

CLIENT: VotingWorks

PROJECT: VXScan

DOCUMENT NUMBER: VWX-001-D010

DOCUMENT TITLE: 4.0 Vibration Test Report

REVISION: X01

DATE: 10/8/2024

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1.0 PURPOSE AND SCOPE

The purpose of this test is to verify that the VXScan system meets the requirements for MIL-STD-810H method 514 vibration tolerance that simulates shipping the product by truck.

2.0 REFERENCES

2.1 Internal References

Document Number	Document Title
N/A	VxScan v3.1 and v4.0 Tests of Normal Function, 9/3/2024 Version
REP061410-ENV	Env Summary Test Report

2.2 External References

Document Number	Document Title
MIL-STD-810H	Method 514.8C-2 – Category 4: Common carrier longitudinal & vertical

3.0 ACRONYMS AND TERMS DEFINED

Acronym	Definition
EUT	Equipment Under Test
NRTL	Nationally Recognized Testing Laboratory

4.0 ITEMS UNDER TEST, MATERIALS, EQUIPMENT, AND CONDITIONS

4.1 Items Under Test

Item	Item #	Rev	Lot #	Sample Size
EUT	VXScan	4.0	n/a	1

4.2 Conditions

The VXScan consists of 3 discrete components, the Scanner, the Ballot Box, and the UPS. The tests are performed with each component separately fastened securely to a shaker table.

5.0 PROCEDURE

Prior to the vibration test, a test of normal functions was performed to verify that the system was functioning normally. Each component was attached to a shaker table and was subjected to

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vibration for the duration specified in the procedure. See the Nemko report for complete details on the vibration test procedure.

6.0 ACCEPTANCE CRITERIA

After the test is complete, the device is undamaged, and it passes the tests of normal function.

7.0 DATA

The test data is in Nemko's report REP061410-ENV.

8.0 RESULTS

The EUT received minor scuff marks and abrasions where parts rubbed against the shaker table. These are described in Nemko's report.

The spring for the latch on the top of the ballot box came loose.



The front door was jammed closed at first and was difficult to open. When closing, it did not latch smoothly anymore.

The UPS appeared undamaged. There did not appear to be any loose parts inside. It powered on and functioned normally.


There were loose parts inside the MCM. When rocking it from side to side, small objects could be heard sliding around.

A screw and washer were found in the bottom of the printer. Another screw and washer were found under the bottom plate. The screws and washers were of the type shown below.

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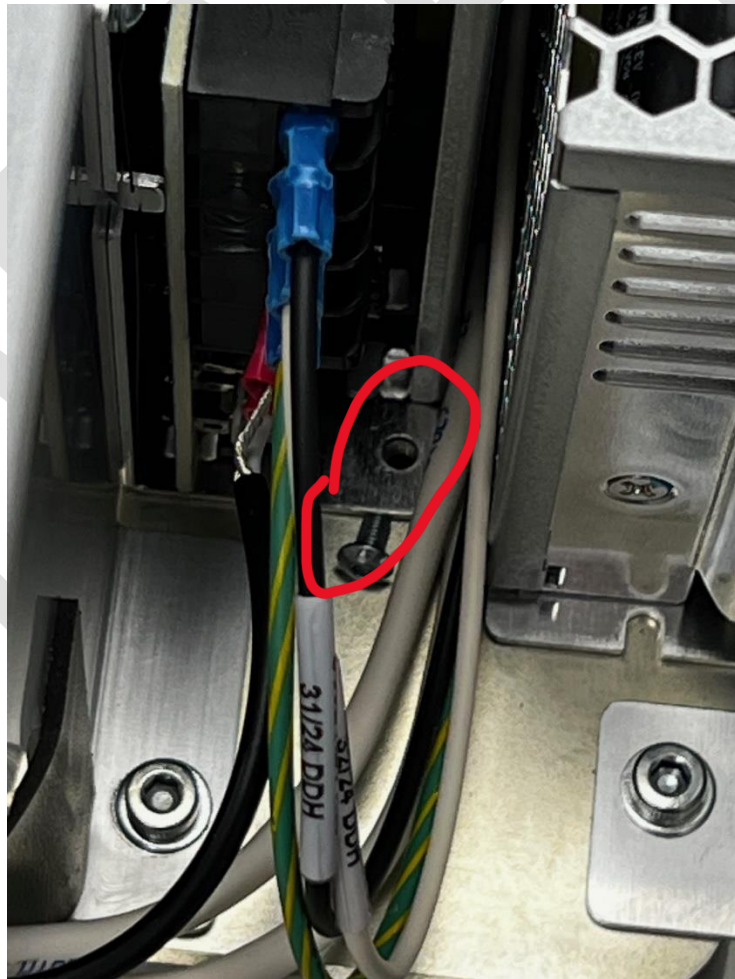
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One of the screws and washers appears to have come from where the 5V power supply is screwed to the bottom plate. The source of the other screw and washer is unknown.



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The wires that run along the front of the unit came out of their clips. Nemko did not disassemble the MCM, so the vibration was the cause of the wires coming loose.



The tape that protects the wires from the sharp edge started coming off. This is probably not due to the vibration test, though. Another method of protecting the wires from the sharp edge should be considered.



After the inspection, another test of normal functions was performed. No problems were found.

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9.0 CONCLUSION


The system did not pass the acceptance criteria of no damage, as noted above. Once the loose parts were secured, the system did pass its test of normal operation indicating there was no permanent damage done.

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REVISION HISTORY AND APPROVALS

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X01	Submitted to Client	N/A	10/8/2024	D. Dull

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