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	SPF, Aircraft System Engineering Department					
Aircraft	A330 MRTT					

Title:

Ice & Rain Protection System Functional Test

Summary:

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REVISIONS RECORD

Issue	Revision Reason	Approved
Date	Chapters, Sections, Affected Pages	Signature
A	New Issue	A. Corrales
01/03/11	All pages	

1 INTRODUCTION

1.1 Object

The aim of these tests is to demonstrate the correct operation of the Ice & Rain Protection system after the modification

1.2 List of acronyms and abbreviations

AMM	A330 MRTT- Aircraft Maintenance Manual
MCDU	Multipurpose Control & Display Unit
MRTT	Multi Roll Tanker & Transport
N / A	Non Applicable

2 APPLICABLE DOCUMENTATION

[1] AMM – MRTT A330 Aircraft Maintenance Manual (AMM) – MRTT

3 REQUIRED EQUIPMENT

- Warning notice.
- Ground Power Unit (115 Volts 400Hzs)
- Ground water source
- Access platform 6m (19 ft. 8 in.)

4 DEFINITIONS

N/A

5 PRELIMINARY INSTRUCTIONS

All the ATA 30 components shall be installed on A/C, and its electrical bonding tested.

6 TEST EXECUTION

6.1 Operational Test of the Probe Ice Protection

WARNING: DO NOT TOUCH THE PROBES DURING OR IMMEDIATELY AFTER THIS PROCEDURE. THE PROBES ARE HOT AND CAN BURN YOU.

CAUTION: REMOVE THE PROTECTIVE COVERS FROM THE PROBES AND THE SENSORS BEFORE YOU DO THE TEST

1. Remove the protective covers from probes and sensors.

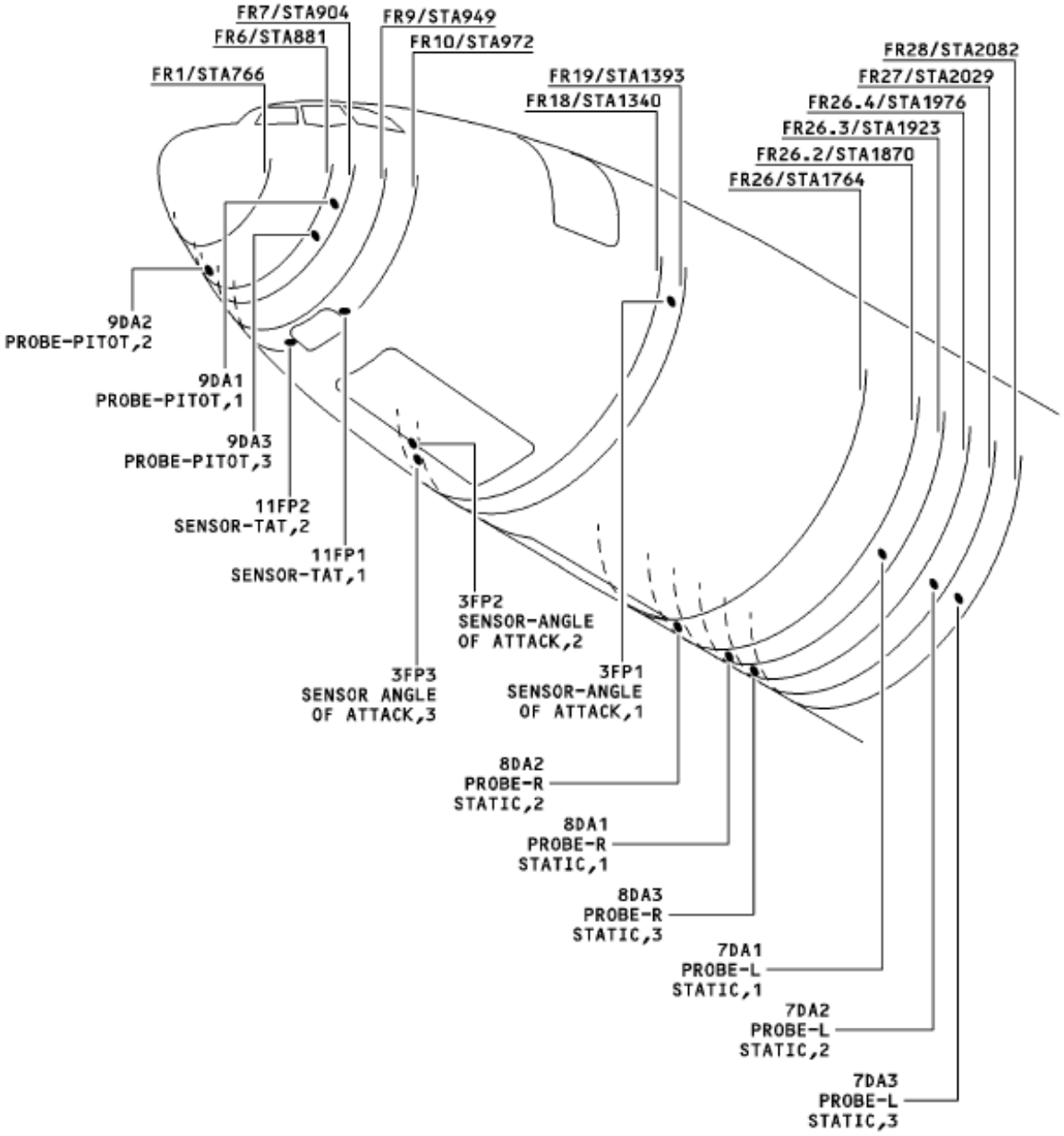

Figure 1: Probes and Sensors Location

2. Energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-861-801).
3. On the AIR control panel 225VU make sure that the PROBE & WINDOW HEAT pushbutton switch is released (ON legend off).
4. Do the Air Data Inertial Reference System (ADIRS) start procedure. (Ref. AMM TASK 34-10-00-860-801)
5. Close the following circuit breakers (please close the PHC's c/bs first, following the order stated on the table bellow)::

PANEL	DESIGNATION	FIN	LOCATION
721VU	PHC 1	2DA1	P12
722VU	PHC 2	2DA2	X40
721VU	PHC 3	2DA3	N07
721VU	ANTI ICE TAT 1	12DA1	B06
721VU	ANTI ICE PITOT 3	4DA1	L07
721VU	ANTI ICE STAT 3	11DA3	W10
721VU	ANTI ICE STAT 1	11DA1	W09
721VU	ANTI ICE AOA 3	31DA3	C05
722VU	ANTI ICE TAT 2	12DA2	E43
722VU	ANTI ICE AOA 2	1DA2	F48
722VU	ANTI ICE PITOT 2	4DA2	F43
722VU	ANTI ICE STAT 2	11DA2	X41
742VU	ANTI ICE PITOT1OR3	3DA	Q72

PHC 1 Operational Test

6. Do the procedure to get the SYSTEM REPORT/TEST ICE RAIN: HEATING. (Ref. AMM TASK 45-10-00-860-816).
7. On the Multipurpose Control and Display Unit (MCDU): push the line key adjacent to the PHC 1 indication.
   - the Probe Heat Computer (PHC) 1 page comes into view.
8. On the MCDU: push the line key adjacent to the TEST indication.
   - the TEST IN PROGRESS 25 S indication comes into view.
9. Check that after some seconds the TEST OK indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

10. On the MCDU, push once the line key adjacent to the RETURN indication.
11. On the MCDU: push the line key adjacent to the CLASS 3 FAULTS indication.
12. On the MCDU, check that the NO FAULT DETECTED indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

13. On the MCDU, push the line key adjacent to the RETURN indication until the MAINTENANCE MENU 1/2 page comes into view.

PHC 2 Operational Test

14. Do the procedure to get the SYSTEM REPORT/TEST ICE RAIN: HEATING. (Ref. AMM TASK 45-10-00-860-816).
15. On the Multipurpose Control and Display Unit (MCDU): push the line key adjacent to the PHC 2 indication.
    - the Probe Heat Computer (PHC) 2 page comes into view.
16. On the MCDU: push the line key adjacent to the TEST indication.
    - the TEST IN PROGRESS 25 S indication comes into view.
17. Check that after some seconds the TEST OK indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

18. On the MCDU, push once the line key adjacent to the RETURN indication.
19. On the MCDU: push the line key adjacent to the CLASS 3 FAULTS indication.
20. On the MCDU, check that the NO FAULT DETECTED indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

21. On the MCDU, push the line key adjacent to the RETURN indication until the MAINTENANCE MENU 1/2 page comes into view.

PHC 3 Operational Test

22. Do the procedure to get the SYSTEM REPORT/TEST ICE RAIN: HEATING. (Ref. AMM TASK 45-10-00-860-816).
23. On the Multipurpose Control and Display Unit (MCDU): push the line key adjacent to the PHC 3 indication.
    - the Probe Heat Computer (PHC) 3 page comes into view.
24. On the MCDU: push the line key adjacent to the TEST indication.
    - the TEST IN PROGRESS 25 S indication comes into view.
25. Check that after some seconds the TEST OK indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

26. On the MCDU, push once the line key adjacent to the RETURN indication.
27. On the MCDU: push the line key adjacent to the CLASS 3 FAULTS indication.
28. On the MCDU, check that the NO FAULT DETECTED indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

29. On the MCDU, push the line key adjacent to the RETURN indication until the MAINTENANCE MENU 1/2 page comes into view
30. Open, safety and tag the following circuit breakers (please open the PHC's c/bs the last, following the order stated on the table bellow)::

PANEL	DESIGNATION	FIN	LOCATION
721VU	ANTI ICE TAT 1	12DA1	B06
721VU	ANTI ICE PITOT 3	4DA1	L07
721VU	ANTI ICE STAT 3	11DA3	W10
721VU	ANTI ICE STAT 1	11DA1	W09
721VU	ANTI ICE AOA 3	31DA3	C05
722VU	ANTI ICE TAT 2	12DA2	E43
722VU	ANTI ICE AOA 2	1DA2	F48
722VU	ANTI ICE PITOT 2	4DA2	F43
722VU	ANTI ICE STAT 2	11DA2	X41
742VU	ANTI ICE PITOT1OR3	3DA	Q72
721VU	PHC 1	2DA1	P12
722VU	PHC 2	2DA2	X40
721VU	PHC 3	2DA3	N07

31. Wait 15 minutes to let probes and sensors become cool.
32. Install the protective covers on probes and sensors.
33. De-energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-862-801).

6.2 Operational Test of the Windshield Anti Icing and Defogging

1. Energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-861-801)
2. On the AIR control panel 225VU make sure that the PROBE & WINDOW HEAT pushbutton switch is released (ON legend off).
3. Make sure that the following circuit breakers are closed:

PANEL	DESIGNATION	FIN	LOCATION
715VU	ANTI ICE WSHLD R	1DG2	R57
721VU	ANTI ICE WINDOWS L	4DG1	D03
722VU	ANTI ICE WINDOWS R	4DG2	D43
722VU	WHC 2	5DG2	X39
740VU	ANTI ICE WSHLD L	1DG1	T74
742VU	WHC 1	5DG1	G64

WHC 1 Operational Test

4. Do the procedure to get SYSTEM REPORT/TEST/ATA 30: HEATING (Ref. AMM TASK 45-10-00-860-816).
5. On the Multipurpose Control and Display Unit (MCDU): push the line key adjacent to the WHC 1 indication.
   - the Window Heat Computer (WHC) 1 page comes into view.
6. On the MCDU: push the line key adjacent to the TEST indication.
   - the TEST IN PROGRESS 20 S indication comes into view.
7. Check that after some seconds the TEST OK indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

8. On the MCDU, push once the line key adjacent to the RETURN indication.
9. On the MCDU: push the line key adjacent to the CLASS 3 FAULTS indication.
10. On the MCDU, check that the NO FAULT DETECTED indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

11. On the MCDU, push the line key adjacent to the RETURN indication until the MAINTENANCE MENU 1/2 page comes into view.

WHC 2 Operational Test

12. Do the procedure to get SYSTEM REPORT/TEST/ATA 30: HEATING (Ref. AMM TASK 45-10-00-860-816).
13. On the Multipurpose Control and Display Unit (MCDU): push the line key adjacent to the WHC 2 indication.
    - the Window Heat Computer (WHC) 2 page comes into view.
14. On the MCDU: push the line key adjacent to the TEST indication.
    - the TEST IN PROGRESS 20 S indication comes into view.
15. Check that after some seconds the TEST OK indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

16. On the MCDU, push once the line key adjacent to the RETURN indication.
17. On the MCDU: push the line key adjacent to the CLASS 3 FAULTS indication.
18. On the MCDU, check that the NO FAULT DETECTED indication comes into view.

PASS ☐ **FAIL** ☐ **COMMENT:**

19. On the MCDU, push the line key adjacent to the RETURN indication until the MAINTENANCE MENU 1/2 page comes into view.
20. De-energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-862-801).

6.3 Functional Test of the Windshield Rain Protection

WARNING: MAKE SURE THAT THE CIRCUIT BREAKERS RELATED TO THE WEATHER RADAR ARE OPENED, SAFETIED AND TAGGED.

CAUTION: ONLY OPERATE THE WIPERS WHEN THE WINDSHIELD IS WET. PUT WATER ON THE WINDSHIELD WHEN THE WIPERS OPERATE.
IF NOT YOU WILL SCRATCH ON THE WINDSHIELD AND CAUSE DAMAGE TO THE WIPER BLADES.

1. Put the access platform in position on the applicable side of the aircraft near the windshield.
2. Energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-861-801).
3. Make sure that these circuit breakers are closed:

PANEL	DESIGNATION	FIN	LOCATION
721VU	WIPER CAPT	2DB1	W05
722VU	WIPER F/O	2DB2	S40

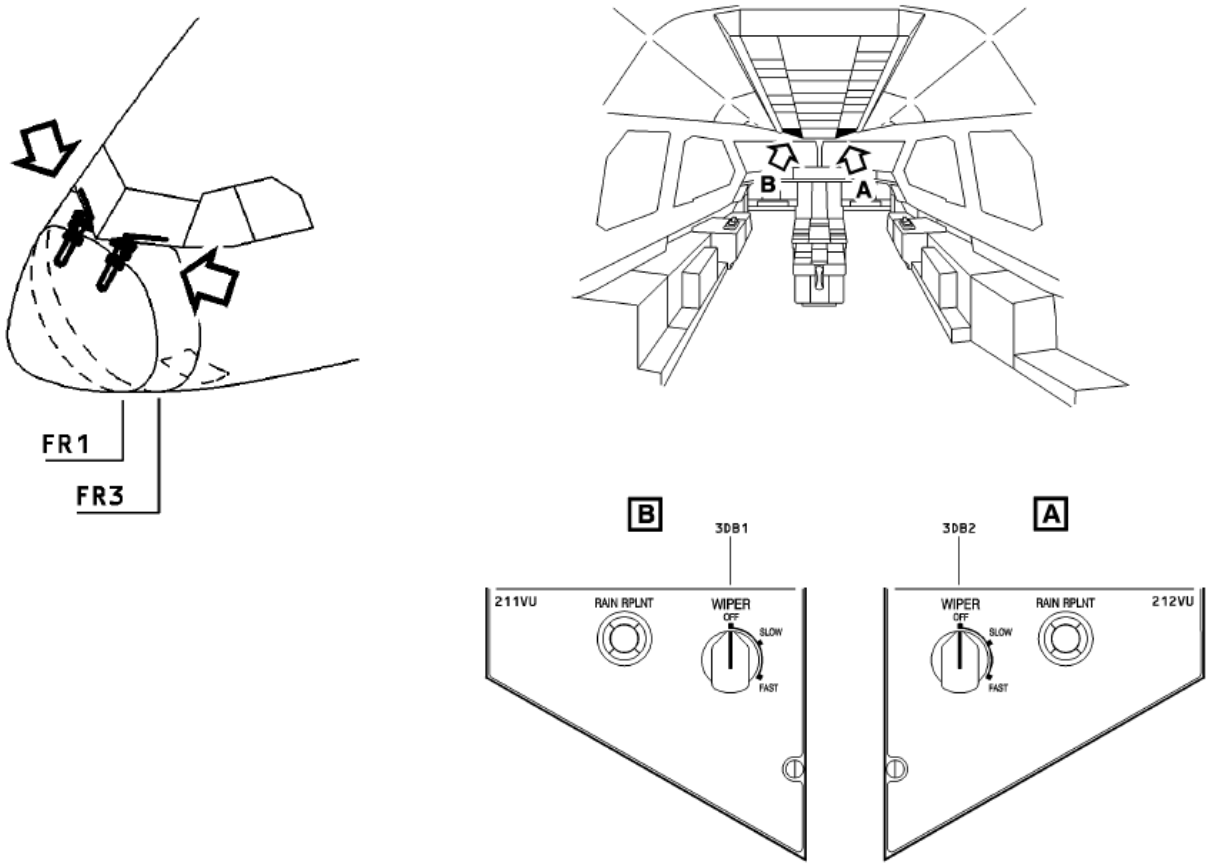

Figure 2: Windshield Rain Protection Subsystem components location

4. Open, safety and tag these circuit breakers:

PANEL	DESIGNATION	FIN	LOCATION
722VU	WXR 2	9SQ2	E49
742VU	WXR 1	9SQ1	H64

5. Make sure that the wipers are in the correct condition and clear the windshield before you operate the wipers.
6. Wet the Captain windshield with water.
7. On the WIPER section of the panel 211VU set the CAPT WIPER selector switch to SLOW.
8. On the Windshield:
   - the wiper moves slowly
   - make sure that the blade does not touch the metal section in the middle of the windshield
   - make sure that the speed of the wiper is approximately 95 strokes per minute
   - make sure that the wiper blade moves smoothly and continuously.

PASS ☐ **FAIL** ☐ **COMMENT:**

9. Set the CAPT WIPER selector switch to FAST.
   - the wiper moves fast
   - make sure that the speed of the wiper is approximately 140 strokes per minute
   - make sure that the wiper blade moves smoothly and continuously

PASS ☐ **FAIL** ☐ **COMMENT:**

10. Set the CAPT WIPER selector switch to OFF.
    - Check that the wiper stops and moves to the park position.

PASS ☐ **FAIL** ☐ **COMMENT:**

11. Wet the First Officer windshield with water.
12. On the WIPER section of the panel 212VU set the F/O WIPER selector switch to SLOW.
13. On the Windshield:
    - the wiper moves slowly
    - make sure that the blade does not touch the metal section in the middle of the windshield
    - make sure that the speed of the wiper is approximately 95 strokes per minute
    - make sure that the wiper blade moves smoothly and continuously.

PASS ☐ **FAIL** ☐ **COMMENT:**

14. Set the F/O WIPER selector switch to FAST.
    - the wiper moves fast
    - make sure that the speed of the wiper is approximately 140 strokes per minute
    - make sure that the wiper blade moves smoothly and continuously

PASS ☐ **FAIL** ☐ **COMMENT:**

15. Set the F/O WIPER selector switch to OFF.
    - Check that the wiper stops and moves to the park position.

PASS ☐ **FAIL** ☐ **COMMENT:**

16. Remove the remaining water and dry the windshield.
17. Remove the access platform
18. De-energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-862-801).

6.4 Bite Test of the Escape-Slide Locking-Mechanism Ice-Protection

1. Energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-861-801).
2. Do the procedure to get the SYSTEM REPORT/TEST item COM: CABIN (Ref. AMM TASK 45-10-00-860-807).
3. Make sure that the Cabin Intercommunication Data System (CIDS) is energized (Ref. AMM TASK 23-73-00-861-801).
4. Make sure that these circuit breakers are closed:

PANEL	DESIGNATION	FIN	LOCATION
5001VE	ICE PROT ESC SLIDE DOOR 1/2	1DH	F07
5005VE	ICE PROT ESC SLIDE DOOR 3/4	2DH	C01

5. In the cockpit, on the Multipurpose Control and Display Unit (MCDU): Push the CIDS1 line select key.
   - In the cockpit, on the MCDU: The CIDS1 page comes on.
6. In the cockpit, on the MCDU: push the GND SCANNING line select key.
   - In the cockpit, on the MCDU: The CIDS1 GROUND SCANNING page comes on.

NOTE: Wait approx. 180 sec. to make sure that you get the correct system status.

7. After approx. 180 sec. make sure that the 'NO FAULT DETECTED' message comes on.

PASS ☐ **FAIL** ☐ **COMMENT:**

8. De-energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-862-801).

6.5 Operational Test of the Ice Detection System

1. Put warning notices in position on the ice detectors 1DD1 and 1DD2 to tell persons not to touch the ice detectors

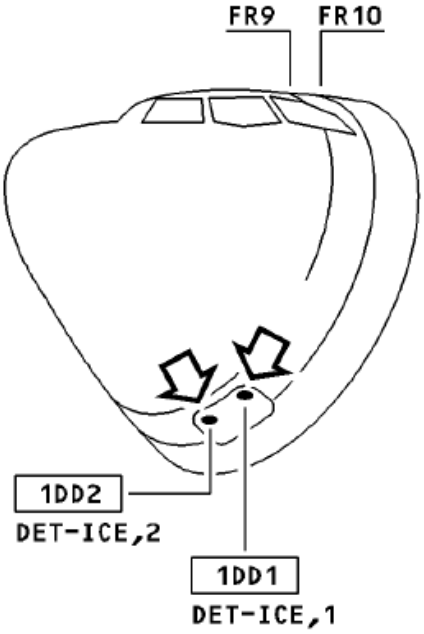

Figure 3: Ice detectors location

2. Energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-861-801).
3. Close the following circuit breakers:

PANEL	DESIGNATION	FIN	LOCATION
721VU	ICE DET 1	2DD1	B07
722VU	ICE DET 2	2DD2	F47

4. On the MCDU, do the procedure to get SYSTEM REPORT/TEST ICE DETECTOR pages (Ref. AMM TASK 45-10-00-860-827).
5. On the MCDU: push the line key adjacent to the TEST indication
   - ➢ after some seconds, the TEST OK indication must come on.

PASS ☐ **FAIL** ☐ **COMMENT:**

6. Open the following circuit breakers:

PANEL	DESIGNATION	FIN	LOCATION
721VU	ICE DET 1	2DD1	B07
722VU	ICE DET 2	2DD2	F47

7. Remove the warning notices.
8. De-energize the aircraft electrical circuits (Ref. AMM TASK 24-41-00-862-801).

7 TEST RESULTS

Test results have to be logged on and any additional observations have to be recorded

Test	Task	Result/ value	Required value	Comments
6.1.9	PHC 1 Operational Test		Test OK	
6.1.12	PHC 1 Class 3 Faults		NO FAULTS	
6.1.17	PHC 2 Operational Test		Test OK	
6.1.20	PHC 2 Class 3 Faults		NO FAULTS	
6.1.25	PHC 3 Operational Test		Test OK	
6.1.28	PHC 3 Class 3 Faults		NO FAULTS	
6.2.7	WHC 1 Operational Test		Test OK	
6.2.10	WHC 1 Class 3 Faults		NO FAULTS	
6.2.15	WHC 2 Operational Test		Test OK	
6.2.18	WHC 2 Class 3 Faults		NO FAULTS	
6.3.8	Capt. Wiper SLOW mode		--	
6.3.9	Capt. Wiper FAST mode		--	
6.3.10	Capt. Wiper turn off procedure		--	
6.3.13	F/O Wiper SLOW mode		--	
6.3.14	F/O Wiper FAST mode		--	
6.3.15	F/O Wiper turn off procedure		--	
6.4.7	Escape-Slide Locking-Mechanism Ice-Protection		--	
6.5.5	Operational Test of the Ice Detection System		--	

Table 1: Test Results

IMPORTANT NOTE: Any comments or remarks arisen during test execution shall be written down here and sent to Engineering Department. Non-conformities shall be processed according to CASA-1023

NOTE: In Case of NCS, write down its number on Table 1

N.C.S. Number	Date

Table 1

NOTE: After this functional test execution, stamp the correspondent operation on the Production Order.

NOTE: Every result sheet must be stamped and attached to Production Order.

STAMP:	
DATE:	