

# Test Project

*Module D Aircraft Avionic System Inspection  
Rectification*

*Aircraft Maintenance*

Independent Test Project Designer: Winston Hoo, Bombardier  
Independent Test Project Validator: Seppo Huittinen

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# Introduction to Test Project

Aircraft are operated by complex electrical systems. Every system such as lighting, landing gear, instrumentation, and ignitions systems are each run by an electrical system. Aircraft engineers are specially trained to install and maintain these systems.

## Marking Scheme

AIRCRAFT AVIONIC SYSTEM INSPECTION RECTIFICATION
D1 Board preparation, Wiring and Looming
D2 Use of Tools
D3 Connector Installation and Termination
D4 Annunciator Lamp and Circuit Breaker
D5 Solder Terminations
D6 Test harness: Operational Test
D7 Safety/Housekeeping/Sustainability
D8 Documentation/Certification
D9 Troubleshooting - Service Bulletin completed

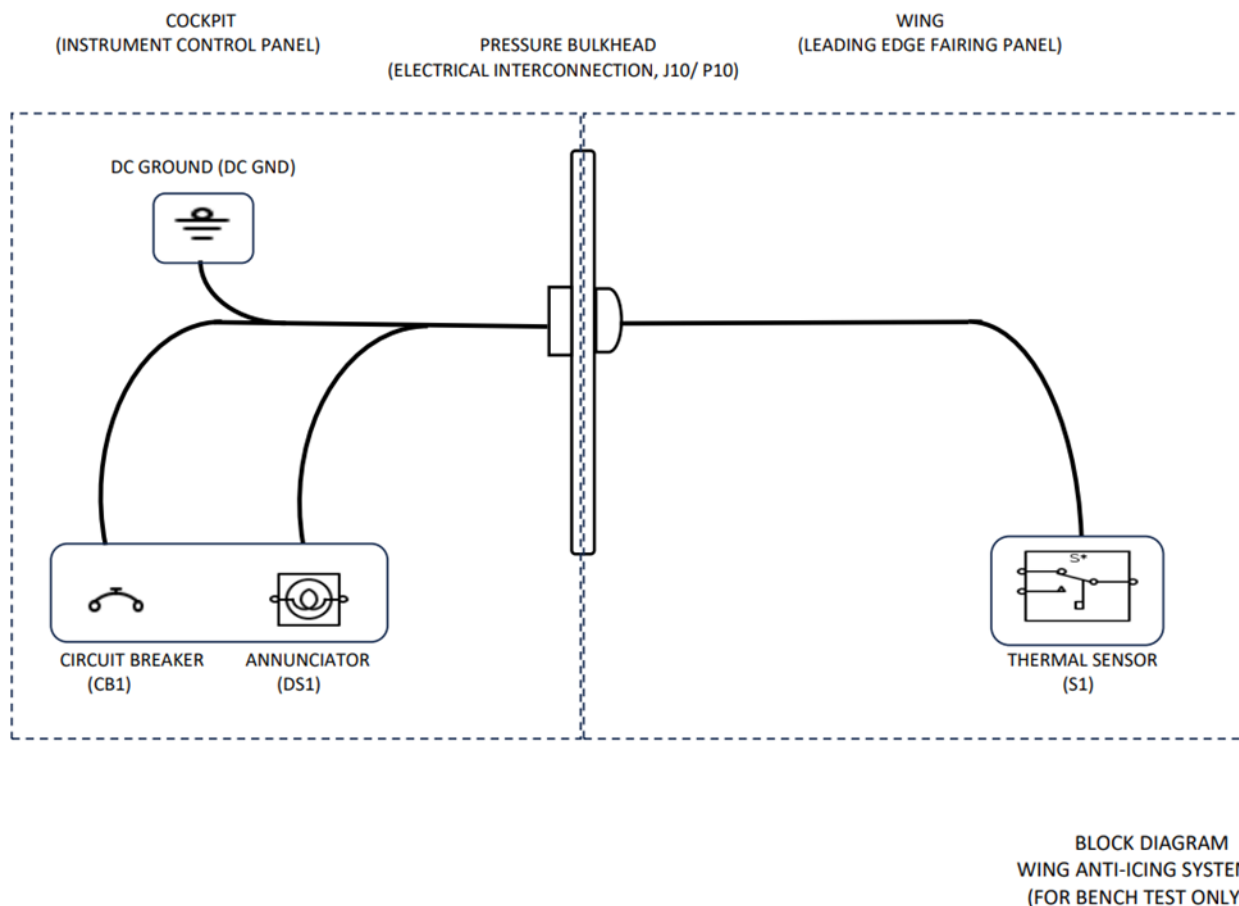
# Instructions to the Competitor

NAME	(FIRST)	(LAST)
COUNTRY		
START TIME	Part 1 Wing Anti-icing system	
	Part 2 Troubleshooting	
Objectives	1. To assess the Competitors' competency to fabricate, install and terminate wire loom in accordance with the wiring diagrams and OEM's manuals* provided. 2. To assess the Competitors' ability to troubleshoot electrical defects.	
Time allotted	3 hours 15 minutes - 2 hours 30 minutes to complete the test board. - 45 minutes for troubleshooting a defective component.	
Process:		
1	<b>Part 1: Wing Anti-icing system (For bench-test only)</b> <ul style="list-style-type: none"> <li>Use appropriate PPE and safety precautions during fabrication, installation and termination of wire loom.</li> <li>Fabricate, install, and terminate wire loom as per wiring diagram in Figure 2.               <ul style="list-style-type: none"> <li>Show Expert the crimp tool setting.</li> </ul> </li> <li>Prepare wire circuit board per board drawing, figure 1.</li> <li>Do the functional test for the circuit               <ul style="list-style-type: none"> <li>Inform the Expert for verification.</li> </ul> </li> <li>Complete the Task Card (1).</li> <li>Housekeeping and restoring workplace.</li> </ul>	
2	<b>Part 2</b> <ul style="list-style-type: none"> <li>To troubleshoot and to identify the root cause of the unserviceable component.               <ul style="list-style-type: none"> <li>Identify the schematic figure number, description of the faulty part, and equipment identifier (ID) which contributed to the cause of system failure.</li> <li>The battery pack is removed from the component.</li> <li>The CMM is provided.</li> <li>Restore back the component after troubleshooting and do not rectify the defect.</li> </ul> </li> <li>Complete the Task Card (2).</li> </ul>	

\* In the absence of the appropriate aircraft maintenance manuals and OEM's manual, CASA AC 21-99 will serve as reference as per SAG.

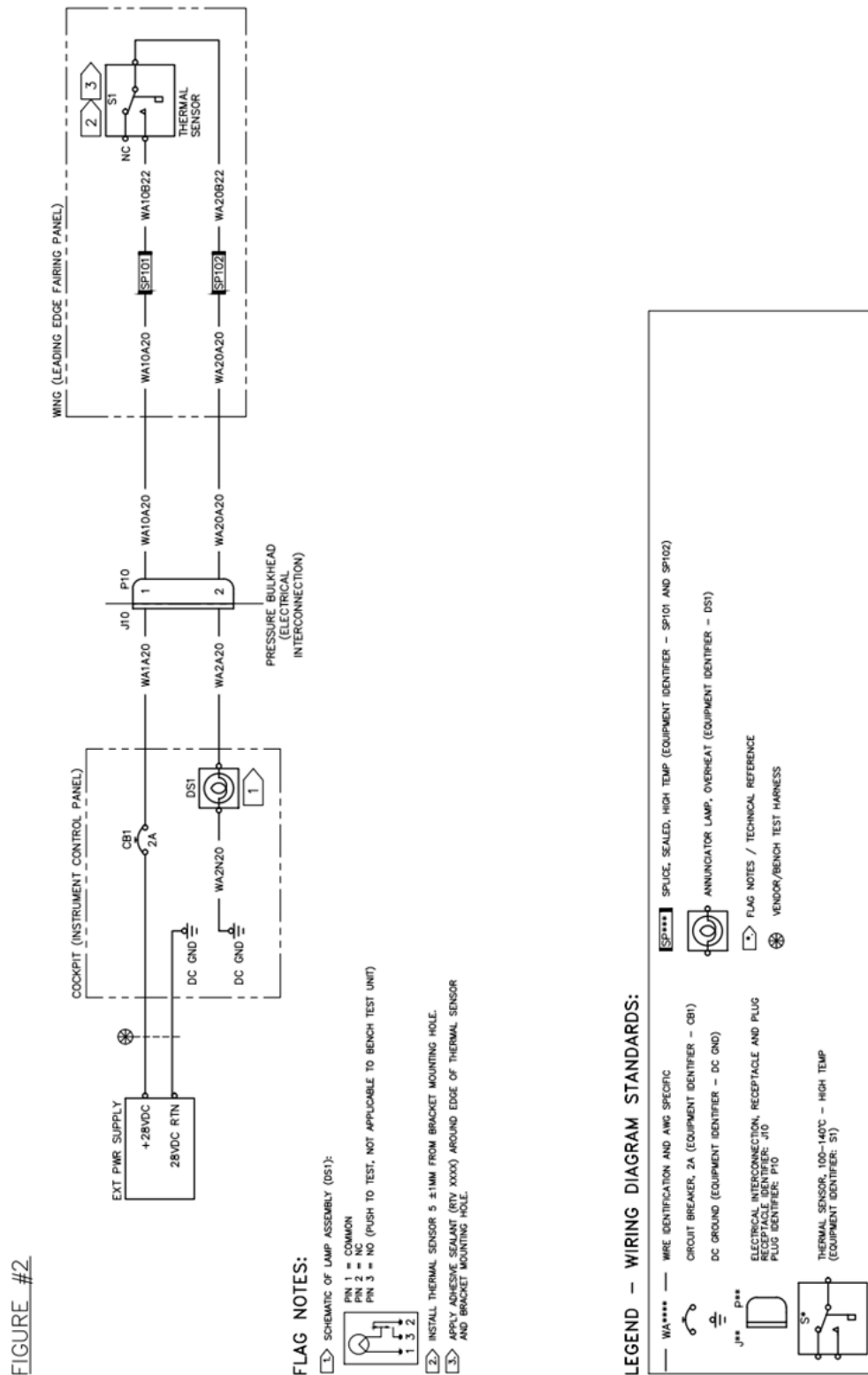
# Figure 1: Electrical Board Diagram

**FIGURE #1**



PART1: WING ANTI-ICING SYSTEM  
(FOR BENCH TEST ONLY)

## Figure 2: Wiring Diagram



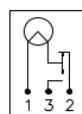
## PART 1: WING ANTI-ICING SYSTEM (FOR BENCH TEST ONLY)

## GENERAL NOTES:

1. ALL WIRES (AWG) TO BE INSTALLED AS PER FIGURE 2, AND MARKER WITH IDENTIFICATION (ID) LABELS, HEAT SHRINKABLE SLEEVE IN ACCORDANCE WITH STANDARD WIRING PRACTICES.
2. ALL WIRES AT WING ARE TO BE PROTECTED WITH EXPANDO FLEXWRAP, AND INSTALLED WITH BEST PRACTICES IN ACCORDANCE WITH STANDARD WIRING PRACTICES.
3. ALL WIRES AT WING ARE TO BE INSTALLED WITH PROPER PROTECTION METHODS AND SECURED IN ACCORDANCE WITH STANDARD WIRING PRACTICES.
4. CIRCUIT BREAKER TO BE COLLARED WITH SAFETY LOCKOUT RING, PRIOR TO INSTALLATION OF WIRES.
5. INSTALL FILLER OR SEAL PLUG IN ALL UNUSED ELECTRICAL INTERCONNECTION CONTACT LOCATIONS.
6. SOLDERING WITH SAFE AND BEST WORKSHOP PRACTICES IN ACCORDANCE WITH STANDARD WIRING PRACTICES.
7. PERFORM ELECTRICAL CONTINUITY AND INSULATION CHECKS IN ACCORDANCE WITH STANDARD WIRING PRACTICES MANUAL, AND RECORD VALUES IN PAPER WORK.
8. GROUND TEST PROCEDURES:
  - A. CONNECT JUMPER CABLES FROM EXTERNAL POWER SUPPLY, 28VDC TO TEST CIRCUITRY.
  - WARNING: OBEY ALL THE ELECTRICAL/ELECTRONIC PRECAUTIONS.
  - B. VERIFY CIRCUIT BREAKER (CB1) IS IN "CLOSE-POSITION".
  - C. SWITCH ON 28VDC POWER SUPPLY TO TEST CIRCUITRY.
  - D. SET HEAT GUN TO 120°C OR 248°F AND APPLY HEAT GRADUALLY, SLOWLY TOWARDS THERMAL SENSING SURFACES (EQUIPMENT ID: S1).
  - CAUTION: OBEY ALL PPE, SAFETY PRECAUTIONS AND ENSURE NO FLAMMABLE MATERIAL/LIQUIDS WITHIN 3 FEET OF TEST CIRCUITRY PRIOR TO APPLICATION OF HEAT.
  - E. MONITOR STATUS OF ANNUNCIATOR LAMP (EQUIPMENT ID: DS1).
  - F. STOP AND REMOVE HEAT FROM SENSOR ONCE LIGHT ILLUMINATES.
  - G. SWITCH OFF 28VDC POWER FROM TEST CIRCUITRY.
  - H. REPEAT PROCEDURES 8.C THROUGH 8.G ON THERMAL SWITCH (EQUIPMENT ID: S2).
  - I. SWITCH OFF AND REMOVE JUMPER CABLES FROM EXTERNAL DC POWER SUPPLY.
  - J. REFER TO GUIDANCE MATERIAL, CASA AC21-99 AND OEM TECHNICAL PUBLICATION FOR REFERENCES.
- CLOSE UP:
  - A. HOUSEKEEP ALL TOOLS, EQUIPMENT AND REMOVE UNWANTED MATERIALS FROM THE WORK AREA.
9. Use OEM's data for MIL-DTL-38999, SERIES 3 connector.
10. Fill connectors' cavities with appropriate sealing plugs.

## FLAG NOTES:

1. SCHEMATIC OF LAMP ASSEMBLY (DS1):



PIN 1 = COMMON  
 PIN 2 = NC  
 PIN 3 = NO (PUSH TO TEST, NOT APPLICABLE TO BENCH TEST UNIT)

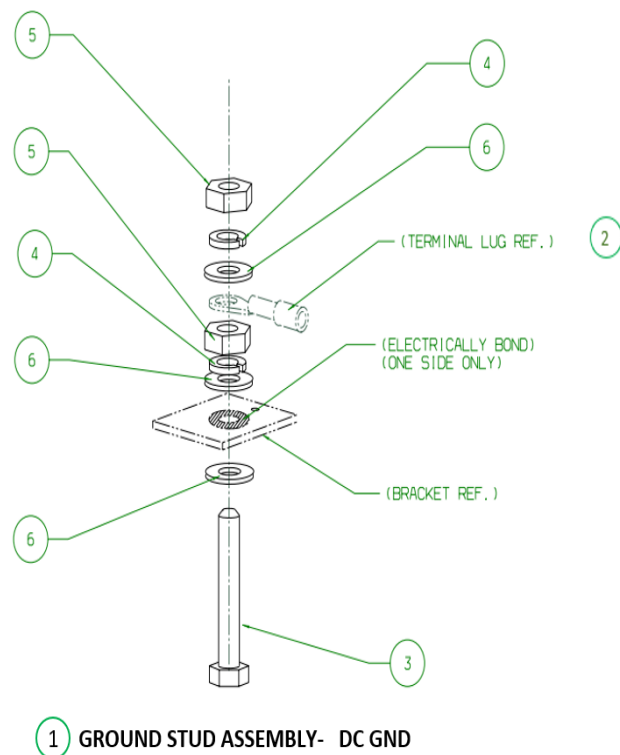
2. INSTALL THERMAL SENSOR 5 ±1MM FROM BRACKET MOUNTING HOLE.
3. APPLY ADHESIVE SEALANT (RTV XXXX) AROUND EDGE OF THERMAL SENSOR AND BRACKET MOUNTING HOLE.
4. INSTALL DC GROUND STUD (DC GND) ASSEMBLY IN ACCORDANCE WITH STANDARD PRACTICES AS PER FIGURE #3.
5. APPLY AND RECORD TORQUE VALUES (POUND-FORCE INCH, LBF IN) ON APPLICABLE GROUND STUD ASSEMBLY AND TERMINAL:
  - A. GROUND STUD, INNER NUT = 25-29,
  - B. GROUND STUD, OUTER NUT WITH TERMINAL = 20-25.

## PART 1: WING ANTI-ICING SYSTEM (FOR BENCH TEST ONLY)

## Figure 3: Ground Stud Assembly

ITEM NO	DESCRIPTION	PART NO	FLAG NOTES
1	GROUND STUD ASSEMBLY	DC GND	
2	TERMINAL LUG	MS25036-103	
3	BOLT	NAS1801-3-12	4,5
4	WASHER, SPRING	MS35336-43	
5	NUT, PLAIN	MS35650-302	4,5
6	WASHER, PLAIN	NAS1149D0332J	

**FIGURE #3**



LEGEND - DIAGRAM STANDARDS:

*	REFER TO FIGURE #2 FOR FLAG NOTES / TECHNICAL REFERENCE
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PART 1: WING ANTI-ICING SYSTEM  
(FOR BENCH TEST ONLY)



<b>TASK CARD 1</b>		<b>TECHNICAL INSTRUCTION</b>	<b>AS PER</b> WSC2024_TP14_EN_ELECTRICAL	<b>PAGE:</b>
<b>Wing Anti-icing system (For bench-test only)</b>	<b>Aircraft Regn</b>	NA		<b>Reported by</b>  Name of Competitor
	<b>Date</b>			

<b>S/N</b>	<b>MAINTENANCE REQUIRED / DEFECT DESCRIPTION</b>	<b>RESOLUTION</b>	<b>RESOLVED BY/DATE</b>
Certifies that the work specified except as otherwise specified was carried out in accordance with the requirement of the Air Navigation Act and in respect to that work the aircraft/engine/aircraft component is considered ready for release to service		Certified by (Signature & ACA)  Date	

<b>TASK CARD 2</b>		<b>TECHNICAL INSTRUCTION</b>	<b>AS PER WSC2024_TP14_EN_ELECTRICAL</b>	<b>PAGE:</b>
<b>To troubleshoot unserviceable component.</b>	Aircraft Regn	NA		Reported by Name of Competitor
	Date			

S/N	MAINTENANCE REQUIRED/ DEFECT DESCRIPTION	RESOLUTION	RESOLVED BY/DATE
Certifies that the work specified except as otherwise specified was carried out in accordance with the requirement of the Air Navigation Act and in respect to that work the aircraft/engine/aircraft component is considered ready for release to service		Certified by (Signature & ACA)  Date	