

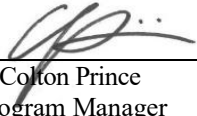
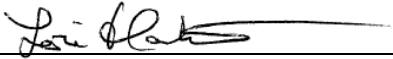
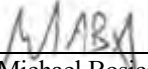
Element Materials Technology Denver-Longmont A.K.A. NTS Labs, LLC Test Report for Environmental/Dynamics Testing of the OSCAR

Prepared For

SHOTOVER Systems | 5660 Airport Boulevard, Suite 101 | Boulder, CO 80301

Prepared By

Element Materials Technology Denver-Longmont | 1601 Dry Creek Drive, Suite 2000 | Longmont, CO 80503 | 303-776-7249 | www.element.com


Colton Prince
Program Manager
Lori Hartman
Preparer
Michael Bosica
Program Manager
Michael Bosica
Revised By

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Revision History

Rev.	Description	Issue Date
0	Initial Release	02/19/2026
1	Revised fan p/n, spec for explosive, added RTCA DO-160 sections to spec listings, updated results	03/12/2026

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1.0 Introduction

This document presents the test procedures used and the results obtained during the performance of an Environmental/Dynamics test program at Element Materials Technology Denver-Longmont (hereafter referred to as “Element”). The test program was conducted to assess the ability of the specified Equipment Under Test (EUT) to successfully satisfy the requirements defined in the test specification.

2.0 References

The following references listed below form a part of this document to the extent specified herein.

- Test Specification: See Table 5.0-1
- SHOTOVER Systems Purchase Order PO-10496 dated 01/16/2025
- Element Quotation OP0666899 dated 11/20/2024
- ISO/IEC 17025:2017(E) *General Requirements for the Competence of Testing and Calibration Laboratories*, dated 11/2017

3.0 Product Selection and Description

SHOTOVER Systems selected and provided the following test sample(s) to be used as the Equipment Under Test.

Table 3.0-1: Product Identification – Equipment Under Test (EUT)

Item	Qty.	Name/Description	Part Number	Serial Number
1	3	OSCAR	012-0031	190019, 190020, 190026
1	3	Fan Blower	MF50151VX-1B00U-A99	1, 2, 3

3.1 Security Classification

Non-classified

4.0 General Test Requirements

4.1 Test Equipment

The instrumentation used in the performance of these tests is periodically calibrated and standardized within manufacturer's rated accuracies and are traceable to the National Institute of Standards and Technology. The calibration procedures and practices are in accordance with ISO 17025:2017. Certification of calibration is on file subject to inspection by authorized personnel.

5.0 Test Description and Results

Table 5.0-1: Summary of Test Information & Results

Section	Test	Specification	Test Facility	Test Date	Part #	Serial #	Test Result
5.1	Humidity	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	12/29/2025 - 01/08/2026	012-0031	190019	³ Pass
5.2	Altitude	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	12/29/2025	012-0031	190020	³ Pass
5.3	Temperature	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	12/29/2025 - 12/31/2025	012-0031	190020	³ Pass
5.4	Temperature Variation	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	01/05/2026 - 01/06/2026	012-0031	190020	³ Pass
5.5	Operational Shocks	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	01/29/2026	012-0031	190026	³ Pass
5.6	Crash Safety - Impulse	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	01/29/2026	012-0031	190020	³ Pass
5.7	Vibration	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	01/13/2026 - 01/15/2026	012-0031	190020	³ Pass
5.8	Vibration	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	01/16/2026 - 01/19/2026	012-0031	190020	³ Pass
5.9	Vibration	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Longmont	01/20/2026 - 01/22/2026	012-0031	190020	³ Pass
Appendix A	¹ Explosive Atmosphere	US211-9002-Rev0.1_OSCAR Explosive Atmosphere Test Plan	Seattle	01/16/2026- 01/19/2026	012-0031	190019	³ Pass
Appendix B	² Flammability	US211-9001-Rev0.2_OSCAR Environmental Test Plan - DO-160G Testing	Minneapolis	02/06/2026- 02/10/2026	MF50151VX- 1B00U-A99	1, 2, 3	³ Pass

¹Note: Explosive Atmosphere testing was performed by Element Materials Technology Seattle 2200 222nd Street SE Bothell, WA 98021.

²Note: Flammability testing was performed by Element Materials Technology Minneapolis 9725 Girard Avenue South Minneapolis, MN 55431.

³The customer verified compliance to their acceptance criteria and relayed pass/fail determination to Element.

5.1 Humidity

5.1.1 Test Procedure

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 6.0, Category B

5.1.2 Test Result

The EUT's results were determined by SHOTOVER Systems to be a Pass.

5.1.3 Test Datasheets

CLIMATICS TEST LOG					
Start Date:	12/29/2025	End Date:	1/8/2026	Job No:	PR188450
Customer:	Shotover Systems		Test Engineer:	Cam Storey	
Customer Witness:	Ken Haan	Lab Temp:	65F	Lab Humidity:	16%
Part Name:	OSCAR	Part Number:	012-0031		
Test Specification:	US211-9001-Rev0.1_In Process_OSCAR Environmental Test Plan - DO-160G - Google Docs			Serial number:	190019
Test Performed:	Severe Humidity Environment			Lot:	N/A
Date	Time	Remarks			Initials
		Sample will be exposed to Humidity test. The EUT shall be tested in accordance with RTCA DO-160G Section 6, Category B. The non operating sample will be exposed to ten 24-hour cycles of humidity with temperature varying between +38C and +65C while maintaining 95% RH. Within 1 hour after the exposure the sample will be removed from the chamber and checked for functionality			CS
12/29/2025	845	Sample was placed within chamber asset #1236			CS
12/29/2025	930	Chamber was programmed to test specifications			CS
12/29/2025	1036	Chamber door was sealed shut. Test has begun			CS
1/8/2026	1445	Sample has completed the exposure			CS
1/8/2026	1445	Customer arrived on site and performed post operational check on the sample for 15 minutes within 1 hour of test completion			CS
		Test Results = Sample showed no visual signs of anomalies after the exposure. Customer to determine Pass/Fail of sample upon further inspection			CS
		Test complete			CS

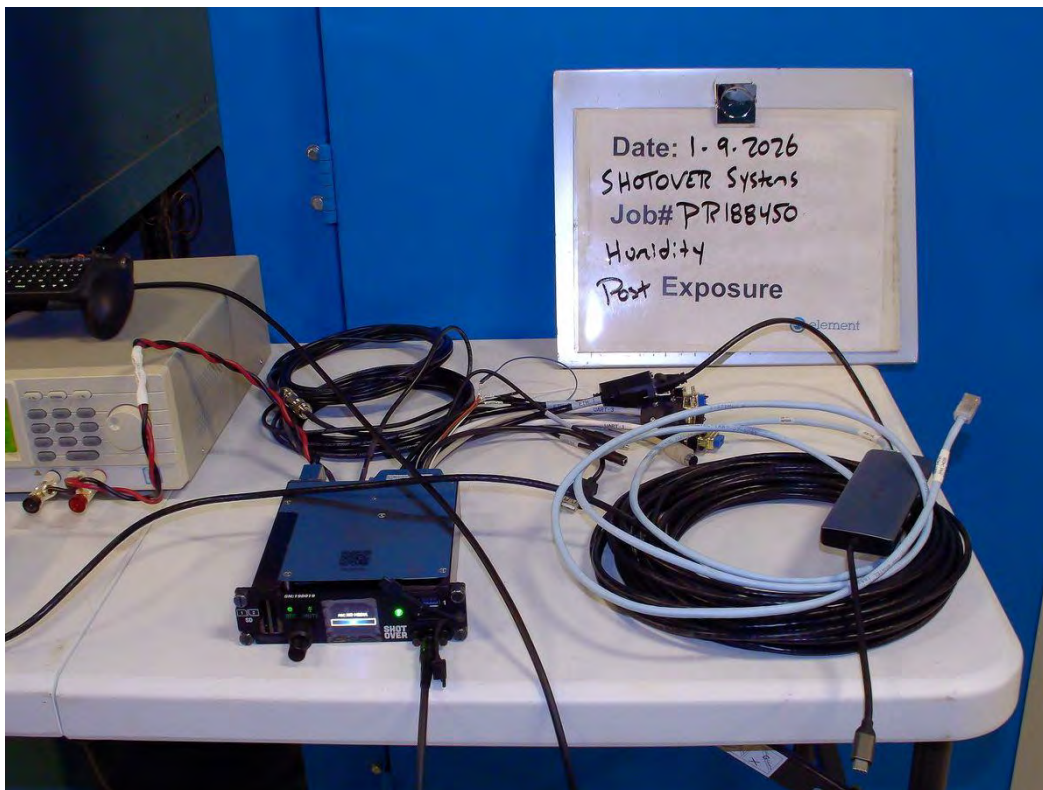
5.1.4 Test Photographs



Pre-Exposure



Pre-Exposure



Post Exposure

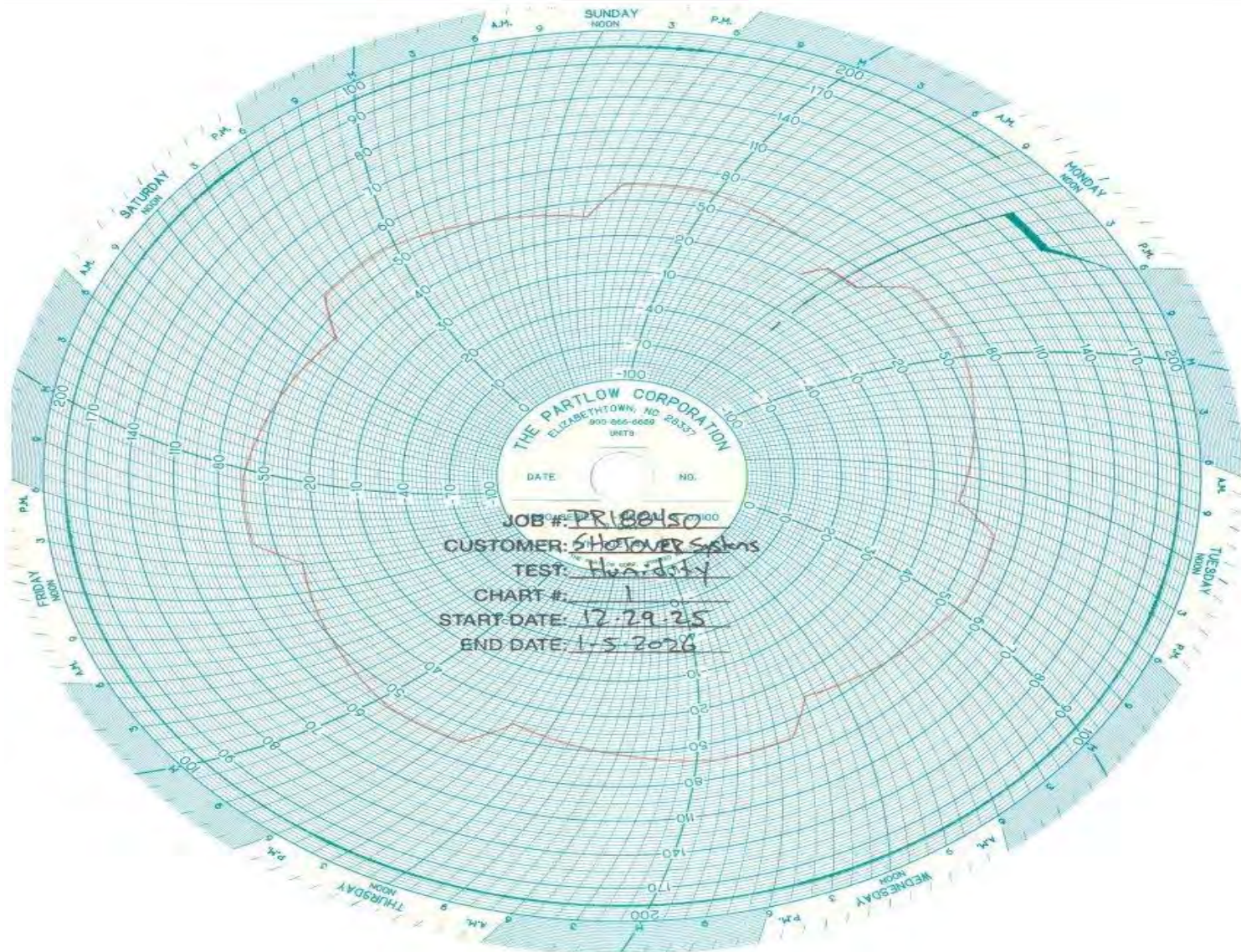


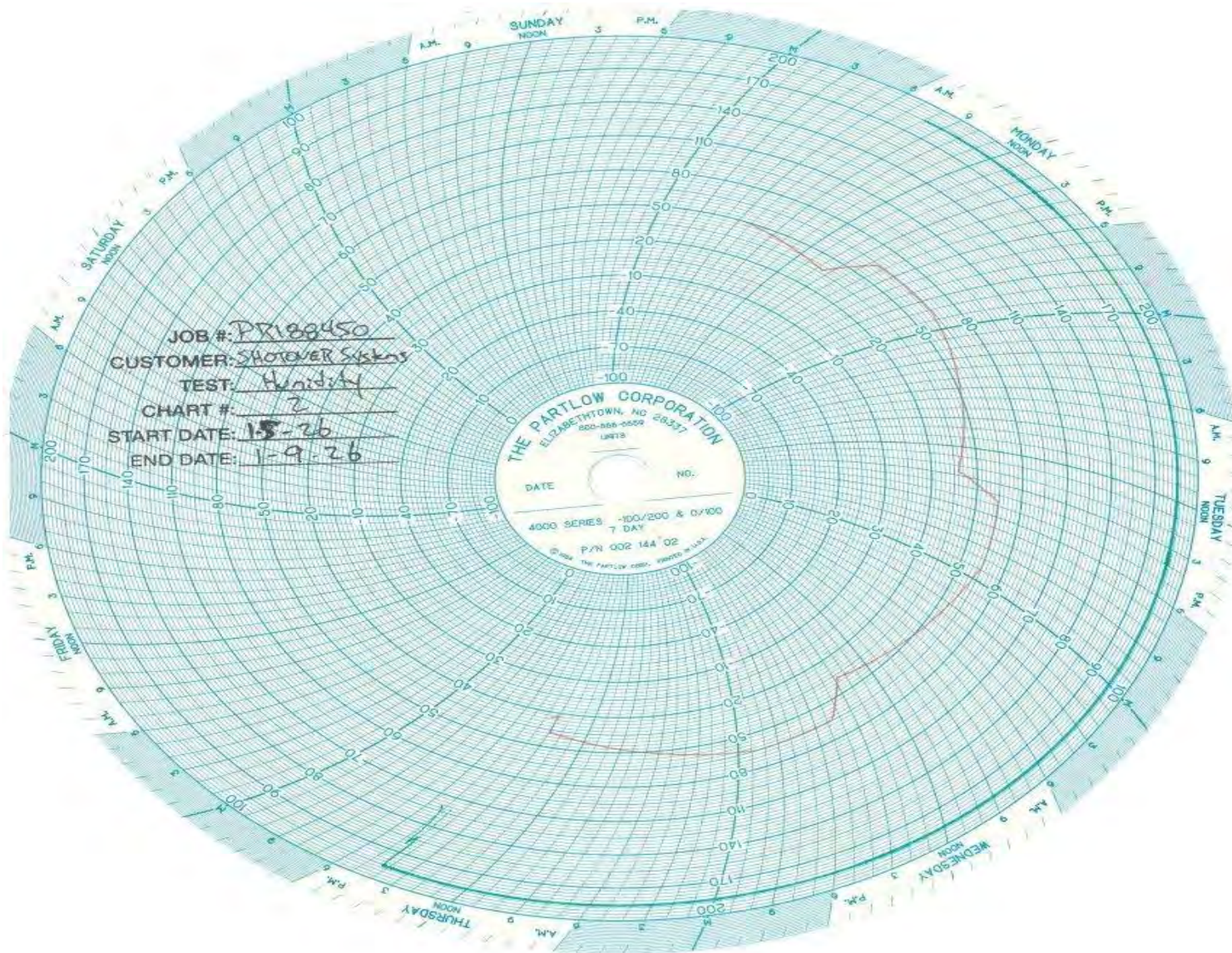
Post Exposure



Post Exposure

5.1.5 Test Data





5.1.6 Test Equipment List

Table 5.1-1: Section 6, Category B - Humidity Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A080838	Thermal Chamber	Thermotron	SM-32C	08/07/2025	08/07/2026
US58-A084267	Temp/Humidity Indicator	Digi-Sense	90080-03	07/24/2025	07/24/2026
US58-A080932	Digital Stopwatch	Digi-Sense	94460-28	03/21/2024	03/21/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.2 Altitude

5.2.1 Test Procedure

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 4.0, Category B2

5.2.2 Test Result

The EUT's results will be determined by SHOTOVER Systems.

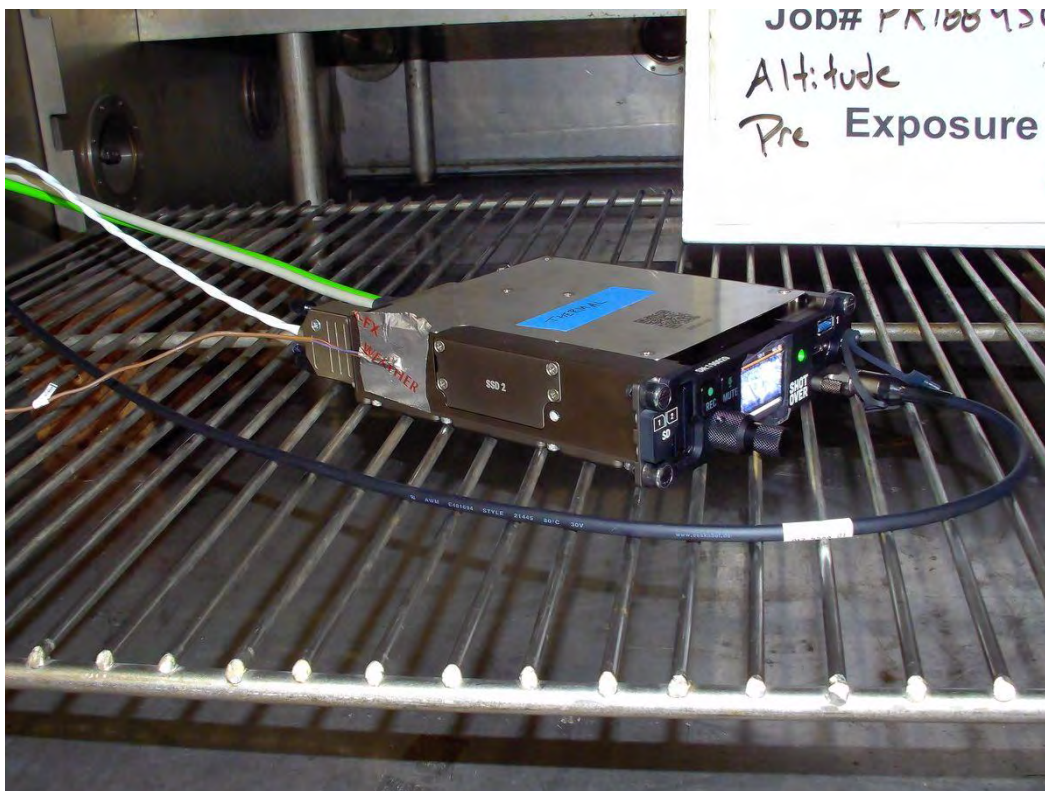
5.2.3 Test Datasheets

CLIMATICS TEST LOG					
Start Date:	12/29/2025	End Date:	12/29/2025	Job No:	PR188450
Customer:	SHOTOVER Systems		Test Engineer:	Cam Storey	
Customer Witness:	Ken Haan		Lab Temp:	65F	Lab Humidity: 16%
Part Name:	OSCAR		Part Number:	012-0031	
Test Specification:	US211-9001-Rev0.1_In Process_OSCAR Environmental Test Plan - DO-160G - Google Docs			Serial number:	190020
Test Performed:	Altitude			Lot:	N/A
Date	Time	Remarks			Initials
		Sample will be exposed to Altitude test. The operating sample will be exposed to 25,000 feet (5.45 PSIA) at ambient temperature. The sample will dwell for 2 hours following stabilization. After the exposure the chamber will be brought back to ambient conditions			CS
12/29/2025	1051	Sample was placed within chamber asset #1895			CS
12/29/2025	1115	Chamber was programmed to test specifications			CS
12/29/2025	1148	Chamber door was sealed shut. Test has begun with a ramp to 12.200 PSIA and +23C			CS
12/29/2025	1157	Ramp chamber to 25,000 feet (5.45 PSIA) and +23C in 15 minutes and allow sample to reach stabilization			CS
12/29/2025	1211	Sample achieved stabilization. Begin a 2 hour minimum dwell			CS
12/29/2025	1448	Dwell complete			CS
12/29/2025	1449	Ramp chamber to 12.200 PSIA and +23C in 15 minutes			CS
12/29/2025	1525	Customer removed sample from the chamber			CS
		Test Results = Sample showed no visual signs of anomalies after the exposure. Customer to determine Pass/Fail of sample upon further inspection			CS
		Test complete			CS

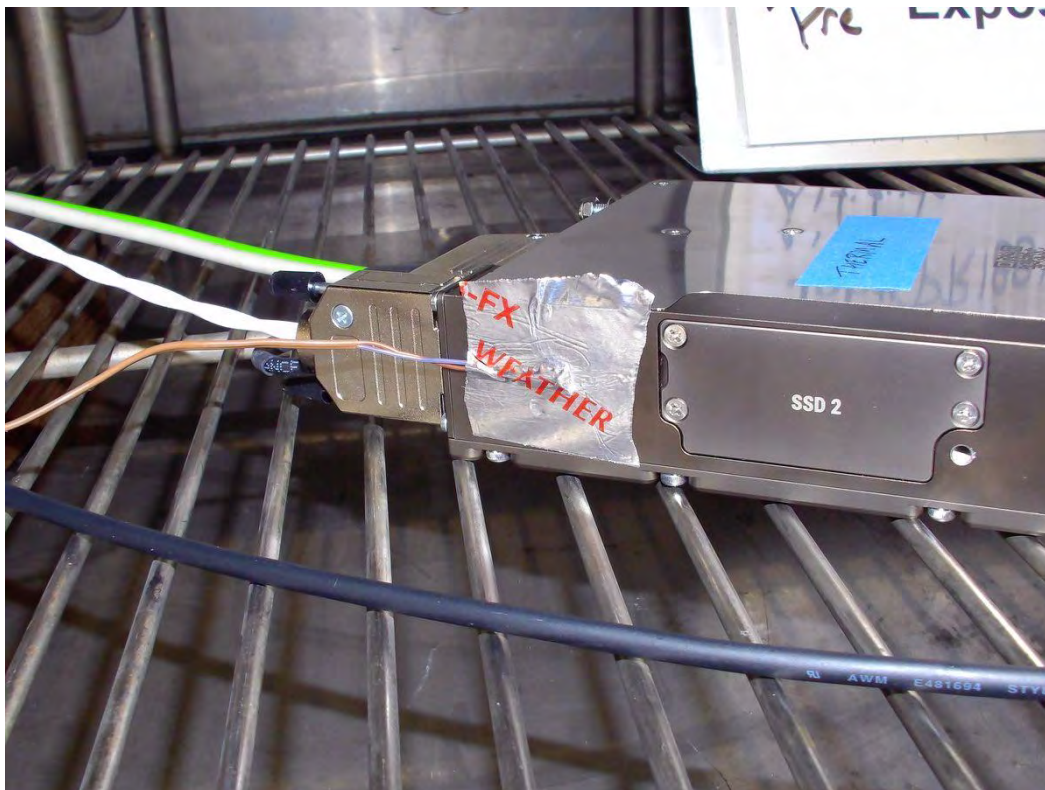
5.2.4 Test Photographs



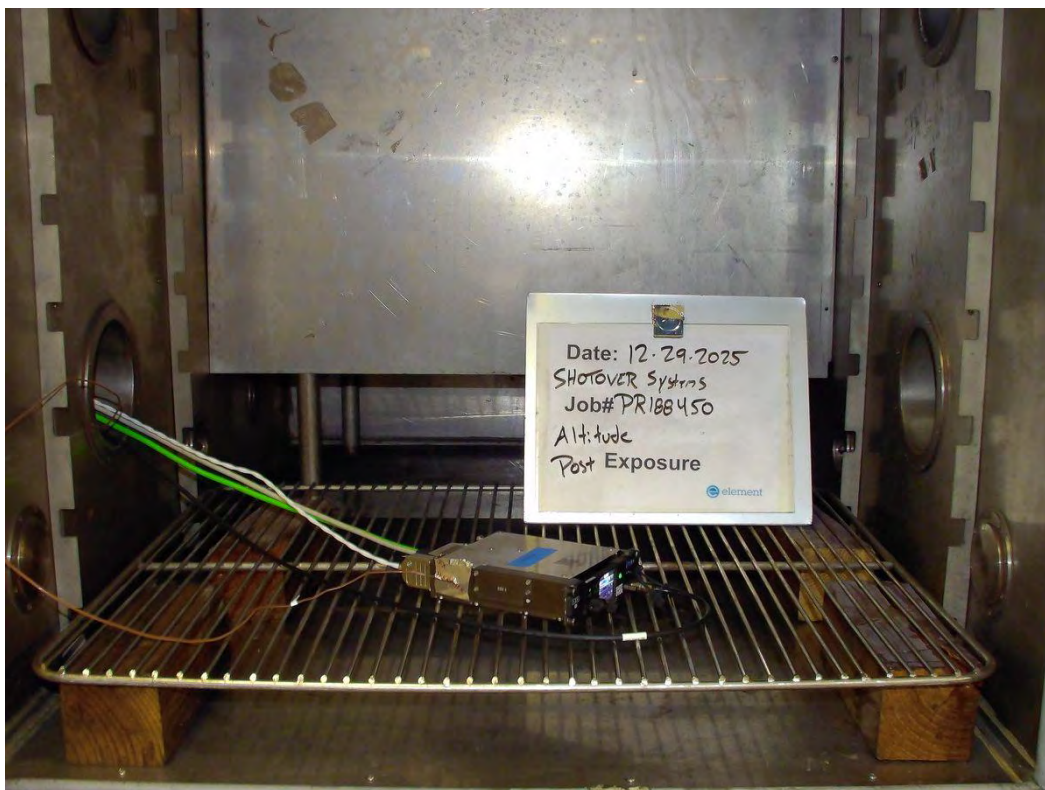
Pre-Exposure



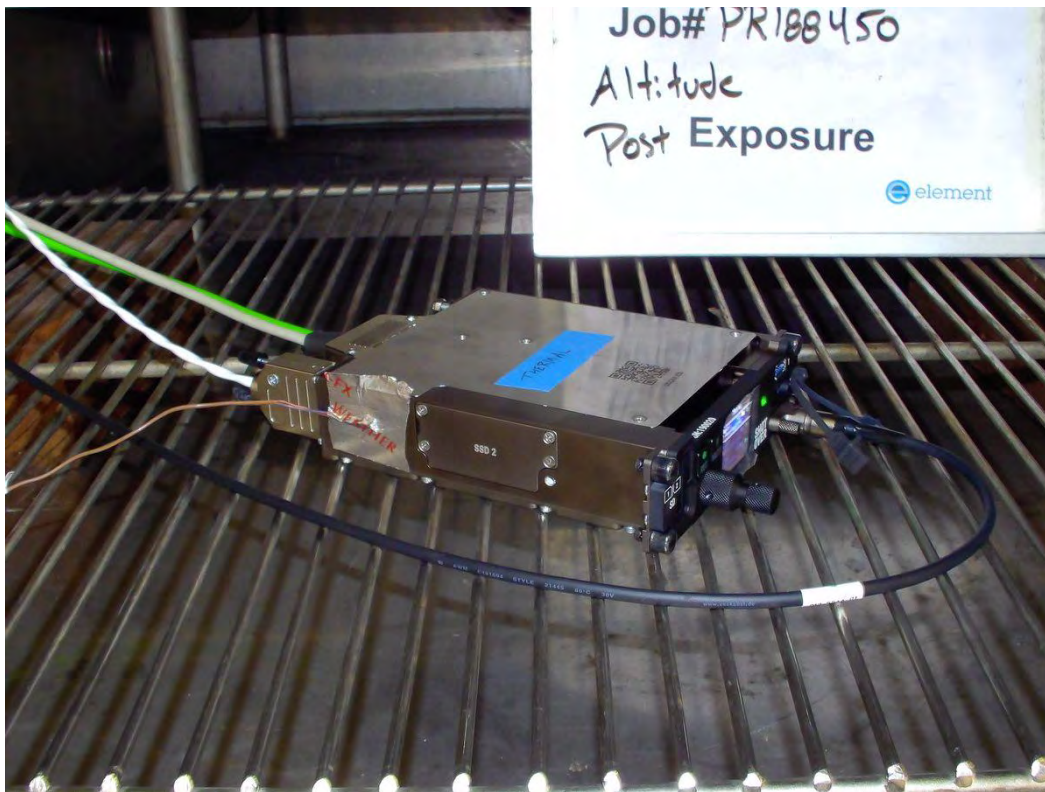
Pre-Exposure



Pre-Exposure

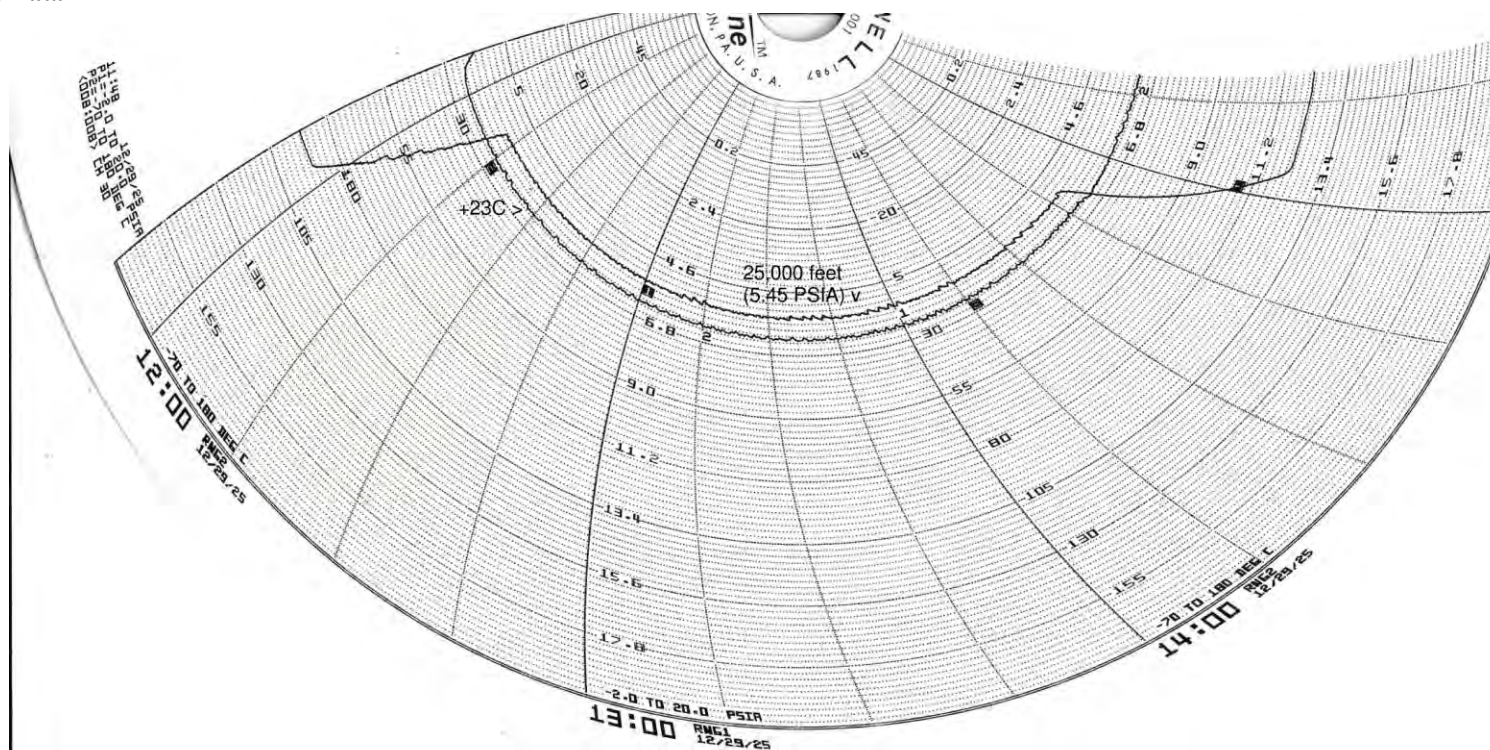


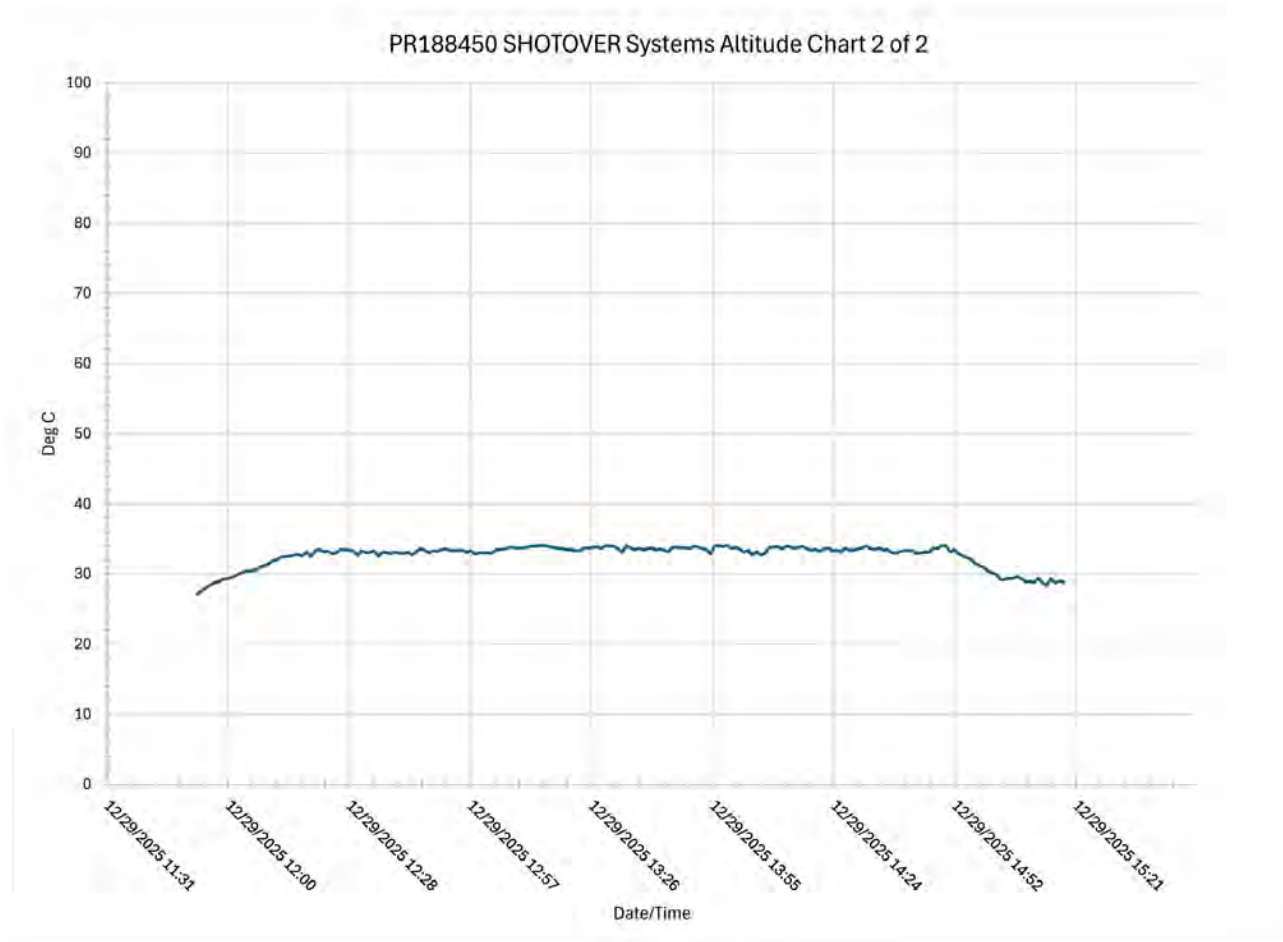
Post Exposure



Post Exposure

5.2.5 Test Data





5.2.6 Test Equipment List

Table 5.2-1: Altitude Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A059893	Chamber 30	StorageTek	Altitude	04/28/2025	04/28/2026
US58-A084267	Temp/Humidity Indicator	Digi-Sense	90080-03	07/24/2025	07/24/2026
US58-A080895	Data Acquisition	Agilent Technologies	34970A	01/31/2025	01/31/2026
US58-A070360	Data Acq mux cards	Agilent Technologies	34901A	04/17/2025	04/17/2026
US58-A080932	Digital Stopwatch	Digi-Sense	94460-28	03/21/2024	03/21/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.3 Temperature

5.3.1 Test Procedure

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 4.0, Category B4

5.3.2 Test Result

The EUT's results will be determined by SHOTOVER Systems.

5.3.3 Test Datasheets

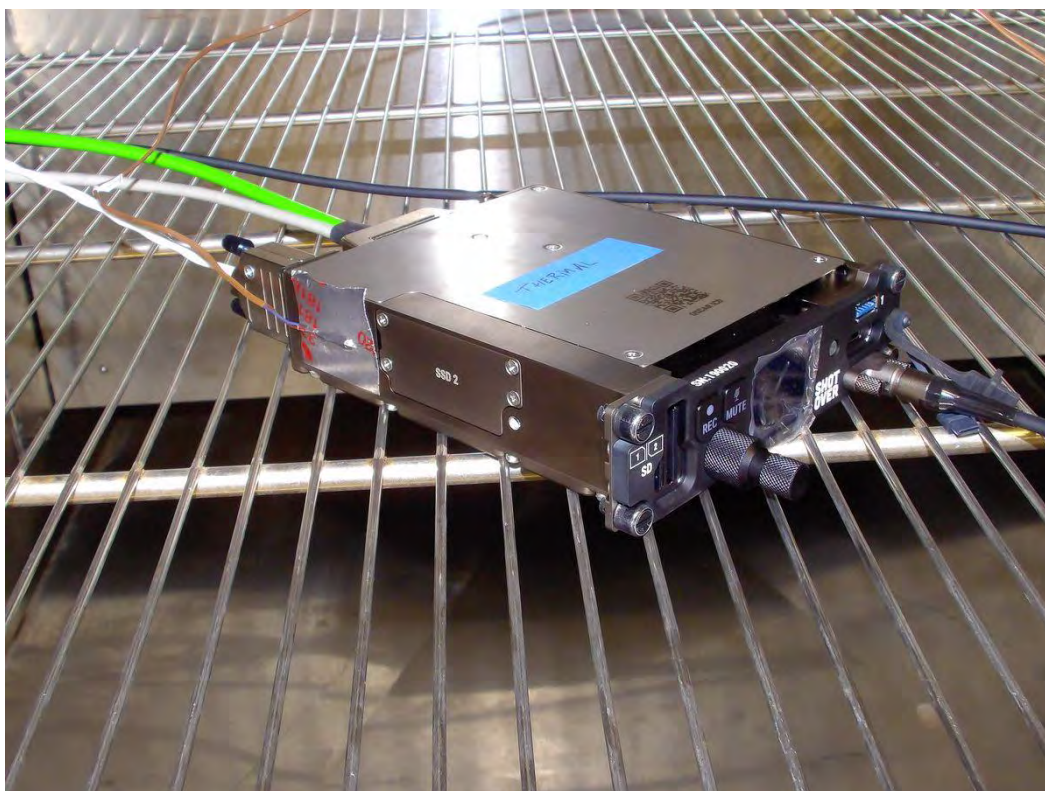
CLIMATICS TEST LOG					
Start Date:	12/29/2025	End Date:	12/30/2025	Job No:	PR188450
Customer:	SHOTOVER Systems		Test Engineer:	Cam Storey	
Customer Witness:	Ken Haan		Lab Temp:	65F	Lab Humidity: 16%
Part Name:	OSCAR		Part Number:	012-0031	
Test Specification:	US211-9001-Rev0.1 In Process_OSCAR Environmental Test Plan - DO-160G - Google Docs			Serial number:	190020
Test Performed:	Ground Survival Low Temperature and Operating Low Temperature				Lot: N/A
Date	Time	Remarks			Initials
		Sample will be exposed to Ground Survival Low Temperature and Operating Low Temperature test. The EUT shall be tested in accordance with RTCA DO-160G Section 4, Category B4. Ground Survival Low Temperature will be defined as -55C and Operating Low Temperature will be defined as -20C. Ramp rate will be at a minimum rate of 2C/minute			CS
12/29/2025	1545	Sample was placed within chamber asset #1203			CS
12/29/2025	1645	Chamber was programmed to test specifications			CS
12/29/2025	1700	Chamber door was sealed shut. Test has begun			CS
12/29/2025	1700	Chamber profile was created to ramp the chamber to -55C at a rate of 2C/minute at midnight then dwell for 6 hours (stabilization time + dwell). After the dwell the chamber will ramp to -20C at a rate of 2C/minute and hold			CS
12/30/2025	000	Begin Ground Survival Low Temperature test. Chamber started the ramp to -55C			CS
12/30/2025	040	Begin 6 hour dwell			CS
12/30/2025	640	Dwell complete. Begin Operational Low Temperature test. Chamber started the ramp to -20C at a rate of 2C/minute			CS
12/30/2025	658	Chamber reached -20C. Sample will continue to dwell at condition			CS
12/30/2025	909	Customer arrived on site			CS
12/30/2025	912	Customer powered on the sample and performed an operational check			CS
12/30/2025	912	Sample will remain powered on and will restabilize			CS
12/30/2025	1000	Sample achieved stabilization. Begin a minimum dwell of 2 hours			CS
12/30/2025	1218	Dwell complete. Customer performed operational check on the sample			CS
12/30/2025	1227	Ramp chamber to +23C at a rate of 2C/minute and allow the sample to stabilize			CS
12/30/2025	1315	Sample achieved stabilization. Customer performed operational check on the sample			CS
12/30/2025	1330	Ground Survival Low Temperature and Operating Low Temperature tests complete			CS
		Test Results = Sample showed no visual signs of anomalies after the exposure. Customer to determine Pass/Fail of sample upon further inspection			CS
		Test complete			CS

CLIMATICS TEST LOG					
Start Date:	12/30/2025	End Date:	12/31/2025	Job No:	PR188450
Customer:	SHOTOVER Systems		Test Engineer:	Cam Storey	
Customer Witness:	Ken Haan		Lab Temp:	65F	Lab Humidity: 16%
Part Name:	OSCAR		Part Number:	012-0031	
Test Specification:	US211-9001-Rev0.1_In Process_OSCAR Environmental Test Plan - DO-160G - Google Docs			Serial number:	190020
Test Performed:	Ground Survival High Temperature and Operating High Temperature			Lot:	N/A
Date	Time	Remarks			Initials
		Sample will be exposed to Ground Survival High Temperature and Operating High Temperature test. The EUT shall be tested in accordance with RTCA DO-160G Section 4, Category B4. Ground Survival High Temperature will be defined as +85C and Operating High Temperature will be defined as +70C. Ramp rate will be at a minimum rate of 2C/minute			CS
12/30/2025	1430	Sample was placed within chamber asset #1203			CS
12/30/2025	1430	Chamber was programmed to test specifications			CS
12/30/2025	1601	Chamber door was sealed shut. Test has begun			CS
12/30/2025	1601	Chamber profile was created to ramp the chamber to +85C at a rate of 2C/minute at 2300 then dwell for 6 hours (stabilization time + dwell). After the dwell the chamber will ramp to +70C at a rate of 2C/minute and hold			CS
12/30/2025	2300	Begin Ground Survival High Temperature test. Chamber started the ramp to +85C			CS
12/30/2025	2337	Begin 6 hour dwell			CS
12/31/2025	537	Dwell complete. Begin Operational High Temperature test. Chamber started the ramp to +70C at a rate of 2C/minute			CS
12/31/2025	543	Chamber reached +70C. Sample will continue to dwell at condition			CS
12/31/2025	725	Customer arrived on site			CS
12/31/2025	731	Customer powered on the sample and performed an operational check			CS
12/31/2025	810	Sample will remain powered on and will restabilize			CS
12/31/2025	820	Sample achieved stabilization. Begin a minimum dwell of 2 hours			CS
12/31/2025	1024	Dwell complete. Customer performed operational check on the sample			CS
12/31/2025	1024	Ramp chamber to +23C at a rate of 2C/minute and allow the sample to stabilize			CS
12/31/2025	1122	Sample achieved stabilization. Customer performed operational check on the sample			CS
12/31/2025	1200	Ground Survival High Temperature and Operating High Temperature tests complete			CS
		Test Results = Sample showed no visual signs of anomalies after the exposure. Customer to determine Pass/Fail of sample upon further inspection			CS
		Test complete			CS

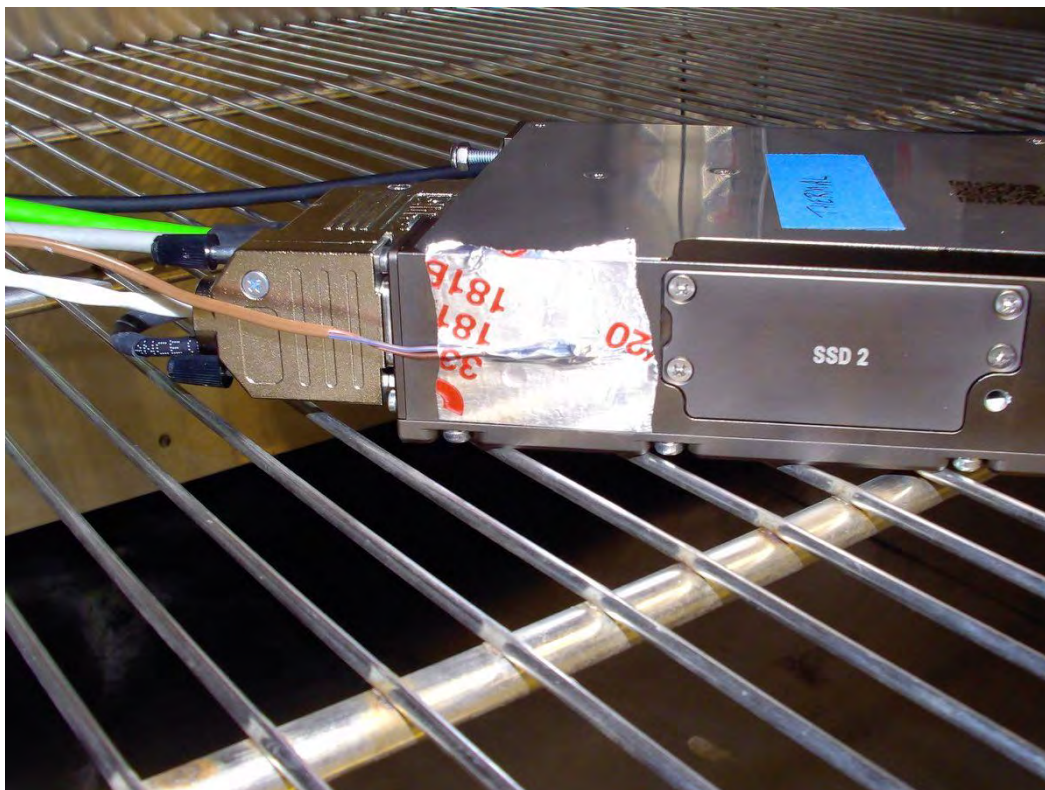
5.3.4 Test Photographs



Pre-Exposure



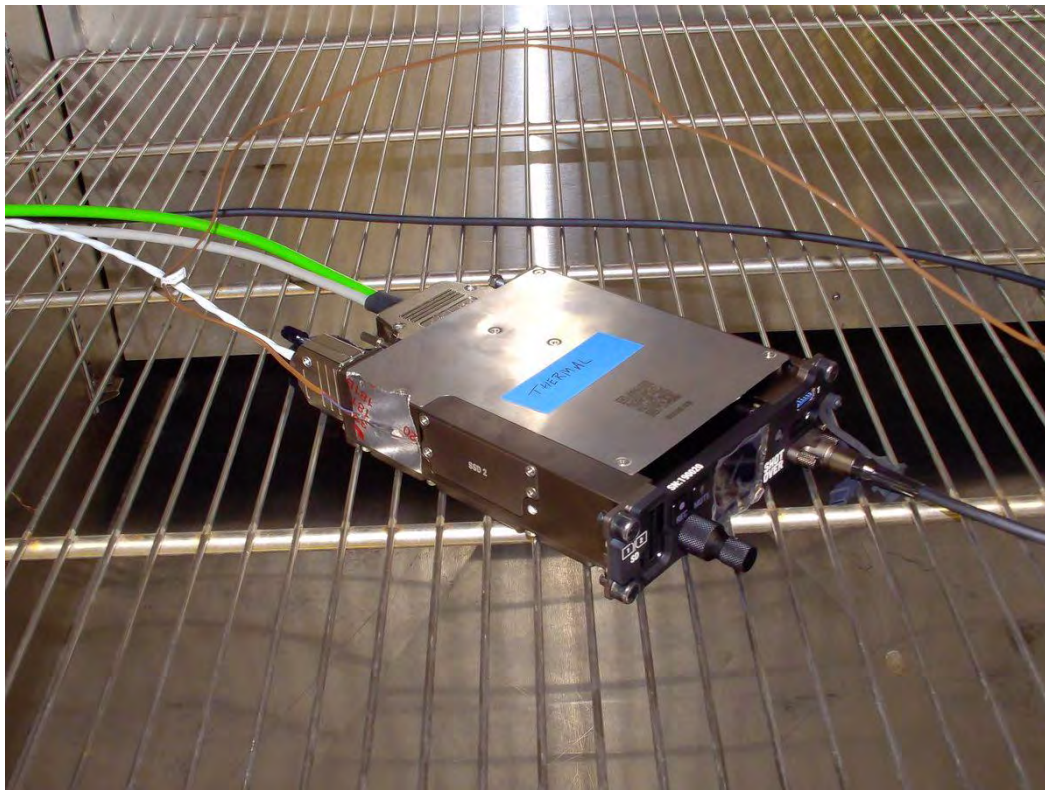
Pre-Exposure



Pre-Exposure



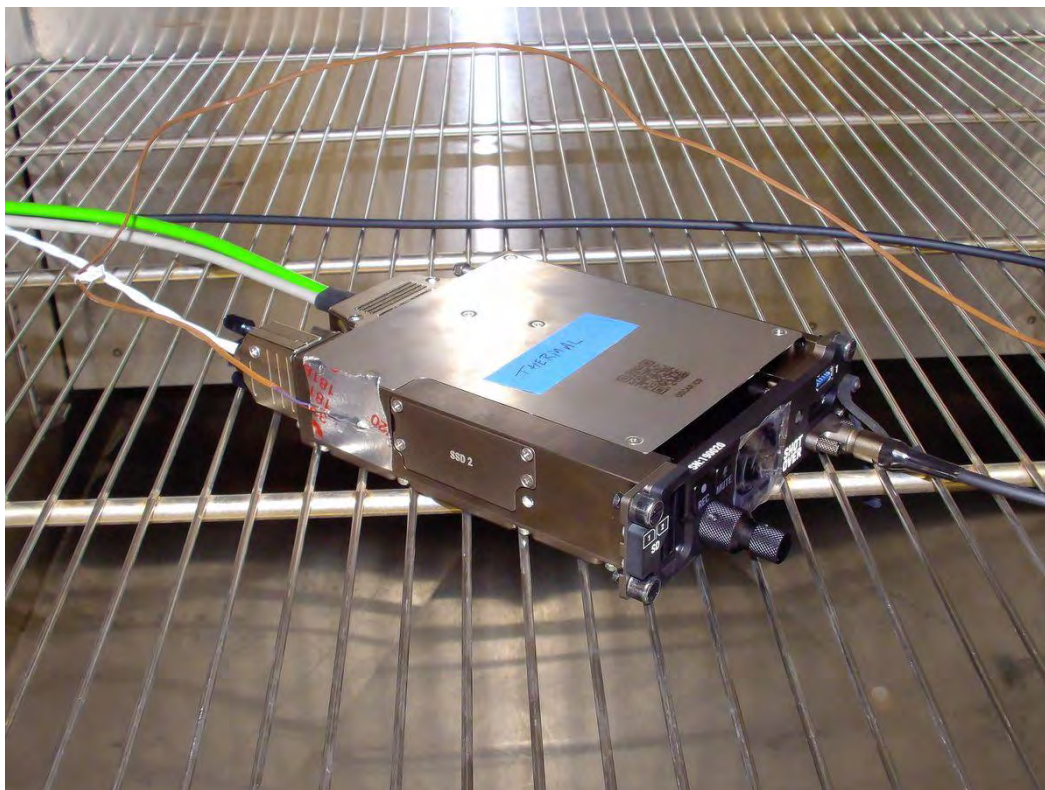
Post Exposure



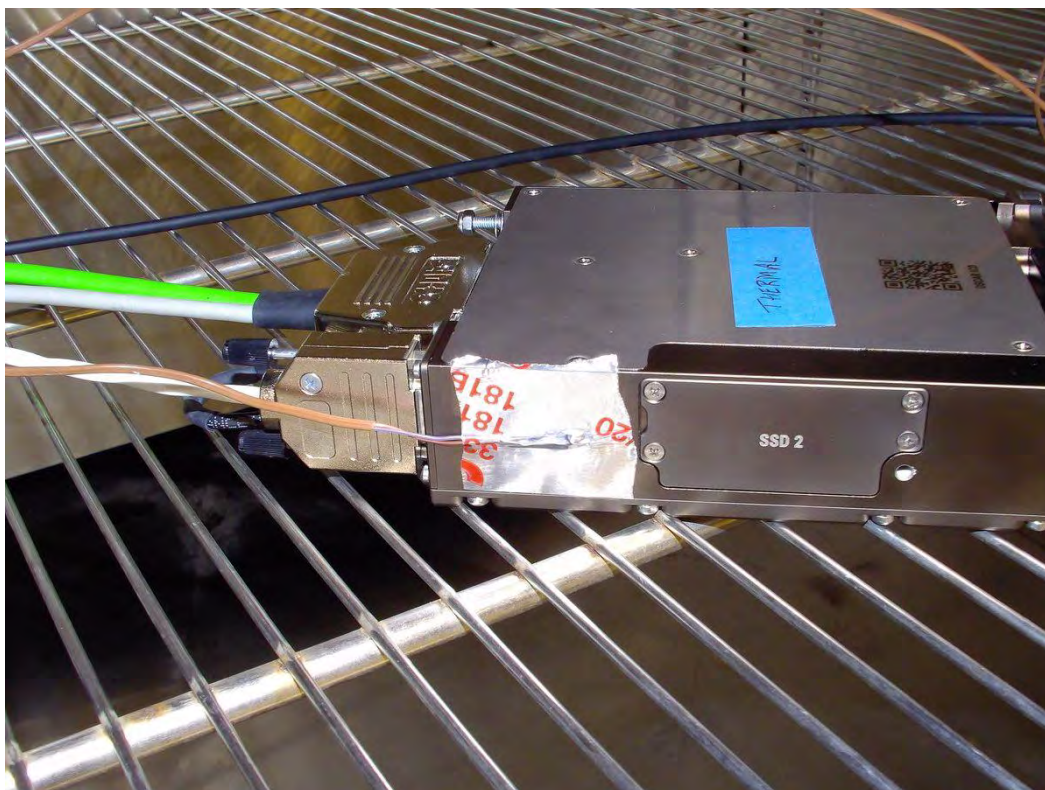
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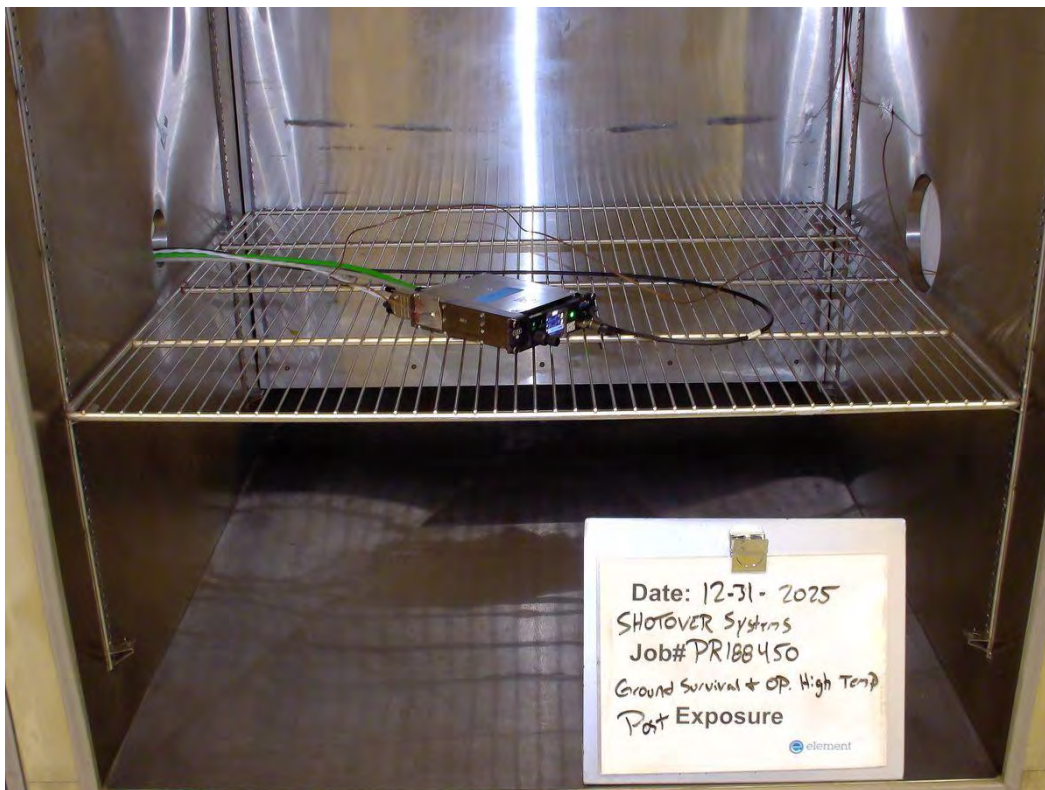
Pre Exposure



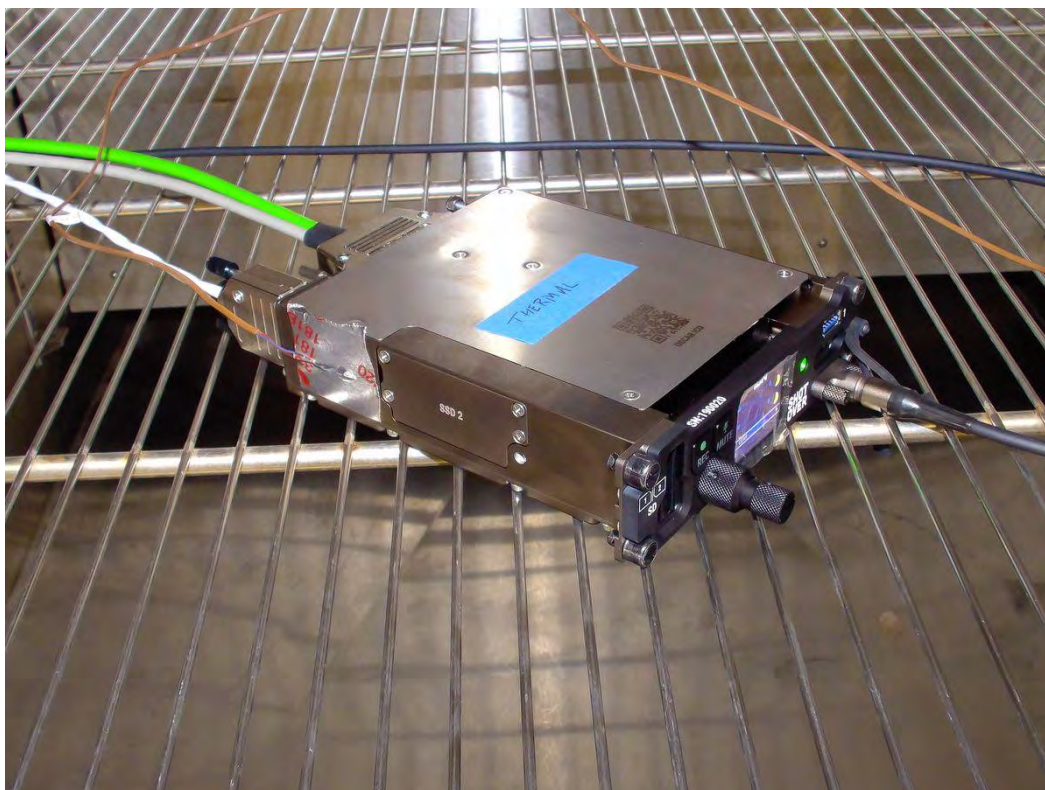
Pre-Exposure



Pre-Exposure

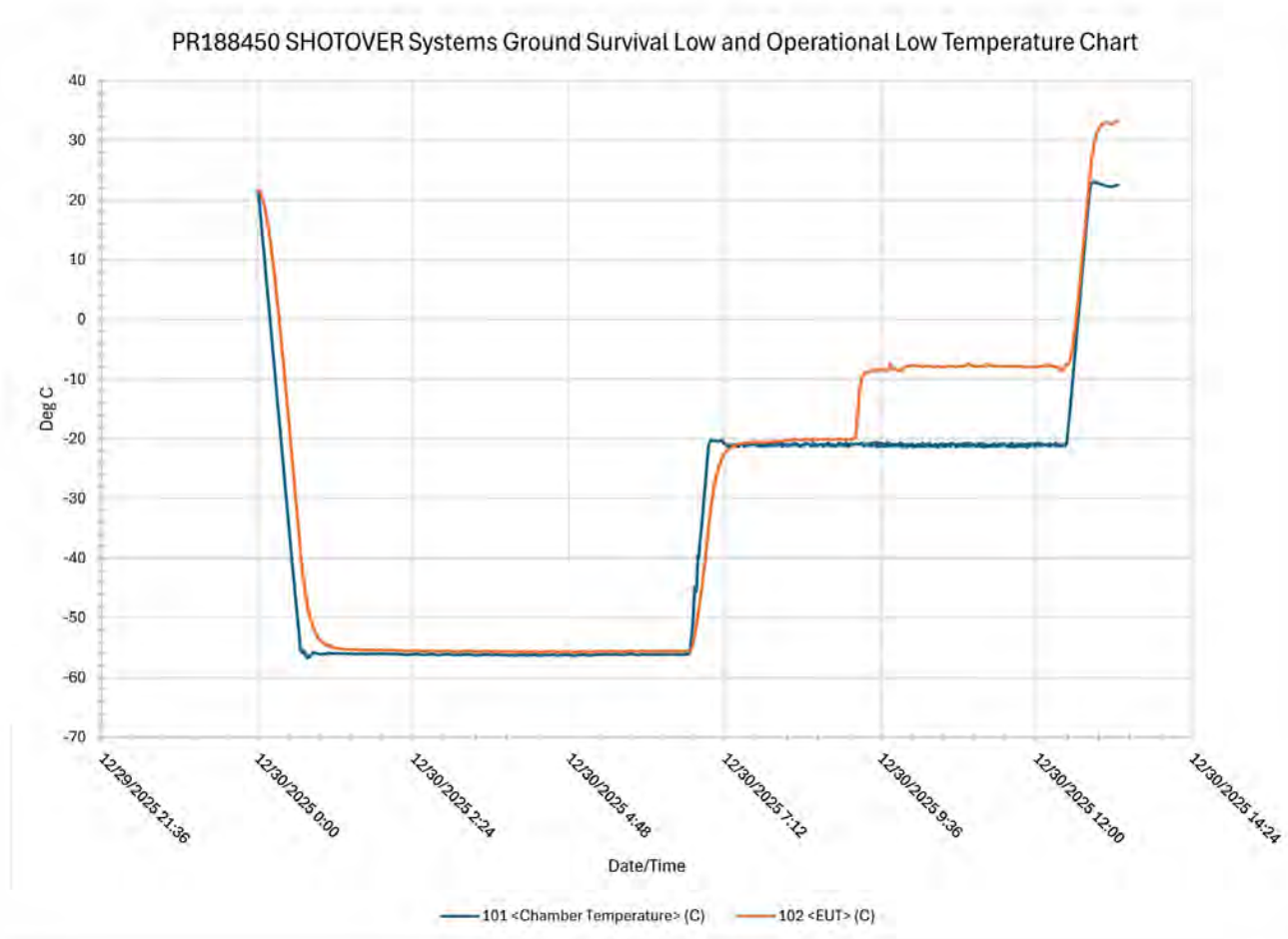


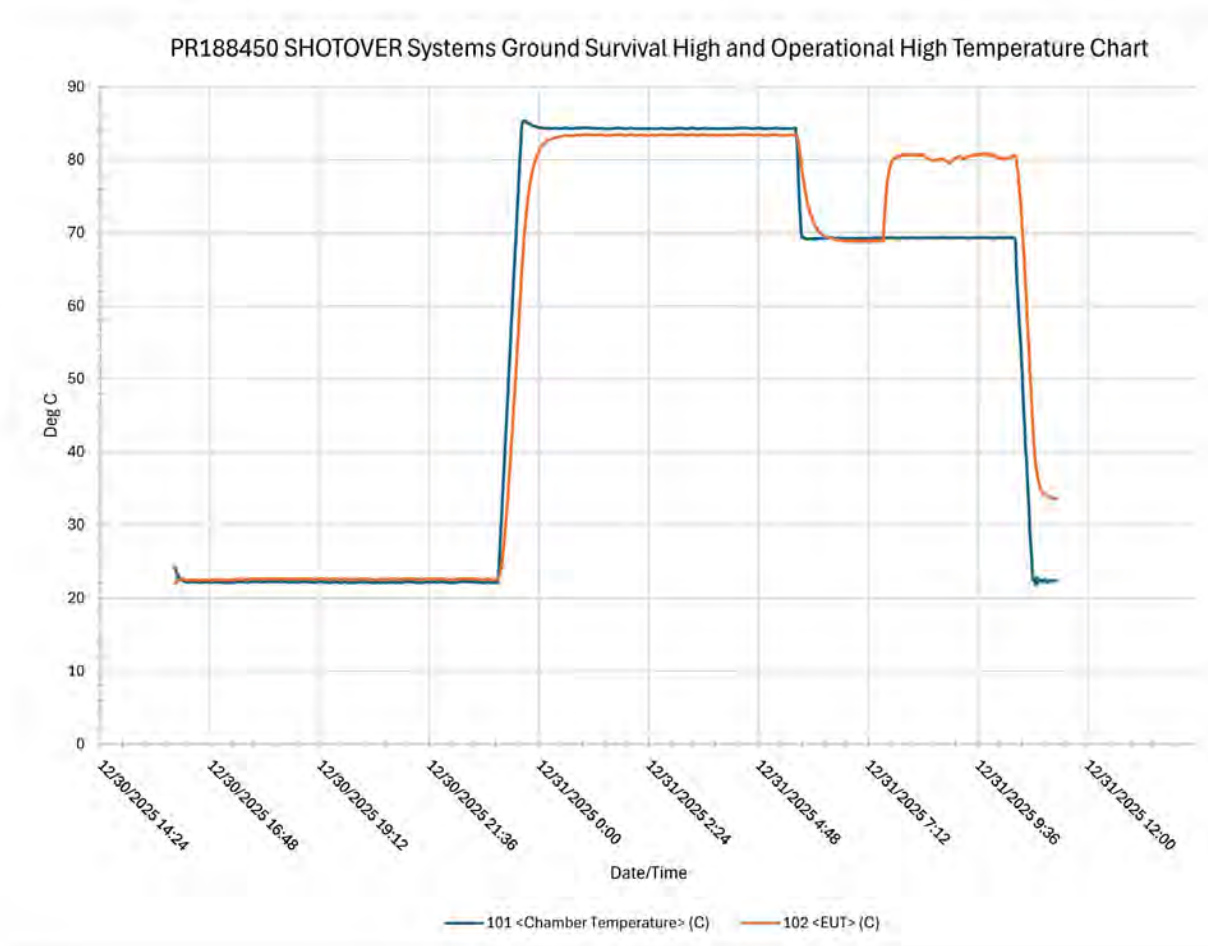
Post Exposure



Post Exposure

5.3.5 Test Data





5.3.6 Test Equipment List

Table 5.3-1: Temperature Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A084345	Temperature Chamber	CSZ	Z-32-2-2-H/WC	11/13/2025	11/13/2026
US58-A084267	Temp/Humidity Indicator	Digi-Sense	90080-03	07/24/2025	07/24/2026
US58-A080895	Data Acquisition	Agilent Technologies	34970A	01/31/2025	01/31/2026
US58-A070360	Data Acq mux cards	Agilent Technologies	34901A	04/17/2025	04/17/2026
US58-A080932	Digital Stopwatch	Digi-Sense	94460-28	03/21/2024	03/21/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.4 Temperature Variation**5.4.1 Test Procedure**

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 5.0, Category C

5.4.2 Test Result

The EUT's results will be determined by SHOTOVER Systems.

5.4.3 Test Datasheets

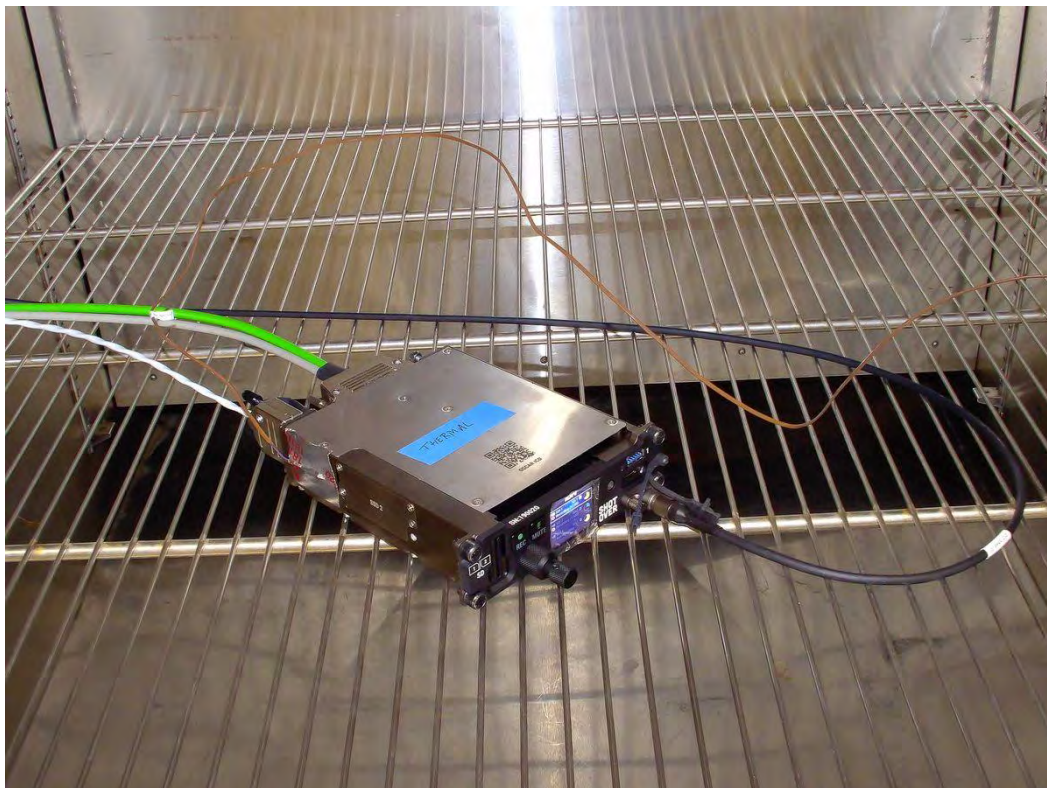
CLIMATICS TEST LOG					
Start Date:	1/5/2026	End Date:	1/6/2026	Job No:	PR188450
Customer:	SHOTOVER Systems		Test Engineer:	Cam Storey	
Customer Witness:	Ken Haan	Lab Temp:	68F	Lab Humidity:	22%
Part Name:	OSCAR	Part Number:	012-0031		
Test Specification:	US211-8001-Rev0.1_In Process_OSCAR Environmental Test Plan - DO-160G - Google Docs			Serial number:	190020
Test Performed:	Temperature Variation			Lot:	N/A
Date	Time	Remarks			Initials
		Sample will be exposed to Temperature Variation test. EUT shall be tested in accordance to RTCA DO-160G Section 5, Category C. The Operational Low Temperature will be defined as -20C and the Operational High Temperature will be defined as +70C. 2 cycles of exposure. Ramp rate will be at a minimum rate of 2C/minute			CS
1/5/2026	745	Sample was placed within chamber asset #1203 and powered on			CS
1/5/2026	839	Chamber door was sealed shut. Test has begun with a ramp to +20C			CS
1/5/2026	847	Ramp chamber to -20C at a rate of 2C/minute			CS
1/5/2026	908	Chamber reached -20C. Sample will continue to dwell in condition until stabilization is achieved			CS
1/5/2026	959	Sample achieved stabilization			CS
1/5/2026	1000	Ramp chamber to +70C at a rate of 2C/minute			CS
1/5/2026	1045	Chamber reached +70C. Sample will continue to dwell in condition until stabilization is achieved			CS
1/5/2026	1139	Sample achieved stabilization. Customer powered off the sample for a minimum of 2 minutes			CS
1/5/2026	1141	Customer powered sample back on and performed an operational check			CS
1/5/2026	1149	Ramp chamber to -20C at a rate of 2C/minute			CS
1/5/2026	1234	Chamber reached -20C. Sample will continue to dwell in condition until stabilization is achieved			CS
1/5/2026	1252	Sample achieved stabilization. Begin dwell for 1 hour			CS
1/5/2026	1431	1 hour dwell complete. Customer powered off the sample for a 30 minute unpowered dwell			CS
1/5/2026	1511	30 minute dwell complete. Customer powered the sample back on			CS
1/5/2026	1513	Ramp chamber to +23C at a rate of 2C/minute and allow sample to reach stabilization			CS
1/5/2026	1556	Sample achieved stabilization. Shut down chamber. Customer performed operational check on the sample			CS
1/5/2026	1615	Cycle 1 complete. Testing paused for the day			CS
1/6/2026	750	Customer arrived on site and powered the sample on			CS
1/6/2026	801	Testing resumed. Ramp chamber to +20C			CS
1/6/2026	806	Ramp chamber to -20C at a rate of 2C/minute			CS
1/6/2026	828	Chamber reached -20C. Sample will continue to dwell in condition until stabilization is achieved			CS

1/6/2026	932	Sample achieved stabilization	CS
1/6/2026	933	Ramp chamber to +70C at a rate of 2C/minute	CS
1/6/2026	1020	Chamber reached +70C. Sample will continue to dwell in condition until stabilization is achieved	CS
1/6/2026	1100	Sample achieved stabilization. Customer powered off the sample for a minimum of 2 minutes	CS
1/6/2026	1102	Customer powered sample back on and performed an operational check	CS
1/6/2026	1113	Ramp chamber to -20C at a rate of 2C/minute	CS
1/6/2026	1158	Chamber reached -20C. Sample will continue to dwell in condition until stabilization is achieved	CS
1/6/2026	1228	Sample achieved stabilization. Begin dwell for 1 hour	CS
1/6/2026	1334	1 hour dwell complete. Customer powered off the sample for a 30 minute unpowered dwell	CS
1/6/2026	1405	30 minute dwell complete. Customer powered the sample back on	CS
1/6/2026	1409	Ramp chamber to +23C at a rate of 2C/minute and allow sample to reach stabilization	CS
1/6/2026	1524	Sample achieved stabilization. Shut down chamber. Customer performed operational check on the sample	CS
1/6/2026	1525	Cycle 2 complete. Temperature Variation test complete	CS
		Test Results = Sample showed no visual signs of anomalies after the exposure. Customer to determine Pass/Fail of sample upon further inspection	CS
		Test complete	CS

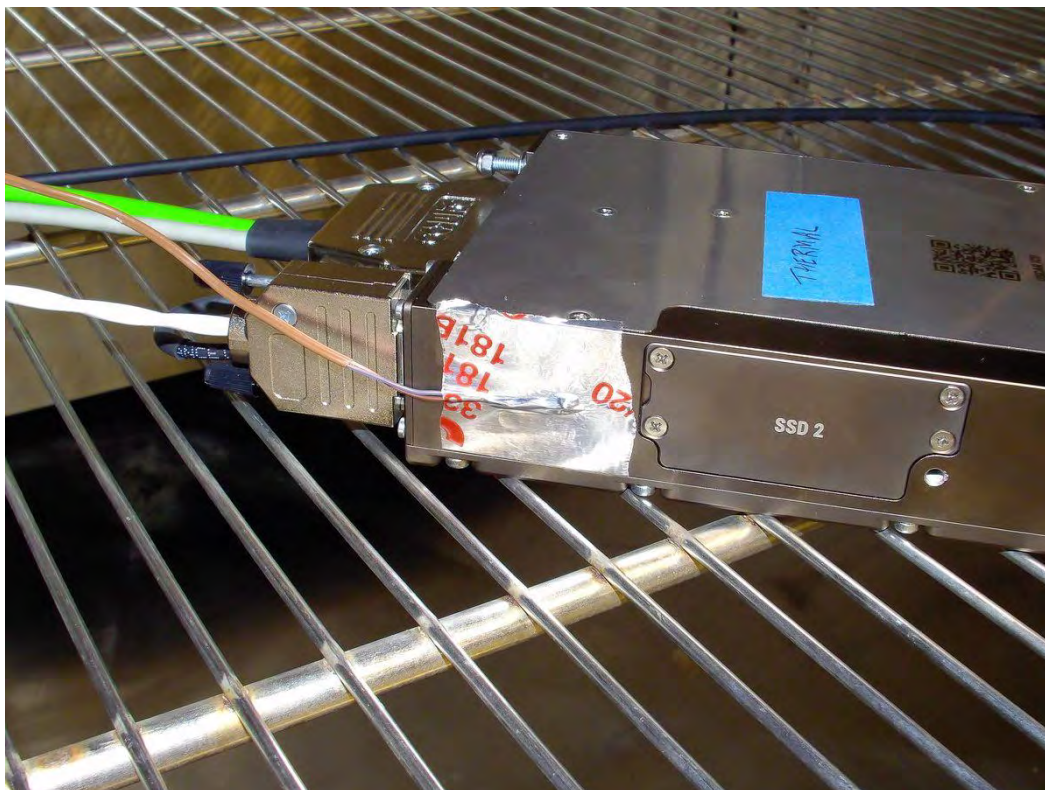
5.4.4 Test Photographs



Pre-Exposure



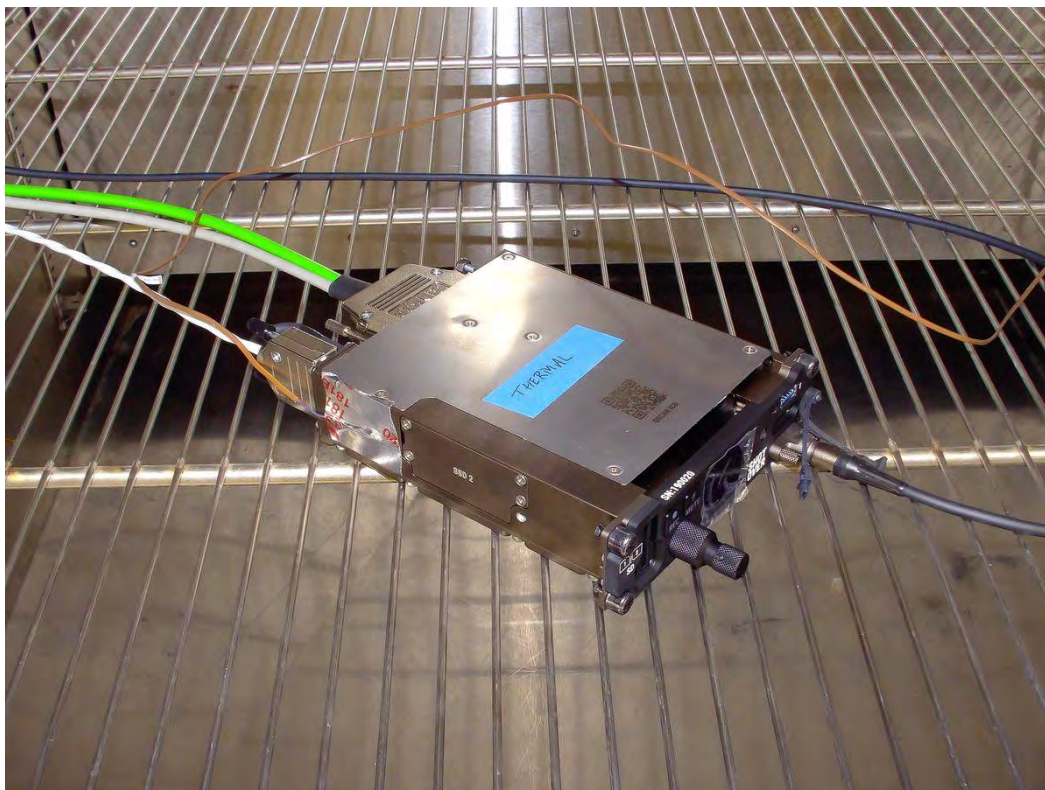
Pre-Exposure



Pre-Exposure

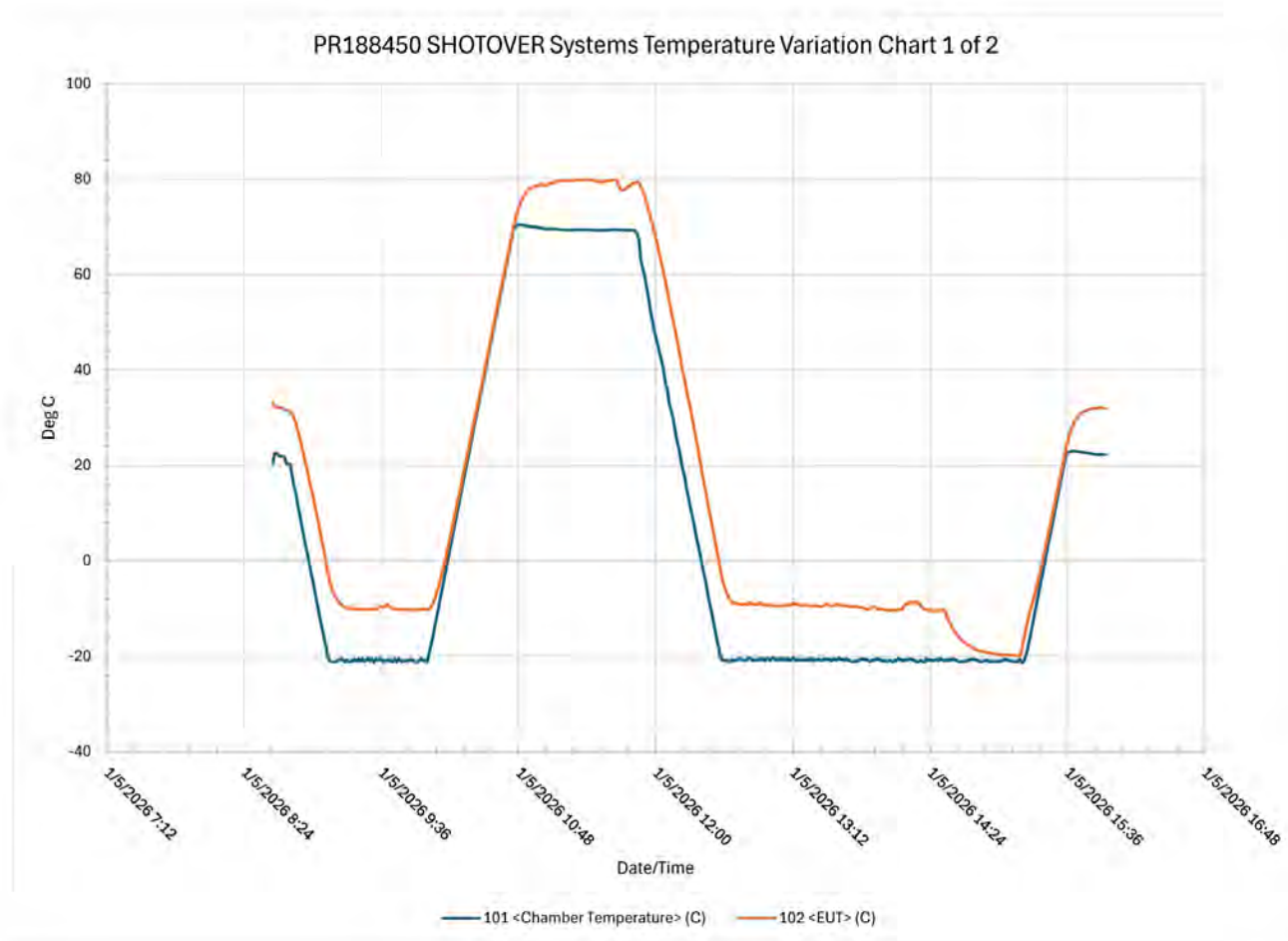


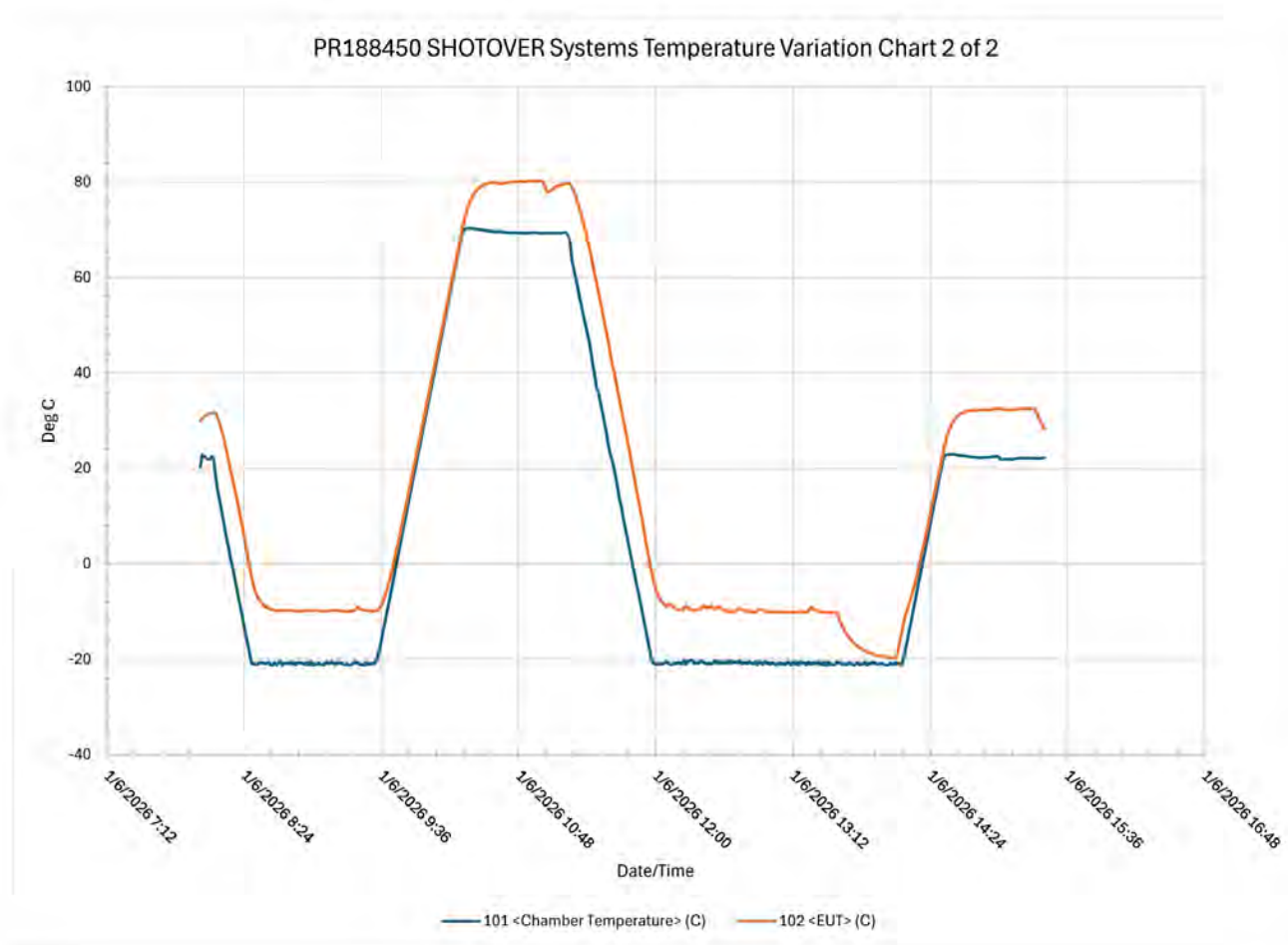
Post Exposure



Post Exposure

5.4.5 Test Data





5.4.6 Test Equipment List

Table 5.4-1: Temperature Variation Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A084345	Temperature Chamber	CSZ	Z-32-2-2-H/WC	11/13/2025	11/13/2026
US58-A084267	Temp/Humidity Indicator	Digi-Sense	90080-03	07/24/2025	07/24/2026
US58-A080895	Data Acquisition	Agilent Technologies	34970A	01/31/2025	01/31/2026
US58-A070360	Data Acq mux cards	Agilent Technologies	34901A	04/17/2025	04/17/2026
US58-A080932	Digital Stopwatch	Digi-Sense	94460-28	03/21/2024	03/21/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.5 Operational Shock**5.5.1 Test Procedure**

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 7.0, Category D

5.5.2 Test Result

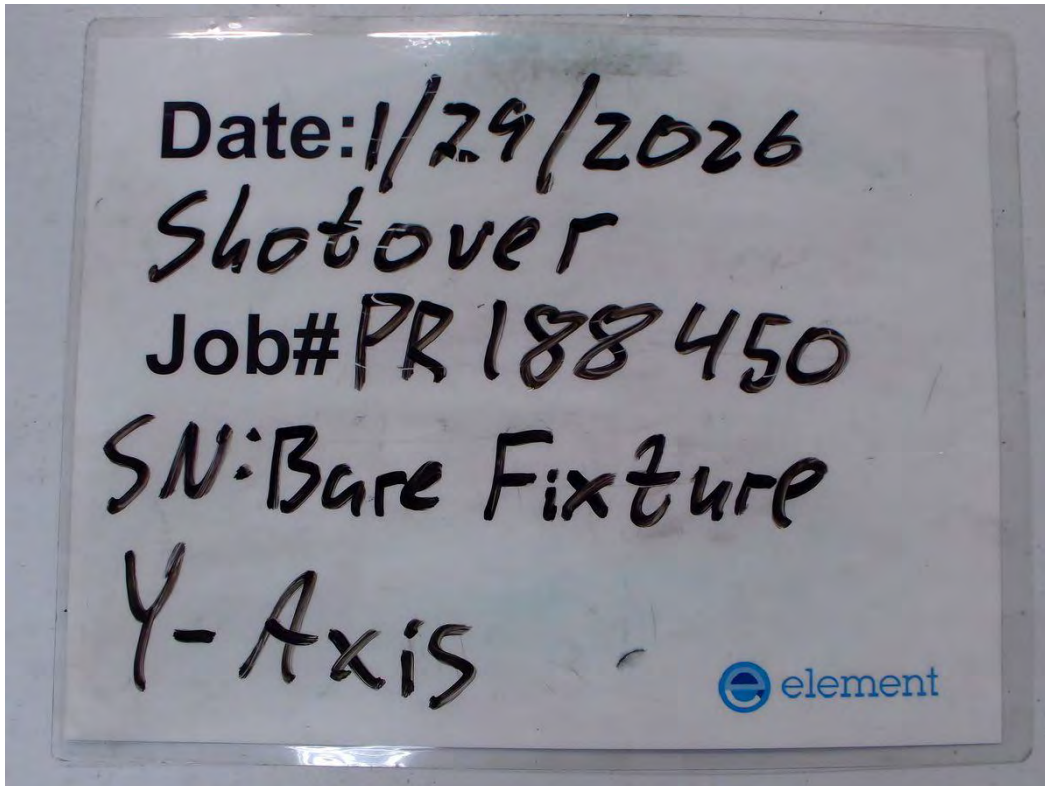
The EUT's results will be determined by SHOTOVER Systems.

5.5.3 Test Datasheets

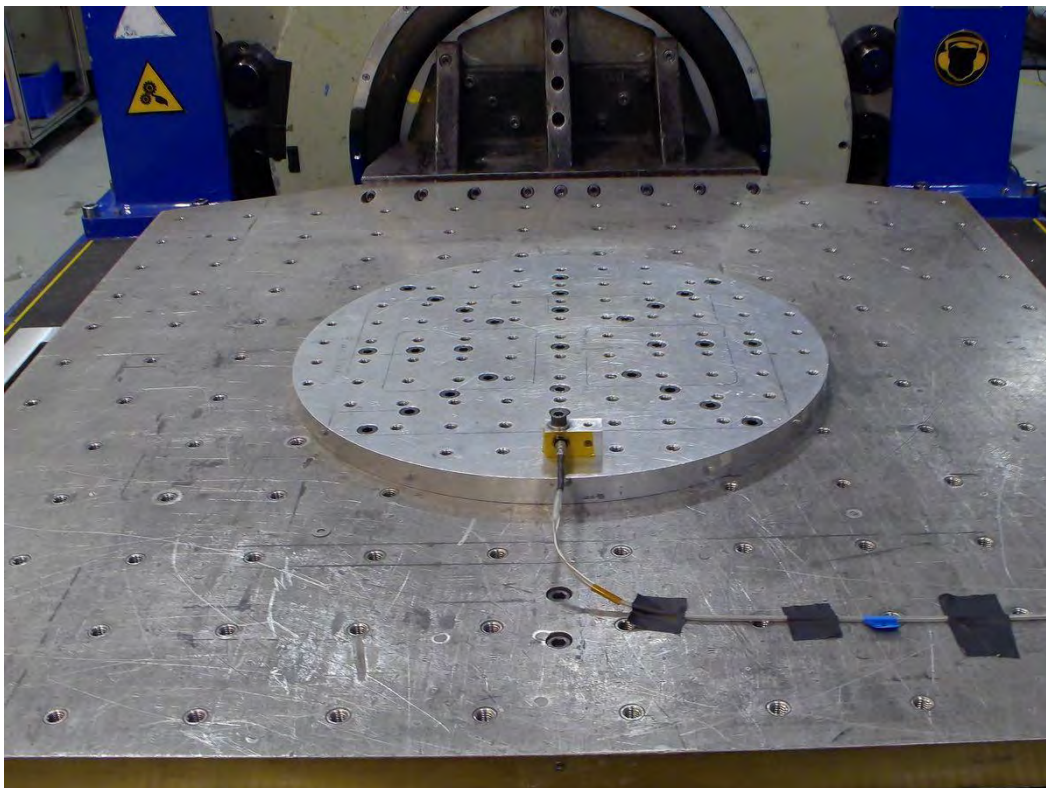
DYNAMICS TEST LOG						
Start Date:	1/29/2026	End Date:	1/29/2026	Job No:	PR188450	
Customer:	Shotover System			Test Engineer:	Flynn Nyman	
Customer Witness:	Ken Haan			Lab Temp & Humidity:	67.6F, 15%	
Part Name:	OSCAR			Part Number:	012-0031	
Test Specification:	US211-9001-Rev0.1, OSCAR Environmental Test Plan - DO-160 Testing			Serial number:	190026	
Test Performed:	6G 20 mS terminal peak shock.					
Date	Time	Axis	Plot No.	Remarks		Initials
1/29/2026	830	Y		Adapter plate mounted to DS16 slip plate.		FN
	900	Y		Customers fixture mounted to adapter plate for Y-axis bare fixture.		FN
	921	Y	Run 1	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.		FN
	924	Y	Run 2	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.		FN
	936	Y		Customer mounted UUT SN: 190026 to fixture for Y-axis testing.		FN
	1000	Y		Response accels mounted to unit.		FN
	1010	Y	Run 3	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.		FN
	1010	Y	Run 4	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.		FN
	1020	Y		Unit would not turn on after test. Customer fixed issue and decided to rerun the Y-axis shocks.		FN
	1030	Y	Run 5	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.		FN
	1030	Y	Run 6	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.		FN
	1035	Y		Customer chose to run tests again but with unit in operational mode.		FN
	1123	Y	Run 7	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.		FN
	1123	Y	Run 8	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.		FN
	1127	Y		Customers unit responded well, chose to rerun one more time to make sure.		FN
	1128	Y	Run 9	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.		FN

	1128	Y	Run 10	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.	FN
	1140	X		Fixture was rotated for X-axis bare fixture.	FN
	1144	X	Run 11	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.	FN
	1144	X	Run 12	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.	FN
	1153	X		Customer mounted UUT SN: 190026 to fixture for X-axis testing.	FN
	1201	X	Run 13	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.	FN
	1201	X	Run 14	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.	FN
	1220	Z		Customer removed unit to switch to Z-axis testing.	FN
	1250	Z		Angel fixture was attached to table for Z-axis.	FN
	1301	Z	Run 15	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.	FN
	1302	Z	Run 16	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.	FN
	1315	Z		Customer mounted UUT SN: 190026 to fixture for Z-axis testing.	FN
	1324	Z	Run 17	Ran 6 G 20 mS terminal peak shock 3 times in positive direction.	FN
	1324	Z	Run 18	Ran 6 G 20 mS terminal peak shock 3 times in positive negative.	FN
1/29/2026	1335	Z		Testing complete for operational shock, customer to make final determination.	FN

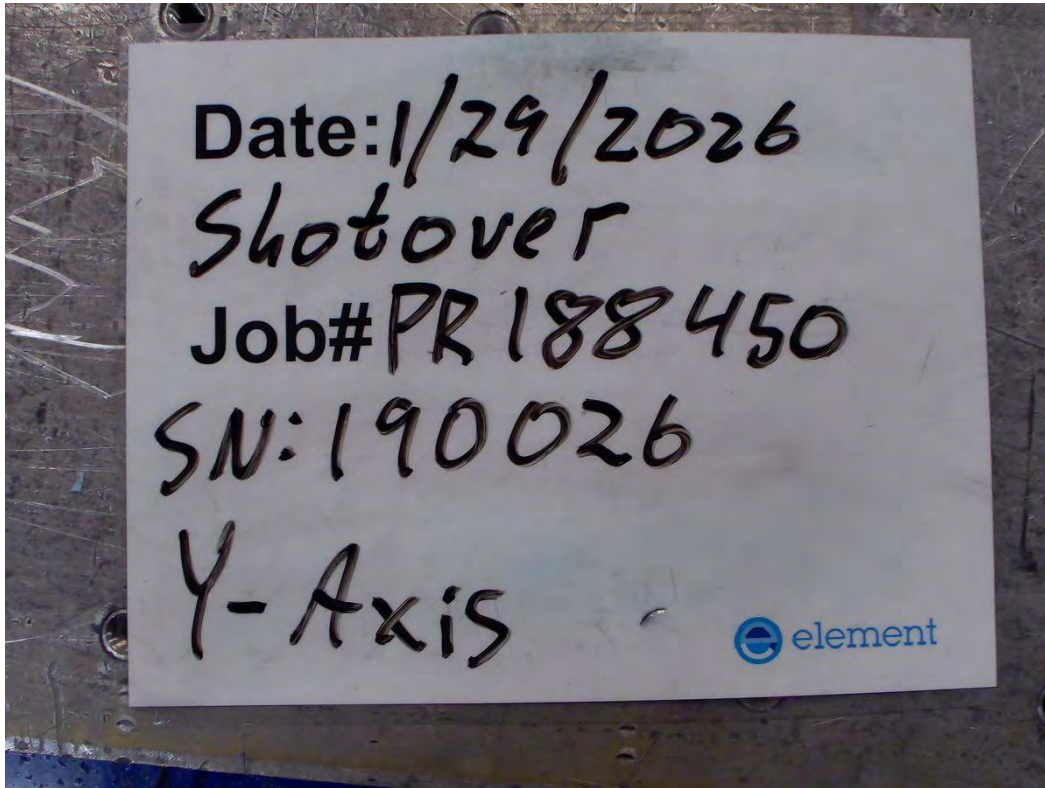
5.5.4 Test Photographs



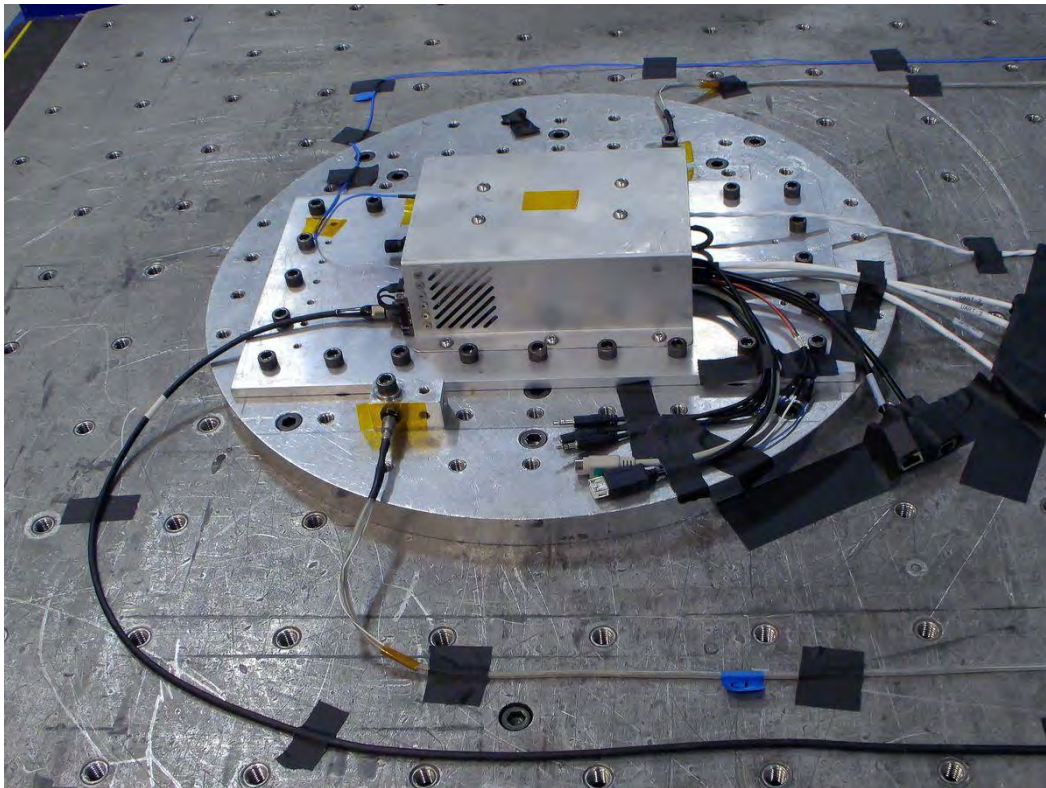
OSCAR_Bare-Fixture_Y-Axis



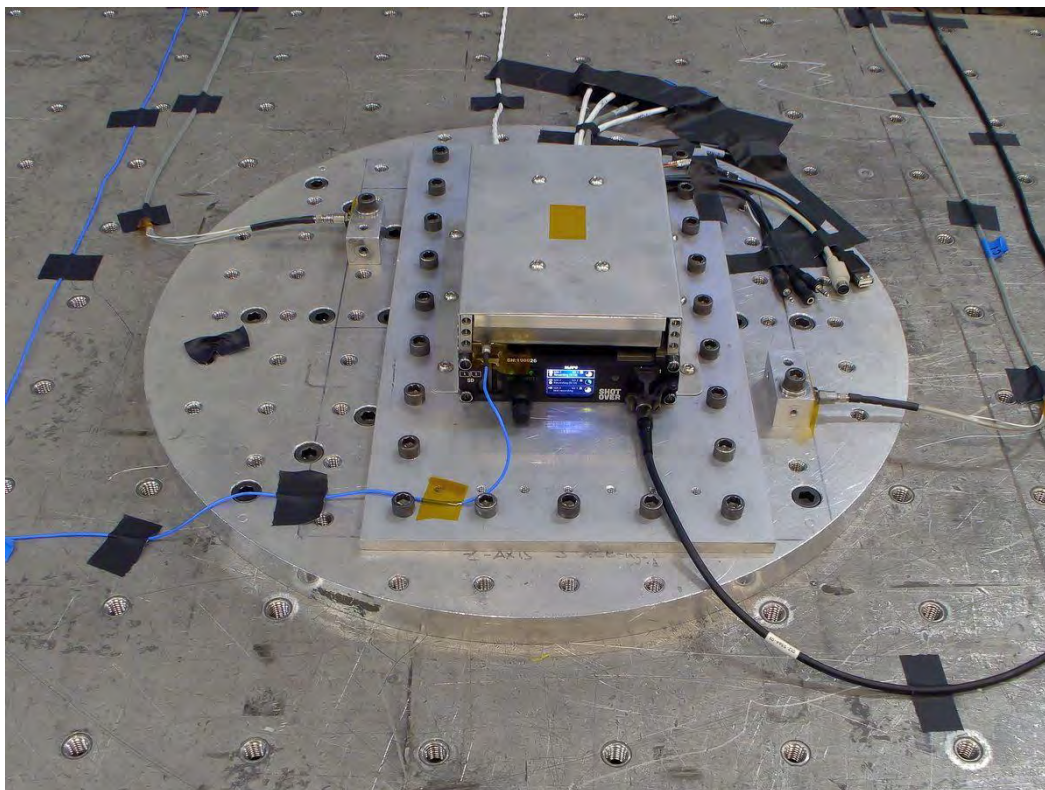
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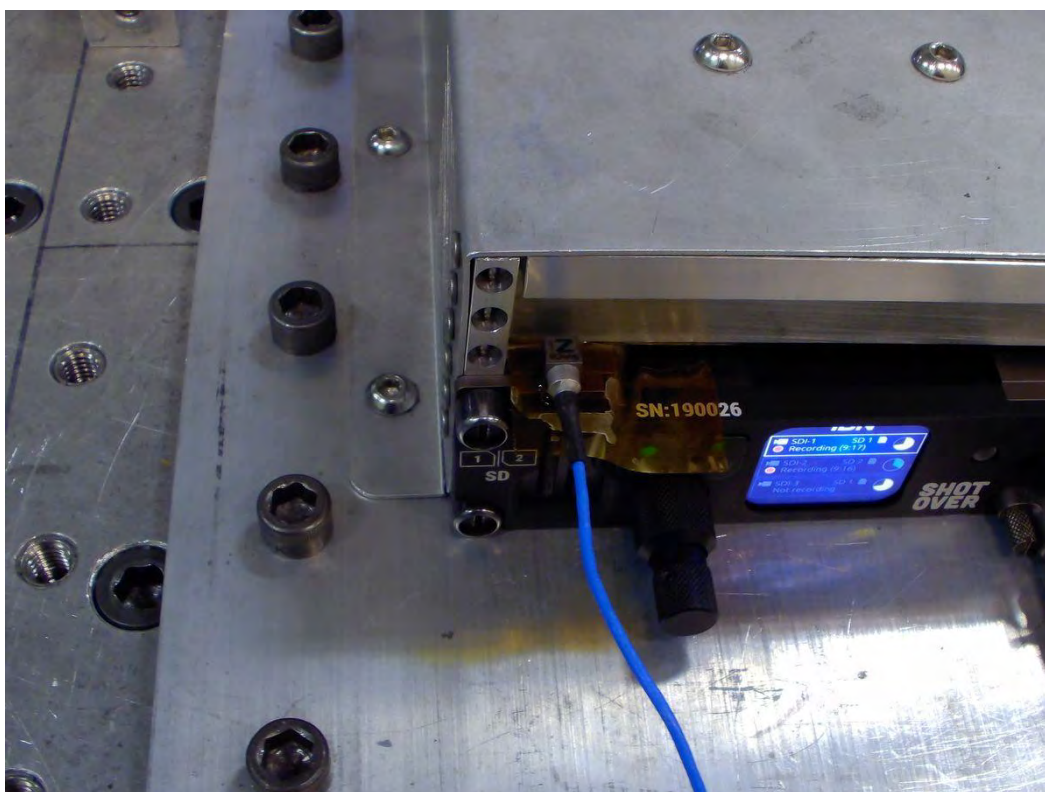
OSCAR_SN190026_Y-Axis



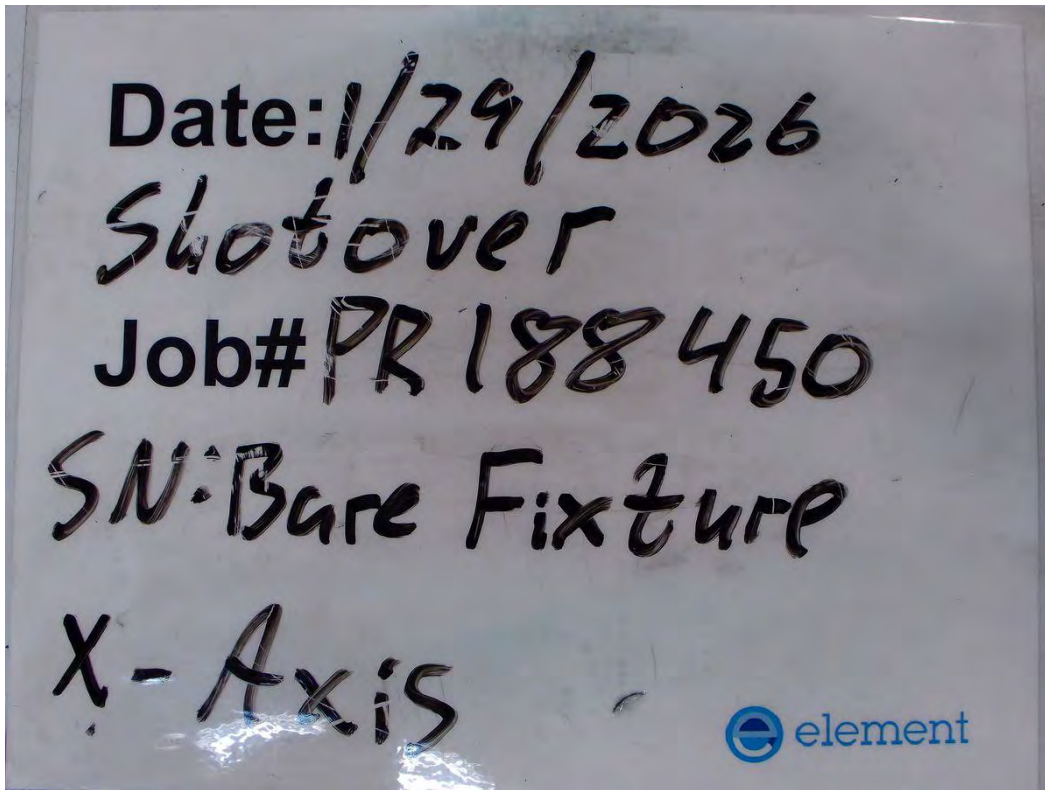
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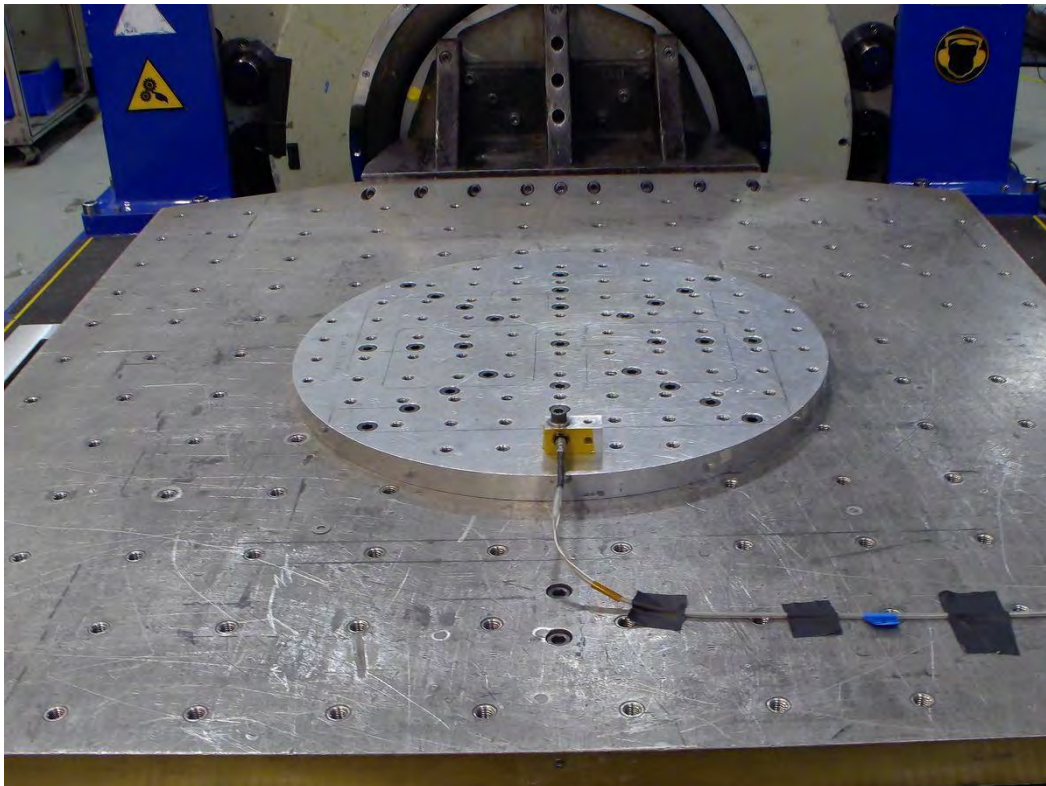
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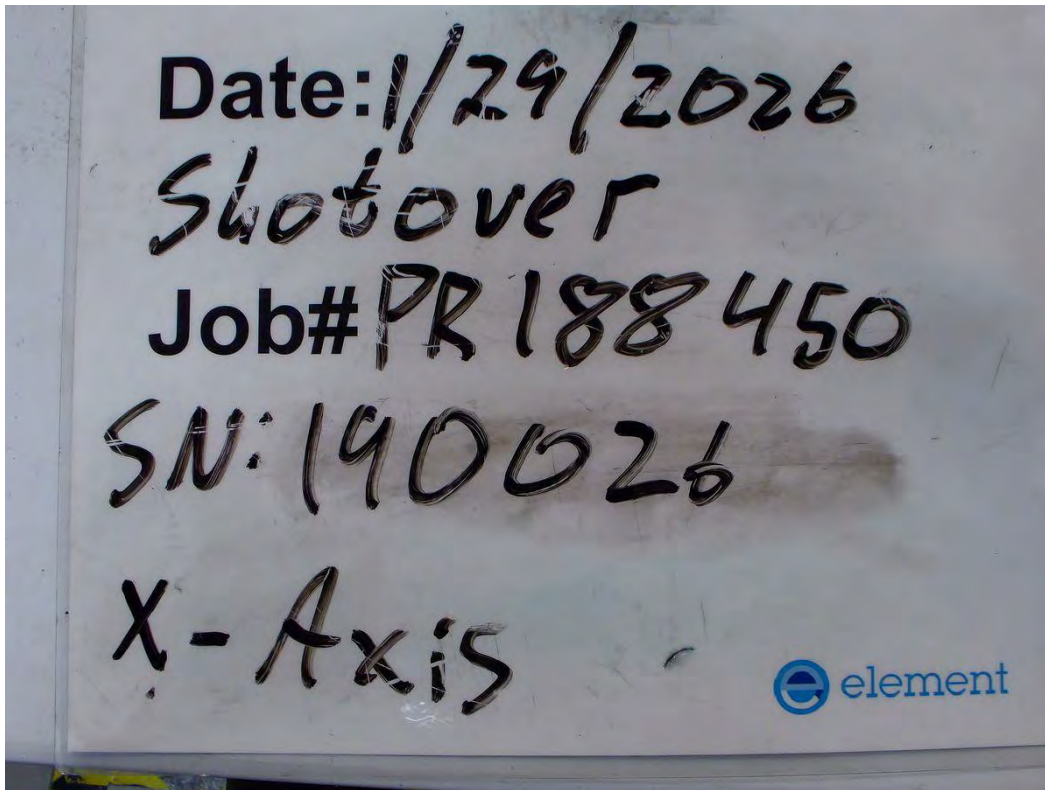
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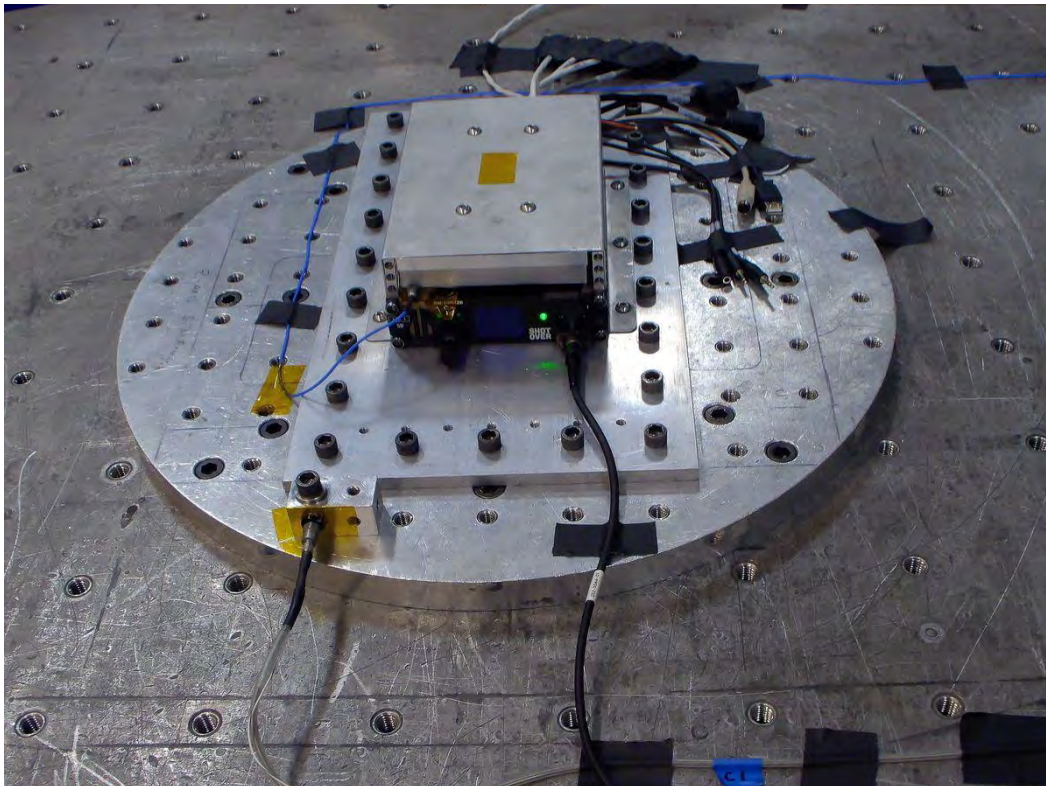
OSCAR_Bare-Fixture_X-Axis



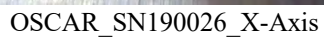
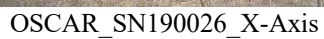
OSCAR_Bare-Fixture_X-Axis

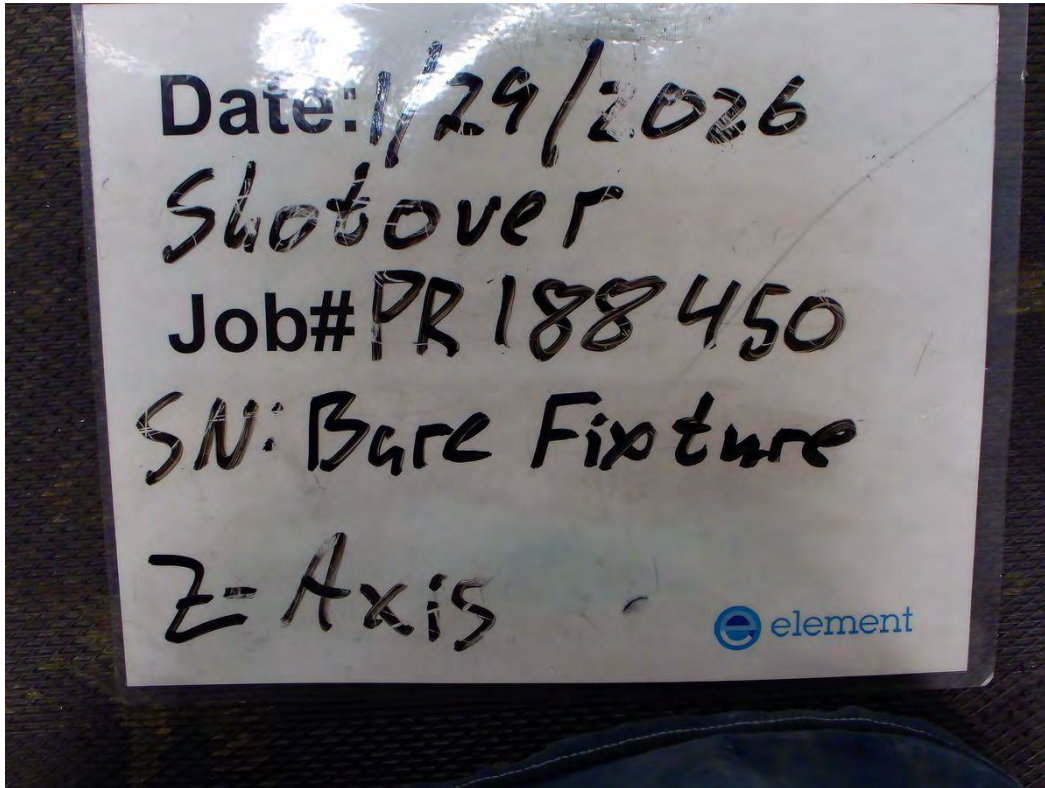


OSCAR_SN190026_X-Axis

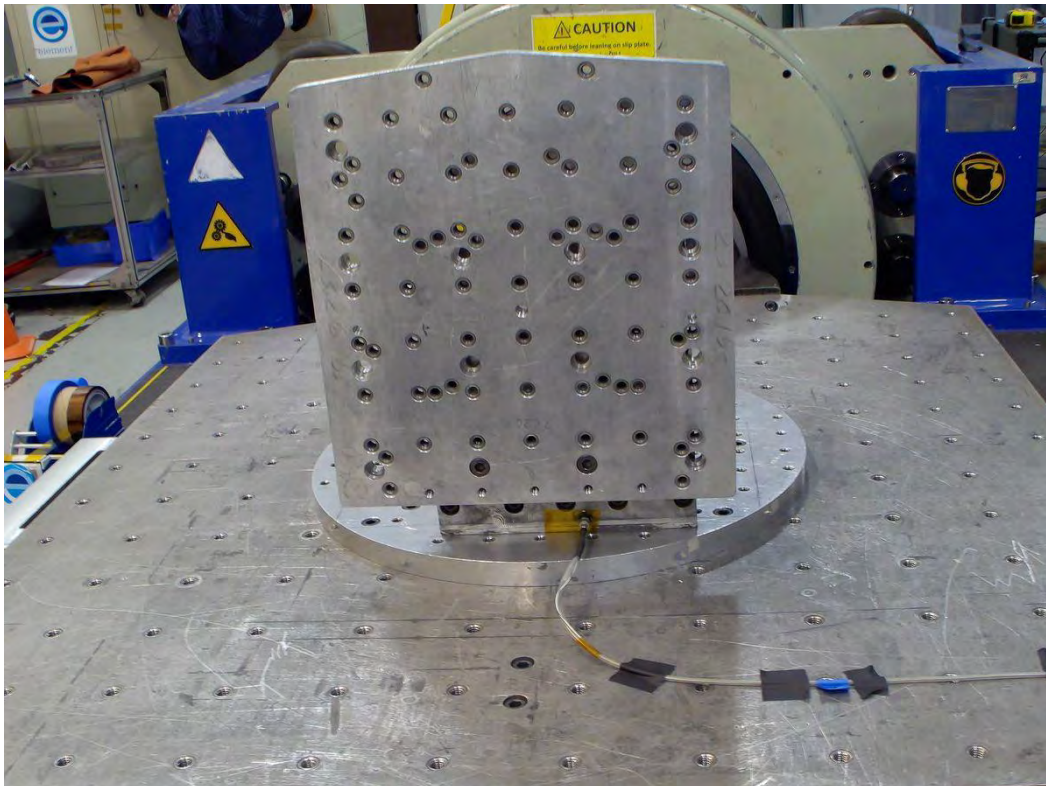


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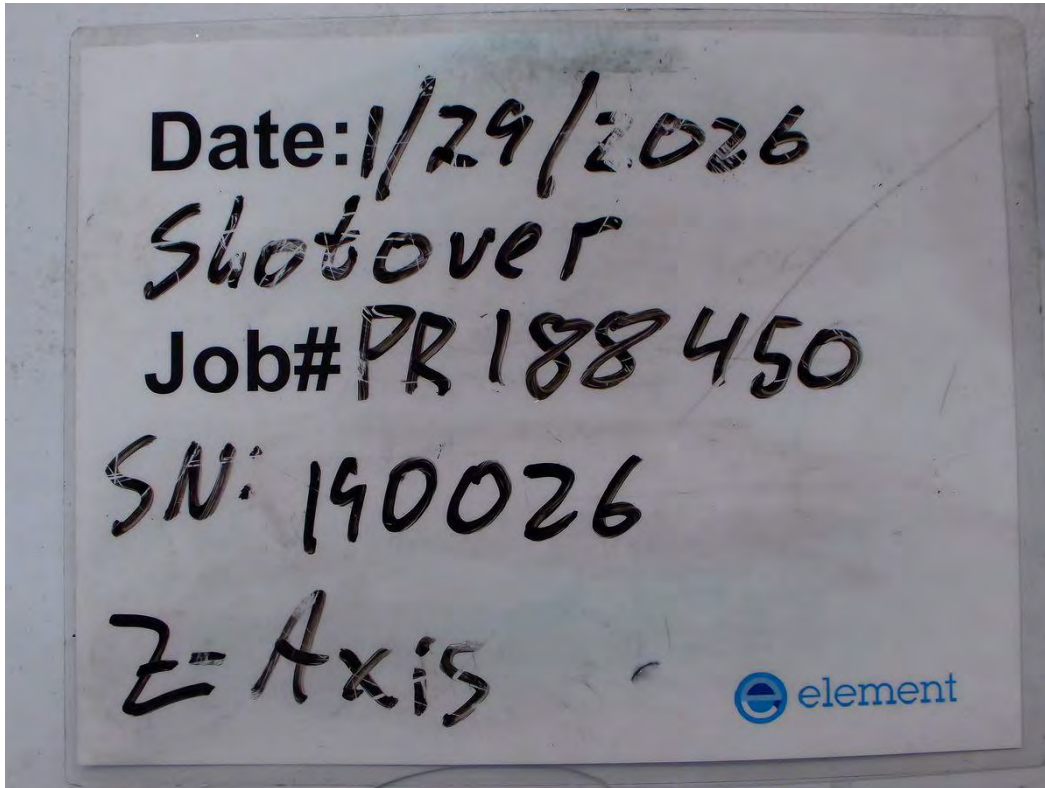




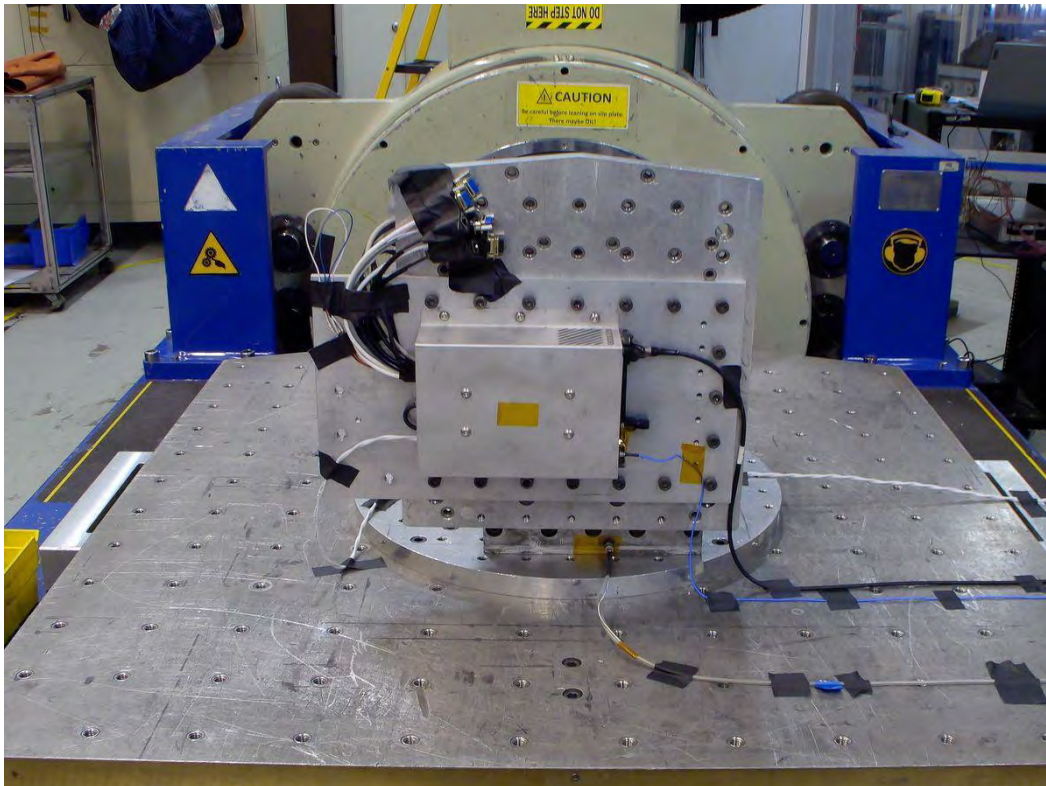
OSCAR_Bare-Fixture_Z-Axis



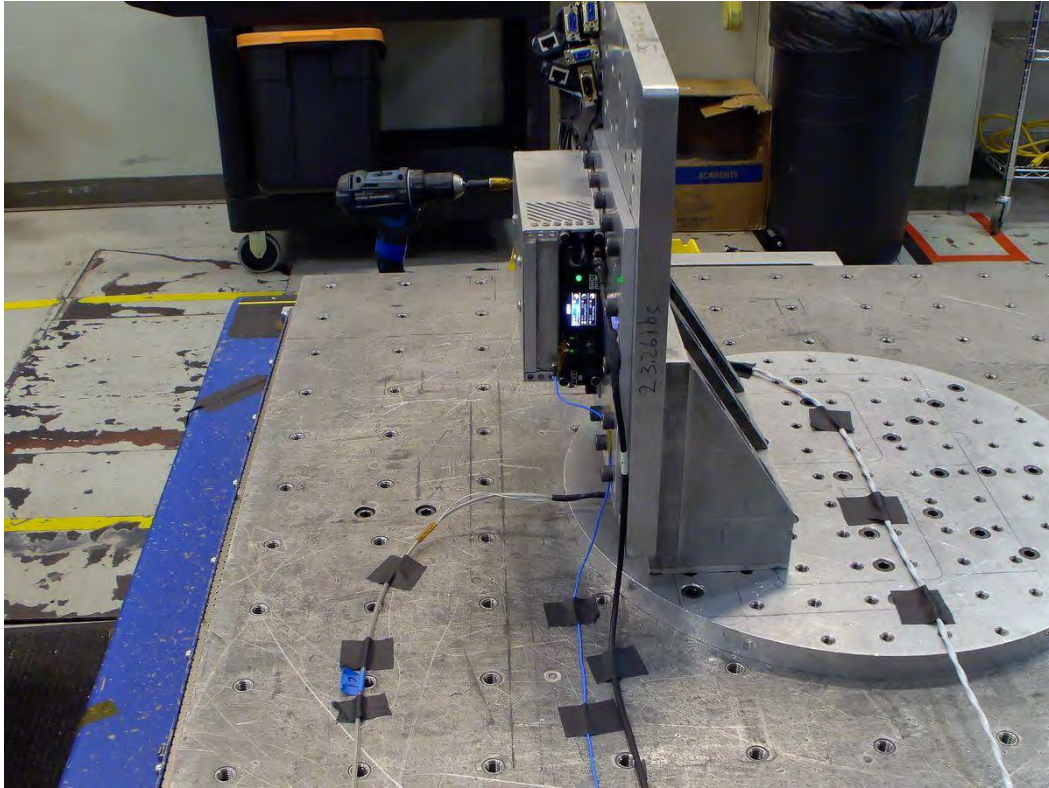
OSCAR_Bare-Fixture_Z-Axis



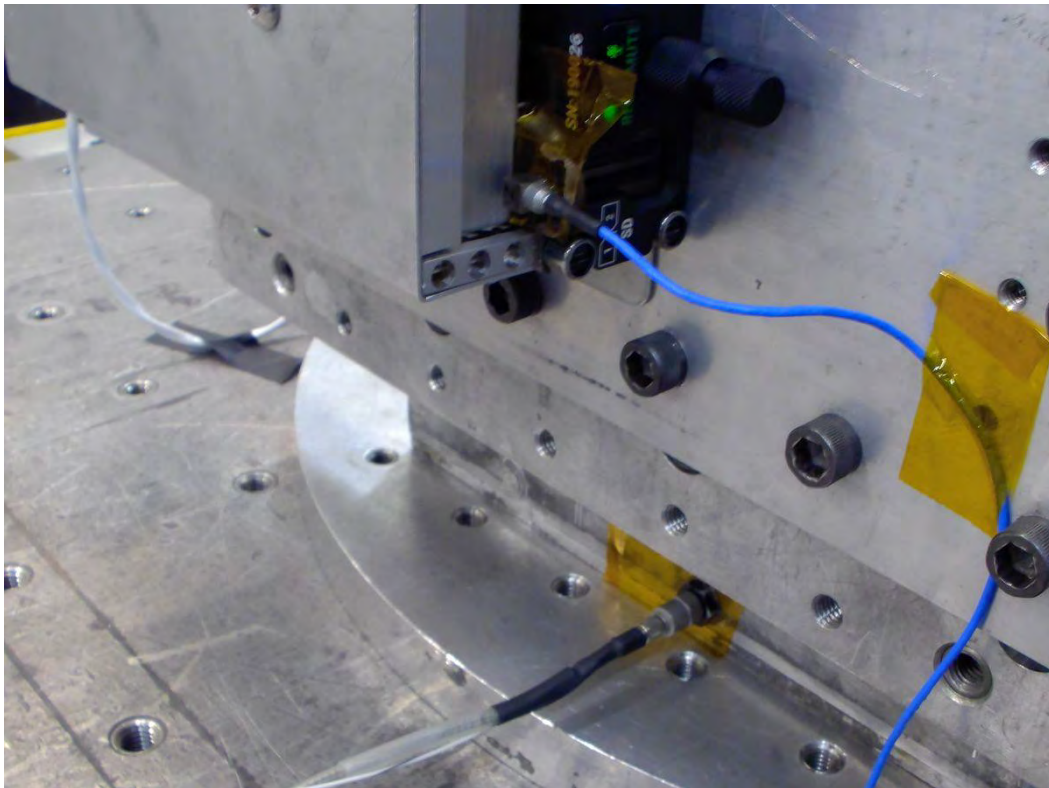
OSCAR_SN190026_Z-Axis



OSCAR_SN190026_Z-Axis



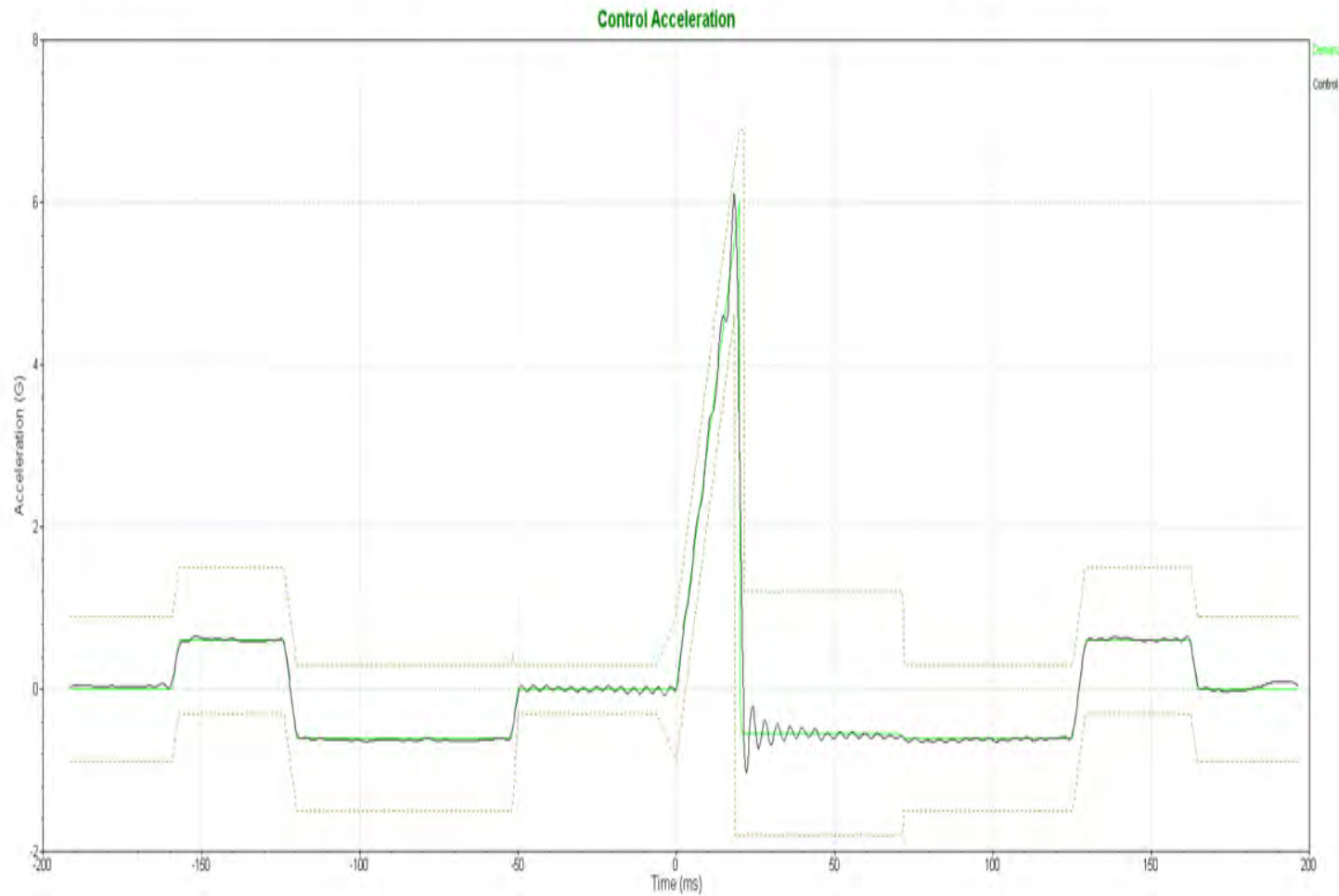
OSCAR_SN190026_Z-Axis



OSCAR_SN190026_Z-Axis

5.5.5 Test Data

Element-Longmont	Pulse count: 1 of 3	Pulse amplitude: 6 G peak	Project: PR188450	Run 1
Customer: Shotover Systems	Test Axis: Y	Pulse polarity: Positive	UUT: OSCAR	
Jan 29, 2026 09:21:04	Pulse remaining: 2	Pulse width: 20 ms	S/N: Bare Fixture	



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 1

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

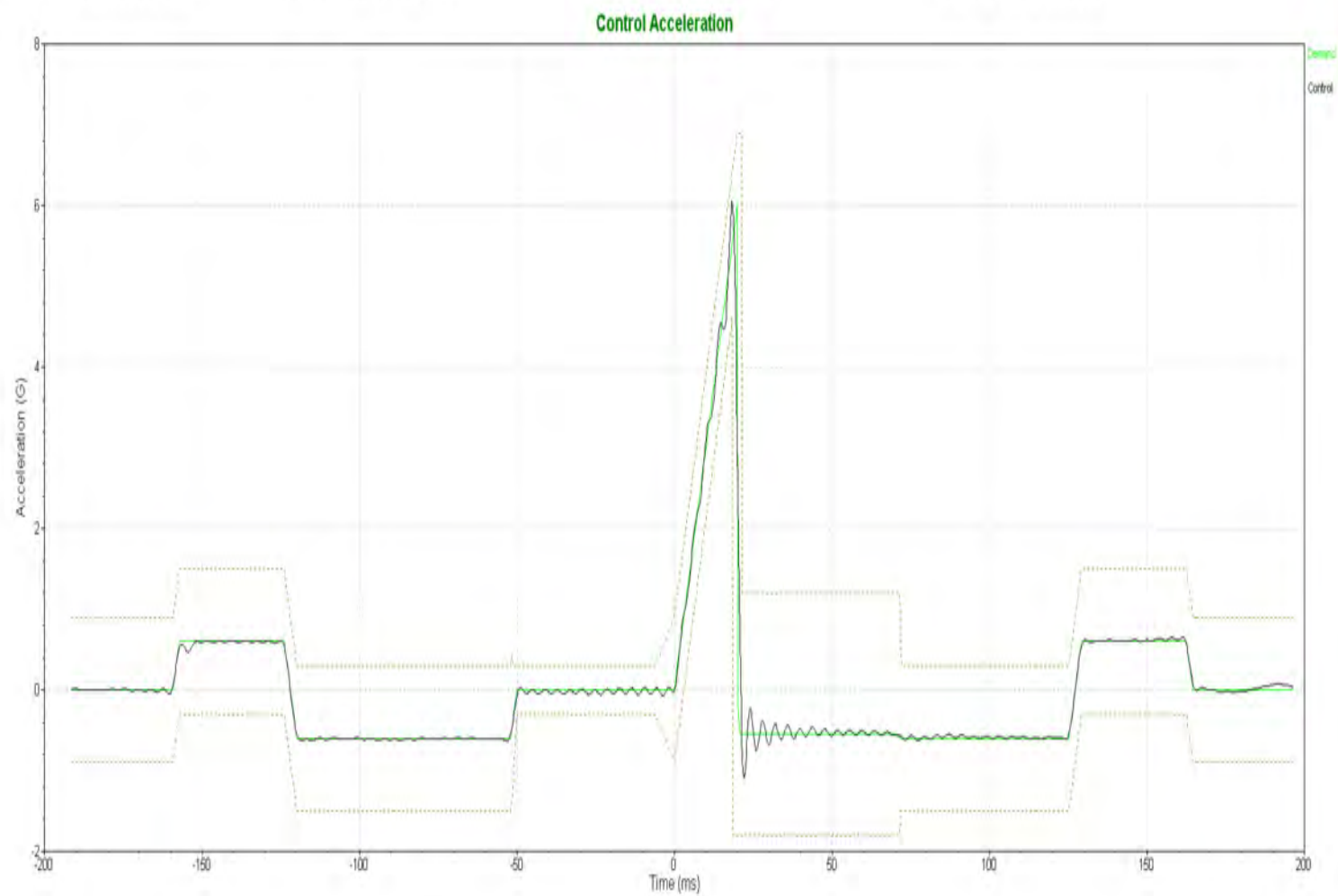
UUT: OSCAR

Jan 29, 2026 09:21:04

Pulse remaining: 1

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 1

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

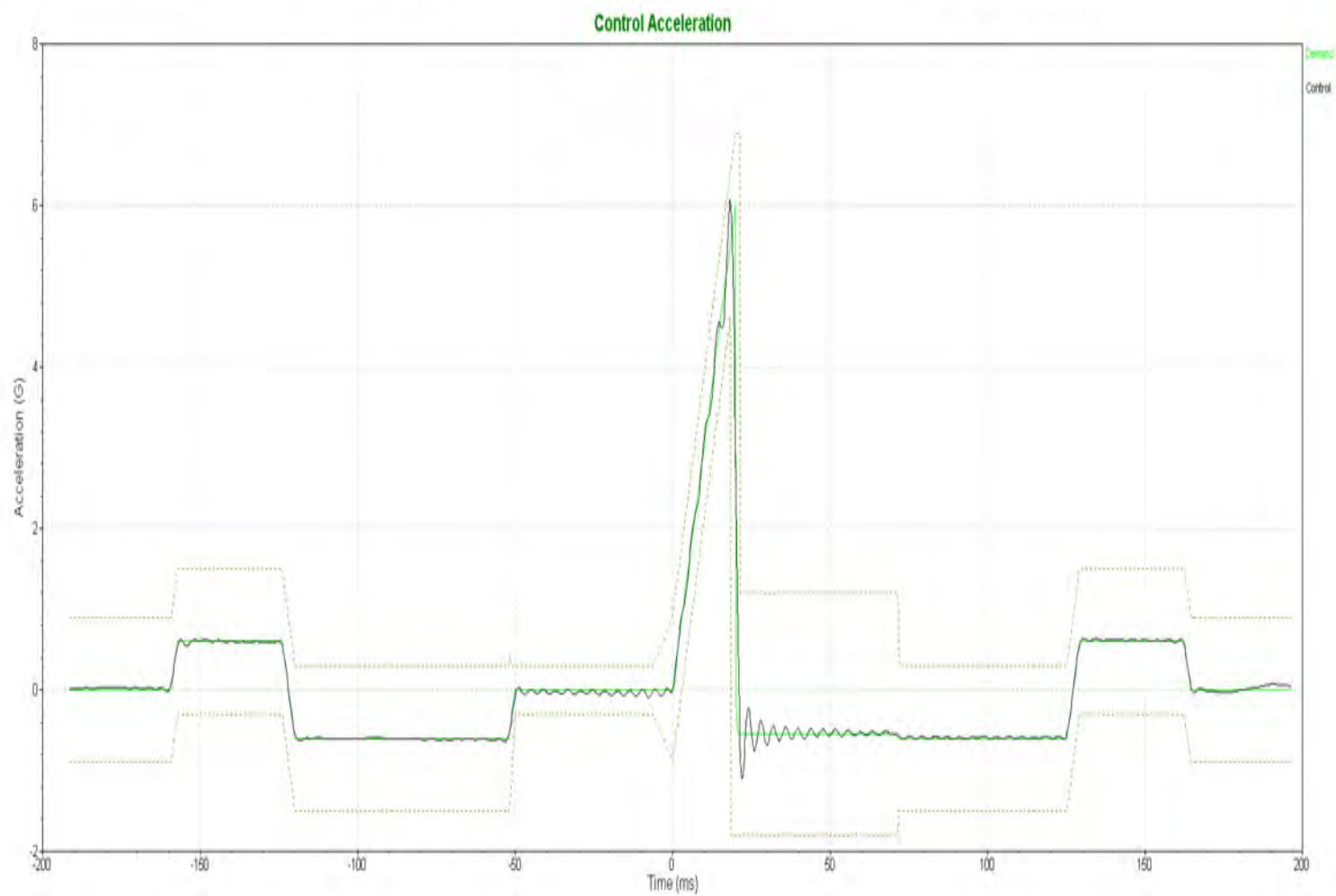
UUT: OSCAR

Jan 29, 2026 09:21:04

Pulse remaining: 0

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 2

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

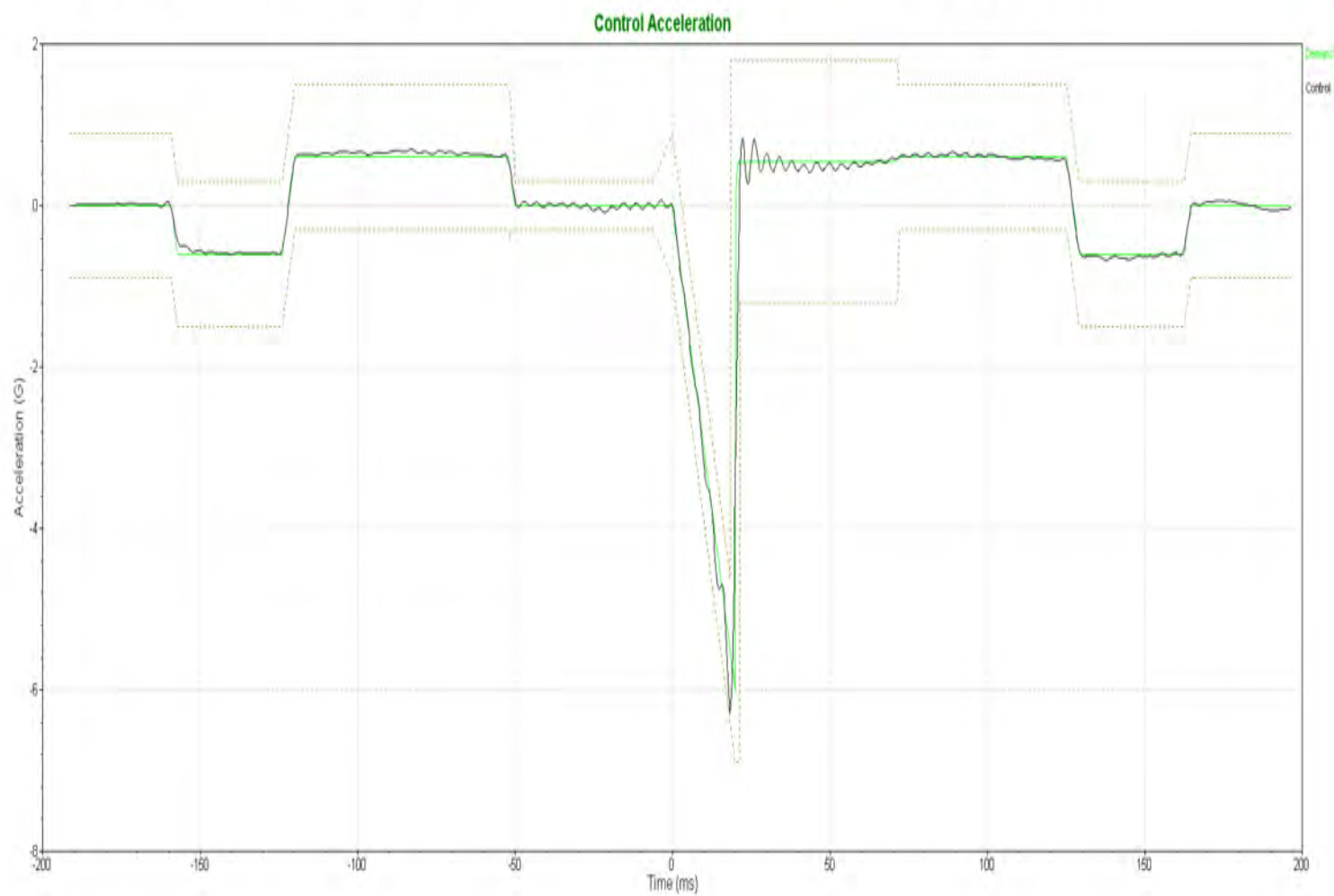
UUT: OSCAR

Jan 29, 2026 09:24:07

Pulse remaining: 2

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 2

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

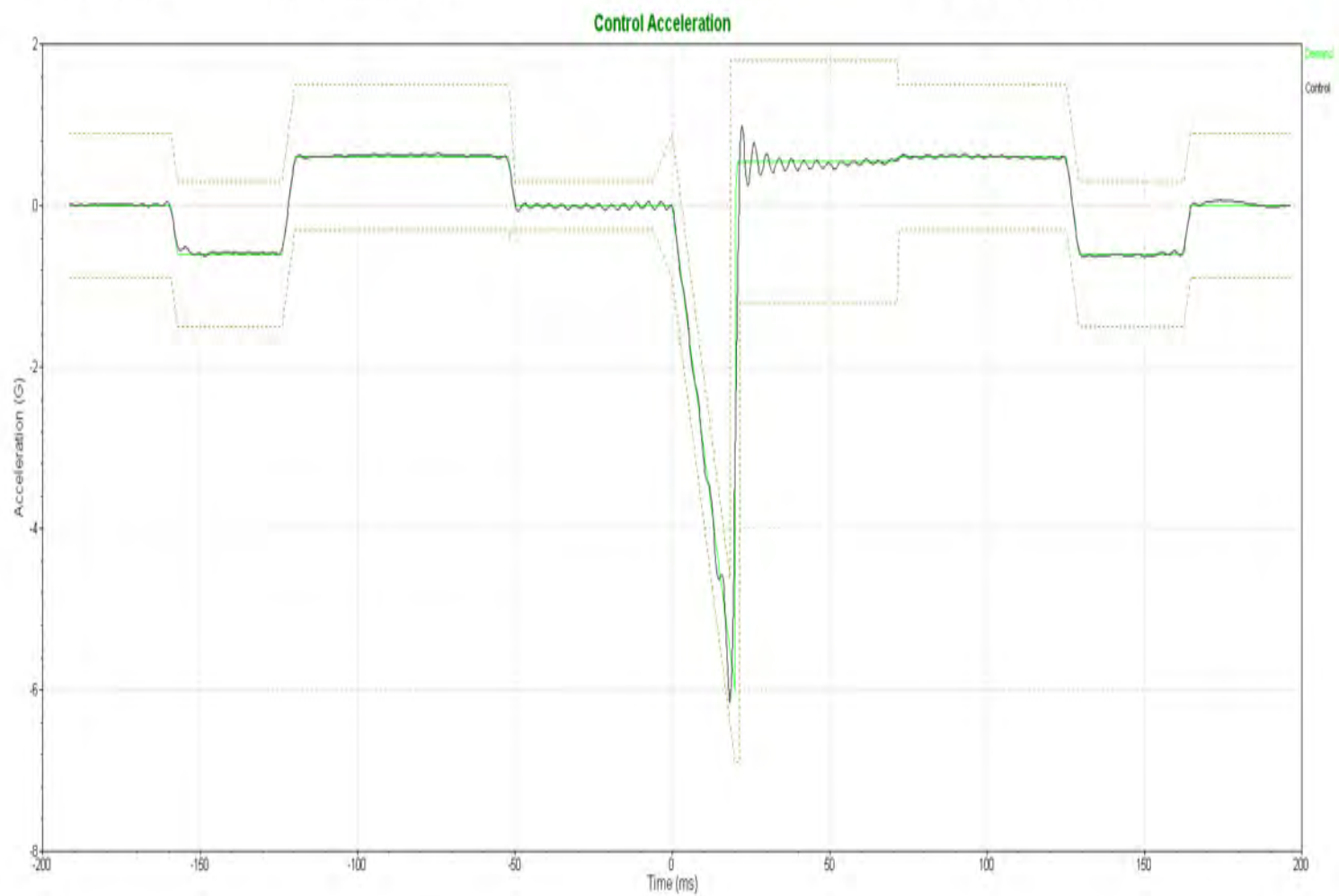
UUT: OSCAR

Jan 29, 2026 09:24:07

Pulse remaining: 1

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 2

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

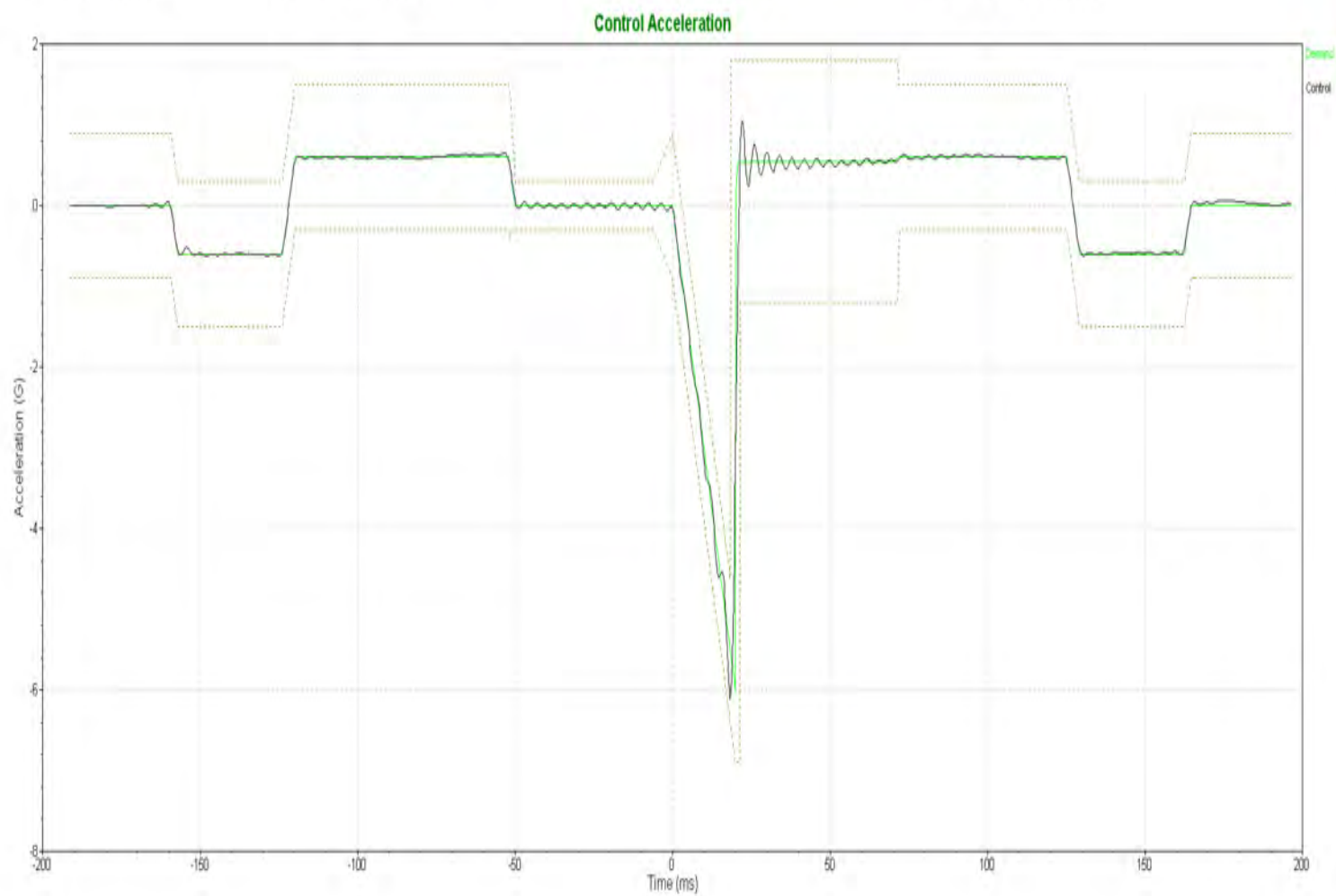
UUT: OSCAR

Jan 29, 2026 09:24:07

Pulse remaining: 0

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 3

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

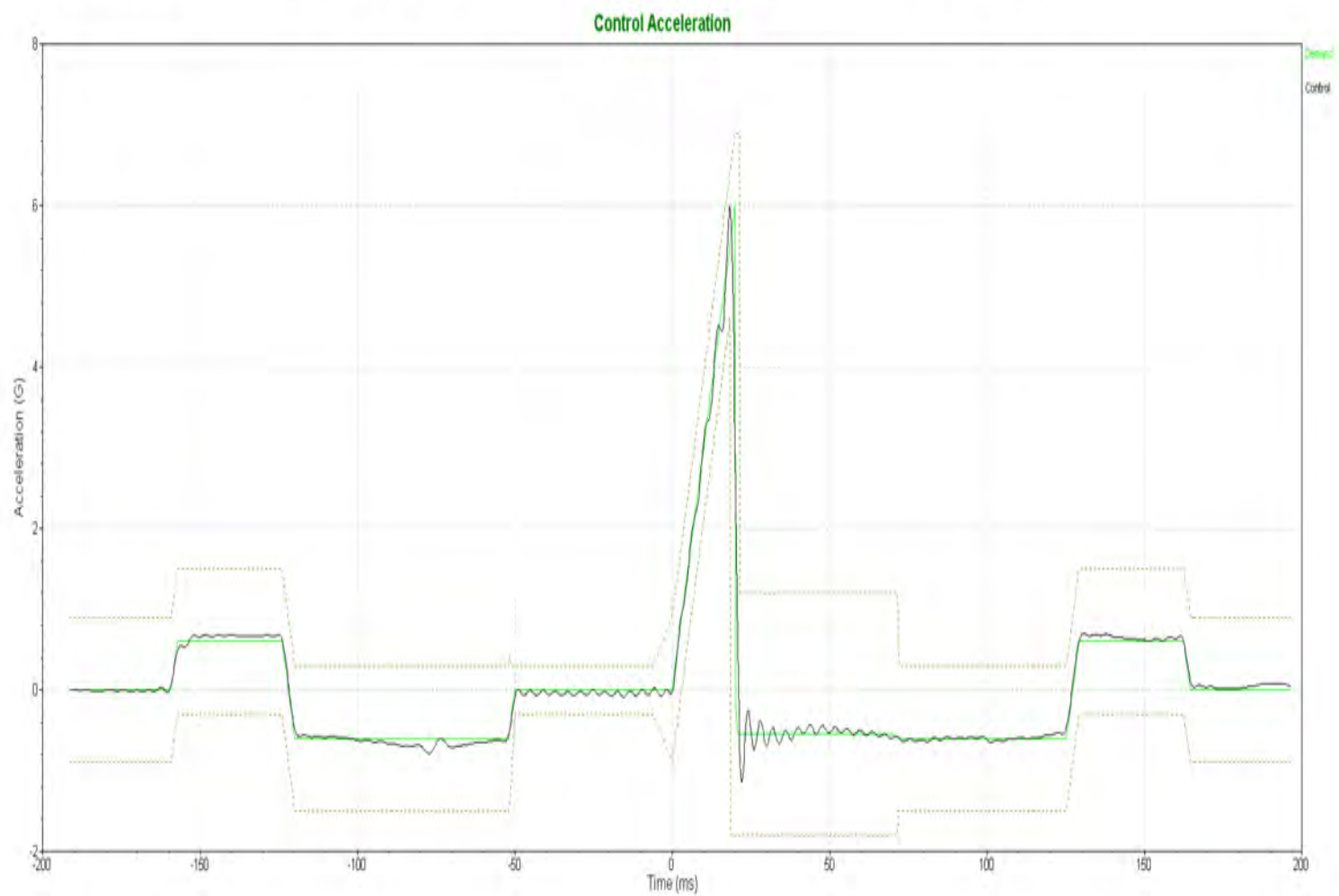
UUT: OSCAR

Jan 29, 2026 10:10:17

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 3

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

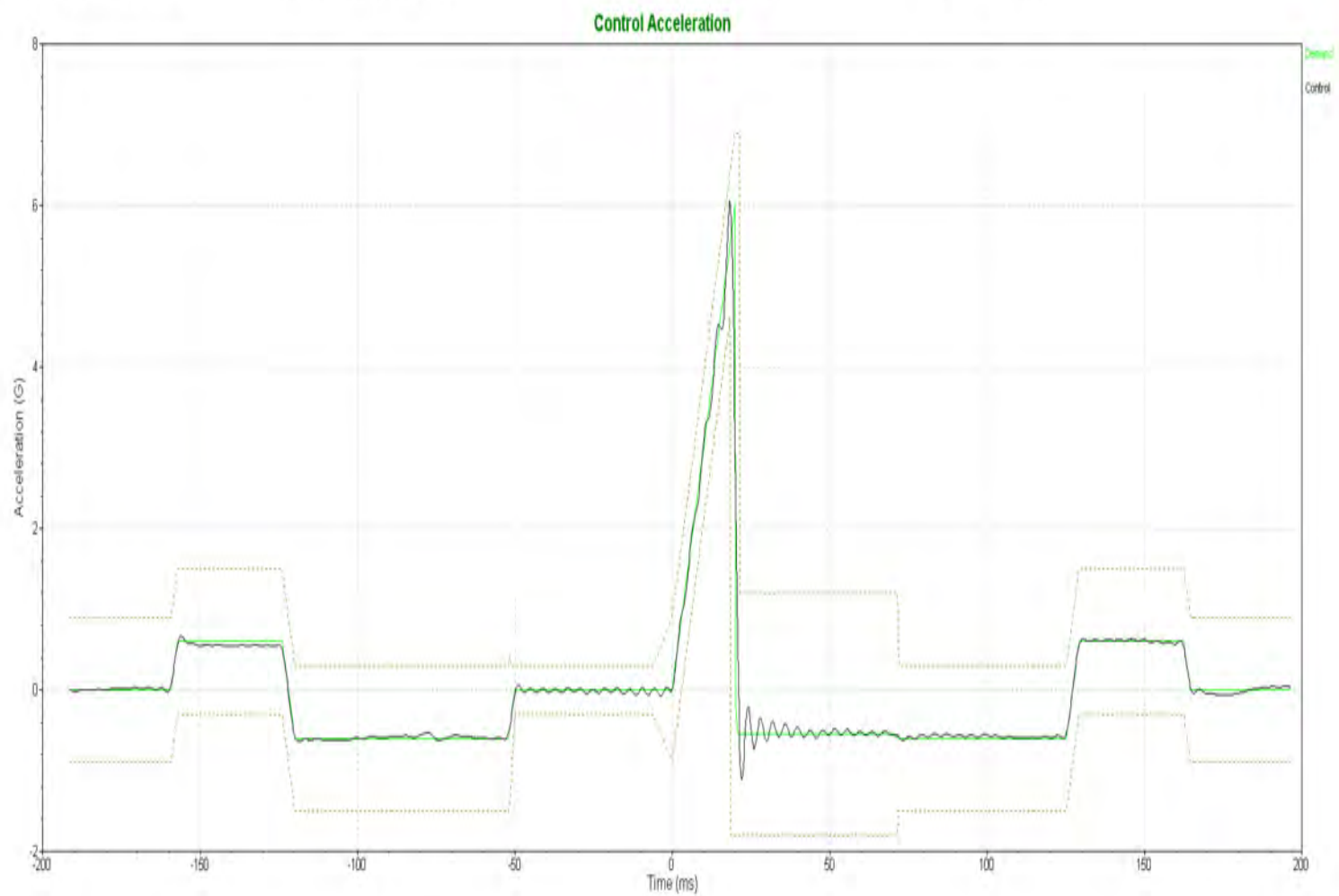
UUT: OSCAR

Jan 29, 2026 10:10:17

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 3

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

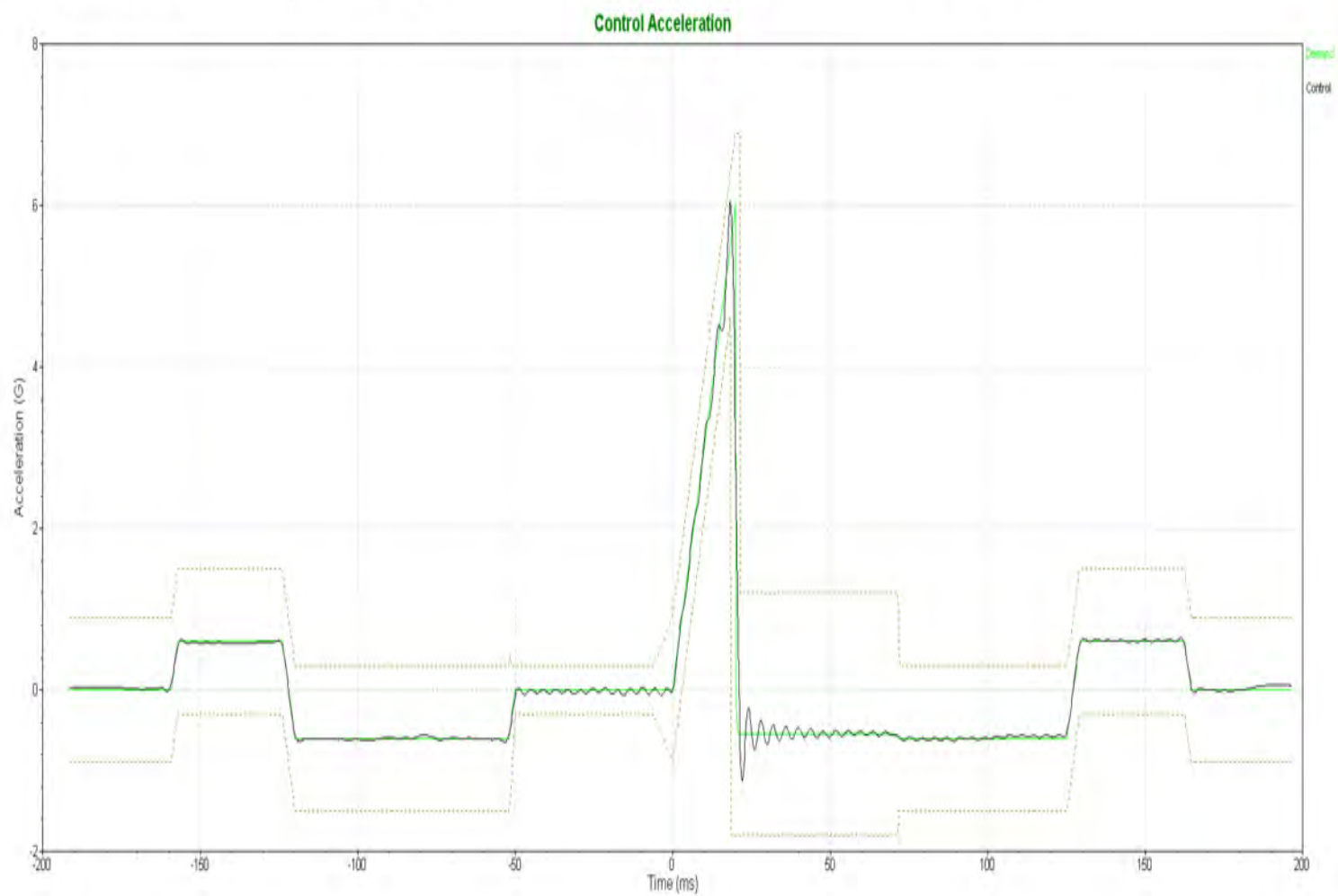
UUT: OSCAR

Jan 29, 2026 10:10:17

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 4

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

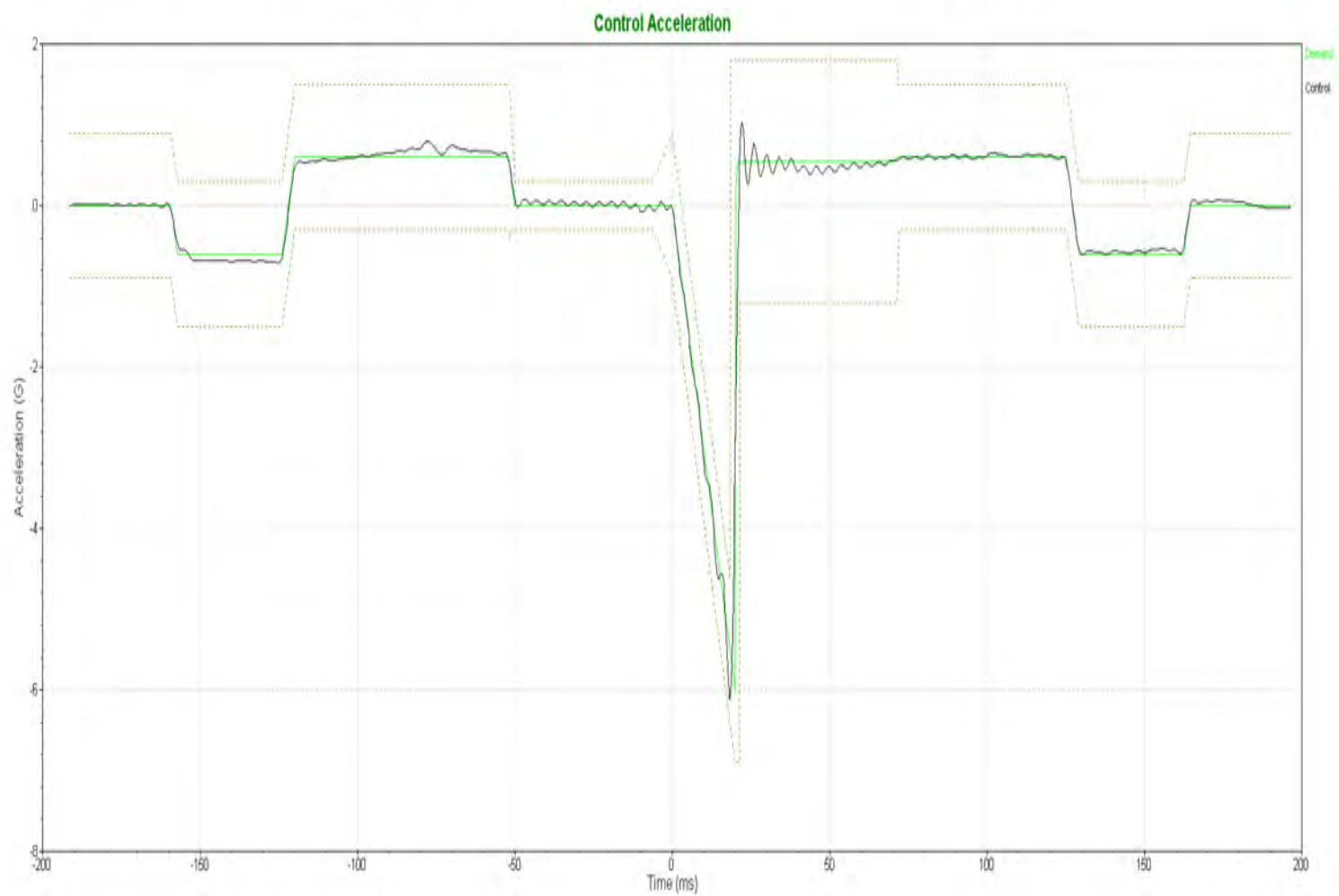
UUT: OSCAR

Jan 29, 2026 10:10:38

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 4

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

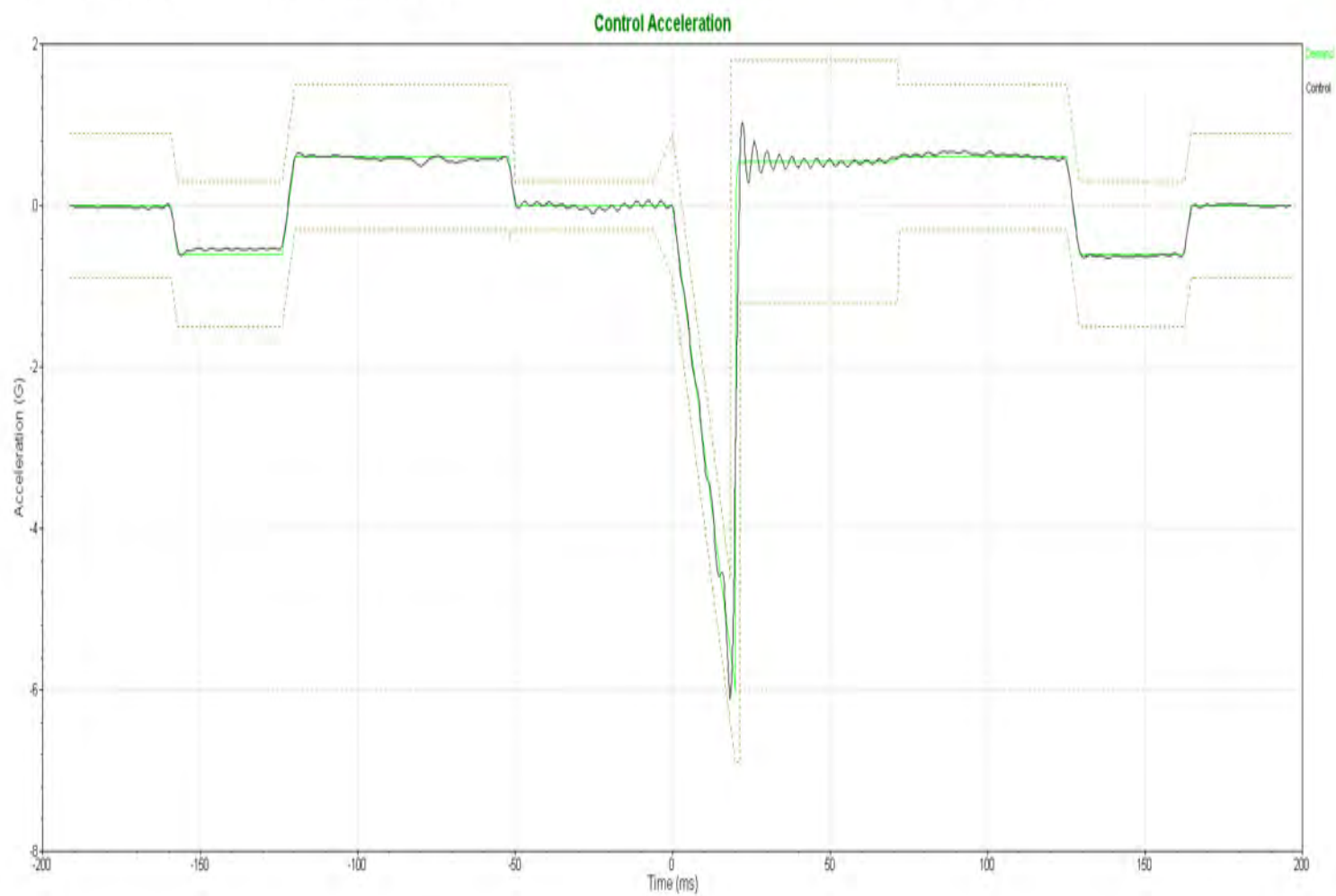
UUT: OSCAR

Jan 29, 2026 10:10:38

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 4

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

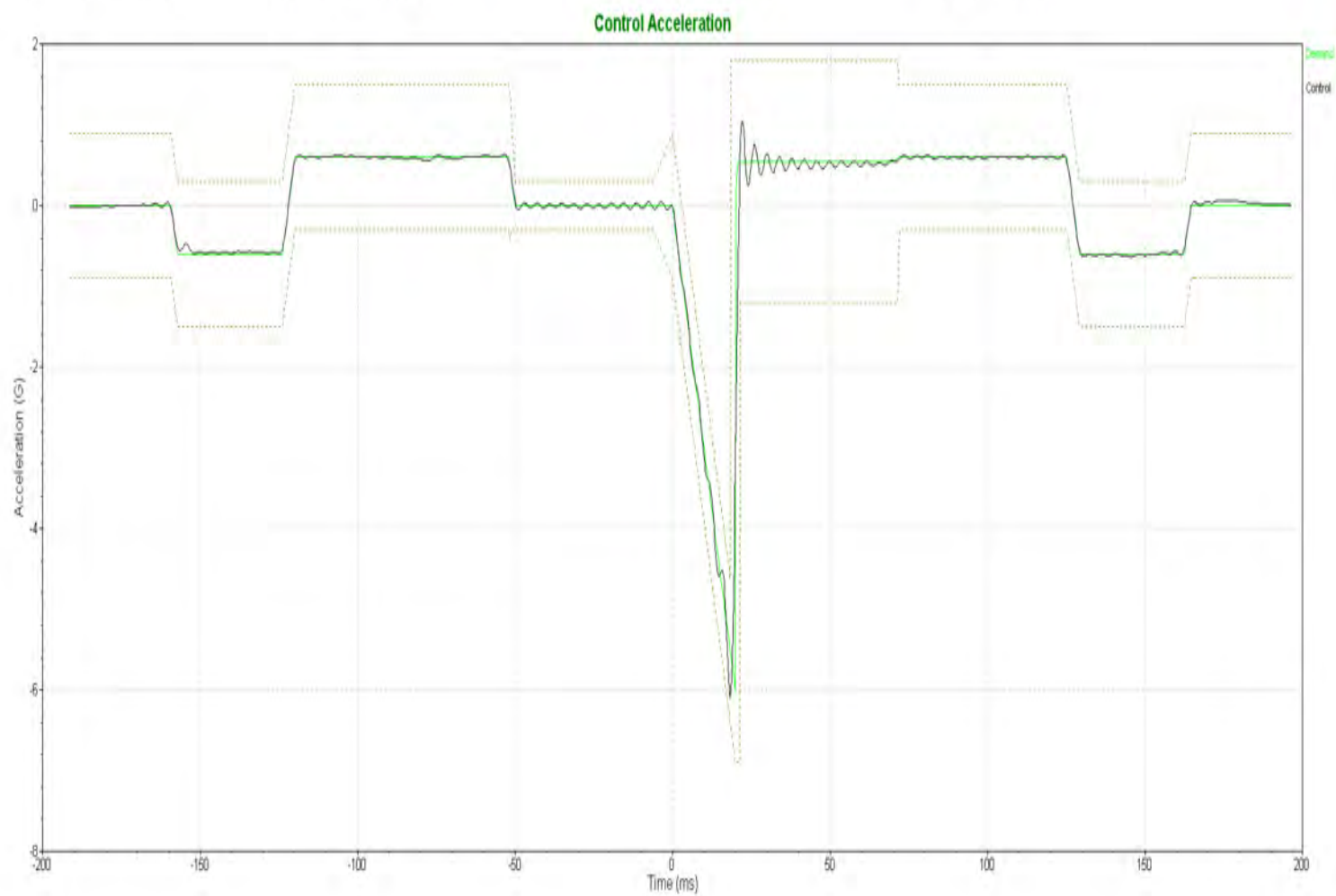
UUT: OSCAR

Jan 29, 2026 10:10:38

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 5

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

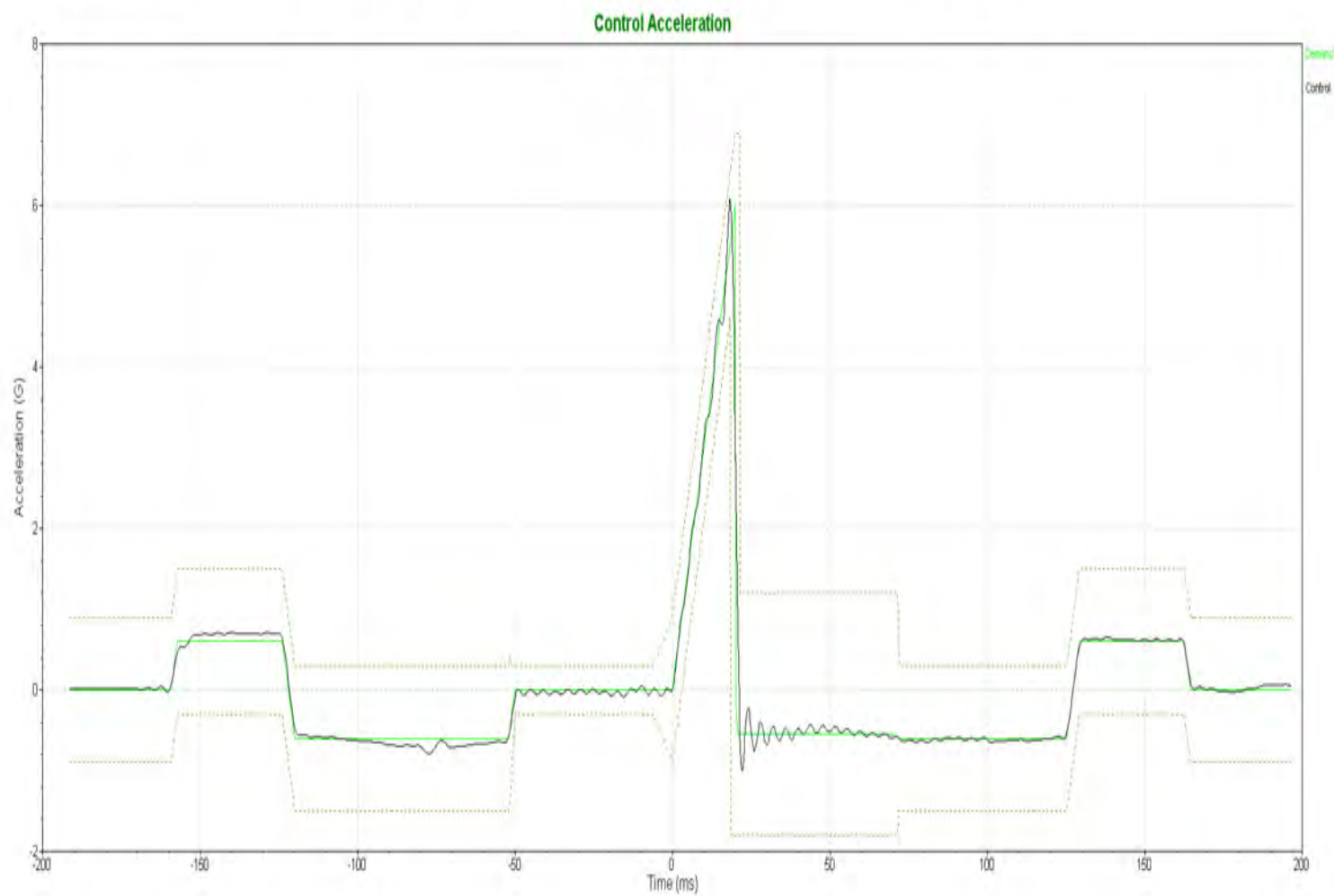
UUT: OSCAR

Jan 29, 2026 10:30:25

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 5

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

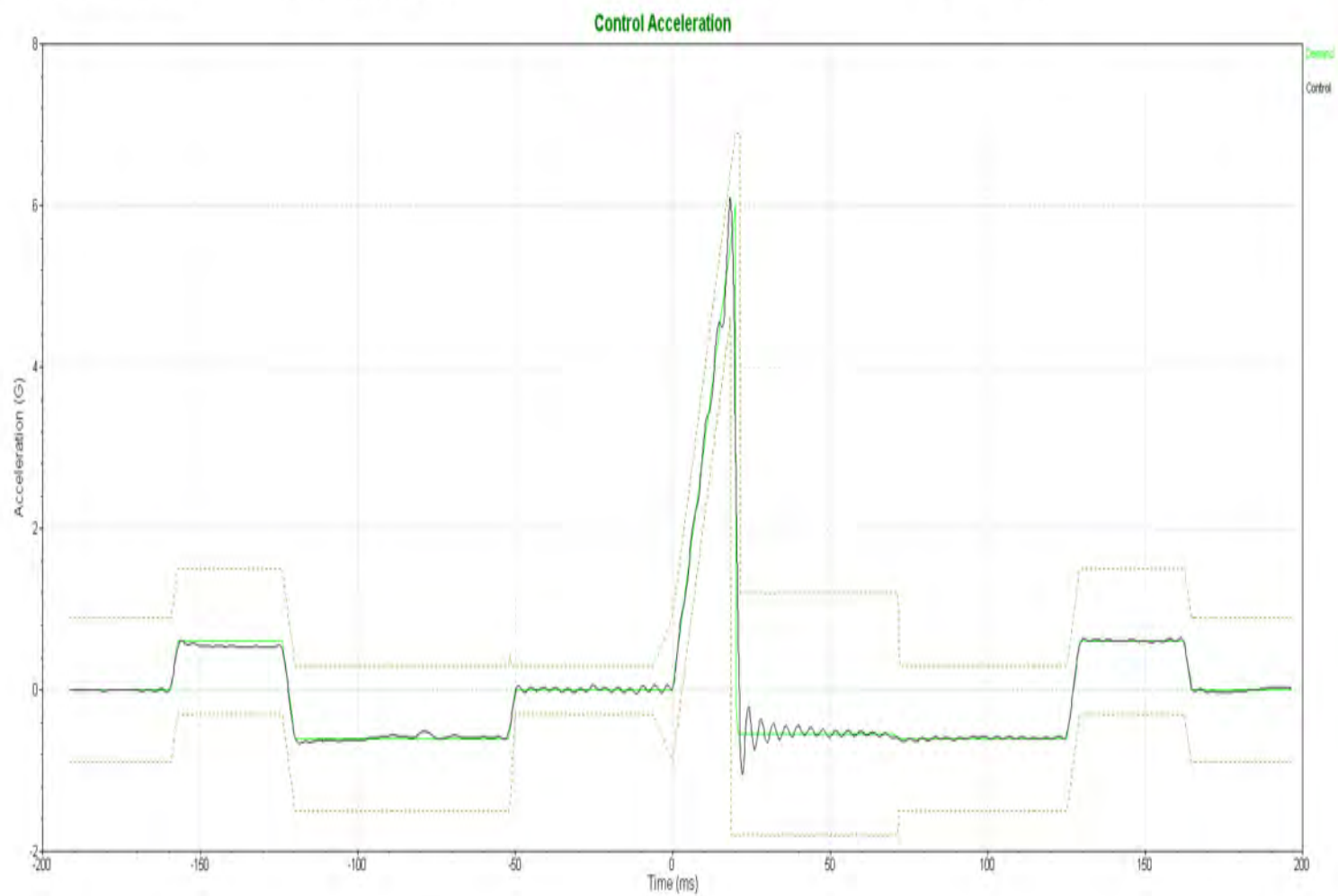
UUT: OSCAR

Jan 29, 2026 10:30:25

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 5

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

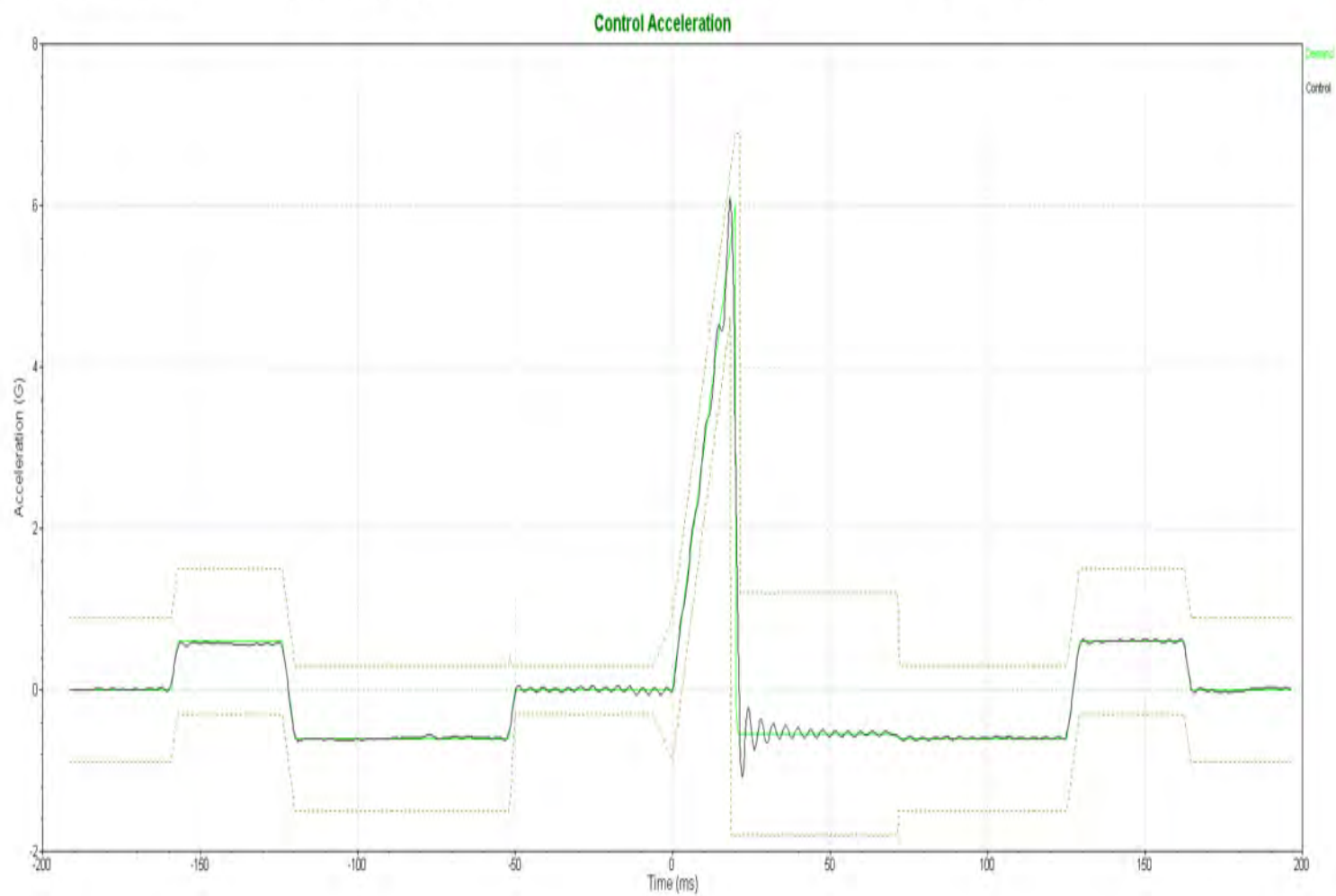
UUT: OSCAR

Jan 29, 2026 10:30:25

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 6

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

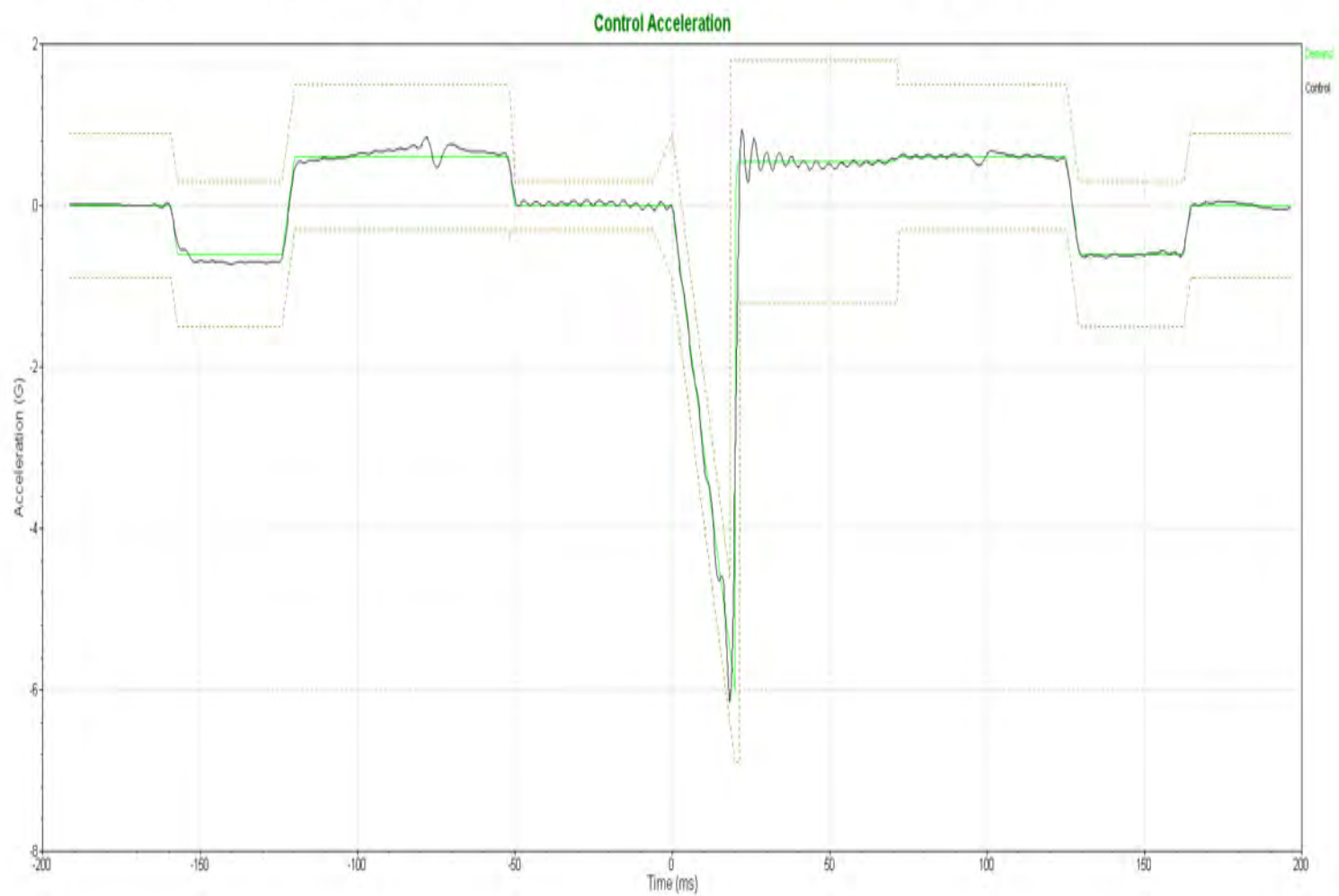
UUT: OSCAR

Jan 29, 2026 10:30:50

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 6

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

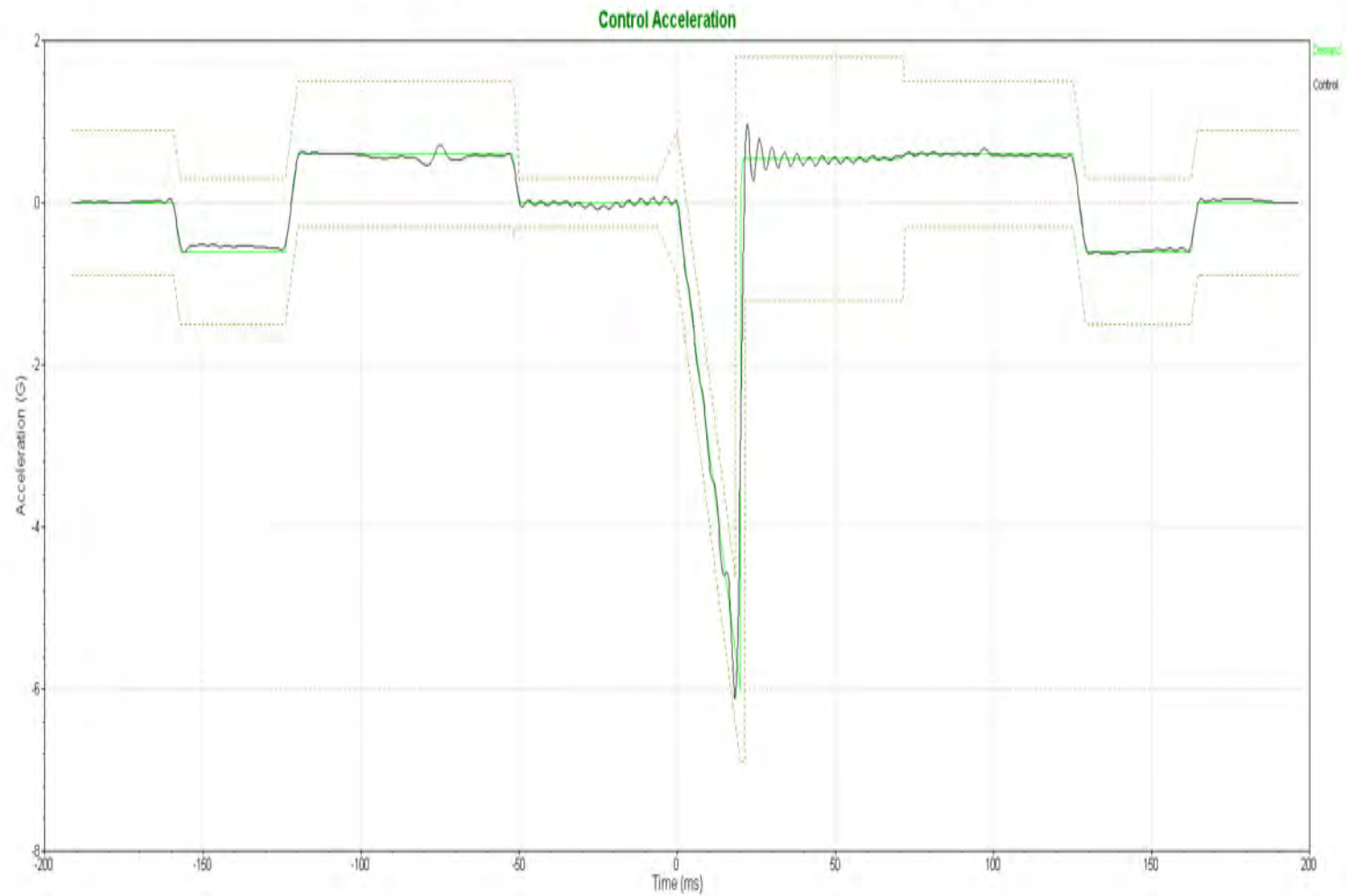
UUT: OSCAR

Jan 29, 2026 10:30:50

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 6

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

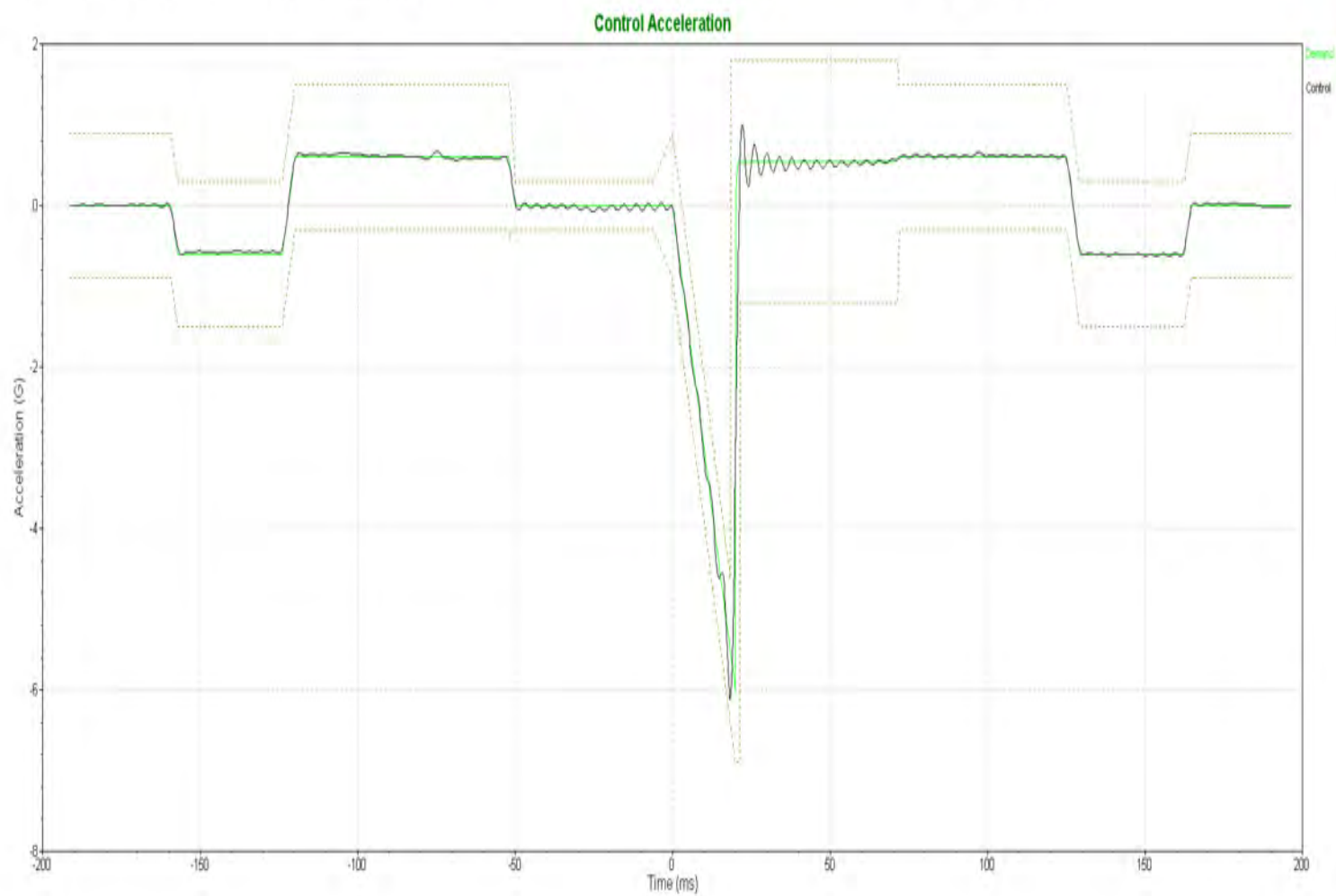
UUT: OSCAR

Jan 29, 2026 10:30:50

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 7

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

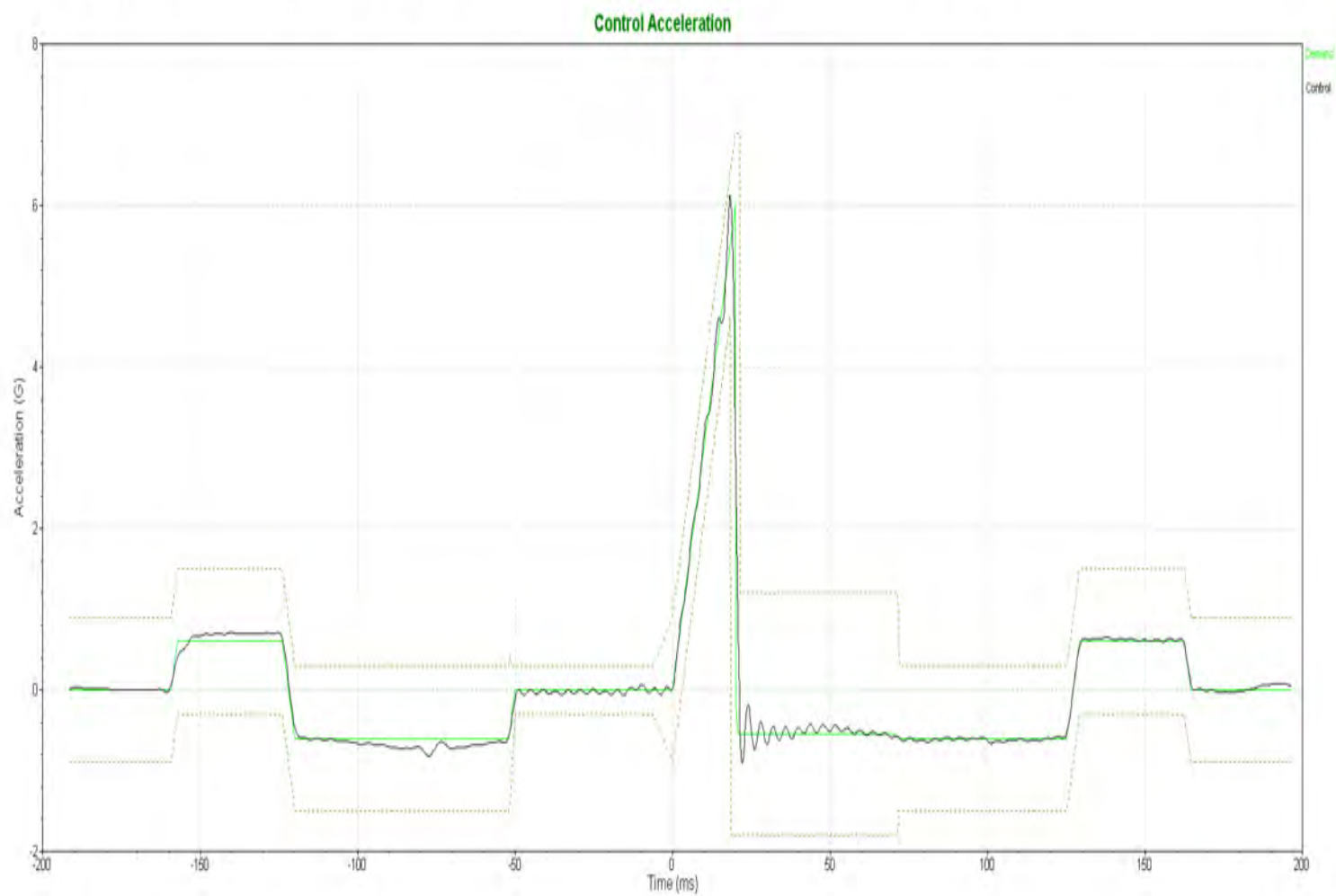
UUT: OSCAR

Jan 29, 2026 11:23:17

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 7

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

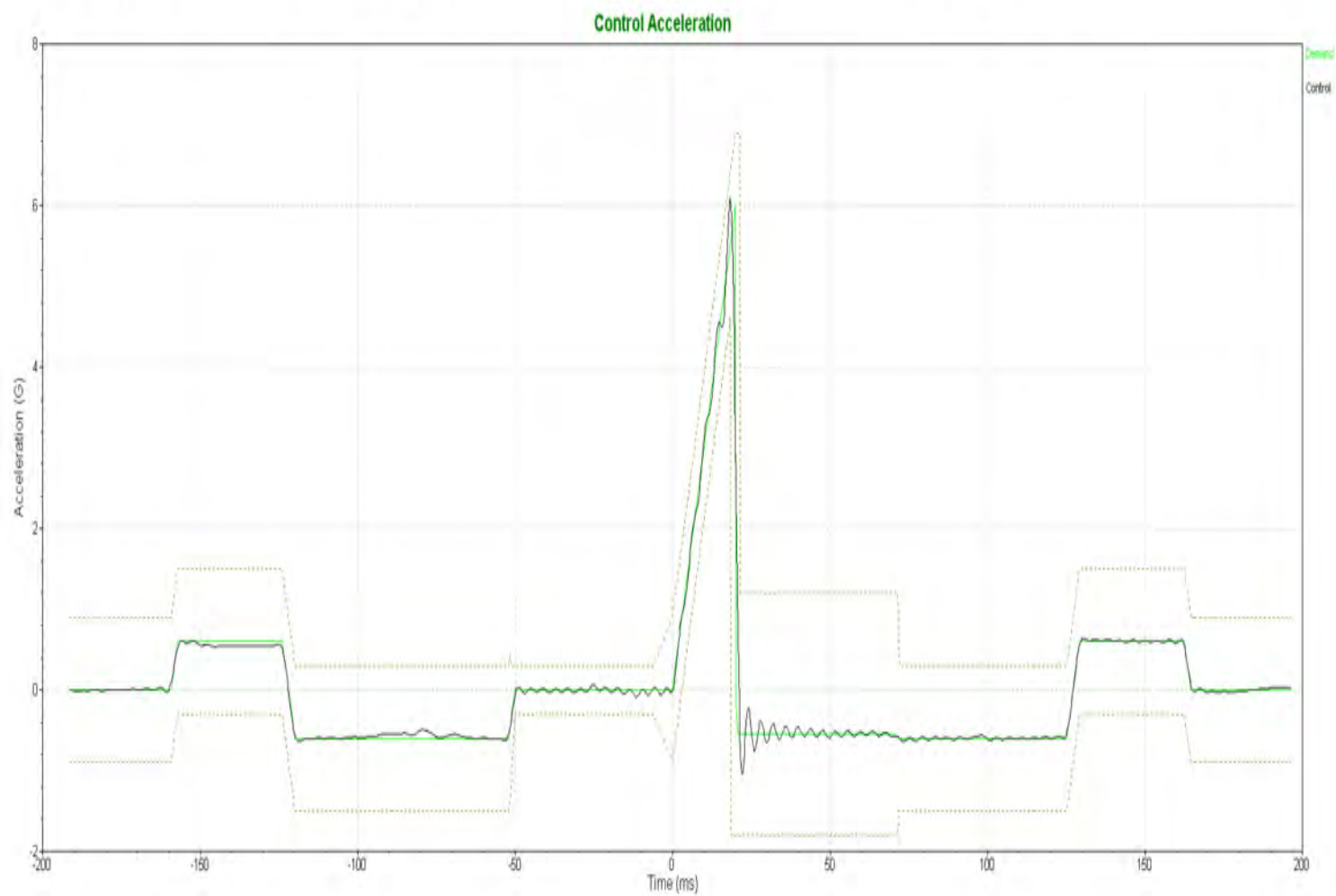
UUT: OSCAR

Jan 29, 2026 11:23:17

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 7

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

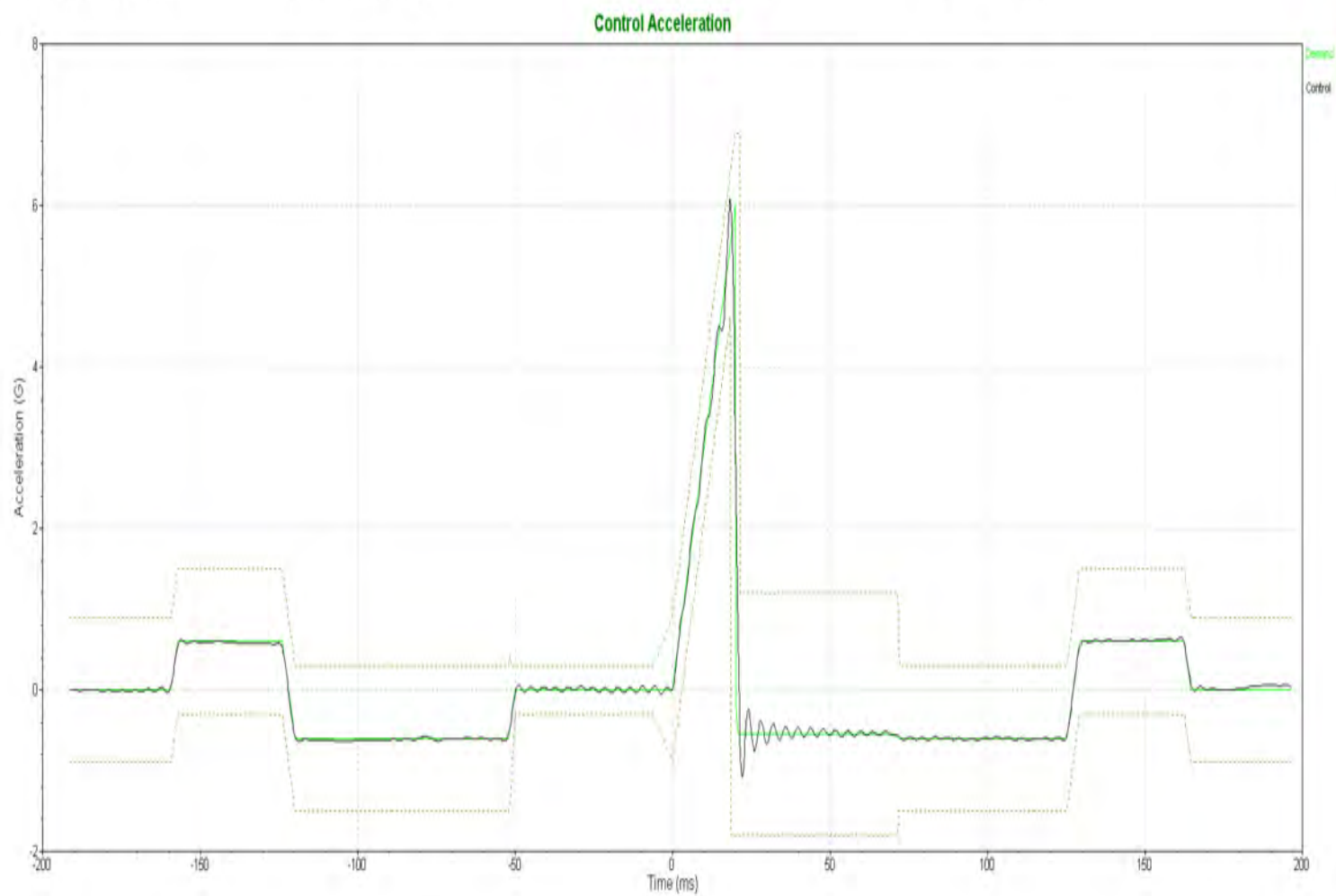
UUT: OSCAR

Jan 29, 2026 11:23:17

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 8

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

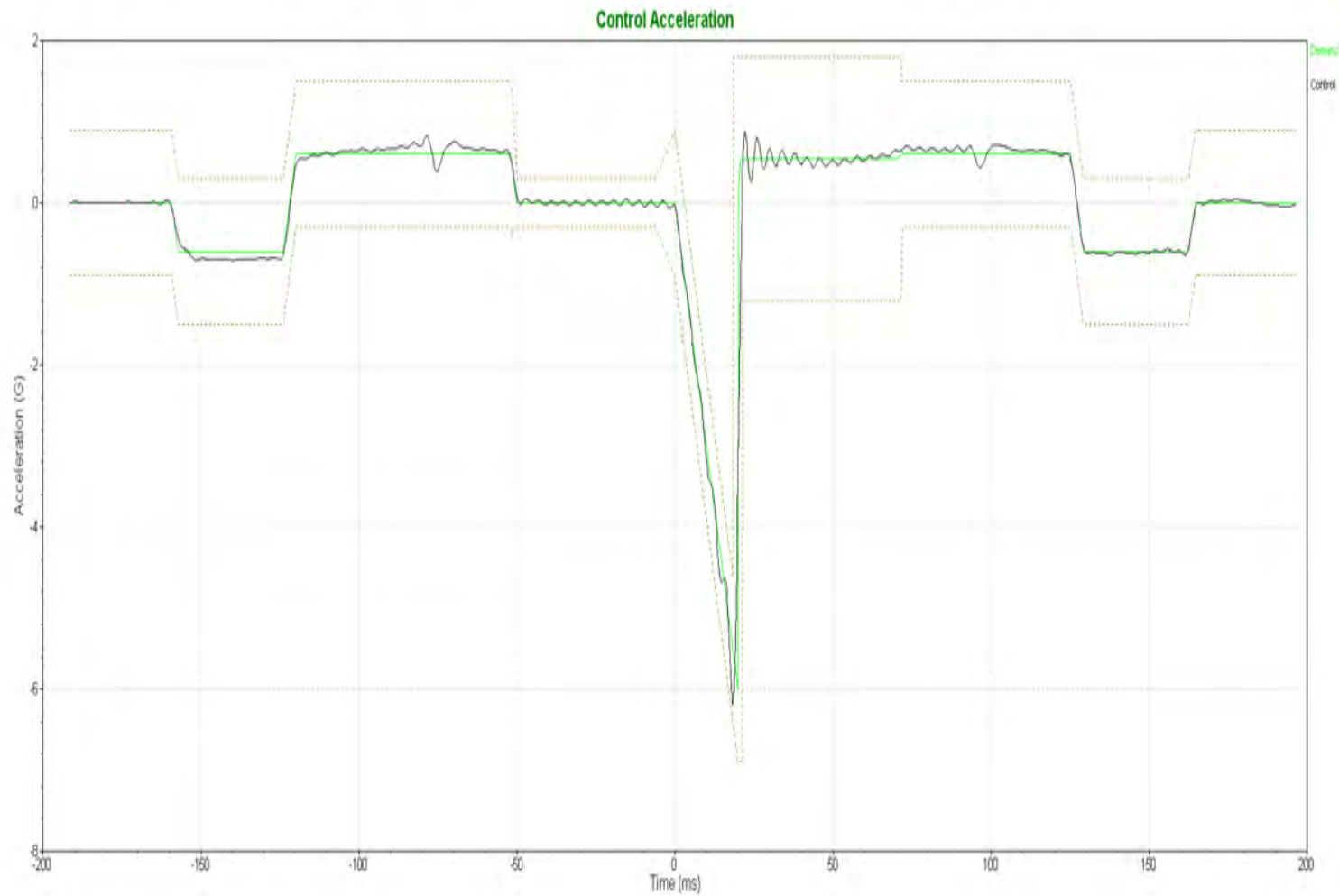
UUT: OSCAR

Jan 29, 2026 11:23:38

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 8

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

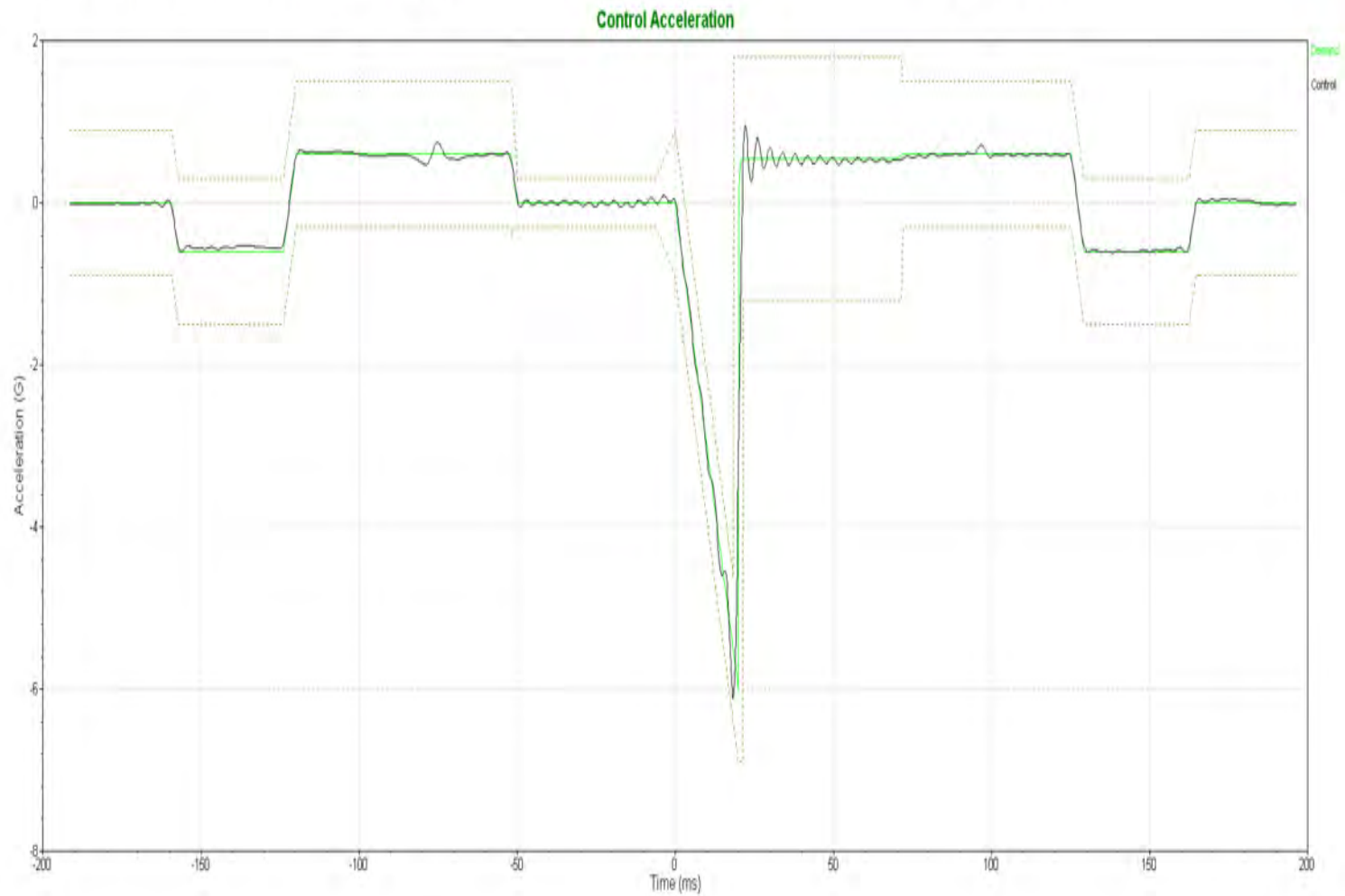
UUT: OSCAR

Jan 29, 2026 11:23:38

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 8

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

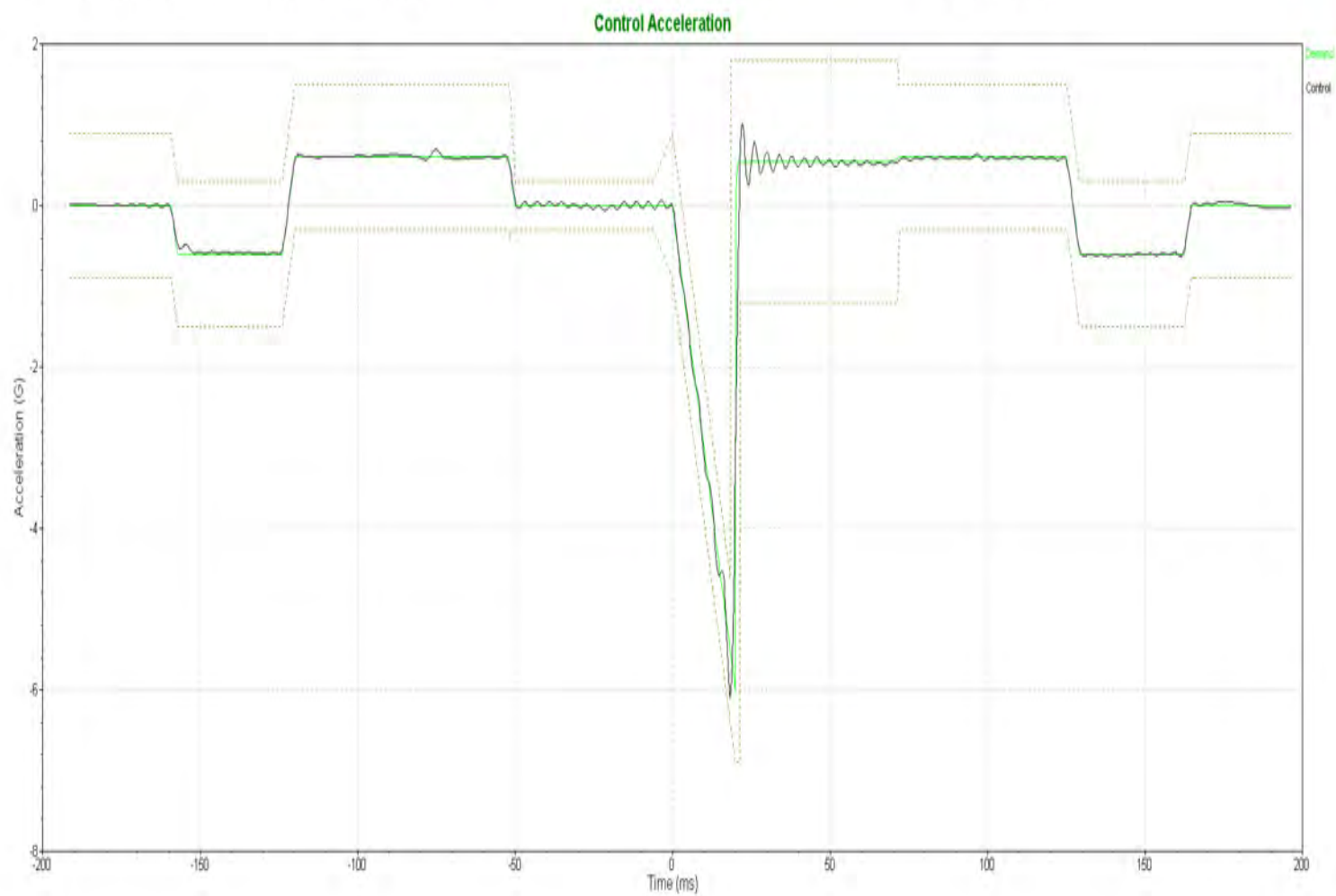
UUT: OSCAR

Jan 29, 2026 11:23:38

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 9

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

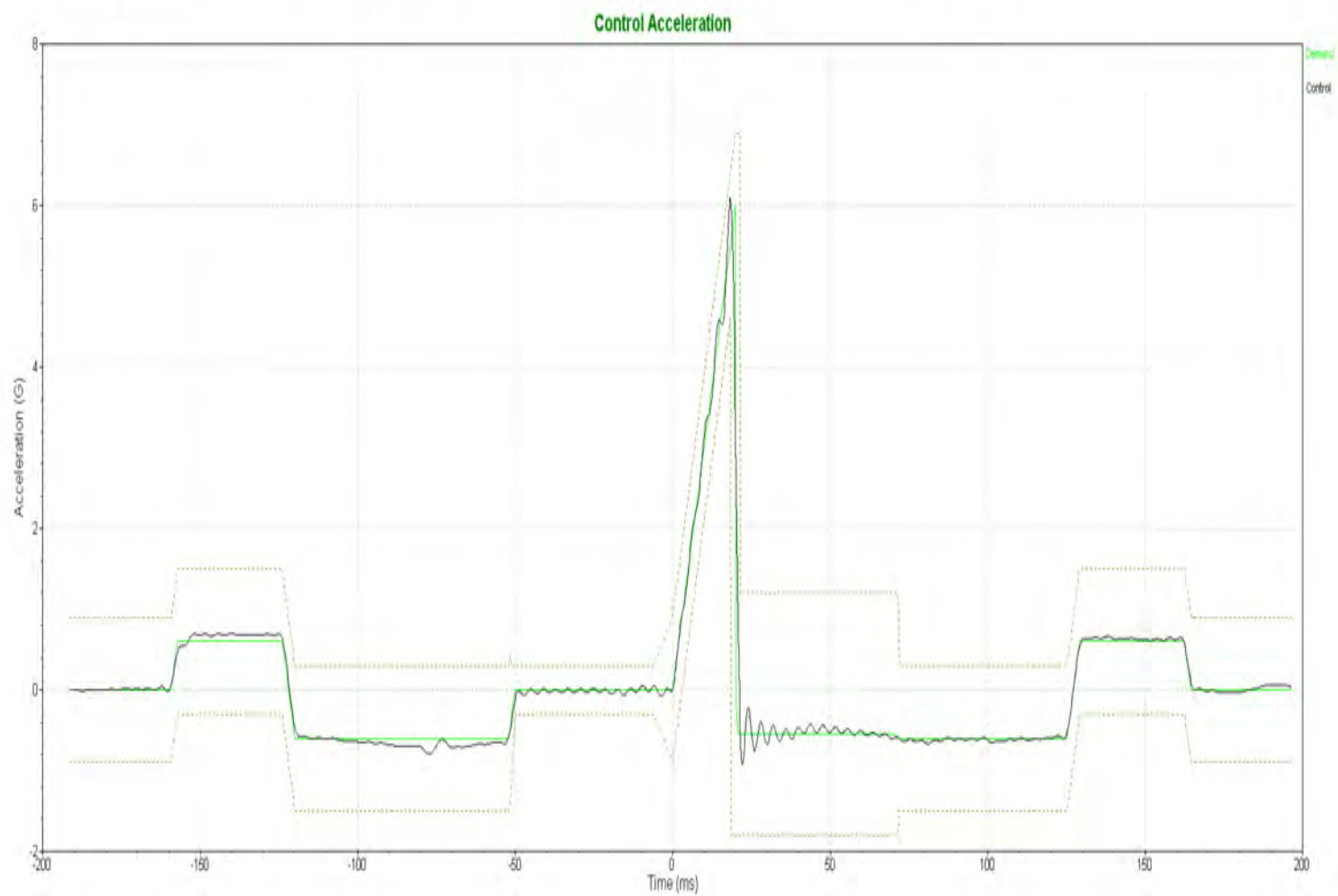
UUT: OSCAR

Jan 29, 2026 11:28:18

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 9

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

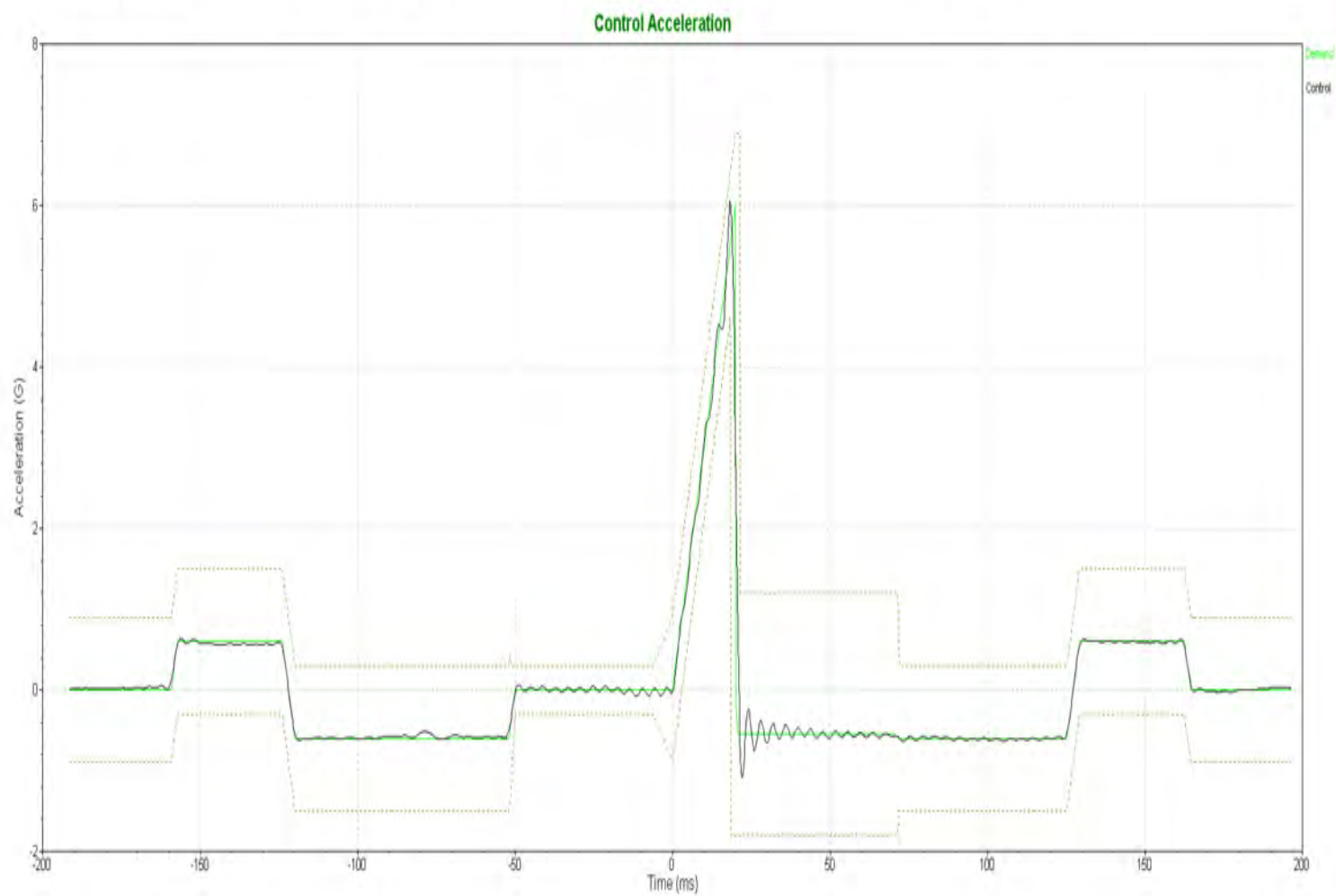
UUT: OSCAR

Jan 29, 2026 11:28:18

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 9

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Positive

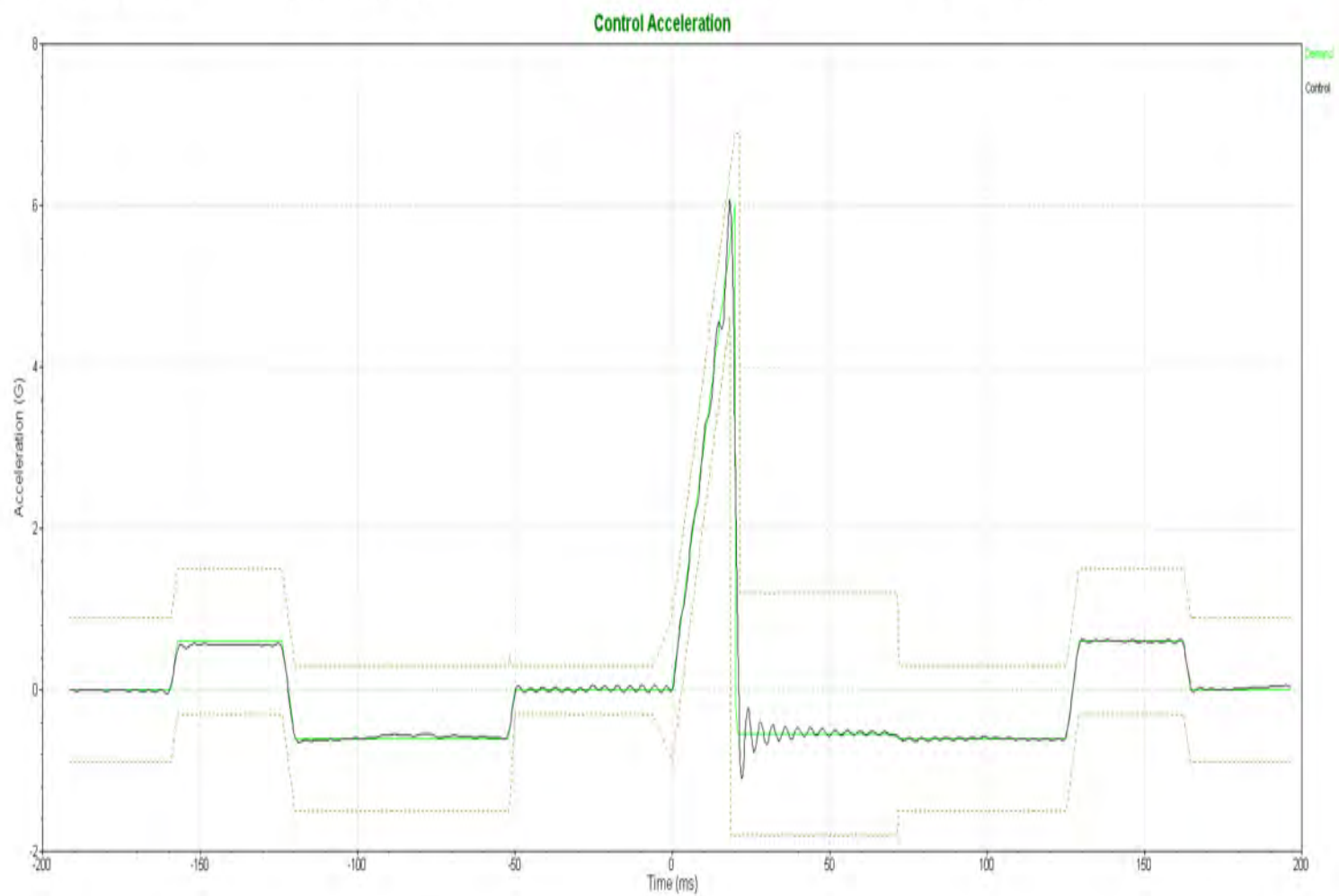
UUT: OSCAR

Jan 29, 2026 11:28:18

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 10

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

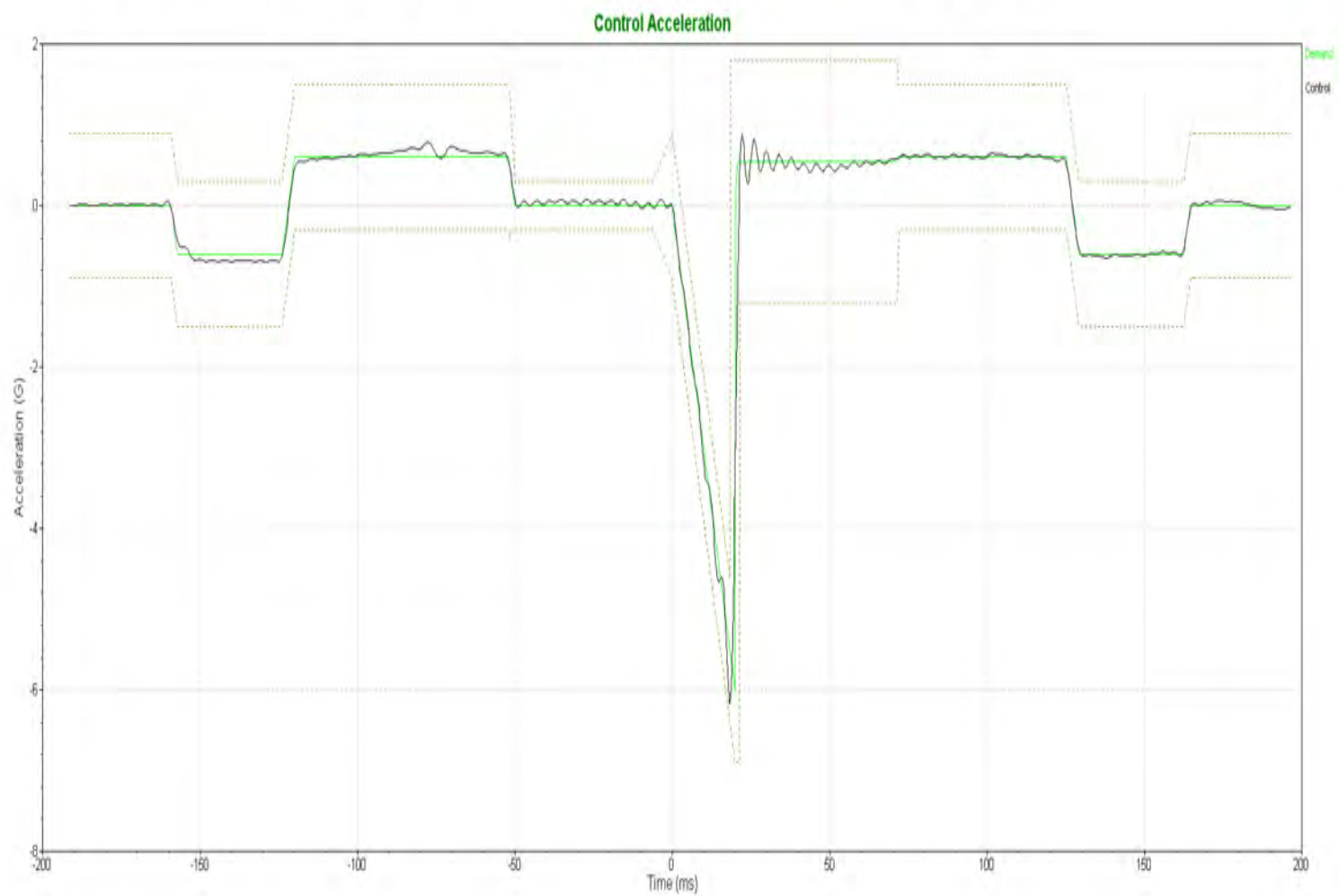
UUT: OSCAR

Jan 29, 2026 11:28:37

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 10

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

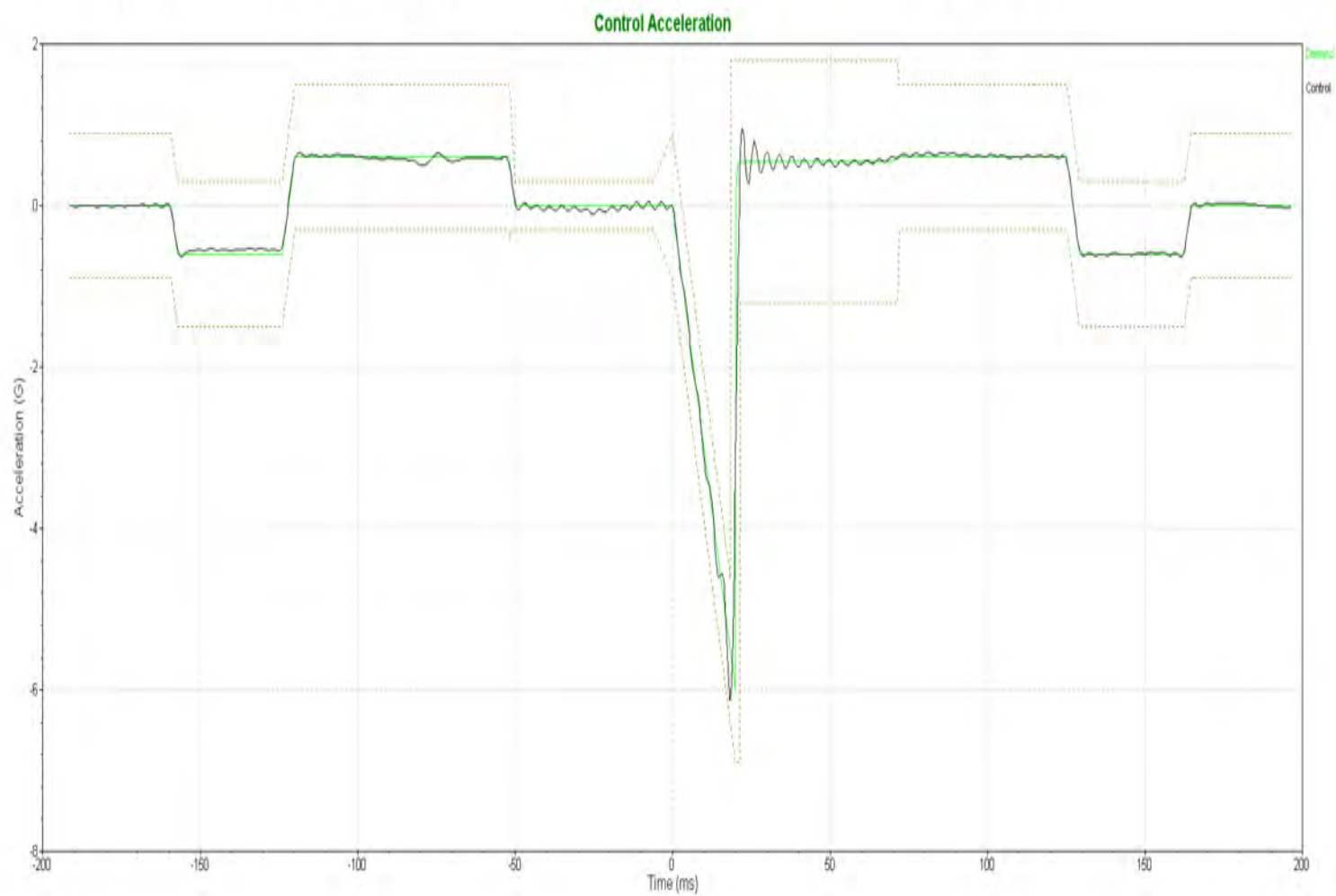
UUT: OSCAR

Jan 29, 2026 11:28:37

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 10

Customer: Shotover Systems

Test Axis: Y

Pulse polarity: Negative

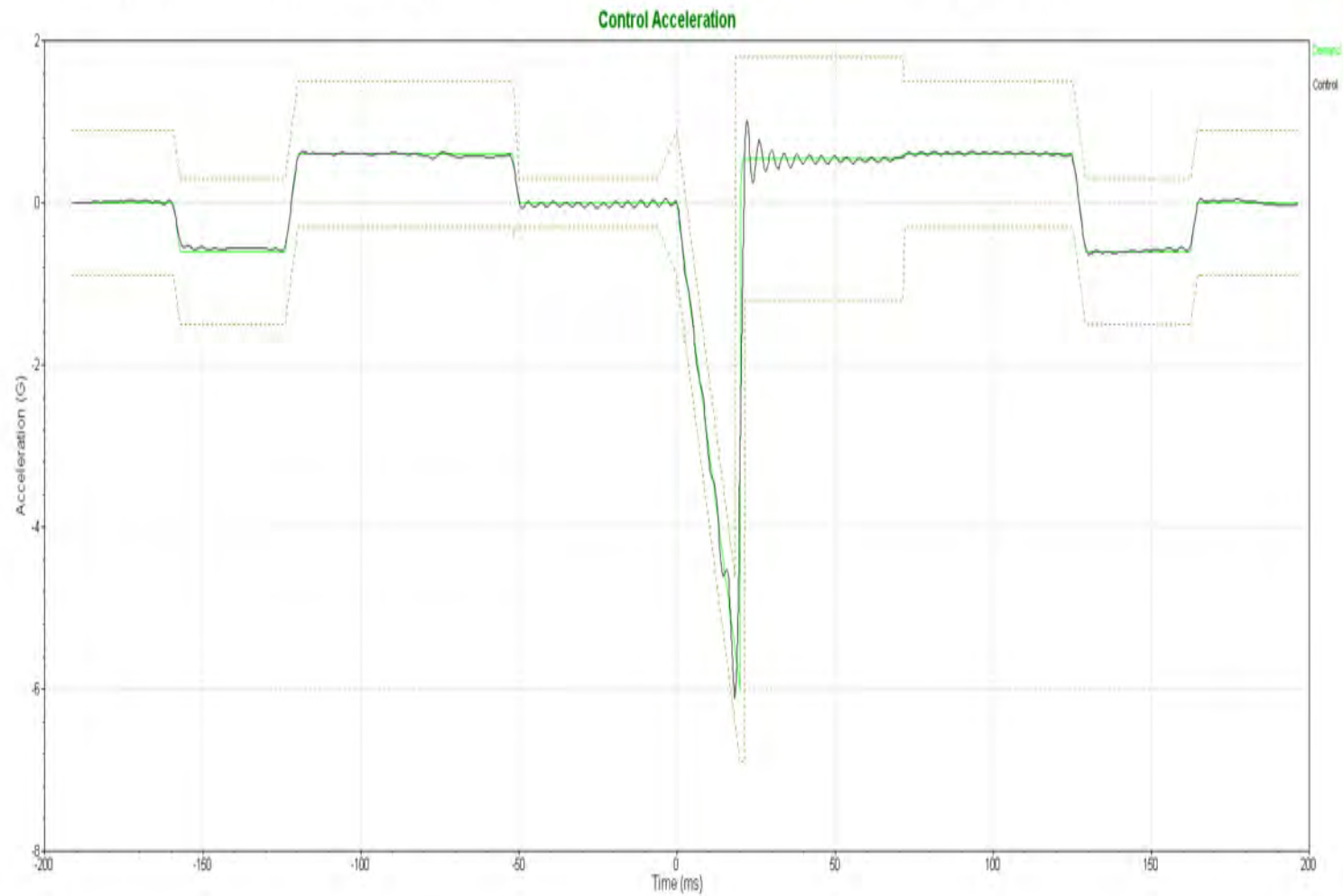
UUT: OSCAR

Jan 29, 2026 11:28:37

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 11

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Positive

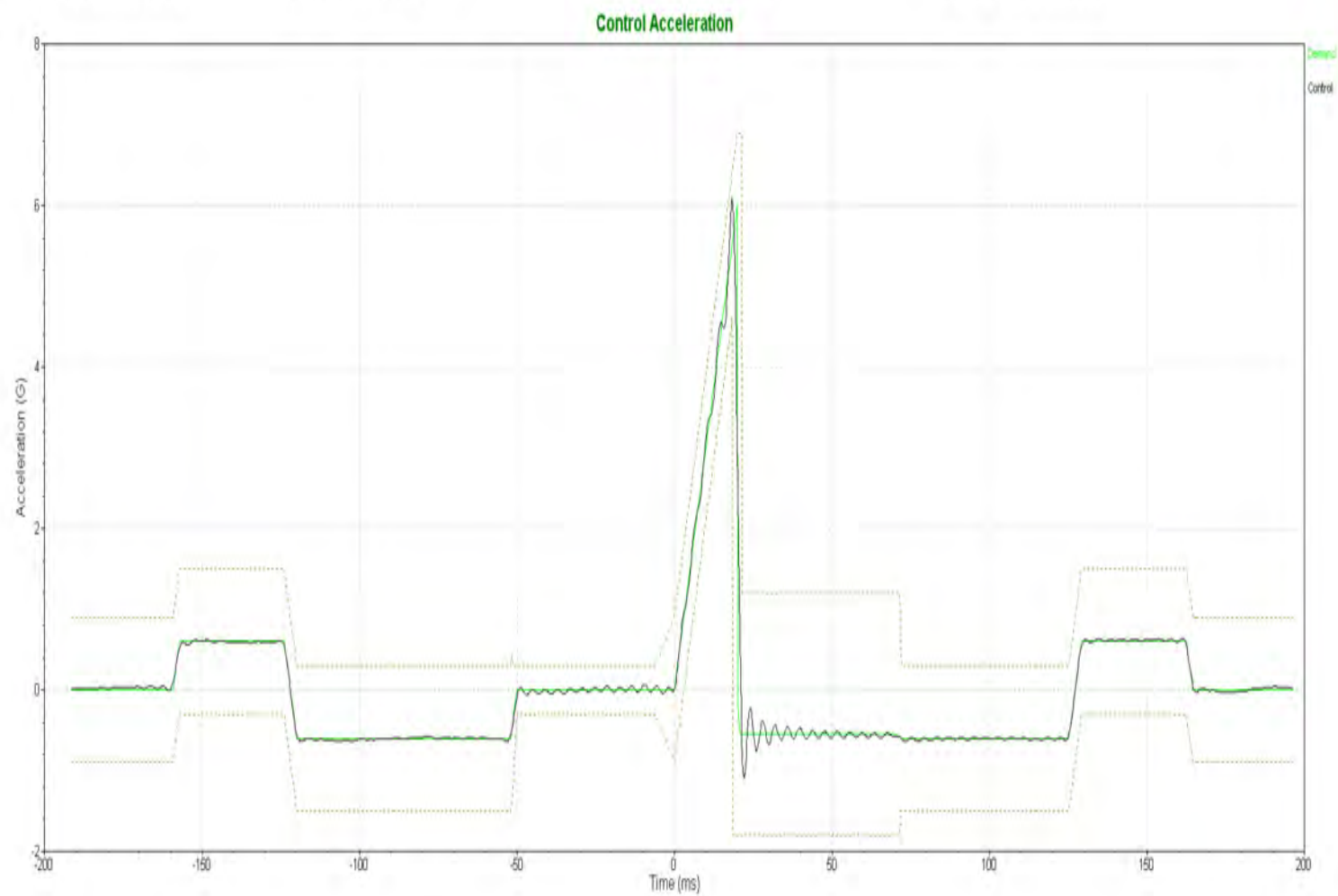
UUT: OSCAR

Jan 29, 2026 11:44:31

Pulse remaining: 2

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 11

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Positive

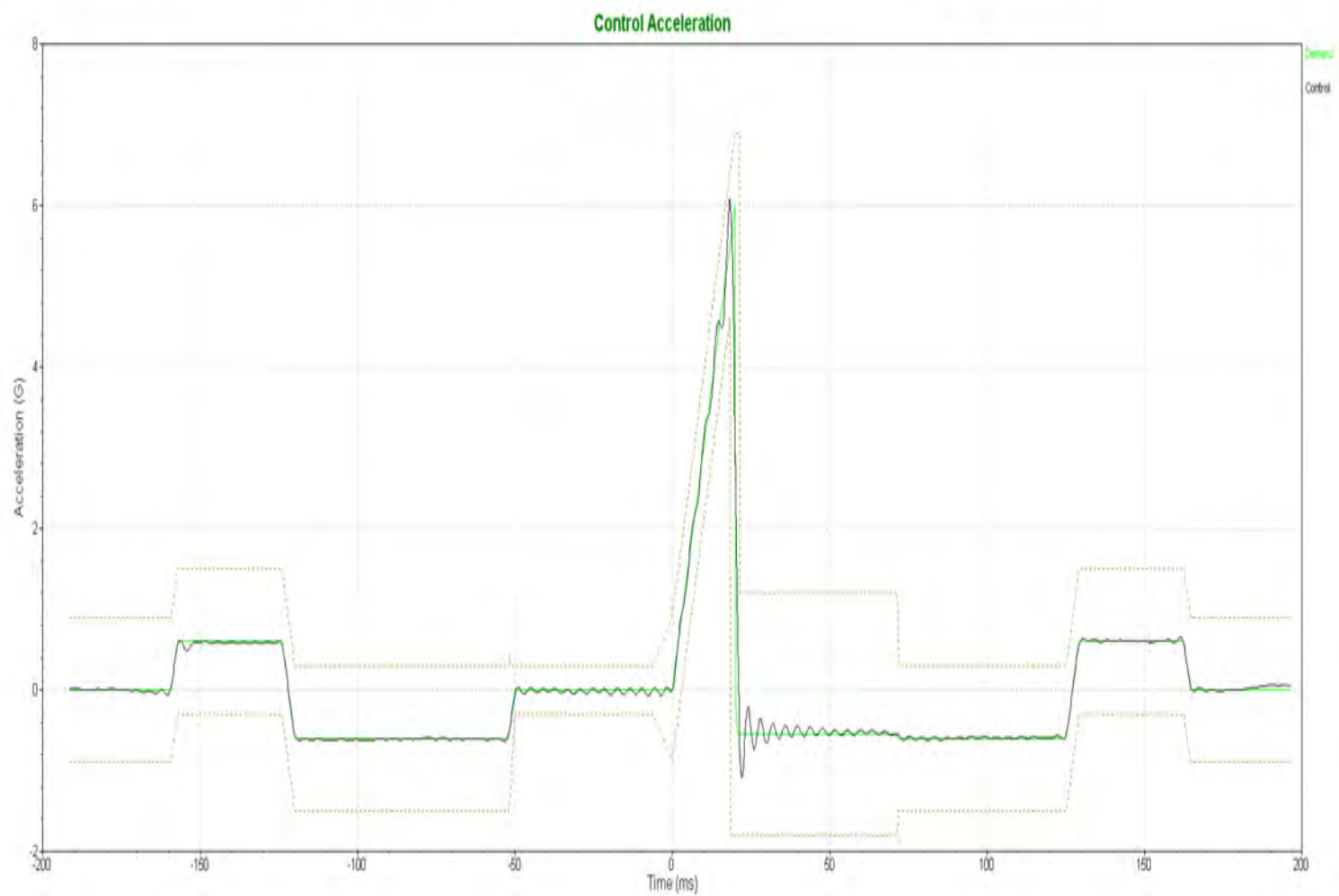
UUT: OSCAR

Jan 29, 2026 11:44:31

Pulse remaining: 1

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 11

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Positive

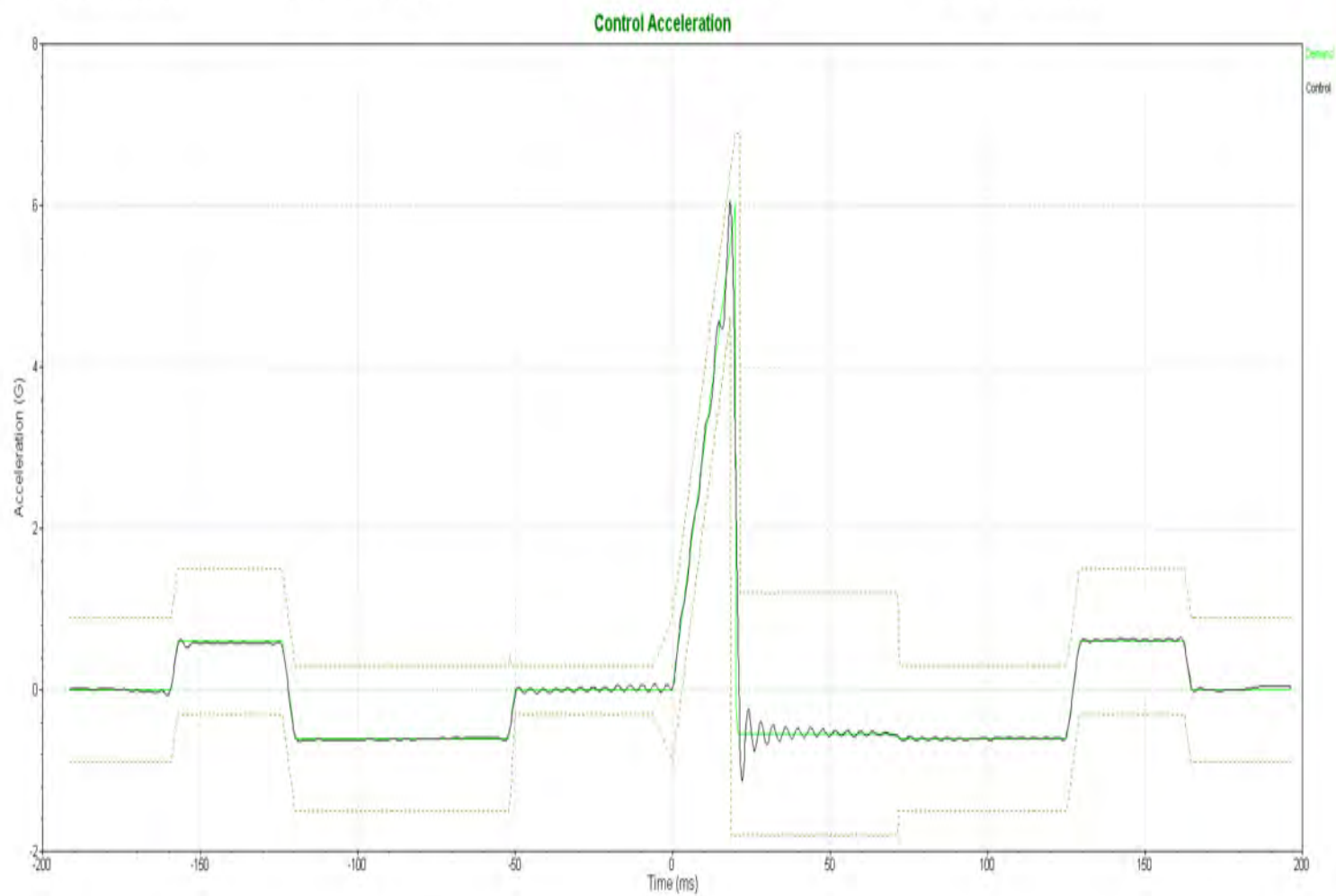
UUT: OSCAR

Jan 29, 2026 11:44:31

Pulse remaining: 0

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 12

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Negative

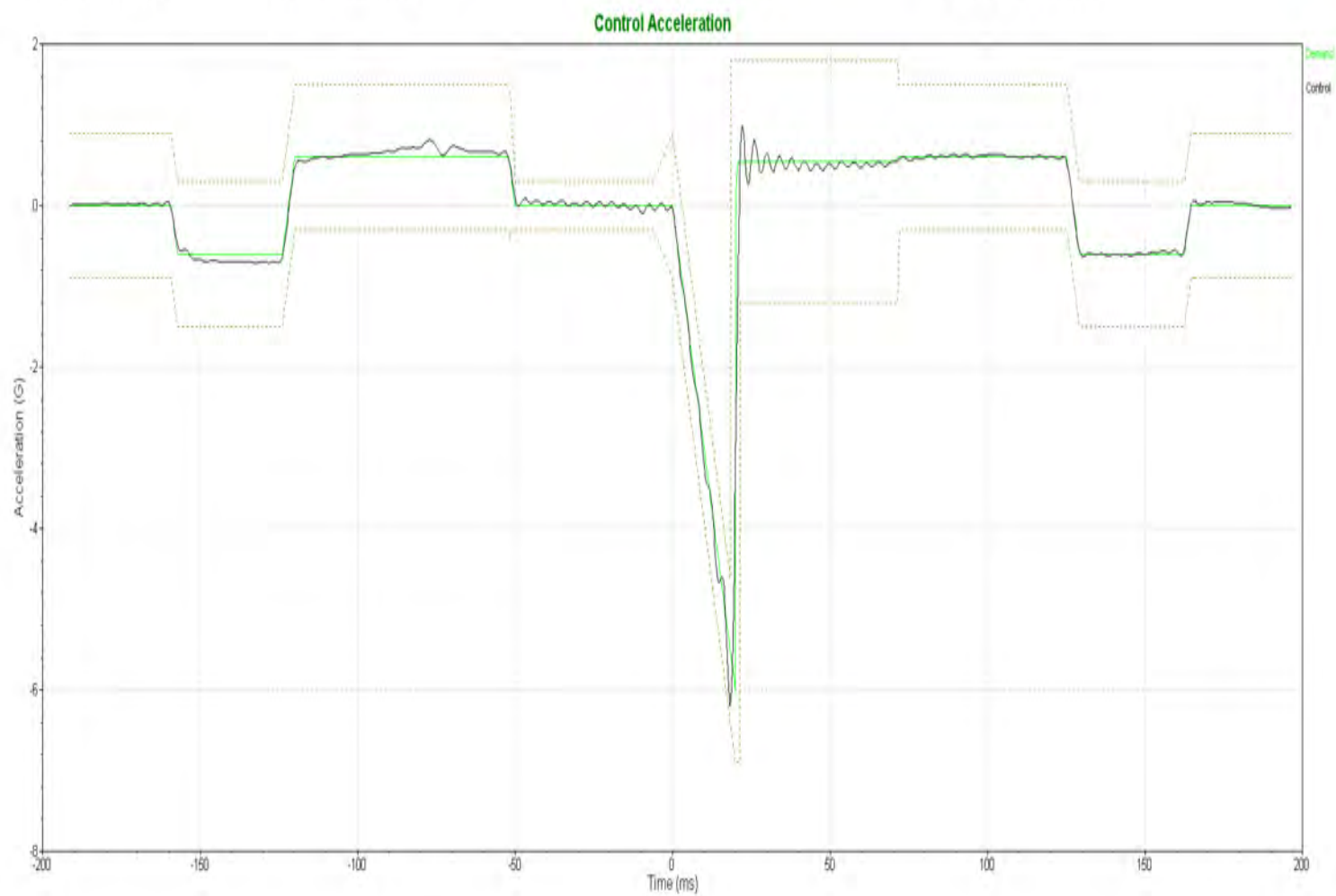
UUT: OSCAR

Jan 29, 2026 11:44:54

Pulse remaining: 2

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 12

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Negative

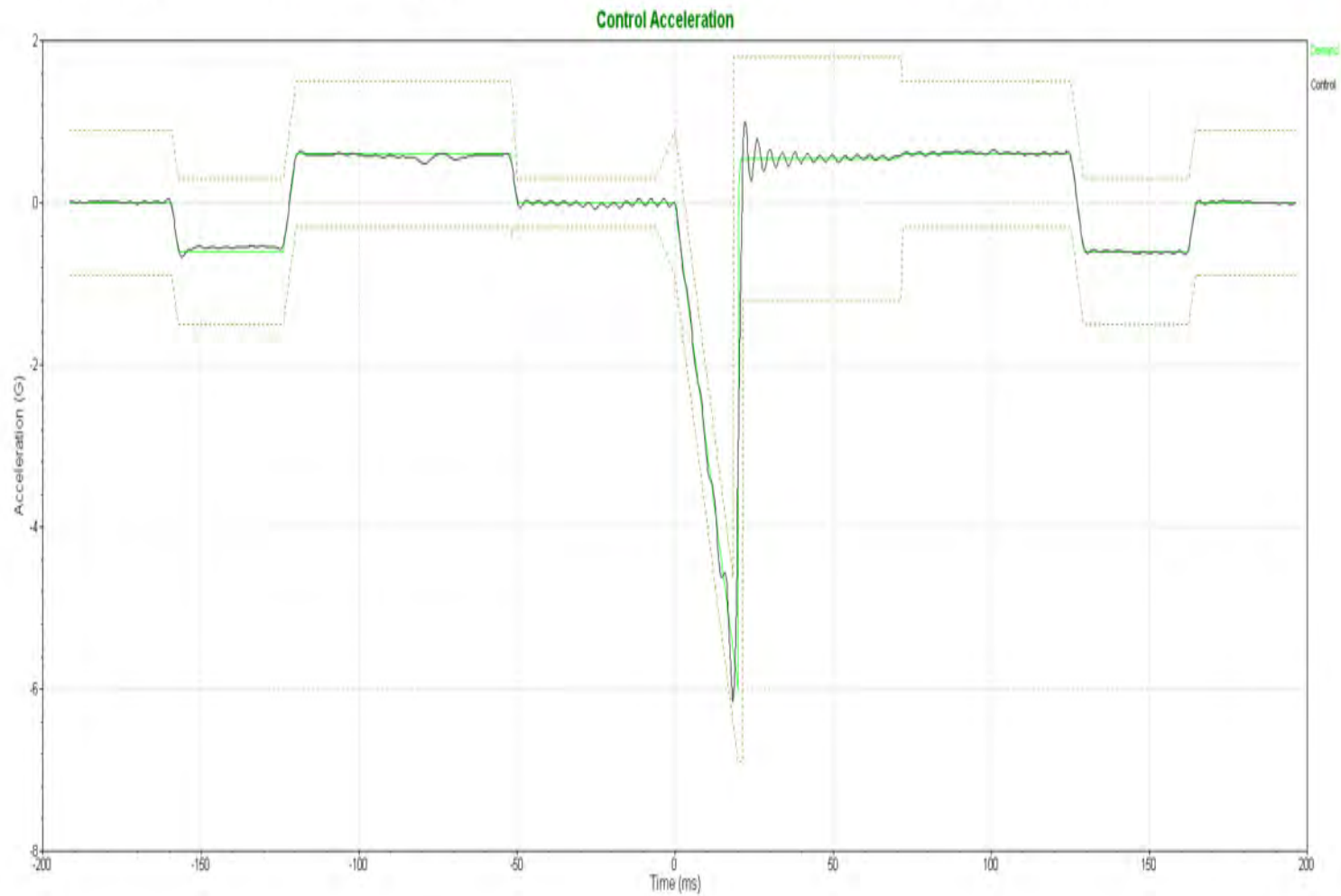
UUT: OSCAR

Jan 29, 2026 11:44:54

Pulse remaining: 1

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 12

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Negative

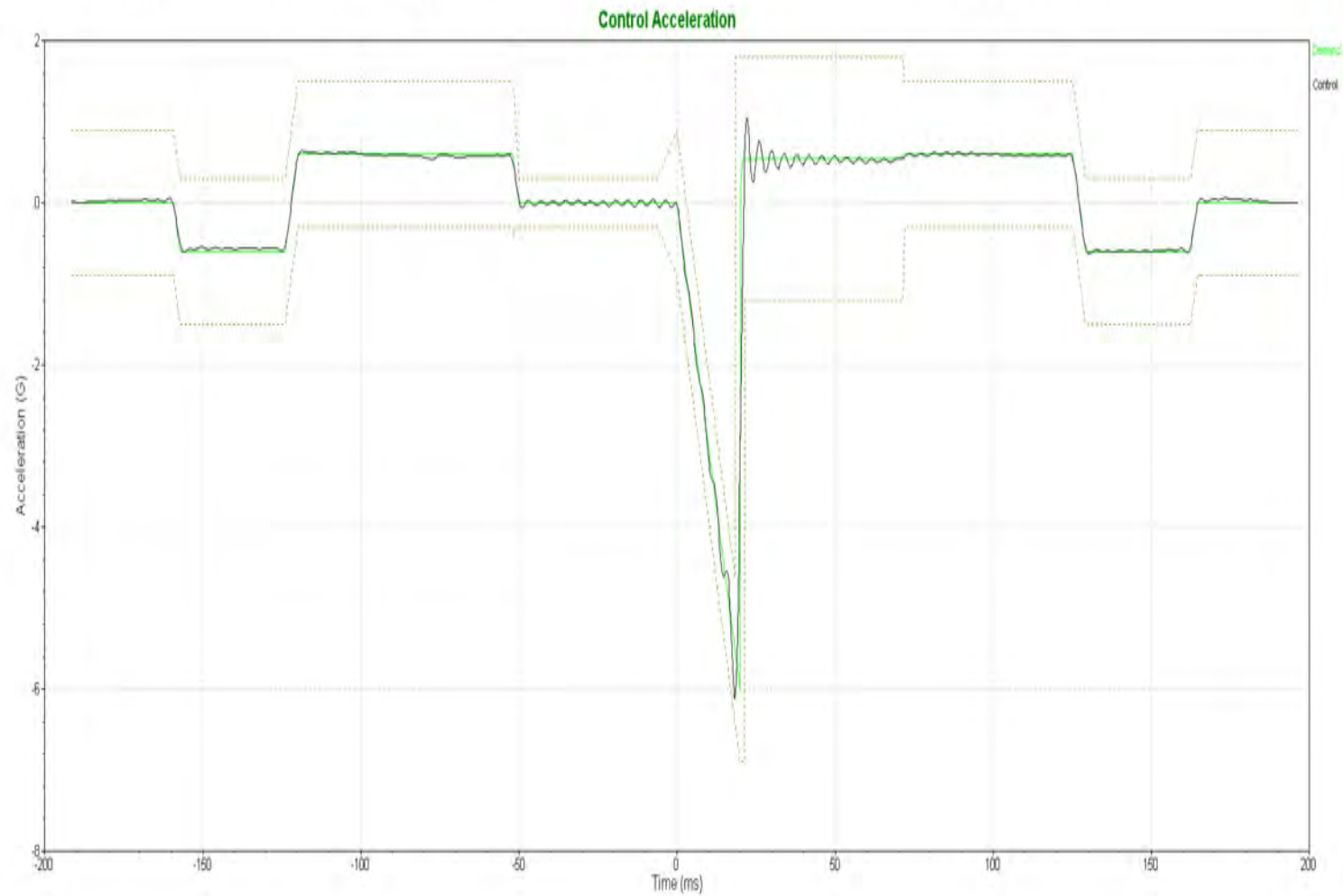
UUT: OSCAR

Jan 29, 2026 11:44:54

Pulse remaining: 0

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 13

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Positive

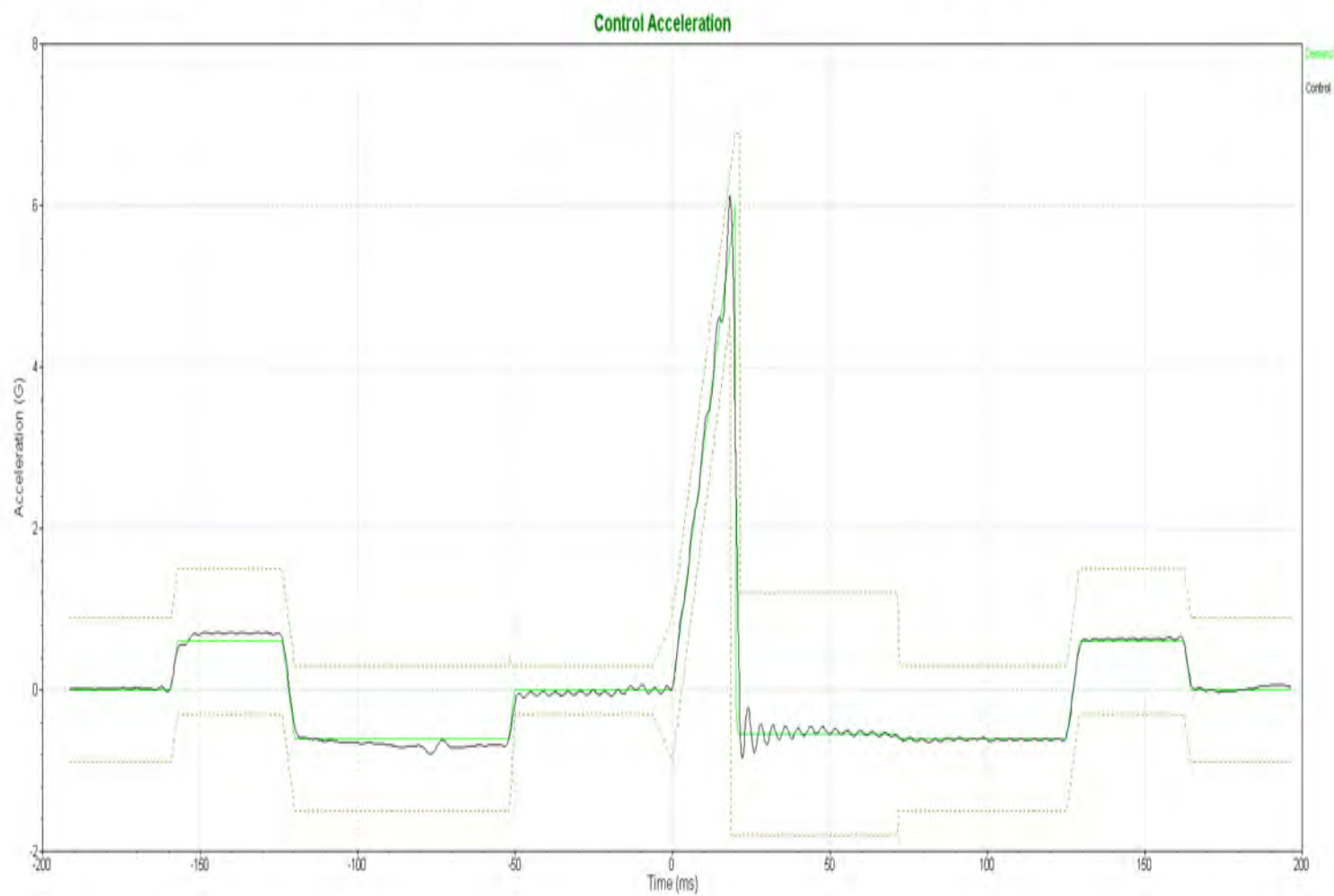
UUT: OSCAR

Jan 29, 2026 12:01:25

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 13

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Positive

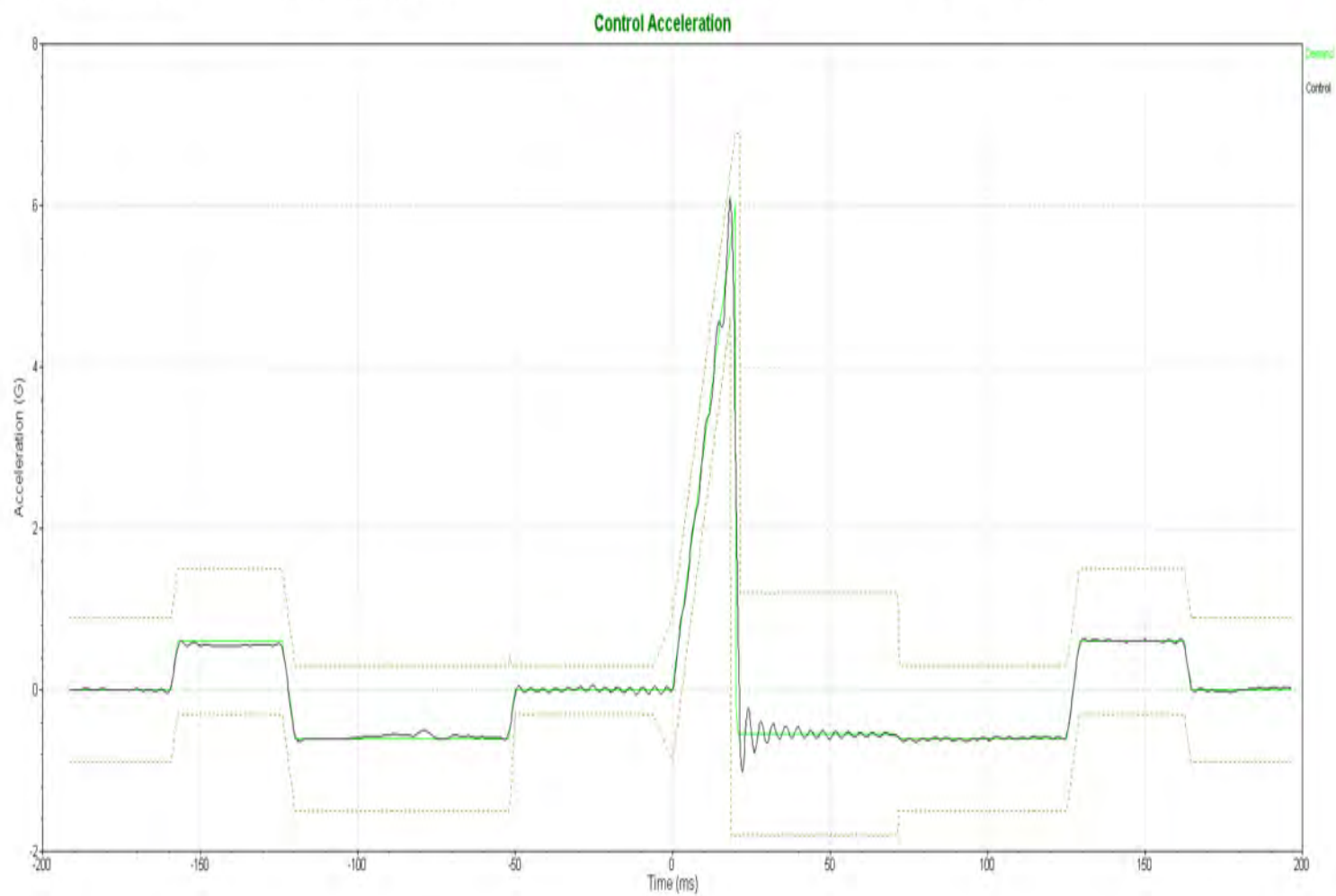
UUT: OSCAR

Jan 29, 2026 12:01:25

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 13

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Positive

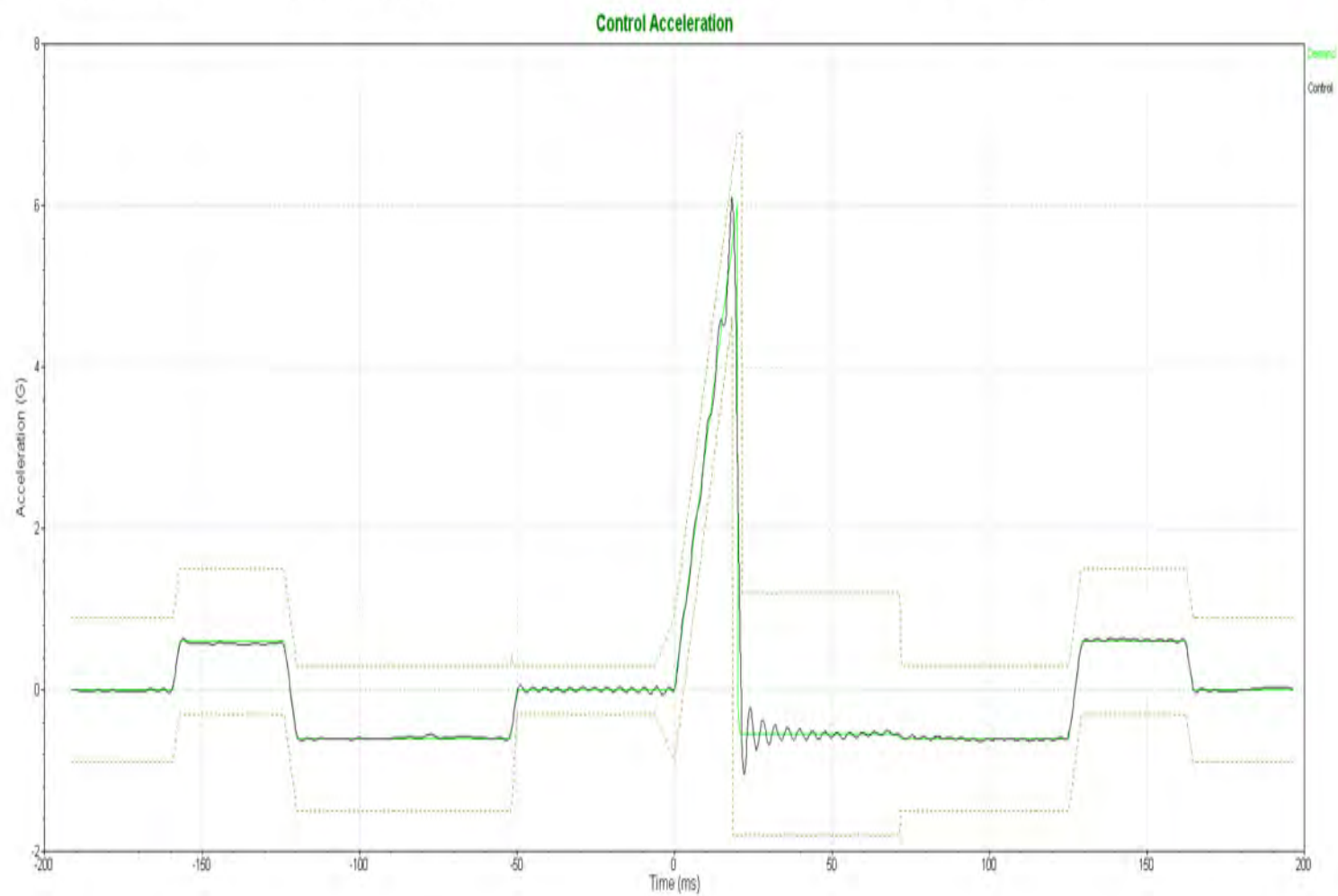
UUT: OSCAR

Jan 29, 2026 12:01:25

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 14

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Negative

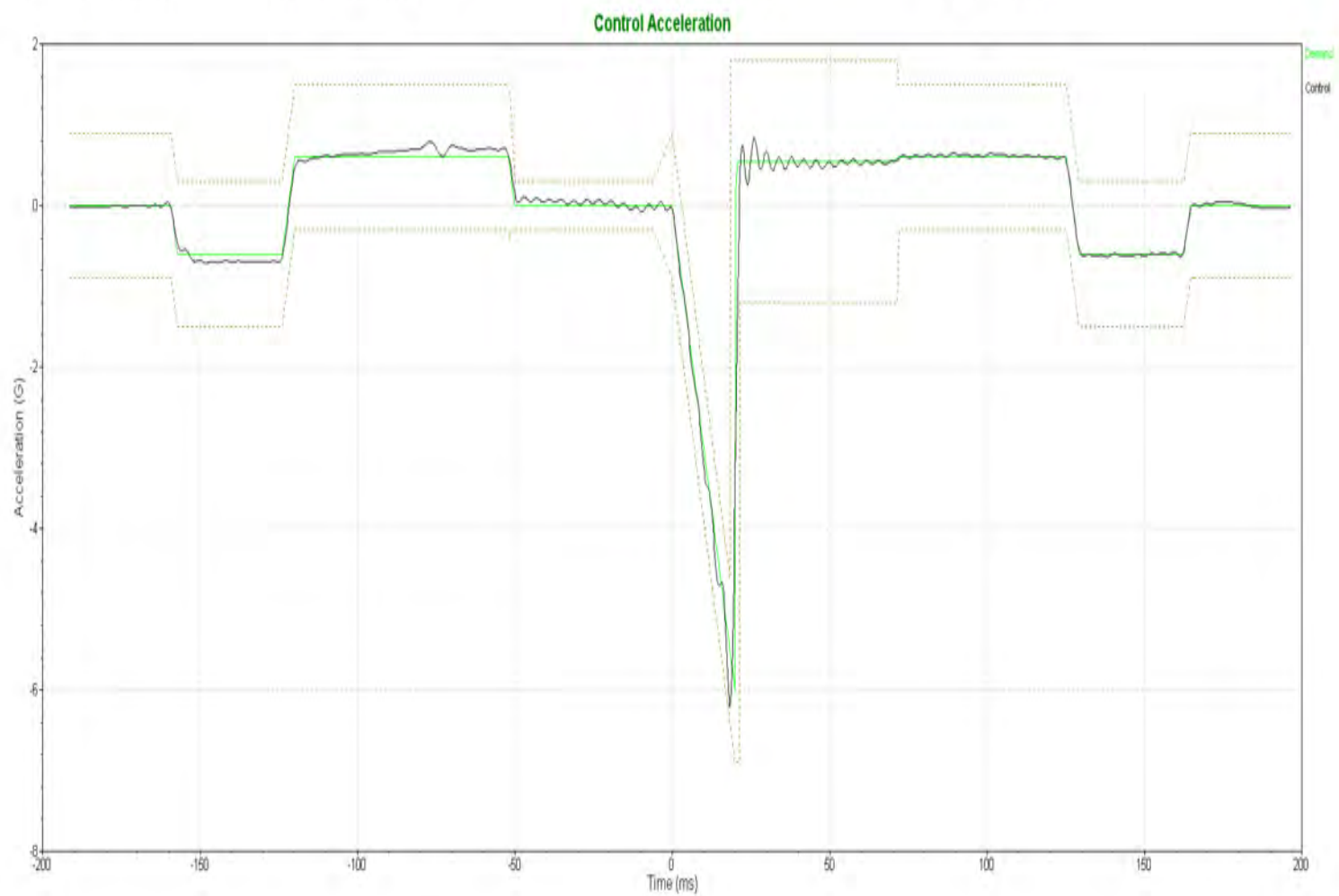
UUT: OSCAR

Jan 29, 2026 12:01:44

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 14

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Negative

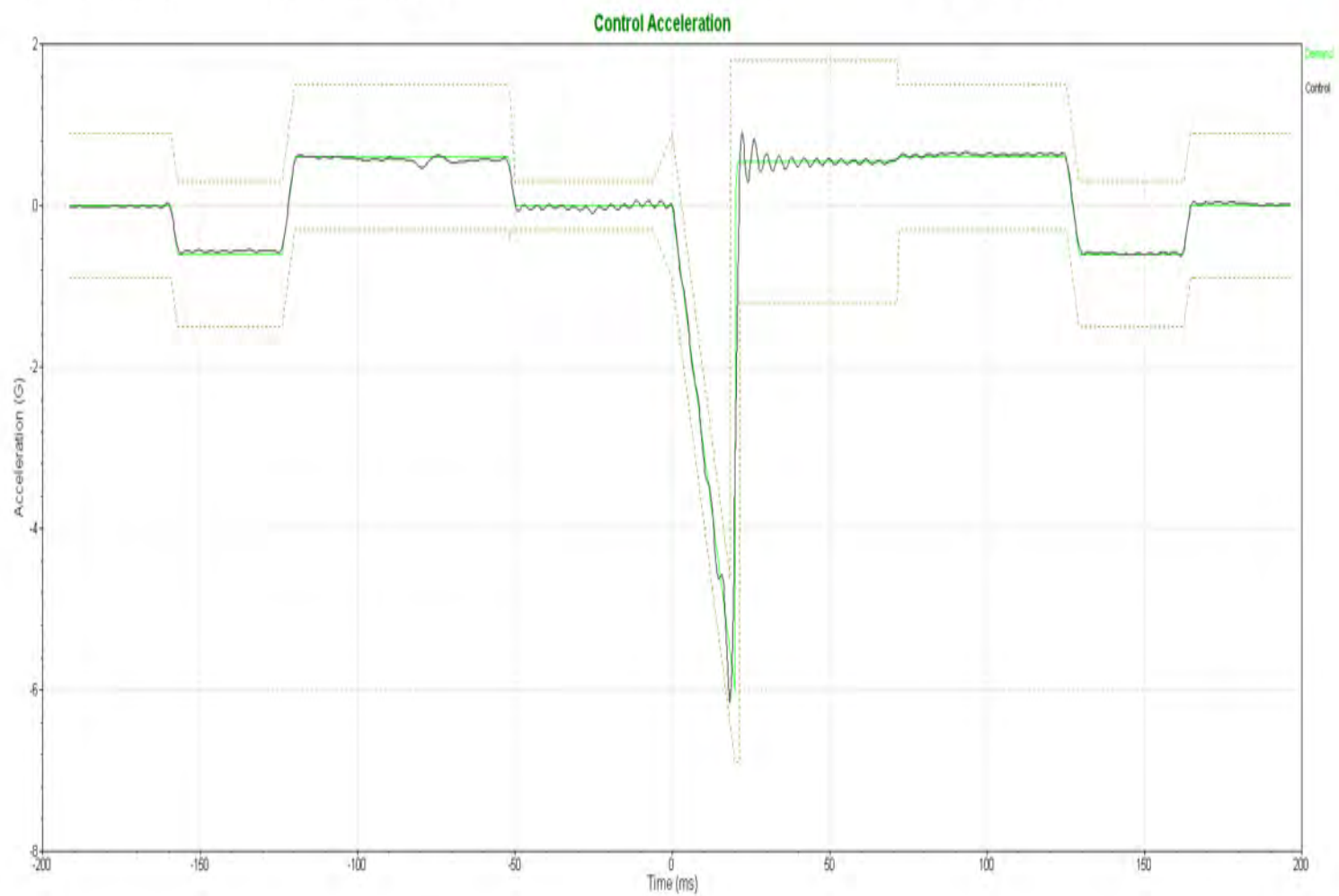
UUT: OSCAR

Jan 29, 2026 12:01:44

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 14

Customer: Shotover Systems

Test Axis: X

Pulse polarity: Negative

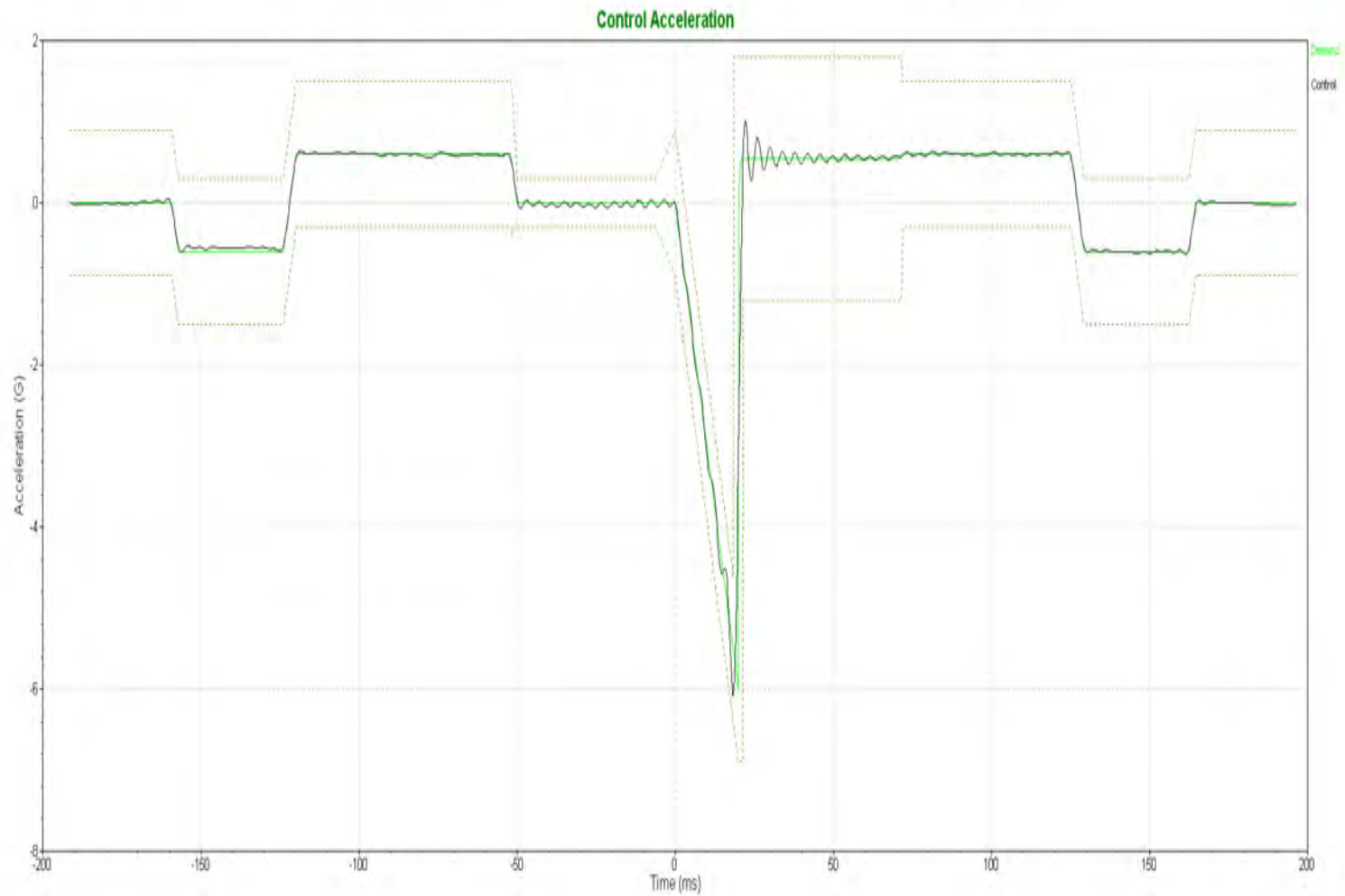
UUT: OSCAR

Jan 29, 2026 12:01:44

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 15

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Positive

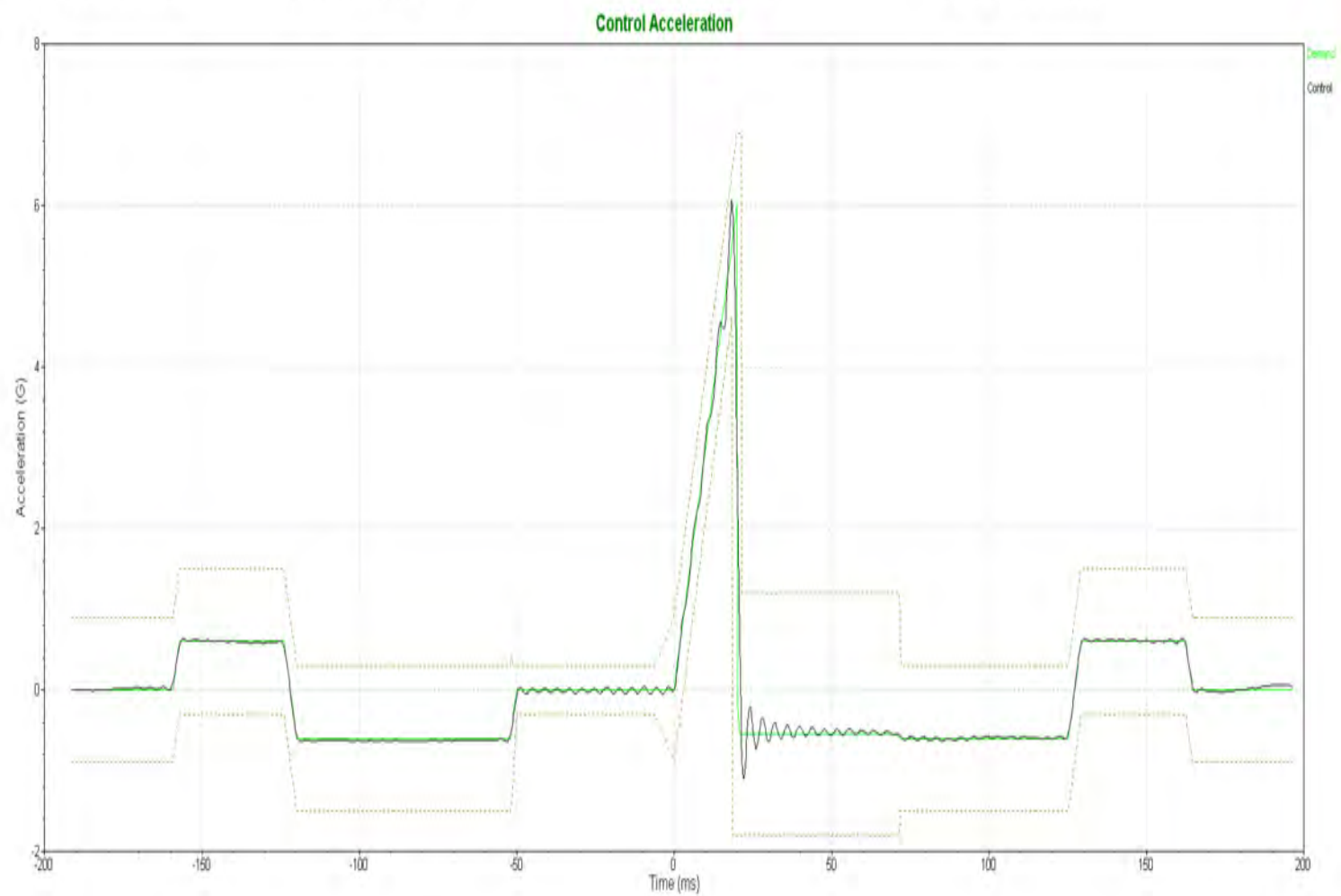
UUT: OSCAR

Jan 29, 2026 13:01:47

Pulse remaining: 2

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 15

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Positive

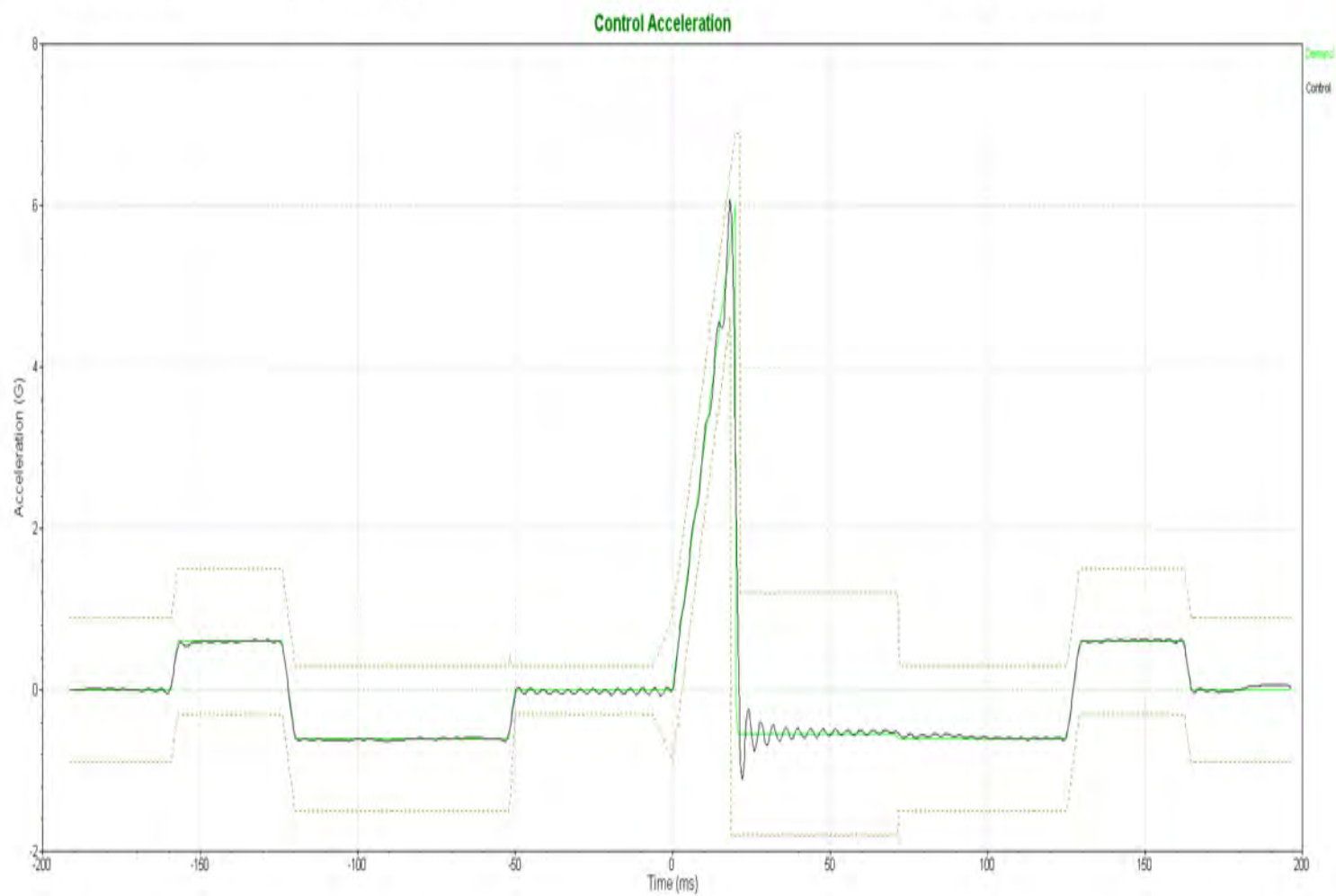
UUT: OSCAR

Jan 29, 2026 13:01:47

Pulse remaining: 1

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 15

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Positive

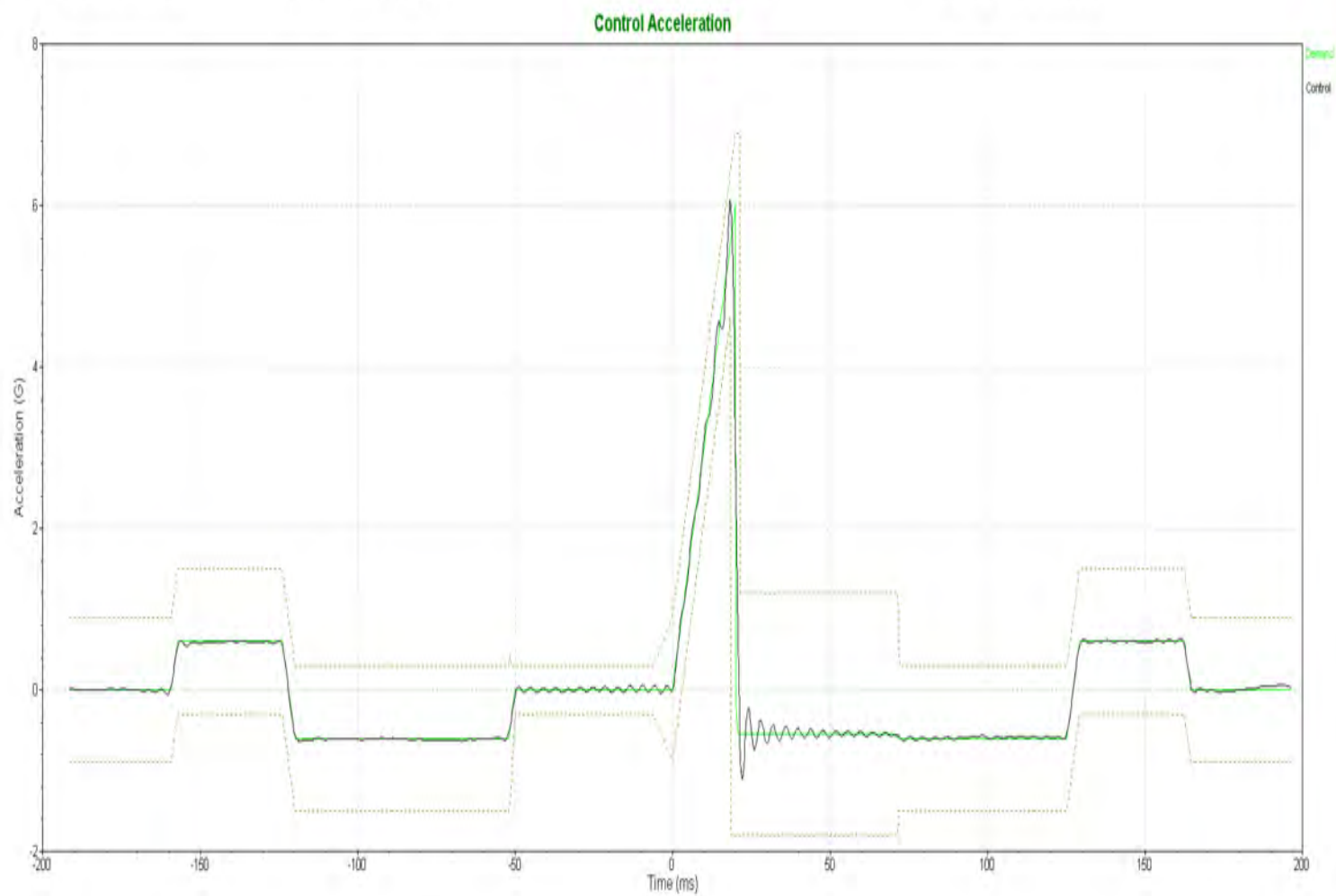
UUT: OSCAR

Jan 29, 2026 13:01:47

Pulse remaining: 0

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 16

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Negative

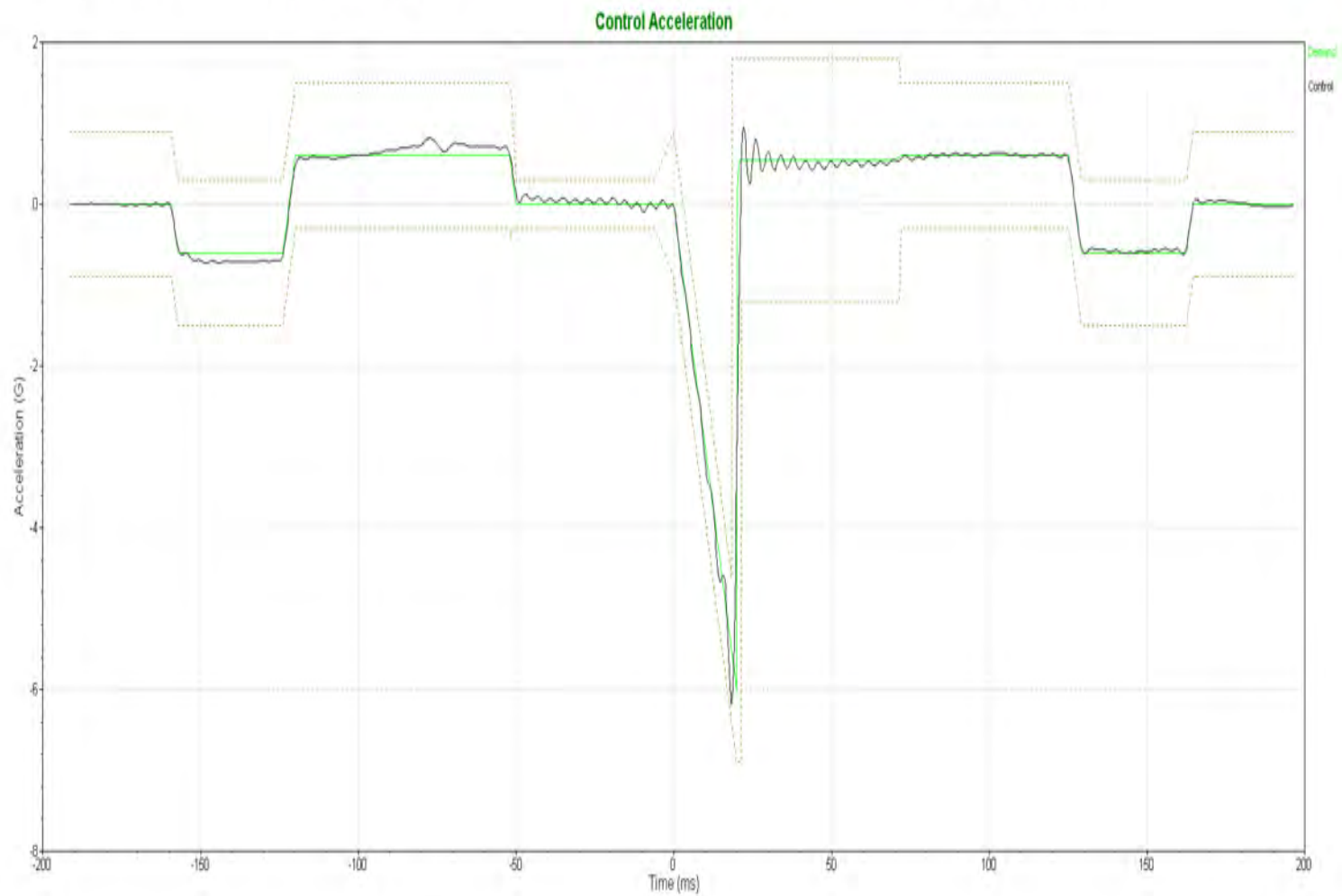
UUT: OSCAR

Jan 29, 2026 13:02:52

Pulse remaining: 2

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 16

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Negative

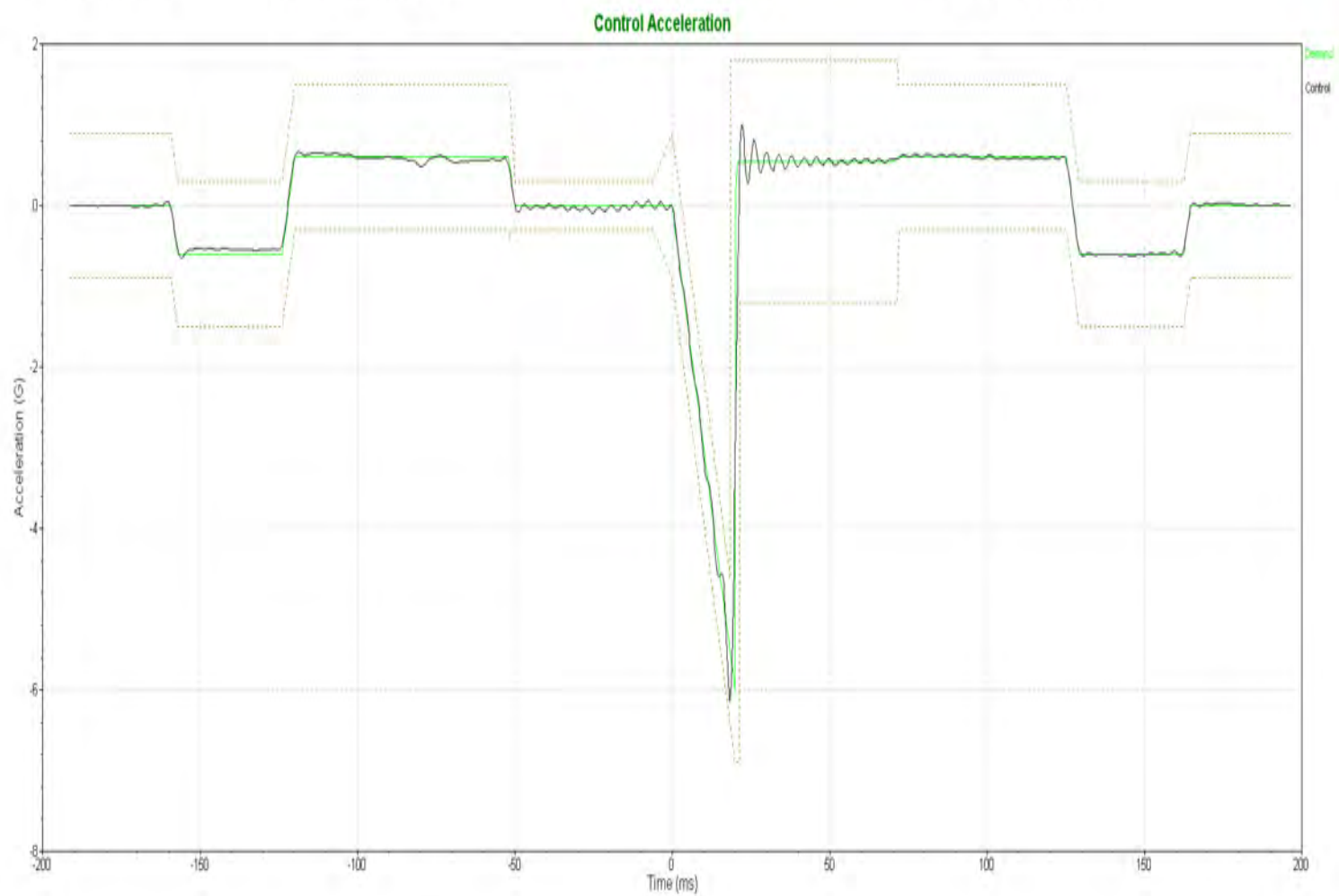
UUT: OSCAR

Jan 29, 2026 13:02:52

Pulse remaining: 1

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 16

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Negative

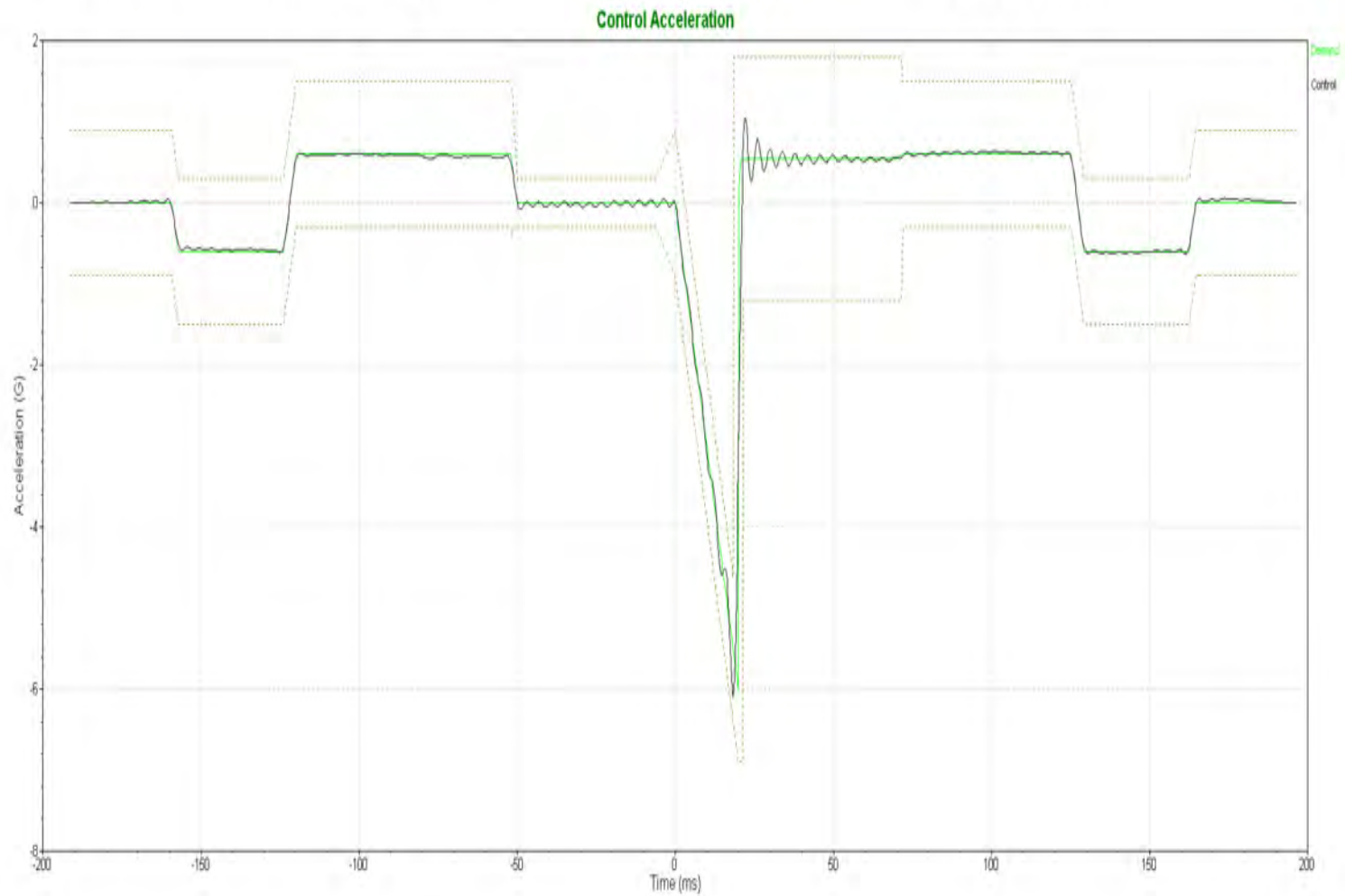
UUT: OSCAR

Jan 29, 2026 13:02:52

Pulse remaining: 0

Pulse width: 20 ms

S/N: Bare Fixture



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 17

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Positive

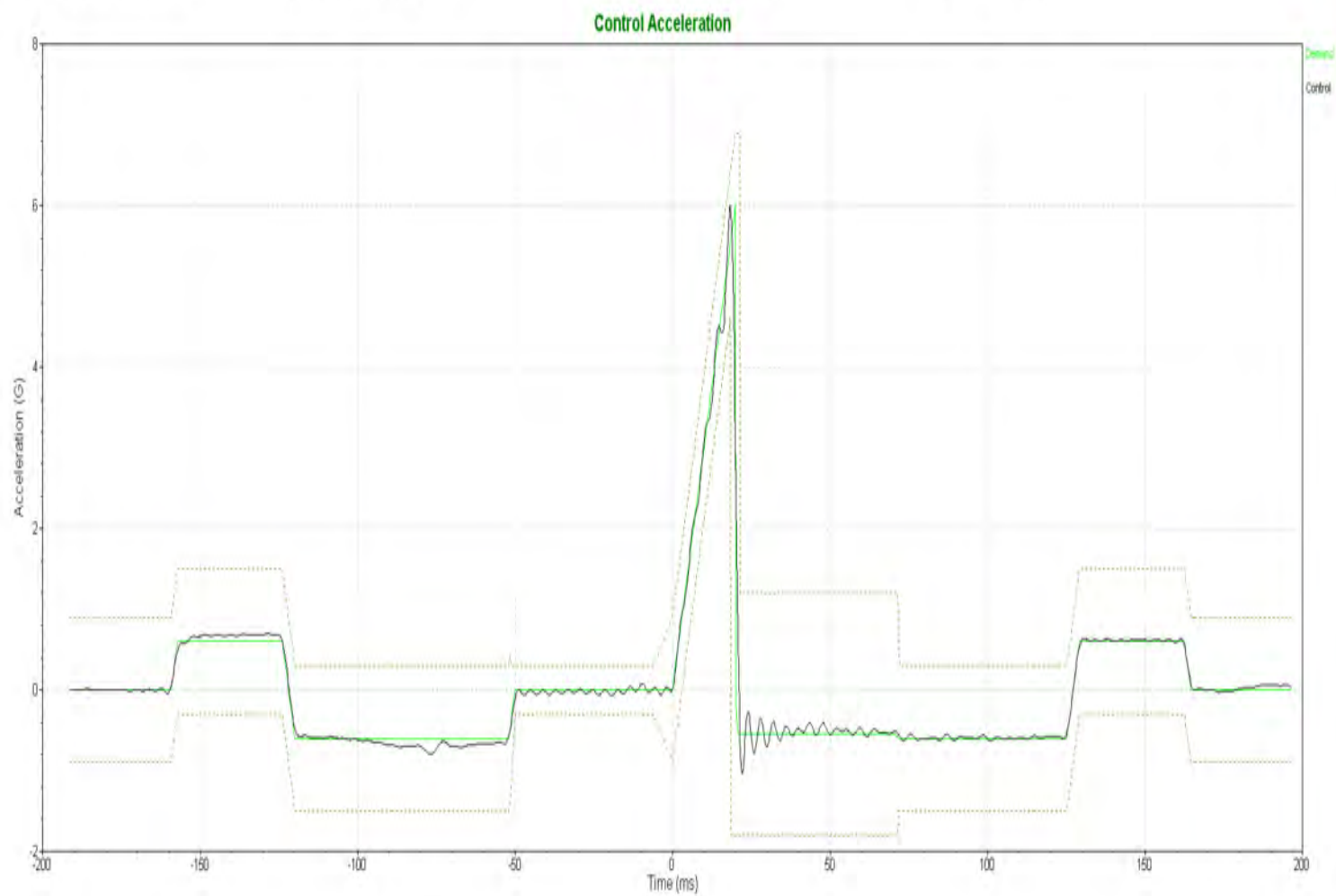
UUT: OSCAR

Jan 29, 2026 13:24:30

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 17

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Positive

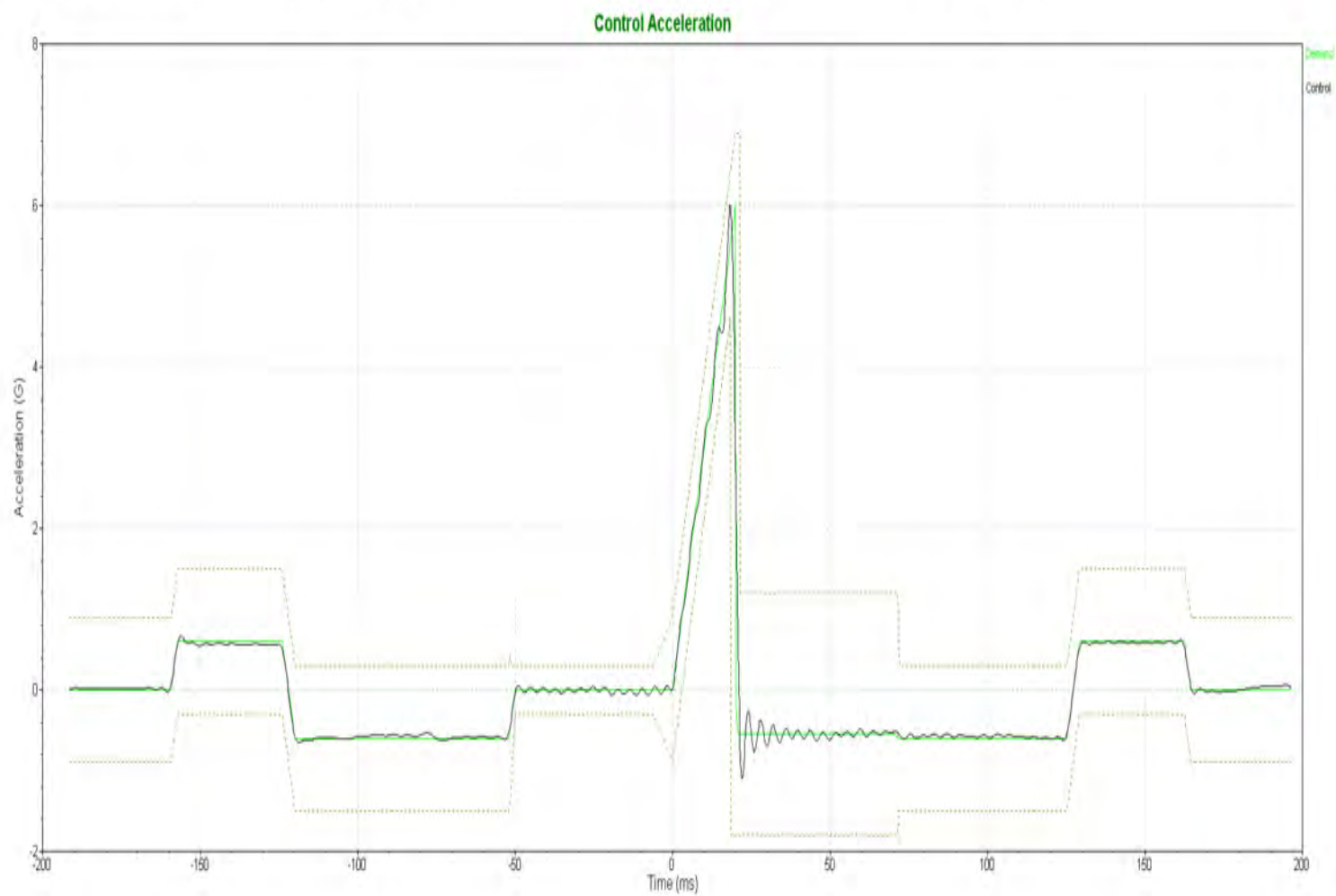
UUT: OSCAR

Jan 29, 2026 13:24:30

Pulse remaining: 1

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 3 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 17

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Positive

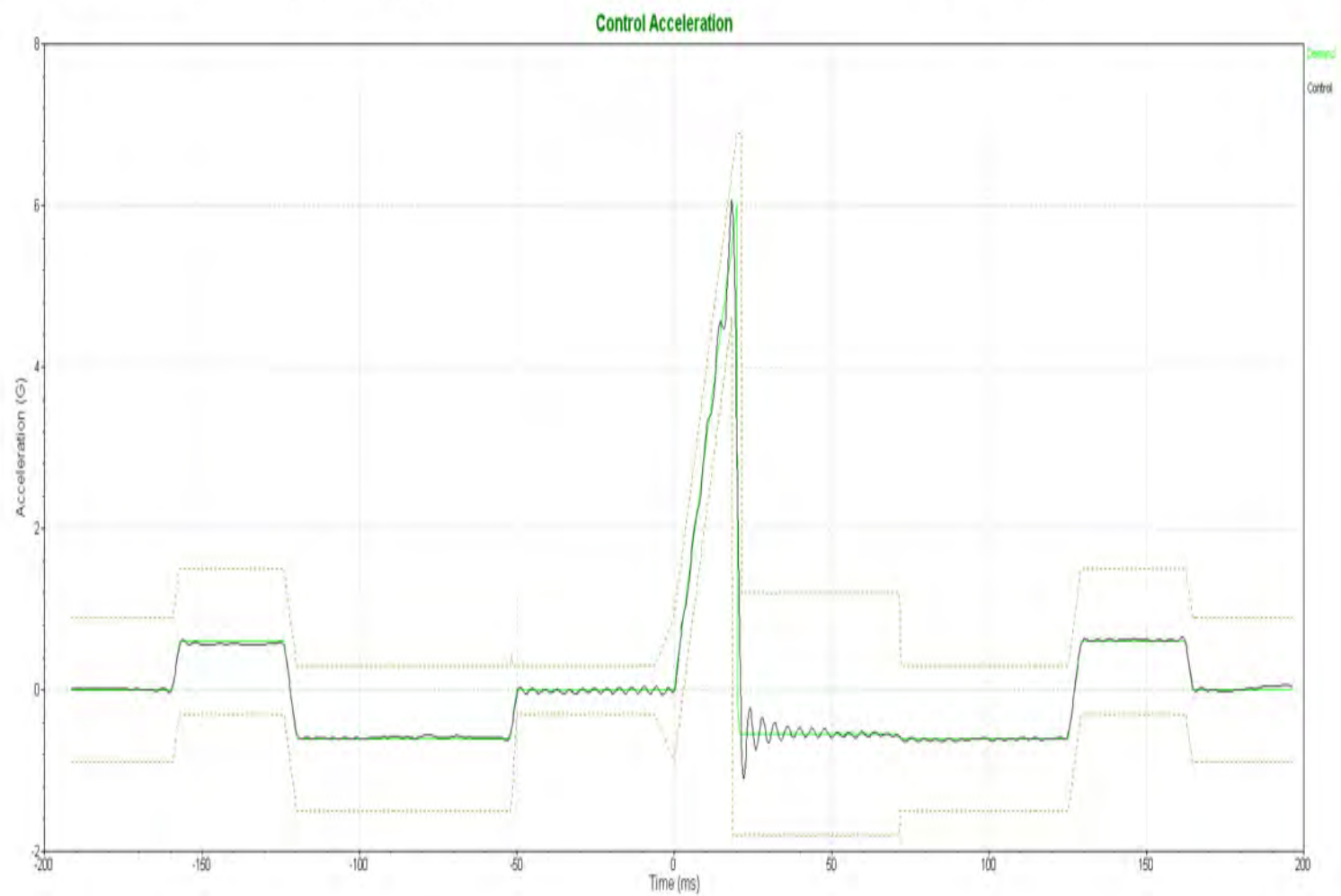
UUT: OSCAR

Jan 29, 2026 13:24:30

Pulse remaining: 0

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 1 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 18

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Negative

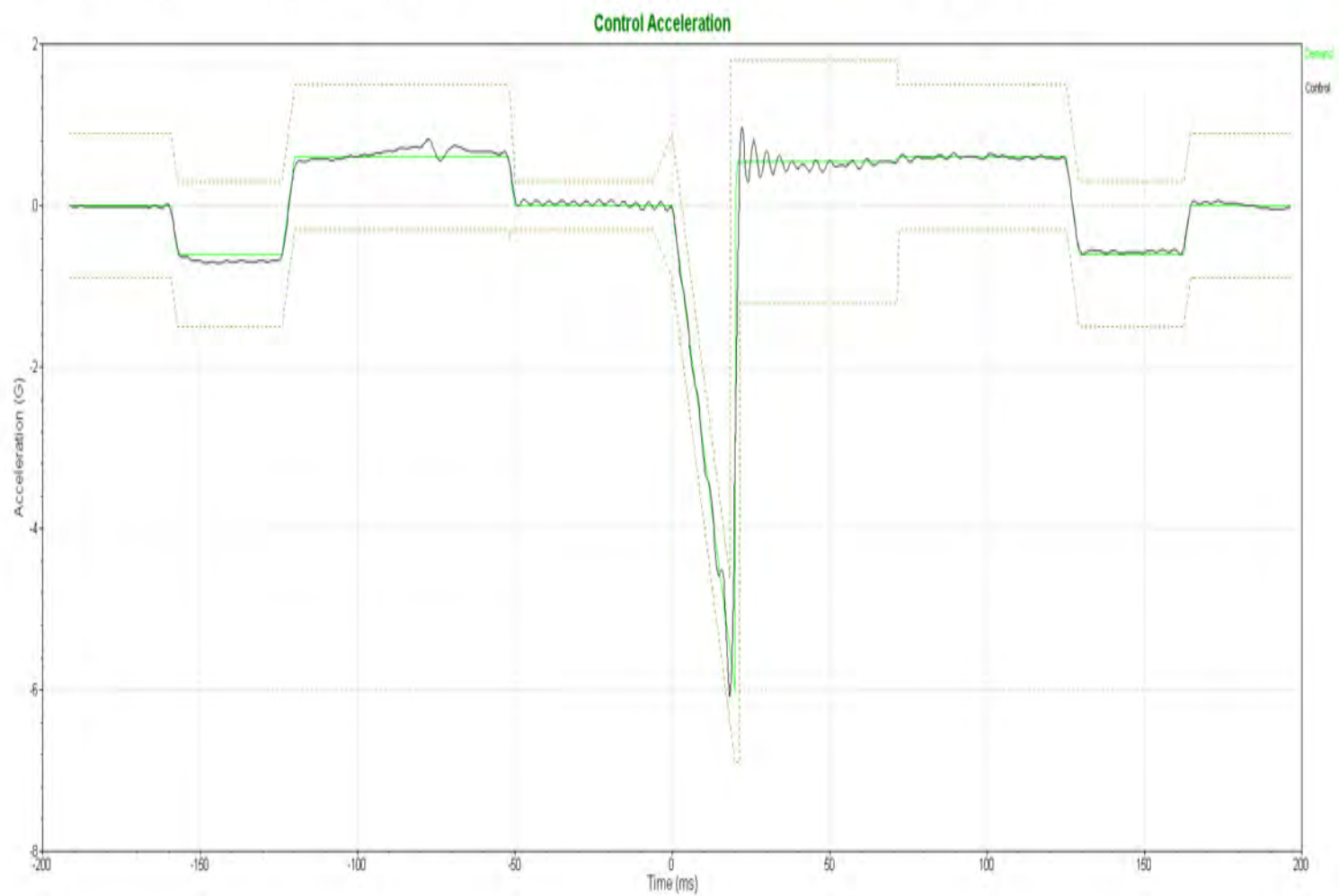
UUT: OSCAR

Jan 29, 2026 13:24:52

Pulse remaining: 2

Pulse width: 20 ms

S/N: 190026



Element-Longmont

Pulse count: 2 of 3

Pulse amplitude: 6 G peak

Project: PR188450 Run 18

Customer: Shotover Systems

Test Axis: Z

Pulse polarity: Negative

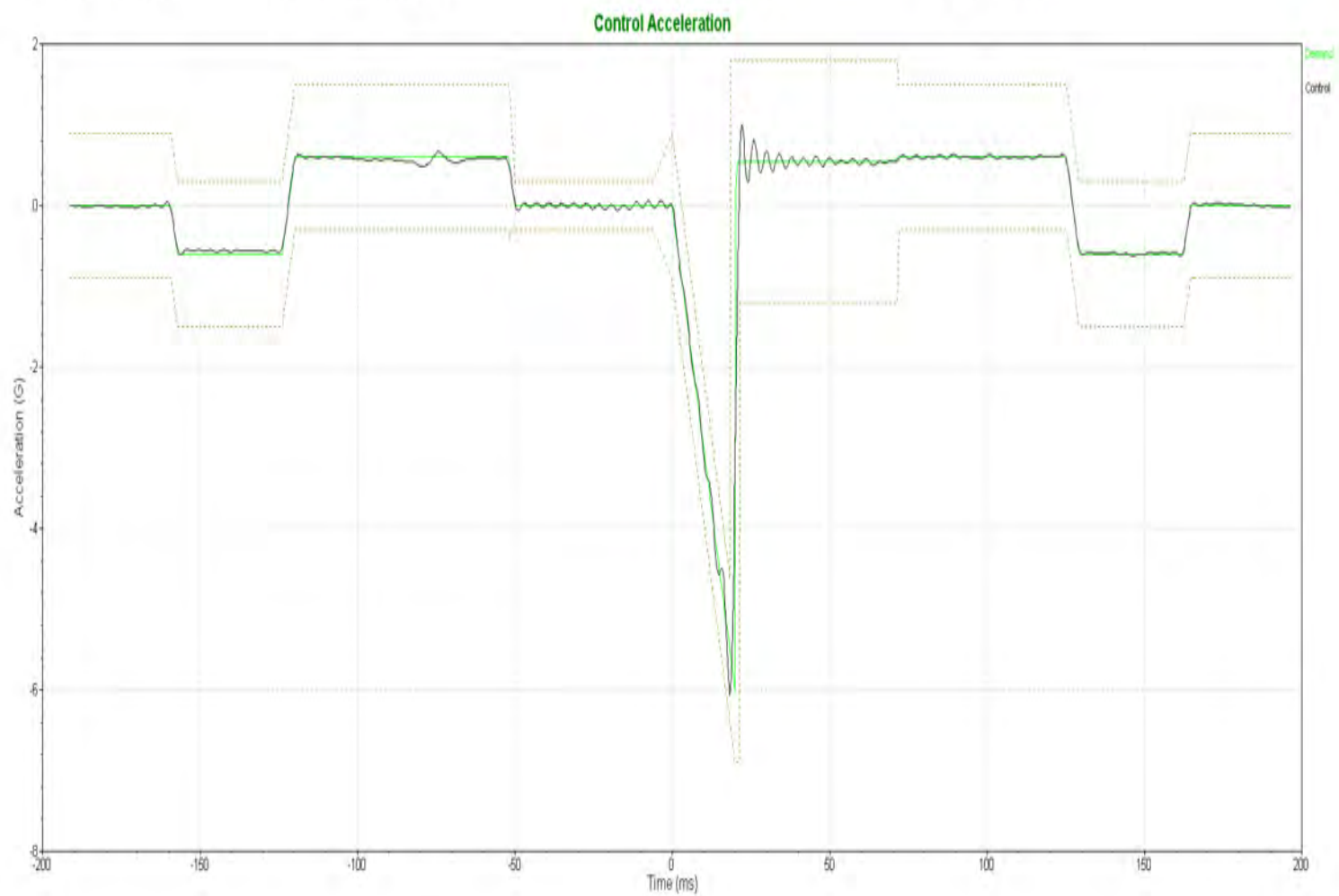
UUT: OSCAR

Jan 29, 2026 13:24:52

Pulse remaining: 1

Pulse width: 20 ms

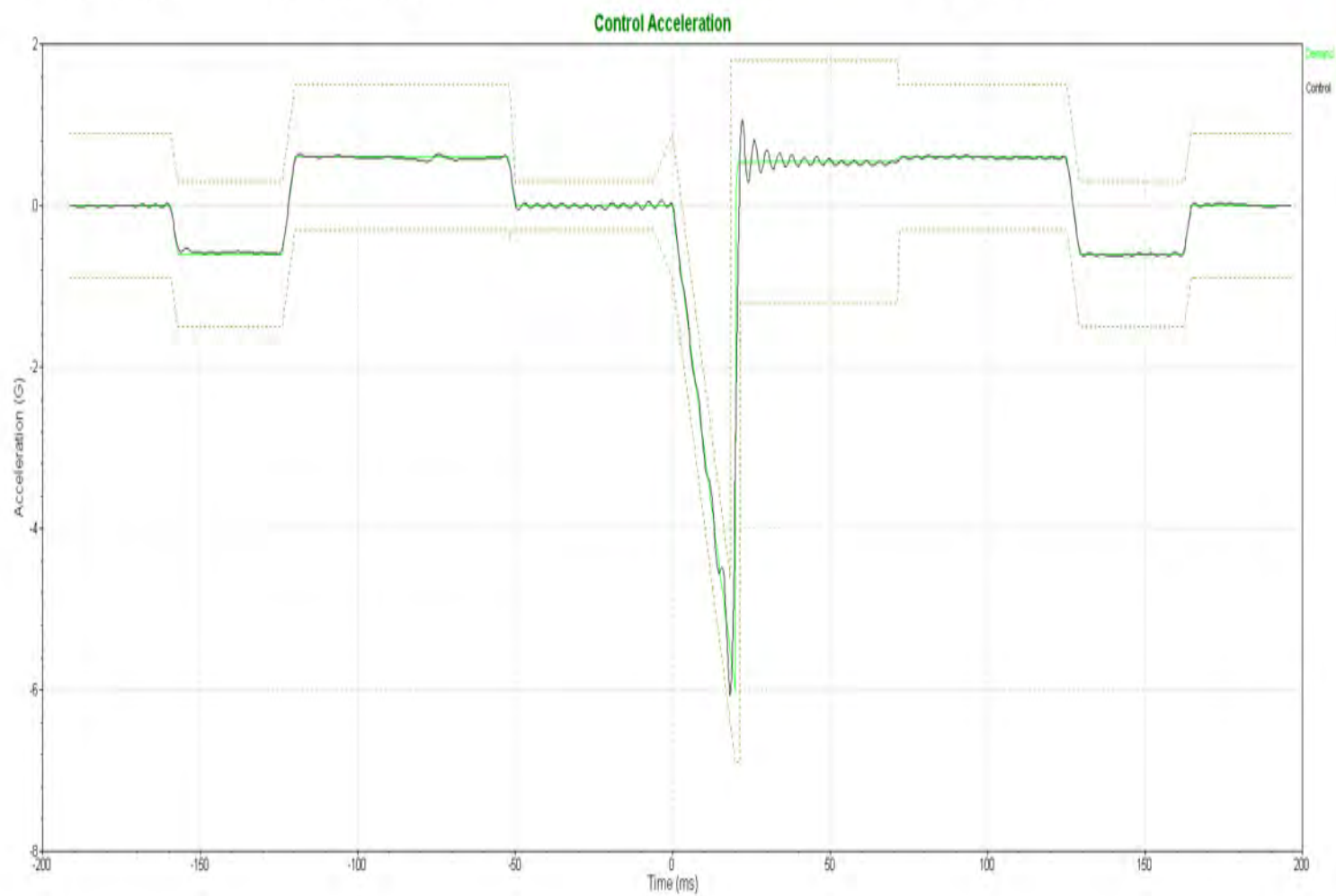
S/N: 190026



Project: PR188450 Run 18

UUT: OSCAR

S/N: 190026



5.5.6 Test Equipment List

Table 5.5-1: Shock Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A084307	Vibration Shaker D516	Dynamic Solution	DS-15400VHI22-70	NCR	NCR
US58-A080917	Accelerometer	Dytran Instruments	3030B5	04/22/2025	04/22/2026
US58-A059867	Triaxial Accelerometer	PCB Piezotronics	356A01	09/26/2024	09/26/2026
US58-A061701	Vibration Controller	Vibration Research	VR9500	03/24/2025	03/24/2026
US58-A080893	Torque Wrench	Snap-on	OD3R150A	06/02/2025	06/02/2026
US58-A070466	Humidity & Temperature Meter	Fluke	971	07/09/2025	07/09/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.6 Crash Safety - Impulse

5.6.1 Test Procedure

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 7.0, Category E

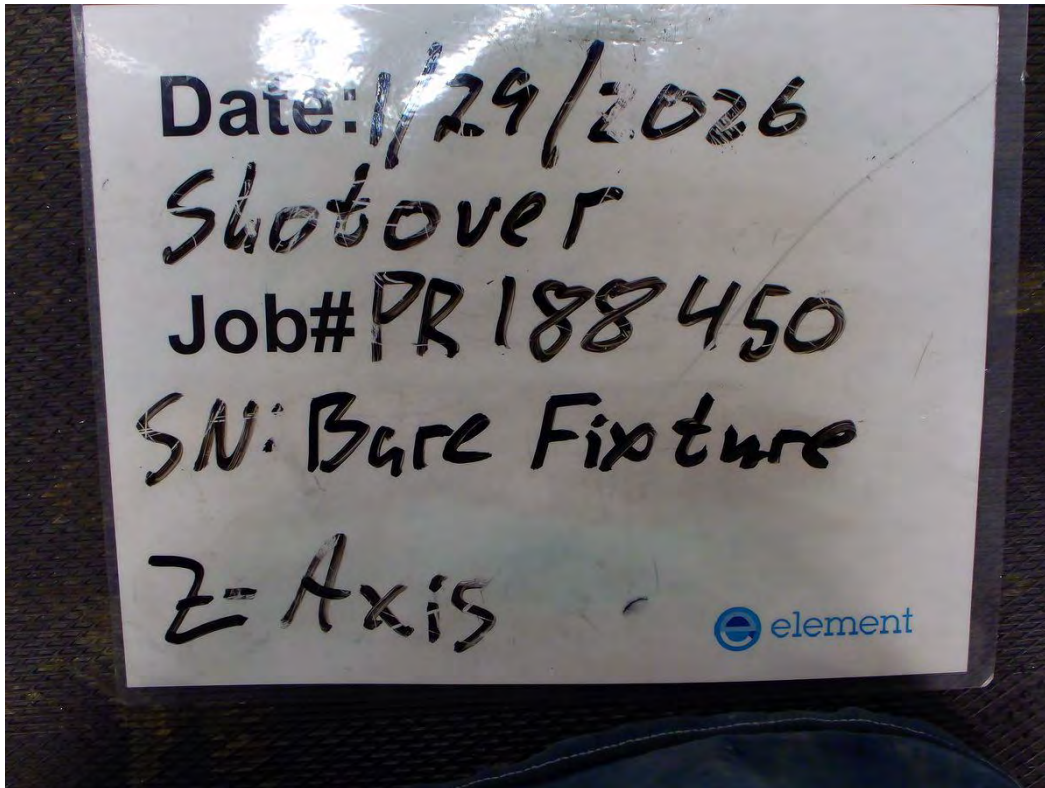
5.6.2 Test Result

The EUT's results will be determined by SHOTOVER Systems.

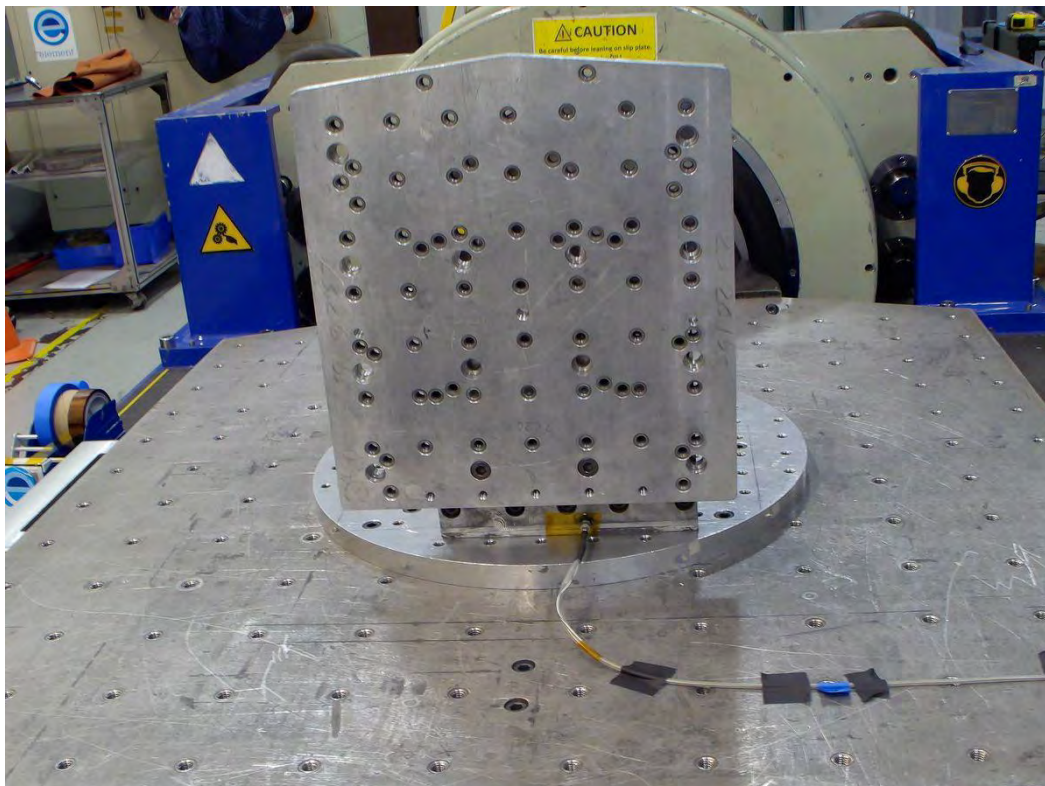
5.6.3 Test Datasheets

DYNAMICS TEST LOG						
Start Date:	1/29/2026	End Date:	1/29/2026	Job No:	PR188450	
Customer:	Shotover System			Test Engineer:	Flynn Nyman	
Customer Witness:	Ken Haan			Lab Temp & Humidity:	67.6F, 15%	
Part Name:	OSCAR			Part Number:	012-0031	
Test Specification:	US211-9001-Rev0.1, OSCAR Environmental Test Plan - DO-160 Testing			Serial number:	190020	
Test Performed:	20G 20 mS terminal peak shock.					
Date	Time	Axis	Plot No.	Remarks	Initials	
1/29/2026	1335	Z		Fixture attached to DS16 slip plate. Starting with Z-axis bare fixture.	FN	
	1345	Z	Run 1	Ran 20 G 20 mS terminal peak shock 3 times in positive direction.	FN	
	1345	Z	Run 2	Ran 20 G 20 mS terminal peak shock 3 times in positive negative.	FN	
	1350	Z		Customer mounted UUT SN: 190020 to fixture for Z-axis crash safety testing.	FN	
	1359	Z	Run 3	Ran 20 G 20 mS terminal peak shock 3 times in positive direction.	FN	
	1400	Z	Run 4	Ran 20 G 20 mS terminal peak shock 3 times in positive negative.	FN	
	1410	X		Unit removed and bracket fixture removed for horizontal testing.	FN	
	420	X		Control accel placed for X-axis bare fixture.	FN	
	1424	X	Run 5	Ran 20 G 20 mS terminal peak shock 3 times in positive direction.	FN	
	1424	X	Run 6	Ran 20 G 20 mS terminal peak shock 3 times in positive negative.	FN	
	1430	X		Customer mounted UUT SN: 190020 to fixture for X-axis crash safety testing.	FN	
	1442	X	Run 7	Ran 20 G 20 mS terminal peak shock 3 times in positive direction.	FN	
	1443	X	Run 8	Ran 20 G 20 mS terminal peak shock 3 times in positive negative.	FN	
	1450	X		Unit rotated for Y-axis testing.	FN	
	1459	X	Run 9	Ran 20 G 20 mS terminal peak shock 3 times in positive direction.	FN	
	1500	X	Run 10	Ran 20 G 20 mS terminal peak shock 3 times in positive negative.	FN	
1/29/2026				Testing complete for crash safety, customer to make final determination.	FN	

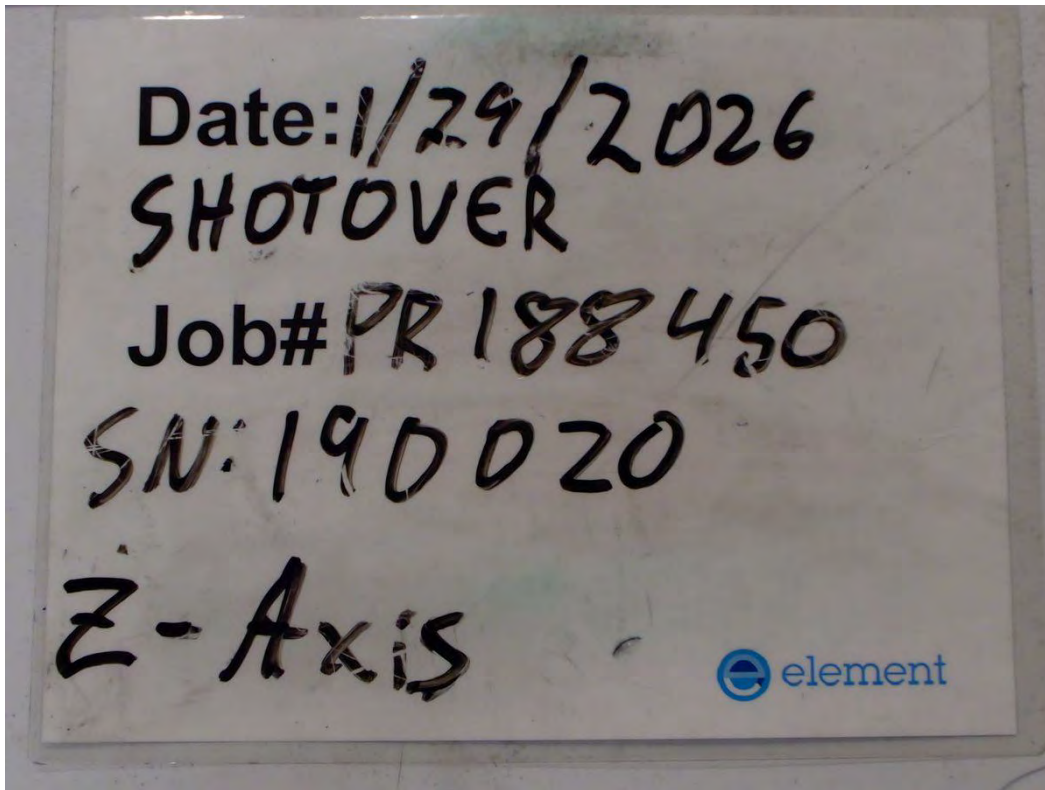
5.6.4 Test Photographs



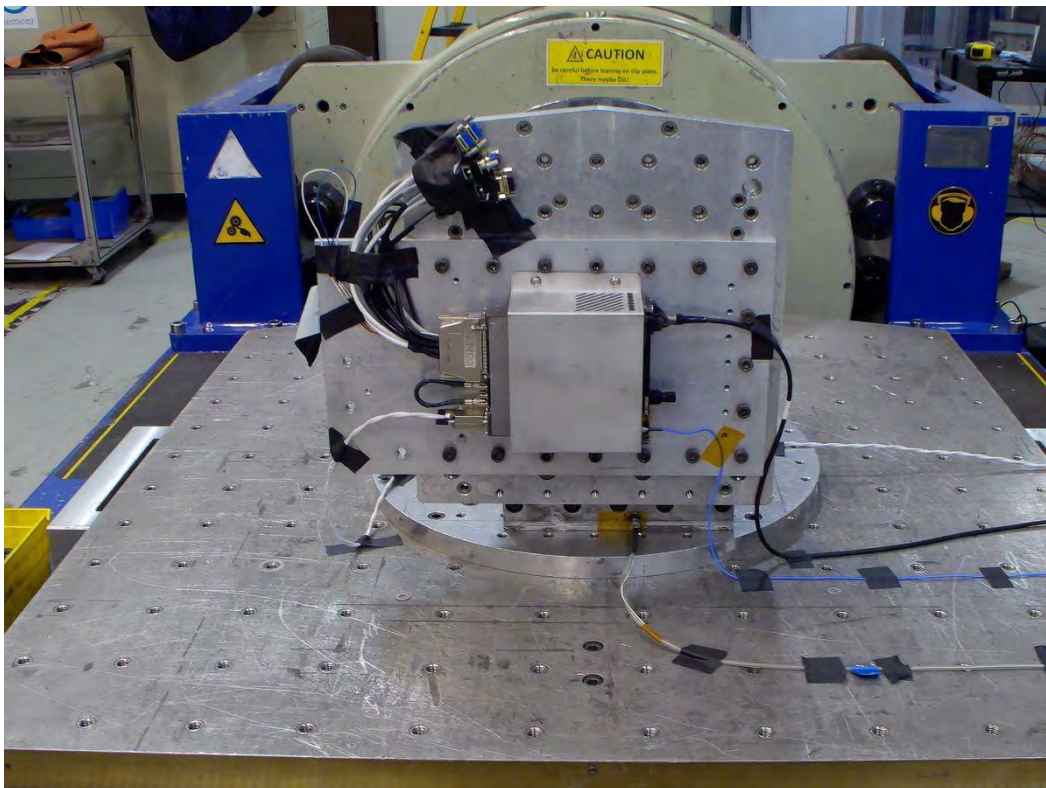
OSCAR_Bare-Fixture_Z-Axis



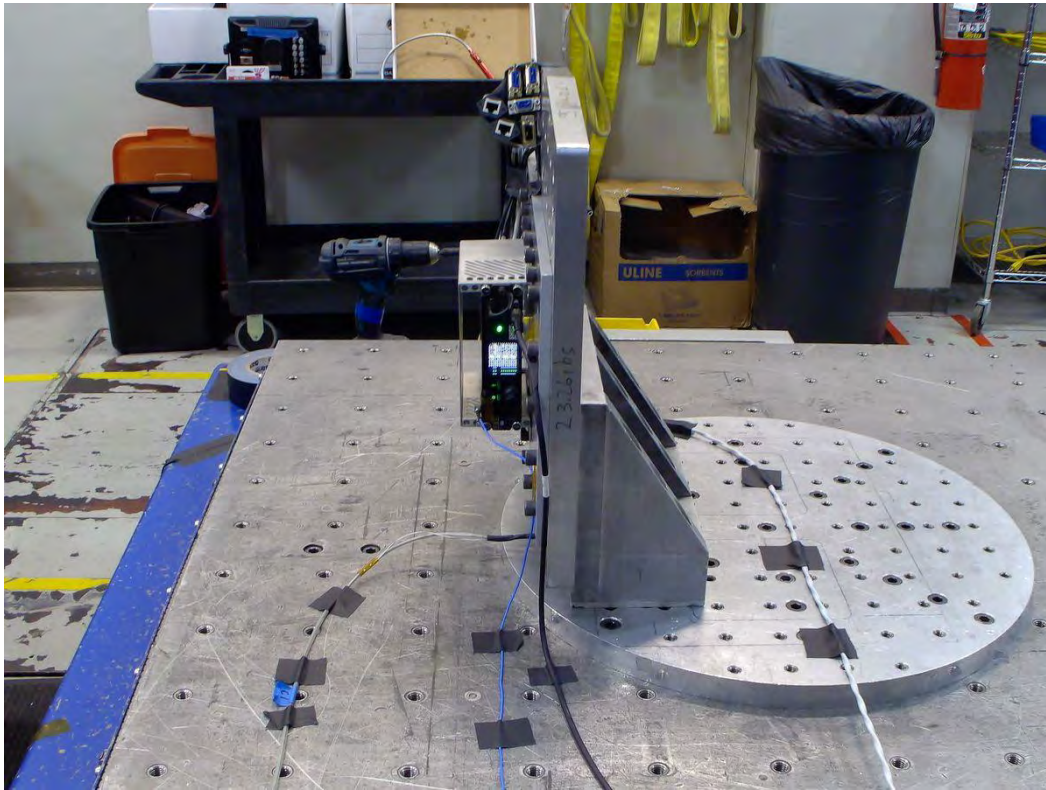
OSCAR_Bare-Fixture_Z-Axis



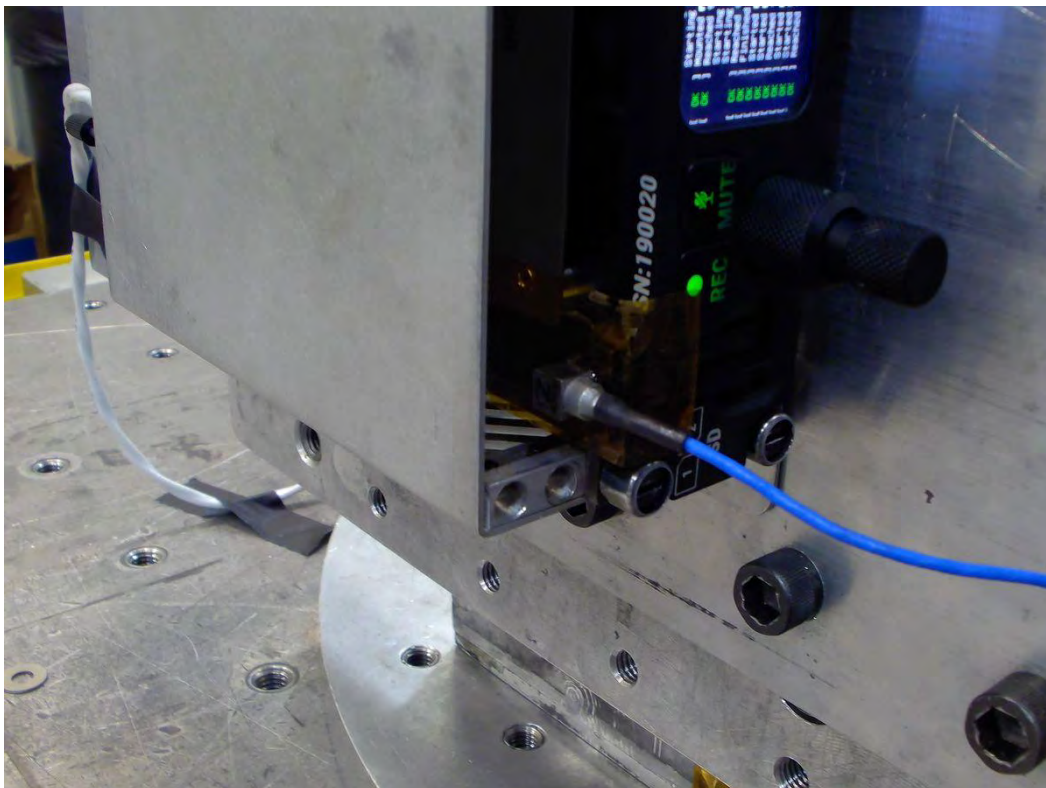
OSCAR_SN190020_Z-Axis



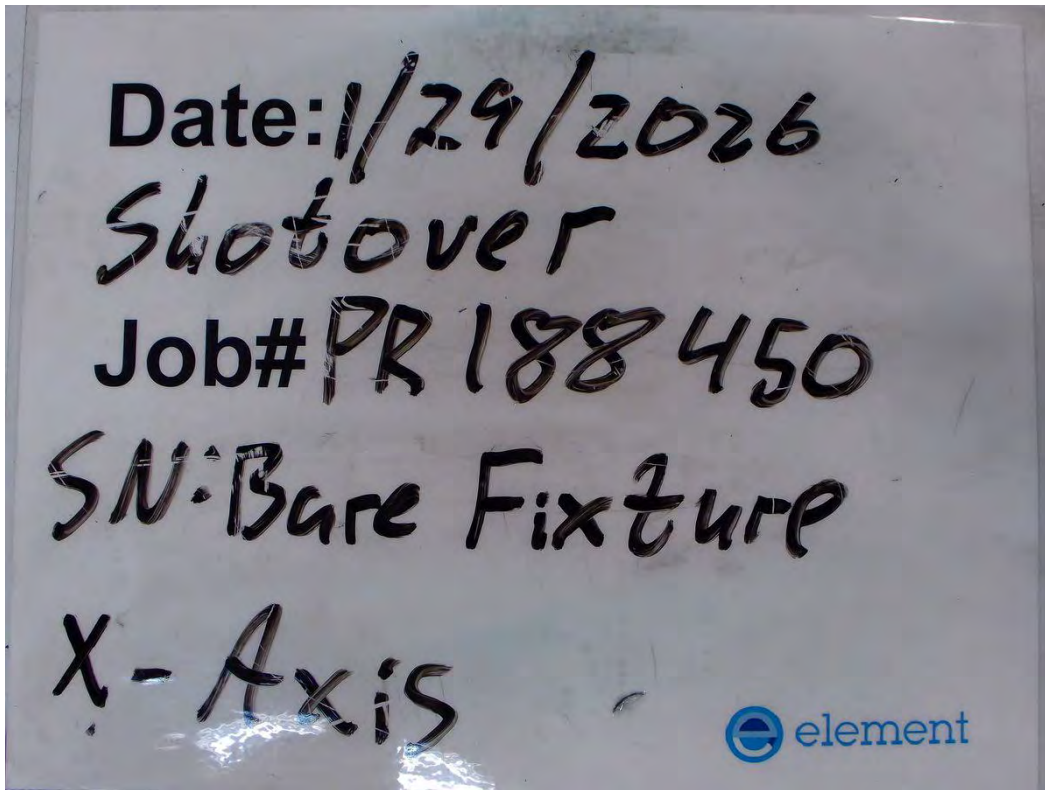
OSCAR_SN190020_Z-Axis



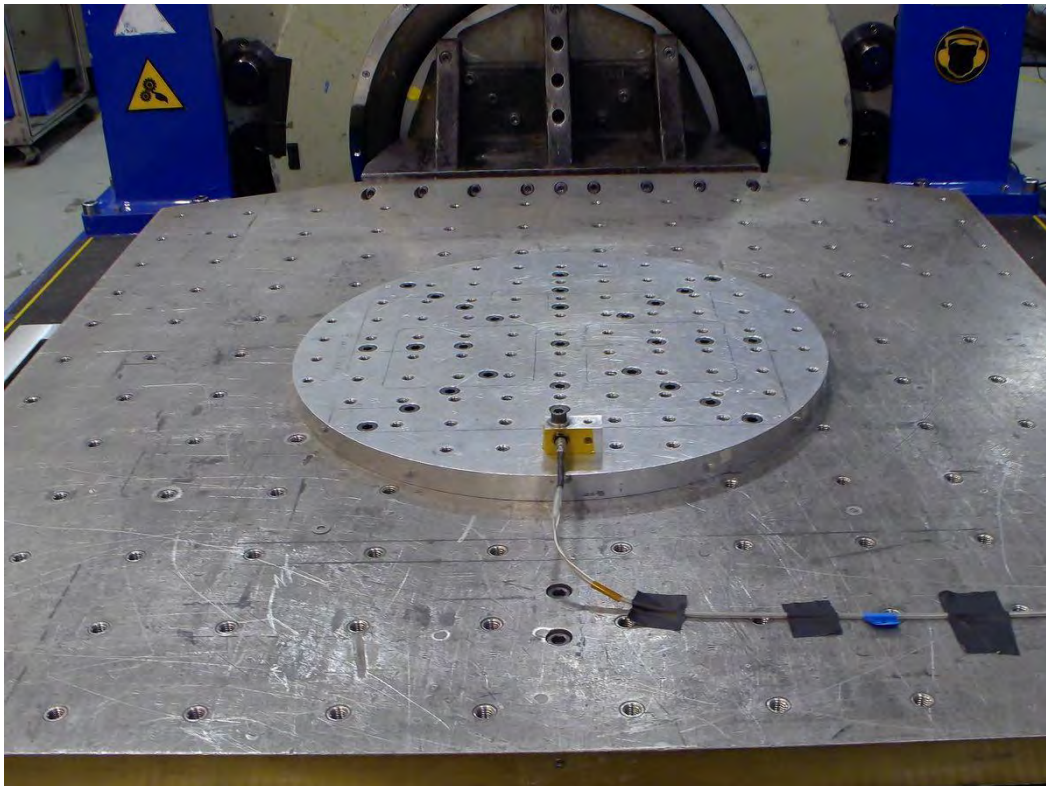
OSCAR_SN190020_Z-Axis



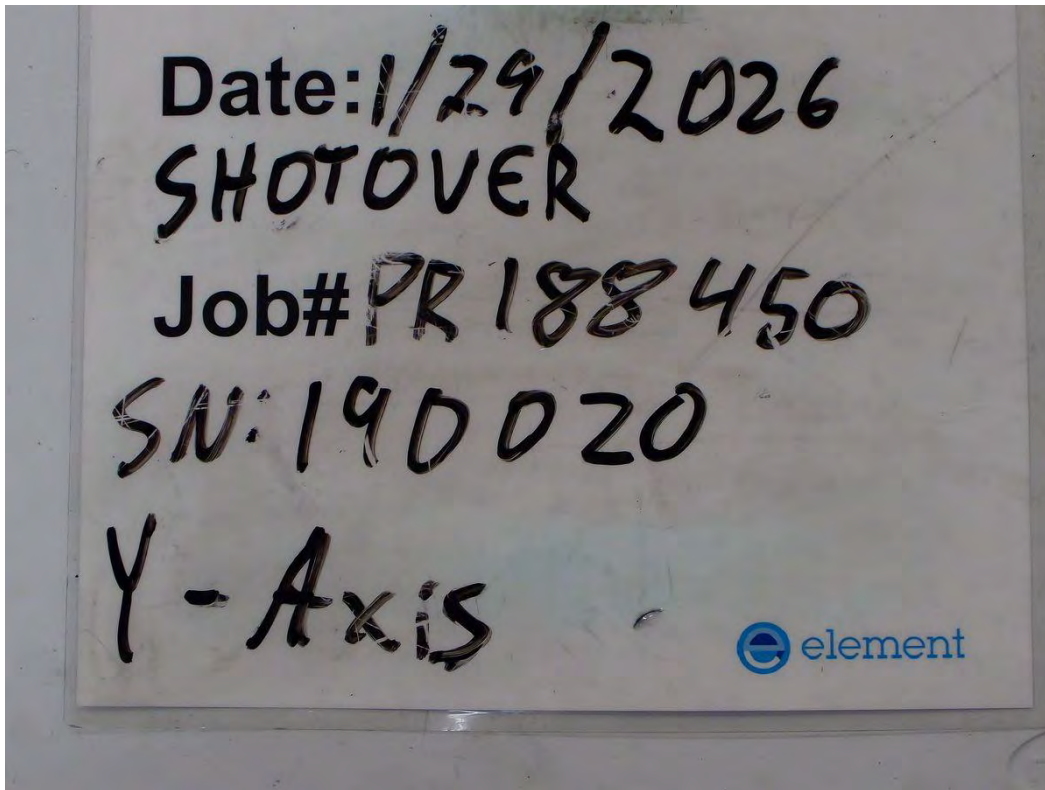
OSCAR_SN190020_Z-Axis



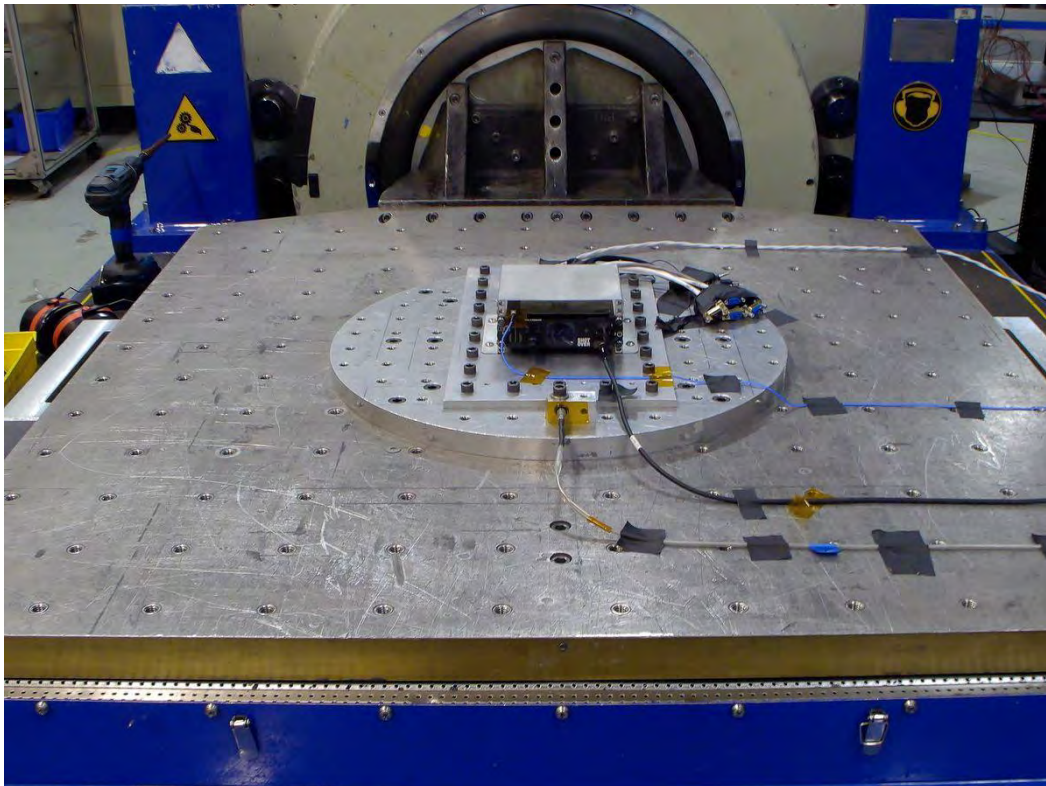
OSCAR_ Bare-Fixture _X-Y-Axis



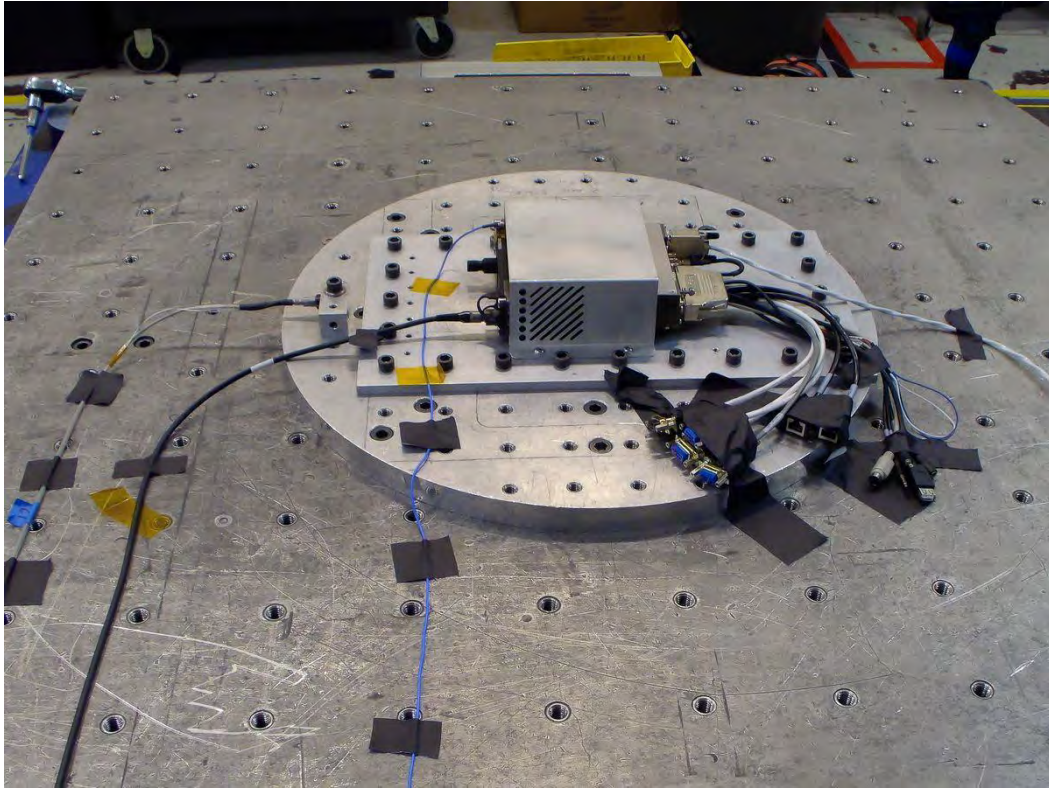
OSCAR_ Bare-Fixture _X-Y-Axis



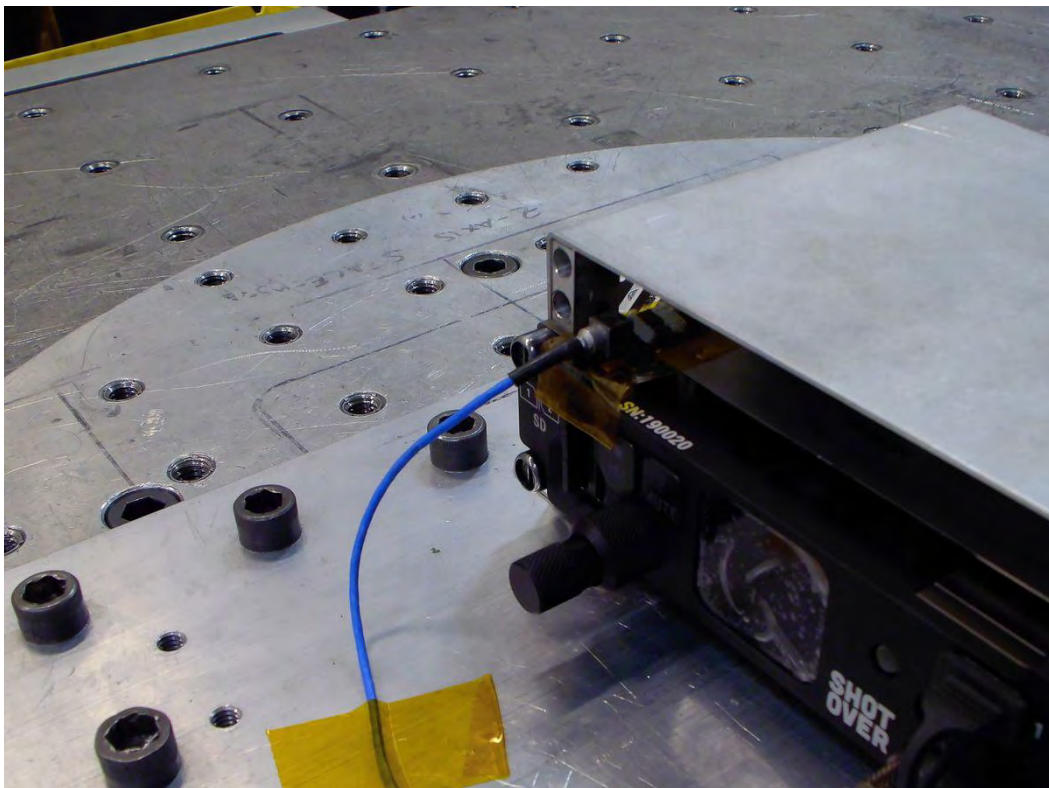
OSCAR_SN190020_Y-Axis



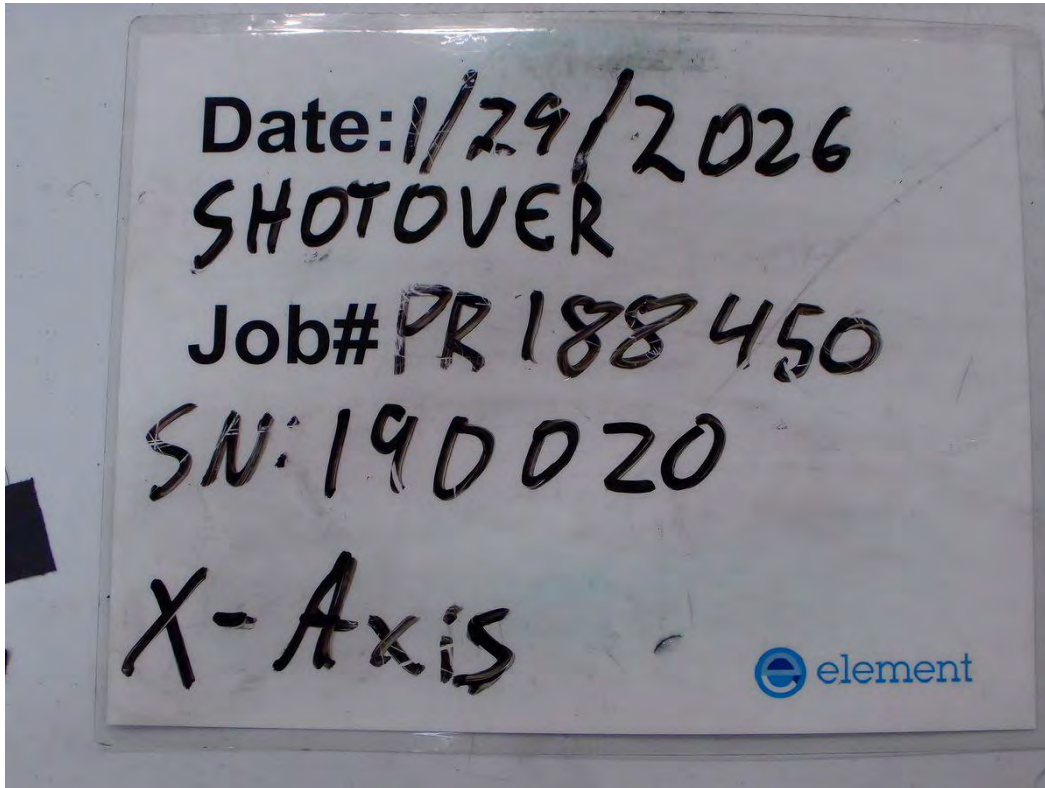
OSCAR_SN190020_Y-Axis



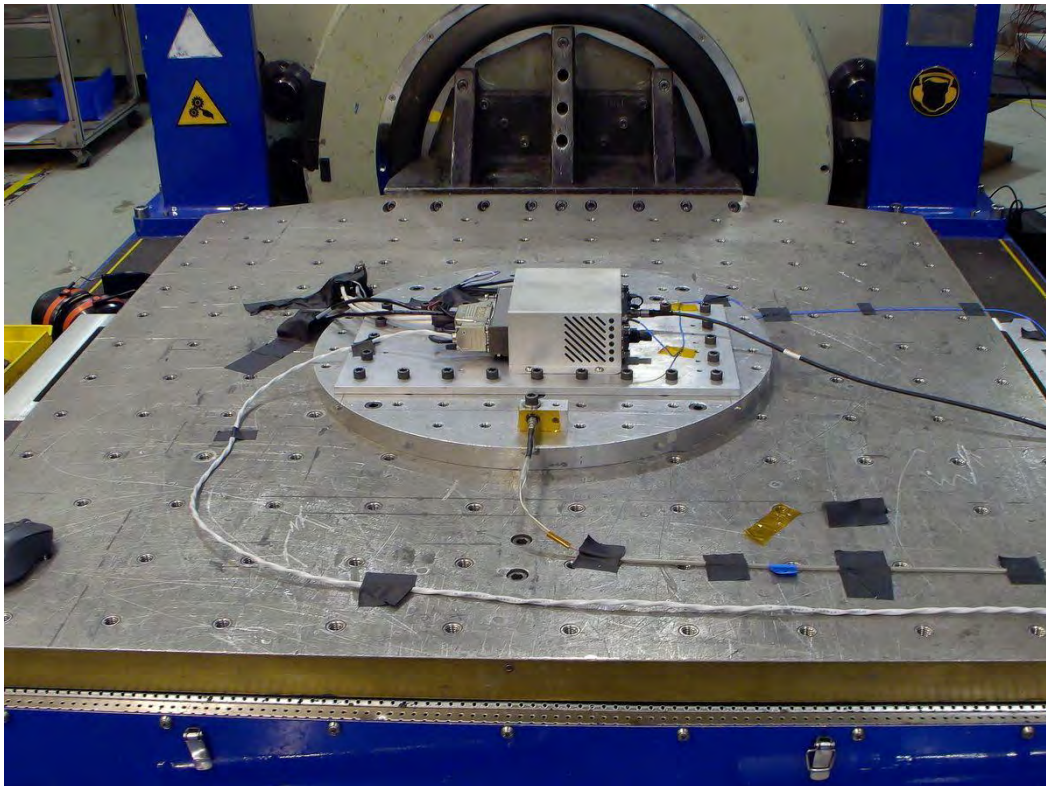
OSCAR_SN190020_Y-Axis



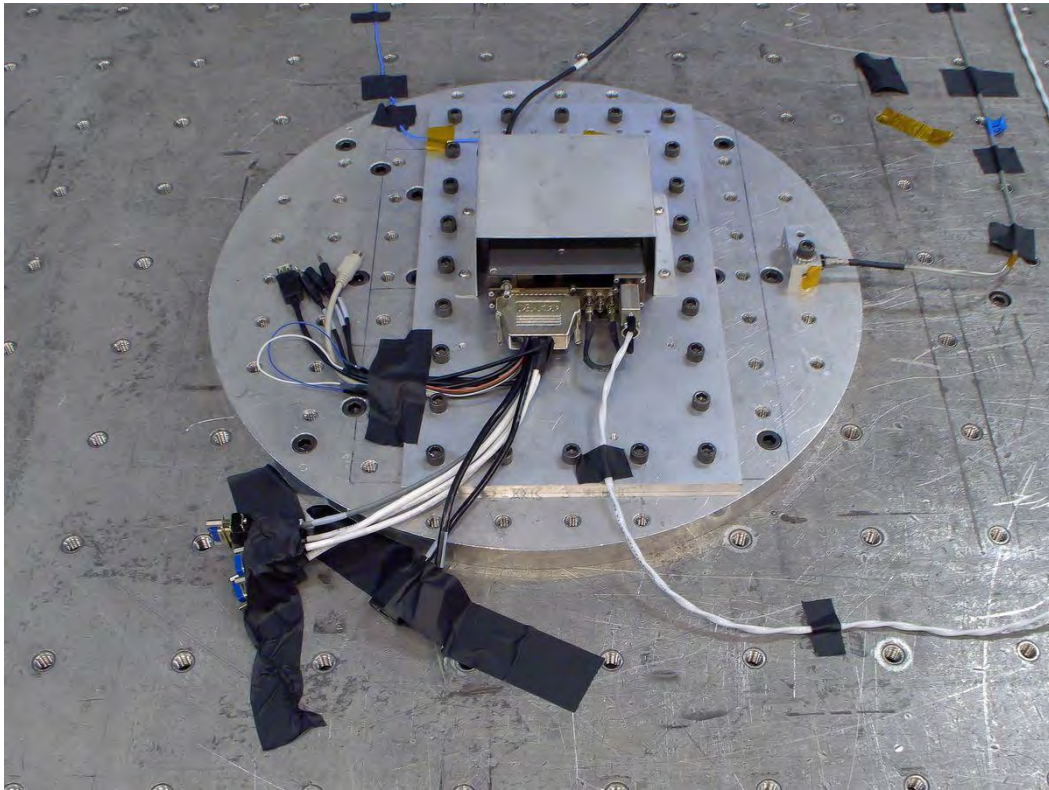
OSCAR_SN190020_Y-Axis



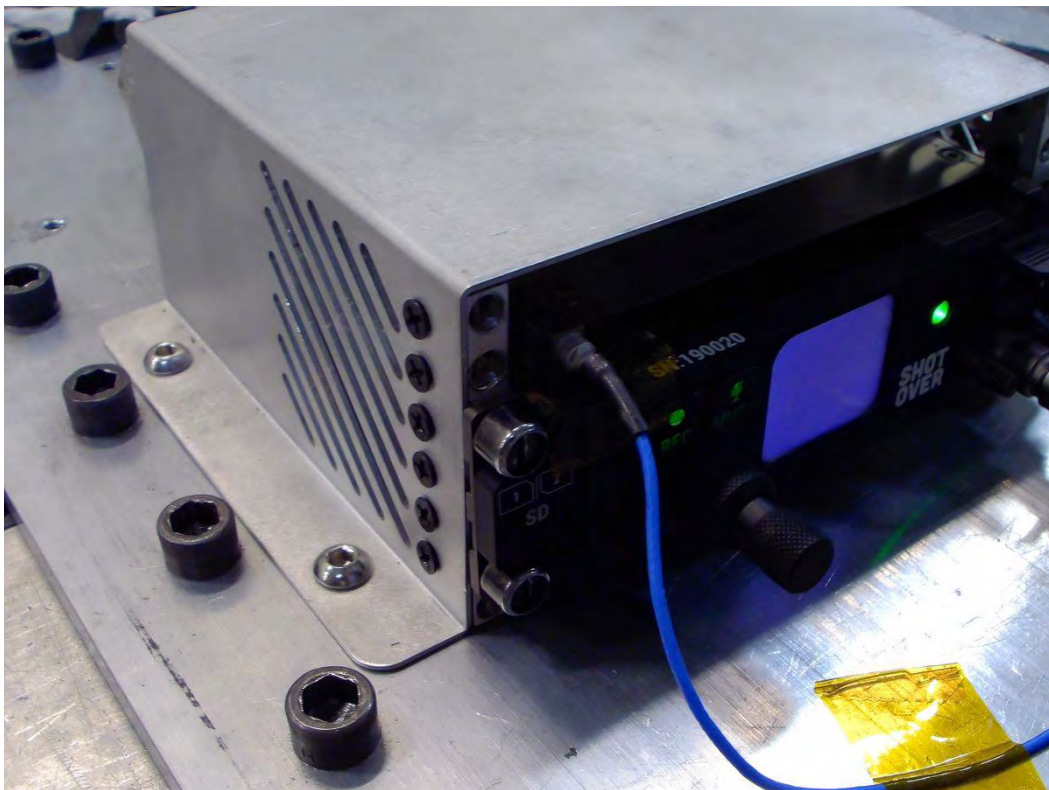
OSCAR_SN190020_X-Axis



OSCAR_SN190020_X-Axis



OSCAR_SN190020_X-Axis



OSCAR_SN190020_X-Axis

5.6.5 Test Equipment List

Table 5.6-1: Crash Safety - Impulse Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A084307	Vibration Shaker D516	Dynamic Solution	DS-15400VHI22-70	NCR	NCR
US58-A080917	Accelerometer	Dytran Instruments	3030B5	04/22/2025	04/22/2026
US58-A059867	Triaxial Accelerometer	PCB Piezotronics	356A01	09269/2024	09/26/2026
US58-A061701	Vibration Controller	Vibration Research	VR9500	03/24/2025	03/24/2026
US58-A080893	Torque Wrench	Snap-on	OD3R150A	06/02/2025	06/02/2026
US58-A070466	Humidity & Temperature Meter	Fluke	971	07/09/2025	07/09/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.7 Vibration**5.7.1 Test Procedure**

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 8.0, Category U2.

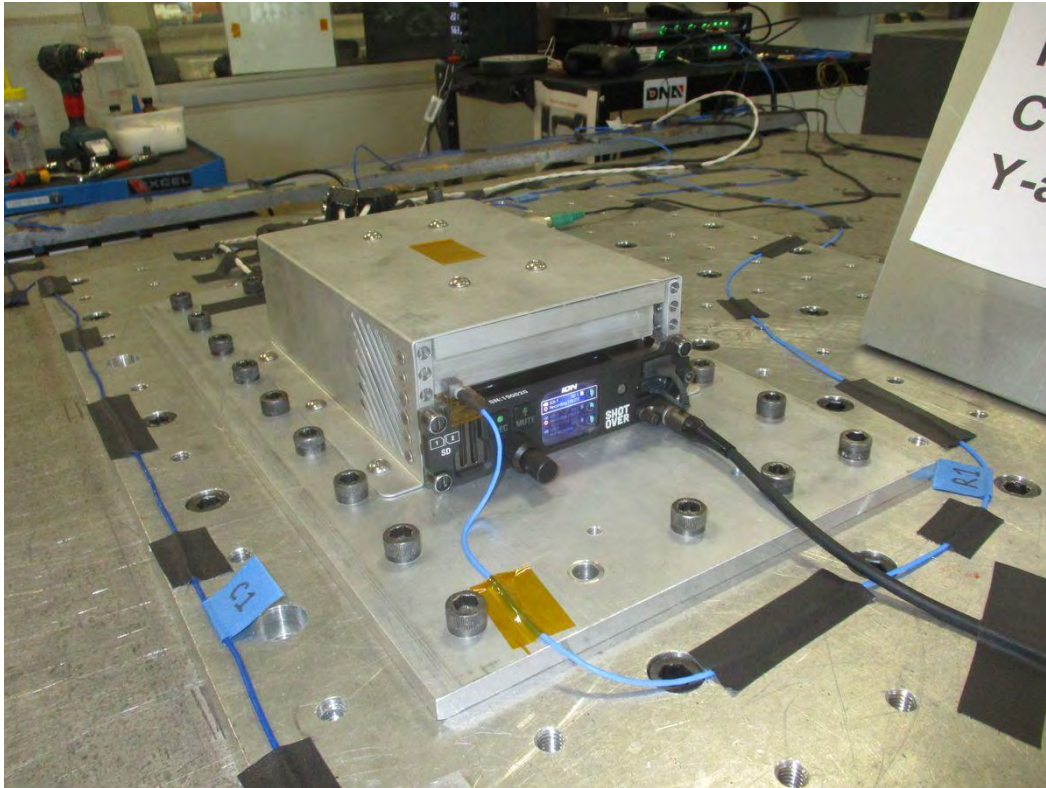
5.7.2 Test Result

The EUT's results will be determined by SHOTOVER Systems.

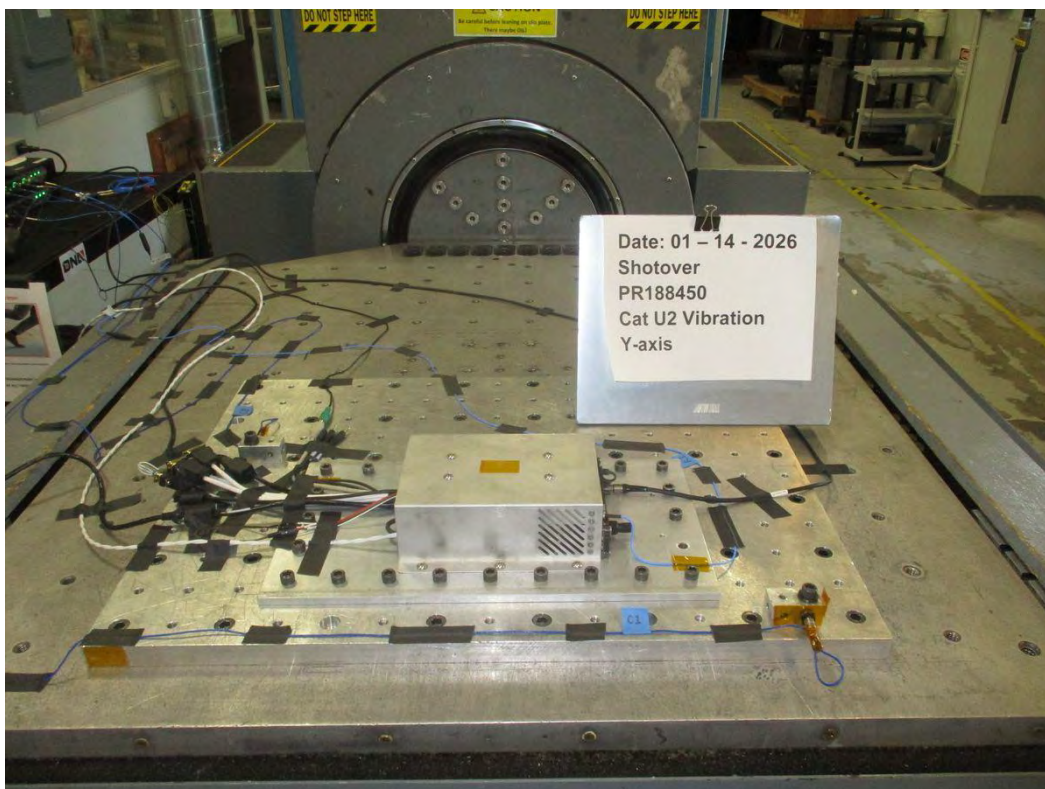
5.7.3 Test Datasheets

DYNAMICS TEST LOG					
Start Date:	1/14/2026	End Date:	1/15/2026	Job No:	PR188450
Customer:	Shotover Systems		Test Engineer:	Brendan Arthur	
Customer Witness:	Ken Haan			Lab Temp & Humidity:	67°F/21%
Part Name:	OSCAR		Part Number:	012-0031	
Test Specification:	"US211-9001-Rev0.1_In Process_OSCAR Environmental Test Plan" PDF (RTCA DO-160G)			Serial number:	190020
Test Performed:	DO-160G Category U2 unknown helicopter frequencies curves F and F1 for 10 minutes and 3 hours.				
Date	Time	Axis	Plot No.	Remarks	Initials
1/14/2026	0730			The test profiles whave been configured and shaker setup for testing.	MB
1/14/2026	0810	Y		The UUT is mounted to shaker in the Y-Axis with 2 controls and 1 response accelerometer	MB
1/14/2026	0814	Y	Run 1	Perform the Cat U2 Curve F performance random for 00:10:00 duration	MB
1/14/2026	0835	Y	Run 2	Perform the Cat U2 Curve F1 endurance random for 03:00:00 duration	MB
1/14/2026	1159	Y	Run 3	Perform the Cat U2 Curve F performance random for 00:10:00 duration	MB
1/14/2026	1215	X		The UUT is mounted to shaker in the X-Axis with 2 controls and 1 response accelerometer	MB
1/14/2026	1236	X	Run 4	Perform the Cat U2 Curve F performance random for 00:10:00 duration	MB
1/14/2026	1256	X	Run 5	Perform the Cat U2 Curve F1 endurance random for 03:00:00 duration	MB
1/14/2026	1609	X	Run 6	Perform the Cat U2 Curve F performance random for 00:10:00 duration	MB
1/15/2026	0800	Z		The UUT is mounted to shaker in the Z-Axis with 2 controls and 1 response accelerometer	MB
1/15/2026	0801	Z	Run 7	Perform the Cat U2 Curve F performance random for 00:10:00 duration	MB
1/15/2026	0820	Z	Run 8	Perform the Cat U2 Curve F1 endurance random for 03:00:00 duration	MB
1/15/2026	1143	Z	Run 9	Perform the Cat U2 Curve F performance random for 00:10:00 duration	MB
1/15/2026				Testing Complete. No Anomalies noted on UUT during testing.	MB
1/15/2026				Customer to make finale determination on Pass/Fail of UUT upon further inspection.	MB

5.7.4 Test Photographs



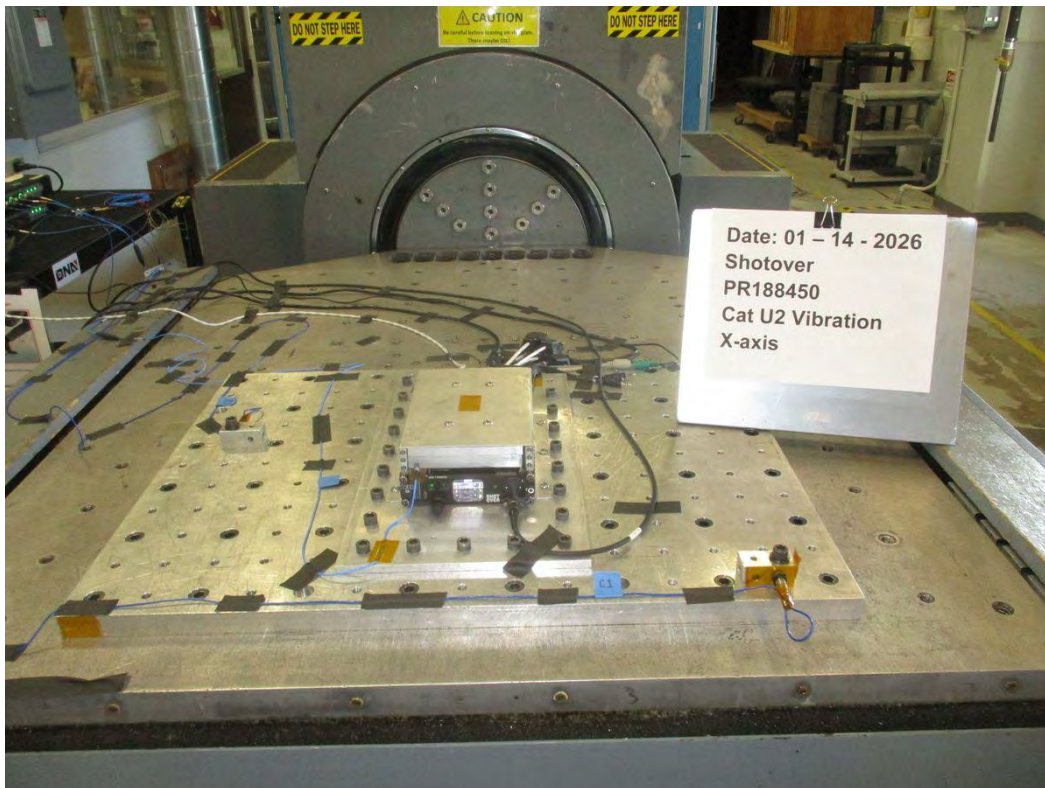
Y-Axis (Cat U2)



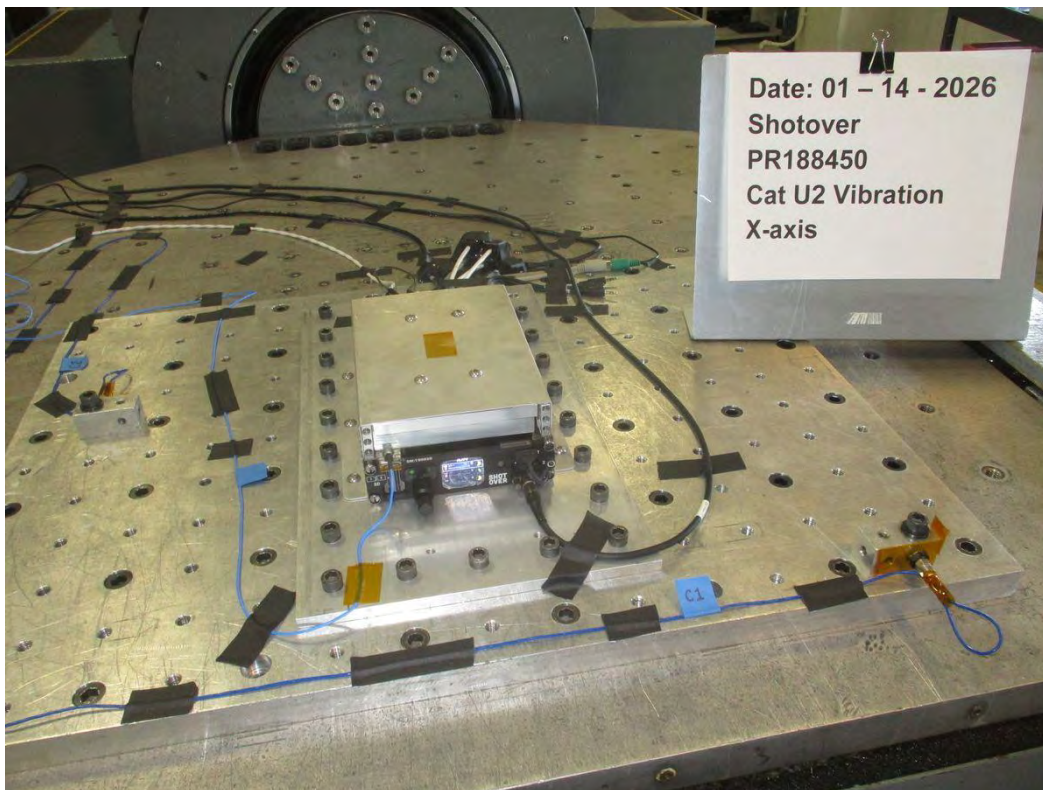
Y-Axis (Cat U2)



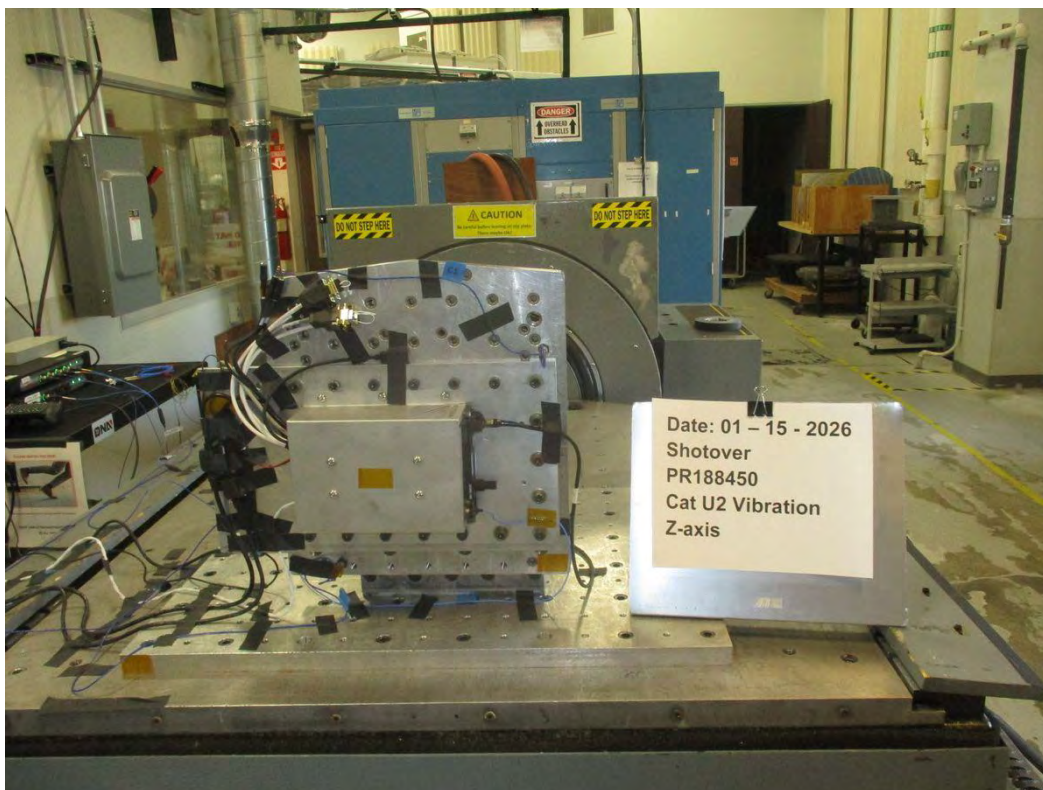
Y-Axis (Cat U2)



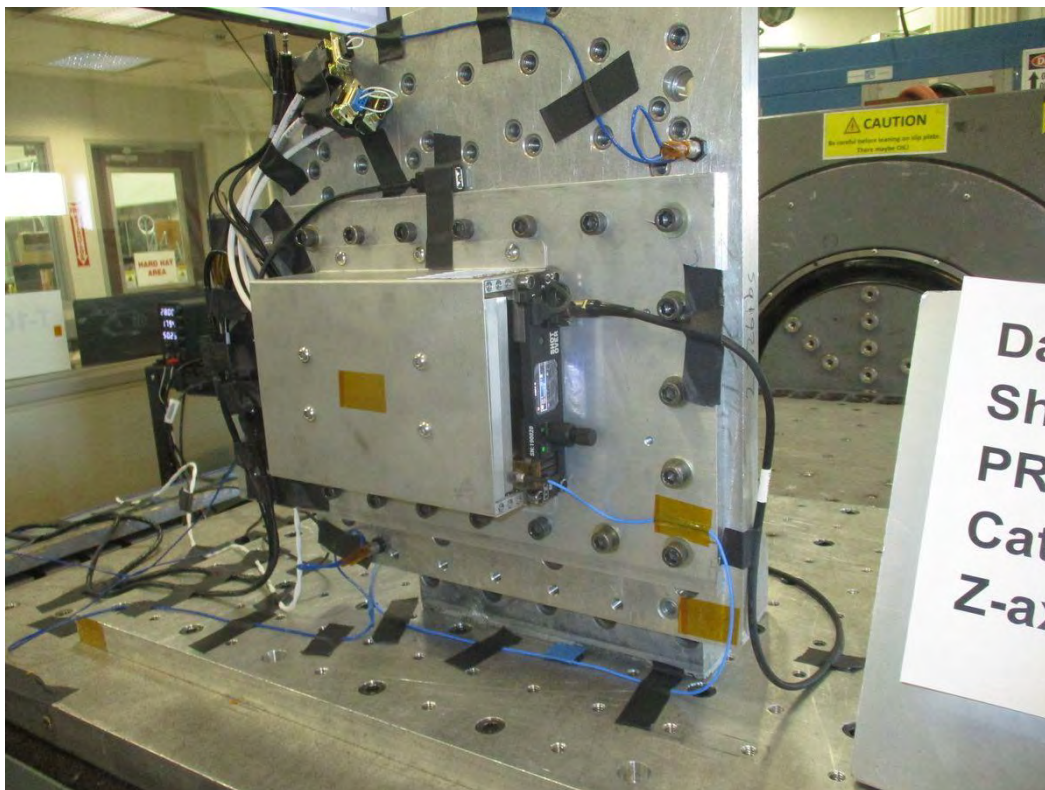
X-Axis (Cat U2)



X-Axis (Cat U2)



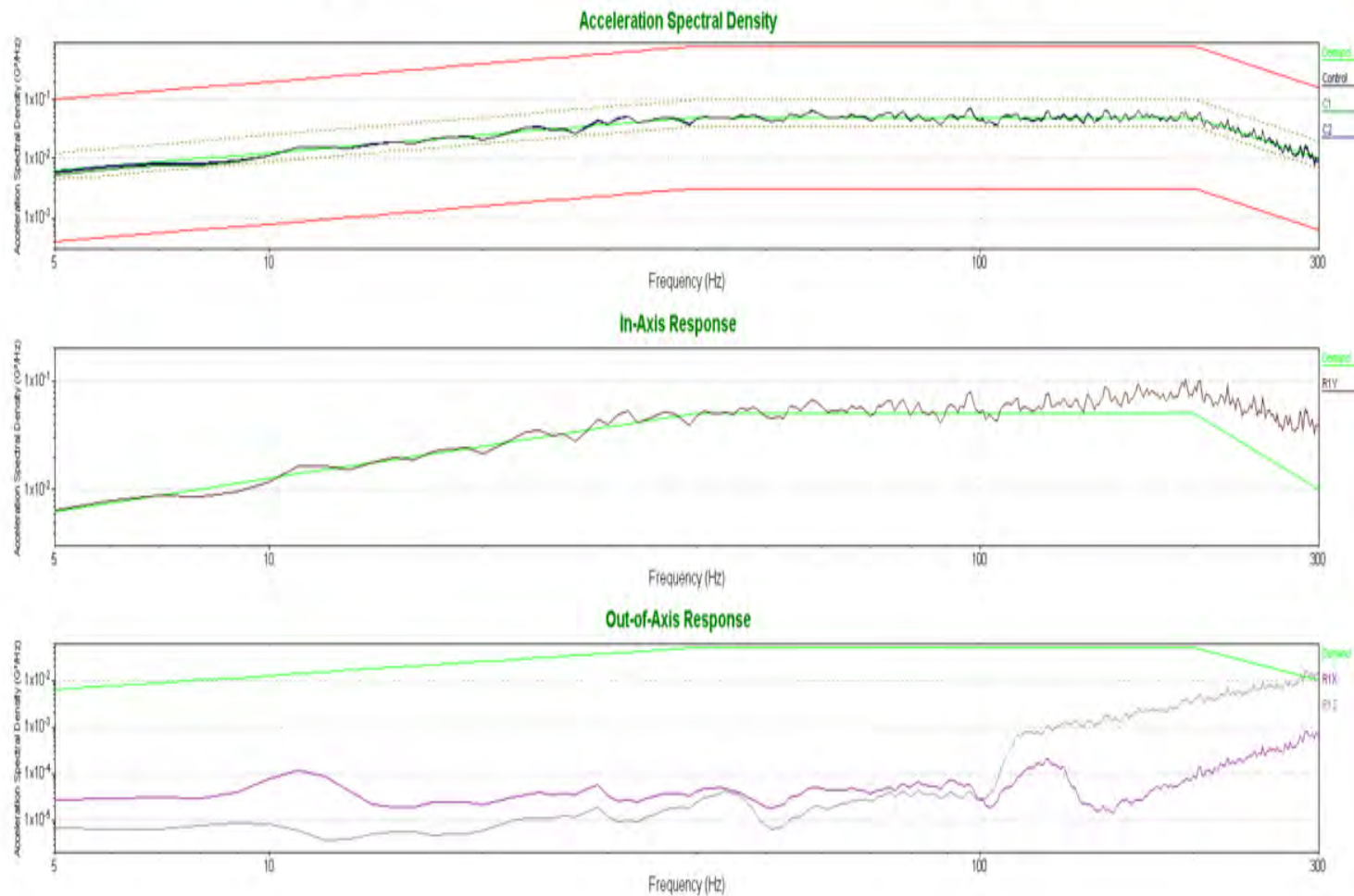
Z-Axis (Cat U2)



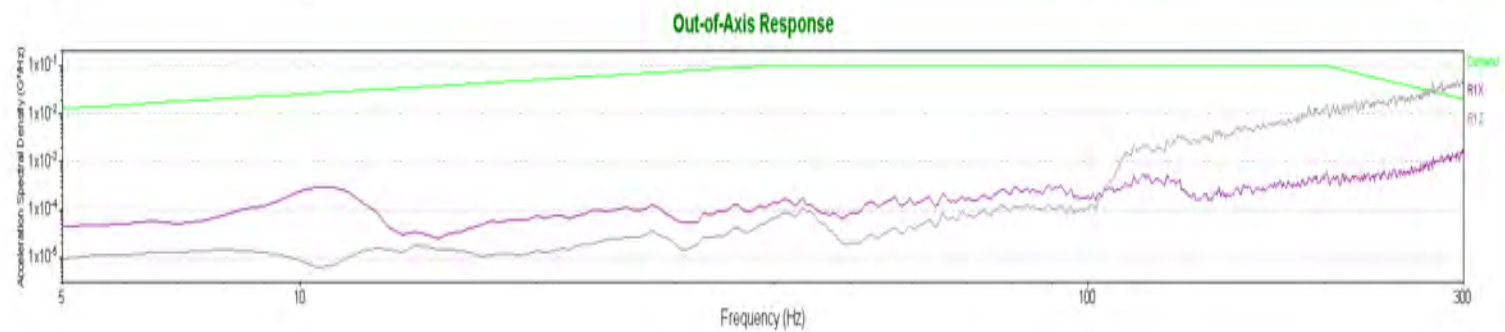
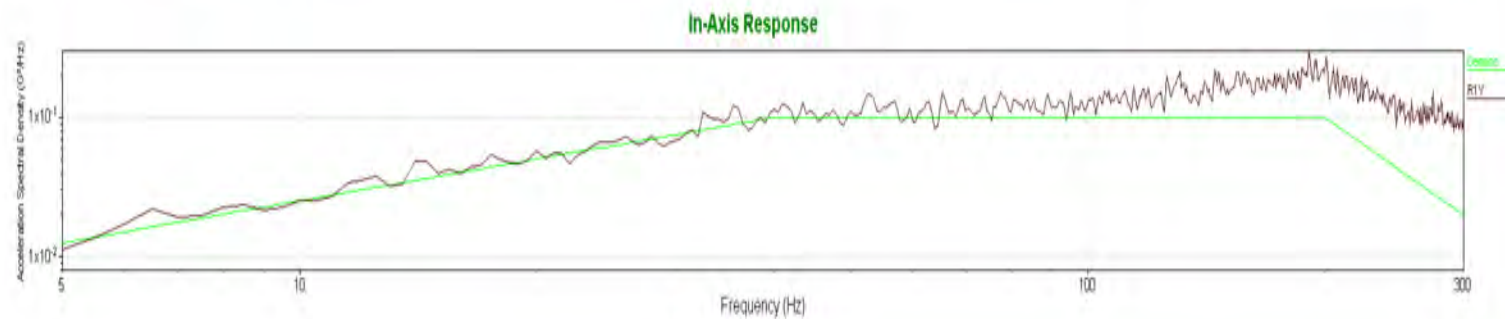
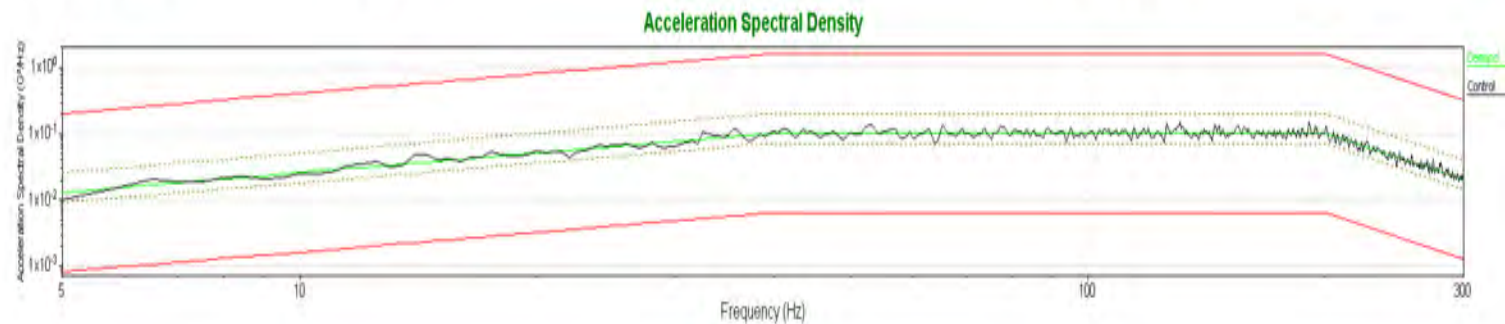
Z-Axis (Cat U2)

5.7.5 Test Data

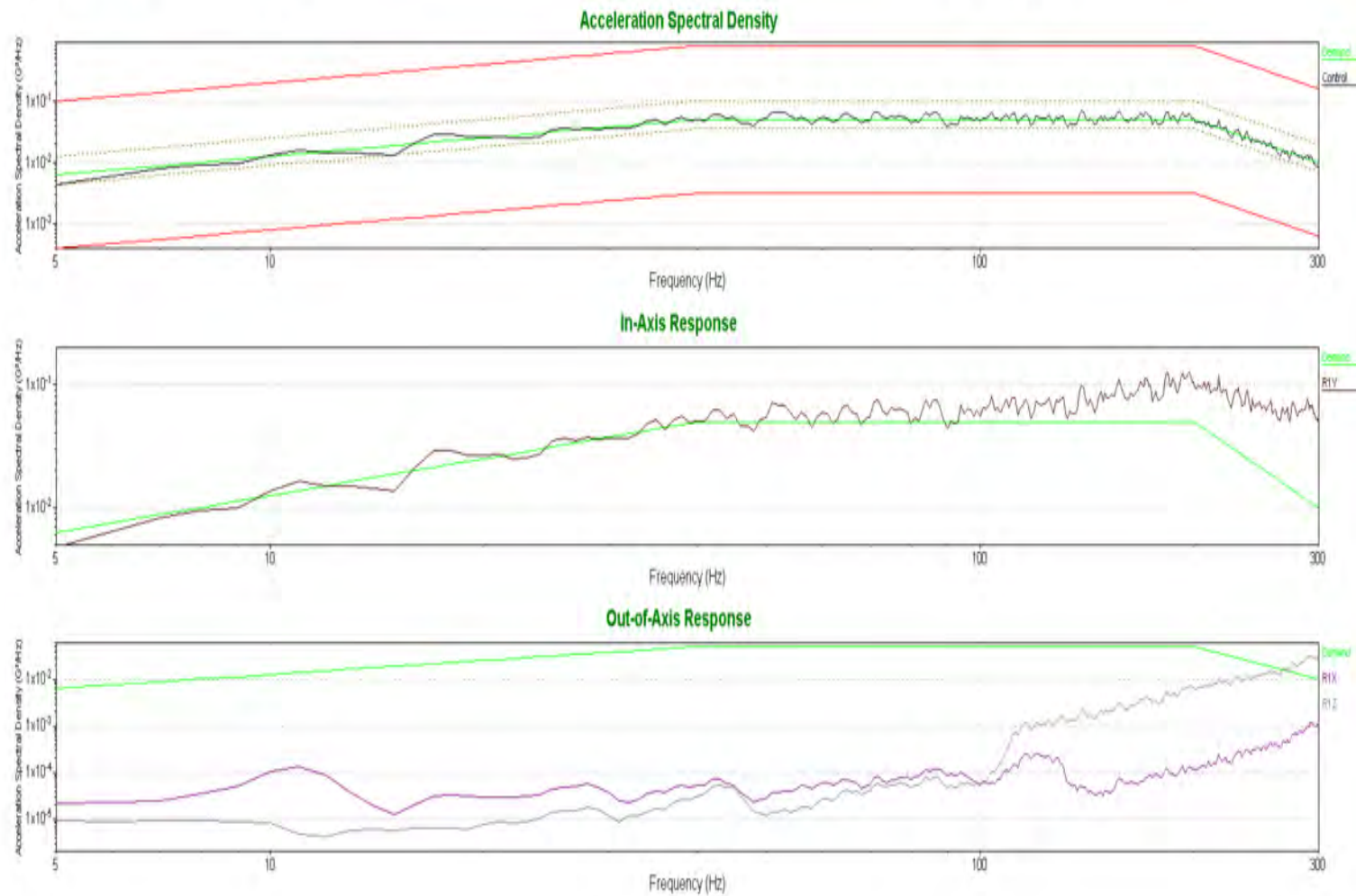
Element-Longmont	Level Time: 0:10:00	Demand: 3.368 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 0:11:57	Control: 3.385 G RMS	UUT: OSCAR
Jan 14, 2026 08:14:32	Run 1	Test axis: Y	SN: 190020



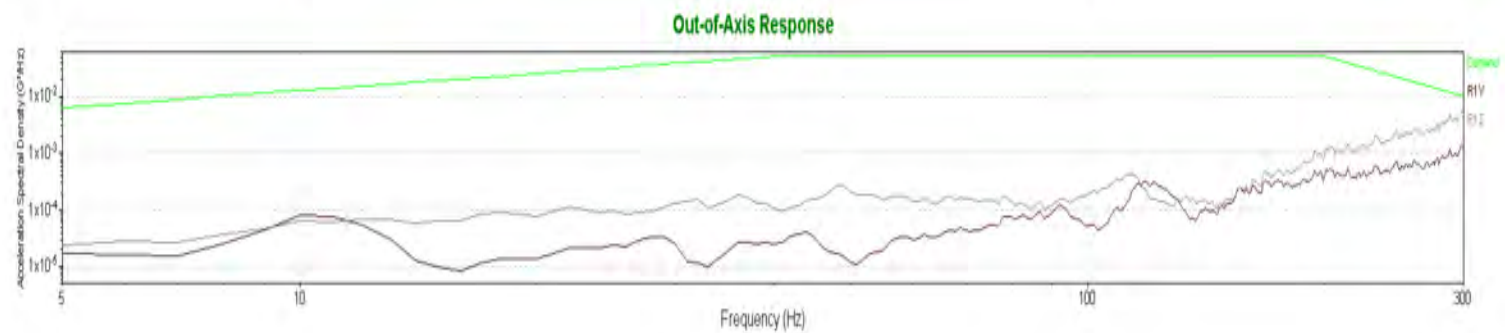
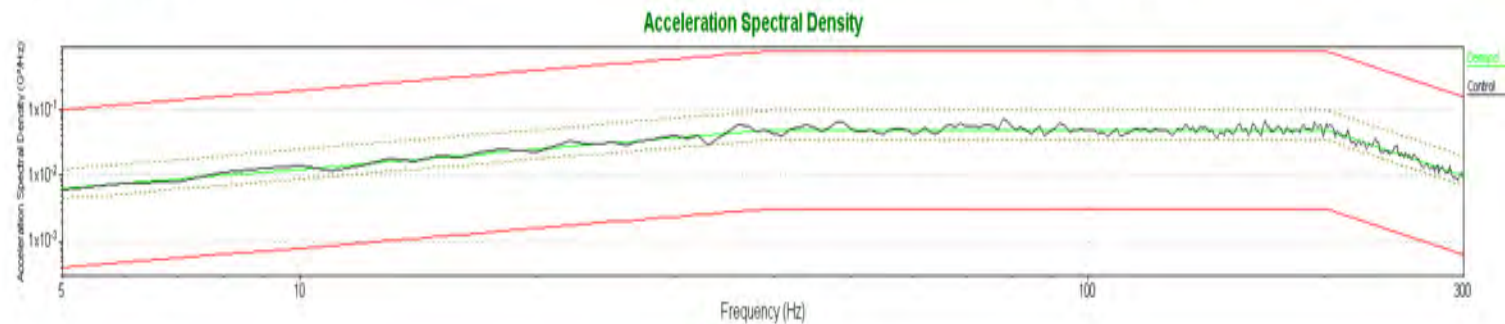
Element-Longmont	Level Time: 3:00:00	Demand: 4.763 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 3:01:25	Control: 4.789 G RMS	UUT: OSCAR
Jan 14, 2026 08:35:52	Run 2	Test axis: Y	SN: 190020



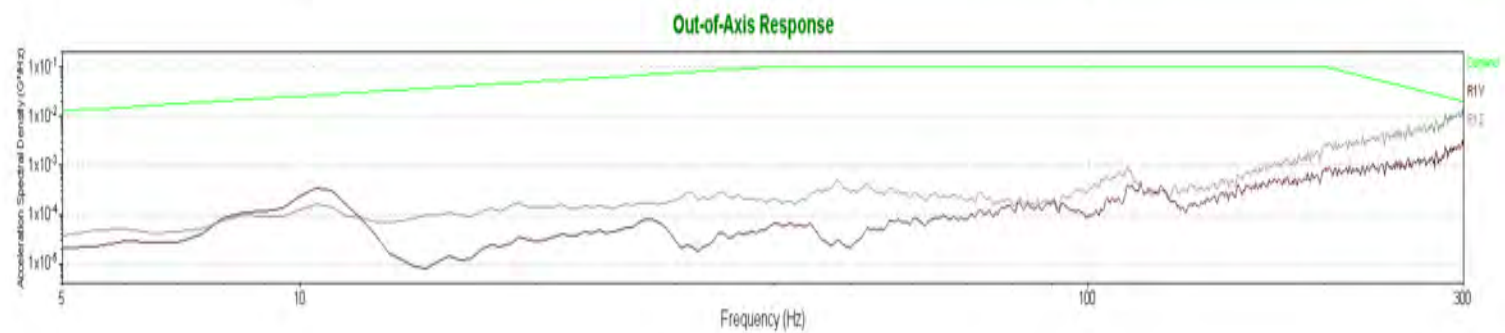
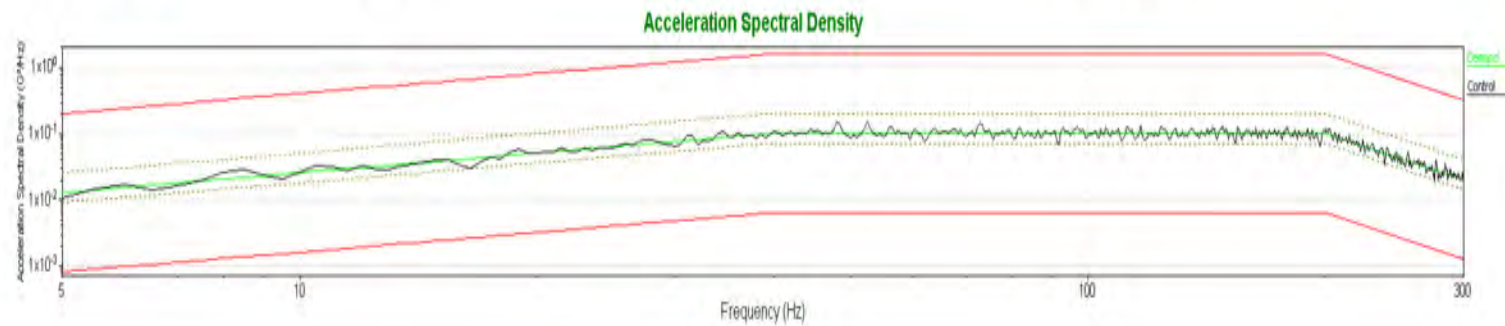
Element-Longmont	Level Time: 0:10:00	Demand: 3.368 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 0:11:06	Control: 3.436 G RMS	UUT: OSCAR
Jan 14, 2026 11:59:21	Run 3	Test axis: Y	SN: 190020



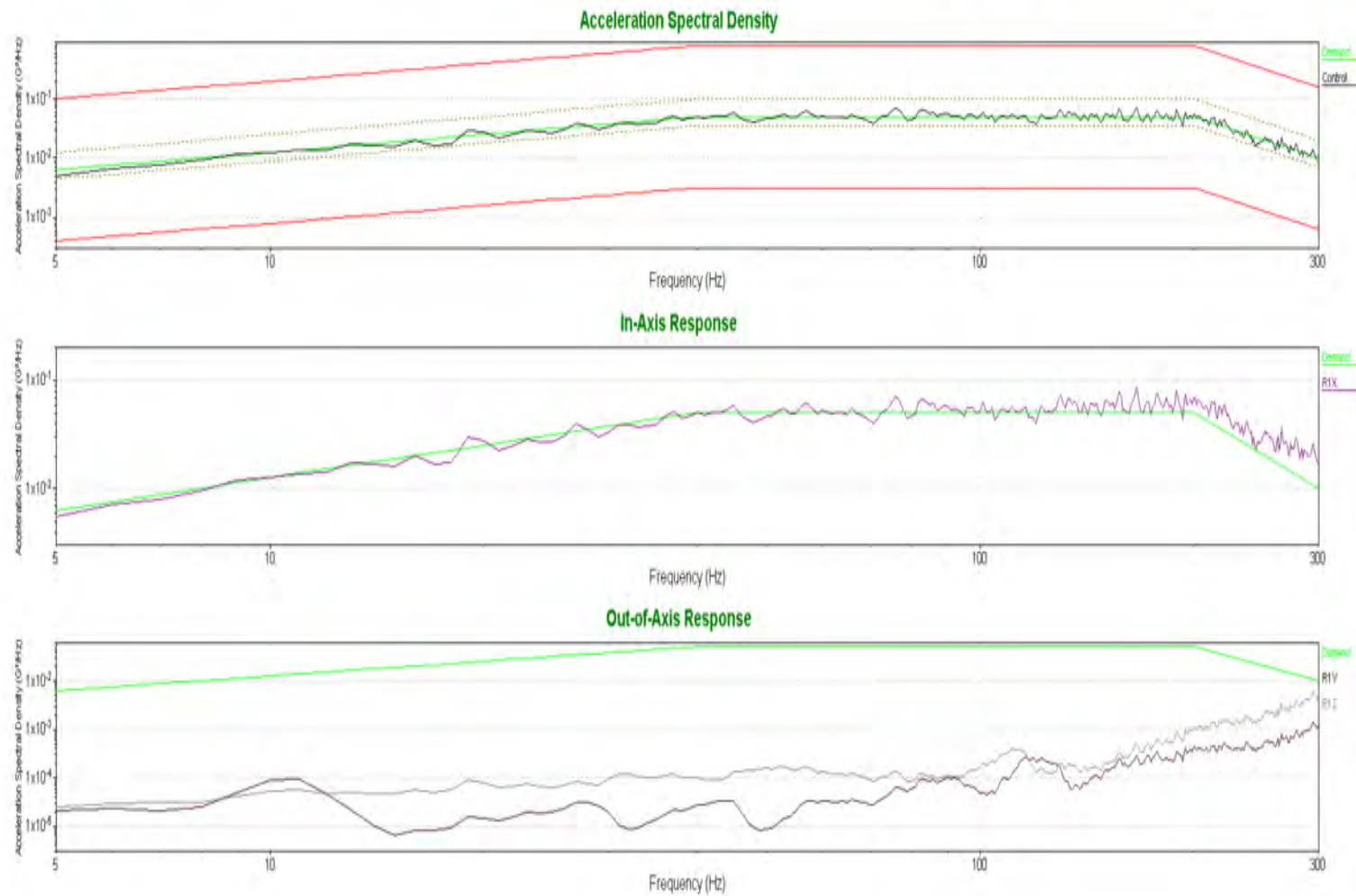
Element-Longmont	Level Time: 0:10:00	Demand: 3.368 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 0:11:11	Control: 3.39 G RMS	UUT: OSCAR
Jan 14, 2026 12:36:56	Run 4	Test axis: X	SN: 190020



Element-Longmont	Level Time: 3:00:00	Demand: 4.763 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 3:01:45	Control: 4.779 G RMS	UUT: OSCAR
Jan 14, 2026 12:56:34	Run 5	Test axis: X	SN: 190020

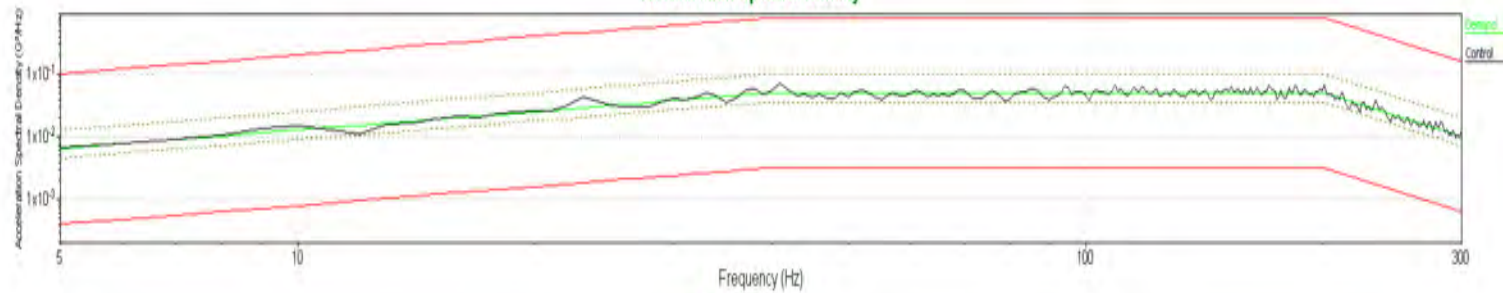


Element-Longmont	Level Time: 0:10:00	Demand: 3.368 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 0:11:08	Control: 3.39 G RMS	UUT: OSCAR
Jan 14, 2026 16:09:18	Run 6	Test axis: X	SN: 190020

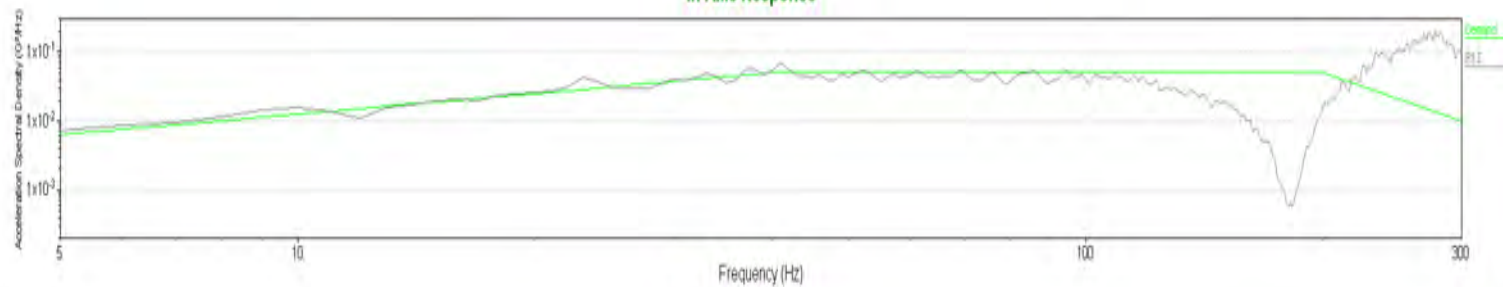


Element-Longmont	Level Time: 0:10:00	Demand: 3.368 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 0:11:12	Control: 3.375 G RMS	UUT: OSCAR
Jan 15, 2026 08:01:00	Run 7	Test axis: Z	SN: 190020

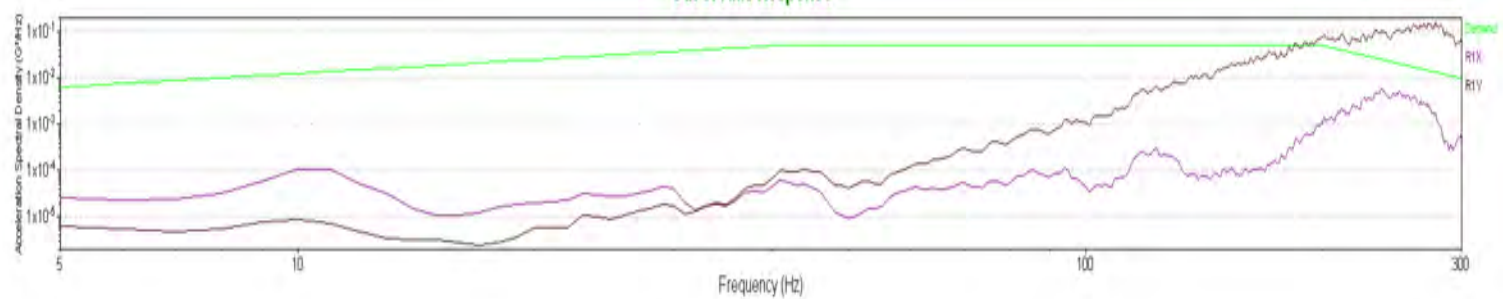
Acceleration Spectral Density



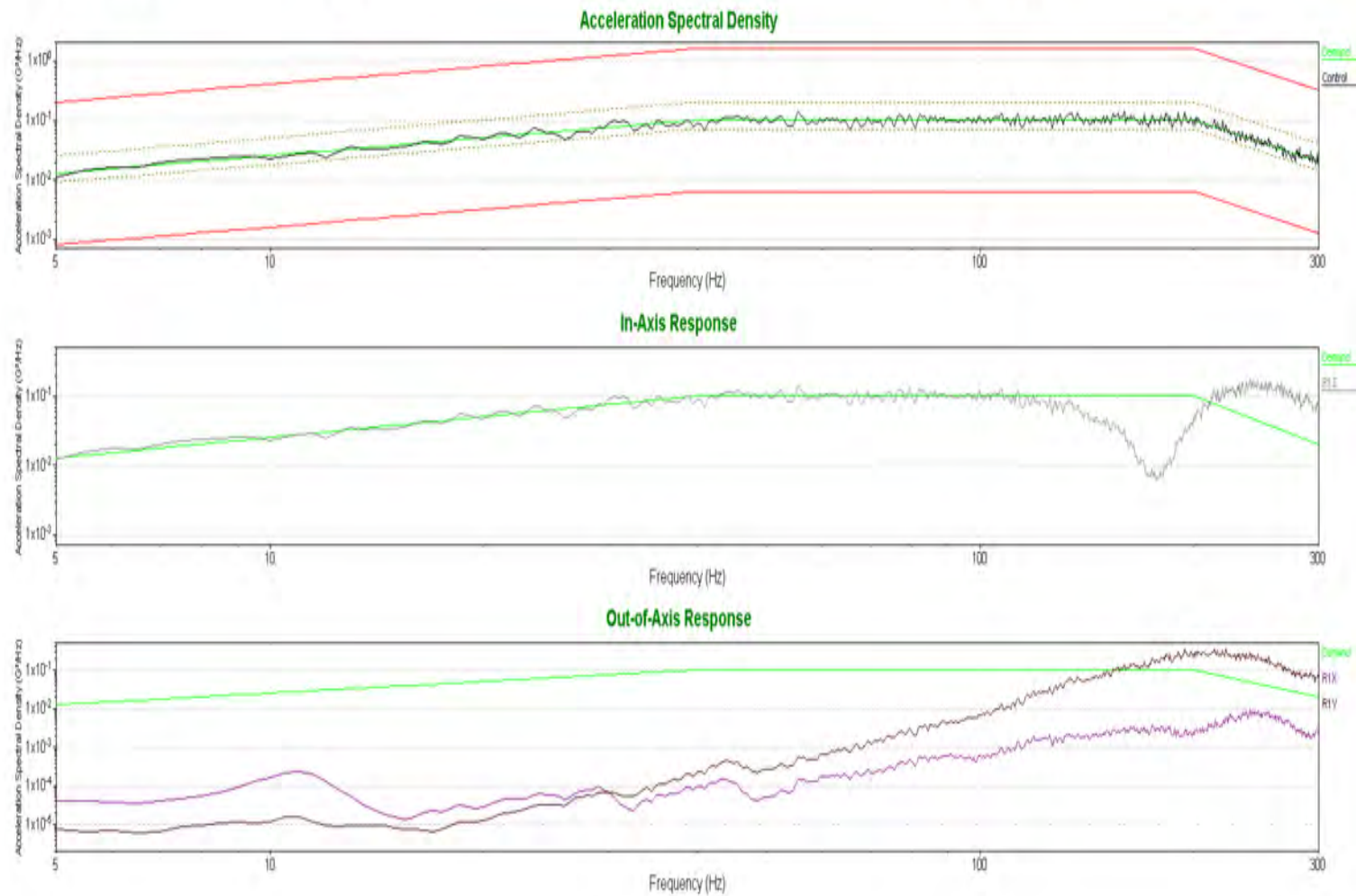
In-Axis Response



Out-of-Axis Response

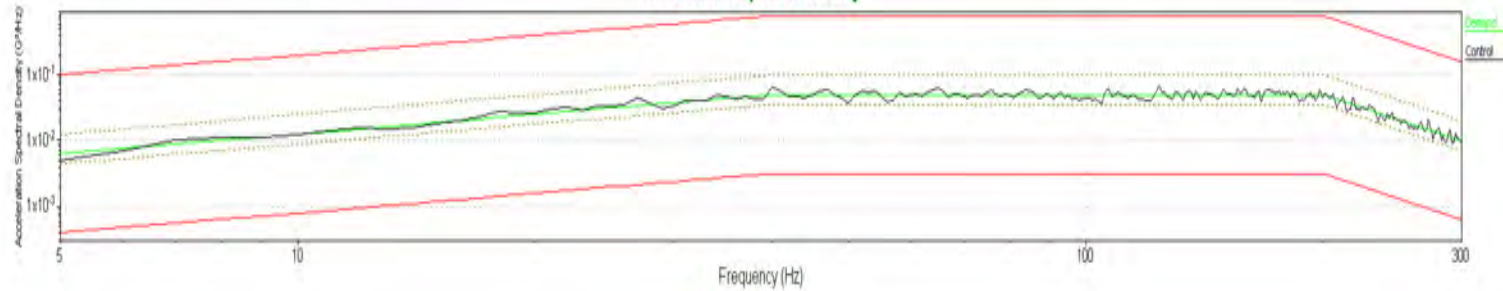


Element-Longmont	Level Time: 3:00:00	Demand: 4.763 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 3:01:22	Control: 4.788 G RMS	UUT: OSCAR
Jan 15, 2026 08:20:58	Run 8	Test axis: Z	SN: 190020

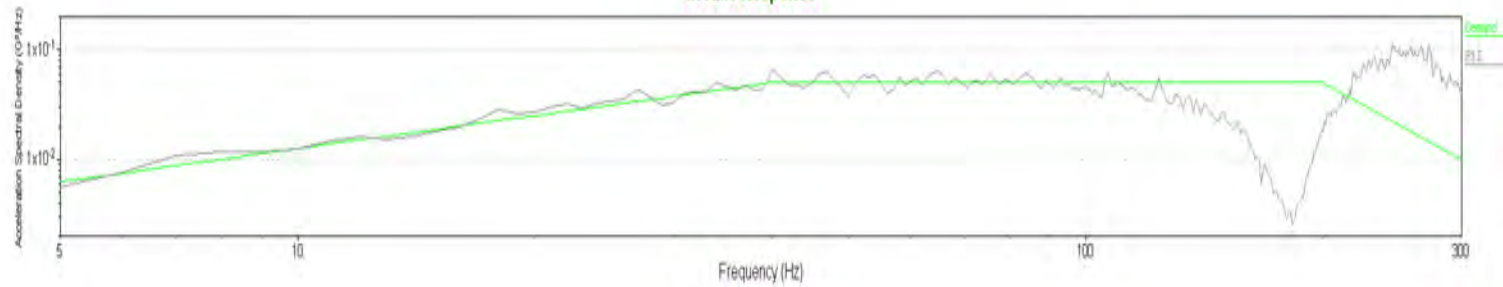


Element-Longmont	Level Time: 0:10:00	Demand: 3.368 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 0:11:14	Control: 3.366 G RMS	UUT: OSCAR
Jan 15, 2026 11:43:10	Run 9	Test axis: Z	SN: 190020

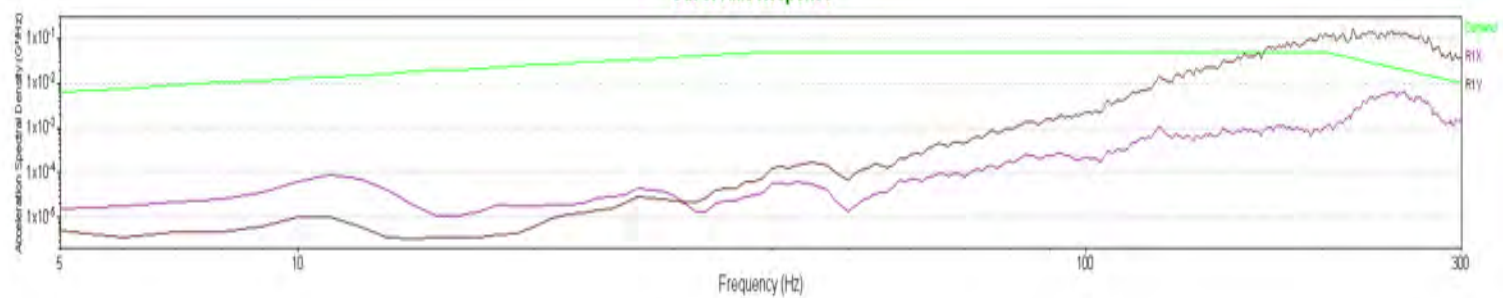
Acceleration Spectral Density



In-Axis Response



Out-of-Axis Response



5.7.6 Test Equipment List

Table 5.7-1: Vibration Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A084305	Vibration Shaker T1000	Unholtz-Dickie	T1000 1 AR	NCR	NCR
US58-A061706	Vibration Controller	Vibration Research	VR9500	03/21/2025	03/21/2026
US58-A080916	Accelerometer	Dytran Instruments	3030B5	03/28/2025	03/28/2026
US58-A080910	Accelerometer	Dytran Instruments	3030B5	11/11/2025	11/11/2026
US58-A086205	Triaxial Accelerometer	PCB Piezotronics	356A03	03/25/2025	03/25/2026
US58-A070466	Humidity & Temperature Meter	Fluke	971	07/09/2025	07/09/2026
US58-A084276	Vibration Controller	Vibration Research	VR9500	06/16/2025	06/16/2026
US58-A084273	Torque Wrench	Snap-on	QD3R150	04/23/2025	04/23/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.8 Vibration**5.8.1 Test Procedure**

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 8.0, Category R.

5.8.2 Test Result

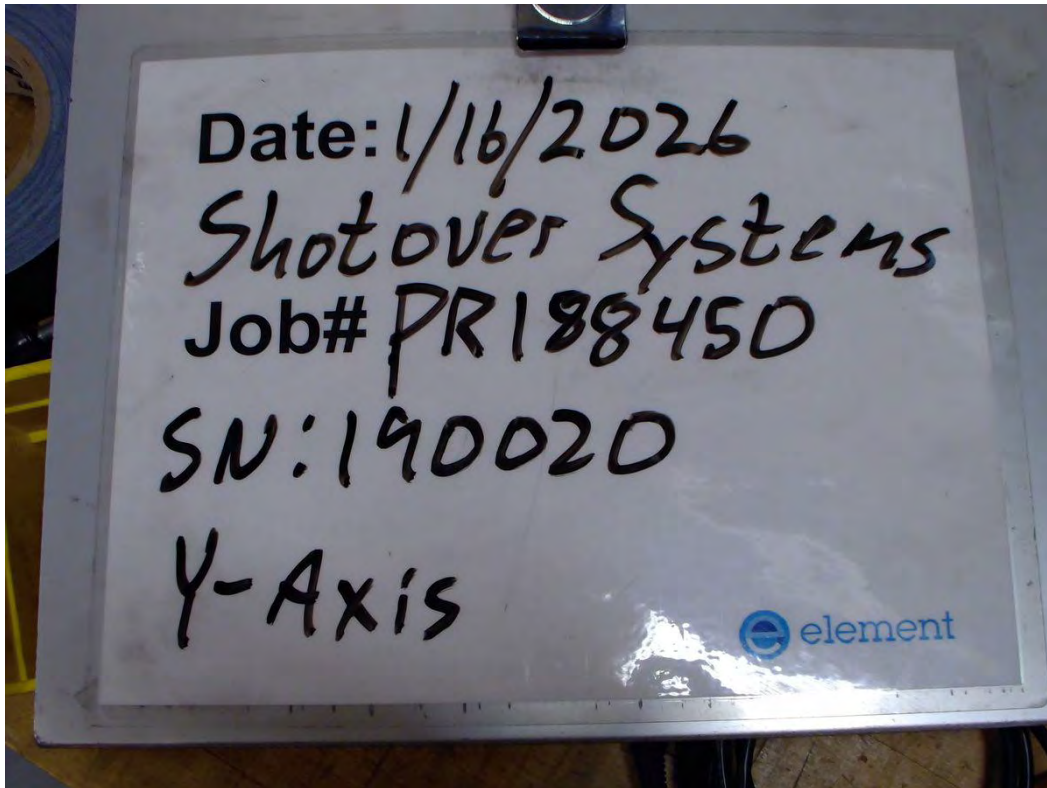
The EUT's results will be determined by SHOTOVER Systems.

5.8.3 Test Datasheets

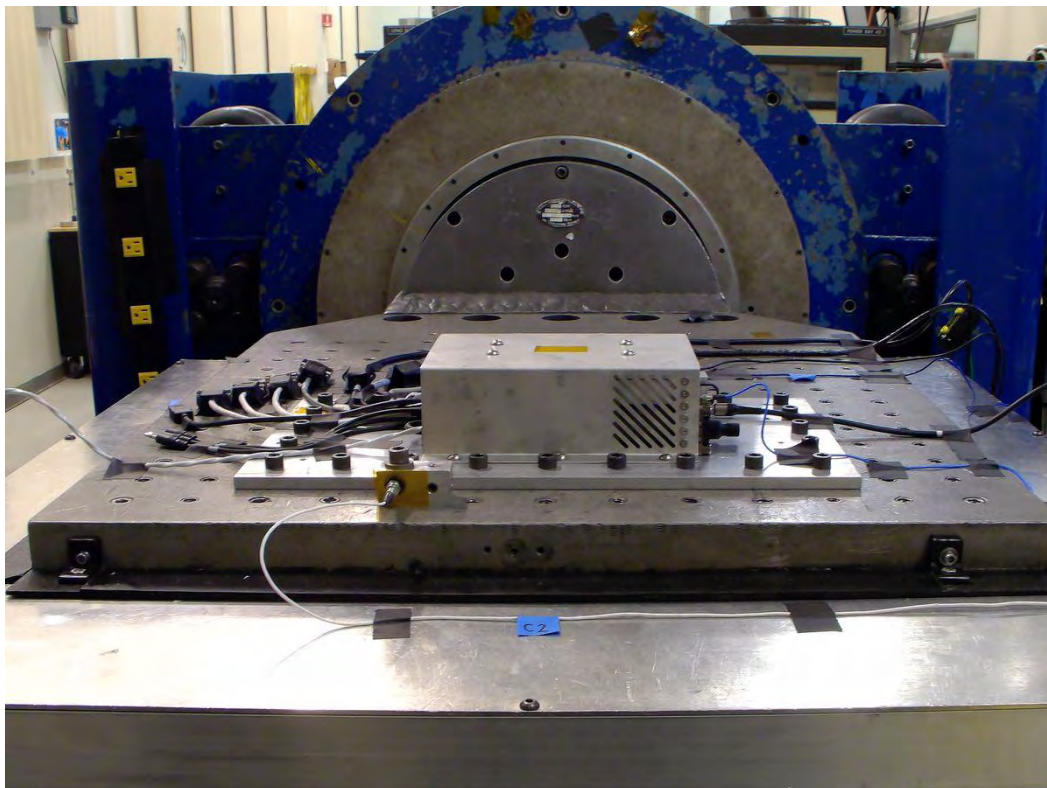
DYNAMICS TEST LOG					
Start Date:	1/16/2026		End Date:	1/19/2026	
Job No:	PR188450				
Customer:	Shotover Systems			Test Engineer:	Flynn Nyman/Brendan Arthur
Customer Witness:	Ken Haan			Lab Temp & Humidity:	67°F, 21%
Part Name:	OSCAR			Part Number:	012-0031
Test Specification:	"US211-9001-Rev0.1_In Process_OSCAR Environmental Test Plan" PDF (RTCA DO-160G)			Serial number:	190020
Test Performed:	DO-160G Category R random procedure fixed wing frequencies curves B and B1 Sine sweep: 0.5G from 10-2000 Hz at 1 oct/min				
Date	Time	Axis	Plot No.	Remarks	Initials
1/16/2026	0800	Y		Customer mounted fixture and unit to ED02 in horizontal configuration.	FN
1/16/2026	0840	Y		Control and response accels mounted to unit.	FN
1/16/2026	0908	Y	Run 1	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	FN
1/16/2026	0946	Y	Run 2	Ran DO-160 Cat R Curve B random vibe for 0:10:00.	FN
1/16/2026	1003	Y	Run 3	Ran DO-160 Cat R Curve B1 Endurance random vibe for 3:00:00.	FN
1/16/2026	1316	Y	Run 4	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	FN
1/16/2026	1345	X		Fixture was rotated for X-axis testing.	FN
1/16/2026	1359	X	Run 5	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	FN
1/16/2026	1410	X	Run 6	Ran DO-160 Cat R Curve B random vibe for 0:10:00.	FN
1/19/2026	0816	X	Run 7	Ran DO-160 Cat R Curve B1 Endurance random vibe for 3:00:00.	BMA
1/19/2026	1125	X	Run 8	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA
1/19/2026	1145			Removed UUT and fixture in order to mount vertical adapter plate	BMA
1/19/2026	1219	Z		Mounted vertical adapter plate with 2 controls in order to confirm proper control response	BMA
1/19/2026	1234	Z	Run 9	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA

1/19/2026	1324	Z		UUT mounted to shaker in the Z-Axis with 2 controls and 1 response accelerometer	BMA
1/19/2026	1324	Z	Run 10	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA
1/19/2026	1347	Z	Run 11	Ran DO-160 Cat R Curve B random vibe for 0:10:00.	BMA
1/19/2026	1401	Z	Run 12	Ran DO-160 Cat R Curve B1 Endurance random vibe for 3:00:00.	BMA
1/19/2026	1711	Z	Run 13	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA
1/19/2026				Testing Complete. No Anomalies noted on UUT during testing.	BMA
1/19/2026				Customer to make final determination on Pass/Fail of UUT upon further inspection.	BMA

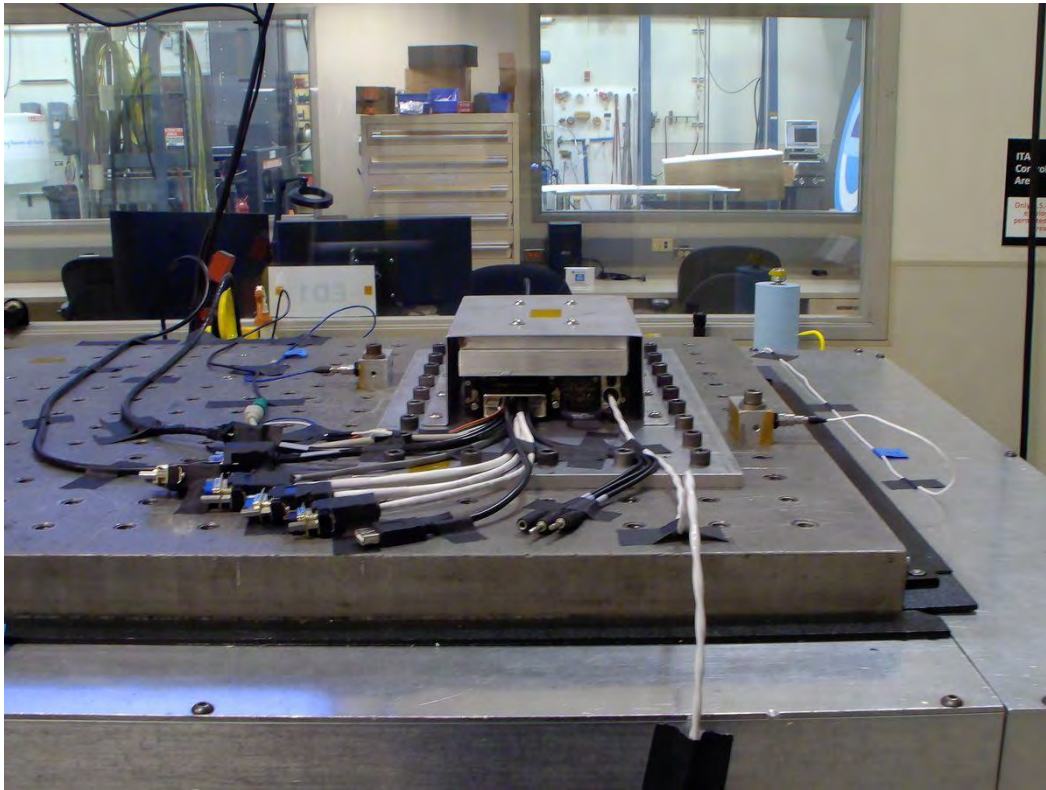
5.8.4 Test Photographs



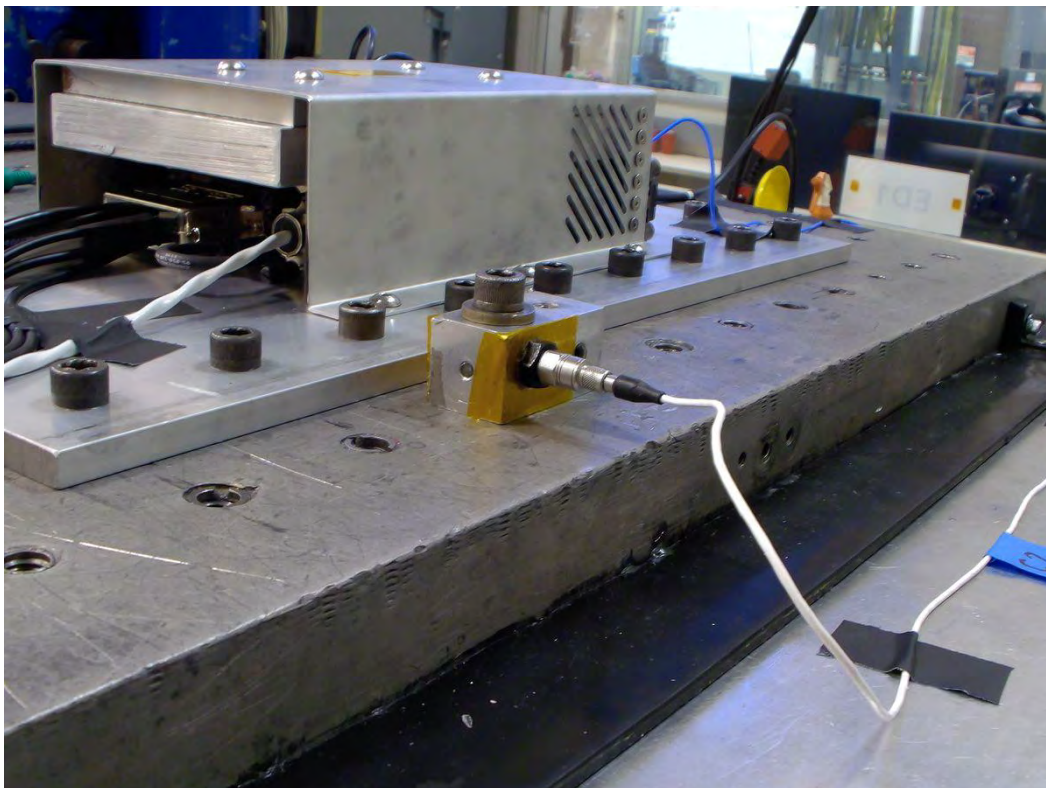
UUT_Y-Axis



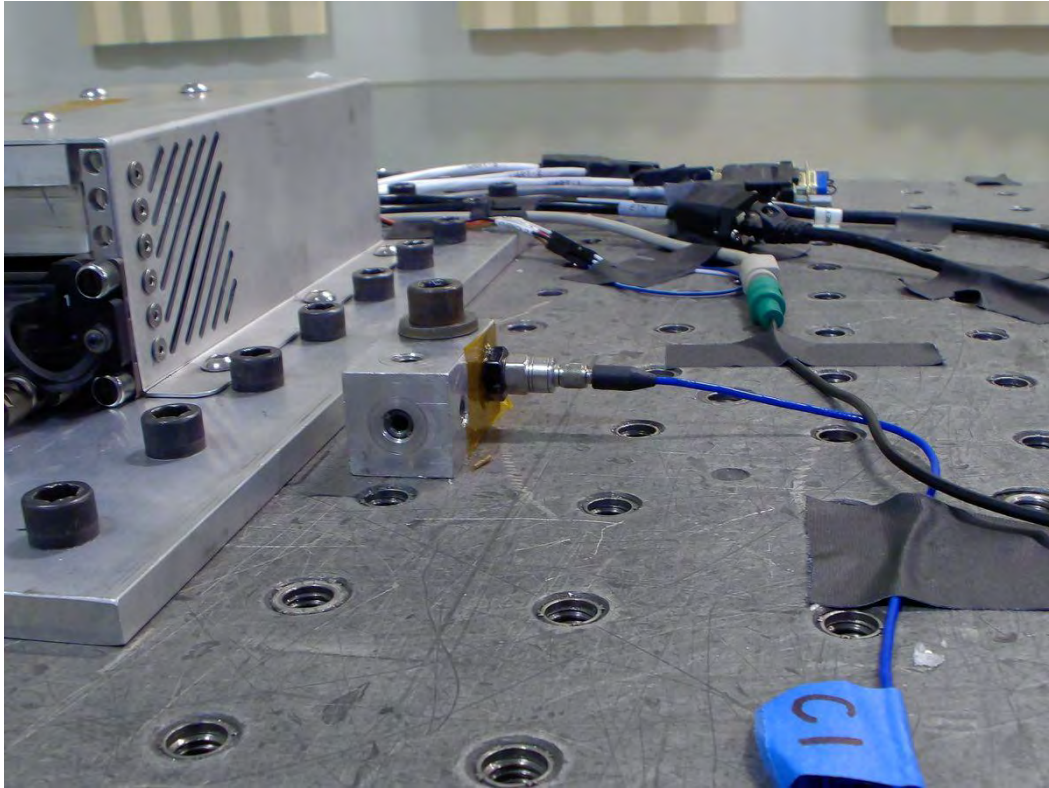
UUT_Y-Axis



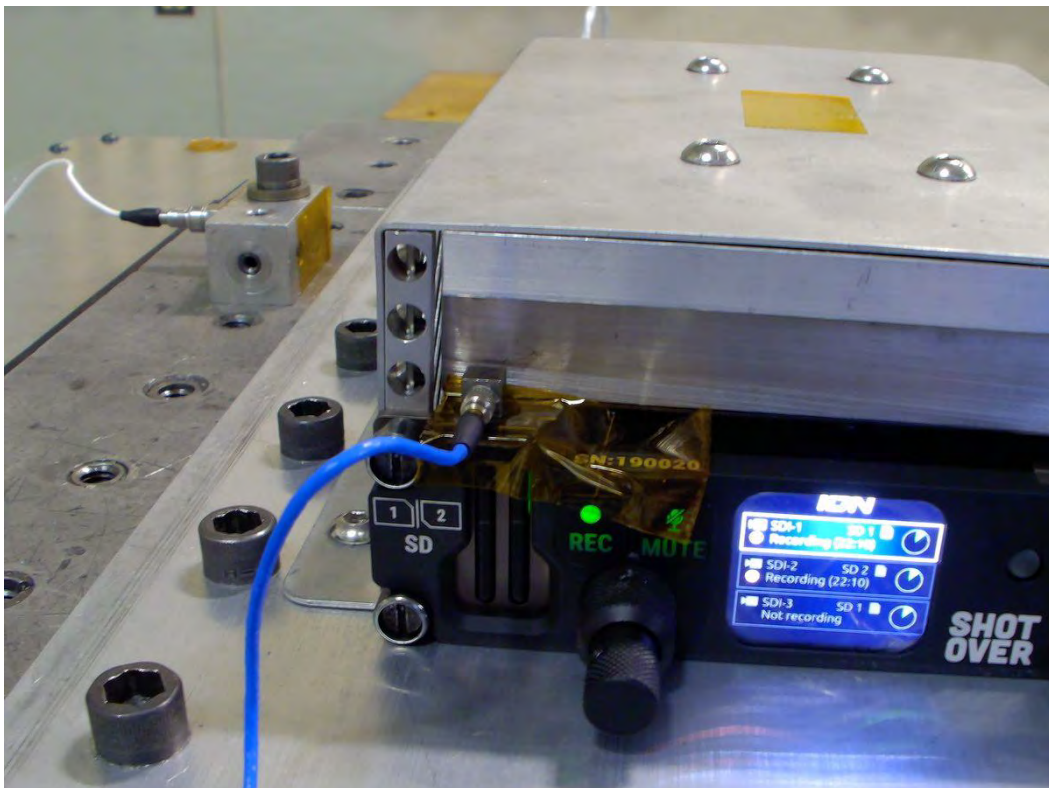
UUT_Y-Axis



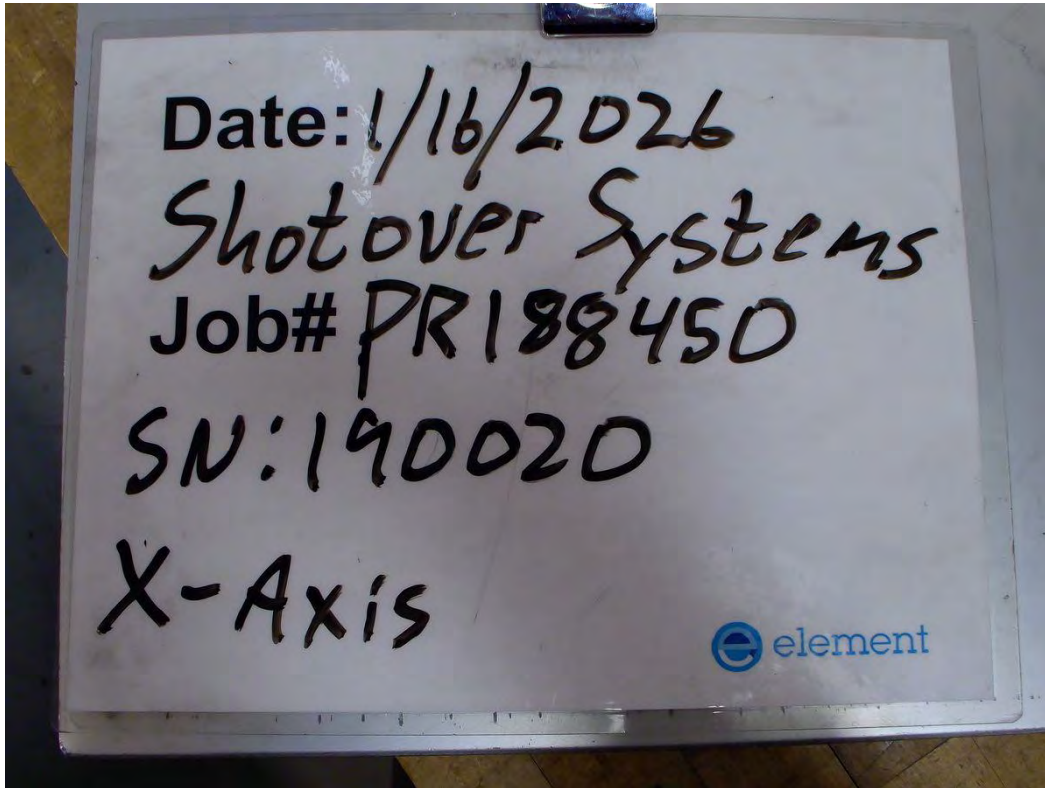
UUT_Y-Axis



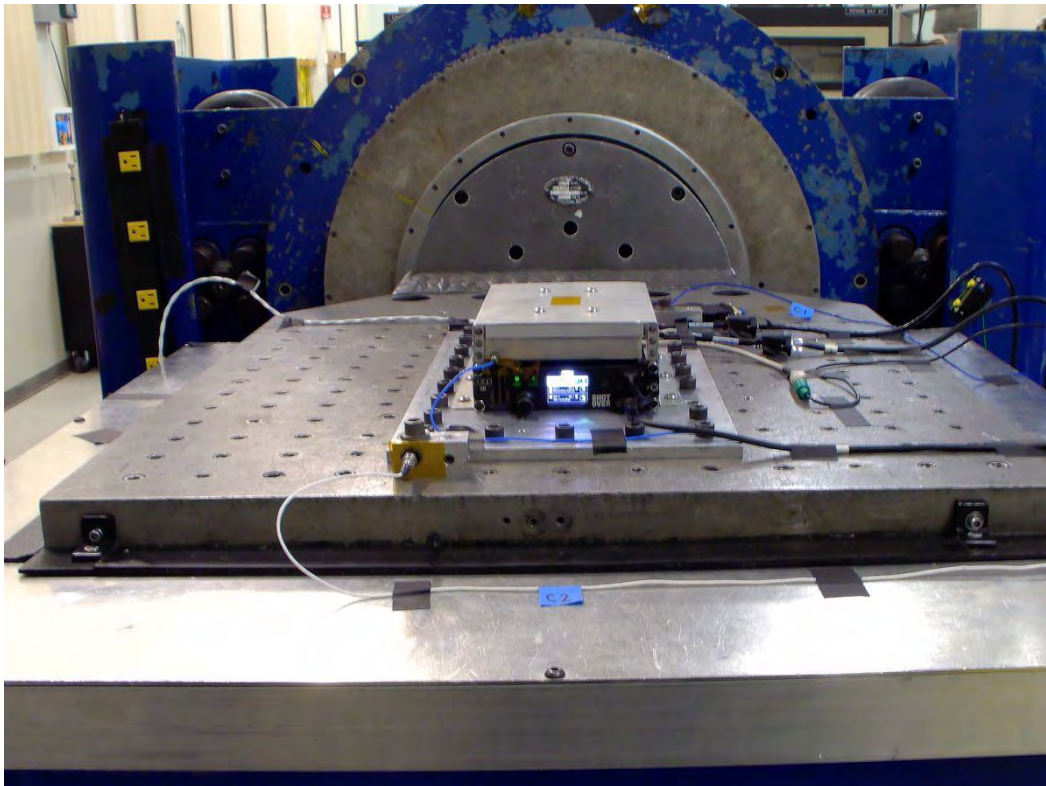
UUT_Y-Axis



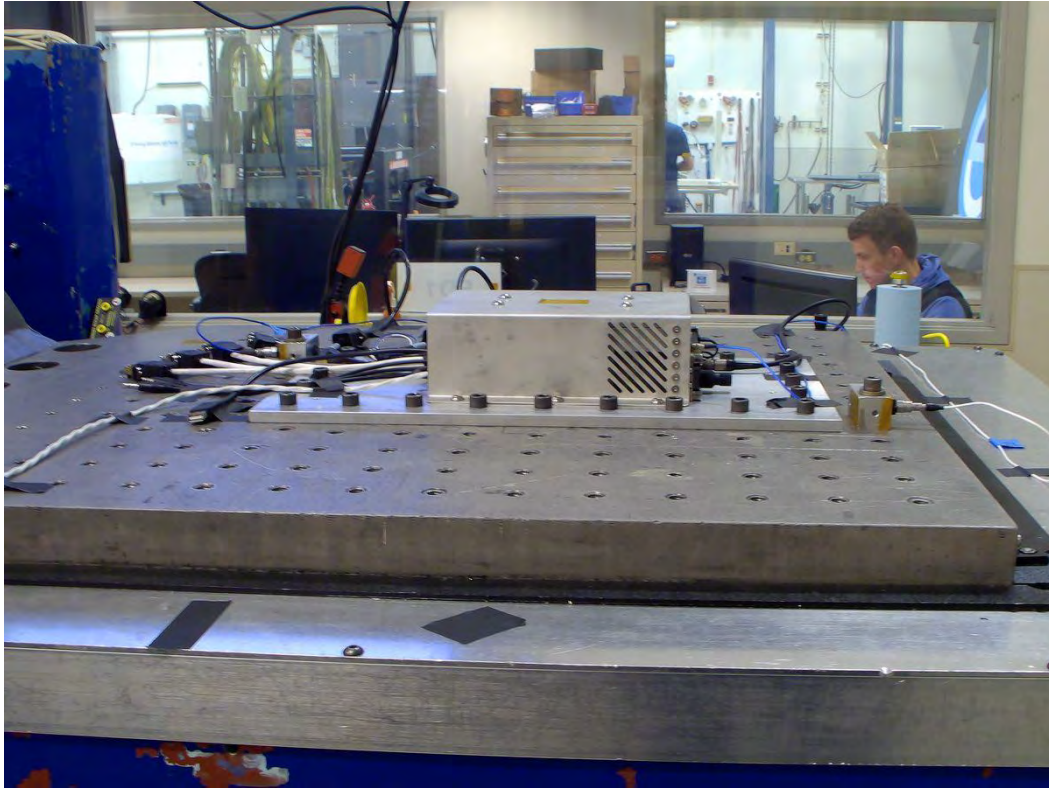
UUT_Y-Axis



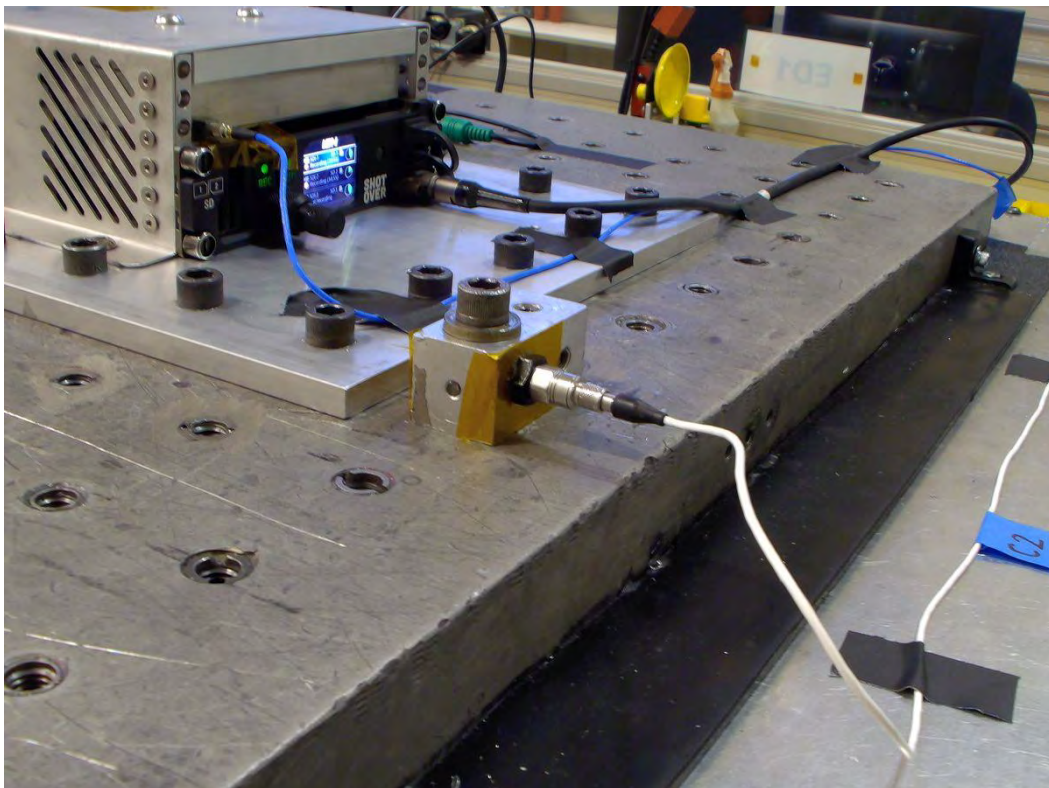
UUT_X-Axis



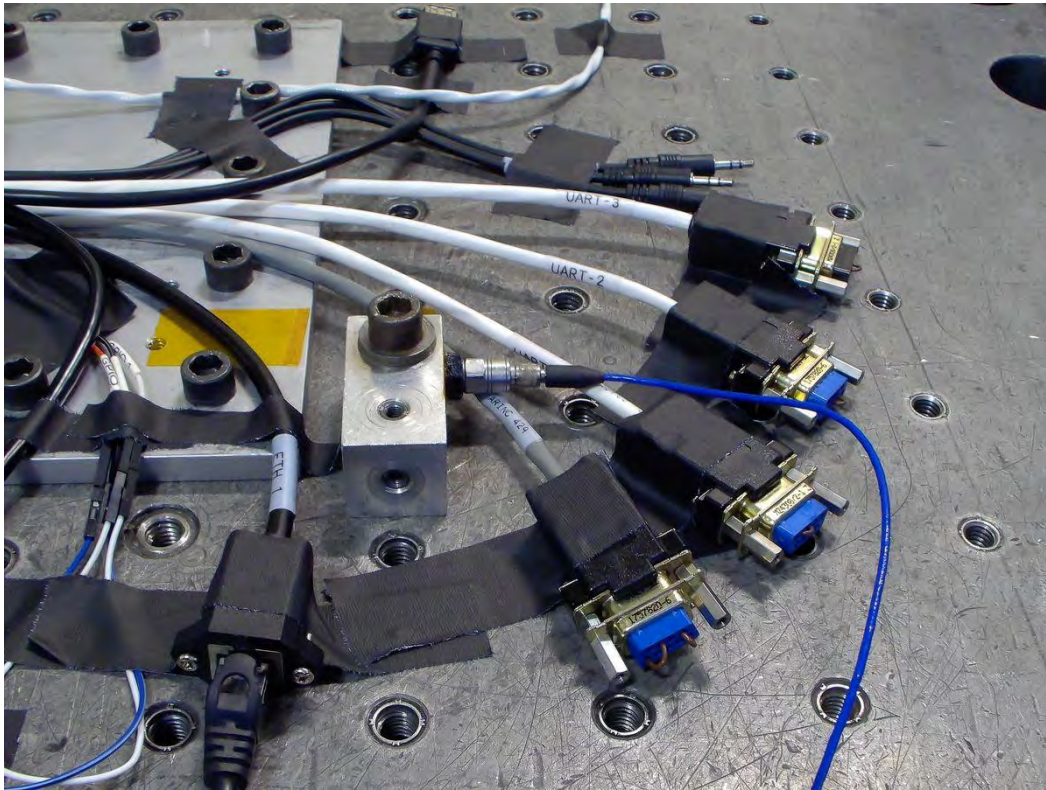
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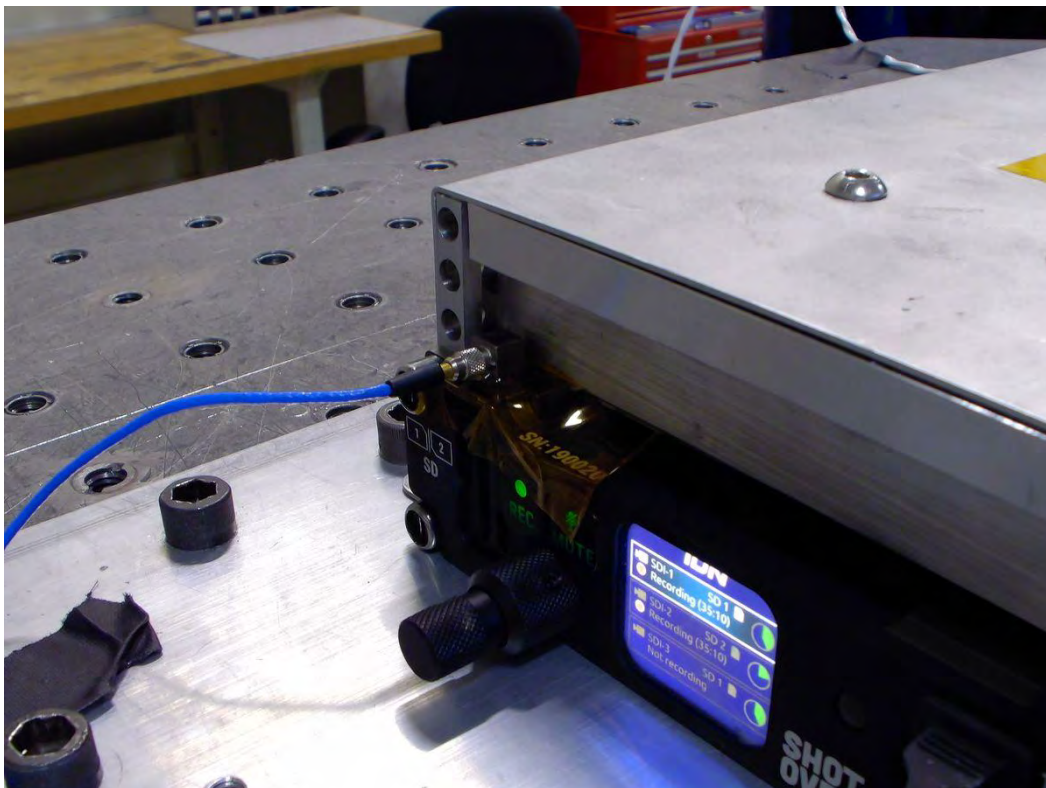
UUT_X-Axis



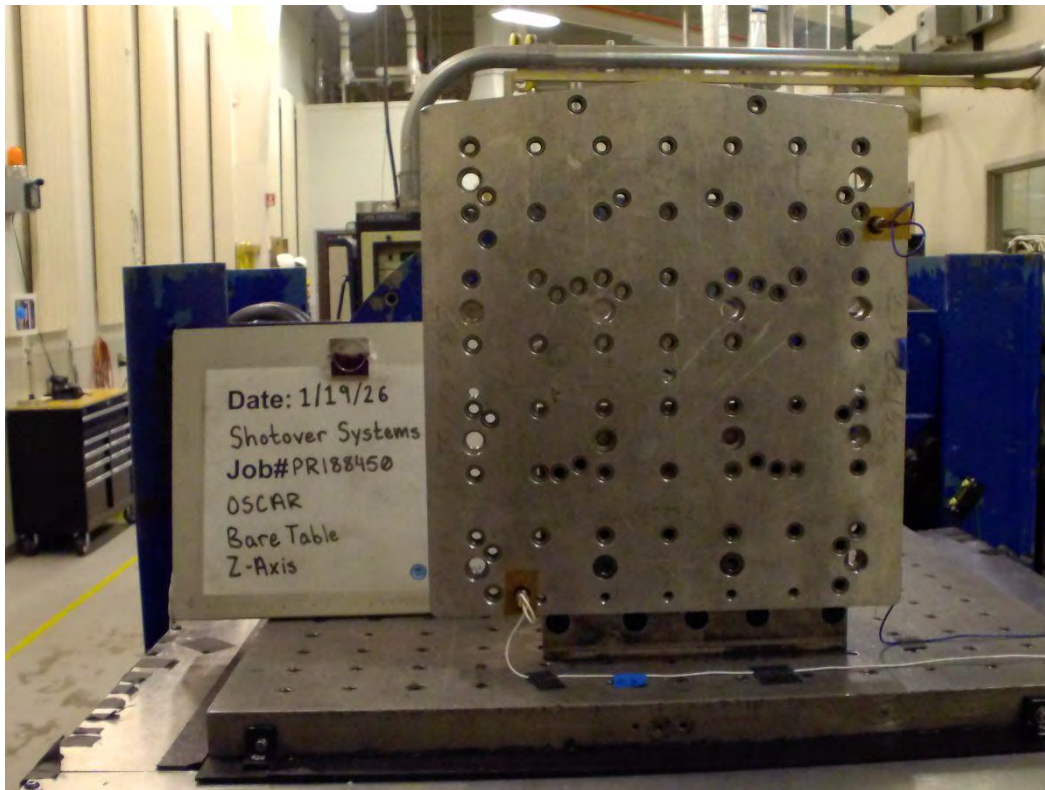
UUT_X-Axis



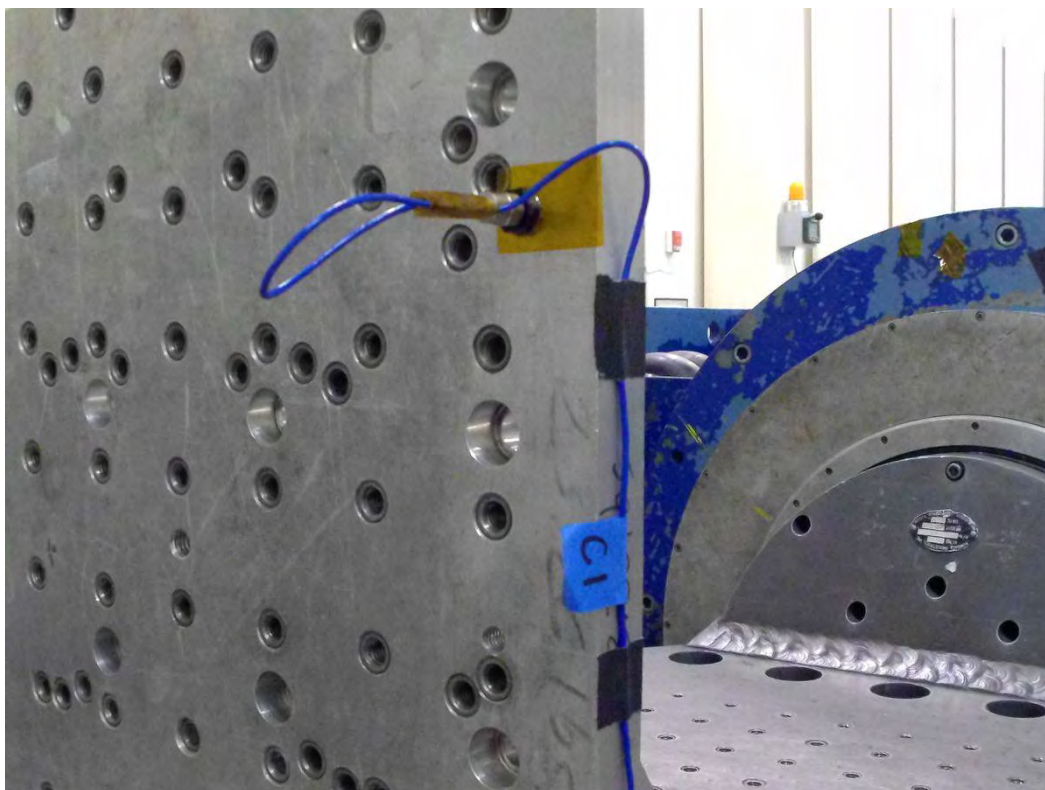
UUT_X-Axis



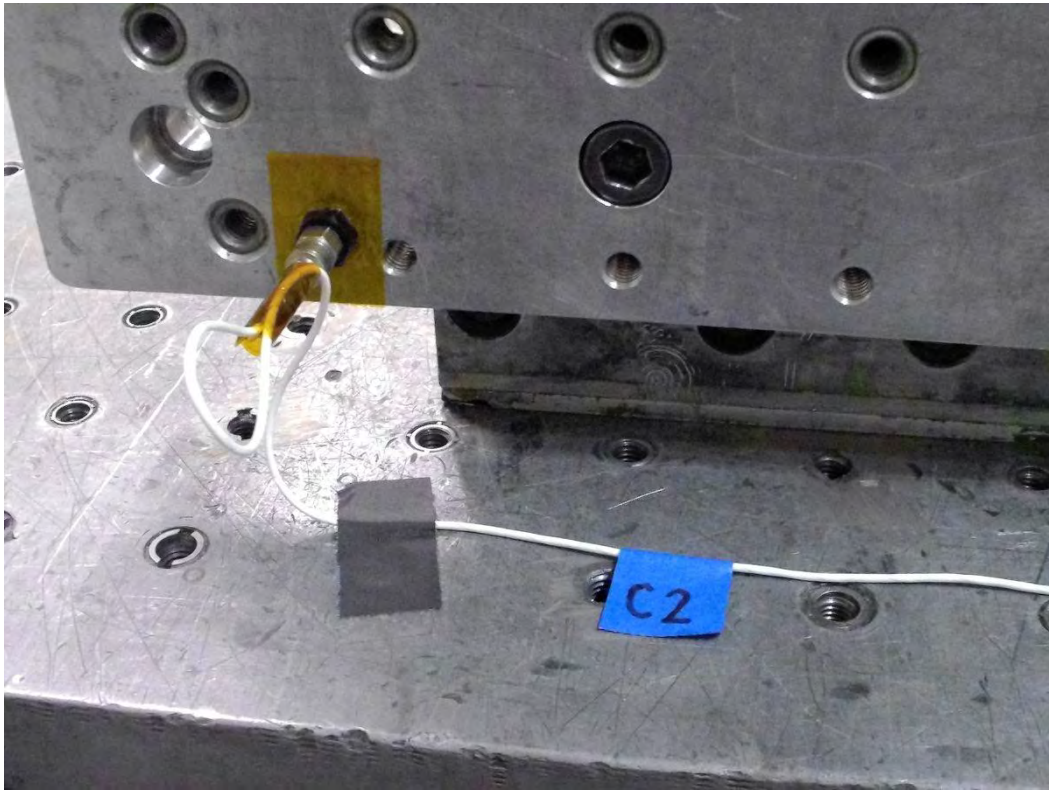
UUT_X-Axis



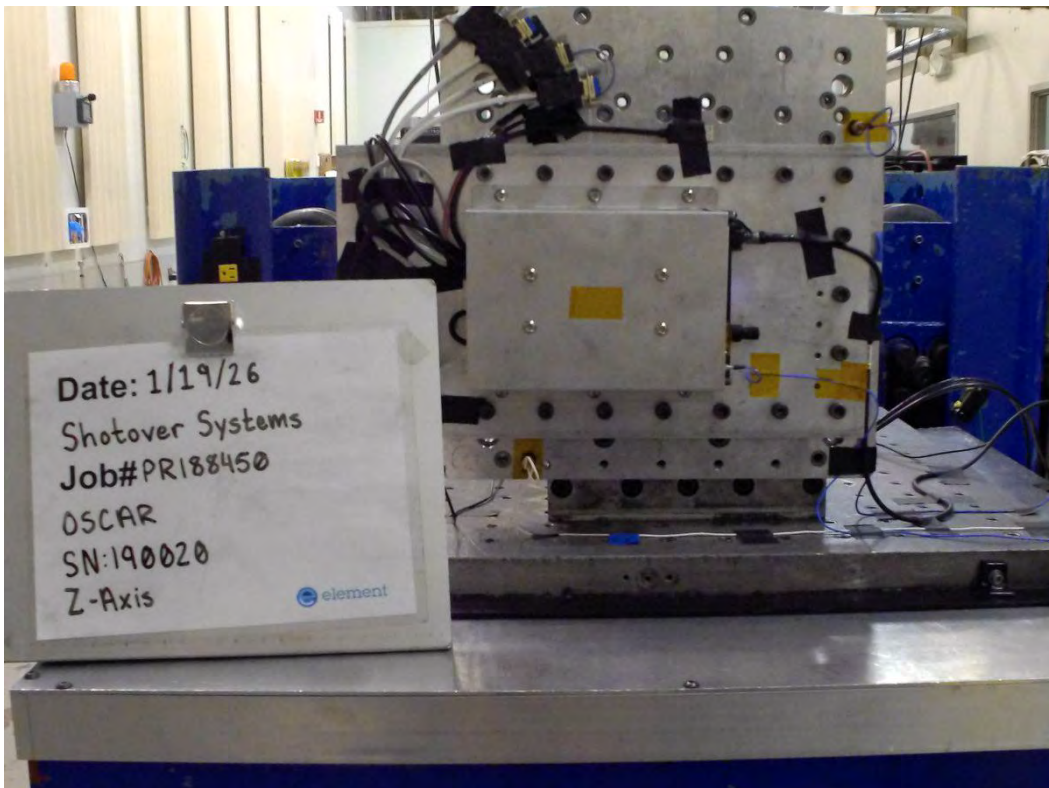
Bare Table _Z-Axis



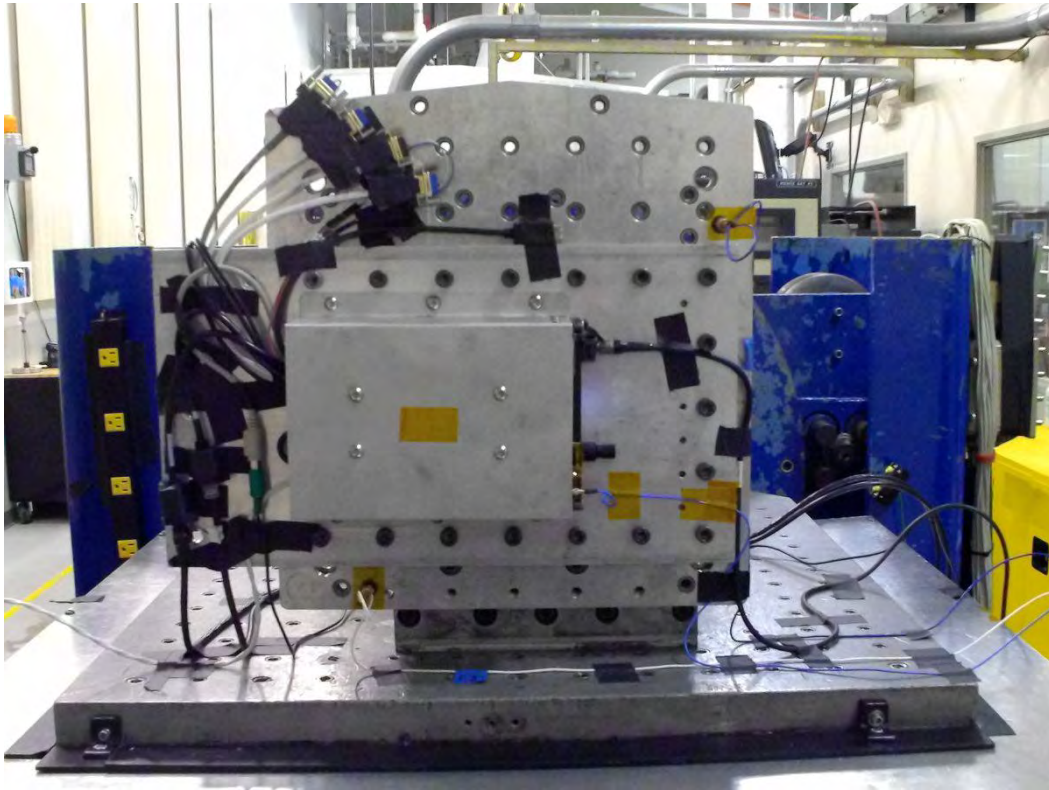
Bare Table _Z-Axis



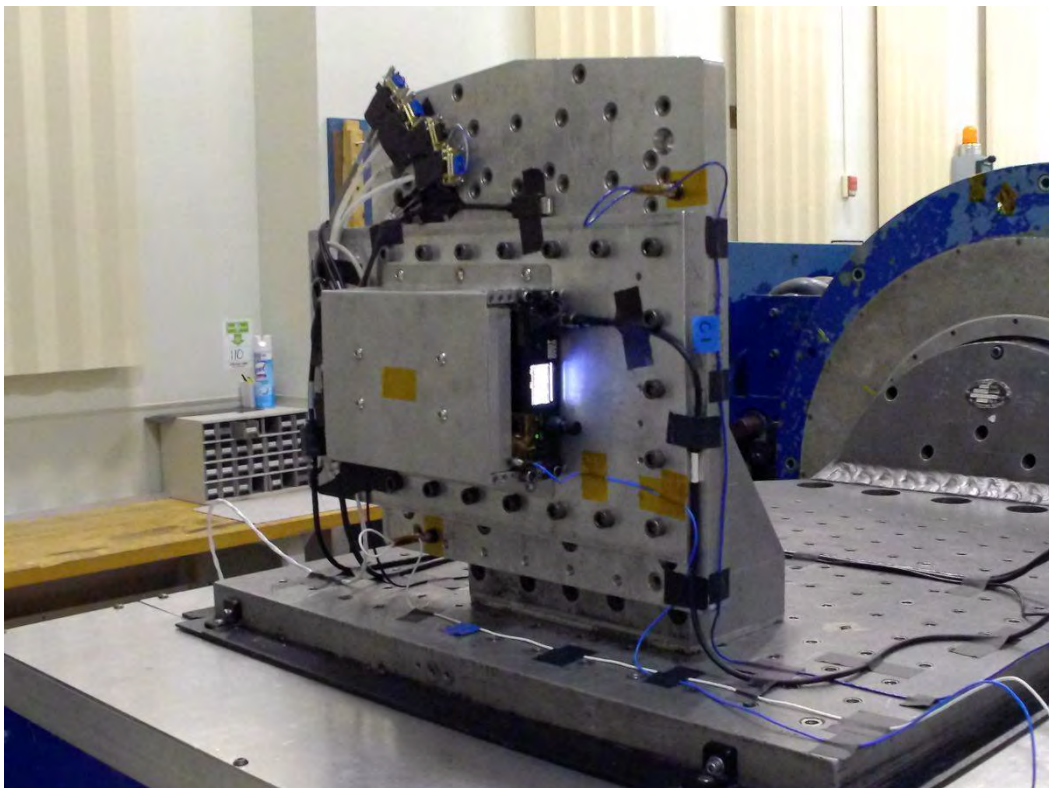
Bare Table_Z-Axis



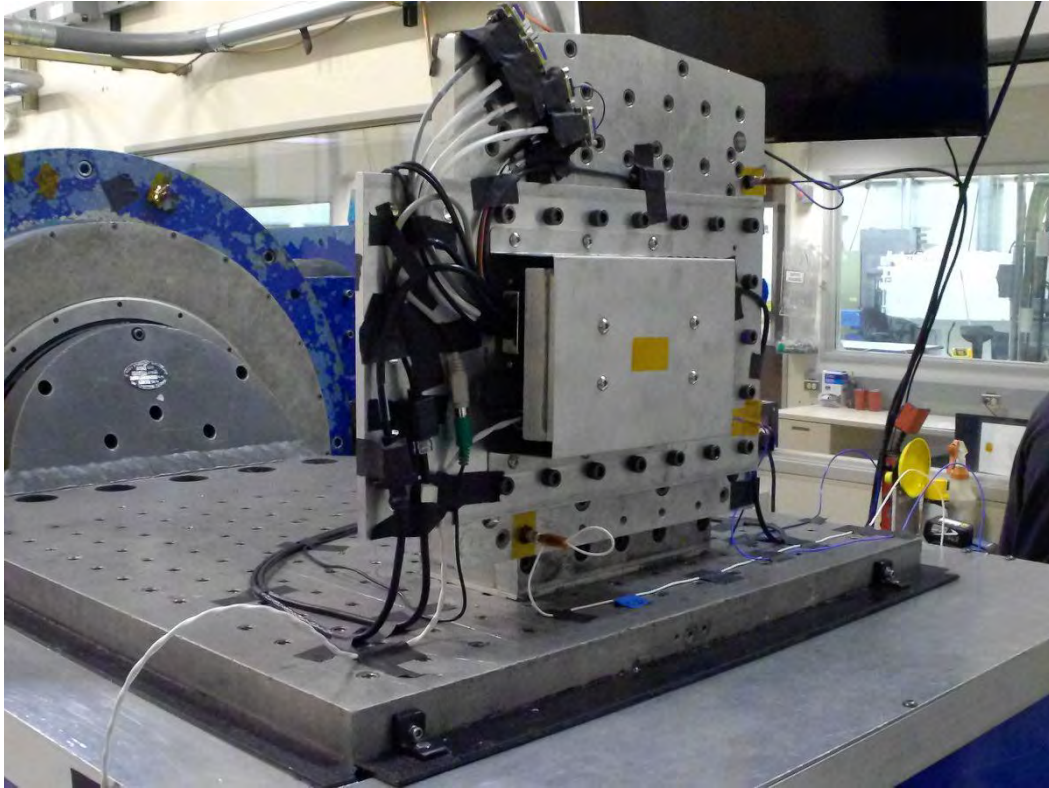
UUT_Z-Axis



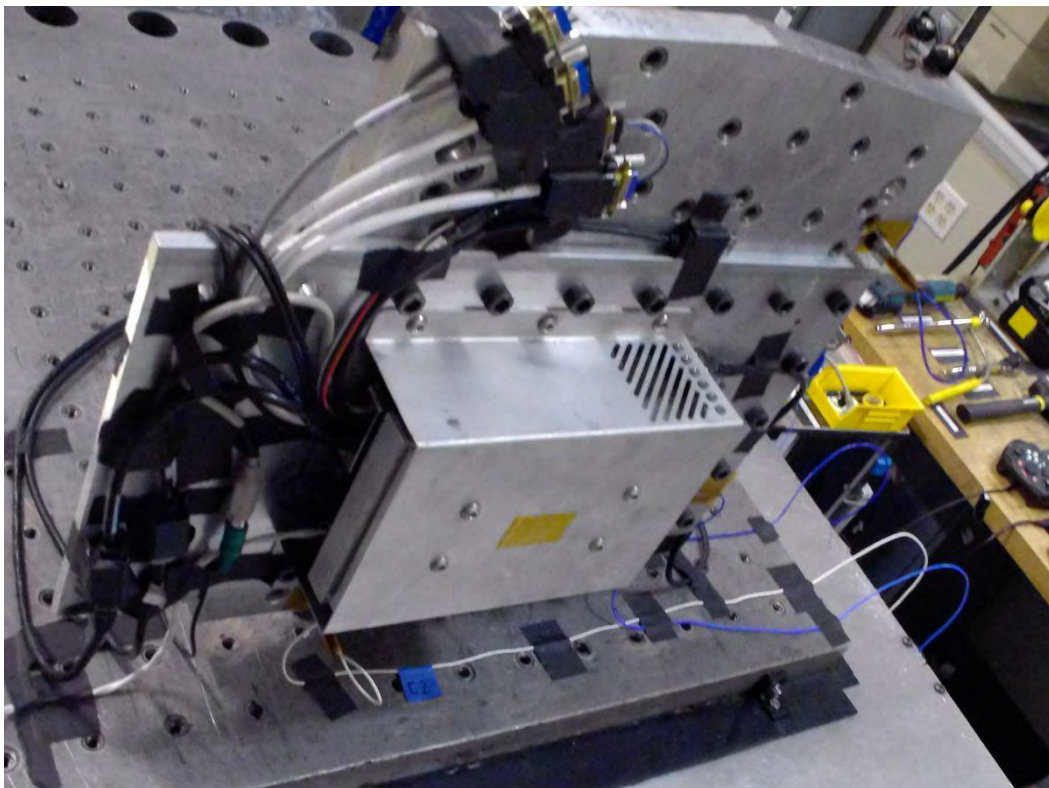
UUT_Z-Axis



UUT_Z-Axis



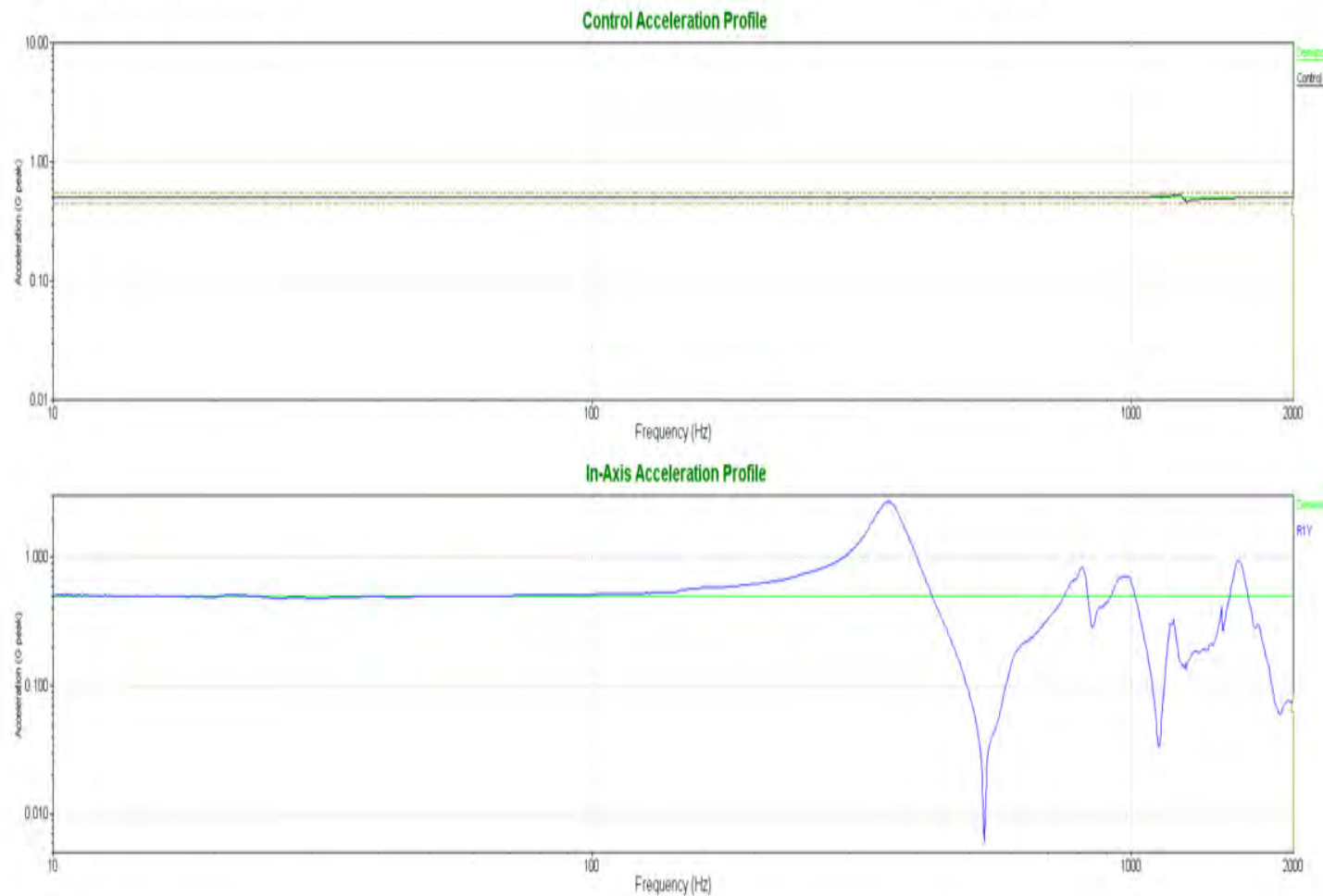
UUT_Z-Axis



UUT_Z-Axis

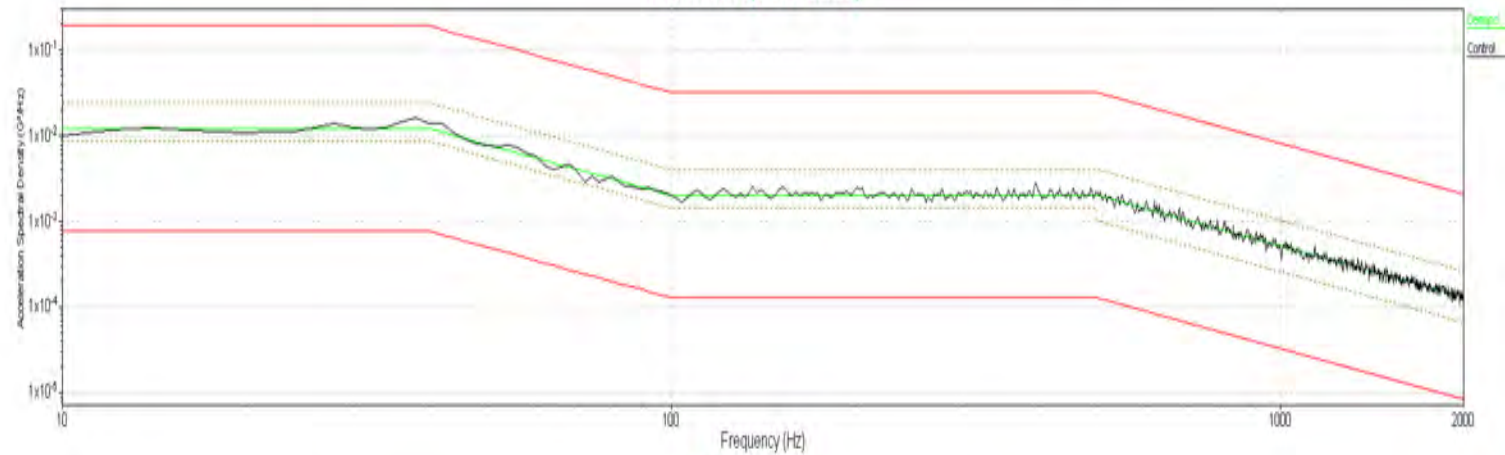
5.8.5 Test Data

Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.502 G	UUT: OSCAR
Start time: Jan 16, 2026 09:08:51 Run 1		Test axis: Y	S/N: 190020

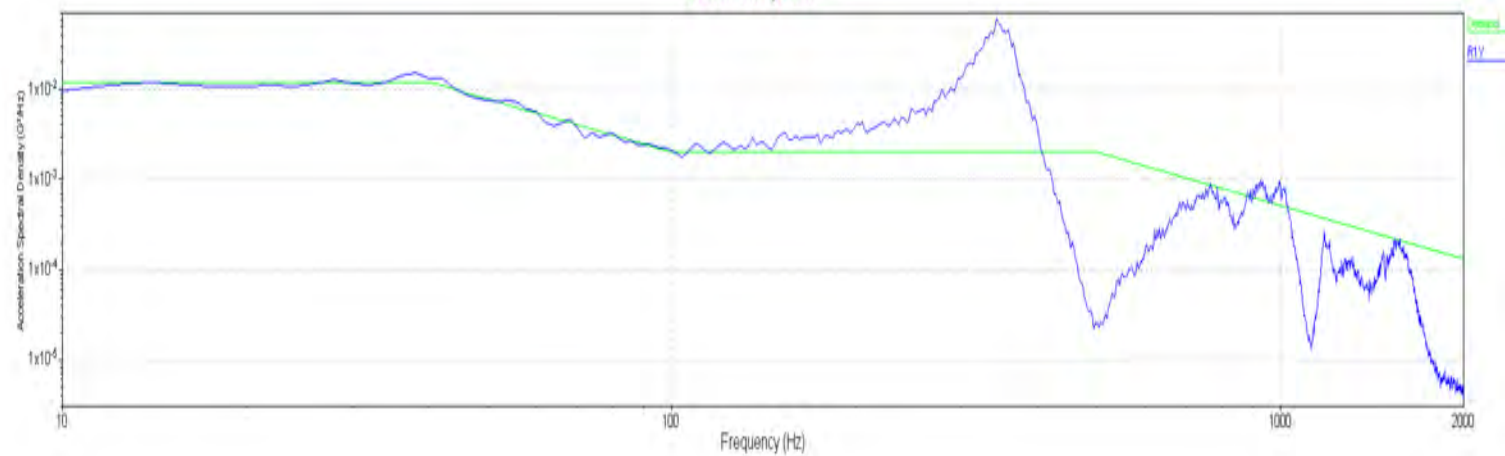


Element- Denver	Level Time: 0:10:00	Demand: 1.492 G RMS	PR188450
Shotover Systems	Total Time: 0:10:55	Control: 1.507 G RMS	UUT: OSCAR
Jan 16, 2026 09:46:41	Run 2	Test axis: Y	SN: 190020

Acceleration Spectral Density

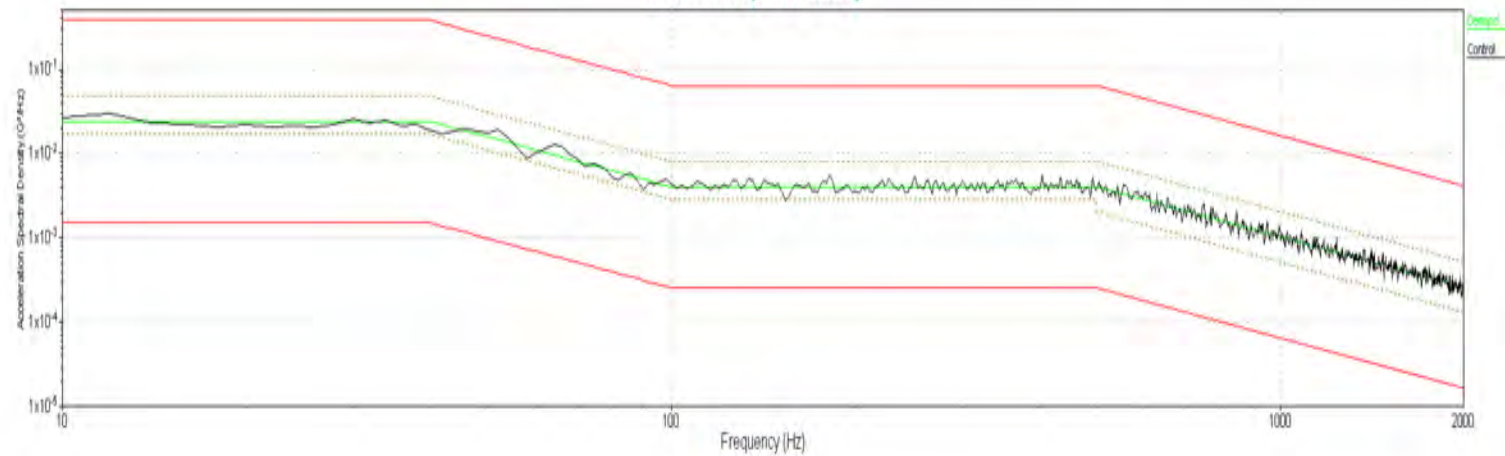


In-Axis Response

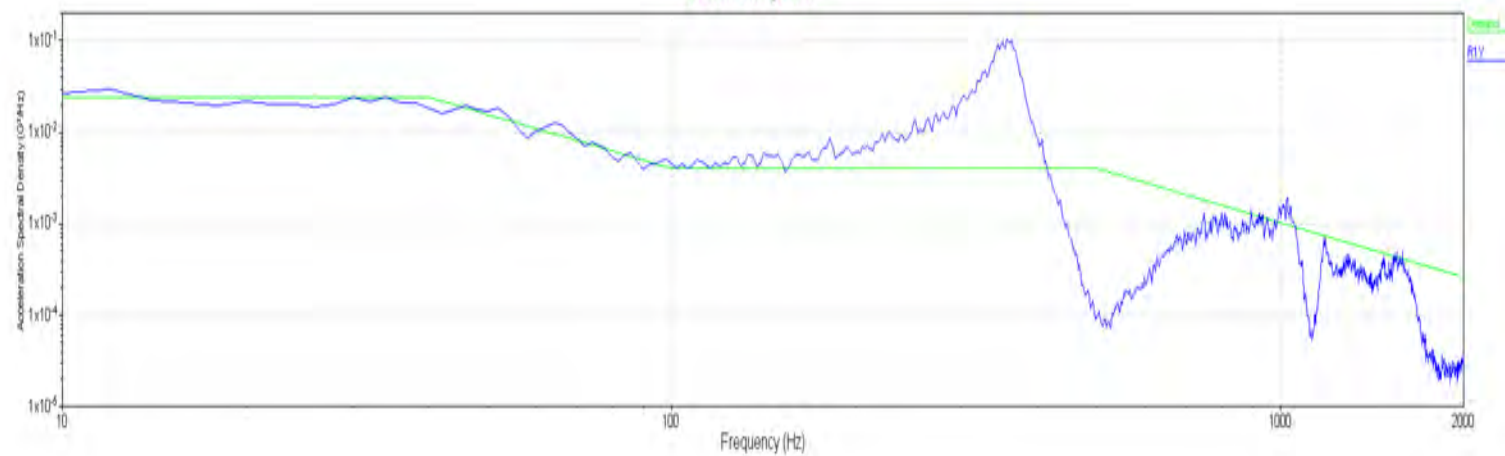


Element- Denver	Level Time: 3:00:00	Demand: 2.11 G RMS	PR188450
Shotover Systems	Total Time: 3:02:06	Control: 2.119 G RMS	UUT: OSCAR
Jan 16, 2026 10:03:35	Run 3	Test axis: Y	SN: 190020

Acceleration Spectral Density

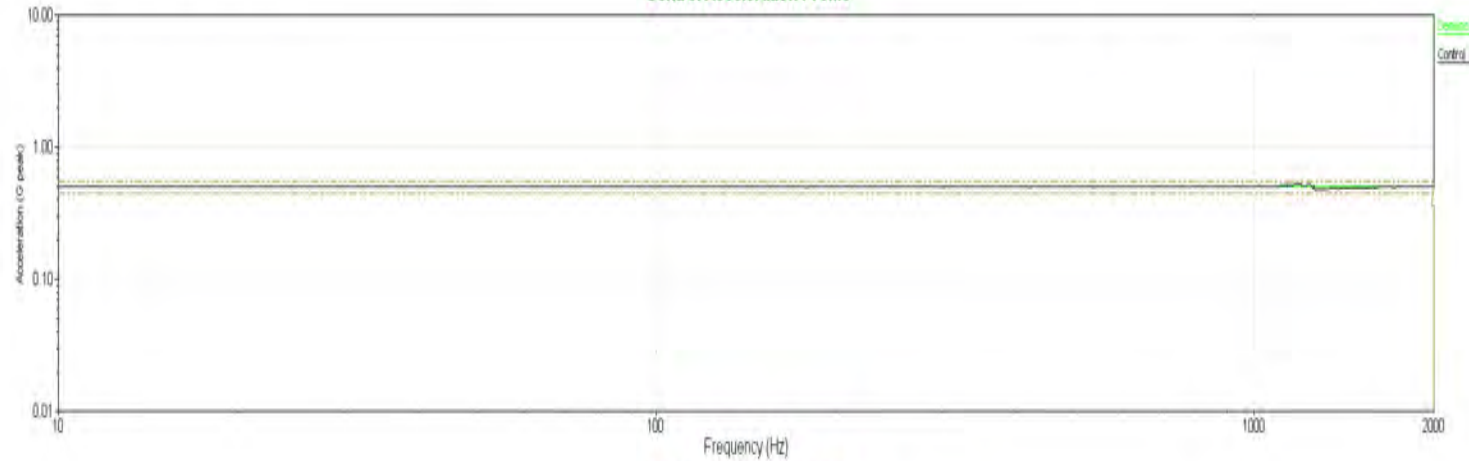


In-Axis Response

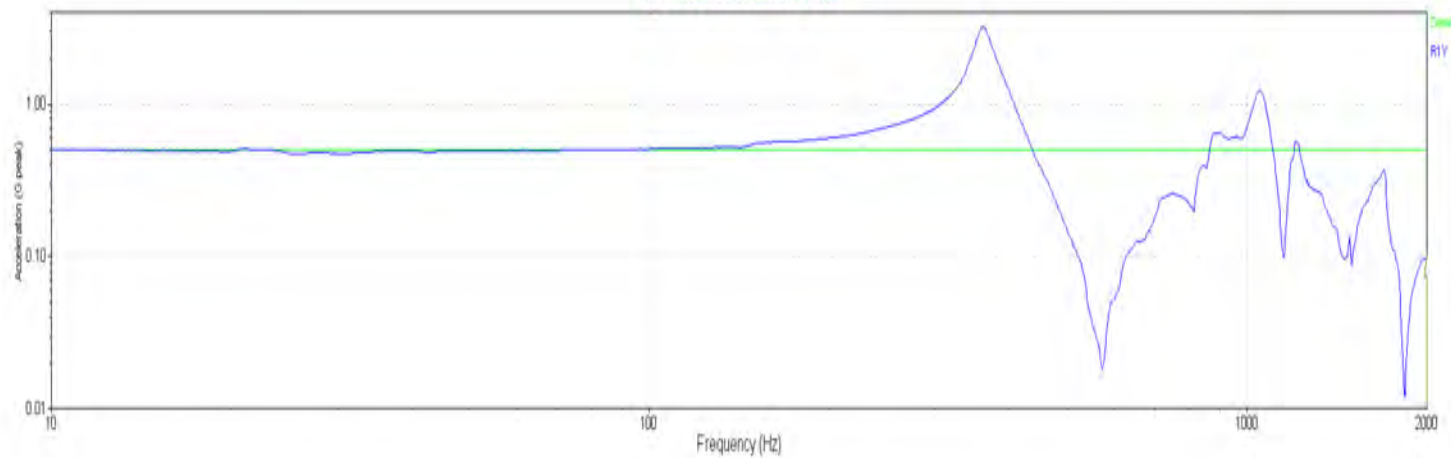


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5045 G	UUT: OSCAR
Start time: Jan 16, 2026 13:16:31 Run 4		Test axis: Y	S/N: 190020

Control Acceleration Profile

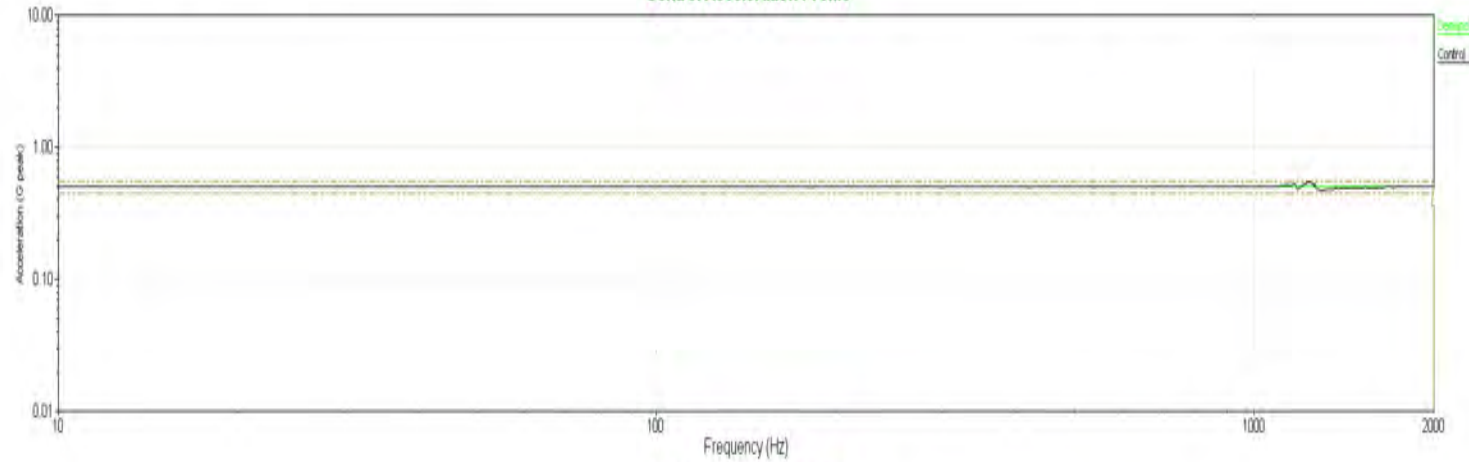


In-Axis Acceleration Profile

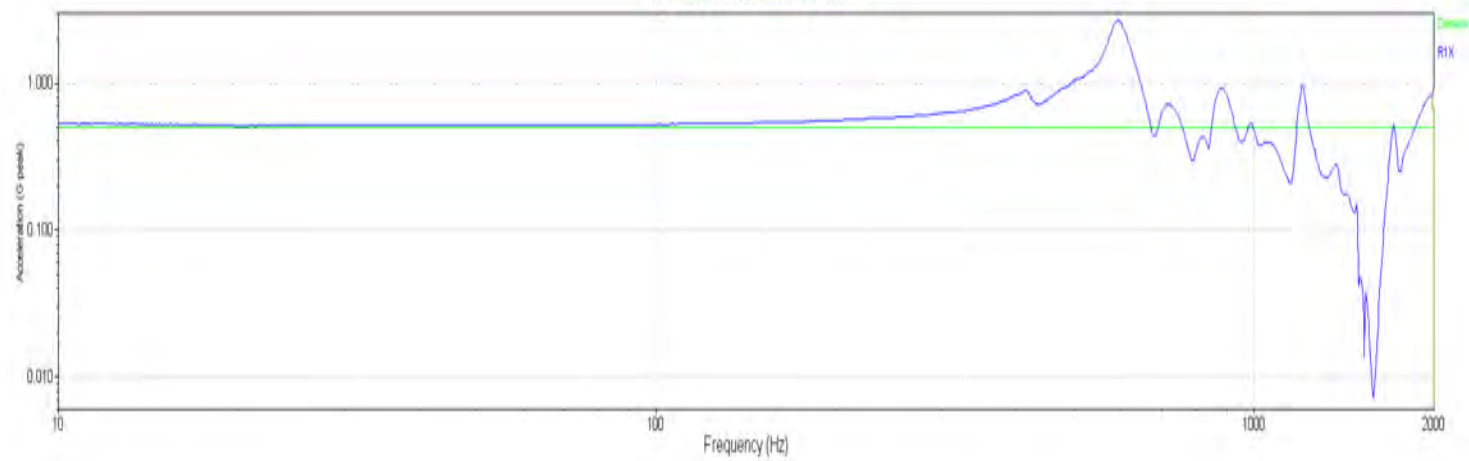


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5038 G	UUT: OSCAR
Start time: Jan 16, 2026 13:59:31 Run 5		Test axis: X	S/N: 190020

Control Acceleration Profile

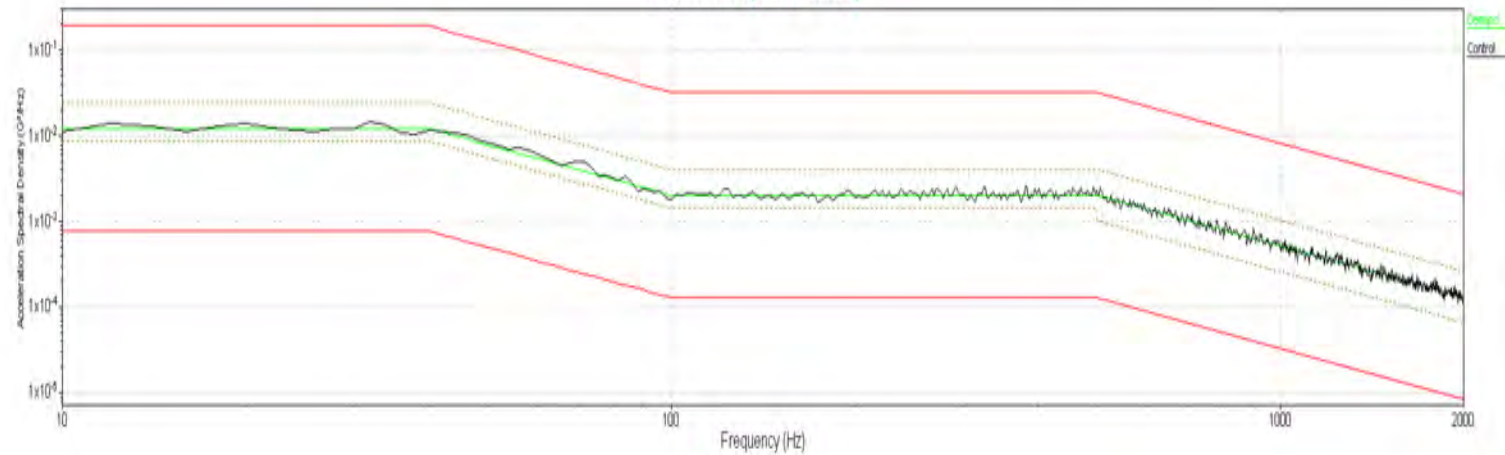


In-Axis Acceleration Profile

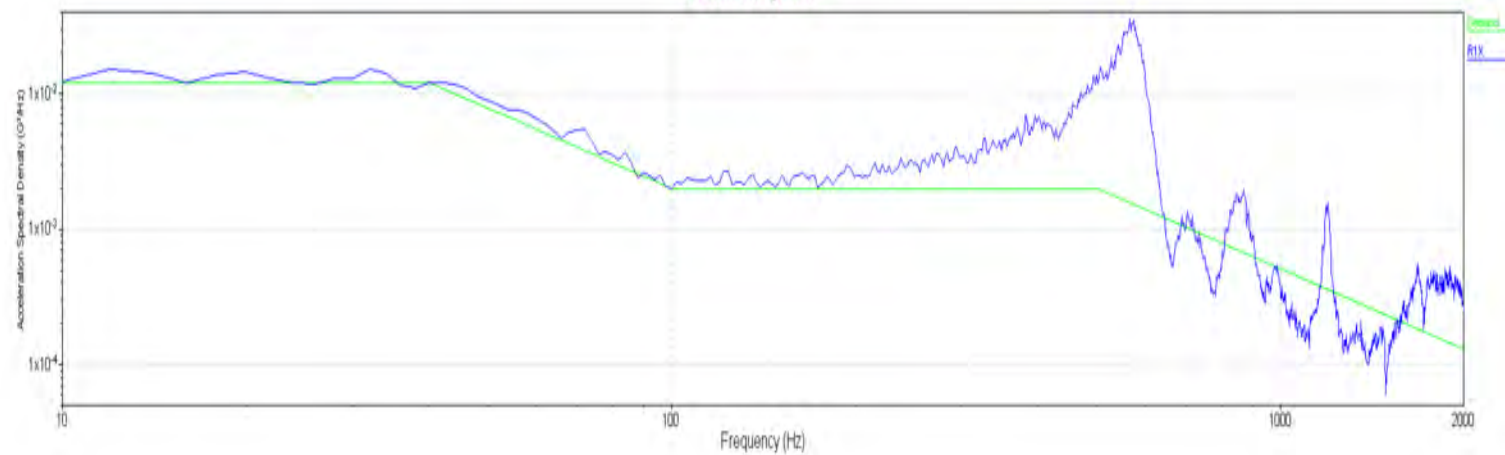


Element- Denver	Level Time: 0:10:00	Demand: 1.492 G RMS	PR188450
Shotover Systems	Total Time: 0:10:54	Control: 1.513 G RMS	UUT: OSCAR
Jan 16, 2026 14:10:40	Run 6	Test axis: X	SN: 190020

Acceleration Spectral Density

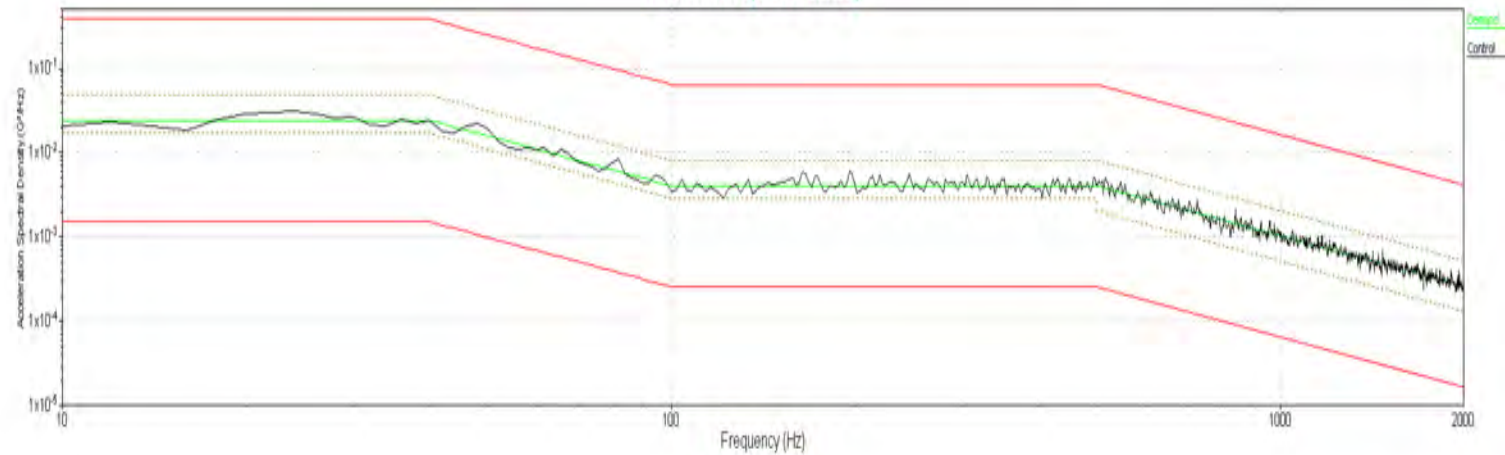


In-Axis Response

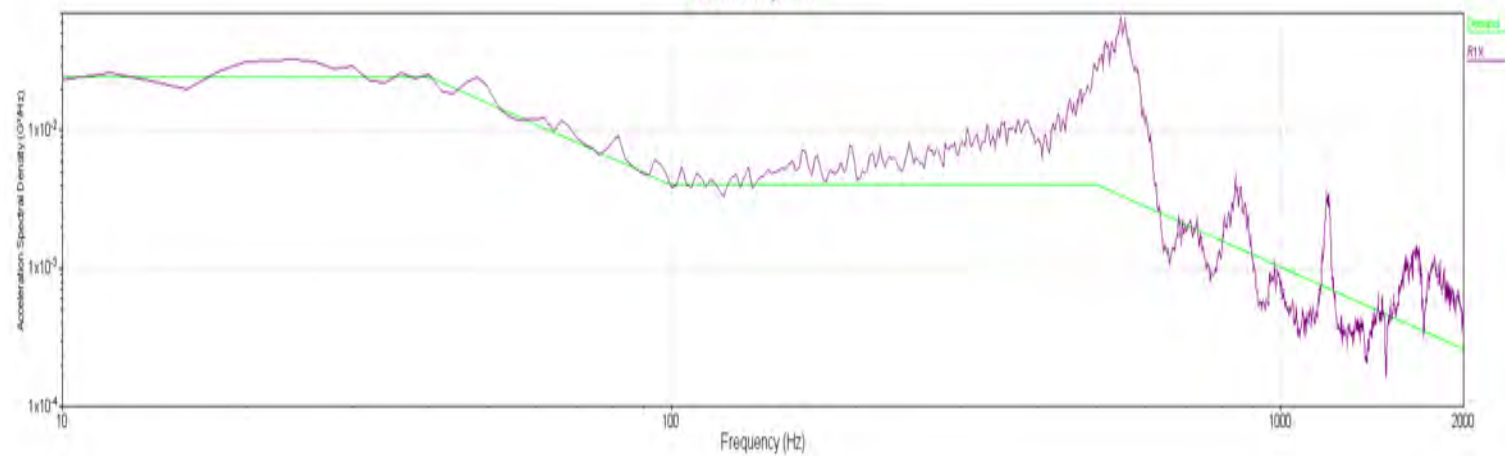


Element- Denver	Level Time: 3:00:00	Demand: 2.11 G RMS	PR188450
Shotover Systems	Total Time: 3:01:03	Control: 2.131 G RMS	UUT: OSCAR
Jan 19, 2026 08:16:03	Run 7	Test axis: X	SN: 190020

Acceleration Spectral Density

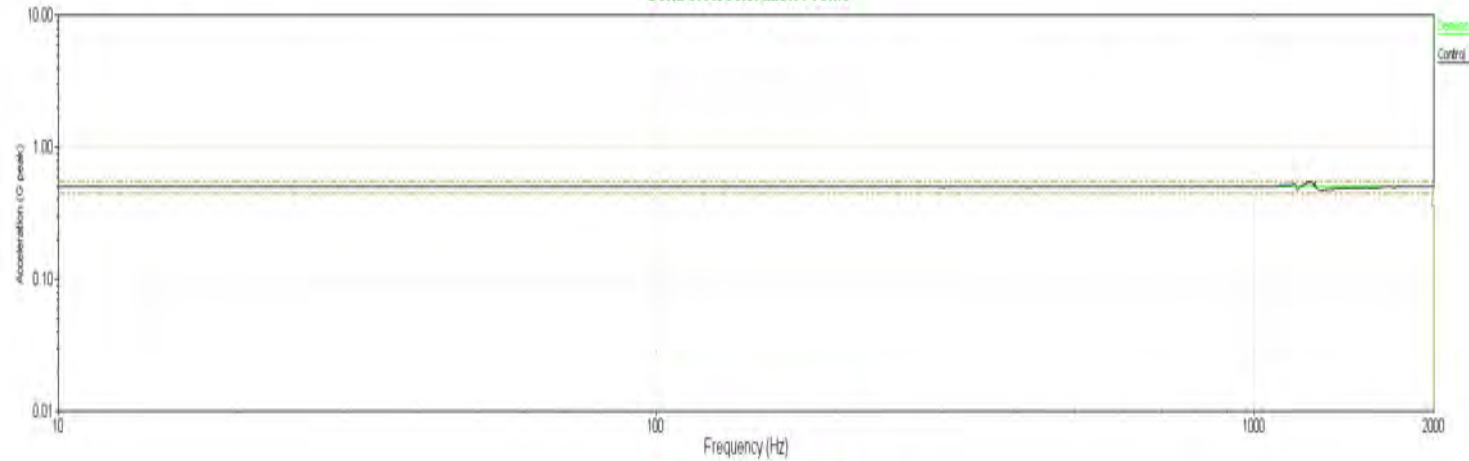


In-Axis Response

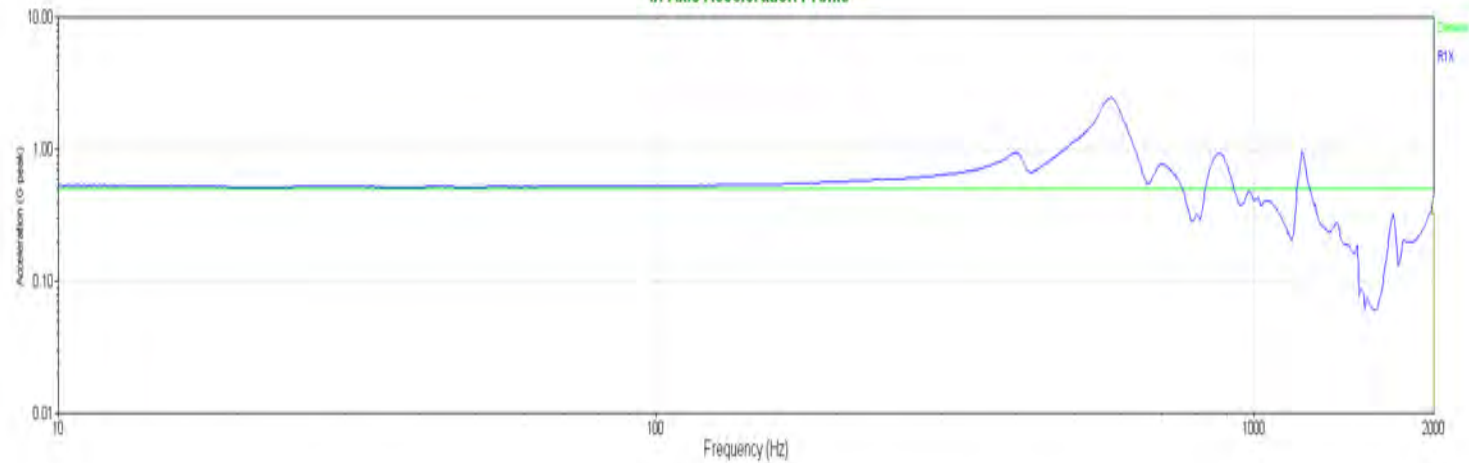


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5043 G	UUT: OSCAR
Start time: Jan 19, 2026 11:25:47 Run 8		Test axis: X	S/N: 190020

Control Acceleration Profile

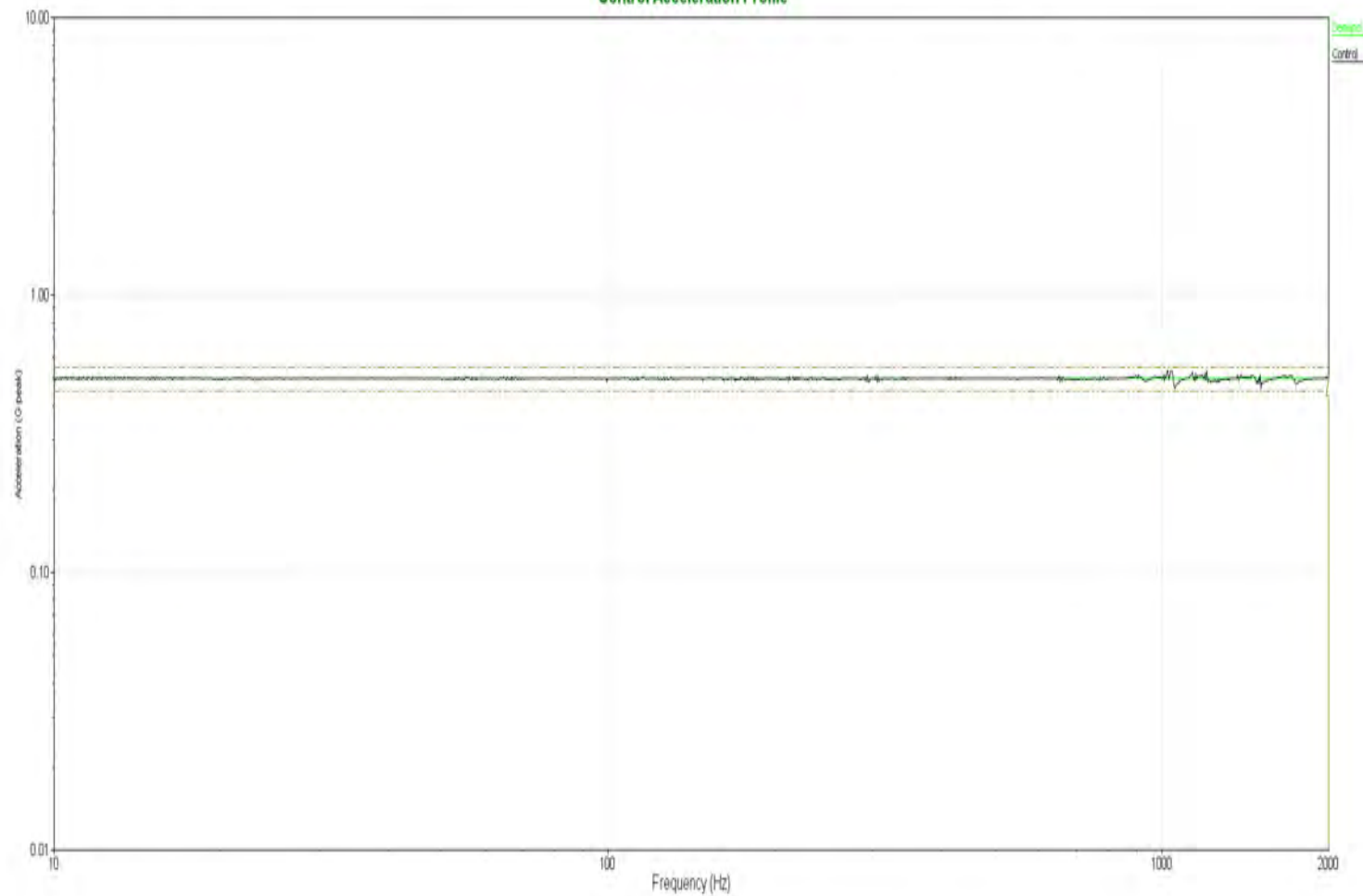


In-Axis Acceleration Profile



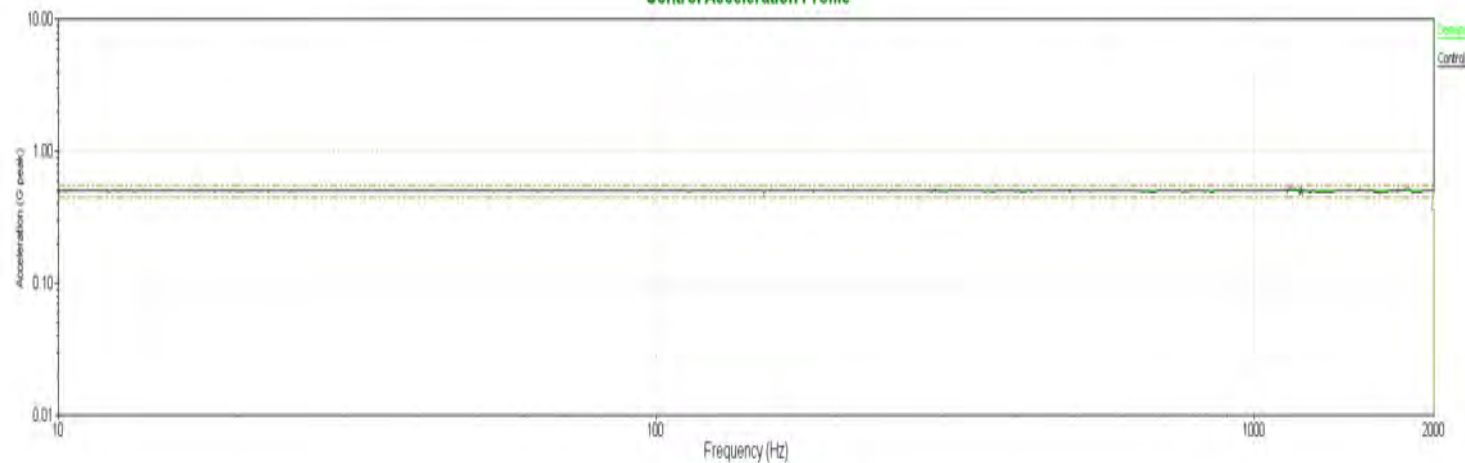
Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.4997 G	UUT: OSCAR
Start time: Jan 19, 2026 12:34:17 Run 9		Test axis: Z	S/N: Bare Table

Control Acceleration Profile

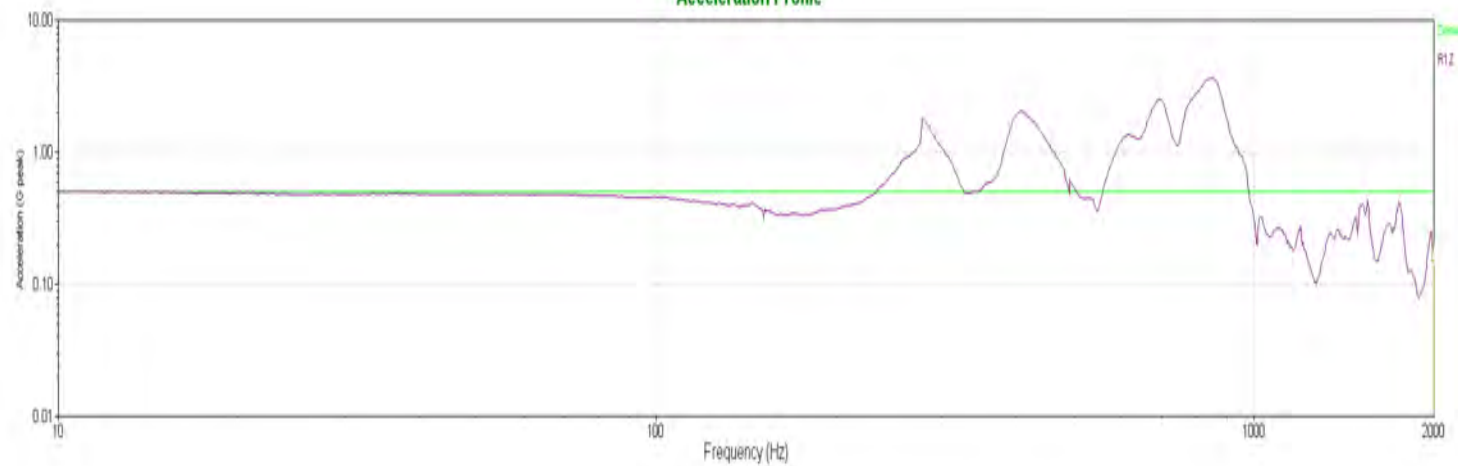


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5001 G	UUT: OSCAR
Jan 19, 2026 13:24:56	Run 10	Test axis: Z	S/N: 190020

Control Acceleration Profile

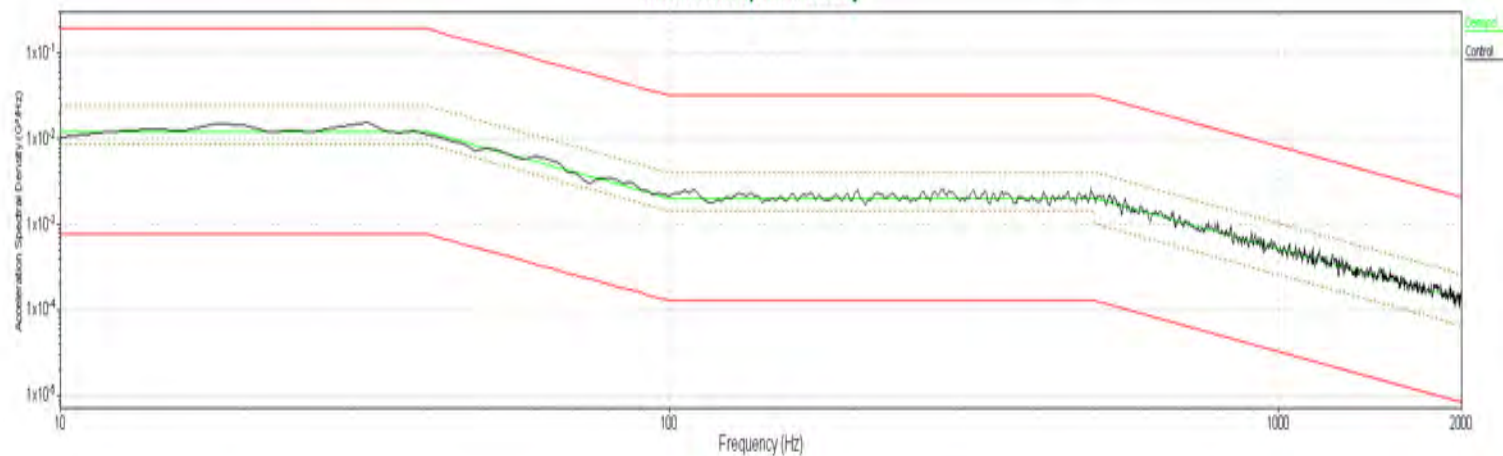


Acceleration Profile

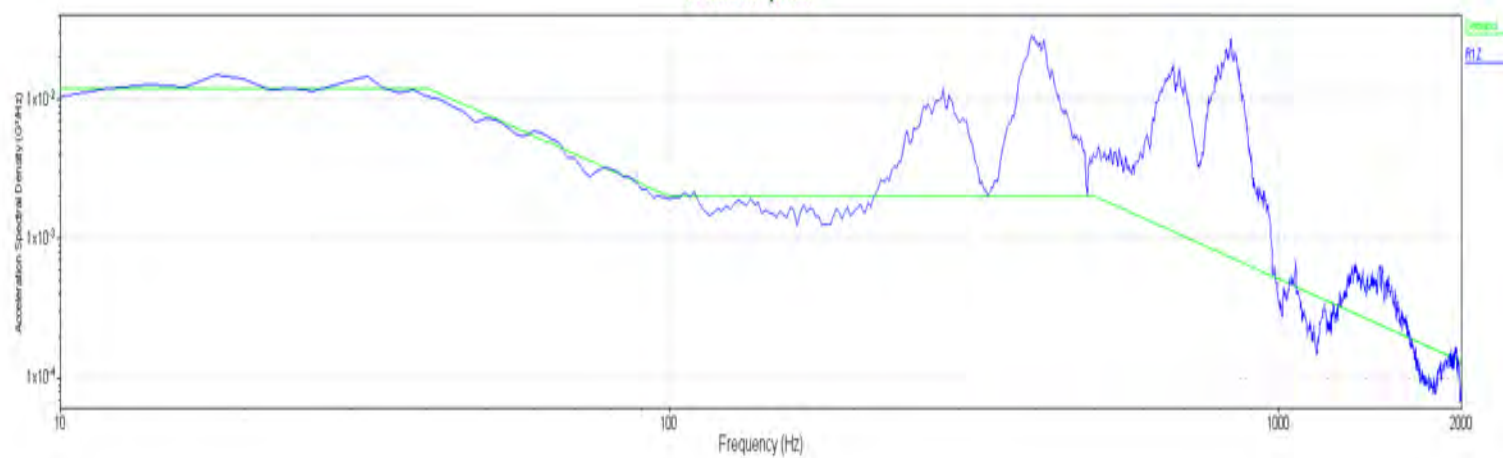


Element- Denver	Level Time: 0:10:00	Demand: 1.492 G RMS	PR188450
Shotover Systems	Total Time: 0:11:00	Control: 1.517 G RMS	UUT: OSCAR
Jan 19, 2026 13:47:28	Run 11	Test axis: Z	SN: 190020

Acceleration Spectral Density

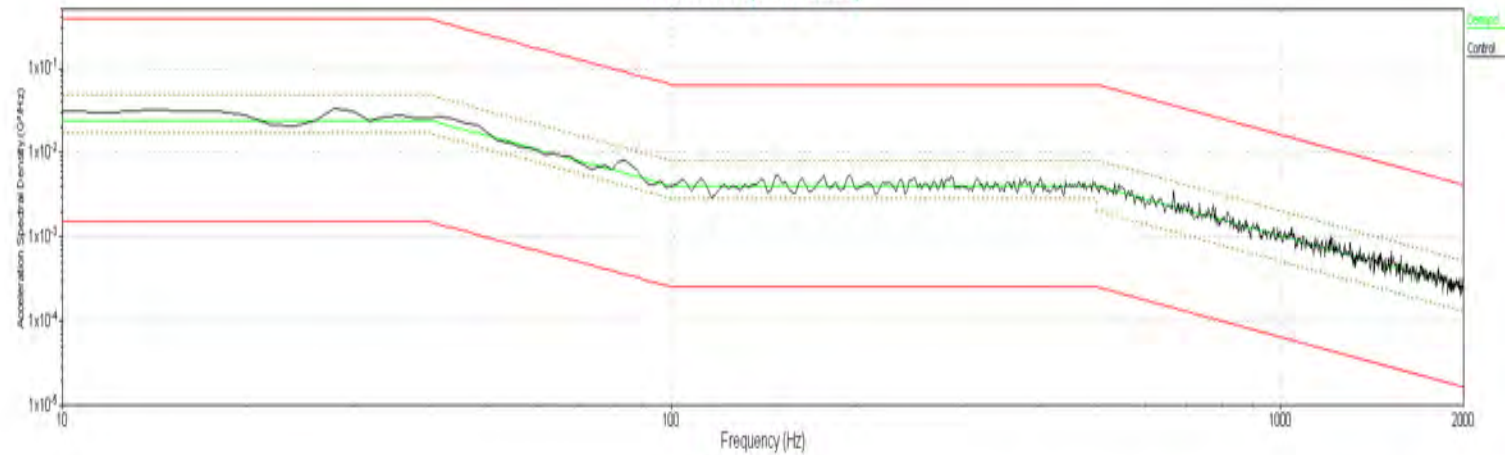


In-Axis Response

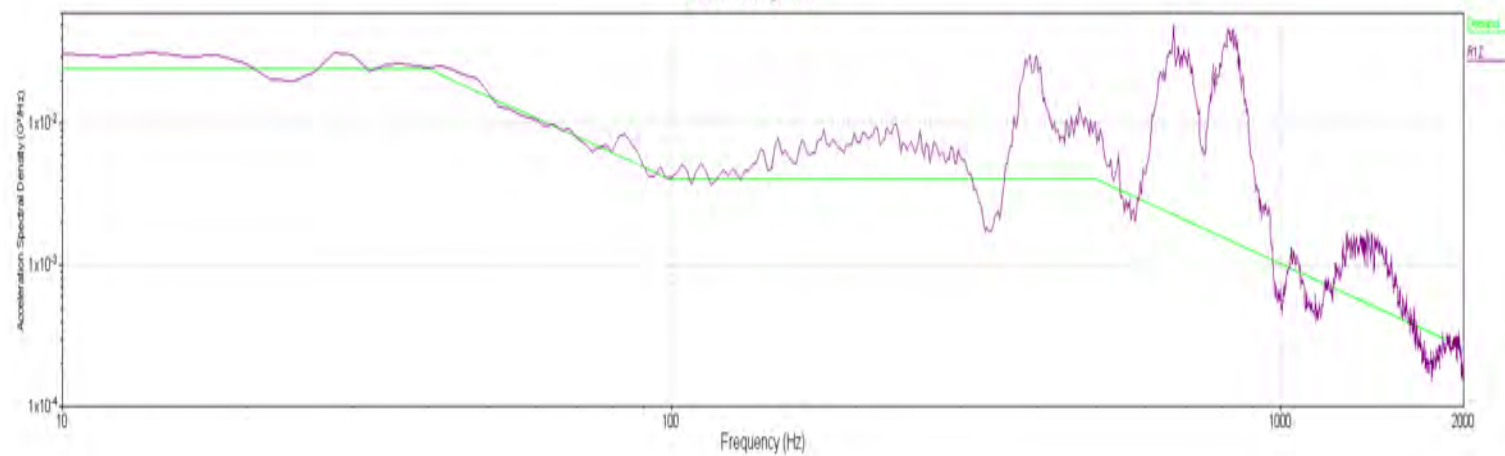


Element- Denver	Level Time: 3:00:00	Demand: 2.11 G RMS	PR188450
Shotover Systems	Total Time: 3:00:51	Control: 2.158 G RMS	UUT: OSCAR
Jan 19, 2026 14:01:42	Run 12	Test axis: Z	SN: 190020

Acceleration Spectral Density

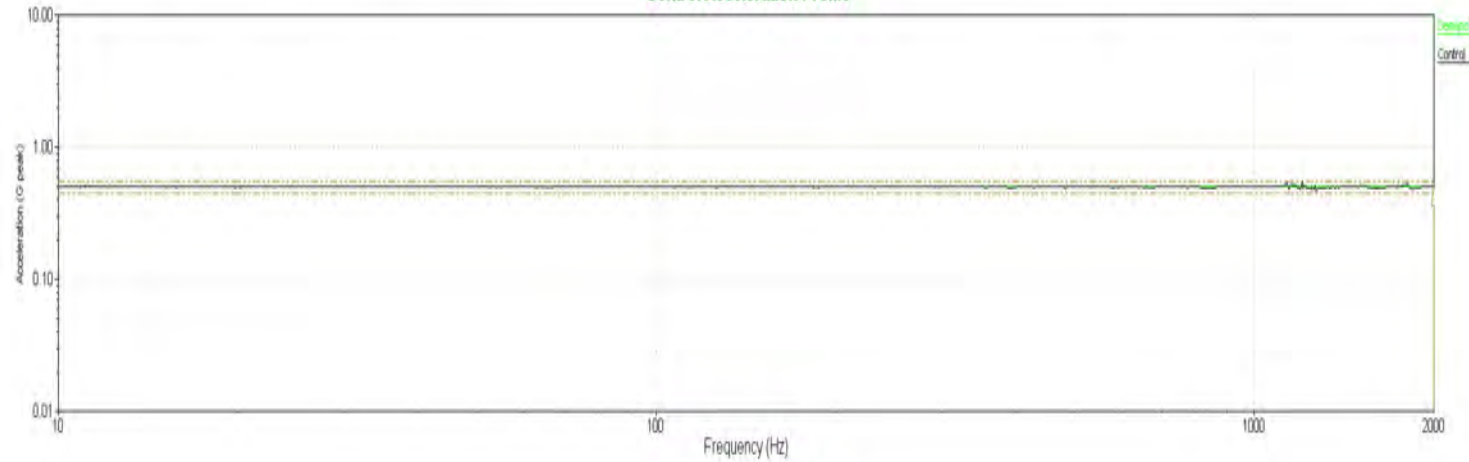


In-Axis Response

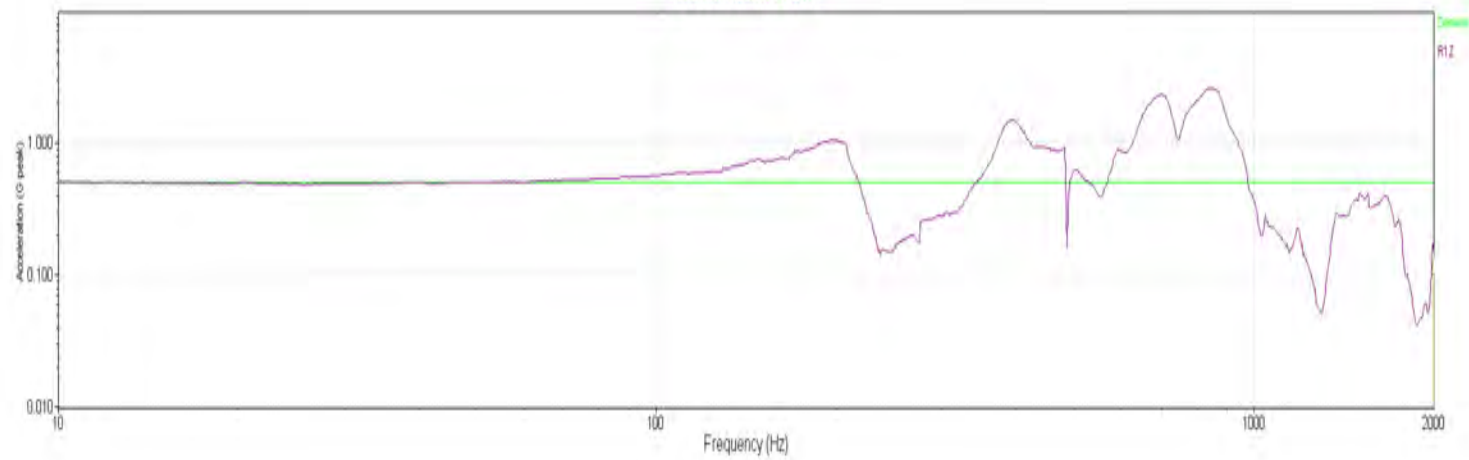


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.4995 G	UUT: OSCAR
Jan 19, 2026 17:07:40	Run 13	Test axis: Z	S/N: 190020

Control Acceleration Profile



Acceleration Profile



5.8.6 Test Equipment List

Table 5.8-1: Vibration Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A061440	Shaker, vertical/horizontal, ED 01	Ling	B335	NCR	NCR
US58-A059875	VR9500	Vibration Research	VR9500	04/14/2025	04/14/2026
US58-A084332	Accelerometer	Dytran Instruments	3030B5	07/29/2025	07/29/2026
US58-A084331	Accelerometer	Dytran Instruments	3030B5	07/28/2025	07/28/2026
US58-A076896	Triaxial	PCB Piezotronics	356A06	03/26/2025	03/26/2026
US58-A076484	Vibration Controller	Vibration Research	VR9500	07/08/2025	07/08/2026
US58-A084273	Torque Wrench	Snap-on	QD3R150	04/23/2025	04/23/2026
US58-A070466	Humidity & Temperature Meter	Fluke	971	07/09/2025	07/09/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.9 Vibration**5.9.1 Test Procedure**

US211-9001-Rev0.2_OSCAR Environmental Test Plan, referencing RTCA DO-160G, Section 8.0, Category S

5.9.2 Test Result

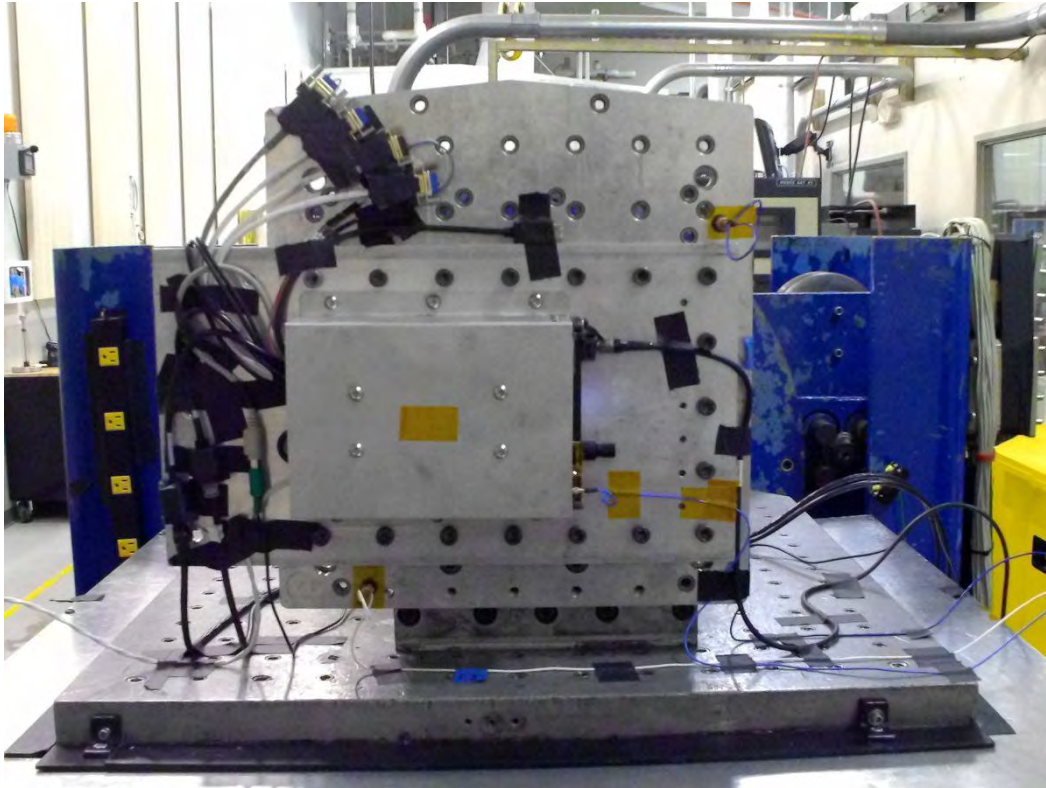
The EUT's results will be determined by SHOTOVER Systems.

5.9.3 Test Datasheets

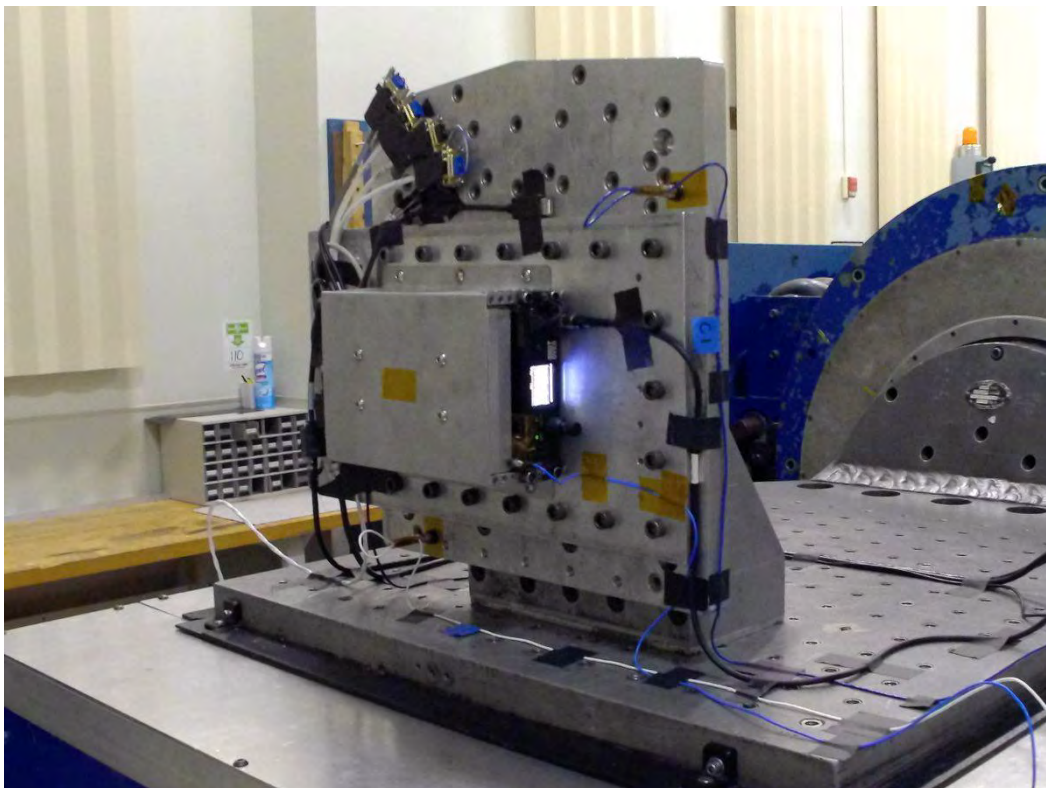
DYNAMICS TEST LOG					
Start Date:	1/20/2026	End Date:	1/22/2026	Job No:	PR188450
Customer:	Shotover Systems			Test Engineer:	Flynn Nyman, Colton Prince, Brendan Arthur
Customer Witness:	Ken Haan			Lab Temp & Humidity:	67°F, 21%
Part Name:	OSCAR			Part Number:	012-0031
Test Specification:	"US211-9001-Rev0.1_In Process_OSCAR Environmental Test Plan" PDF (RTCA DO-160G)			Serial number:	190020
Test Performed:	DO-160G Category S random procedure fixed wing frequencies curves L, M, B and C, Sine sweep: 0.5G from 10-2000 Hz at 1 oct/min				
Date	Time	Axis	Plot No.	Remarks	Initials
1/20/2026	0730	Z		Customer mounted fixture and unit to ED01 in horizontal configuration.	FN
1/20/2026	0820	Z		Control and response accels mounted to unit.	FN
1/20/2026	0843	Z	Run 1	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	FN
1/20/2026	0856	Z	Run 2	Ran DO-160 Cat S Curve L sine vibe for 1:00:00.	FN
1/20/2026	1002	Z	Run 3	Ran DO-160 Cat S Curve M sine vibe for 1:00:00.	CP
1/20/2026	1108	Z	Run 4	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	CP
1/20/2026	1126	Z	Run 5	Ran DO-160 Cat S Curve B random vibe for 1:00:00.	CP
1/20/2026	1234	Z	Run 6	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	CP
1/20/2026	1244	Z	Run 7	Ran DO-160 Cat S Curve C random vibe for 1:00:00.	CP
1/20/2026	1357	Z	Run 8	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	CP
1/20/2026	1450	Y		Fixture and UUT were rotated for Y-axis testing.	CP
1/20/2026	1503	Y	Run 9	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	CP
1/20/2026	1521	Y	Run 10	Ran DO-160 Cat S Curve L sine vibe for 1:00:00.	CP
1/20/2026	1645			UUT removed from shaker in order to move to T1000	BMA
1/21/2026	0817	Y		UUT mounted to T1000 in the Y-Axis with 2 controls and 1 response accelerometer	BMA
1/21/2026	0818	Y	Run 11	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min to characterize new shaker.	BMA
1/21/2026	0834	Y	Run 12	Ran DO-160 Cat S Curve M sine vibe for 1:00:00.	BMA

1/21/2026	0955	Y	Run 13	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA
1/21/2026	1022	Y	Run 14	Ran DO-160 Cat S Curve B random vibe for 1:00:00.	BMA
1/21/2026	1128	Y	Run 15	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA
1/21/2026	1142	Y	Run 16	Ran DO-160 Cat S Curve C random vibe for 1:00:00.	BMA
1/21/2026	1250	Y	Run 17	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA
1/21/2026	1400			UUT removed from shaker for visual inspection	BMA
1/21/2026	1435			Customer decision to rerun Cat S Curve C due to anomalous UUT functionality during testing	BMA
1/21/2026	1510	Y		UUT mounted to T1000 in the Y-Axis with 2 controls and 1 response accelerometer	BMA
1/21/2026	1514	Y	Run 18	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA
1/21/2026	1529	Y	Run 19	Ran DO-160 Cat S Curve C random vibe for 1:00:00.	BMA
1/21/2026	1632	Y	Run 20	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	BMA
1/22/2026	0950	X		Fixture and UUT were rotated for X-axis testing.	CP
1/22/2026	1020	X	Run 21	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	CP
1/22/2026	1035	X	Run 22	Ran DO-160 Cat S Curve L sine vibe for 1:00:00.	CP
1/22/2026	1147	X	Run 23	Ran DO-160 Cat S Curve M sine vibe for 1:00:00.	CP
1/22/2026	1302	X	Run 24	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	CP
1/22/2026	1316	X	Run 25	Ran DO-160 Cat S Curve B random vibe for 1:00:00.	CP
1/22/2026	1427	X	Run 26	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	CP
1/22/2026	1442	X	Run 27	Ran DO-160 Cat S Curve C random vibe for 1:00:00.	CP
1/22/2026	1544	X	Run 28	Ran 0.5g 10-2000Hz sine sweep at 1 oct/min.	CP
1/22/2026				Testing Complete. No Anomalies noted on UUT during testing.	CP
1/22/2026				Customer to make final determination on Pass/Fail of UUT upon further inspection.	CP

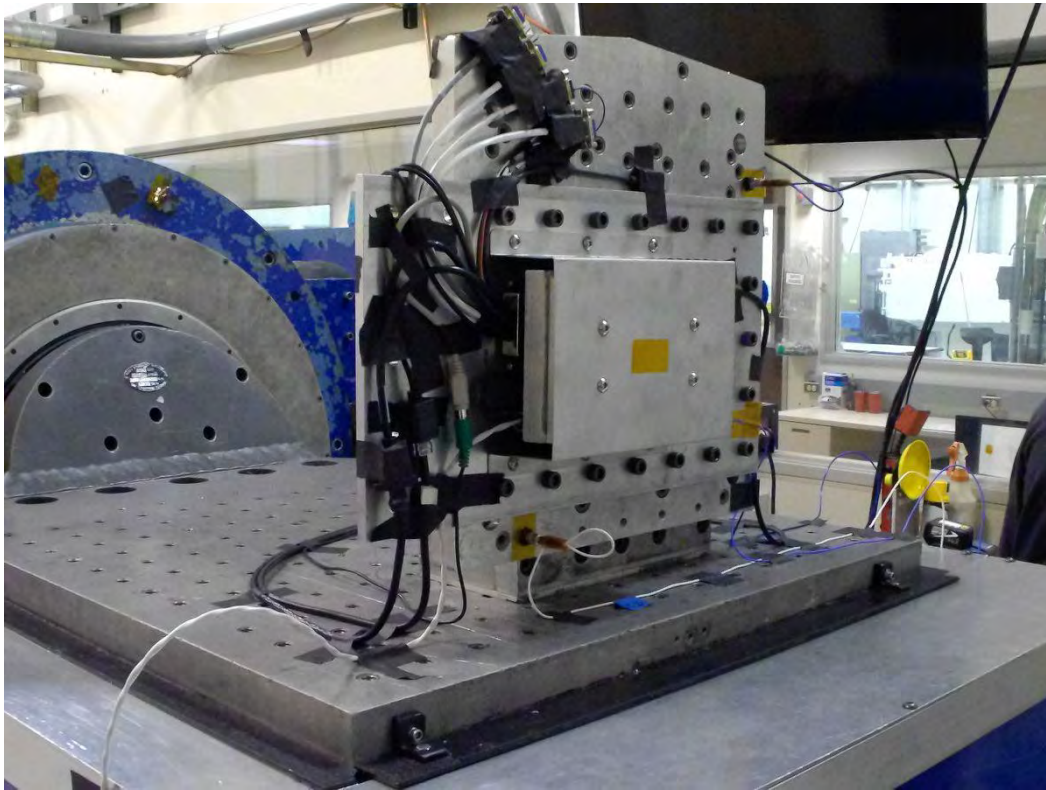
5.9.4 Test Photographs



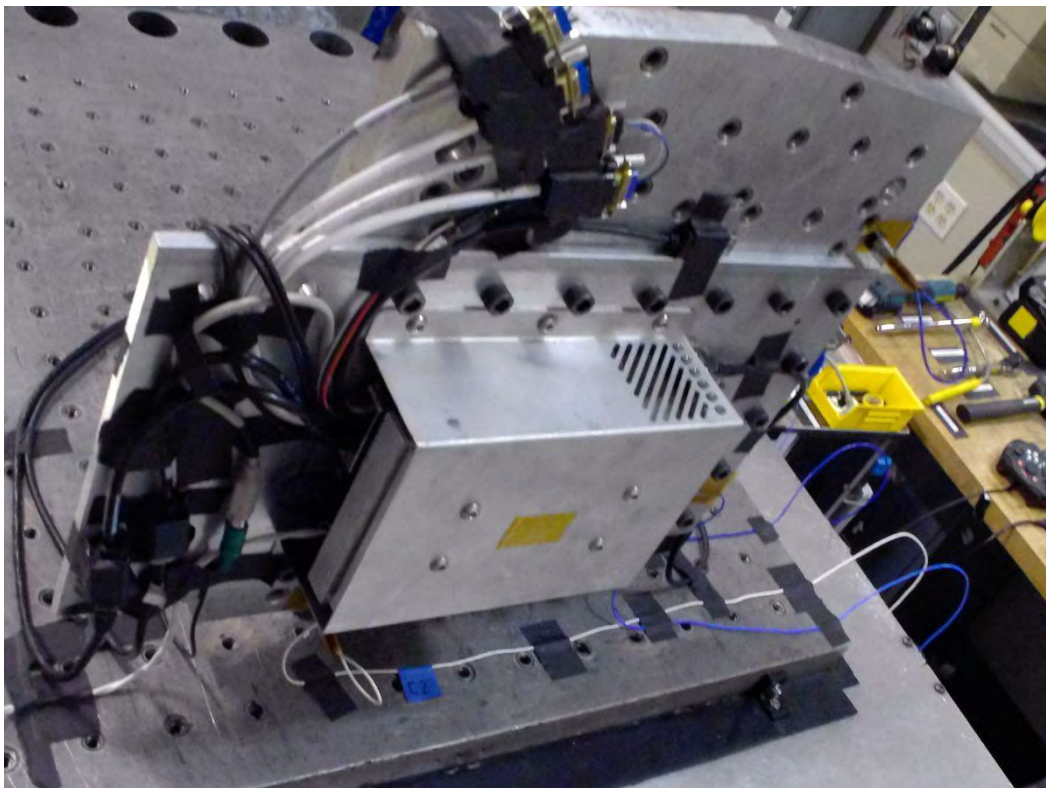
UUT_Z-Axis



UUT_Z-Axis



UUT_Z-Axis



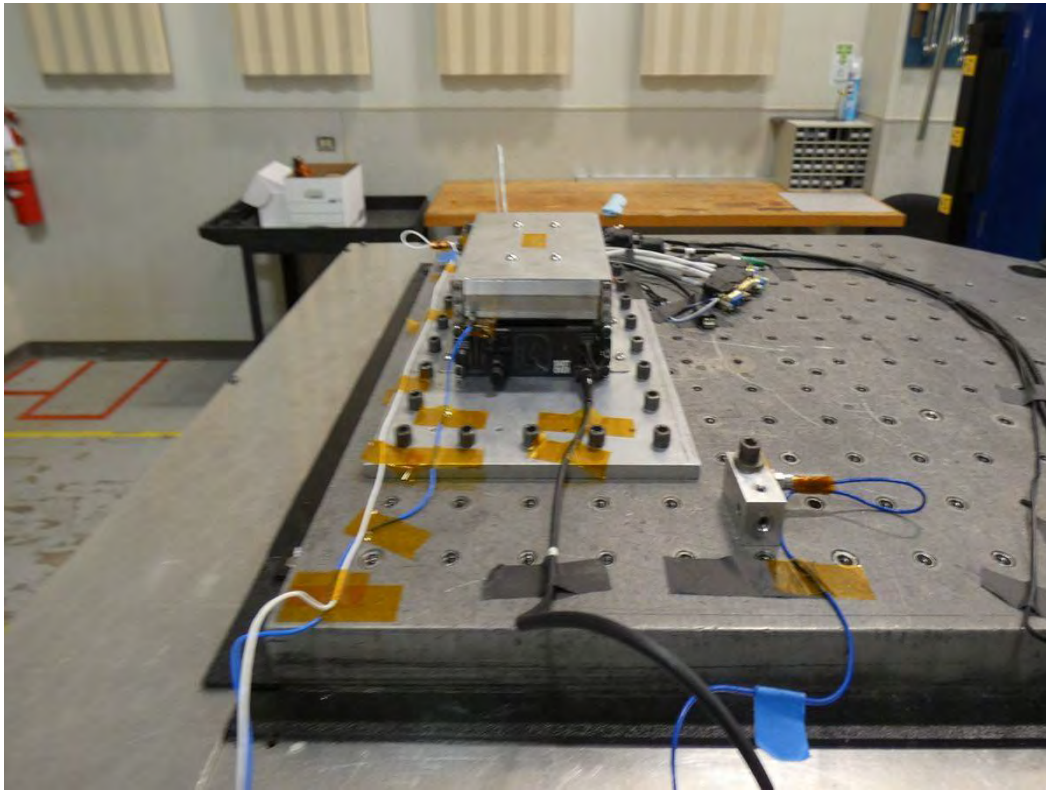
UUT_Z-Axis



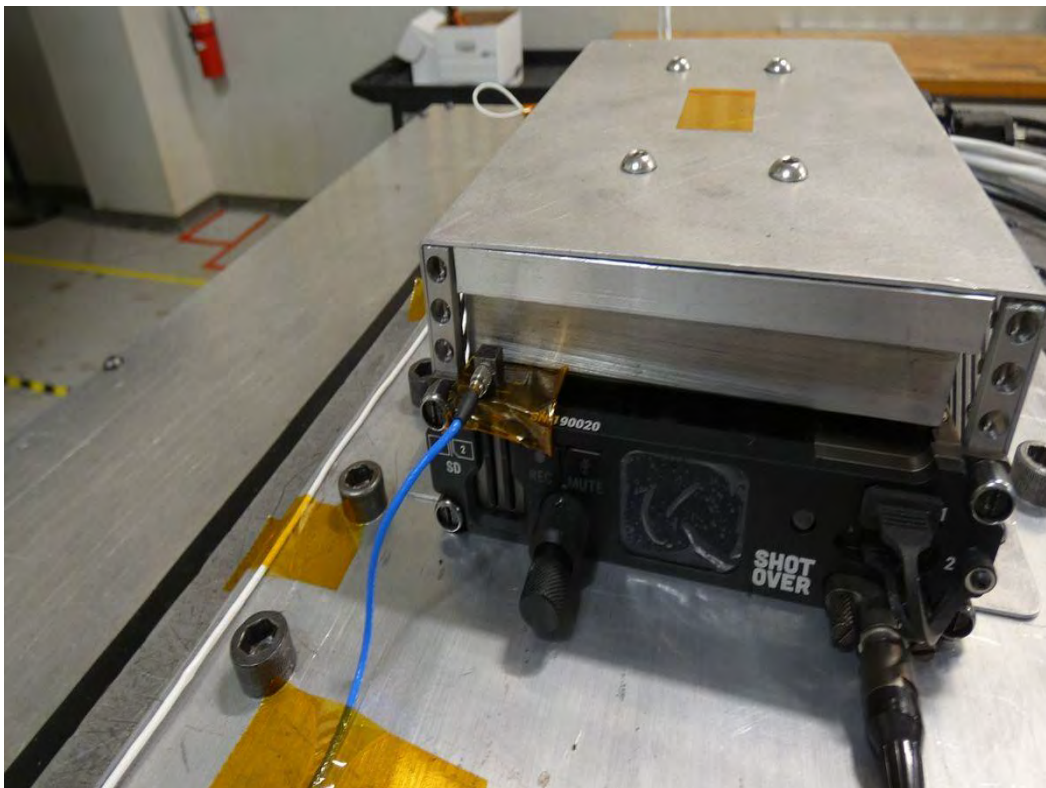
UUT_Y-Axis



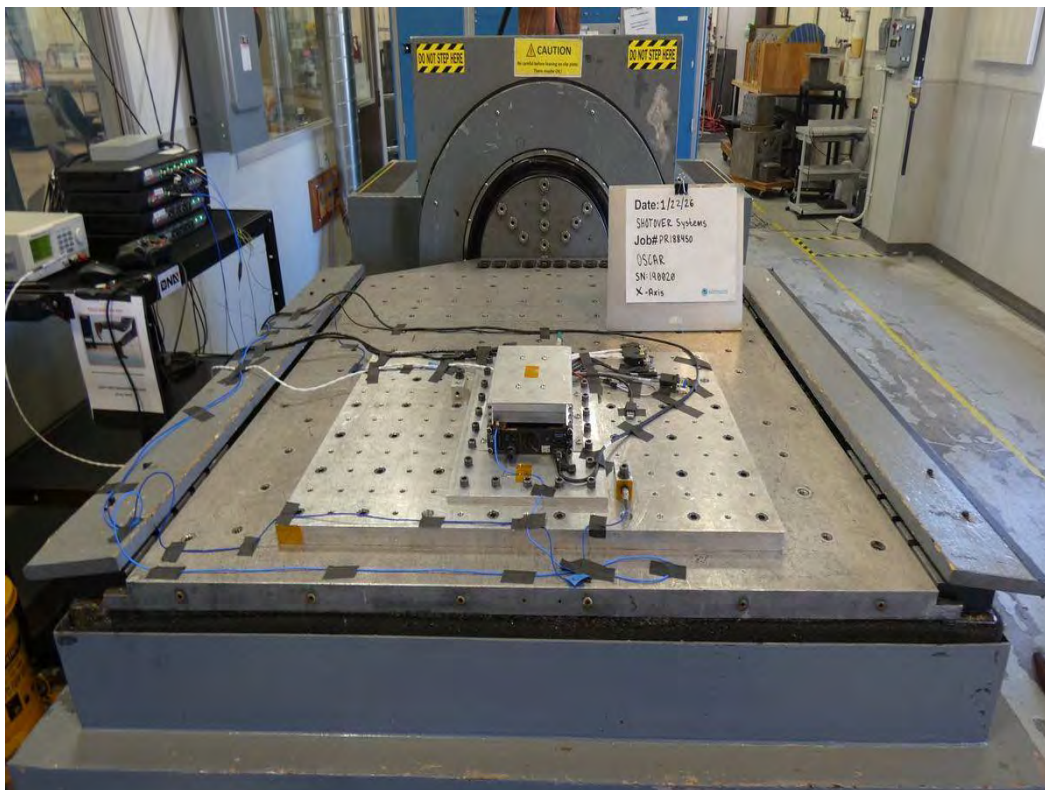
UUT_Y-Axis



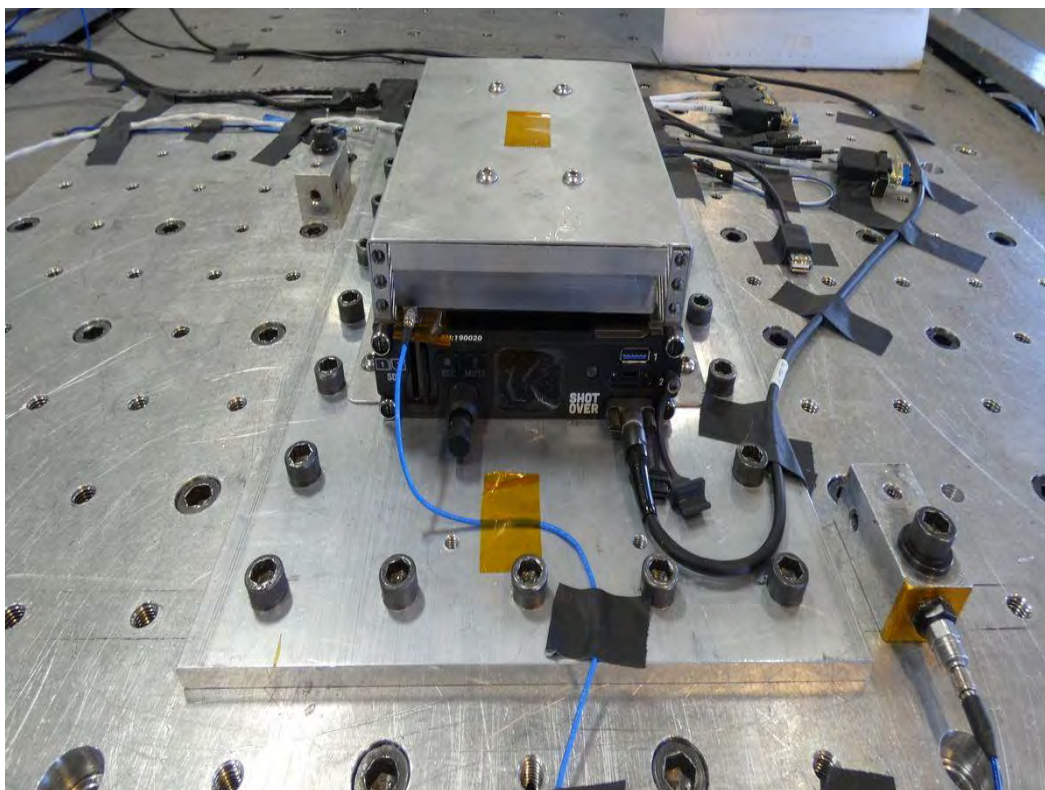
UUT_Y-Axis



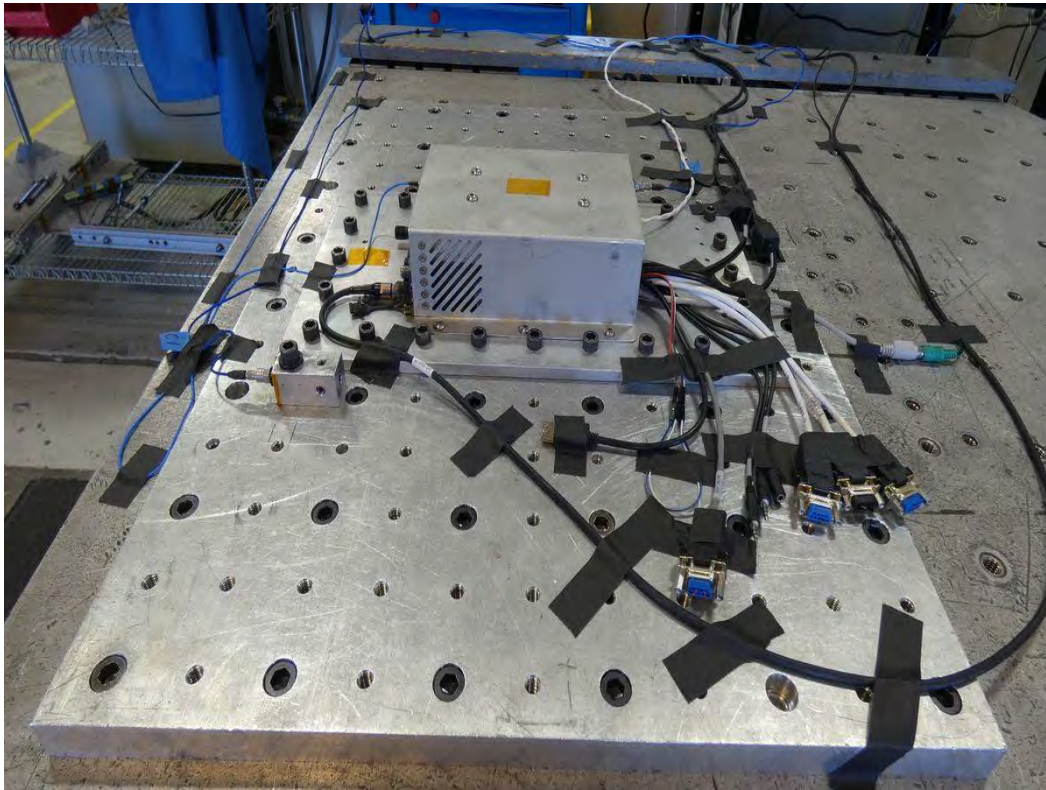
UUT_Y-Axis



UUT_X-Axis



UUT_X-Axis

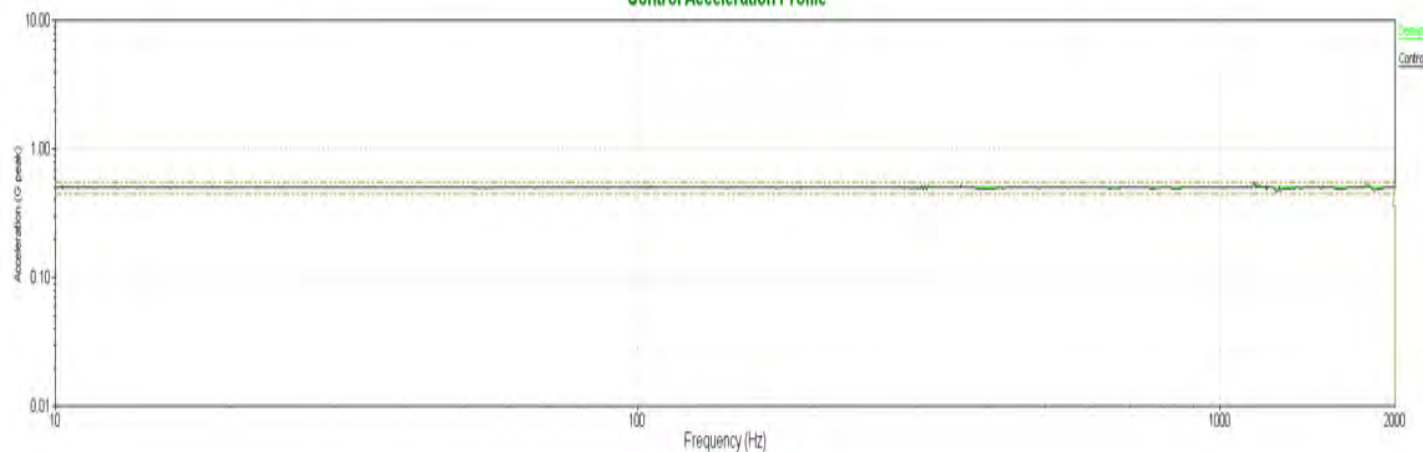


UUT_X-Axis

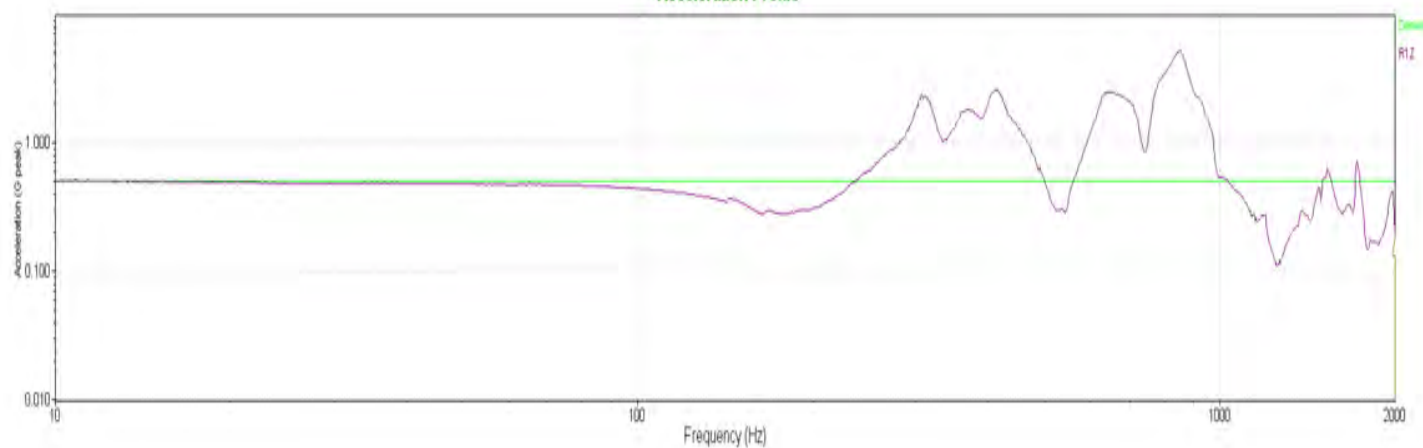
5.9.5 Test Data

Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5045 G	UUT: OSCAR
Jan 20, 2026 08:43:46	Run 1	Test axis: Z	S/N: 190020

Control Acceleration Profile

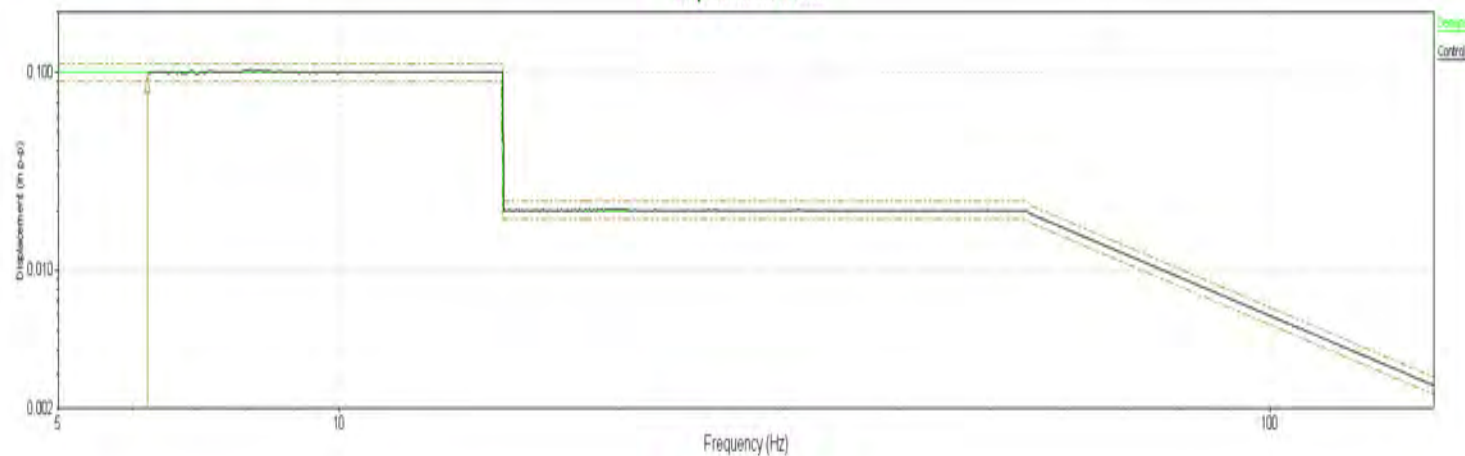


Acceleration Profile



Element-Denver	Level Time: 1:00:00	Demand: 0.1986 G	PR188450
Shotover Systems	Level 100 % 11 sweeps	Control: 0.195 G	UUT: OSCAR
Start time: Jan 20, 2026 08:56:28 Run 2		Test axis: Z	S/N: 190020

Displacement Profile



Displacement Profile



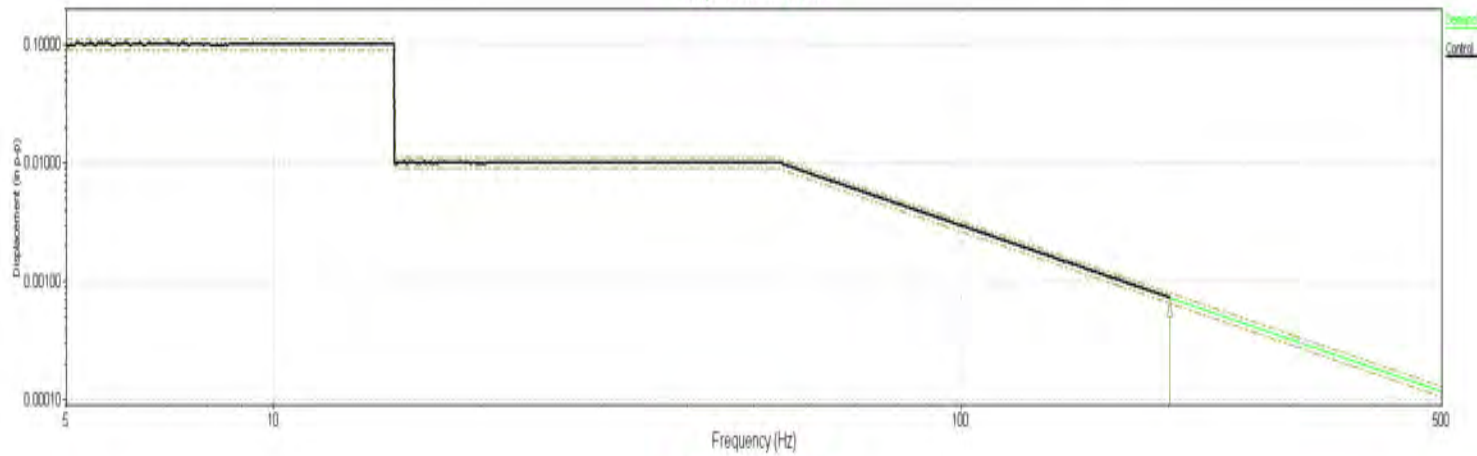
Element-Denver
Shotover Systems
Start time: Jan 20, 2026 10:02:21 Run 3

Level Time: 1:00:00
Level 100 % 8 sweeps

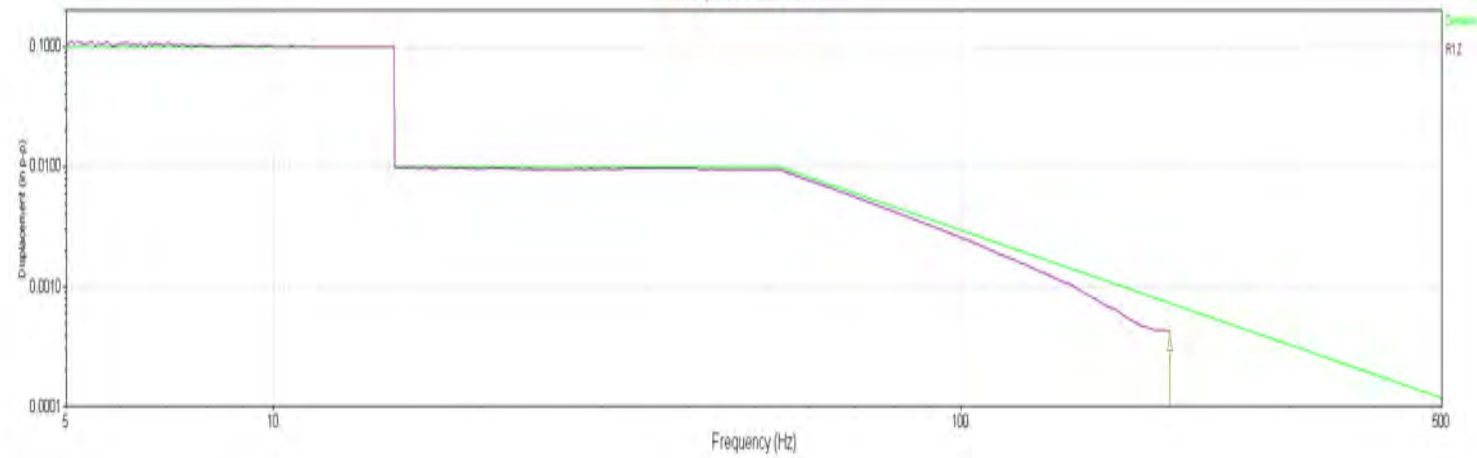
Demand: 1.5 G
Control: 1.498 G
Test axis: Z

PR188450
UUT: OSCAR
S/N: 190020

Displacement Profile

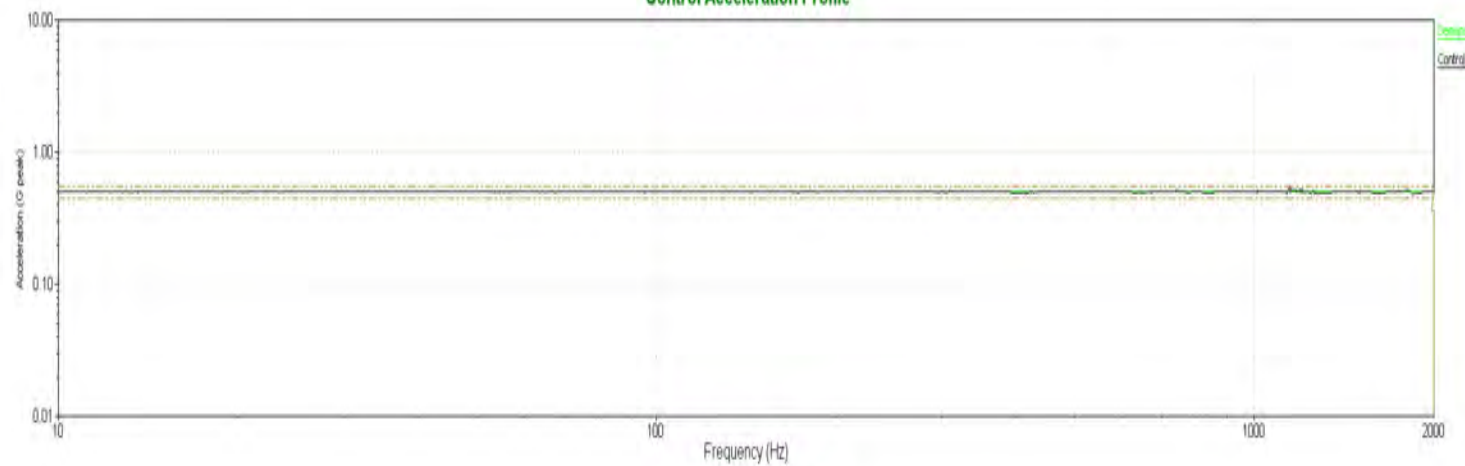


Displacement Profile

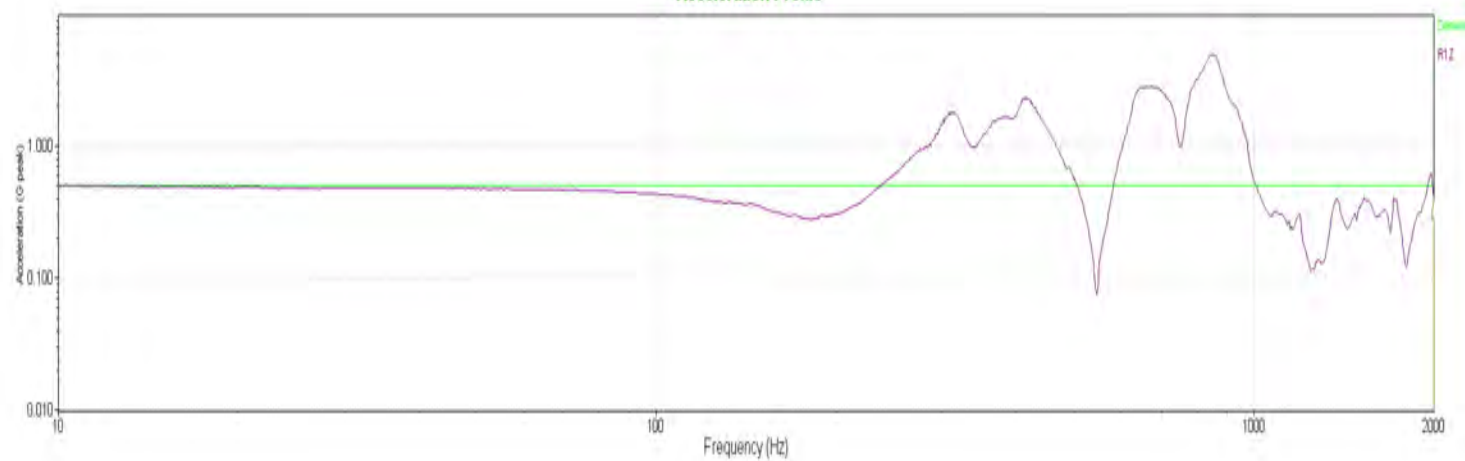


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5063 G	UUT: OSCAR
Jan 20, 2026 11:08:58	Run 4	Test axis: Z	S/N: 190020

Control Acceleration Profile

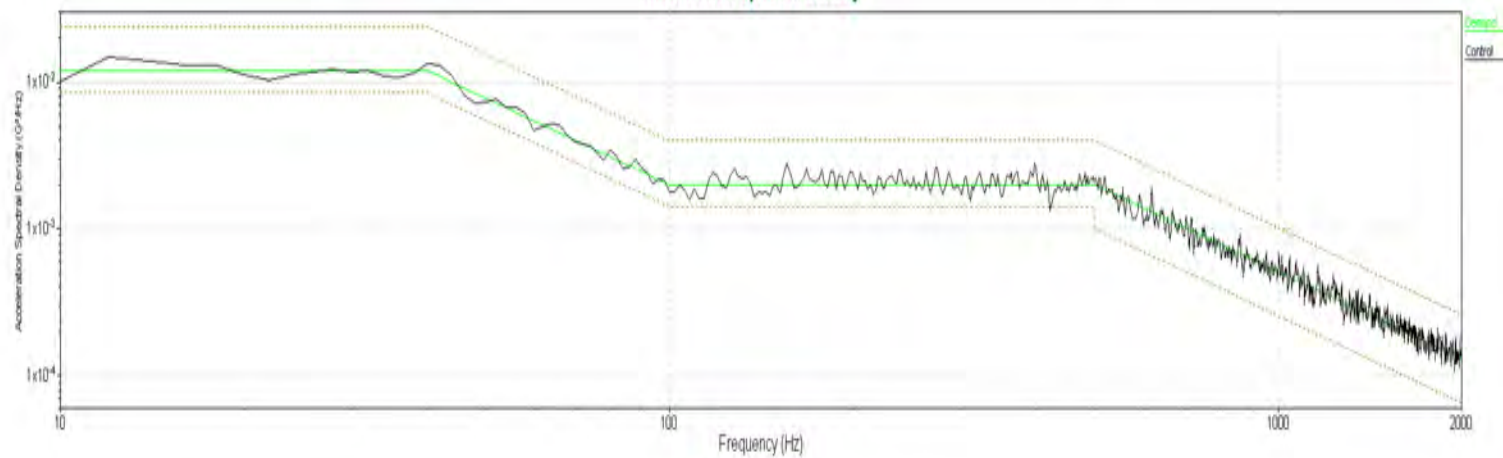


Acceleration Profile

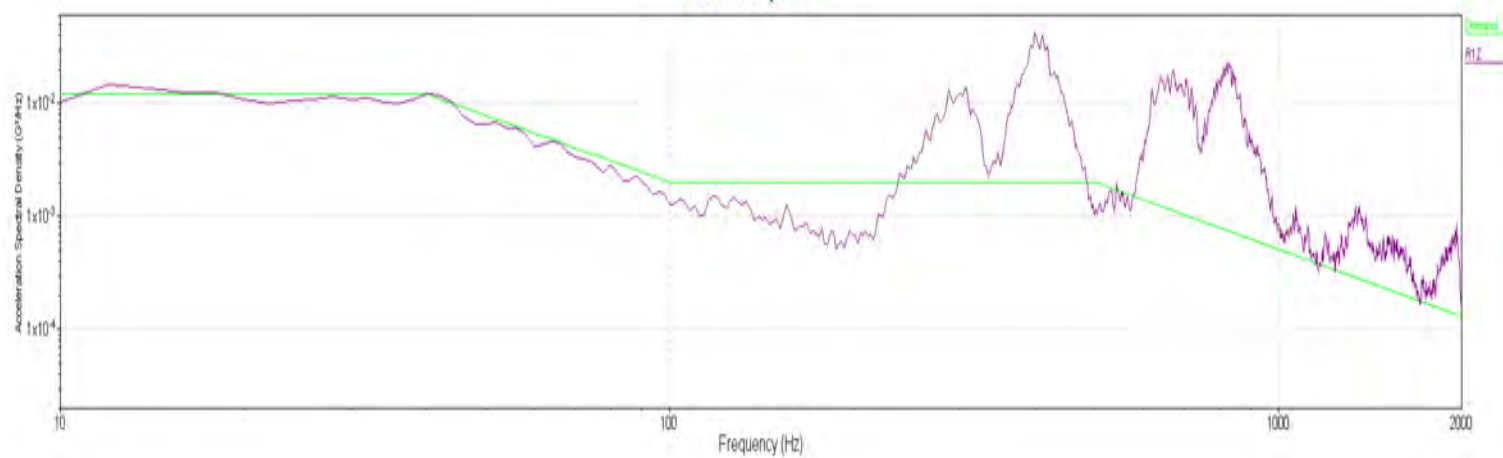


Element- Denver	Level Time: 1:00:00	Demand: 1.492 G RMS	PR188450
Shotover Systems	Total Time: 1:00:56	Control: 1.504 G RMS	UUT: OSCAR
Jan 20, 2026 11:26:58	Run 5	Test axis: Z	SN: 190020

Acceleration Spectral Density

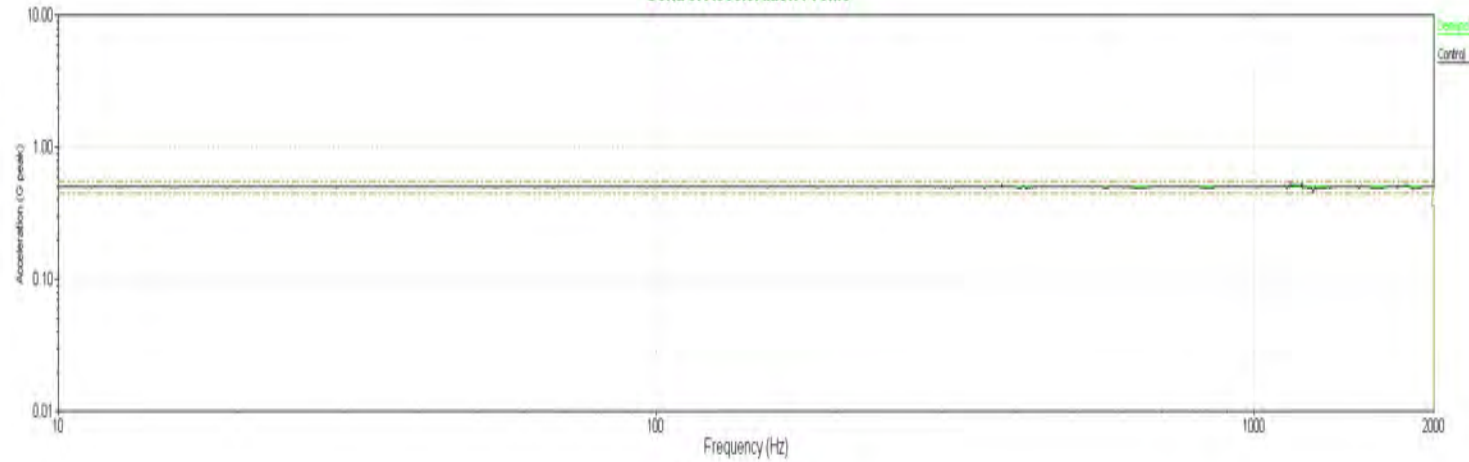


In-Axis Response

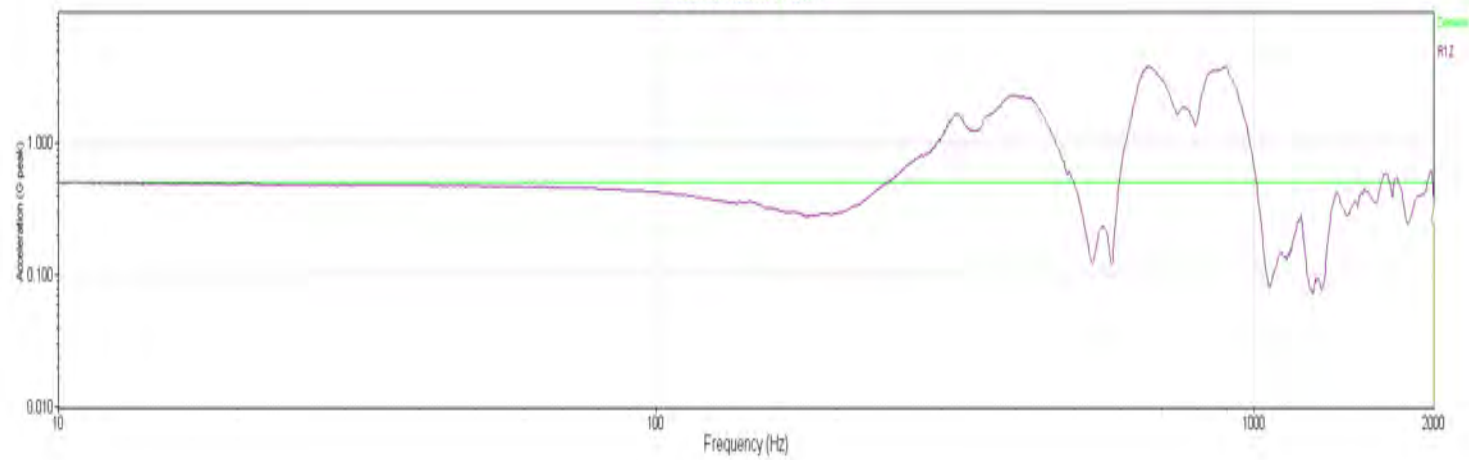


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5035 G	UUT: OSCAR
Jan 20, 2026 12:34:24	Run 6	Test axis: Z	S/N: 190020

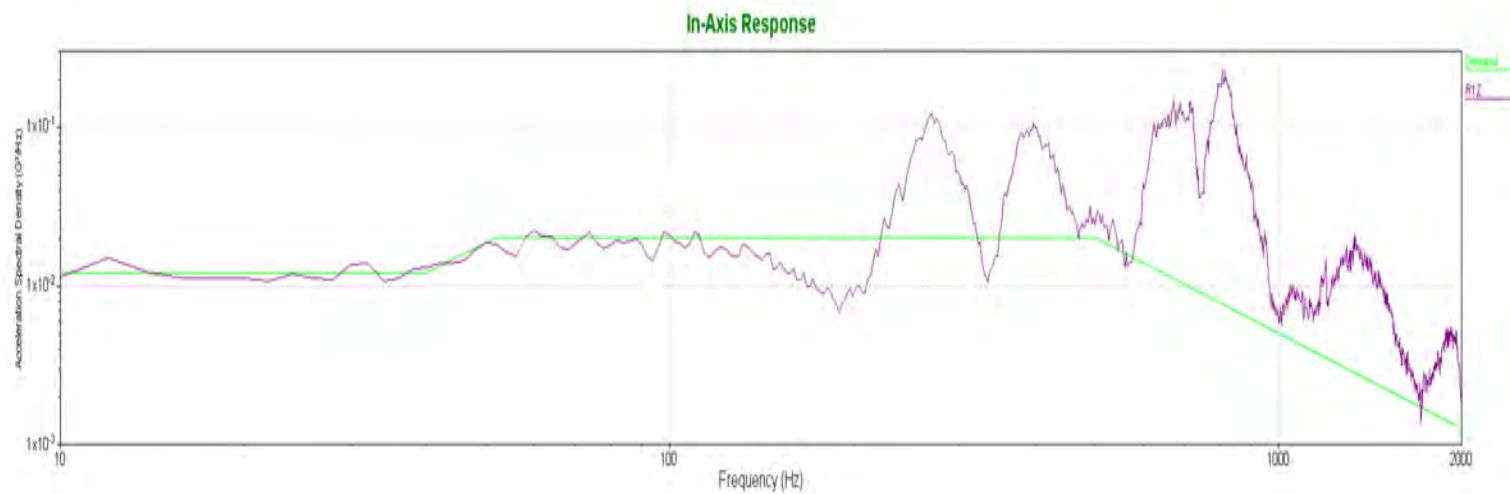
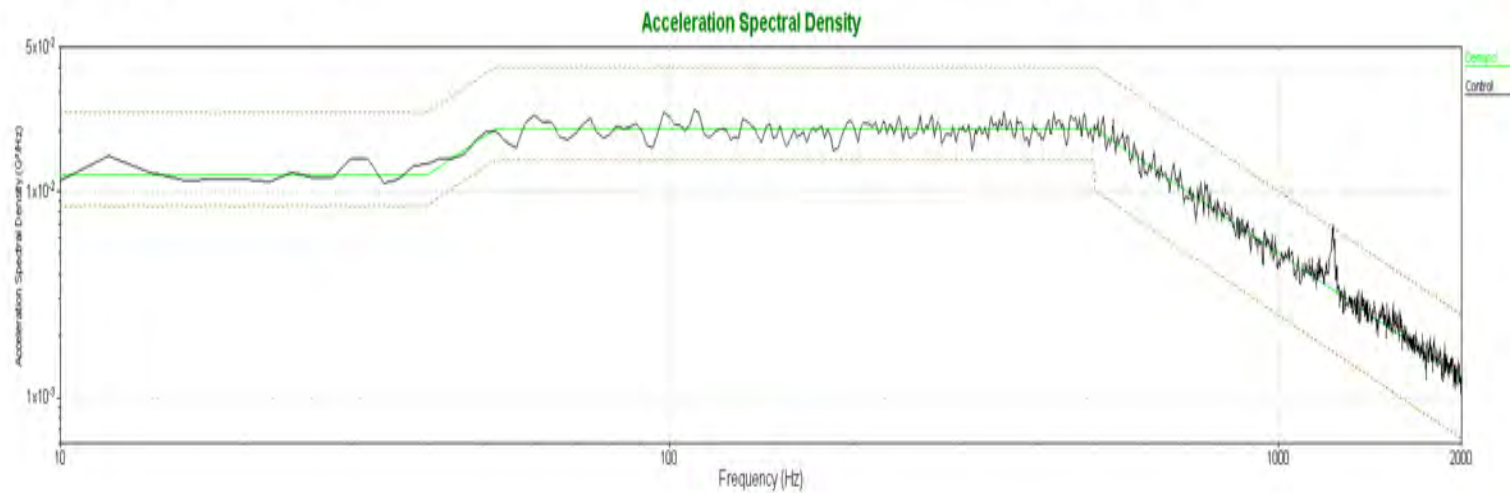
Control Acceleration Profile



Acceleration Profile

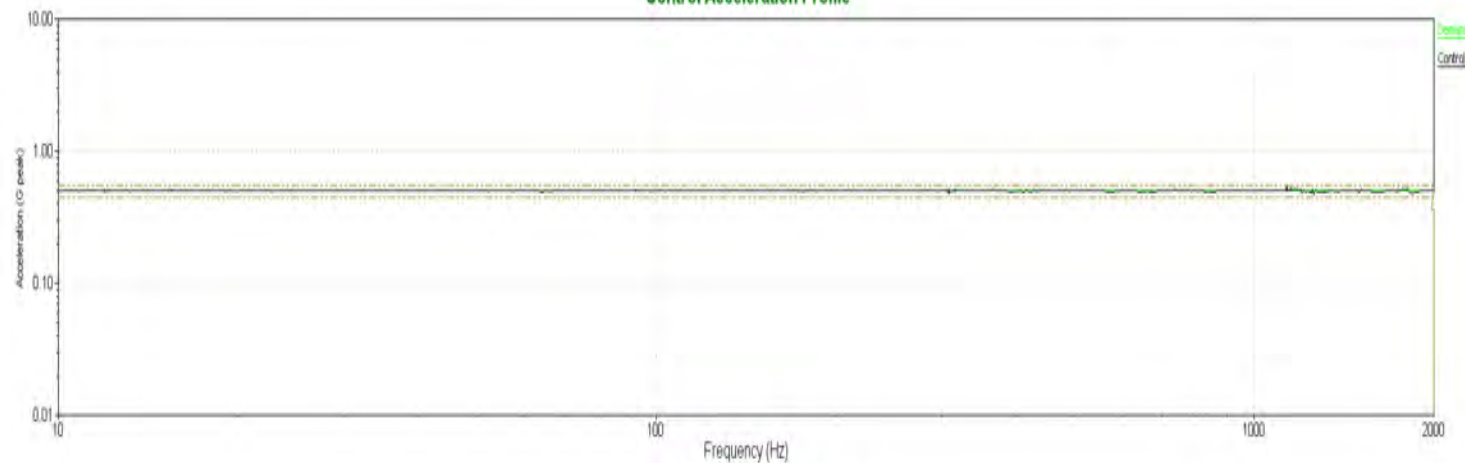


Element- Denver	Level Time: 1:00:00	Demand: 4.129 G RMS	PR188450
Shotover Systems	Total Time: 1:00:53	Control: 4.158 G RMS	UUT: OSCAR
Jan 20, 2026 12:44:31	Run 7	Test axis: Z	SN: 190020

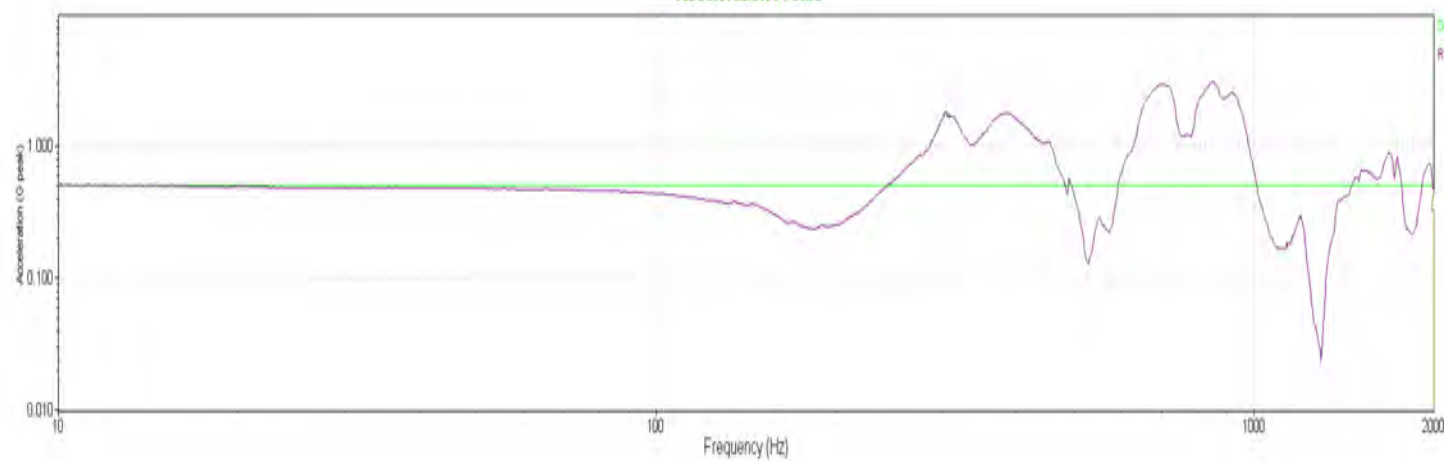


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5025 G	UUT: OSCAR
Jan 20, 2026 13:57:39	Run 8	Test axis: Z	S/N: 190020

Control Acceleration Profile

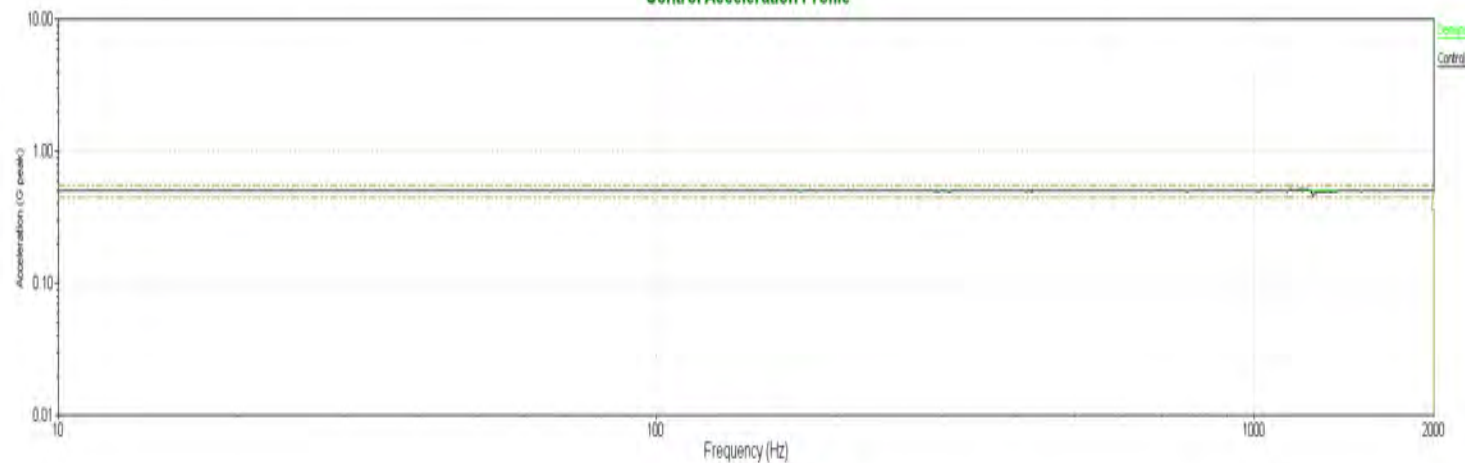


Acceleration Profile

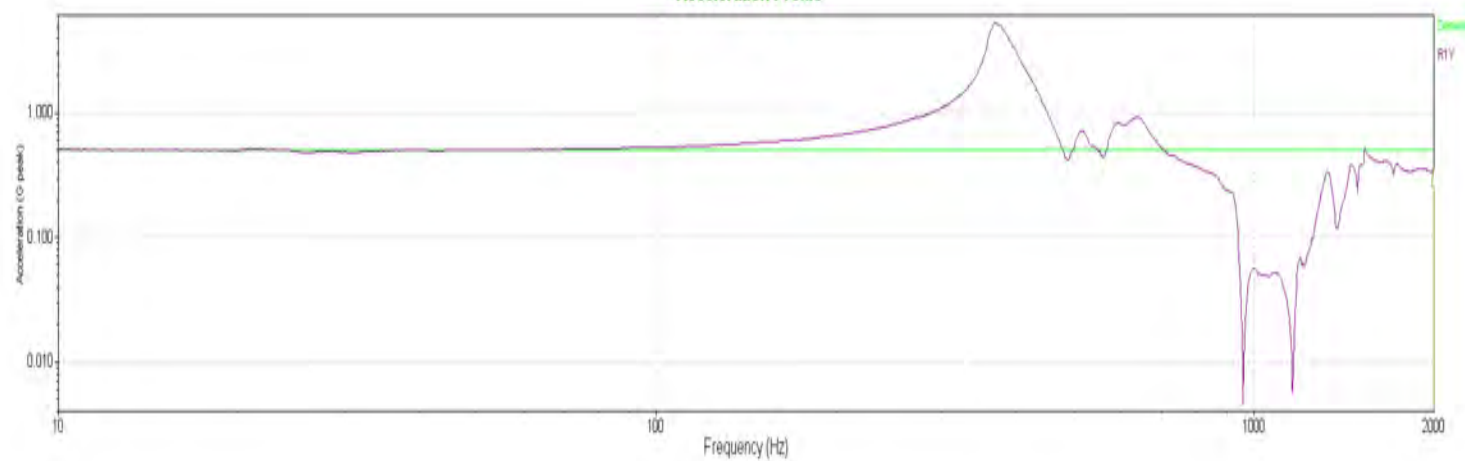


Element-Denver	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 % 1 sweeps	Control: 0.5017 G	UUT: OSCAR
Jan 20, 2026 15:03:45	Run 9	Test axis: Y	S/N: 190020

Control Acceleration Profile



Acceleration Profile



Element-Denver

Level Time: 1:00:00

Demand: 0.1991 G

PR188450

Shotover Systems

Level 100 % 11 sweeps

Control: 0.1982 G

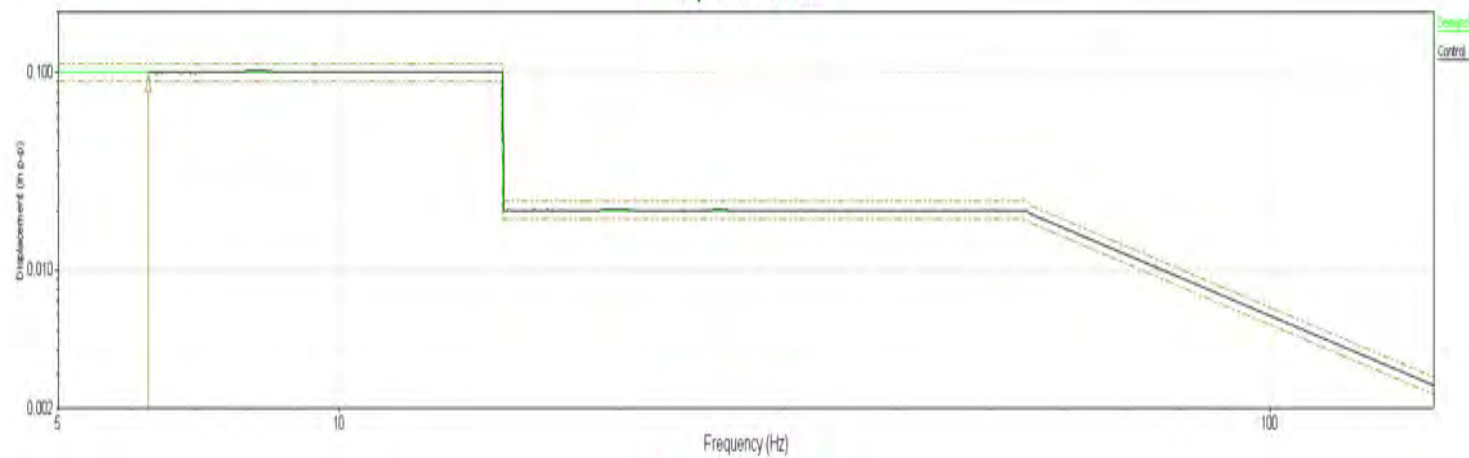
UUT: OSCAR

Start time: Jan 20, 2026 15:21:08 Run 10

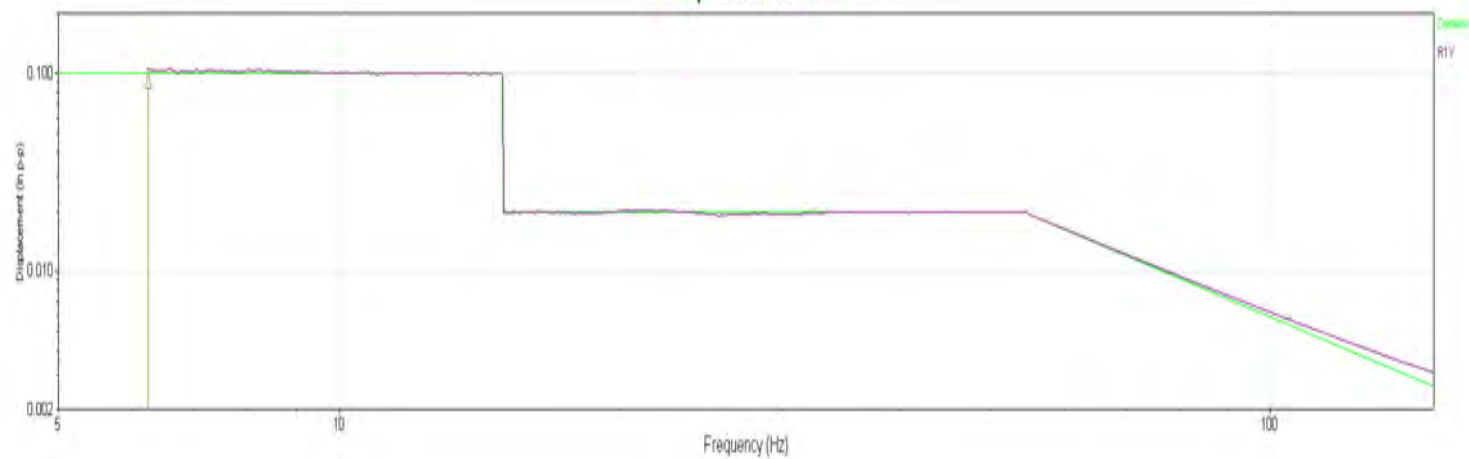
Test axis: Z

S/N: 190020

Displacement Profile

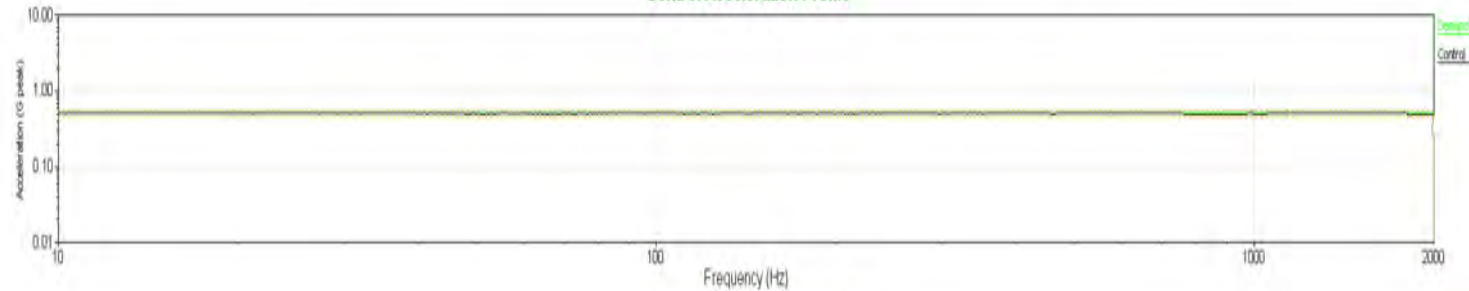


Displacement Profile

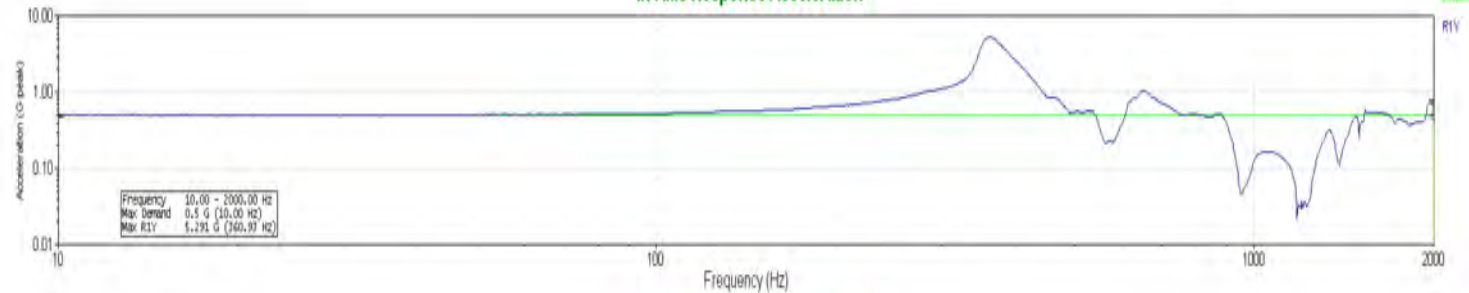


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.4967 G	UUT: OSCAR
Jan 21, 2026 08:18:41	Run 11	Test axis: Y	SN: 190020

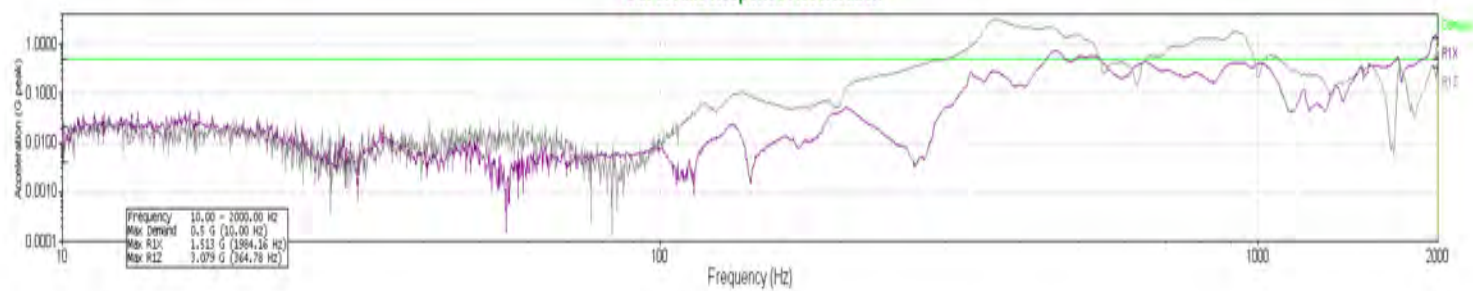
Control Acceleration Profile



In-Axis Response Acceleration

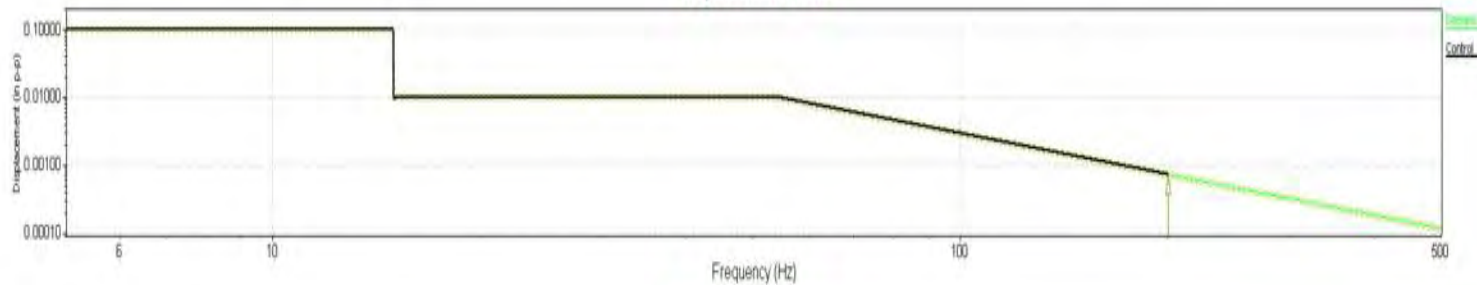


Out of-Axis Response Acceleration

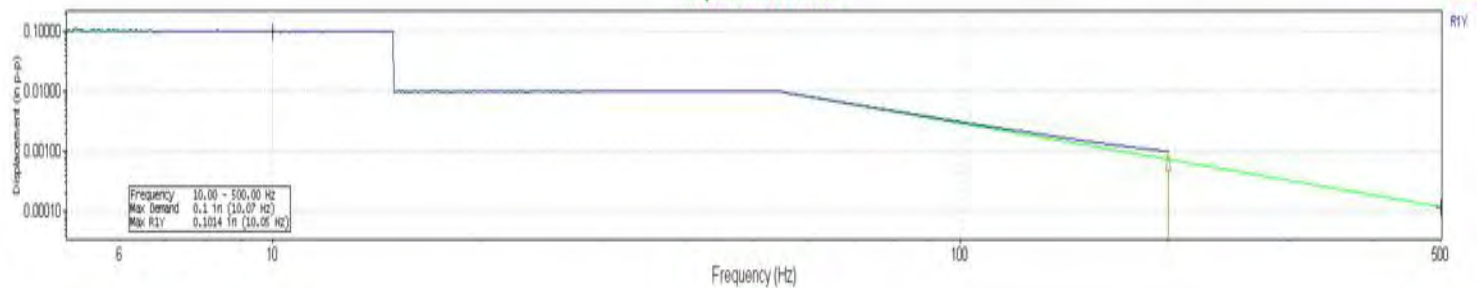


Element-Longmont	Level Time: 1:00:00	Demand: 1.5 G	PR188450
Shotover Systems	Level 100 %	Control: 1.499 G	UUT: OSCAR
Jan 21, 2026 08:34:28	Run 12	Test axis: Y	SN: 190020

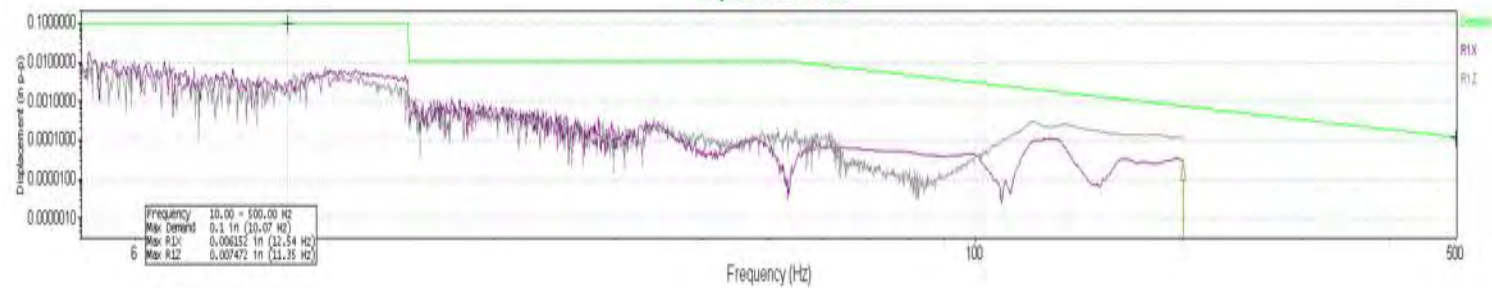
Displacement Profile



Displacement Profile

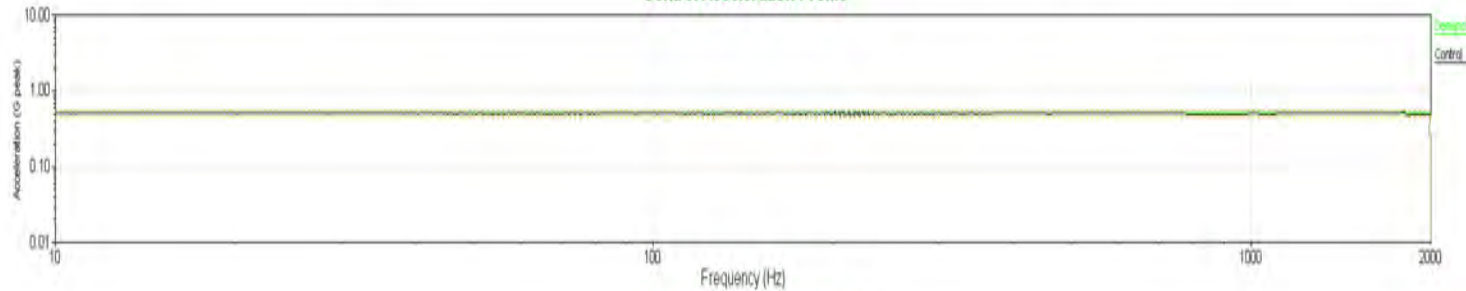


Displacement Profile

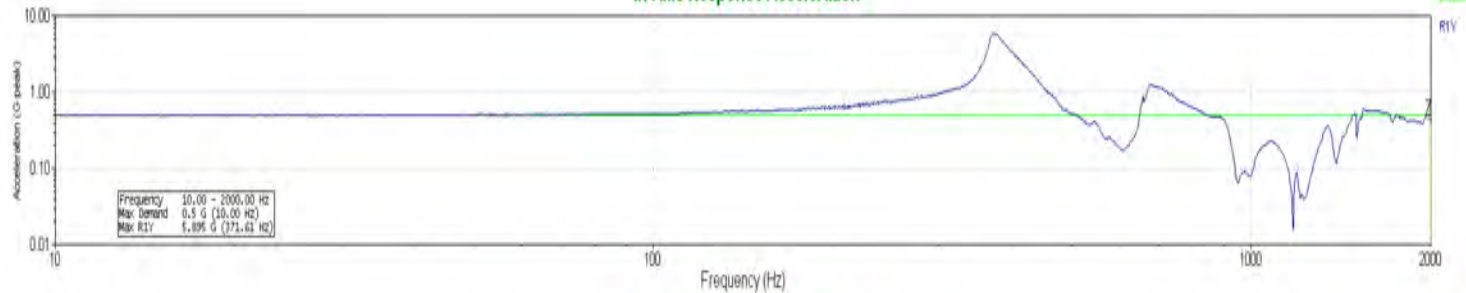


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.4966 G	UUT: OSCAR
Jan 21, 2026 09:55:08	Run 13	Test axis: Y	SN: 190020

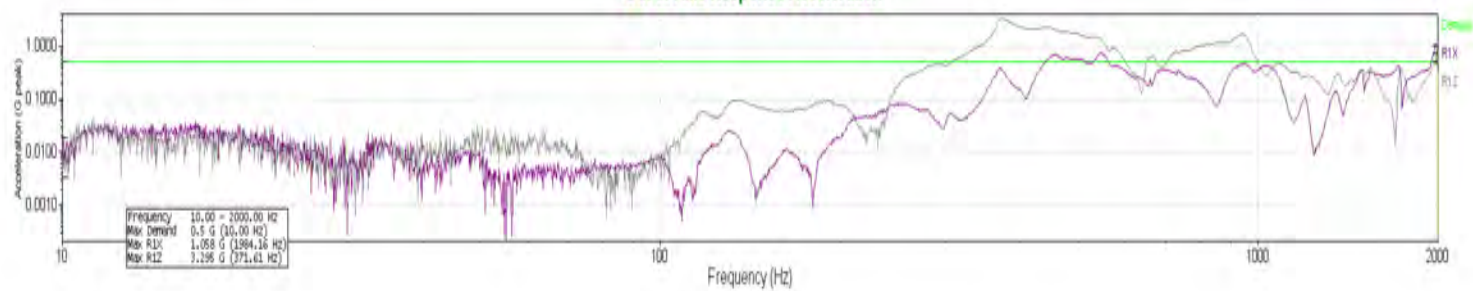
Control Acceleration Profile



In-Axis Response Acceleration

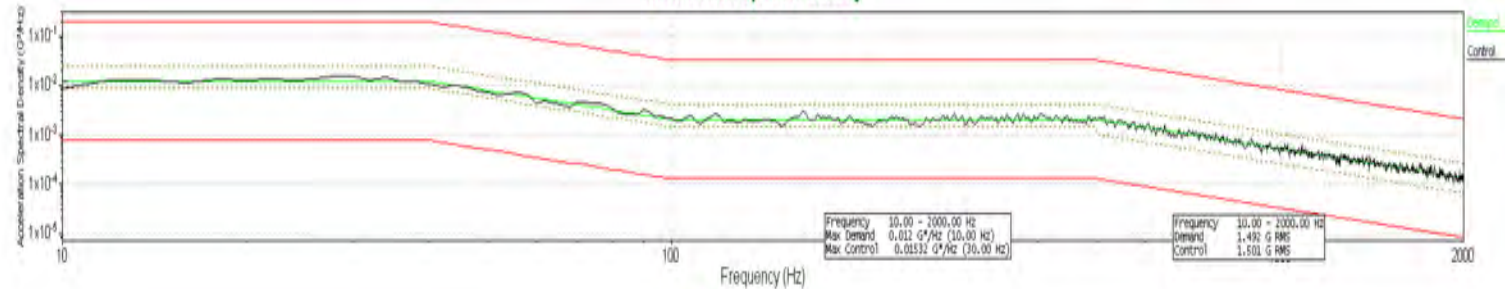


Out of-Axis Response Acceleration

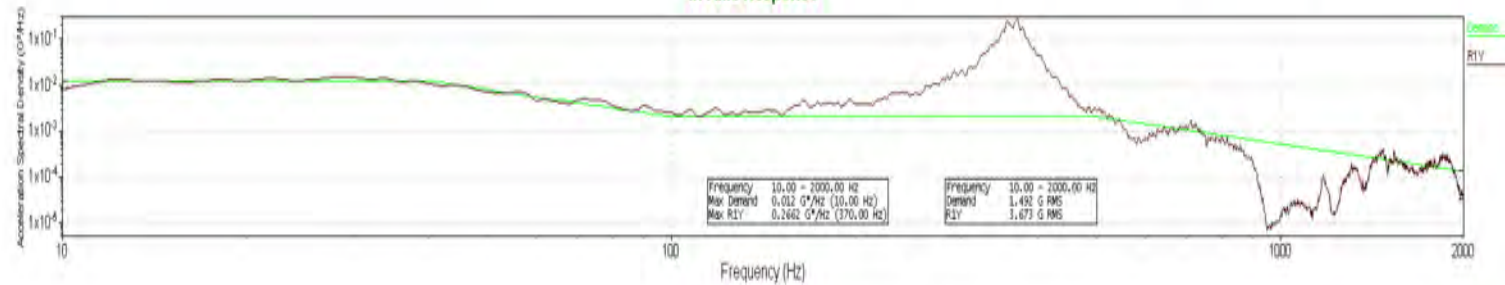


Element-Longmont Level Time: 1:00:00 Demand: 1.492 G RMS PR188450 Level 0 dB
Shotover Systems Total Time: 1:00:52 Control: 1.503 G RMS UUT: OSCAR
Jan 21, 2026 10:22:37 Run 14 Test axis: Y SN: 190020

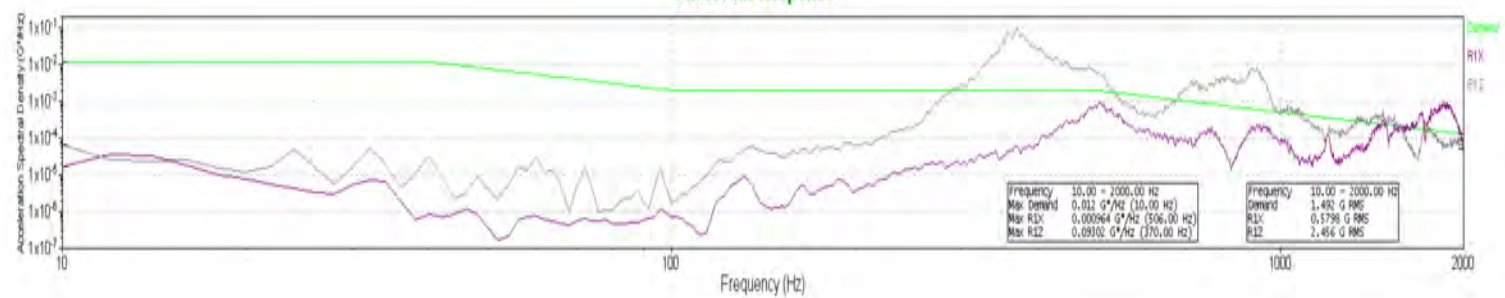
Acceleration Spectral Density



In-Axis Response

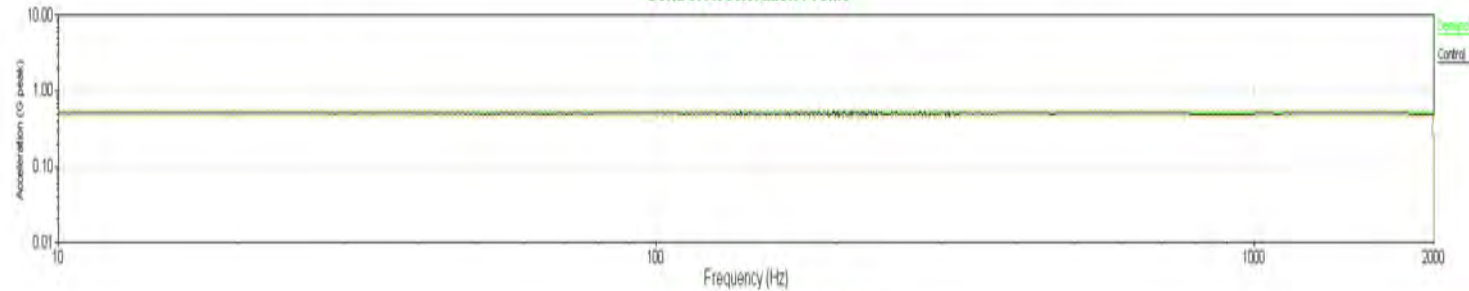


Out-of-Axis Response

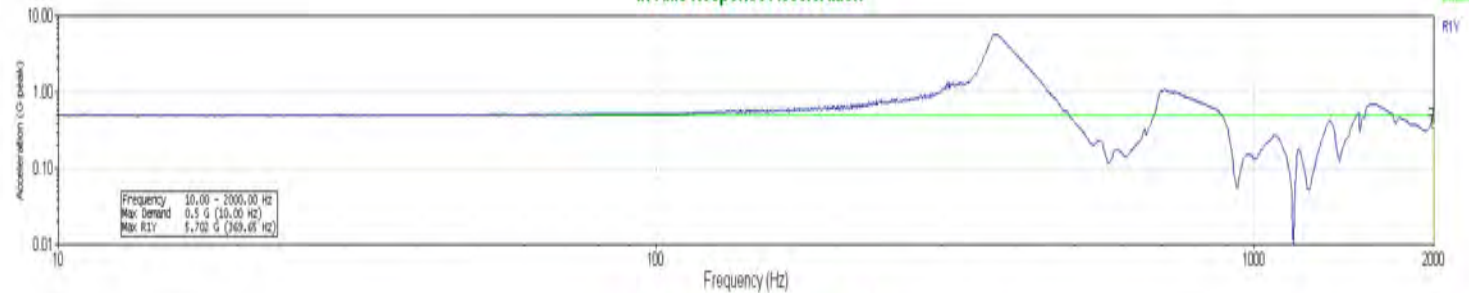


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.4928 G	UUT: OSCAR
Jan 21, 2026 11:28:17	Run 15	Test axis: Y	SN: 190020

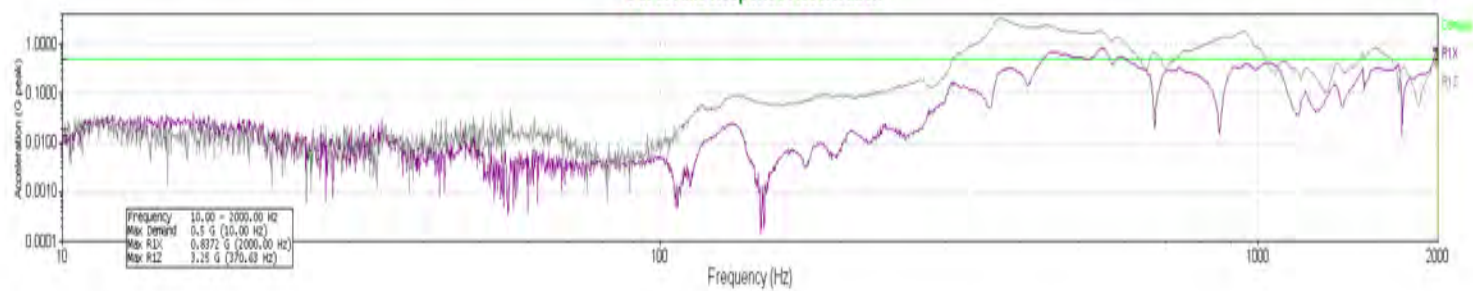
Control Acceleration Profile



In-Axis Response Acceleration

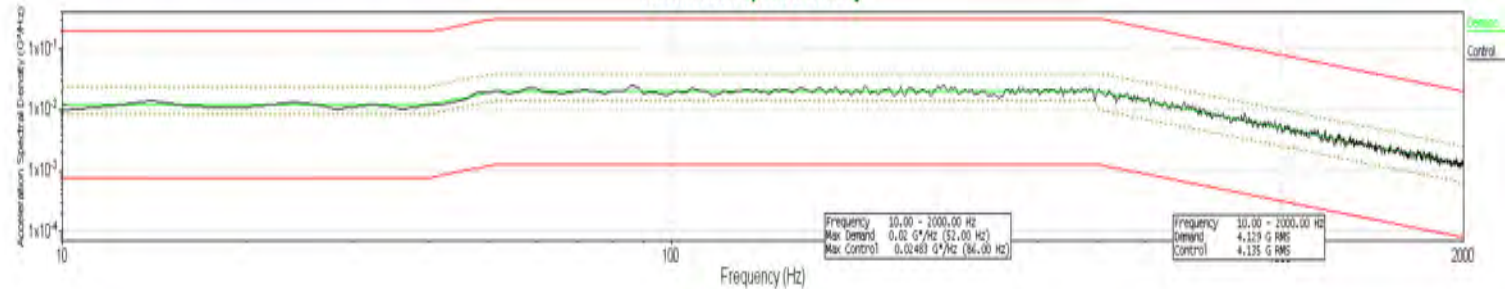


Out of-Axis Response Acceleration

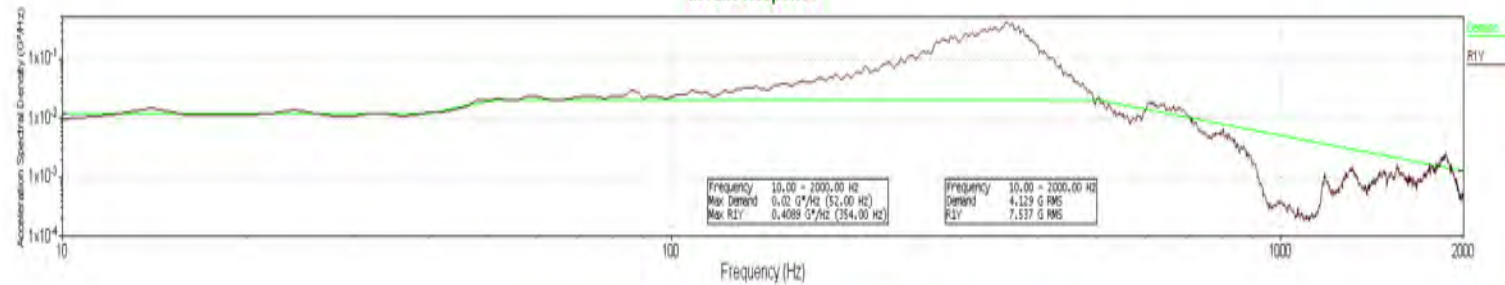


Element-Longmont Level Time: 1:00:00 Demand: 4.129 G RMS PR188450 Level 0 dB
Shotover Systems Total Time: 1:00:54 Control: 4.136 G RMS UUT: OSCAR
Jan 21, 2026 11:42:38 Run 16 Test axis: Y SN: 190020

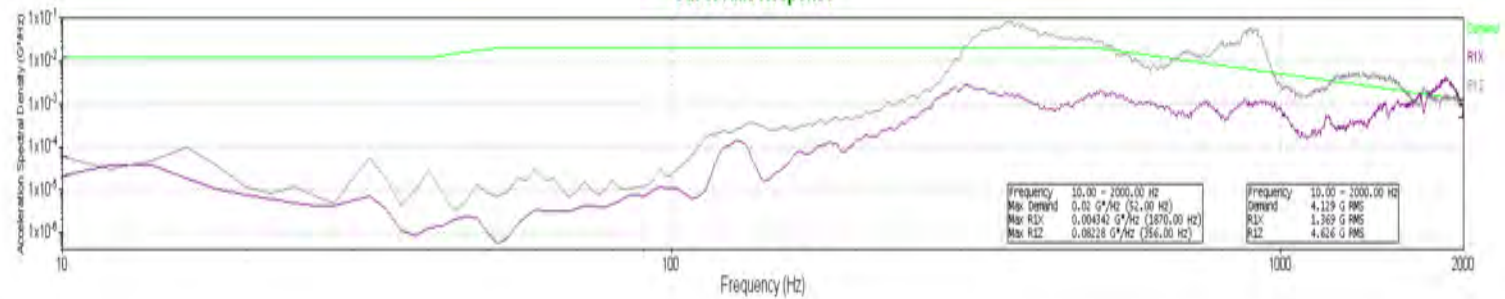
Acceleration Spectral Density



In-Axis Response

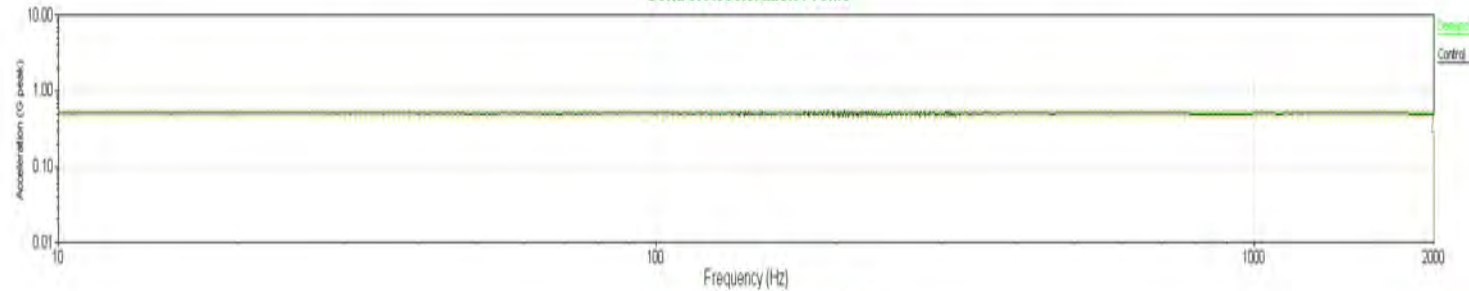


Out-of-Axis Response

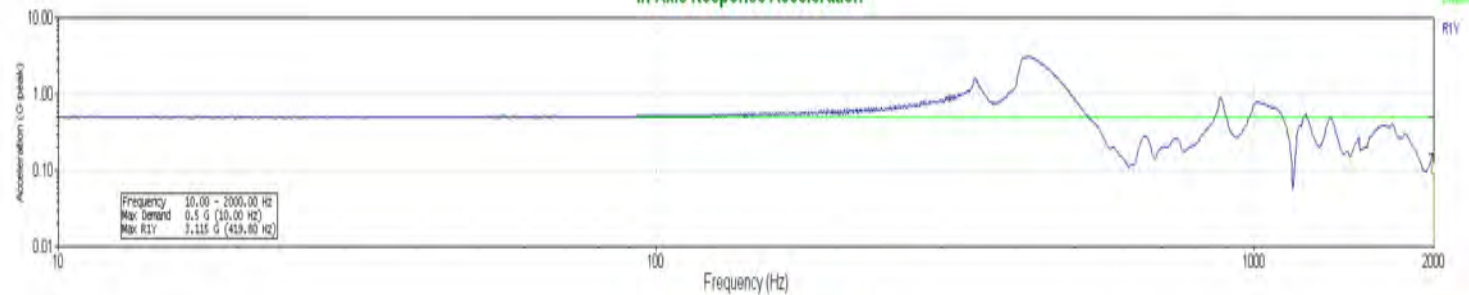


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.5001 G	UUT: OSCAR
Jan 21, 2026 12:50:46	Run 17	Test axis: Y	SN: 190020

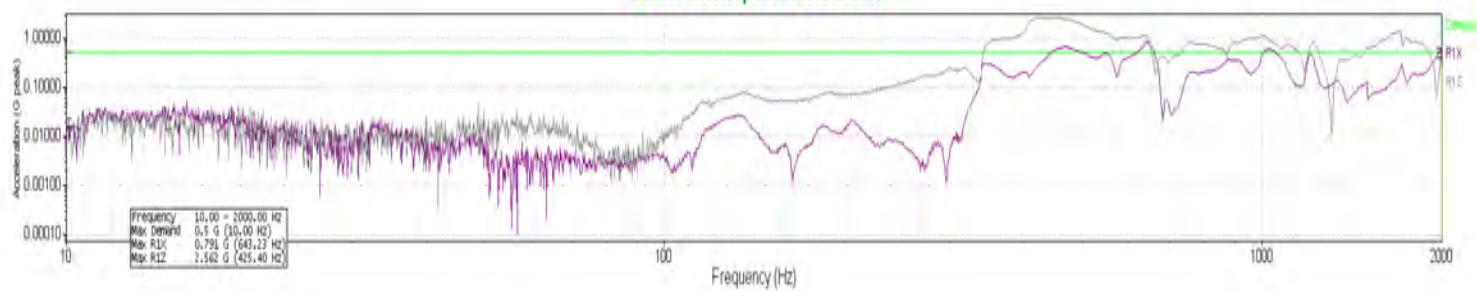
Control Acceleration Profile



In-Axis Response Acceleration

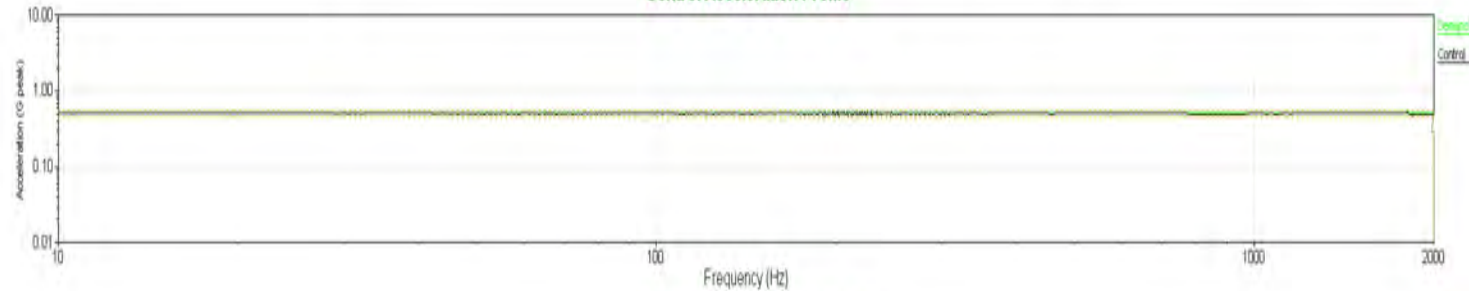


Out of-Axis Response Acceleration

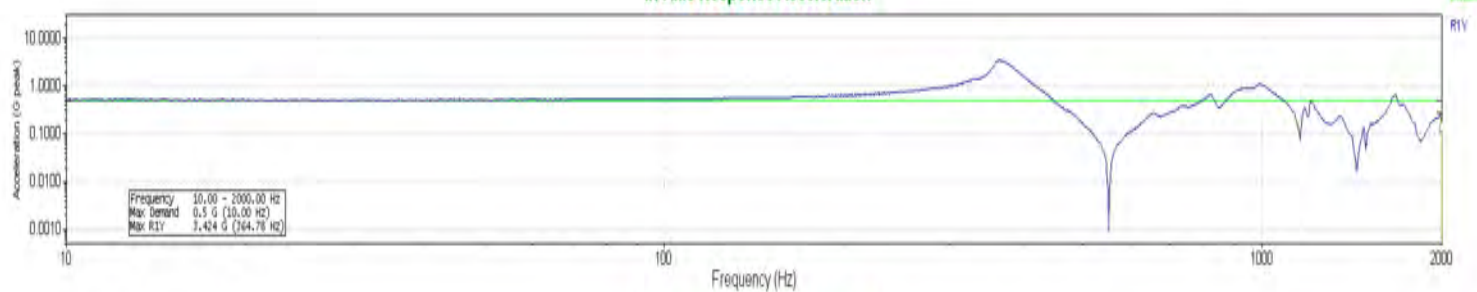


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.4995 G	UUT: OSCAR
Jan 21, 2026 15:14:42	Run 18	Test axis: Y	SN: 190020

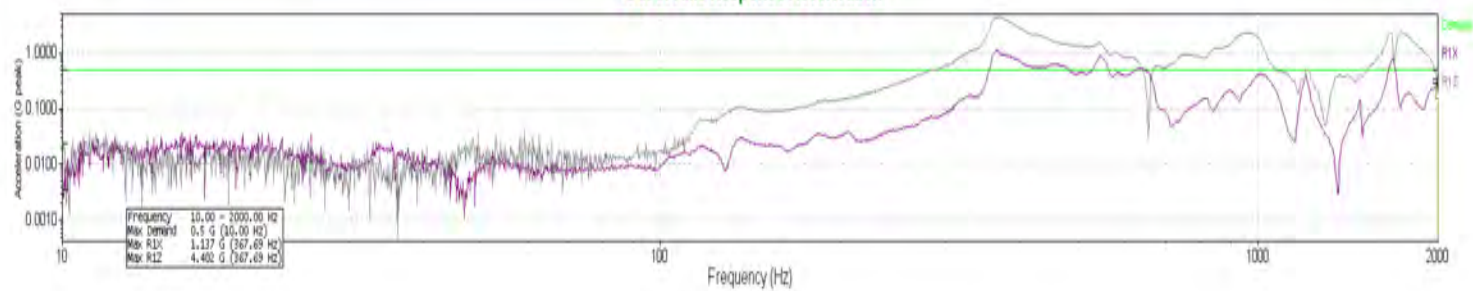
Control Acceleration Profile



In-Axis Response Acceleration

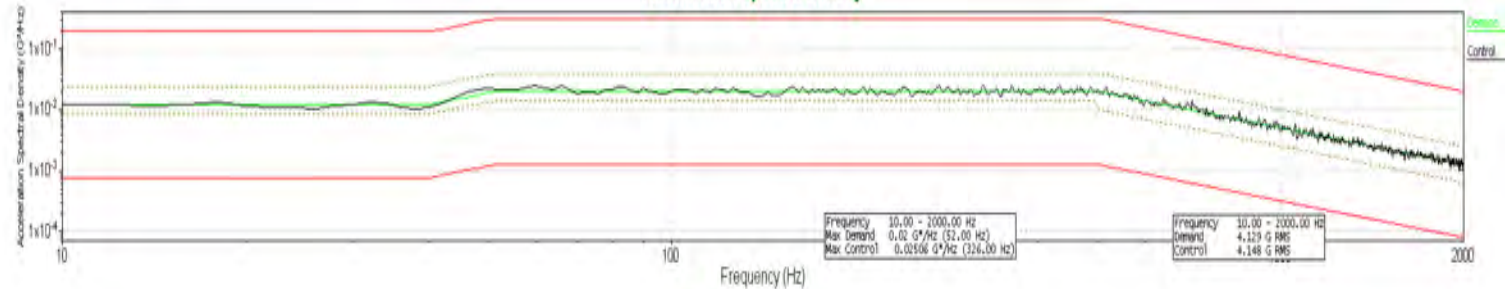


Out of-Axis Response Acceleration

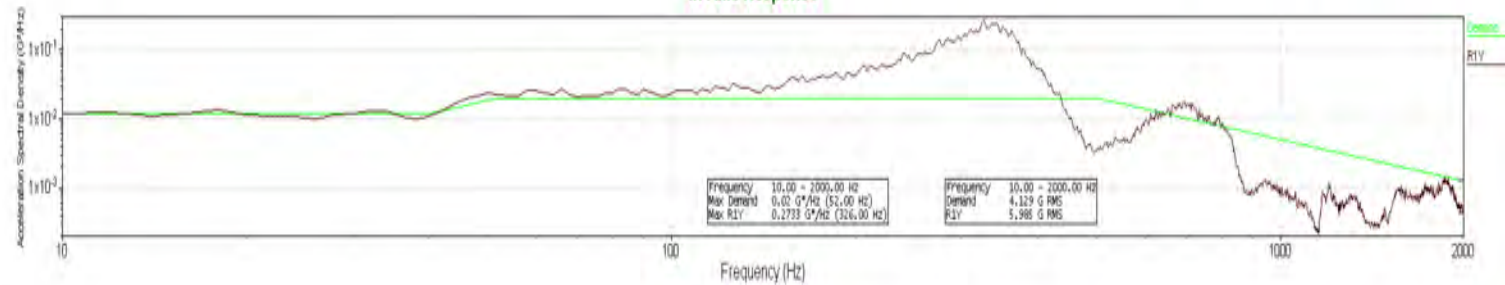


Element-Longmont Level Time: 1:00:00 Demand: 4.129 G RMS PR188450 Level 0 dB
Shotover Systems Total Time: 1:00:53 Control: 4.15 G RMS UUT: OSCAR
Jan 21, 2026 15:29:04 Run 19 Test axis: Y SN: 190020

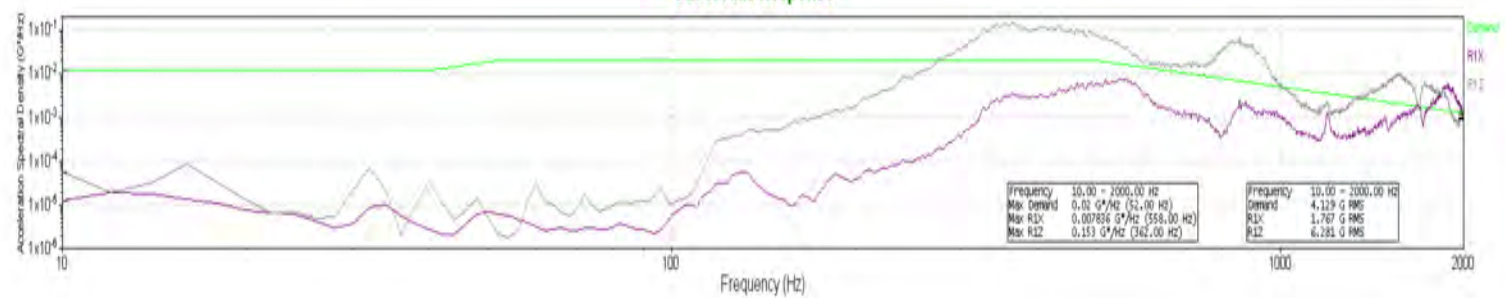
Acceleration Spectral Density



In-Axis Response

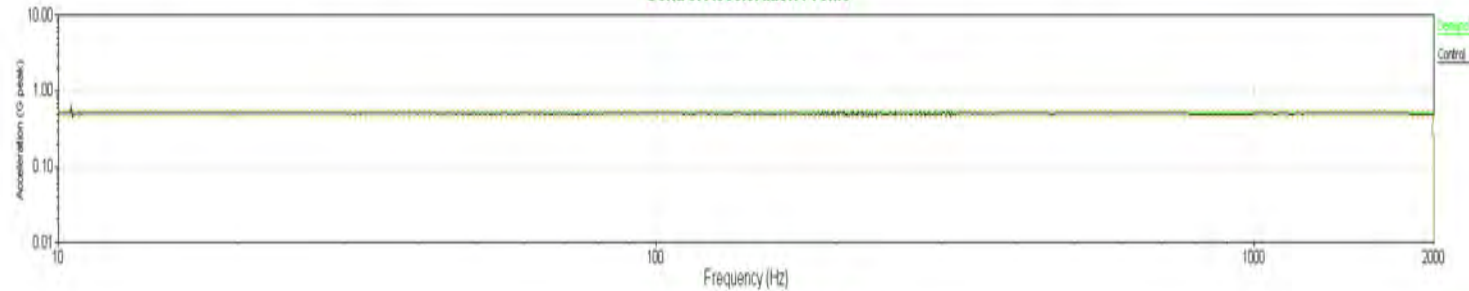


Out-of-Axis Response

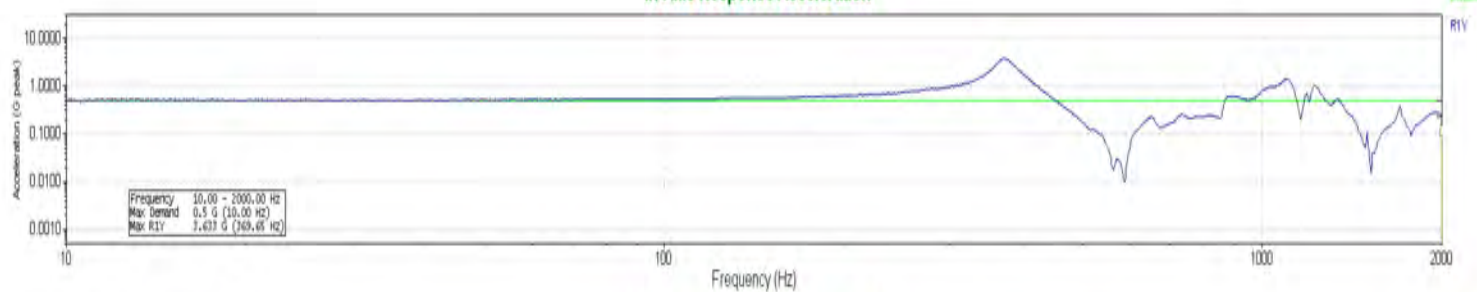


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.4952 G	UUT: OSCAR
Jan 21, 2026 16:32:47	Run 20	Test axis: Y	SN: 190020

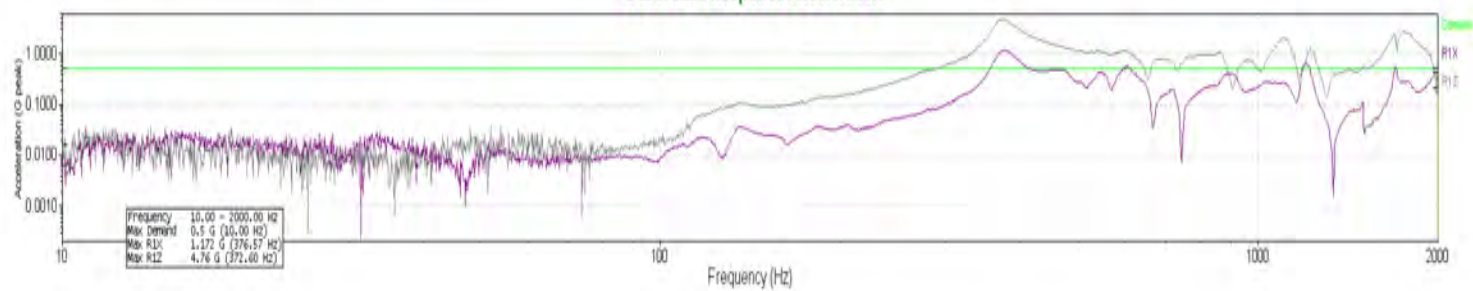
Control Acceleration Profile



In-Axis Response Acceleration

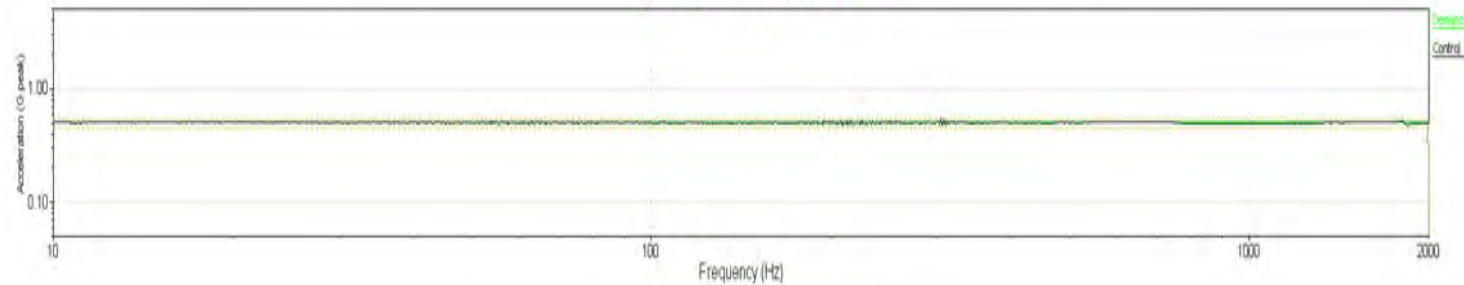


Out of-Axis Response Acceleration

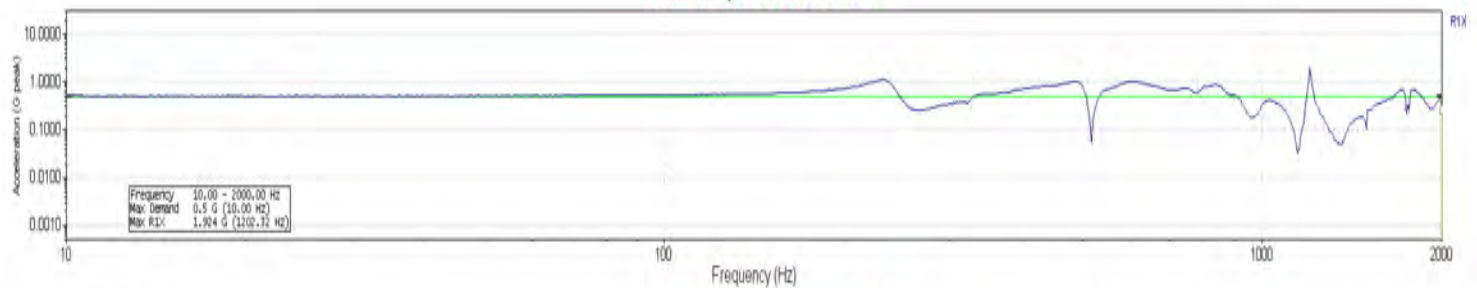


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.4987 G	UUT: OSCAR
Jan 22, 2026 10:20:35	Run 21	Test axis: X	SN: 190020

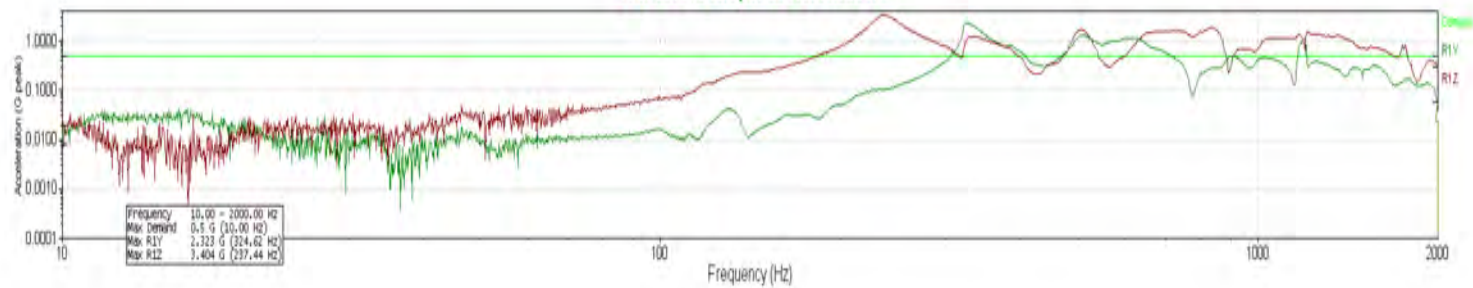
Control Acceleration Profile



In-Axis Response Acceleration

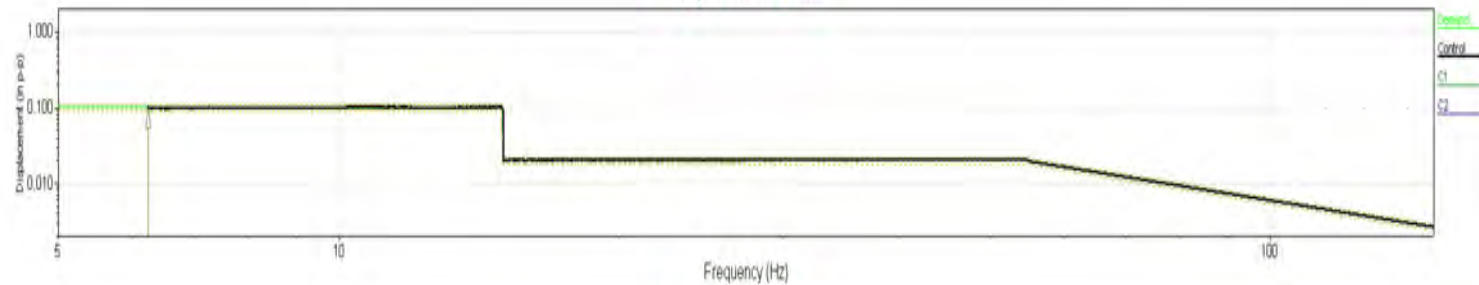


Out of-Axis Response Acceleration

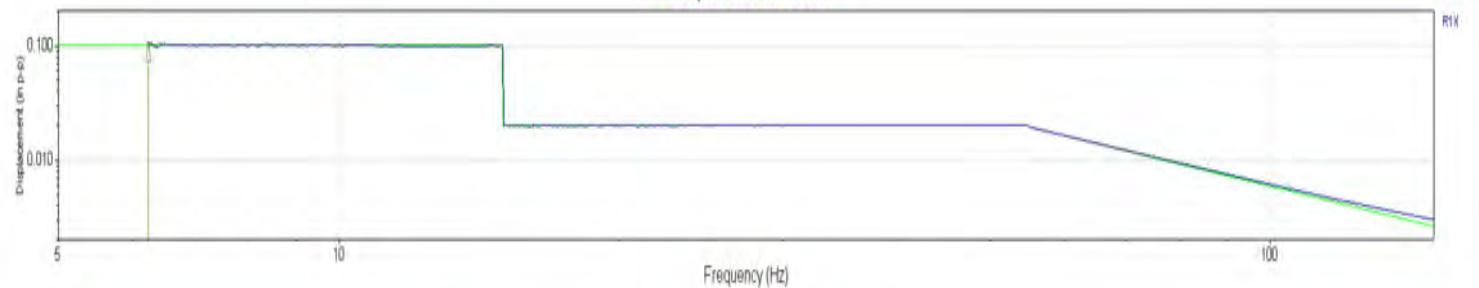


Element-Longmont	Level Time: 1:00:00	Demand: 0.1994 G	PR188450
Shotover Systems	Level 100 %	Control: 0.1983 G	UUT: OSCAR
Jan 22, 2026 10:35:19	Run 22	Test axis: X	SN: 190020

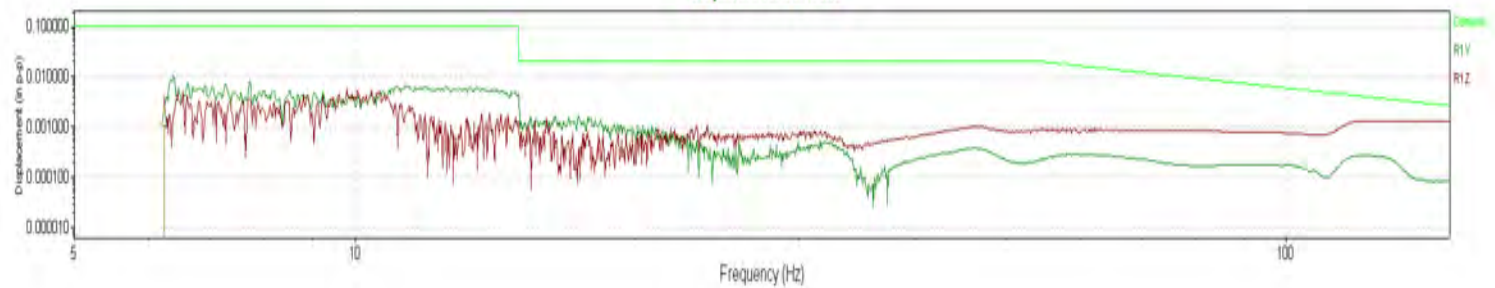
Displacement Profile



Displacement Profile

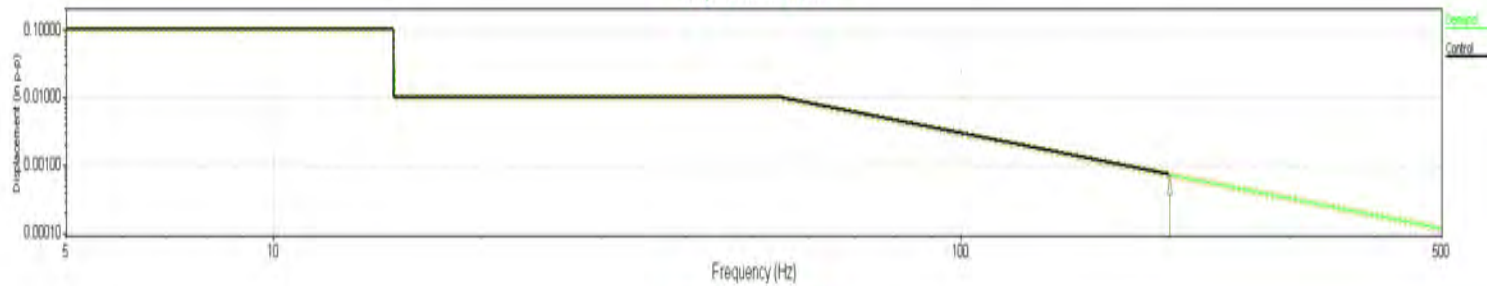


Displacement Profile

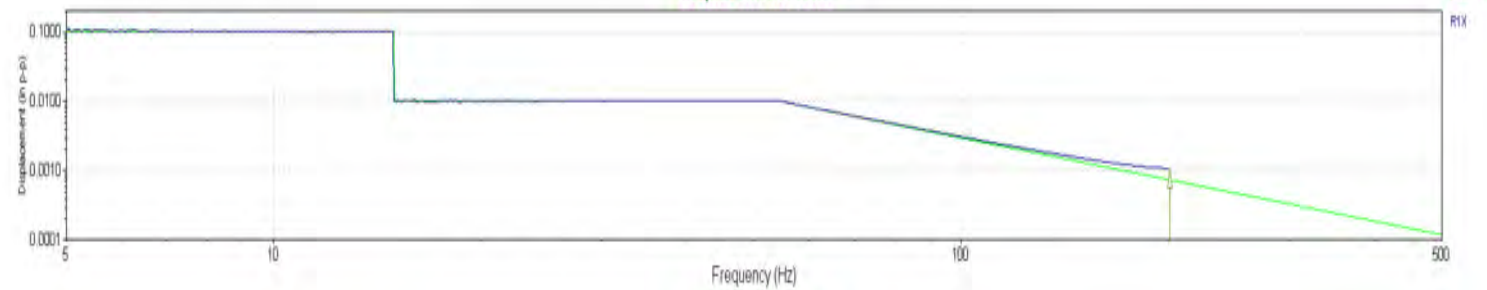


Element-Longmont	Level Time: 1:00:00	Demand: 1.5 G	PR188450
Shotover Systems	Level 100 %	Control: 1.499 G	UUT: OSCAR
Jan 22, 2026 11:47:03	Run 23	Test axis: X	SN: 190020

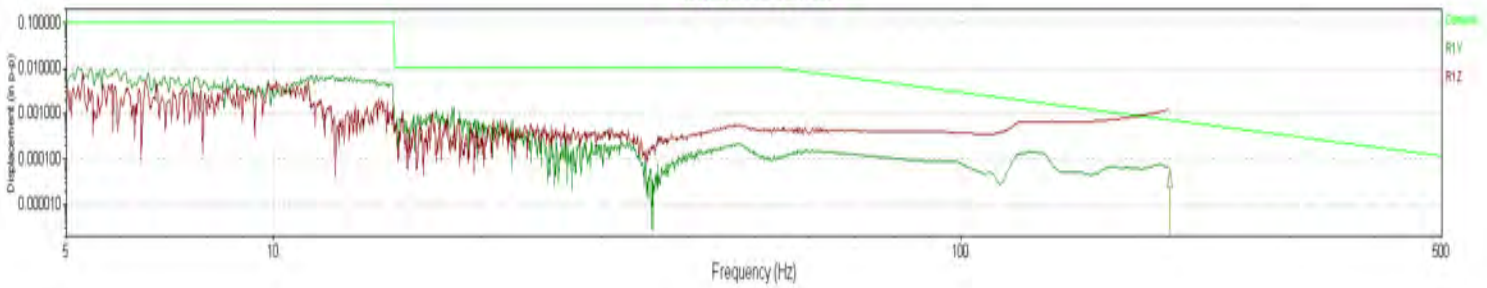
Displacement Profile



Displacement Profile

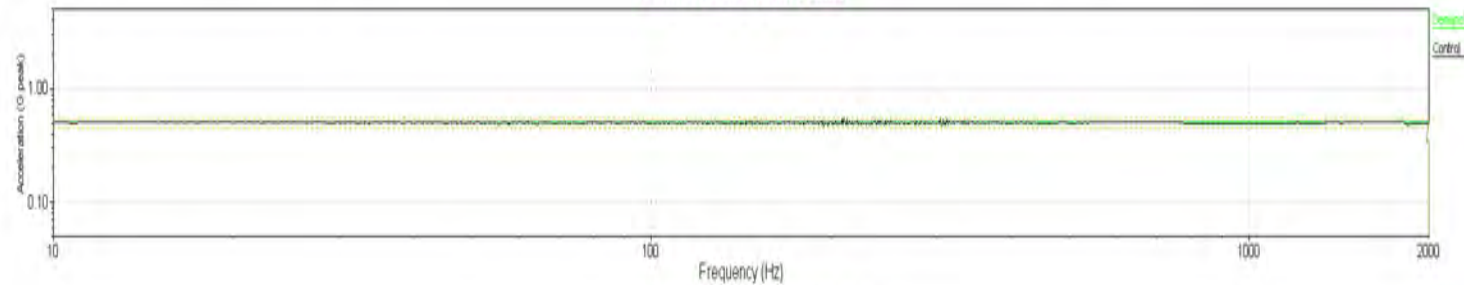


Displacement Profile

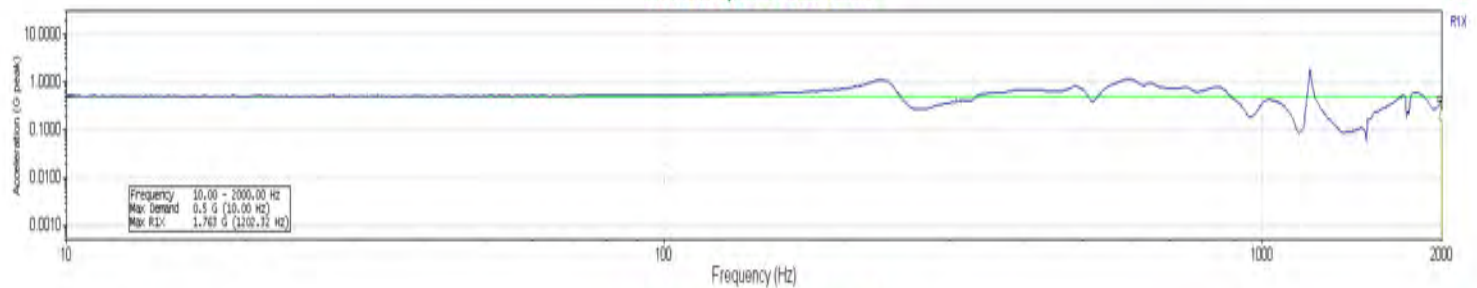


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.5001 G	UUT: OSCAR
Jan 22, 2026 13:02:32	Run 24	Test axis: X	SN: 190020

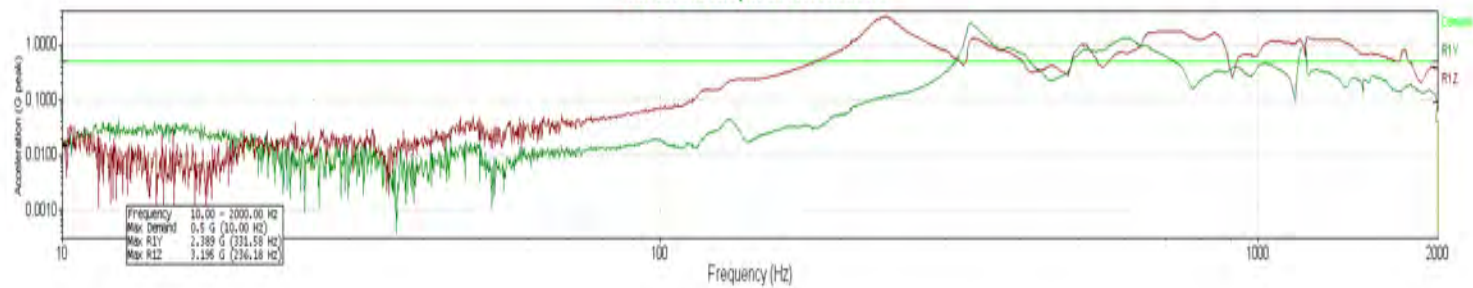
Control Acceleration Profile



In-Axis Response Acceleration

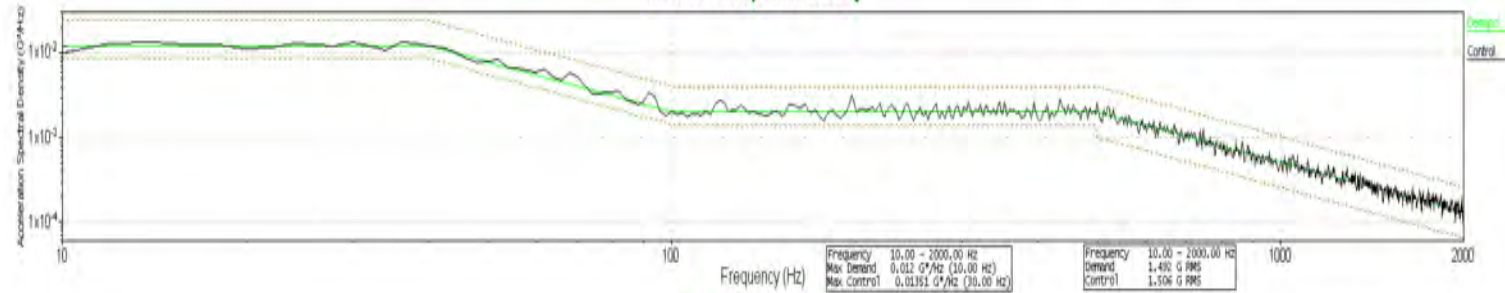


Out of-Axis Response Acceleration

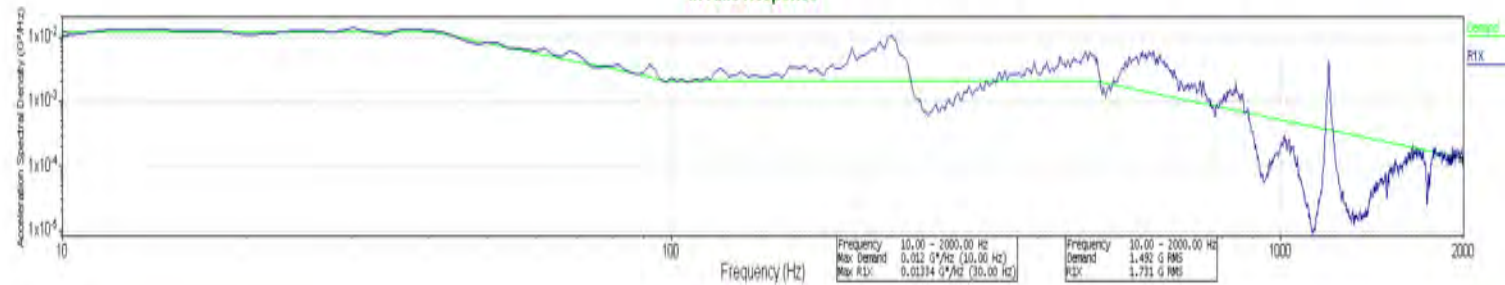


Element-Longmont	Level Time: 1:00:00	Demand: 1.492 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 1:00:52	Control: 1.509 G RMS	UUT: OSCAR
Jan 22, 2026 13:16:19	Run 25	Test axis: X	SN: 190020

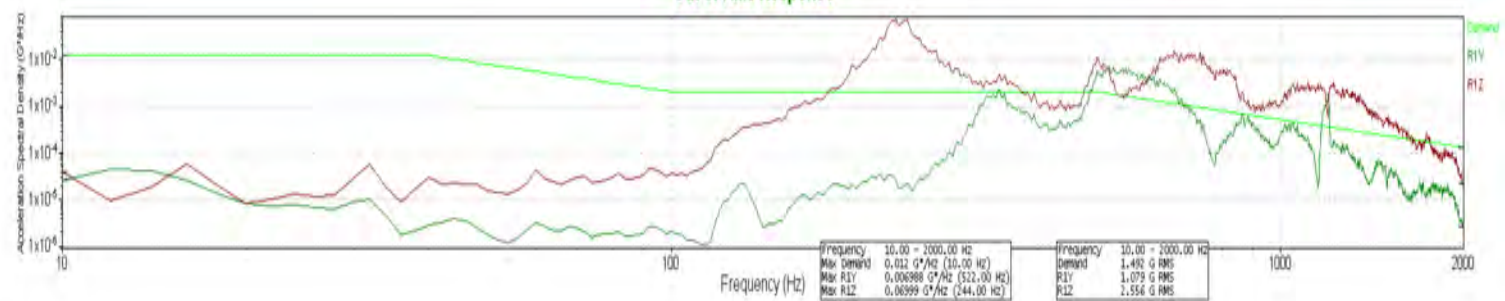
Acceleration Spectral Density



In-Axis Response

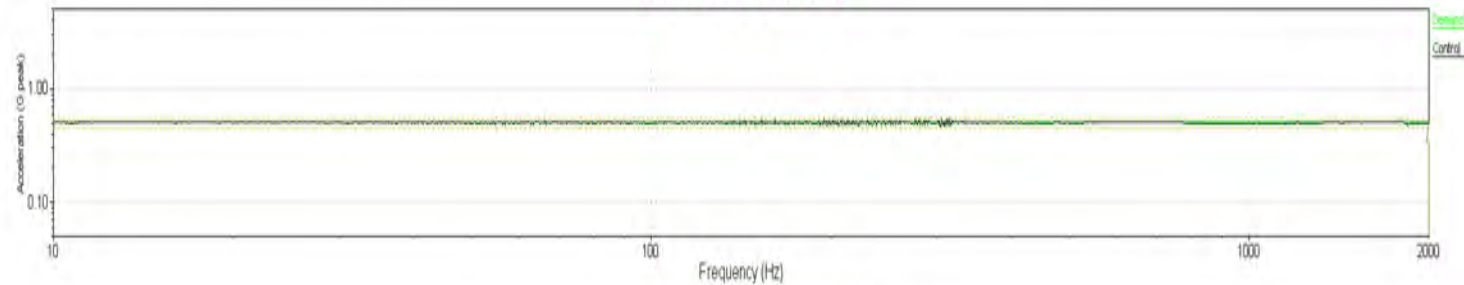


Out-of-Axis Response

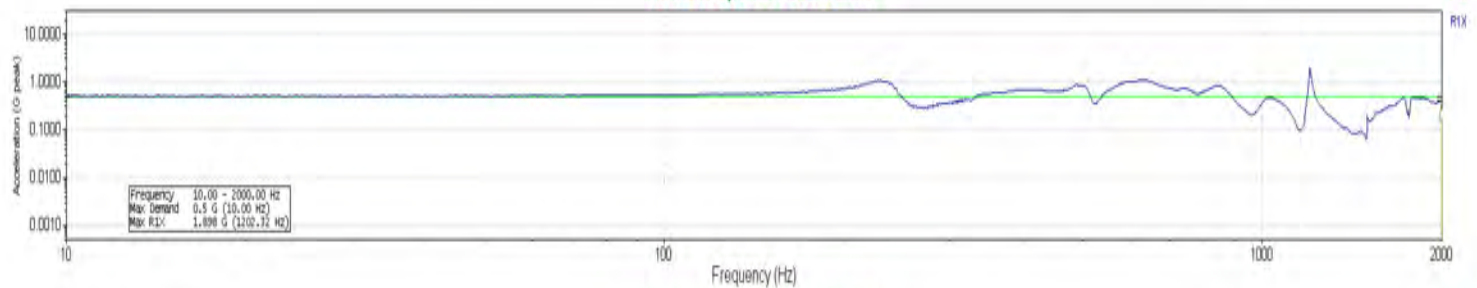


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.4975 G	UUT: OSCAR
Jan 22, 2026 14:27:51	Run 26	Test axis: X	SN: 190020

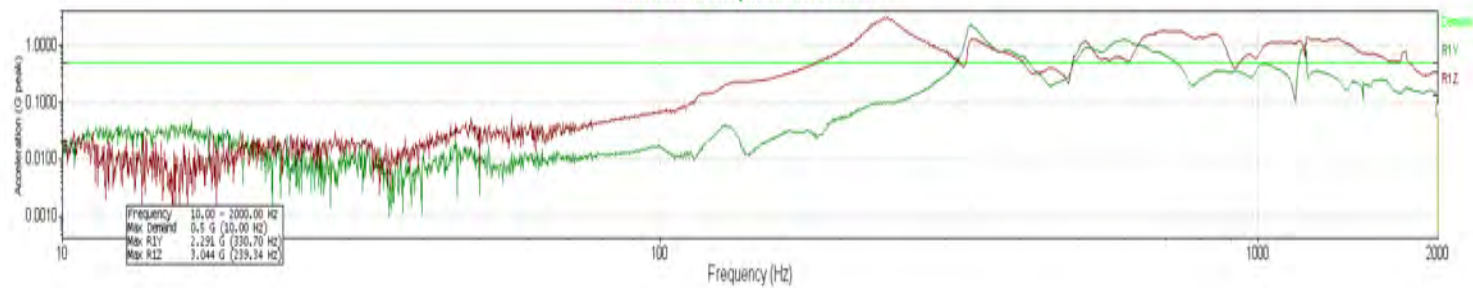
Control Acceleration Profile



In-Axis Response Acceleration

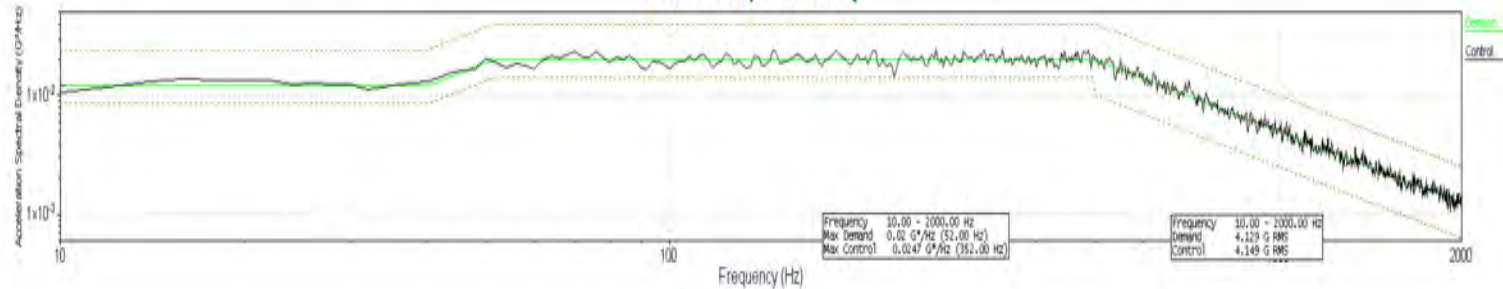


Out of-Axis Response Acceleration

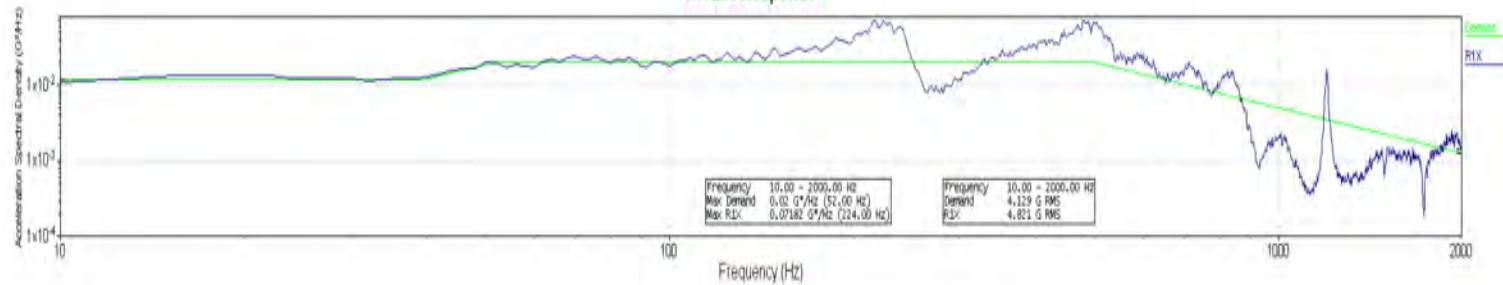


Element-Longmont	Level Time: 1:00:00	Demand: 4.129 G RMS	PR188450 Level 0 dB
Shotover Systems	Total Time: 1:00:55	Control: 4.15 G RMS	UUT: OSCAR
Jan 22, 2026 14:42:25	Run 27	Test axis: X	SN: 190020

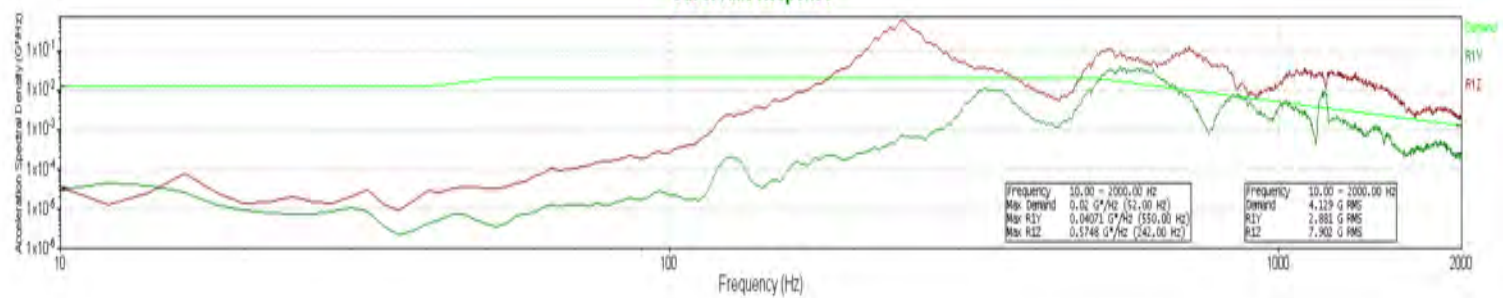
Acceleration Spectral Density



In-Axis Response

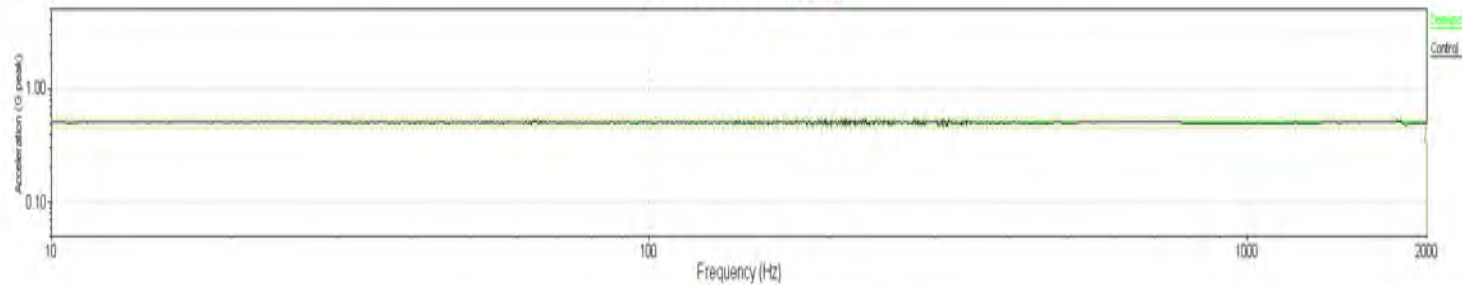


Out-of-Axis Response

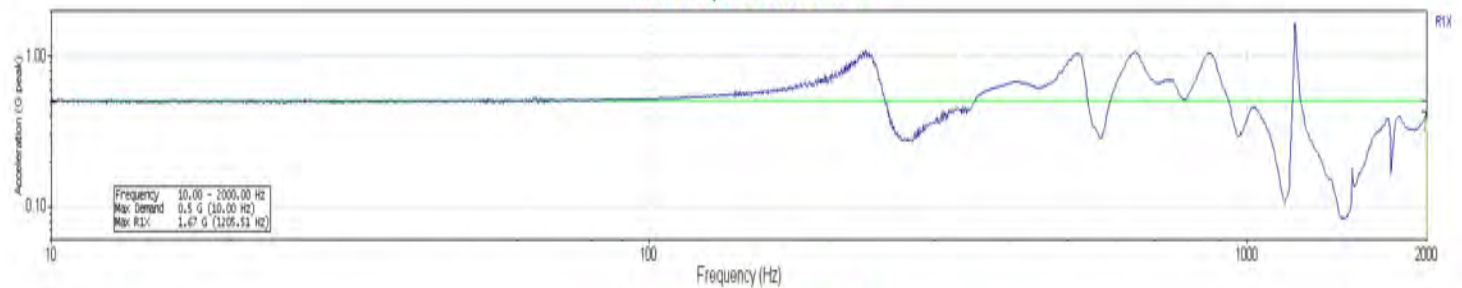


Element-Longmont	Level Time: 0:07:39	Demand: 0.5 G	PR188450
Shotover Systems	Level 100 %	Control: 0.4992 G	UUT: OSCAR
Jan 22, 2026 15:44:03	Run 28	Test axis: X	SN: 190020

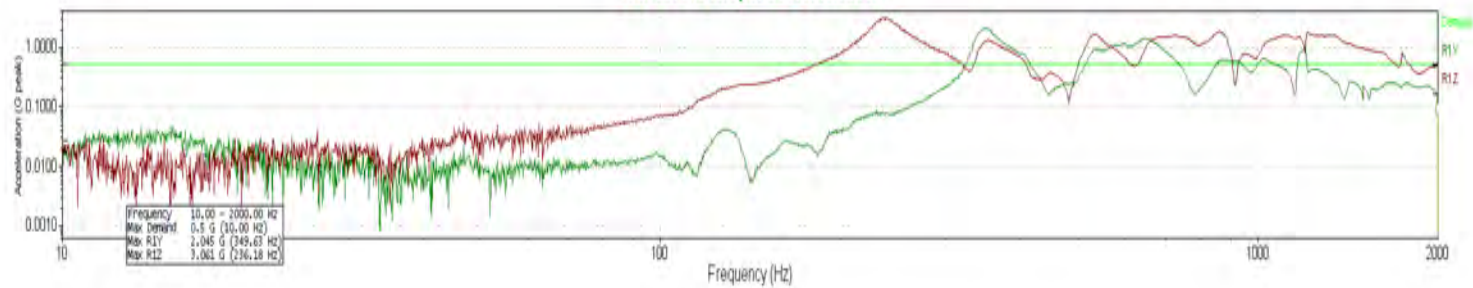
Control Acceleration Profile



In-Axis Response Acceleration



Out of-Axis Response Acceleration



5.9.6 Test Equipment List

Table 5.9-1: Vibration Test Equipment List

Asset Number	Asset Name	Manufacturer	Model	Calibrated	Due
US58-A084305	Vibration Shaker T1000	Unholtz-Dickie	T1000 1 AR	NCR	NCR
US58-A061440	Shaker, vertical/horizontal, ED 01	Ling	B335	NCR	NCR
US58-A070466	Humidity & Temperature Meter	Fluke	971	07/09/2025	07/09/2026
US58-A059875	VR9500	Vibration Research	VR9500	04/14/2025	04/14/2026
US58-A084332	Accelerometer	Dytran Instruments	3030B5	07/29/2025	07/29/2026
US58-A084331	Accelerometer	Dytran Instruments	3030B5	07/28/2025	07/28/2026
US58-A076896	Triaxial	PCB Piezotronics	356A06	03/26/2025	03/26/2026
US58-A061708	Vibration Controller	Vibration Research	VR9500	04/07/2025	04/07/2026
US58-A061703	Vibration Controller	Vibration Research	VR9500	03/20/2025	03/20/2026
US58-A080916	Accelerometer	Dytran Instruments	3030B5	03/28/2025	03/28/2026
US58-A080910	Accelerometer	Dytran Instruments	3030B5	11/11/2025	11/11/2026
US58-A076484	Vibration Controller	Vibration Research	VR9500	07/08/2025	07/08/2026
US58-A084273	Torque Wrench	Snap-on	QD3R150	04/23/2025	04/23/2026

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

Appendix A – Explosive Atmosphere



Element Materials Technology Seattle
2200 222nd Street SE
Bothell, WA 98021
P 425-984-2715

Explosive Atmosphere Test Report

Date: January 26, 2026
Report Number: R21531

Element Denver
1601 Dry Creek Drive
Longmont, CO 80503
United States of America

Prepared By:



Kathryn Walsh-Clark
Element Seattle Technical Writer

1/26/2026

Date

Reviewed By:



Naman Sharma
Element Seattle Operations Manager

1/26/2026

Date

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ADMINISTRATIVE DATA

Prepared For:	Michael Bosica Element Denver 1601 Dry Creek Drive Longmont, CO 80503 United States of America michael.bosica@element.com (720) 340-7810
Tests Performed:	Explosive Atmosphere
Test Facility:	Element Materials Technology Seattle 2200 222nd Street SE Bothell, WA 98021 425-984-2715
Test Unit Description(s):	OSCAR
Part Number(s):	012-0031
Serial Number(s):	190019
Primary Test Specification(s):	Ref Doc: US211-9002-Rev0.1_OSCAR Explosive Atmosphere Test Plan – Ref: RTCA DO-160G section 9.6.2, category E
Purchase Order Number(s):	PRPO155558-3
Element Job Number:	21531
Element Quote Number(s):	EPO021531Q
Date of Receipt of Test Item(s):	1/16/2026
Project Begin Date:	1/16/2026
Project Completion Date:	1/19/2026
Test Report Completion Date:	January 26, 2026

[illegible]

1.0 Introduction

1.1 Scope

This document describes procedures and results of testing performed to the specification(s) and/or requirement(s) detailed herein. The results described in this report relate only to the specific items as received and tested.

1.2 Purpose

The purpose of this test was to demonstrate that the test samples met or exceeded the design specifications and/or requirements during or upon completion of exposure to the testing detailed herein.

1.3 Test Sequence

The following test was performed:

Table 1 – Test Performed

Test	Start Date	End Date
Explosive Atmosphere	1/16/2026	1/19/2026



Element Materials Technology Seattle
2200 222nd Street SE
Bothell, WA 98021
P 425-984-2715

2.0 Applicable Documents

2.1 Specification

Ref Doc: US211-9002-Rev0.1_OSCAR Explosive Atmosphere Test Plan – Ref:
RTCA DO-160G section 9.6.2, category

3.0 General information

3.1 Test Equipment

All test instrumentation was calibrated in accordance with ANSI/NCSL Z540.1, Z540.3 or ISO 10012 as applicable, and are traceable to the National Institute of Standards and Technology (NIST) or other National Metrology Institute (NMI). Test equipment lists are available in individual test detail sections.

3.2 Test Conditions

Unless specified herein, all tests and measurements were performed at the room ambient conditions existing at the laboratory during testing:

Temperature: 15°C to 35°C
Relative Humidity: 0% to 80%

3.3 Test Witnessing/Monitoring

All testing was conducted by a qualified Element Technician and/or Test Engineer under the direction and cognizance of the Lab Manager and Quality Assurance.

3.4 Test Recording

Chronological logs of all significant events are maintained by test lab personnel and indicate date, times and descriptions of conditions. These logs are used as reference and retained at Element, and are available upon request.

3.5 Decision Rule

Based upon the type of testing being categorized as CAT I (Quantitative or Semi-Quantitative) as defined in A2LA's P103 Policy on Estimating Measurement Uncertainty for Testing Laboratories, decision rules are not required.



Element Materials Technology Seattle
2200 222nd Street SE
Bothell, WA 98021
P 425-984-2715

4.0 Explosive Atmosphere Test Details

4.1 Setup

4.1.1 One (1) 012-0031 OSCAR, S/N: 190019 was visually inspected with no signs of damage, deformation, discoloration, corrosion, or any other anomalies noted.

4.1.2 Test equipment utilized for testing as outlined in Table 2.

Table 2 – Explosive Atmosphere Equipment
Test Dates: 1/16/2026 to 1/19/2026

ID#	Description	Mfr.	Model#	Serial#	Cal Date	Cal Due Date
S16985	Lab Barometer	Traceable	4040,90080-06	250005341	1/6/2025	1/6/2027
S16808	Data Acquisition/Switch Unit	Keysight	34970A	MY44077503	7/14/2025	7/14/2026
EC736	Explosives Chamber	Element	NA	NA	Ref only	Ref only
S16710	Multiplexer Switch, 20 Channel	Agilent/HP/Keysight Tech	34901A	US37000578	7/21/2025	7/21/2026
S16968	Hexane 95%	ThermoFisher Scientific	H306	Lot: 230021	9/1/2025	9/1/2028
S16853	Digital Multimeter	Fluke	115	47901171SV	6/17/2025	6/17/2026

4.2 Steps

Initials	Date	Time	Notes
NS	1/16/2026	1600	Set up test sample in chamber and take pre exposure photos. Added Thermocouple to the unit. Removed the side lid according to the customer test plan.
NS	1/16/2026	1750	Allowed 28VDC input to the UUT and UUT cannot be started. Contacted customer.
NS	1/19/2026	1000	Customer responded and the current limit of power supply was set to 5A.
NS	1/19/2026	1032	Started heating the chamber air and stabilized the chamber air temperature.
NS	1/19/2026	1210	UUT operational and take photos of UUT.
NS	1/19/2026	1425	UUT stabilized at 81°C, chamber wall at
NS	1/19/2026	1426	Calculated the n-hexane fuel calculations and amount came out to be 97mL.
NS	1/19/2026	1428	Added 97mL of n-hexane to the chamber and allowed at least 3 minutes for complete vaporization of fuel and the

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Initials	Date	Time	Notes
			development of homogeneous mixture. UUT is still operational.
NS	1/19/2026	1435	Verified the explosiveness of the fuel mixture in combustion chamber using a spark plug.
NS	1/19/2026	1436	Ignition achieved. UUT still operational. Testing completed. Take post exposure photos.

4.2.1 Upon test completion, at ambient conditions, the sample was visually inspected, and then returned to customer for final analysis.

4.3 Results

4.3.1 No signs of damage, deformation, discoloration, corrosion, or any other anomalies noted.

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs

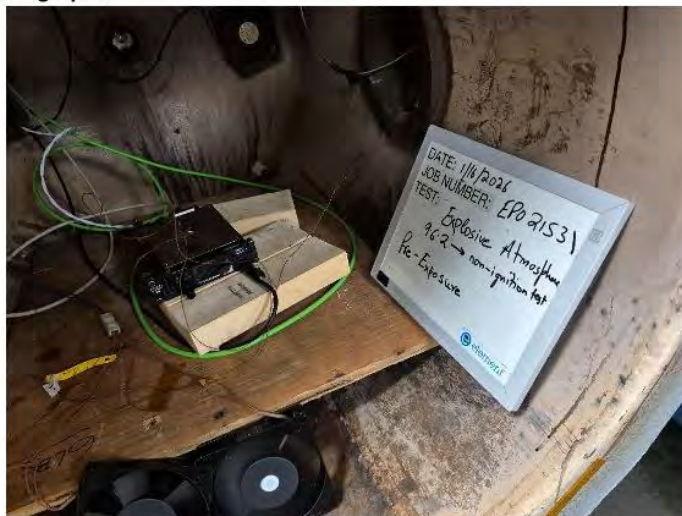


Photo 1 – Pre-Exposure (1)

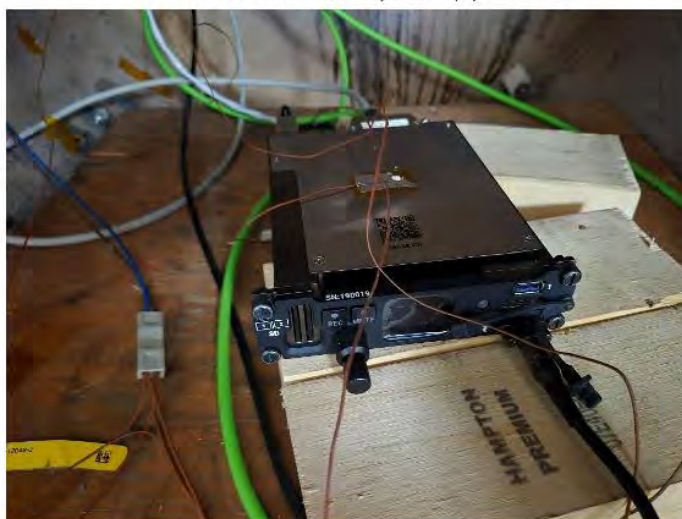


Photo 2 – Pre-Exposure (2)

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs (Continued)



Photo 3 – Pre-Exposure (3)



Photo 4 – Pre-Exposure (4)

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs (Continued)

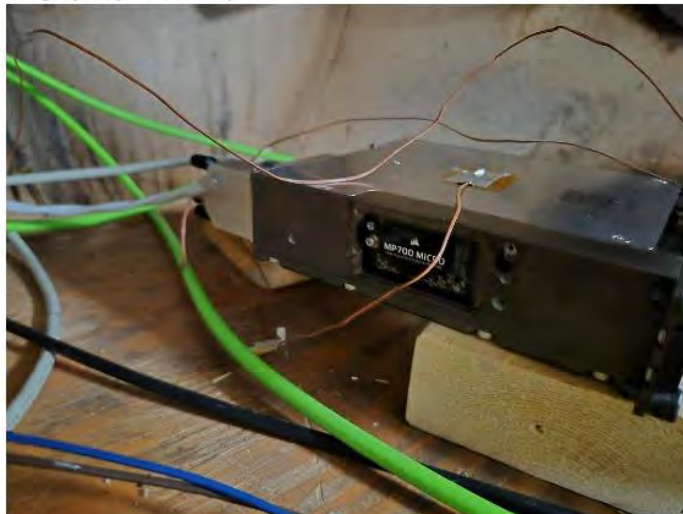


Photo 5 – Pre-Exposure (5)

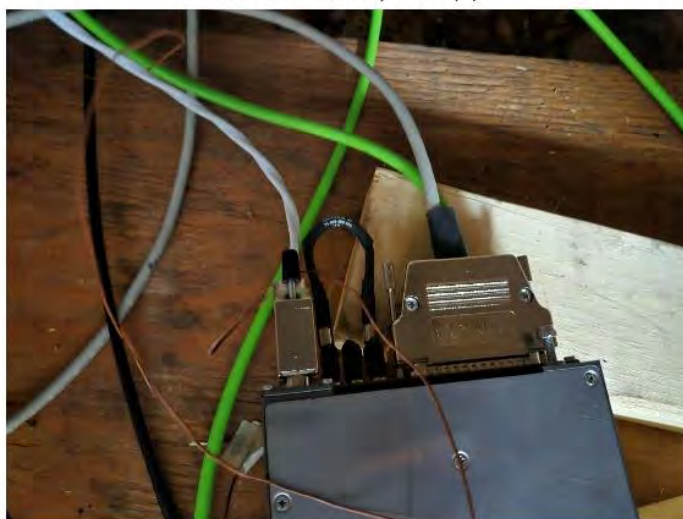


Photo 6 – Pre-Exposure (6)

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs (Continued)



Photo 7 – UUT Operation Verification (1)



Photo 8 – UUT Operation Verification (2)

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs (Continued)



Photo 9 – UUT Operation Verification (3)



Photo 10 – UUT Operation Verification (4)

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs (Continued)



Photo 11 – *n*-Hexane Fuel (1)



Photo 12 – *n*-Hexane Fuel (2)

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs (Continued)



Photo 13 – Post-Exposure (1)



Photo 14 – Post-Exposure (2)

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs (Continued)



Photo 15 – Post-Exposure (3)



Photo 16 – Post-Exposure (4)

4.0 Explosive Atmosphere Test Details (Continued)

4.4 Photographs (Continued)



Photo 17 – Post-Exposure (5)



Photo 18 – Post-Exposure (6)

4.0 Explosive Atmosphere Test Details (Continued)

4.5 Plots, charts, graphs, etc.

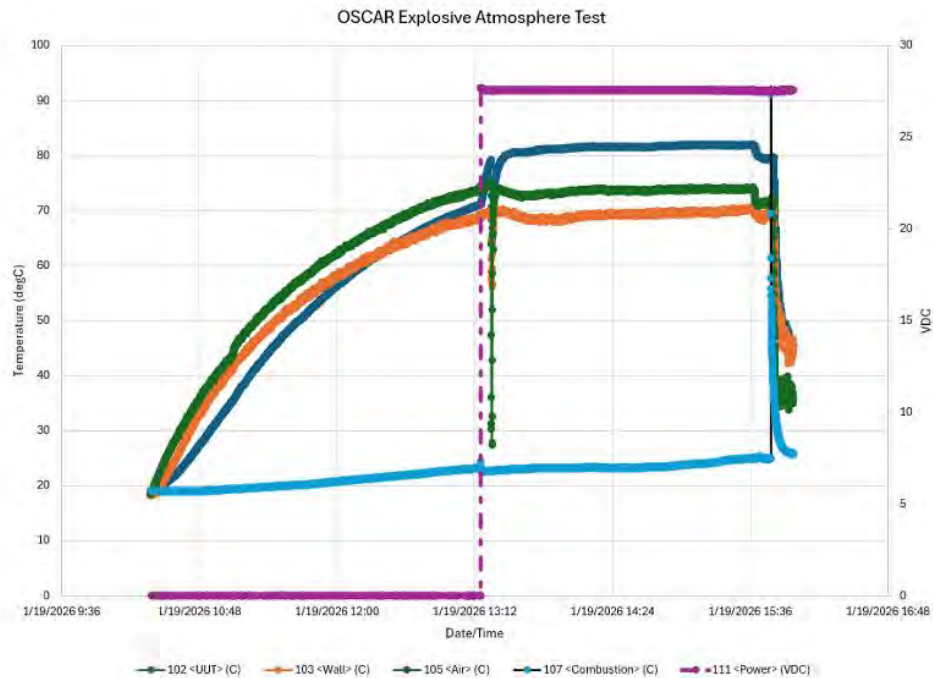


Figure 1 – Explosive Atmosphere Plot

4.0 Explosive Atmosphere Test Details (Continued)

4.5 Plots, Charts, Graphs, Etc. (Continued)

(1) Volume (ml) of 95% normal hexane (metric units) =

$$(511 \text{ L}) \quad (101325 \text{ Pa})$$

$$(4.27 \times 10^{-4}) \frac{[\text{net chamber vol (liters)}][\text{chamber pressure (pascals)}]}{[\text{Chamber temp (K)}][\text{Relative density of n-hexane}]}$$

$$[343.15 \text{ K}] [0.663]$$

$$= 97.17 \text{ mL}$$

(2) Volume (ml) of 95% normal hexane (English units) =

$$(150.41) \frac{[\text{net chamber vol (ft}^3\text{)}][\text{chamber pressure (psia)}]}{[\text{Chamber temp (R)}][\text{Relative density of n-hexane}]}$$

Note: K = the thermodynamic temperature and is °C + 273.15
R = the thermodynamic temperature and is °F + 459.67
The relative density of normal hexane can be determined from Figure 9-2.

The equipment used to vaporize the fuel for use in the explosive atmosphere test should be so designed that a small quantity of air and fuel vapor will be heated together to a temperature such that the fuel vapor will not condense as it is drawn from the vaporizer into the chamber.

When the test facility is designed for fuel vaporization inside the explosion chamber, the fuel may be introduced at the ambient temperature of the test site.

Figure 2 – Calculations for Explosives

End of Report.

Appendix B - Flammability



Page 1 of 16

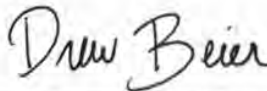
Engineering Report 66405-3

Flammability Test

for

Element Materials Technology - Longmont

Prepared by



Drew Beier, Technical Writer

Approved by



Nathan R. Simmons, Operations Manager

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Revision history

Revision	Total pages	Date	Description
--	16	February 17, 2026	Original

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1.0 Administrative data

Prepared for	Element Materials Technology - Longmont 1601 Dry Creek Dr. Suite 2000 Longmont, CO 80503
Attention	Michael Bosica
Test performed	Flammability Test
Test facility	Element Materials Technology 9725 Girard Avenue South Minneapolis, MN 55431
Item(s) tested	Fan Blower 51.7mm x 15mm, 12VDC Wire
Part number(s)	MF50151VX-1B00U-A99
Sample identifier(s)	1-3
Primary specification(s)	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
PO number	PRPO155463-1
Purchase date	2/6/2025
Element test report number	66405-3
Project start date	2/6/2026
Project completion date	2/10/2026
Test report completion date	2/17/2026
As received	This document describes procedures and results of testing performed to the specification(s) and/or requirement(s) detailed herein. The results described in this report relate only to the specific items as received and tested.
Decision rule	Whenever stating in/out of tolerance or pass/fail results, Element applies "Simple Acceptance"; statements of compliance do not consider measurement uncertainty.

2.0 Instrumentation, procedure, and results

2.1 Instrumentation

All instrumentation is calibrated regularly by instruments directly traceable to the National Institute of Standards and Technology, and in accordance with *ANSI/NCSL Z540.1*, *ANSI/NCSL Z540.3-2006*, and *ISO/IEC 17025: 2017*.

Table 2-1: Instrumentation list

Equipment Number	Description	Manufacturer	Model Number	Last Calibration	Due Calibration	Range
192-005A	Methane - CP Grade 99%	Matheson Tri-Gas	Methane - CP Grade 99%	8/23/2018	8/23/2028	See Certificate of Conformance
400-103	Stopwatch	Traceable	1051	12/17/2024	12/17/2026	24 hrs
501-062	Temperature / Humidity Chamber	Thermotron	SM-32-S	9/26/2025	9/26/2026	Ltd. -30°C to +150°C; 5% to 95% RH
770-070	Caliper	Mitutoyo	500-196-30	11/11/2025	11/11/2026	0 to 6 Inches
950-061	Data Logging System - Main Logger	Fluke	2686A	8/14/2025	8/14/2026	0-300 V; -100-1372°C; 15 Hz-1 MHz; 0-3MΩ

2.2 Procedure

The test units were subjected to Flammability Testing as outlined in Document RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test. Refer to Appendix A for test details.

2.3 Results

Refer to first page of test data sheet on page 7 for a summary of results.

Refer to Appendix A for data, figures, and photographs.

The test units were returned to Element Materials Technology – Longmont.

Appendix A: Flammability Test



Element Minneapolis

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/16/2026

Device under test information

Description	Part number	Number of samples tested	Sample identifier
Fan Blower 51.7mm x 15mm, 12VDC Wire	MF50151VX-1B00U-A99	3	1, 2, 3

Equipment list

192-005A	770-070	501-062	950-061	400-103
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Test conditions and summary

Vertical Bunsen Burner Test:

- The units were placed in a temperature and humidity chamber set to 23°C and 50% RH and conditioned for a minimum of 24 hours prior to testing.
- The gas regulator was connected to a burner with a tube of 3/8 inch (10mm) inside diameter.
- Flame height was adjusted to 1.5 inch (38mm) with an inner blue cone of 7/8 inch (22mm) in height as described in Section 26 of RTCA/DO-160G with a burner fuel of 99% Methane gas.
- One (1) specimen at a time was removed from the conditioning chamber and tested immediately.
- The sample was positioned vertically with its lower edge 3/4 inch (19mm) above the level of the top of the burner.
- The samples were exposed to a flame for 12 seconds.
- After flame time, drip flame time and burn length of the sample was measured and recorded below.

Part number: 259-MF50151VX-1B00U-A99-ND

Sample	Ignition time (sec.)	After flame time (sec.)	Drip flame time (sec.)	Burn length (in.)
Sample 1	12	4.58	0, No drip	1.348
Sample 2	12	5.16	0, No drip	1.434
Sample 3	12	4.70	0, No drip	1.213
Average	12	4.81	0, No drip	1.331
Requirement	~	15 seconds maximum	5 seconds maximum	6 inches maximum
Test results	COMPLIANT			

DUT disposition ☐ Retained at Element ☒ Returned to customer ☐ Other (describe)

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026



Photograph A-1: Test unit identification



Photograph A-2: Test setup, samples inside conditioning chamber

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026



Photograph A-3: Bunsen burner inner diameter verification



Photograph A-4: Outer flame height verification

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026



Photograph A-5: Inner flame height verification



Photograph A-6: Representative Test setup, sample distance to burner

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026



Photograph A-7: Representative Test setup, Vertical Burn



Photograph A-8: During testing

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026



Photograph A-9: During testing

Data sheet Flammability

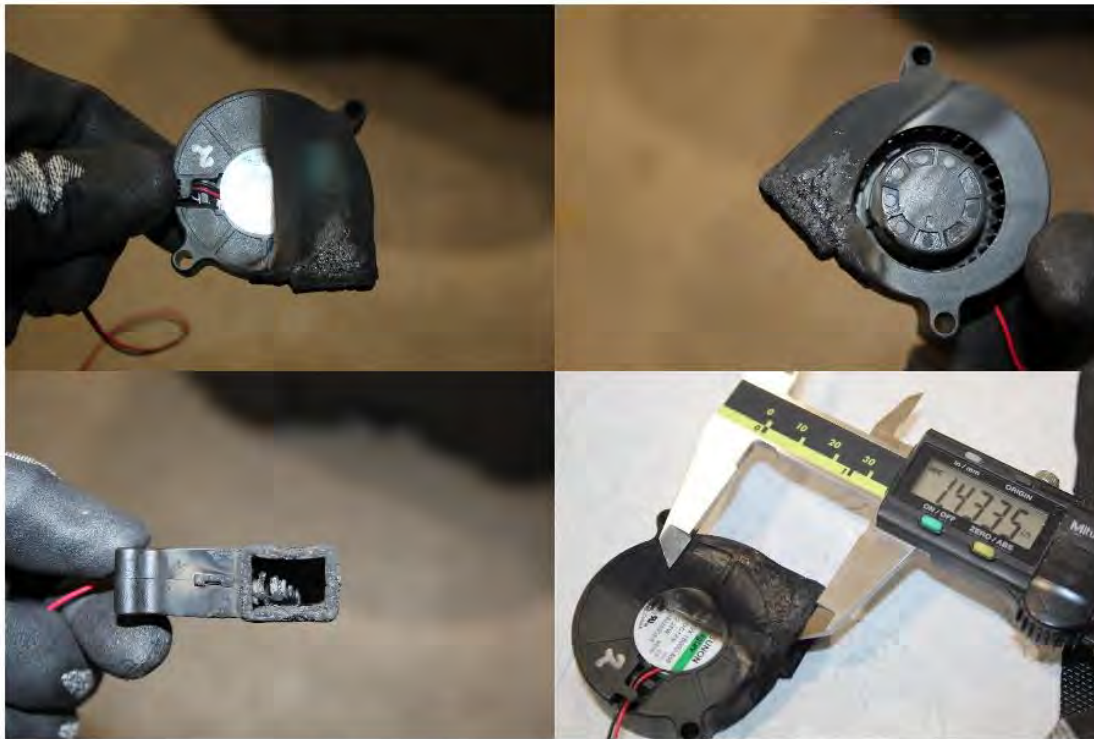
Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026



Photograph A-10: Post test view, DUT1

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026



Photograph A-11: Post test view, DUT2

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026



Photograph A-12: Post test view, DUT3



Element Minneapolis

Data sheet Flammability

Company name	Element Materials Technology - Longmont	Performed by	MMC
Project number	66405-2	Specification	RTCA/DO-160G, Sec. 26, Cat. C, 12 second Vertical test
DUT description	Material Samples	Test date(s)	2/6/2026 through 2/10/2026

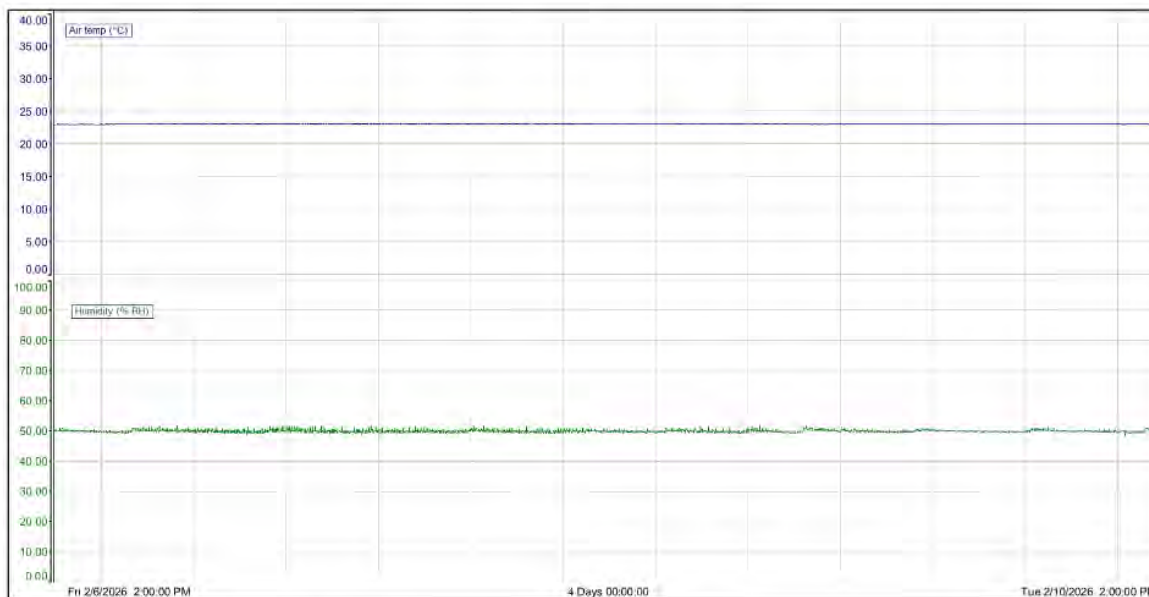


Figure A-1: Conditioning Chamber Graph

End of Test Report