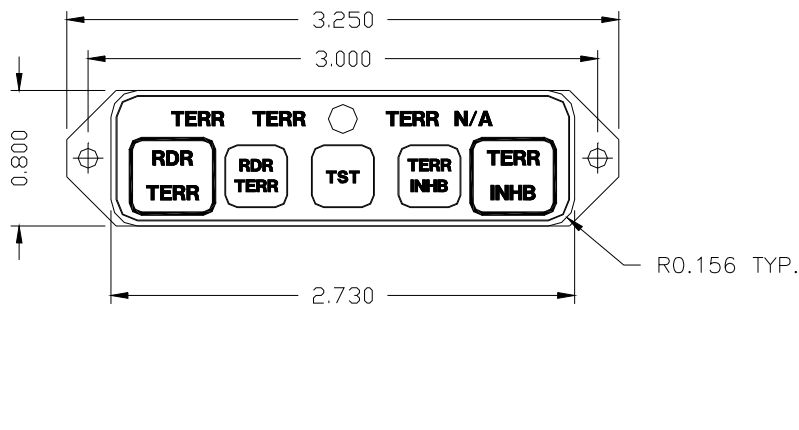
**J1**  
PIN NO.

1 -----	WX RADAR/ KCPB 453 A Input. From N/C relay.
2 -----	KCPB 453 A Input. From N/O relay contact.
3 -----	WX RADAR 453 B Output. From N/C relay contact.
4 -----	WX/TERRAIN Select Input. Ground to energize 453 data relays.
5 -----	Terrain Caution annunciate input. Receives logic low to annunciate.
6 -----	LAMP TEST (receives ground from remote test switch)(optional conn).
7 -----	Bright/Dim annunciation lamp power. 28Vdc for bright, 18Vdc for dim.
8 -----	Push Button Lighting. To 28Vdc lighting buss or 5 Volt for (5V) units
9 -----	Ground for push-button lighting.
10 -----	Terrain N/A annunciate input. Receives logic low to annunciate.
11 -----	Terrain Warning annunciate input. Receives logic low to annunciate.
12 -----	Internal photocell dimming output. To use, jumper pin 12 to pin 7.
13 -----	28 Vdc unit power.
14 -----	WX RADAR 453 A Output. From N/C relay contact.
15 -----	KCPB 453 B Input. From N/O relay contact.
16 -----	WX RADAR/ KCPB 453 B Input. From N/C relay contact.
17 -----	28Vdc EGPWS power input. Voltage for 453 data relays.
18 -----	Terrain Display select output. Momentary switch, provides ground output to select.
19 -----	Terrain Self-Test switch. Momentary switch, provides ground output to select.
20 -----	Terrain Inhibit select switch. Alternate action switch, provides ground output to select.
21 -----	Power Ground
22 -----	Shield Ground
23 -----	Shield Ground
24 -----	Shield Ground
25 -----	Shield Ground

**FIGURE 3-1 SCHEMATIC PINOUT, 25 PIN DSUB**



HORIZONTAL MOUNT



Note 1: Use two 4-40 X 3/8" Flat Head Phillips Screws for Mounting

**FIGURE 3-2 OUTLINE DRAWING**

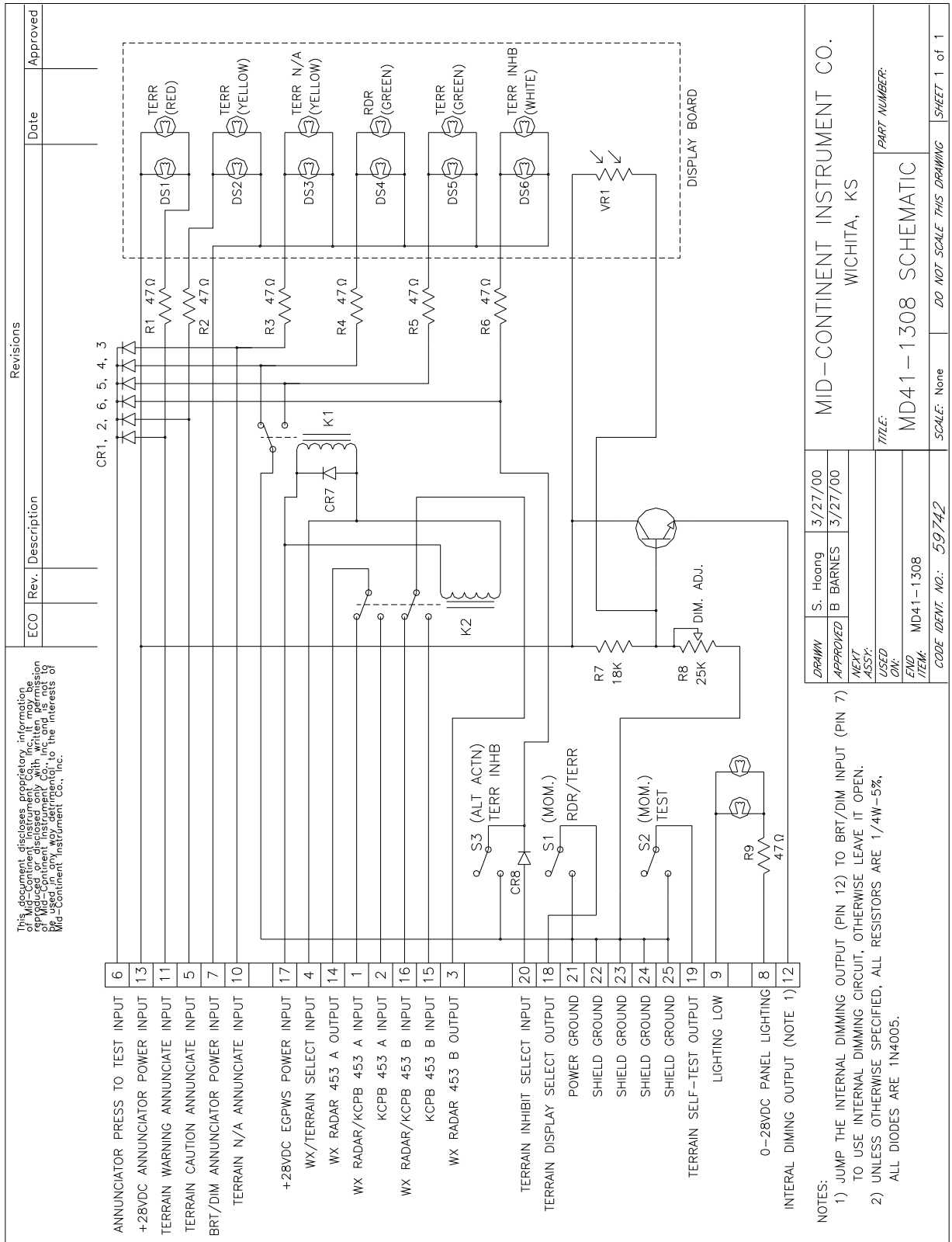
NOTES:

- 1) Unit shall incorporate both photocell and external dimming input. This is configured by installer.
- 2) Design shall meet DO160C environmental tests.
- 3) Jump the internal dimming output (PIN 12) to BRT/DIM input (PIN 7) to use internal dimming circuit, otherwise leave it open.

J1 (25 PIN D-SUB)

WX RADAR/KCPB 453 A INPUT	1	
KCPB 453 A INPUT	2	
WX RADAR 453 B OUTPUT	3	
WX/TERRAIN SELECT INPUT	4	
TERRAIN CAUTION ANNUNCIATE INPUT	5	
ANNUNCIATOR PRESS TO TEST INPUT	6	
BRT/DIM ANNUNCIATOR POWER INPUT	7	
0-28VDC PANEL LIGHTING	8	(5 VOLTS FOR (5V) UNITS)
LIGHTING LOW	9	
TERRAIN N/A ANNUNCIATE INPUT	10	
TERRAIN WARNING ANNUNCIATE INPUT	11	
INTERNAL DIMMING OUTPUT (NOTE 3)	12	
+28VDC ANNUNCIATOR POWER INPUT	13	
WX RADAR 453 A OUTPUT	14	
KCPB 453 B INPUT	15	
WX RADAR/KCPB 453 B INPUT	16	
+28VDC EGPWS POWER INPUT	17	
TERRAIN DISPLAY SELECT OUTPUT	18	
TERRAIN SELF-TEST OUTPUT	19	
TERRAIN INHIBIT SELECT INPUT	20	
POWER GROUND	21	
SHIELD GROUND	22	
SHIELD GROUND	23	
SHIELD GROUND	24	
SHIELD GROUND	25	

**FIGURE 3-3 WIRING DIAGRAM, MD41-1308, -1318, -1308(5V), -1318(5V)**



DRAWN	S. Hoang	3/27/00	MID-CONTINENT INSTRUMENT CO. WICHITA, KS
APPROVED	B BARNES	3/27/00	
DESIGN			
USED			
END	MD41-1308		
ITEM			
CODE IDENT. NO.:	59742		
TITLE:	MD41-1308 SCHEMATIC		
PART NUMBER:			
SCALE:	None		
			SHEET 1 of 1

NOTES:  
 1) JUMP THE INTERNAL DIMMING OUTPUT (PIN 12) TO BRT/DIM INPUT (PIN 7) TO USE INTERNAL DIMMING CIRCUIT, OTHERWISE LEAVE IT OPEN.  
 2) UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/4W-5%.  
 ALL DIODES ARE 1N4005.

FIGURE 3-4 SCHEMATIC, MD41-1308

## **SECTION 4 POST INSTALLATION CHECKOUT**

### **4.1 PRE INSTALLATION TESTS**

With the MD41-1308, -1318, -1308(5V), -1318(5V) disconnected, turn on the avionics master switch and verify that aircraft power is on pin 13 for. Using an ohm-meter, verify pin 21 is aircraft ground.

### **4.2 OPERATING INSTRUCTIONS**

Refer to the EGPWS pilots guide or installation manual for final testing of the MD4-1300 series ACU.

### **4.3 AIRWORTHINESS STATEMENT**

No periodic scheduled maintenance or calibration is necessary for continued airworthiness of the MD41-1308, -1318, -1308(5V), -1318(5V). If unit fails to perform to specifications, the unit must be removed and serviced by a qualified service facility.

# ENVIRONMENTAL QUALIFICATION FORM

## RTCA / DO160C

NOMENCLATURE: MD41-( ) TERRAIN AWARENESS ANNUNCIATION CONTROL  
UNIT

MODEL NO: MD41-( )

PMA PQ3738CE

MANUFACTURER TEST SPECIFICATION:

MPS 7015613

MANUFACTURER: Mid-Continent Instruments and Avionics  
9400 E. 34<sup>th</sup> Street N.  
Wichita, KS 67226  
Phone (316) 630-0101

Conditions	Section	Description of Conducted Tests
Temperature and Altitude Low Temperature High Temperature In-Flight Loss of Cooling Altitude Decompression Overpressure	4.0 4.5.1 4.5.2 & 4.5.3 4.5.4 4.6.1 4.6.2 4.6.3	Equipment tested to Categories A1 & F2 except as noted  Cooling air not required  Not Tested
Temperature Variation	5.0	Equipment tested to Category B
Humidity	6.0	Equipment tested to Category A
Shock Operational Crash Safety	7.0 7.2 7.3	Equipment tested per DO-160C Par. 7.2.1
Vibration	8.0	Equipment tested without shockmounts to Categories M and N (Table 8-1)
Explosion	9.0	Equipment identified as Category X, no test required
Waterproofness	10.0	Equipment identified as Category X , no test required
Fluids Susceptibility	11.0	Equipment identified as Category X, no test required

**Environmental Qualification (cont.)**

Conditions	Section	Description of Conducted Tests
Sand and Dust	12.0	Equipment identified as Category X, no test required
Fungus	13.0	Equipment identified as Category X, no test required
Salt Spray	14.0	Equipment identified as Category X, no test required
Magnetic Effect	15.0	Equipment tested to Class Z
Power Input	16.0	Equipment tested to Category B
Voltage Spike	17.0	Equipment tested to Category A
Audio Frequency Susceptibility	18.0	Equipment tested to Category B
Induced Signal Susceptibility	19.0	Equipment tested to Category A
Radio Frequency Susceptibility	20.0	Equipment tested to Category T
Radio Frequency Emissions	21.0	Equipment tested to Category Z
Lightning Induced Transient Susceptibility	22.0	Equipment identified as Category X, no tests required
Lightning Direct Effects	23.0	Equipment identified as Category X, no tests required
Icing	24.0	Equipment identified as Category X, no test required