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	Departamento Department FUEL & FIRE PROTECTION	Avión Aircraft	A330-200 MRTT

NT-FA-SGC-06066

A330-200 MRTT

ATA 38 Water Waste System Modification

Request for Test (RFT)

Palabras clave/Key words	Clasificación acceso Access class
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AIRBUS, A330, MRTT, ATA 38, WASTE, WATER, VACUUM, DRAIN, TEST	Registro de Revisiones Revisions Record
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Resumen/Summary

The test described in this document is a Design Clearance Test (DCT), which is aimed at validating those CASA designed modifications performed on the ATA 38 Water Waste System during the MRTT conversion.

Note that the results of this test will be used to show compliance with the Airworthiness requirement JAR 25.1301(d) IAW the A330-200 MRTT RAAF Certification Program Plan for Civil Configuration (Reference DT-FA-C00-05001).

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1. INTRODUCTION

1.1 REFERENCES

A. DT-FA-SGC-06002 Rev B, A330-200 MRTT ATA 38 Modification Description

B. DT-FA-C00-05001 Rev C, A330-200 MRTT RAAF Certification Program Plan for Civil Configuration

C. RAAF A330 Aircraft Maintenance Manual (AMM), Rev No.10

D. F380K0003/C05 Issue 2, Ground Test Program / Report for the Water Waste System

E. DT-FA-DA0-07007 Rev A, A330-200 MRTT Configuration for Phase 1 Flight Test

F. Airbus Technical Design Directives (TDD) for A330/340 Water & Waste System – Issue B

G. 330-25.205261 Rev C, A330-200 MRTT Cabin Layout Drawing

H. F383A1000 Issue A, Waste Instl Drawing

1.2 LIST OF ABBREVIATIONS

A/C	Aircraft
AFT	Aft ward
AMM	Aircraft Maintenance Manual
IAW	In Accordance With
ATA	Air Transport Authority
APU	Auxiliary Power Unit
CASA	Construcciones Aeronáuticas SA
CB	Circuit Breaker
CMC	Centralised Maintenance Computer
DCT	Design Clearance Test
FAP	Flight Attendant Panel
FWD	Forward
GPU	Ground Power Unit
JAR	Joint Airworthiness Regulations
MoC	Means of Compliance
MRTT	Multi Role Tanker Transport
O/Board	Overboard
RAAF	Royal Australian Air Force
RFT	Request for Test
VAC	Volts Alternating Current
VDC	Volts Direct Current

1.3 LIST OF APPLICABLE JAR'S

The applicable JAR requirement for the ATA38 Water & Waste system as defined in the A330-200 MRTT RAAF Certification Plan for Civil Aircraft (MoC 5) (Reference B, pg 6.74), is as follows:

- JAR 25.1301(d) - Function and Installation

  Each item of equipment must function properly when installed.

1.4 INTRODUCTION

The A330-200 basic aircrafts ATA 38 Water Waste System has been modified slightly during the MRTT conversion process to avoid interference with new AAR equipment. Since the ATA 38 system is only certified in its original (unmodified) civil configuration, a Design Clearance Test (DCT) needs to be performed on the MRTT ATA 38 system to validate the CASA designed ATA 38 modifications. Subsequently, this document has been raised to detail the DCT procedures for the modified ATA 38 Water Waste System.

1.5 ATA 38 MOD SUMMARY

The modifications made to the ATA38 Water and Waste System are simplistic in nature and do not deviate from the original system architecture or design philosophy; consisting only of relocating the affected ATA 38 components and re-routing the associated ATA 38 piping/connections.

The Toilet System (ATA 38-31-00) was modified to prevent the no.2 waste tank assy from interfering with a new AAR fuel gallery, and to maintain the accessibility/serviceability of the waste service panel, which was affected by the installation of the boom fairing. The modifications included relocating the no.2 waste tank to the spare tank position, and the the waste service panel into the lower adjacent boom fairing, as well as reworking all of the affected plumbing to suit.

It is important to note that the operation of the ATA 38 Water & Waste System is not affected by the modifications performed during MRTT conversion.

See Reference A for more information regarding this modification.

1.6 TEST OBJECTIVE

The DCT will show that the original functionality of the modified ATA 38 water waste system has been retained, which in turn will show compliance with the airworthiness requirement, JAR 25.1301(d) IAW Reference B.

In summary, the DCT will call out a series of proof, leak and functional tests, derived from original certification tests and maintenance tasks (References D & C respectively), to show that the modified waste systems function as per normal.

The DCT will observe any faults reported by the FAP and/or CMC, and particular concern will be paid to any blockages that may occur, delayed flush cycles, drainage and waste transfer performance, etc.

These tests shall be carried out on the first converted MRTT, after completion of the conversion and before the first operative use of the Waste Water System.

2. TEST AIRCRAFT CONFIGURATION

Prior to the test, ensure that the aircraft is configured IAW with the following instructions:

The ATA38 Water & Waste System must be completely assembled for this test.

- Ensure that lavatories are installed IAW A330-200 MRTT lavatory schematic detailed in Reference G.
- Ensure that ATA 30-71-00, Waste Water Ice Protection System is fully installed and functional.
- Ensure that ATA36 Pneumatic System is operative during the entire test; to keep potable water tanks pressurized.
- Ensure that all other ATA Systems are completely assembled or inhibited accordingly.
- Ensure that both 28VDC and 115VAC power supplies are available throughout test; regardless of whether they are provided by the A/C engines, APU or a GPU.
- Ensure that Flight Attendant Panel (FAP) is installed and operational (Reference C, Section 23-73-00).
- Ensure that all applicable standard AMM pre and post installation checks / tests for all of the above mentioned ATA systems (except ATA38-30-00 Waste Disposal System) have been performed.
- Ensure that all applicable AMM post installation BITE tests have been performed on the ATA 30 & 38 systems.

  NOTE: All applicable remaining AMM tasks for the ATA38-30-00 Waste Disposal System will be covered by the tests detailed in Section 4.

3. SPECIFIC REQUIREMENTS FOR TESTING

3.1 GENERAL TEST CONDITIONS

The following test conditions will apply unless otherwise stated:

Ambient temperature: 23 ± 10°C (74 ± 18°F)

Relative Humidity: 60 ± 35%

Atmospheric pressure: local ambient

Aircraft attitude: Pitch: 0° approximately

Roll: 0° approximately

3.2 TEST EQUIPMENT

Table 1 below details the equipment required for the tests outlined in this document.

NOTE: Equivalent substitutes may be used instead of the following.

Equipment	Test Equipment Requirements	Qty	P/N
Air Evacuating Rig	Capable of providing a 'user defined' differential vacuum pressure of -12.0 psig min. (827 hPa)	1	-
Air Pressure Generator or Bottled Nitrogen Supply	Capable of providing a 'user defined' pressure of 75 psig max. (5.17 bar)	1	
Toilet Servicing Cart	To drain & flush A330 waste tanks	1	-
Potable Water Servicing Cart	To fill & drain A330 potable water tanks	1	-
Leak Tester	Standard adapter kit to leak test vacuum toilet system	1	9501501-4000
Thermometer	-15 to 50 ± 0.5°C	1	-
Access Platforms	10 ft high	1	-
Lint-Free Cotton Cloths	-	-	Material No. 19-003
Rubber Gloves	-	-	-
Buttons	3.7 cm dia.	4	-
Pantyhose	-	4	-
Lipstick	-	4	-
Paper towels	Standard airline size	20	-
Toilet Paper, sheets of	Standard airline size	64	-
Potable Water Potable Water Tanks – 25% Full	-	175 L	-
Potable Water Flush Waste Tank	-	200 L	-

Table 1 MTAD Provided ATA38 Waste Disposal System Testing and Handling Equipment

WARNING

The design of air / water supply adaptors shall be such that no abnormal loads shall be put on the system couplings, pipes or supports during connection.

Adaptor Description	Adaptor Requirements	Qty
Adaptor to couple Air Pressure Supply to Waste Tank Flush Lines	Couple to suit. Pressurise with air to +75 psig max.	1
Adaptor to couple Air Evacuating Rig to Leak Tester	Couple to suit. Evacuate system to –12 psig min.	1
Adapter to couple Air Evacuating Rig to Waste Drain Connection	Couple to suit. Evacuate system to –12 psig min.	1

Table 2 Air / Water Supply Adaptors and Couplings

WARNING

The design of pipe blanks shall be such that no abnormal loads shall be put on the system couplings, pipes or supports during connection.

Blank Description	Blank Requirements	Qty
Blank for waste tank flush lines	Couple to suit; to seal against leakage during positive pressure test. Internal pressure to +75 psig max.	2
Blank for o/board vacuum lines	Couple to suit; to seal against leakage during negative pressure test. Internal pressure to –12 psig max.	2

Table 3 Pipe Blanks

3.3 SAFETY CHECKS

All relevant Standing Work Orders concerning safety must be complied with.

This test does involve waste handling activities, however the waste that will be handled is sanitary waste only (in the form of those test items listed in Table 1), however, for added safety, be sure to always use rubber gloves when working on the toilet waste system or parts that have contamination from the waste system.

The aircraft and test equipment must be properly bonded. System pressure is to be monitored at all times to ensure that pressure limits are not exceeded.

3.4 AUTHORITIES / SPECIALISTS PARTICIPATION

EADS-CASA Water Waste Specialists shall oversee the tests.

MTAD Shopfloor Personnel shall perform the tests.

3.5 PRESENTATION OF RESULTS

The following data corresponding to the tests shall be registered in a data sheet:

- Identification and build standard
- Site and date of test / Responsible organisation / Persons present
- General test conditions

Additionally, the data sheet shall register all the information required in this RFT.

Any deviation from this RFT shall be clearly indicated in the data sheet.

The data sheet shall be submitted to:

EADS-CASA Military Transport Aircraft Division

Fuel & Fire Protection Department

Avda. John Lennon s/n

28906 Getafe – Madrid (Spain)

4. TEST REQUIREMENTS

The test sequence in this document is chronological and must be followed strictly. It may be necessary to back-track to an appropriate step if the sequence is broken.

4.1 REAL-TIME MONITORING AND RECORD OF RESULTS

Throughout all test phases of the ATA38 Waste Disposal System, the following shall be monitored and noted (where required) in the attached data sheet (see Appendix A):

- Positive / Vacuum Pressure throughout all test phases; to ensure that test values are not exceeded. No notation required.

  NOTE: All pressure readings are to be taken at:

  - Leak Tester Pressure Manometer
  - Toilet / Potable Water Servicing Carts
  - Air Evacuating Rig
  - Air Pressure Supply (Generator or Bottled Nitrogen)
- Abnormal system behaviour and indications
- Failure messages displayed on FAP and CMC
- Potable water level (no notation required)
- LH & RH Waste tank level (no notation required)

4.2 POSITIVE PRESSURE TEST – LH & RH FLUSH LINES

4.2.1 TEST PREPARATION

Perform the following tasks prior to ground test:

- Ensure that the Aircraft has been set up IAW those instructions in Section 2 of this document.
- Fence off test area and place warning signs accordingly to restrict unauthorised access.

WARNING: OBSERVE ALL ELECTRICAL SAFETY PRECAUTIONS

- Connect external electrical power supply to A/C.
- Remove the LH & RH flush line check valves (5355MG, 5356MG) IAW Subtask 38-31-73-020-050 (Reference C, Task 38-31-73-000-801). See Figure 1 in Appendix B for flush valve location.
- Blank open ends of LH & RH flush lines accordingly; to withstand a positive pressure of up to 75 psig (5.2 bar). See Figure 1 in Appendix B for blank locations.
- Open Waste Service Panel access door (171AL).
- Open the (2) caps of the waste tank flush connections.

4.2.2 PROOF TEST

4.2.2.1 TEST PROCEDURE

A. Connect air pressure generator / nitrogen bottle to RH waste tank flush line connection on waste service panel.

B. Apply a pressure of 75 psig (5.2 bar) to the RH tank flush line. Retain for 5 minutes. Examine the joints / connections of the flush lines for leaks. There shall be no leakage.

C. Reduce line pressure to ambient.

D. Inspect RH flush line for deformation or damage. There shall be no permanent damage or excessive elastic deformation.

E. Repeat steps A – D for the LH flush line.

4.2.2.2 PASS CRITERIA

The proof test shall be deemed a success if the following conditions are met:

- There shall be no leakage.
- There shall be no permanent damage or excessive elastic deformation.

4.2.2.3 TEST CLOSE UP

Perform the following tasks after proof testing the flush lines, in preparation for the leak test that follows in Section 4.2.3:

- Disconnect air supply / bottled nitrogen and associated attachments from waste tank flush lines.
- Remove blanks from flush line ends.
- Reinstall LH & RH flush line check valves (5355MG, 5356MG) IAW Subtask 38-31-73-420-050 (Reference C, Task 38-31-73-400-801).

4.2.3 LEAK TEST

4.2.3.1 TEST PROCEDURE

A. Connect toilet servicing cart to the RH waste tank flush connection on waste service panel.

CAUTION:	**MAKE SURE THAT THE WATER TEMPERATURE IS NOT HIGHTER THAN 60 DEG.C (140 DEG.F), IF IT IS HIGHER, IT CAN CAUSE DAMAGE TO THE COMPONENTS**

B. Turn on pressurised water supply and increase water pressure to 35 psig (2.4 bar).

C. Flush the RH waste holding tank with 50 L (26.5 USgal) of water.

D. Examine the joints / connections of the flush lines for leaks. There shall be no leakage.

E. Repeat steps A – D for the LH flush line.

4.2.3.2 PASS CRITERIA

The leak test shall be deemed a success if the following condition is met:

- There shall be no leakage.

4.2.3.3 TEST CLOSE-UP

Perform the following tasks after pressure testing the LH & RH waste tank flush lines in preparation for the toilet system pressure tests that follow in Section 4.3:

- Drain the LH & RH waste tanks IAW following instructions:

WARNING:	**ALWAYS USE RUBBER GLOVES WHEN YOU DO WORK ON THE TOILET WASTE SYSTEM, OR ON PARTS THAT HAVE CONTAMINATION FROM THE WASTE SYSTEM.** **WHEN YOU COMPLETE THE WORK PROCEDURE, CLEAN YOUR HANDS WITH SOAP AND WATER.** **THIS WILL PREVENT INFECTION (TOILET WASTE IS DANGEROUS FOR HEALTH)**

  - Open the cap of the waste drain-line valve.
  - Connect the hose adaptor and the 4" diameter drain hose of the toilet-servicing cart to the waste-tank drain connection.
  - Push the PUSH TO OPEN lever on the waste drain-line valve to the OPEN position.
  - Push the drain-valve control-levers to the OPEN position and let the waste water drain.
  - Touch the drain hose and make sure that the waste water has drained completely.
  - Put the drain-valve control-levers to the CLOSED position.
  - Disconnect the drain hose and the hose adapter.
  - Close the caps of the waste drain-line valve and the tank flush connections.
  - Clean and dry the service panel area with a clean cloth.

4.3 NEGATIVE PRESSURE TEST – LH & RH TOILET SYSTEMS

4.3.1 TEST PREPARATION

Perform the following tasks prior to ground test:

- Disconnect LH & RH O/Board Vac Pipes from their respective waste separator. See Figure 2 in Appendix B for disconnection points.
- Blank open ends of LH & RH O/Board Vac Pipes accordingly; to withstand a vacuum pressure of –12 psig (827 hPa). See Figure 2 in Appendix B for blank locations.

4.3.2 PROOF TEST

4.3.2.1 TEST PROCEDURE

Proof test the LH & RH vacuum systems IAW the following procedure:

A. Clean Leak Tester interface and adjacent area of vacuum system overboard vents.

B. Install Leak Tester to test LH vacuum system IAW the following instructions. See Figure 3 in Appendix B for installation layout.

   i. Install measuring part of Leak Tester (indication unit Pno. 9501501-4100 and test plug Pno. 9501501-4200) in FWD overboard vent (AFT vent for RH system test).

   ii. Hand tighten serrated nut of test plug to lock in place.

   iii. OPEN manual ventilation valve of the measuring tool.

   iv. Install plug part of Leak Tester (Pno. 9501501-4300) in AFT overboard vent (FWD vent for RH system test).

   v. Hand tighten serrated nut of plug to lock in place.

   vi. CLOSE manual ventilation valve of the plug.

WARNING:	**CONTINUED LOUD CRACKING OR POPPING NOUSES DURING THIS TEST INDICATES THAT FAILURE MAY BE OCCURRING.** **IN THE EVENT THAT FAILURE DOES OCCUR, TURN OFF PRESSURE SUPPLY AND VENT PRESSURE FROM SYSTEM USING MANUAL VENTILATION VALVES.**

C. Connect Air Evacuating Rig to Leak Tester.

D. Evacuate the system slowly to –12 psig (827 hPa). Wait at least 1 min until pressure is stable before progressing with test.

E. Retain vacuum in system for 5 minutes. Inspect all associated joints / connections. There shall be no leakage.

F. Increase air pressure to ambient.

G. Inspect all pipes and associated joints / connections. There shall be no permanent damage or excessive elastic deformation.

H. Repeat steps A – G for the RH vacuum system.

4.3.2.2 PASS CRITERIA

The proof test shall be deemed a success if the following conditions are met:

- There shall be no leakage.
- There shall be no permanent damage or excessive elastic deformation.

4.3.2.3 TEST CLOSE-UP

Perform the following tasks after proof testing the LH & RH vacuum systems & drain line in preparation for the toilet system leak test that follows in Section 4.3.3:

- Leave Leak Test Tool and Air Evacuating Rig installed in RH toilet system.
- Remove all blanks.
- Connect LH & RH O/Board Vac Pipes to waste separators IAW installation drawings.

4.3.3 LEAK TEST

4.3.3.1 TEST PROCEDURE

Leak test the LH & RH vacuum systems IAW the following procedures:

A. Evacuate the RH system slowly to –8.5 psig (586 hPa). Wait at least 1 min until pressure is stable before progressing with test.

B. CLOSE manual ventilation valve of the measuring tool, and turn off vacuum supply.

C. Record initial vacuum pressure.

D. Retain vacuum in system for 5 minutes.

E. Record final vacuum pressure.

F. OPEN manual ventilation valve of the measuring tool to release pressure.

G. Install Leak Tester to test LH Toilet System IAW Step B, Section 4.3.2.1.

H. Repeat steps A – G for the LH toilet system.

4.3.3.2 PASS CRITERIA

The leak test shall be deemed a success if the following condition is met:

- Pressure difference between initial & final system pressure ≤ 0.50 psig (34.5 hPa).

4.3.3.3 TEST CLOSE-UP

Perform the following tasks after testing the toilet systems in preparation for the toilet functional test that follows in Section 4.4:

- Leave Leak Test Tool and Air Evacuating Rig installed in RH toilet system.
- Remove the Safety Clips and Tags and CLOSE the following 5005VE panel circuit breakers:
  - 1MG, 3MG, 4MG, 5MG, 6MG, 101MG, 102MG, 104MG, 105MG, 106MG
- Close all access doors and turn OFF light switches.

4.4 RH TOILET SYSTEM FUNCTIONAL

4.4.1 TEST PREPARATION

Perform the following tasks prior to ground test:

WARNING:	**ALWAYS USE RUBBER GLOVES WHEN YOU DO WORK ON THE TOILET WASTE SYSTEM, OR ON PARTS THAT HAVE CONTAMINATION FROM THE WASTE SYSTEM.** **WHEN YOU COMPLETE THE WORK PROCEDURE, CLEAN YOUR HANDS WITH SOAP AND WATER.** **THIS WILL PREVENT INFECTION (TOILET WASTE IS DANGEROUS FOR HEALTH).**
WARNING:	**DO NOT WORK ON THE TOILET WASTE SYSTEM AND THE POTABLE WATER SYSTEM AT THE SAME TIME. THIS WILL PREVENT CONTAMINATION OF THE POTABLE WATER SYSTEM. SUCH CONTAMINATION CAN BE DANGEROUS TO HEALTH.**
WARNING:	**OBSERVE ALL ELECTRICAL SAFETY PRECAUTIONS.**

- Test functionality of Waste Service Panel-Door Limit-Switch (13MG) IAW Task 38-31-00-710-802 (Reference C).
- CLOSE the following CB's on panel 5005VE; get access to panel IAW Task 31-18-00-010-801 (Reference C).
  - WATER SYSTEM AIR COMPRESSOR (Fin. 1MD)
  - LAV PWR RH MID-AFT (Fin. 3MG)
  - LAV PWR RH AFT (Fin. 4MG)
  - RH VACUUM TOILET SYSTEM (Fin. 5MG)
- OPEN, SAFETY and TAG the RH Vacuum Generator (6MG) CB on panel 5005VE.
- OPEN, SAFETY and TAG the following CB's IAW Subtask 38-31-00-865-062 (Reference C, Task 38-31-00-720-801).
  - CMC 1 (Fin. 3TM1)
  - CMC 2 (Fin. 3TM2)
  - CMC 1 SWTG (Fin. 4TM1)
  - CMC 2 SWTG (Fin. 4TM2)
- Fill Potable Water Tanks to 25% capacity IAW Task 12-15-38-613-801 (Reference C).
- Pressurise the Potable Water System IAW Task 38-10-00-614-801 (Reference C).
- Make sure that the waste service panel door 171AL is CLOSED.
- Simulate A/C Flight Condition IAW the following instructions:
  - Put the nose landing gear in the flight simulation condition IAW Task 32-69-00-860-801 (Reference C).
  - Do the operational test of the landing gear doors IAW Task 32-31-00-710-802 (Reference C).
- Check on FAP display that no ATA38 related error/maintenance messages are shown.
- Perform an operational test of the ATA 38 waste system IAW the following instructions:
  - Get access to the MCDU SYSTEM REPORT / TEST menu page IAW Task 45-10-00-860-801 (Reference C).
  - On the MCDU: - Push the NEXT PAGE pushbutton
    - Push the TOILET> line key → The VACUUM TOILET SYSTEM page shows.
    - Push the SYSTEM TEST> line key → No system faults are displayed.
- Check that there is no water flowing into any of the LH / RH lavatories.

4.4.2 SIMULTANEOUS FLUSH TEST (VAC PRESSURE DIFF @ –200 MBAR [–2.90 PSIG])

4.4.2.1 TEST PROCEDURE

Test the modified RH Toilet System by performing a simultaneous flush test IAW the following test procedures:

NOTE: All references to toilets, toilet bowl and/or flush switch refer to the L14 (fwd-most) and L74 (aft-most) RH lavatories only, unless otherwise mentioned.

IMPORTANT: Wait for end of flush sequence before progressing to next step.

Toilet flush cycles (for same toilet) are inhibited for 12 secs automatically by the VSC.

If an item fails to flush on first flush, a second and third flush attempt is permitted, however, if the item remains lodged after the third flush, then remove item, note failure, and continue with test.

After each of the following flush sequences, wait for the vacuum differential pressure in the RH waste tank to regulate back to –2.90 psig (–200 mbar).

A. Evacuate the system slowly to –2.90 psig (–200 mbar). Wait at least 1 min until pressure is stable before progressing with test.

B. Drop (16) toilet paper sheets (standard aircraft size) in each toilet bowl and simultaneously flush toilets.

C. Drop (1) panty hose in each toilet bowl and simultaneously flush toilets.

D. Drop (5) paper towels (standard airline size) in each toilet bowl and simultaneously flush toilets.

E. Drop (1) button (3.7 cm dia.) in each toilet bowl and simultaneously flush toilets.

F. Drop (1) lipstick in each toilet bowl and simultaneously flush toilets.

G. Drain RH waste holding tank IAW Subtask 38-31-00-680-050 (Reference C, Task 38-31-00-680-801). Note down a description of the waste servicing carts contents after draining the system.

H. Empty waste servicing cart.

I. Flush RH waste holding tank IAW Subtask 38-31-00-170-050 (Reference C, Task 38-31-00-680-801). Note down a description of the waste servicing carts contents after being flushed clean.

J. Empty waste servicing cart.

4.4.2.2 SUCCESS CRITERIA

The simultaneous flush test shall be deemed a success if the following conditions are met:

- All waste matters shall be completely sucked off at first flush attempt.
- There shall be no blockages and/or restrictions in the vacuum waste line between the toilet and waste tank.
- All waste matters shall be completely drained away after the waste tank drain and flush procedures.
- There shall be no error messages flagged on the FAP / CMC panels.

4.4.2.3 TEST CLOSE-UP

Perform the following tasks after simultaneous flush test:

- Disconnect external vacuum unit and associated attachments from aircraft.
- Make sure that the work area is clean and clear of tools and other items.
- Clean interface / adjacent area of vacuum system overboard vents.

- Remove the Safety Clips and Tags and CLOSE the following CB's:
  - RH VACUUM GEN (Fin. 6MG)
  - CMC 1 (Fin. 3TM1)
  - CMC 2 (Fin. 3TM2)
  - CMC 1 SWTG (Fin. 4TM1)
  - CMC 2 SWTG (Fin. 4TM2)

4.4.3 SIMULTANEOUS FLUSH TEST (VACUUM GENERATOR)

4.4.3.1 TEST PROCEDURE

Test the modified RH Toilet System by performing a simultaneous flush test IAW the following test procedures:

NOTE: All references to toilets, toilet bowl and / or flush switch refer to the L14 (fwd-most) and L74 (aft-most) RH lavatories only, unless otherwise mentioned.

IMPORTANT: Wait for end of flush sequence before progressing to next step.

Toilet flush cycles (for same toilet) are inhibited for 12 secs automatically by the VSC.

If an item fails to flush on first flush, a second and third flush attempt is permitted, however, if the item remains lodged after the third flush, then remove item, note failure, and continue with test.

A. Drop (16) toilet paper sheets (standard aircraft size) in each toilet bowl and simultaneously flush toilets.

B. Drop (1) panty hose in each toilet bowl and simultaneously flush toilets.

C. Drop (5) paper towels (standard airline size) in each toilet bowl and simultaneously flush toilets.

D. Drop (1) button (3.7 cm dia.) in each toilet bowl and simultaneously flush toilets.

E. Drop (1) lipstick in each toilet bowl and simultaneously flush toilets.

F. Drain RH waste holding tank IAW Subtask 38-31-00-680-050 (Reference C, Task 38-31-00-680-801). Note down a description of the waste servicing carts contents after draining the system.

G. Empty waste servicing cart.

H. Flush RH waste holding tank IAW Subtask 38-31-00-170-050 (Reference C, Task 38-31-00-680-801). Note down a description of the waste servicing carts contents after being flushed clean.

I. Empty waste servicing cart.

4.4.3.2 SUCCESS CRITERIA

The simultaneous flush test shall be deemed a success if the following conditions are met:

- All waste matters shall be completely sucked off at first flush attempt.
- There shall be no blockages and/or restrictions in the waste line between the toilet and waste tank.
- All waste matters shall be completely drained away after the waste tank drain and flush procedures.
- There shall be no error messages flagged on the FAP / CMC panels.

4.4.3.3 TEST CLOSE-UP

Perform the following tasks after simultaneous flush test:

- Disconnect all attached devices and equipment installed on the aircraft.
- Clean component interfaces and/or adjacent area.

4.5 LH & RH TOILET SYSTEM FUNCTIONAL (SIMPLE)

4.5.1 TEST PREPARATION

Perform the following tasks prior to ground test:

- CLOSE the following CB's on panel 5005VE; get access to panel IAW Task 31-18-00-010-801 (Reference C).
  - WATER SYSTEM AIR COMPRESSOR (Fin. 1MD)
  - LAV PWR RH FWD (Fin. 1MG)
  - LAV PWR RH MID-AFT (Fin. 3MG)
  - LAV PWR RH AFT (Fin. 4MG)
  - RH VACUUM TOILET SYSTEM (Fin. 5MG)
  - RH VACUUM GENERATOR (Fin. 6MG)
  - LAV PWR LH FWD (Fin. 101MG)
  - LH VACUUM TOILET SYSTEM (Fin. 102MG)
  - LAV PWR LH AFT (Fin. 104MG)
  - LH VACUUM TOILET SYSTEM (Fin. 105MG)
  - LH VACUUM GENERATOR (Fin. 106MG)

4.5.2 TEST PROCEDURES

Perform a Functional Test of the LH Toilet Assembly IAW the following test procedures:

NOTE: The flush cycle starts when you push the flush switch in the lavatory. See Reference G for A/C Lavatory layout.

A. Flush all LH Lavatories one after the other. Verify that the following occurs in each lavatory:
   i. In Zone 170: LH vacuum generator 109MG starts / continues to operate
   ii. In the Lavatory Water valve opens 1 sec after flush switch operation. Potable water enters bowl
   iii. In Zone 170: LH vacuum generator 109MG stops operating 15 secs after final flush switch operation

B. Flush LH Lavatories L53 (fwd-most) and L73 (aft-most) at the same time. Verify that the following occurs in both lavatories:
   i. In Zone 170: LH vacuum generator 109MG starts to operate
   ii. In the Lavatory Water valve opens 1 sec after flush switch operation. Potable water enters bowl
   iii. In Zone 170: LH vacuum generator 109MG stops operating 15 secs after flush switch operation

C. Open Waste Service Panel access door (171AL).

D. Flush any LH lavatory. Verify that the following occurs:
   i. In Zone 170: LH vacuum generator 109MG does not operate
   ii. In the Lavatory The toilet does not flush

E. Close Waste Service Panel access door (171AL).

Perform a Functional Test of the RH Toilet Assembly IAW the following test procedures:

F. Flush all RH Lavatories one after the other. Verify that the following occurs in each lavatory:
   i. In Zone 170: RH vacuum generator 9MG starts / continues to operate
   ii. In the Lavatory Water valve opens 1 sec after flush switch operation. Potable water enters bowl
   iii. In Zone 170: RH vacuum generator 9MG stops operating 15 secs after final flush switch operation

G. Flush RH Lavatories L14 (fwd-most) and L74 (aft-most) at the same time. Verify that the following occurs in both lavatories:
   i. In Zone 170: RH vacuum generator 9MG starts to operate
   ii. In the Lavatory Water valve opens 1 sec after flush switch operation. Potable water enters bowl
   iii. In Zone 170: RH vacuum generator 9MG stops operating 15 secs after flush switch operation

H. Open Waste Service Panel access door (171AL).

I. Flush any RH lavatory. Verify that the following occurs:
   i. In Zone 170: RH vacuum generator 9MG does not operate
   ii. In the Lavatory The toilet does not flush

J. Close Waste Service Panel access door (171AL).

4.5.2.1 SUCCESS CRITERIA

The functional flush test shall be deemed a success if the following conditions are met:

- The toilet system shall behave as expected for each flush scenario listed above.
- All waste water shall be completely evacuated.
- There shall be no error messages flagged on the FAP / CMC panels.

4.5.2.2 TEST CLOSE-UP

Put the aircraft back to its initial configuration:

- Drain LH & RH waste holding tanks IAW Subtask 38-31-00-680-050 (Reference C, Task 38-31-00-680-801).
- If necessary, service the toilet system IAW Task 12-16-38-613-801 (Reference C). Skip draining & flushing subtasks.
- Drain potable water system IAW Task 12-24-38-680-801 (Reference C).
- Disconnect all attached devices and equipment installed on the aircraft.
- Clean component interfaces and/or adjacent area.
- Close access doors and turn OFF light switches.
- Put the aircraft back to its initial configuration IAW Subtask 38-31-00-860-054 (Reference C, Task 38-31-00-720-801).
- De-energise ground service network IAW Task 24-42-00-862-801 (Reference C).

5. TEST RESULTS

The test report must include the following:

A. Location of any leakage, along with the corresponding drop in pressure, and an engineering assessment of the expected cause of the leakage. E.g. bad install, component failure or design fault.

B. Description of any abnormality after each flush sequence (water and/or test matter remaining in the bowl).

C. Description of waste tank contents after draining the waste tank. Special attention shall be paid to the test items dropped in the bowl during testing.

D. Description of waste tank content after flushing the waste tank. Special attention shall be paid to the test items dropped in the bowl during testing.

Any of the previous descriptions may be complemented with images /diagrams if this is considered to give a better description. Images shall be captured in colour.

5.1 PASS CRITERIA

No abnormal behaviour of the vacuum system shall be observed during the testing. Subsequently, there shall be no error messages flagged on the FAP / CMC panels.

The vacuum toilet system shall be capable of evacuating all test items dropped in the toilet bowl at first flush attempt, without clogging up the vacuum waste lines.

The waste drain line shall allow for the complete drainage of all test items.

There shall be no system leakage greater than 0.50 psig (34.5 mbar).

There shall be no permanent damage or excessive elastic deformation evident after the proof / leak tests.

5.2 REPORT SHEET

A Report Sheet capturing all of the ATA38 test activities detailed in Section 4 has been included in Appendix A.

6. APPENDIX A – REPORT SHEET

A330 MRTT ATA 38 WATER & WASTE MODIFICATION TESTING RESULTS DATA SHEET			SHEET 1 of 3
Aircraft S/N:	(First production A/C) MSN 0747	**MTAD Representative:**	**Ambient Temperature:**
Company:	EADS-CASA, MTAD	**CAP Representative:**	**Relative Humidity:**
Place:	CAP, Getafe, España		**Atmospheric Pressure:**
Test Responsible Supervisor:		**Signature:**	**Date:**

Test Requirement	GTR Para	Waste Matter / Activity	Start Pressure (psig)	Final Pressure (psig)	Pressure Diff. (psig)	Observations	Pass or Fail
LH & RH FLUSH LINES	**4.2**	LH Proof Test					
		RH Proof Test					
		LH Leak Test					
		RH Leak Test					
LH & RH TOILET SYSTEMS	**4.3**	LH Proof Test					
		RH Proof Test					
		LH Leak Test					
		RH Leak Test					
BITE / OP. TEST	**4.4.1**	Waste Sys Op Test					

A330 MRTT ATA 38 WATER & WASTE MODIFICATION TESTING RESULTS DATA SHEET		SHEET 2 of 3
Test Responsible Supervisor:	**Signature:**	**Date:**

Test Requirement	GTR Para	Waste Matter / Activity	Observations	Pass or Fail
SIMULTANEOUS FLUSH (-200 mbar)	**4.4.2**	Toilet Paper; 16 sheets		
		Panty Hose		
		Paper Towels; 5 sheets		
		Button; 3.7 cm dia.		
		Lipstick		
		Waste Tank Drain		
		Waste Tank Flush		
SIMULTANEOUS FLUSH (Vac Generator)	**4.4.3**	Toilet Paper; 16 sheets		
		Panty Hose		
		Paper Towels; 5 sheets		
		Button; 3.7 cm dia.		
		Lipstick		
		Waste Tank Drain		
		Waste Tank Flush		

A330 MRTT ATA 38 WATER & WASTE MODIFICATION TESTING RESULTS DATA SHEET		SHEET 3 of 3
Test Responsible Supervisor:	**Signature:**	**Date:**

Test Requirement	GTR Para	Waste Matter / Activity	Observations	Pass or Fail
FUNCTIONAL TEST	4.5	LH All Toilets		
		LH Front & Rear Toilet		
		LH Toilet Door Open		
		RH All Toilets		
		RH Front & Rear Toilet		
		RH Toilet Door Open		

7. APPENDIX B – LOCATION OF BLANKS & DISCONNECTION POINTS

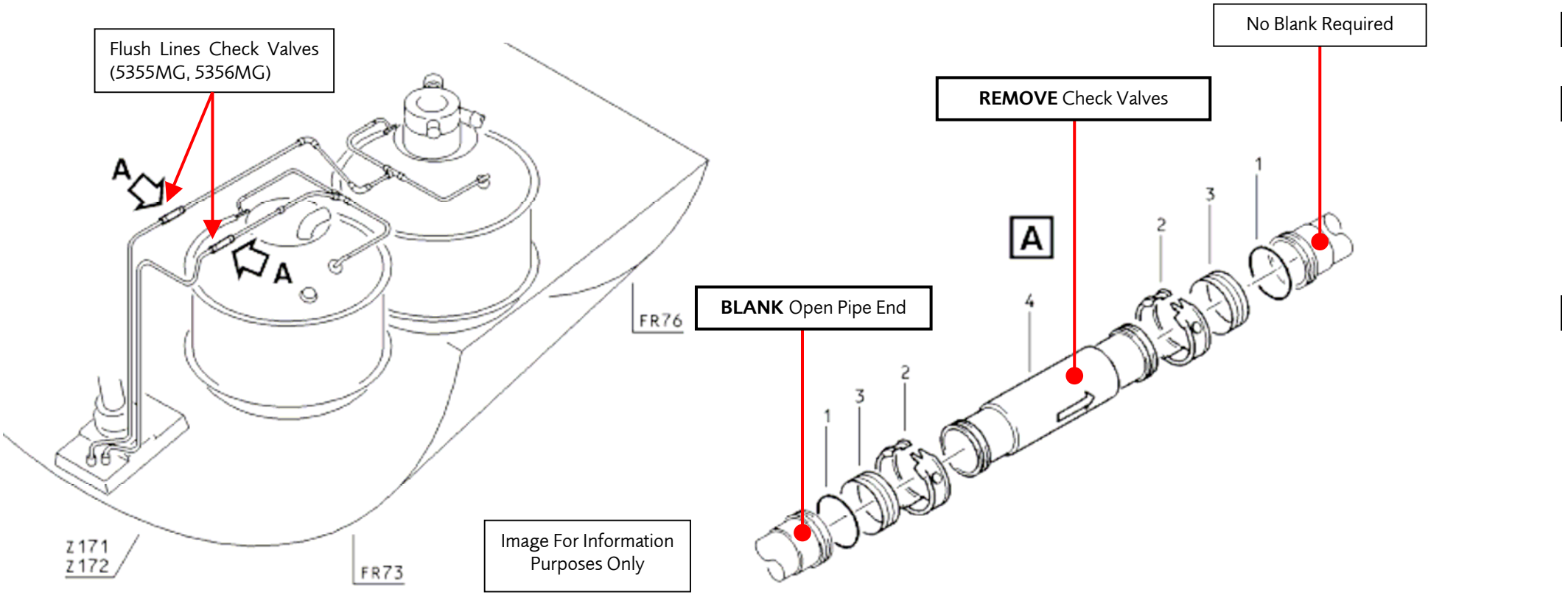

Figure 1 **Location of Flush Line Blanks (Reference C, 38-31-73, pg.404)**

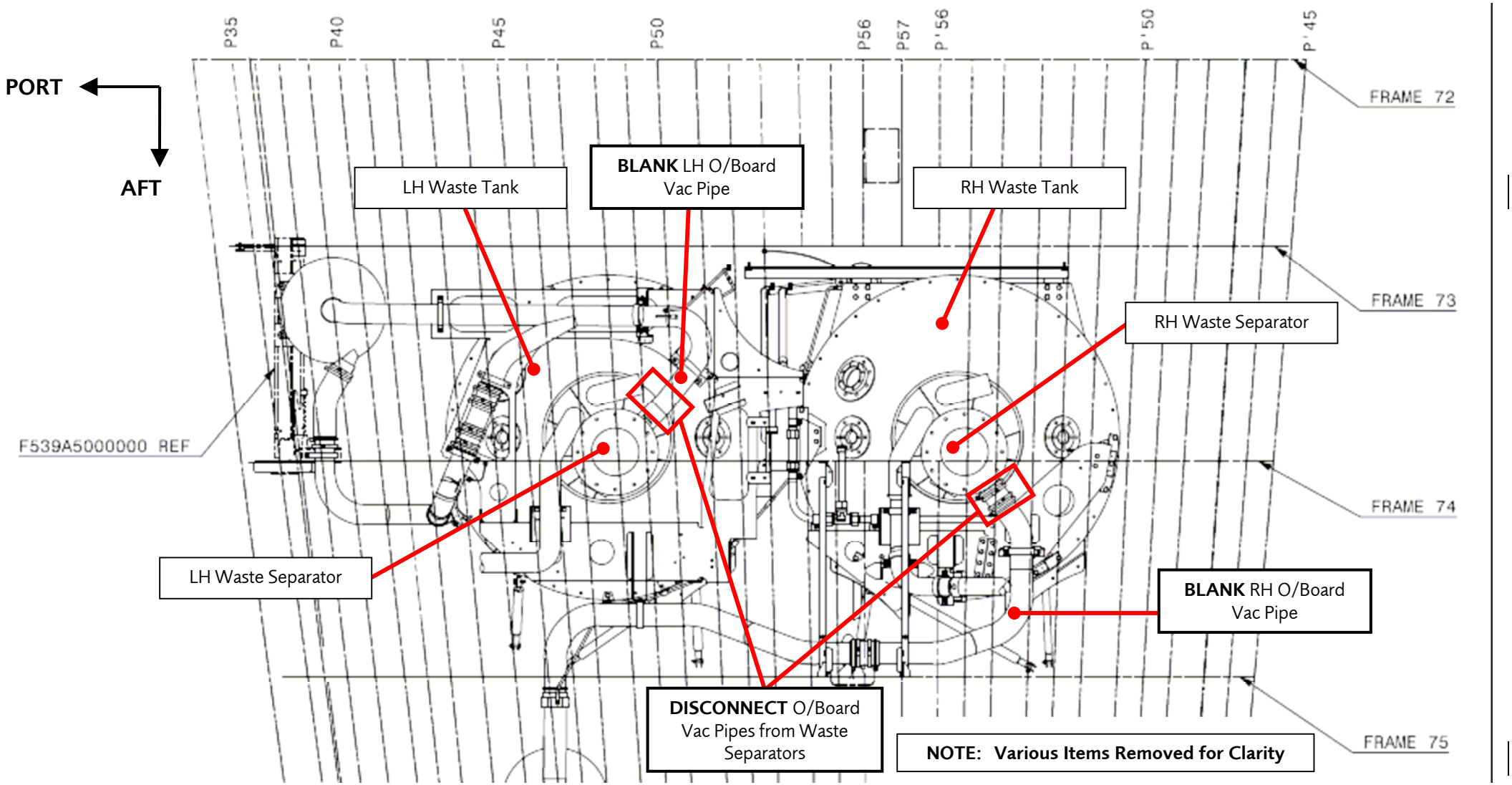

Figure 2 **Location of O/Board Vacuum Line Blanks (Looking Down at Waste Tank Assy) (Reference H)**

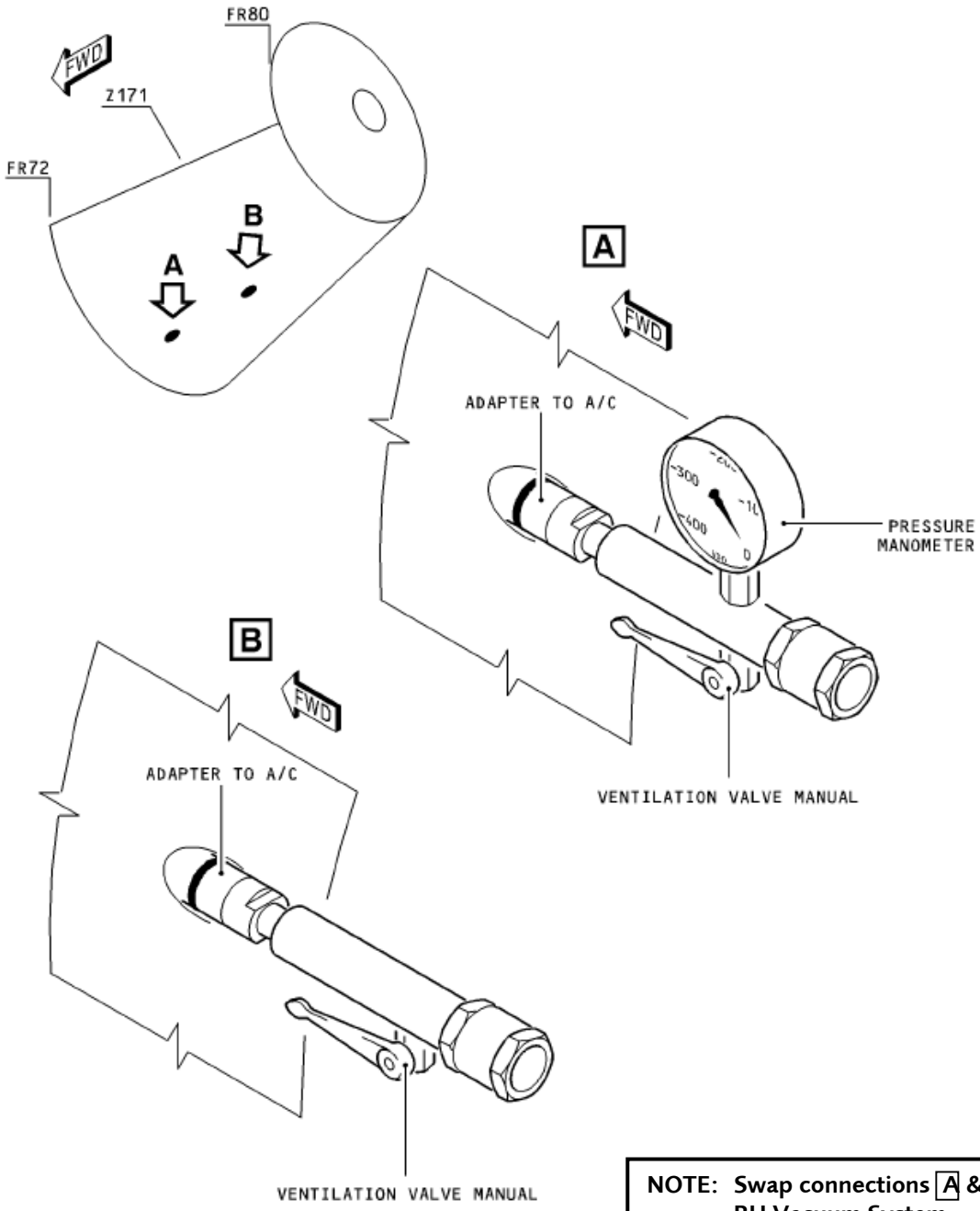

Figure 3 **Leak Tester Installation for Testing LH Toilet System (Reference C, 38-31-00, pg.513)**