Pelican Products Inc

TEST REPORT

SCOPE OF WORK
NFPA 1901, Mechanical Shock, LED Charging Flashlight, 9050

REPORT NUMBER
104401990CRT-002

ISSUE DATE
9-Apr-2021

PAGES
52

DOCUMENT CONTROL NUMBER
NA

Test Report			
Company Name	Pelican Products Inc	**Test Location**	Intertek Testing Services NA
Address	23215 Early Ave	**Address**	3933 US Rt 11
	Torrance, CA 90505-4002		Cortland, NY 13045
	USA		USA
		GIN	G104401990
Client Contact	Jon French	**Quote Number**	Qu-01045051, Qu-01163847
Phone	1-310-326-4700 X1246	**Test Start Date**	March 12, 2021
Email	jon.french@pelican.com	**Completion Date**	April 5, 2021

Standard(s) / Method
NFPA 1901 - Standard for Automotive Fire Apparatus, 2016

Spec. / Method	Test name	Clause	Result
NFPA 1901	Equipment Mounting - Mechanical Shock - Wall Mount in Vertical	14.1.10.2	Complies
NFPA 1901	Equipment Mounting - Mechanical Shock - Wall Mount in Horizontal	14.1.10.2	Complies
NFPA 1901	Equipment Mounting - Mechanical Shock - Table Top Mount	14.1.10.2	Complies

Peter Leshkiv
Sr. Assoc. Engineer
Lighting

Christopher W. Metcalf
Engineering Supervisor
Lighting

Sample Information				
Date Rec.	Intertek ID	Description	Condition	Model No.
2/25/21	CRT2102251514-001-1	LED Charging Flashlight	Production	9050
2/25/21	CRT2102251514-001-2	LED Charging Flashlight	Production	9050
2/25/21	CRT2102251514-001-3	LED Charging Flashlight	Production	9050
2/25/21	CRT2102251514-001-4	LED Charging Flashlight	Production	9050
2/25/21	CRT2102251514-001-3A	LED Charging Flashlight	Production	9050
2/25/21	CRT2102251514-001-4A	LED Charging Flashlight	Production	9050

Picture(s)

Sample Information (cont'd)

Picture(s) - Batteries

Lithium Batterie

AA Batteries

Equipment Mounting - Mechanical Shock - Wall Mount in Vertical

Method:

The test sample was mounted with the sample bracket to a test fixture which was mounted to the mechanical shock machine. The test sample was subjected to half sine shock pulses in the vertical axis in accordance with the following profile below:

Test Parameters:

Axis	Acceleration (G)	Width-Duration	Number of Pulses	Pulse Type
Longitudinal - Z	9G	11ms	3+, 3-	Half-sine
Vertical - Y	9G / 3G	11ms	3+, 3-	Half-sine
Horizontal - X	9G / 3G	11ms	3+, 3-	Half-sine

NOTE: Axis designation is according to the vehicle not the test sample.

Test Setup:

Control Accelerometer(s):	1 Control on Mounting Fixture / Vibration Table
Monitor Accelerometer(s):	1 on Mounting Fixture

Test Configurations: One sample for each configuration

- 1 lithium - Sample 1 - Wall Mount Vertical
- 4 lithium - Sample 2 - Wall Mount Vertical
- 4 battery - Sample 3 - Wall Mount Vertical
- 16 battery - Sample 4 - Wall Mount Vertical
'- 4 battery - Sample 3a - Wall Mount Vertical. Alkaline cells in the yellow flashlight.
- 16 battery - Sample 4a - Wall Mount Vertical. Alkaline cells in the yellow flashlight.

Requirement:

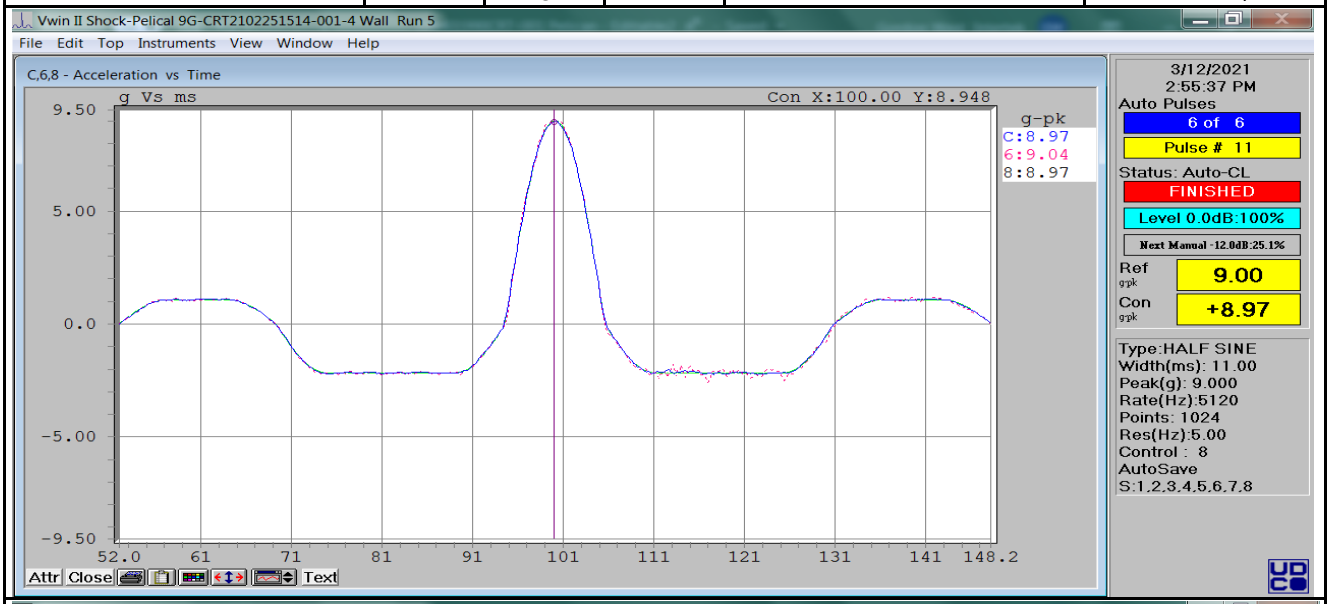
The bracket and charger shall contain the equipment when the equipment is subjected to 9g force in the longitudinal axis of the vehicle or a 3g force in any other direction.

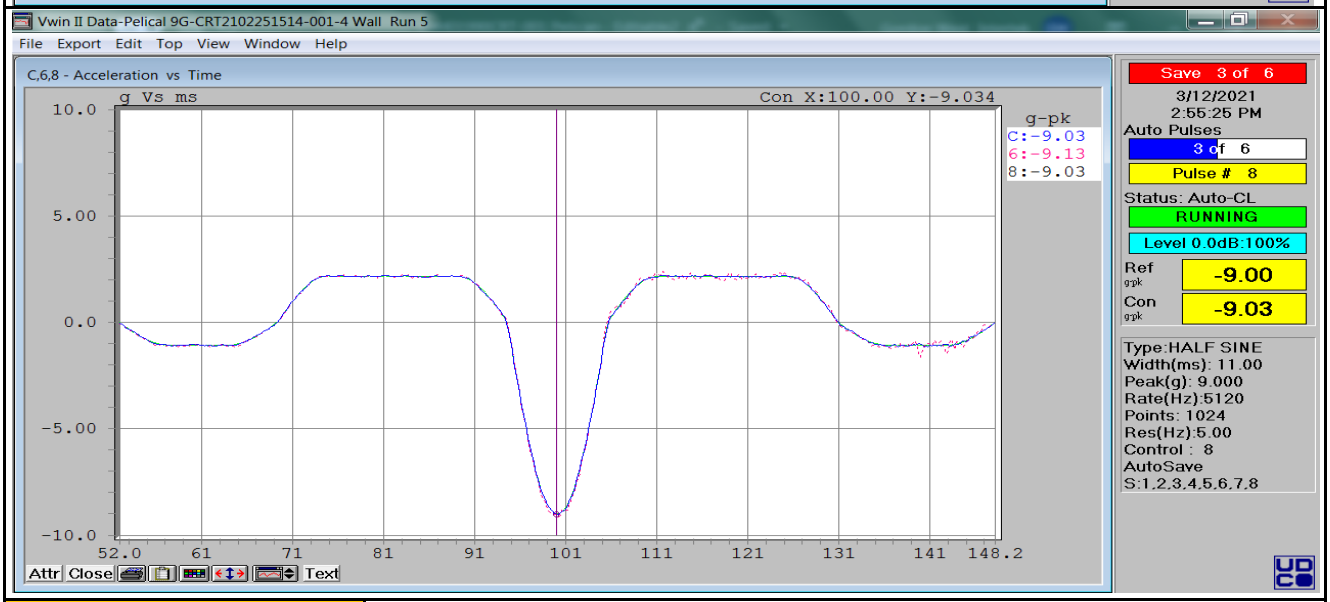
Compliance Test Summary

Sample	Configuration	Mounting	G level	X axis	Y Axis	Z axis	Compliance
1	1 lithium	Wall - Vertical	9	p	p	p	Complies
2	4 lithium	Wall - Vertical	9	p	p	p	Complies
3	4 batteries	Wall - Vertical	9	p	p	NA	Complies
4	16 batteries	Wall - Vertical	9	p	p	NA	Complies
3A	4 batteries	Wall - Vertical	9	NA	NA	p	Complies
4A	16 batteries	Wall - Vertical	9	NA	NA	p	Complies

Results:

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	Y Axis	8	6	Wall Mount In Vertical	16 battery

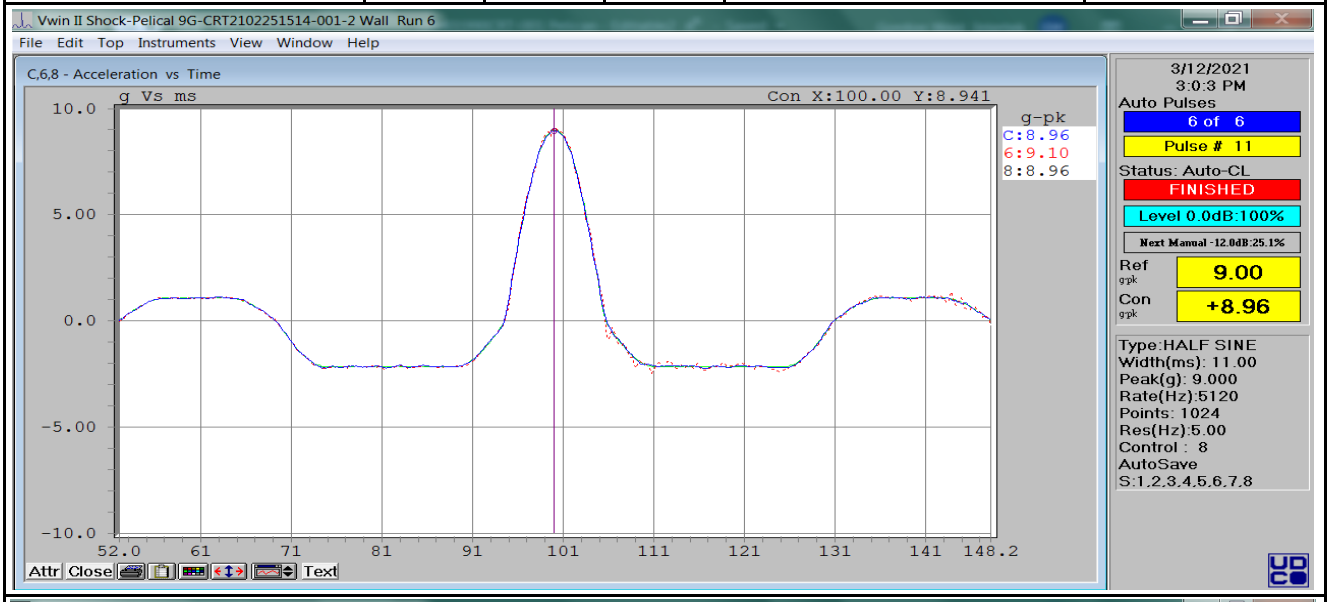


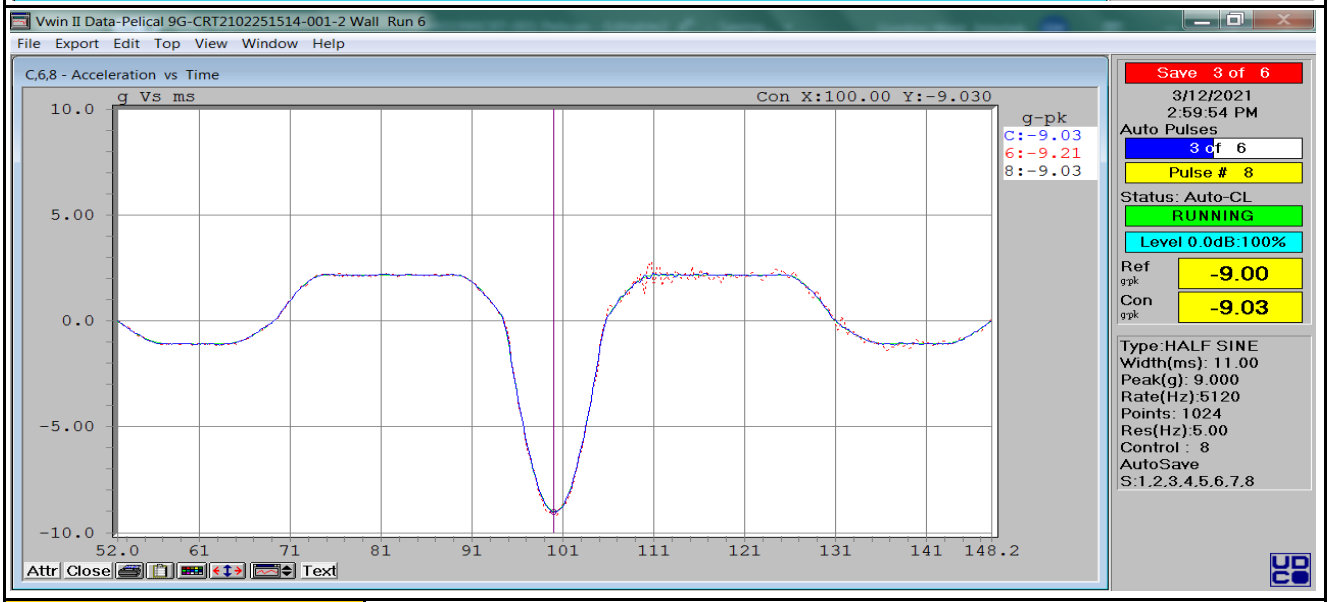


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	Y Axis	8	6	Wall Mount In Vertical	4 lithium

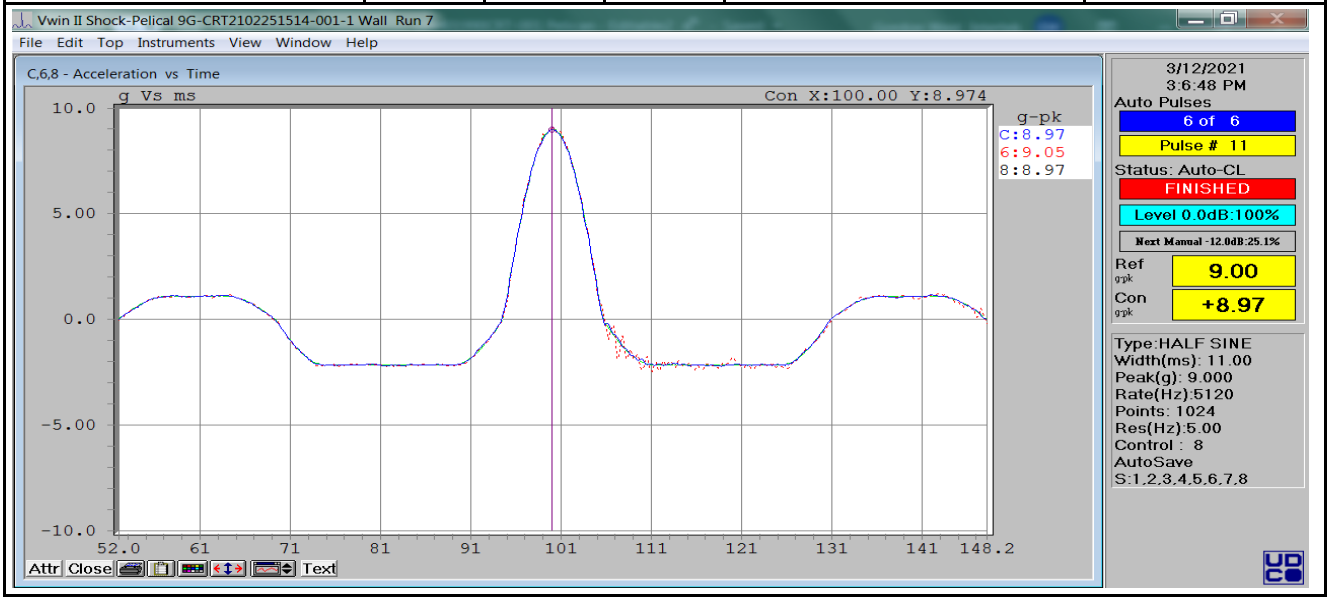


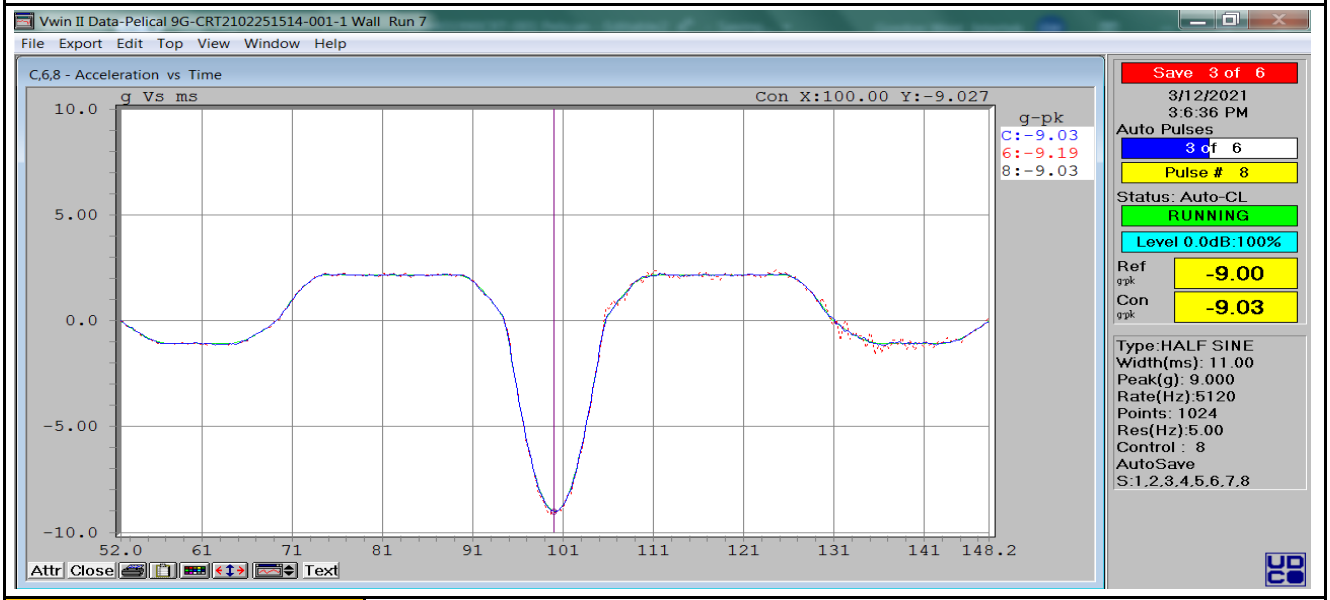


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	Y Axis	8	6	Wall Mount In Vertical	1 lithium

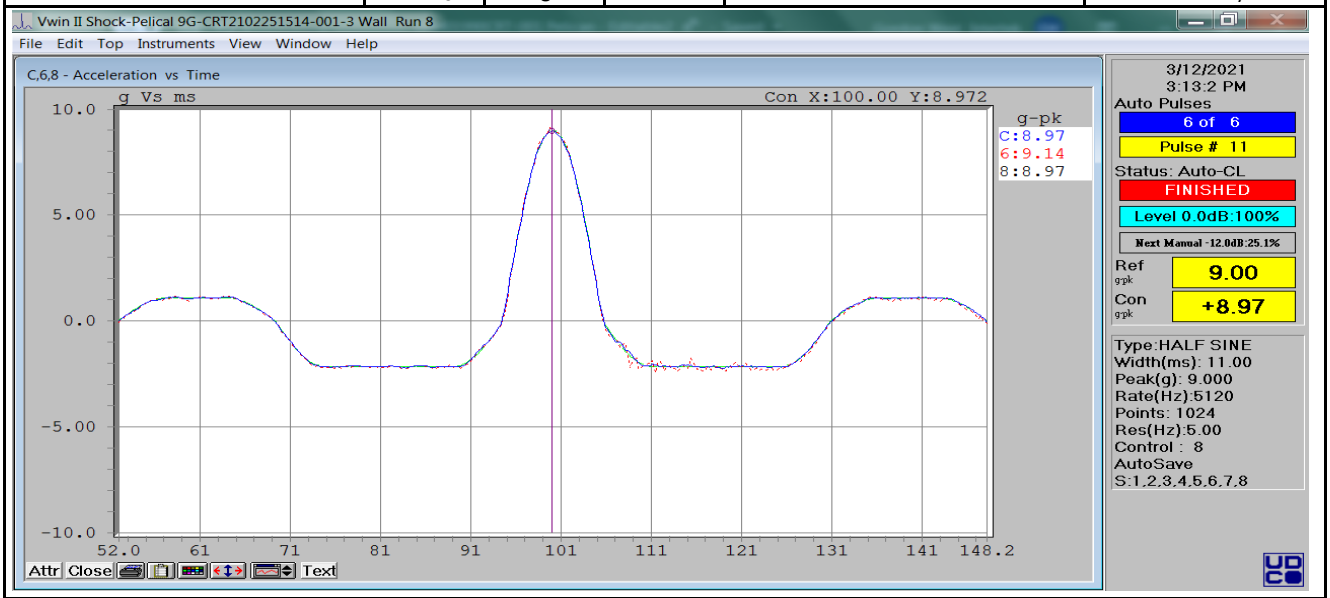


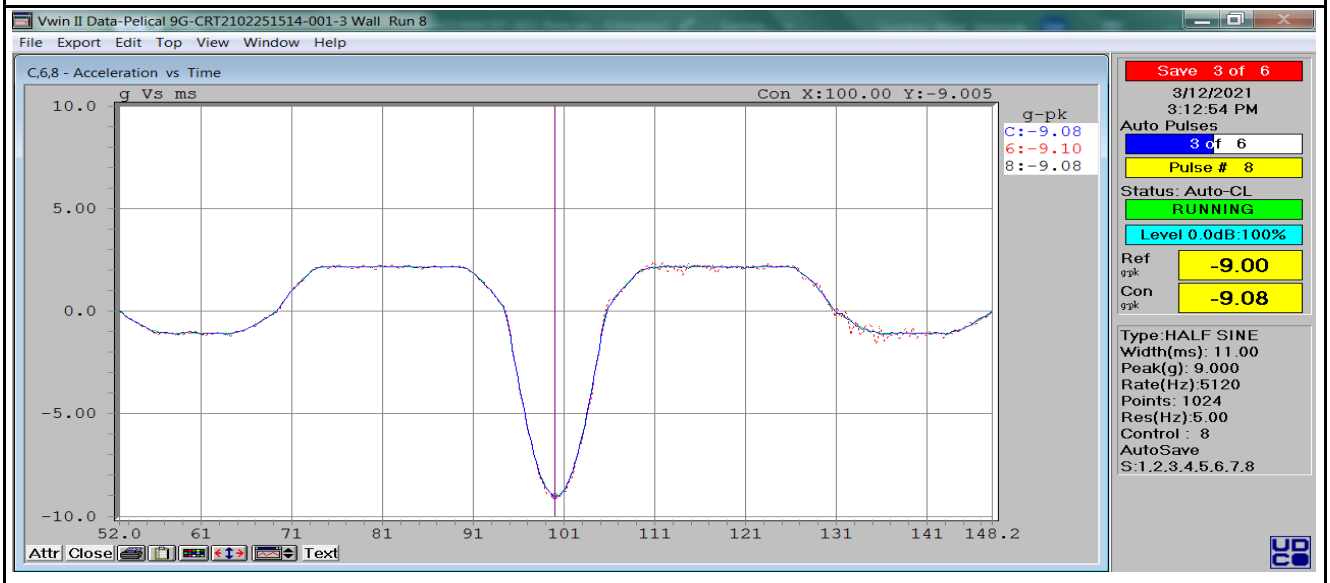


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3	Y Axis	8	6	Wall Mount In Vertical	4 battery

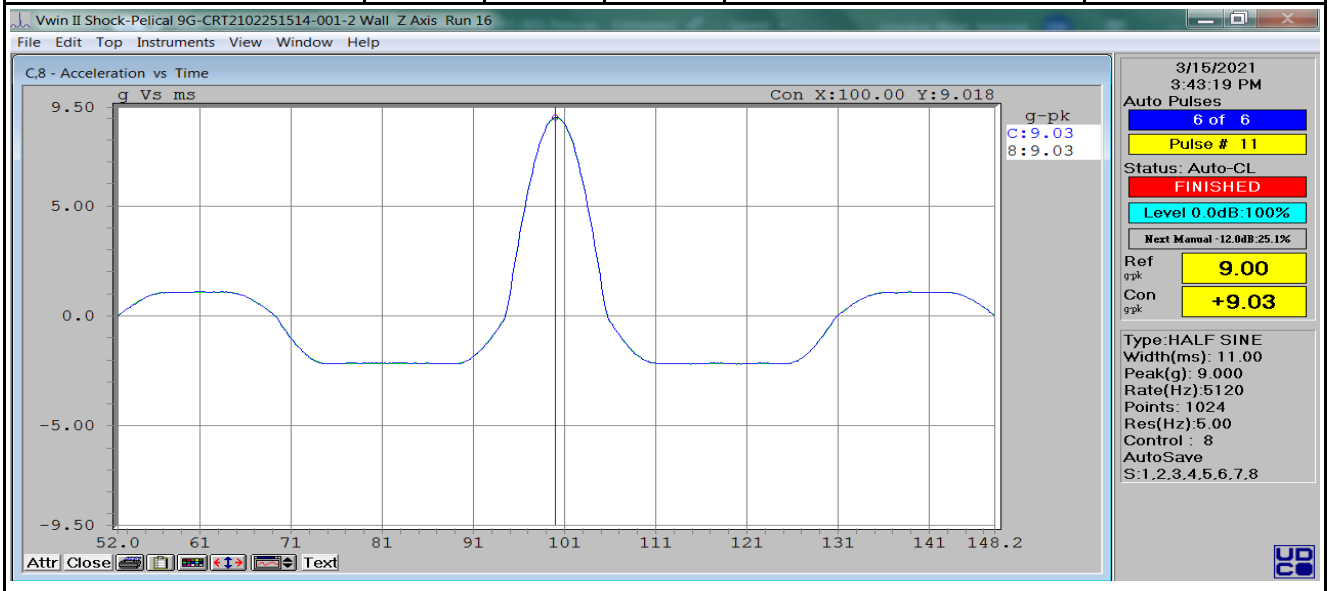


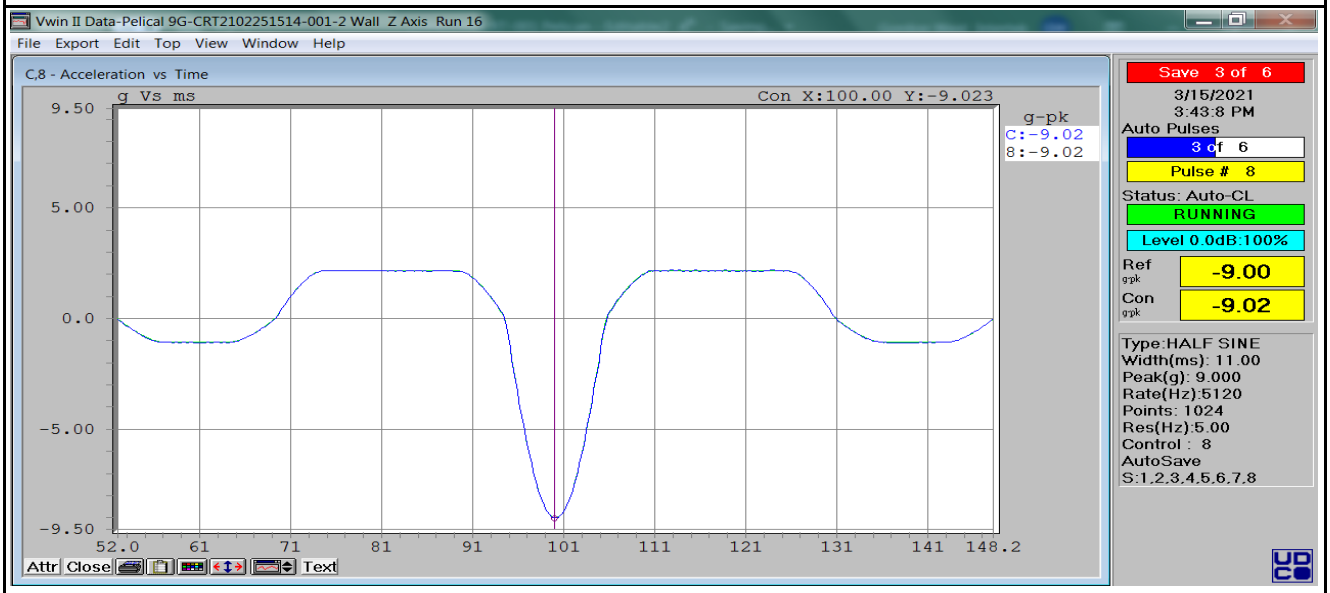


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	Z Axis	8	6	Wall Mount In Vertical	4 lithium

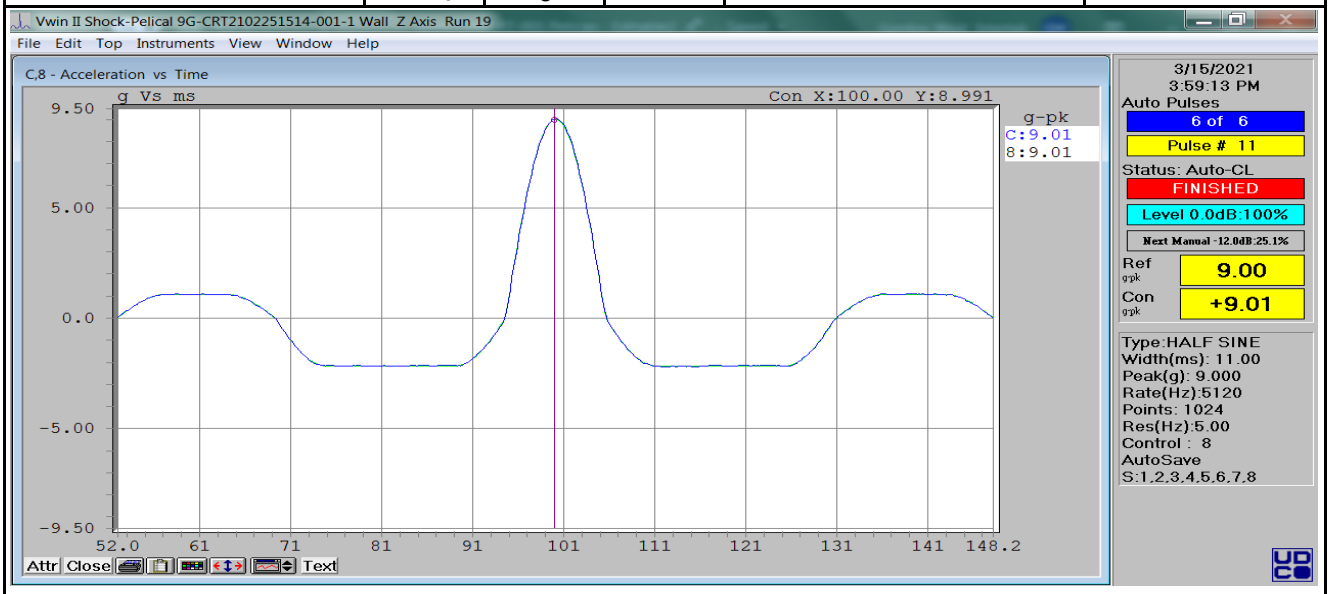


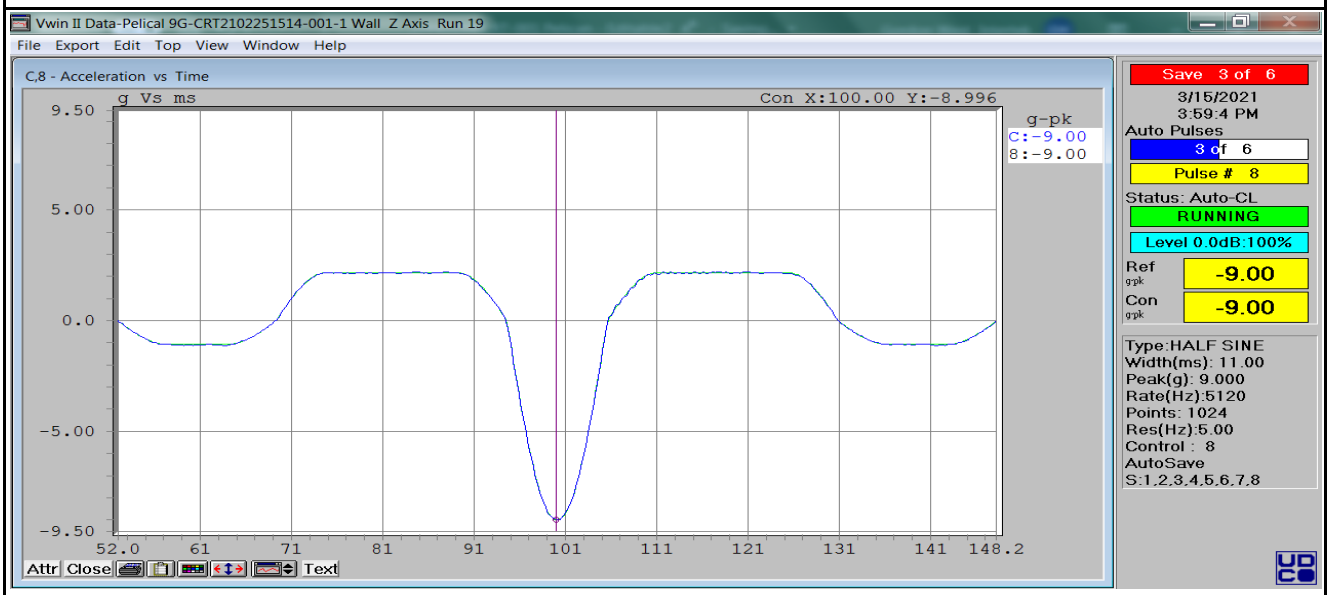


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	Z Axis	8	6	Wall Mount In Vertical	1 lithium

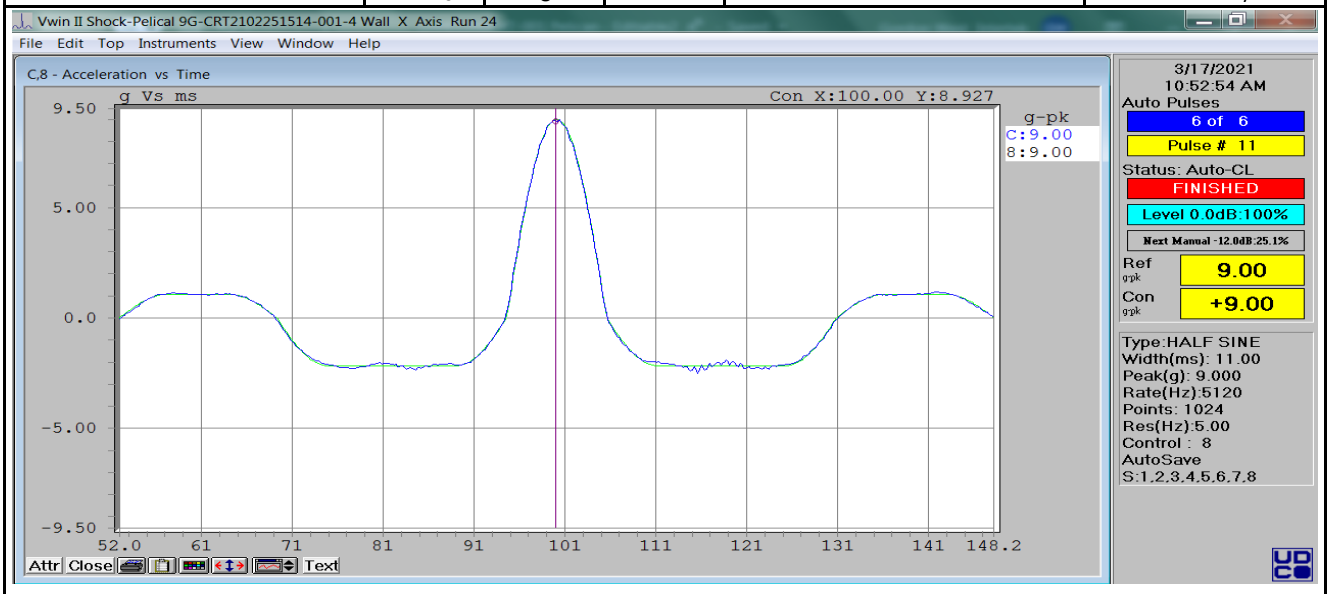


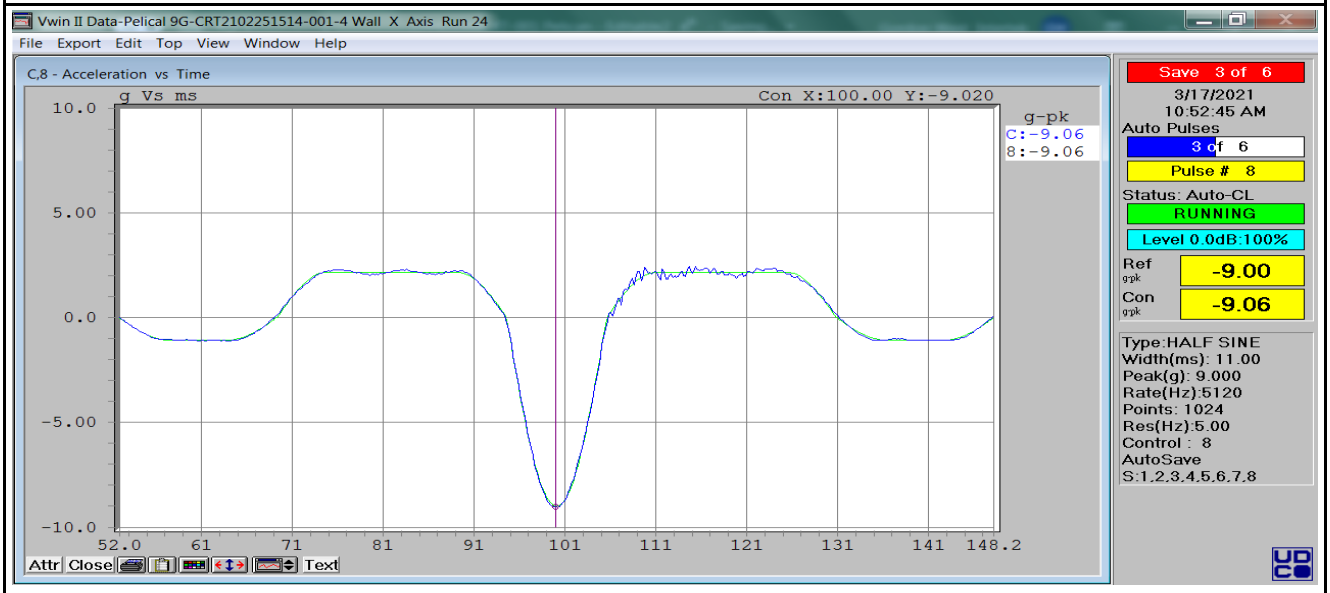


Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	X Axis	8	6	Wall Mount In Vertical	16 battery

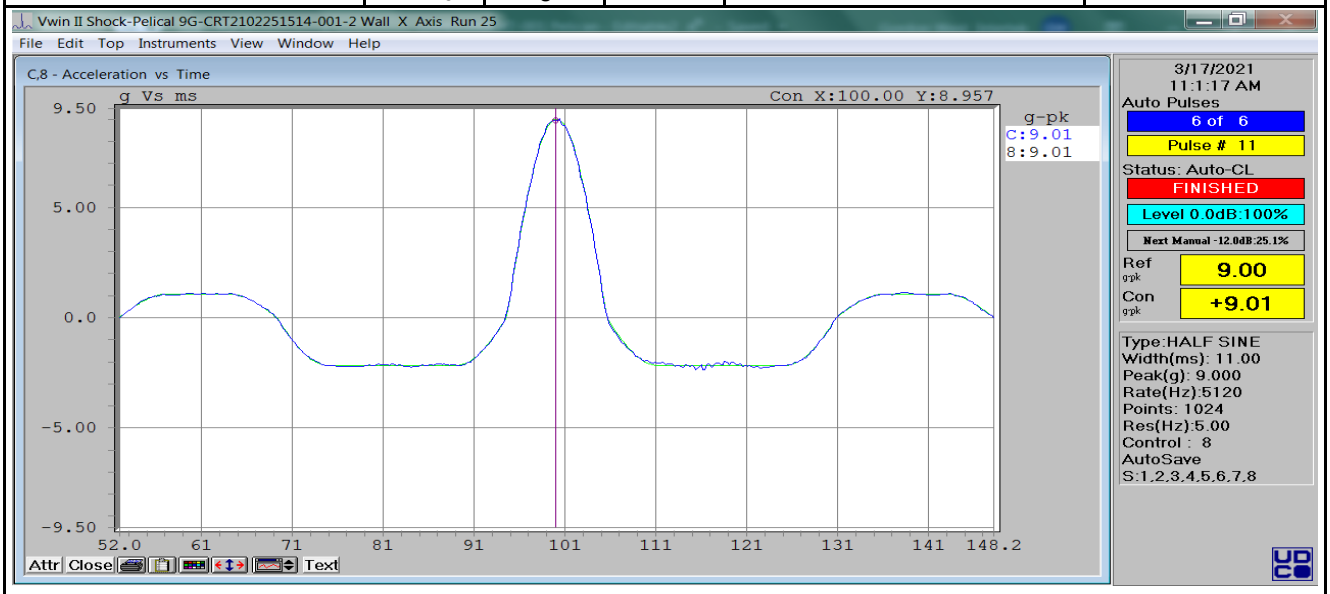


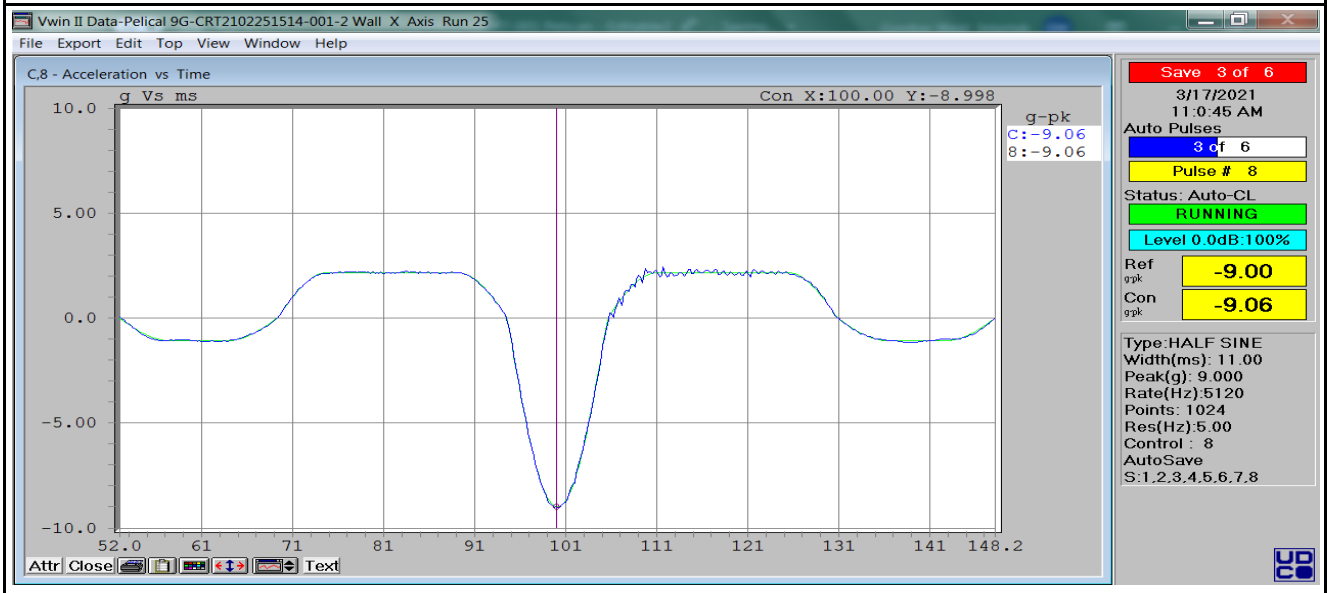


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	X Axis	8	6	Wall Mount In Vertical	4 lithium

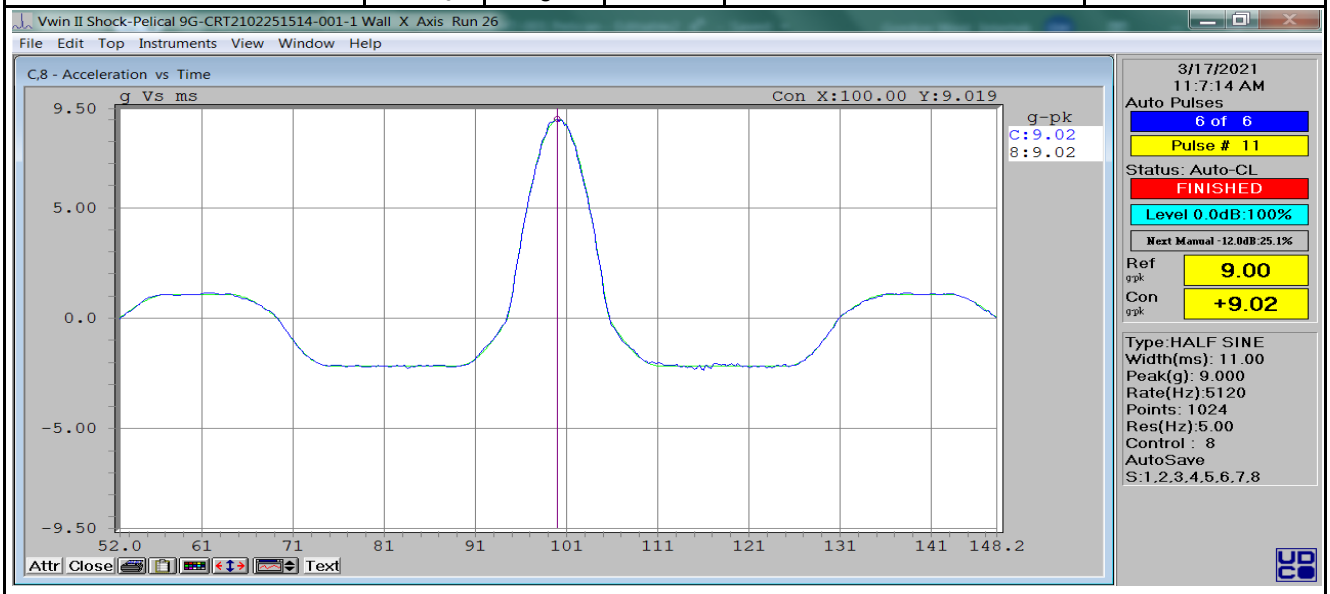


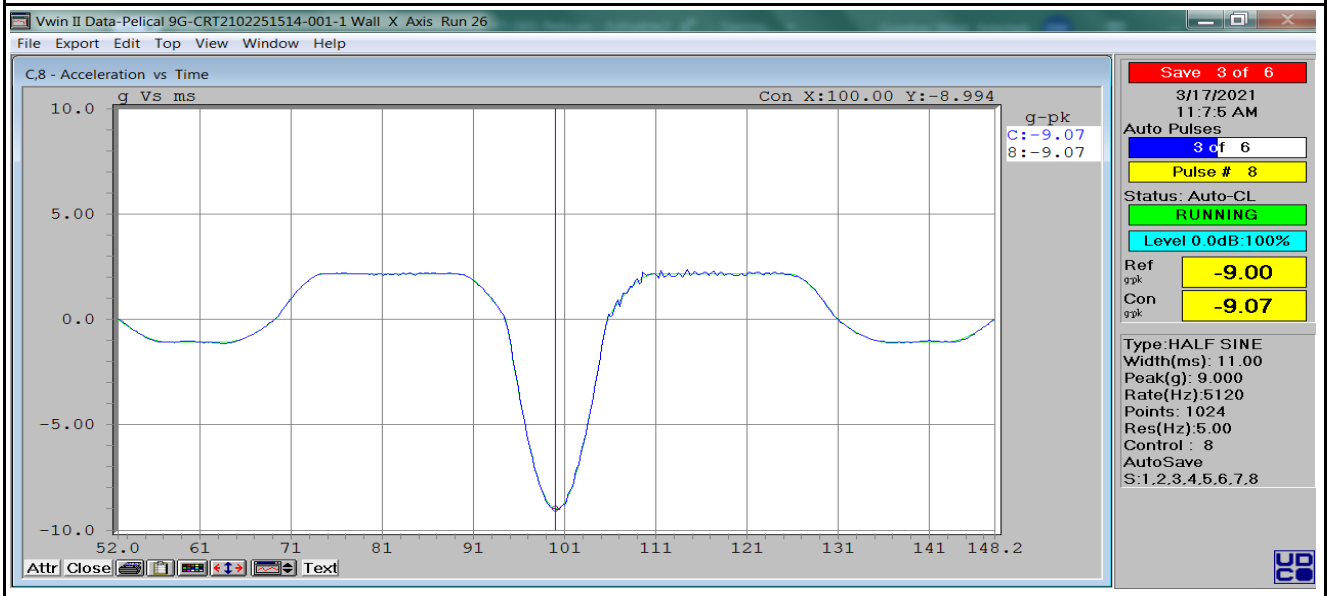


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	X Axis	8	6	Wall Mount In Vertical	1 lithium

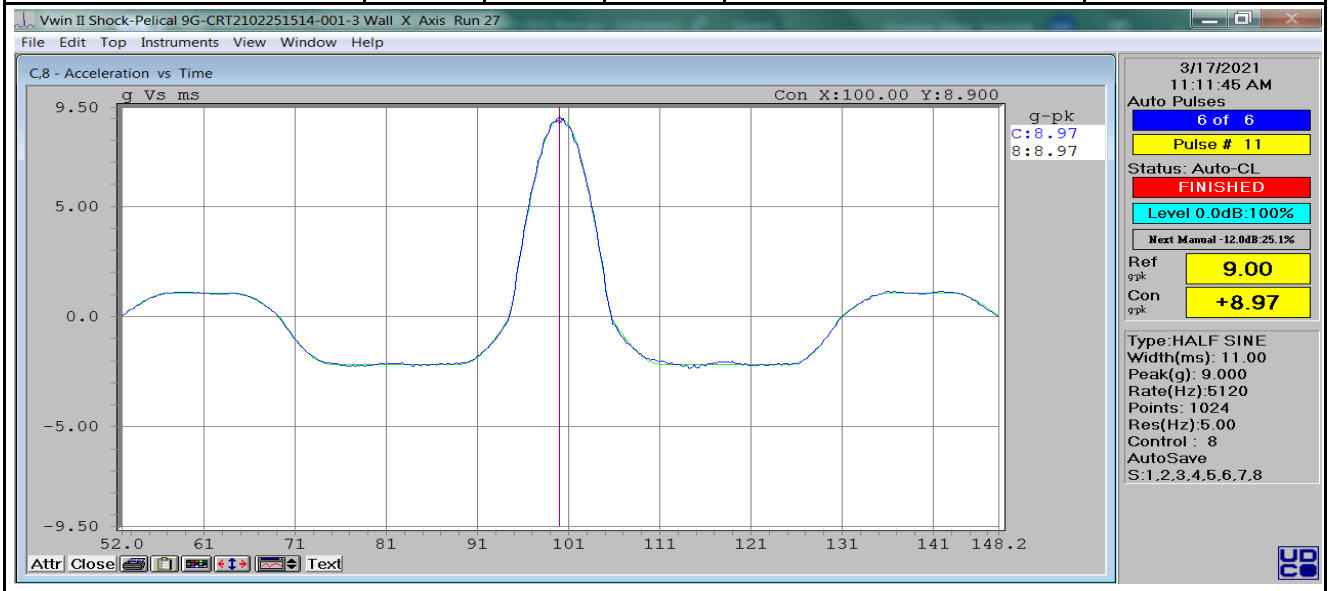


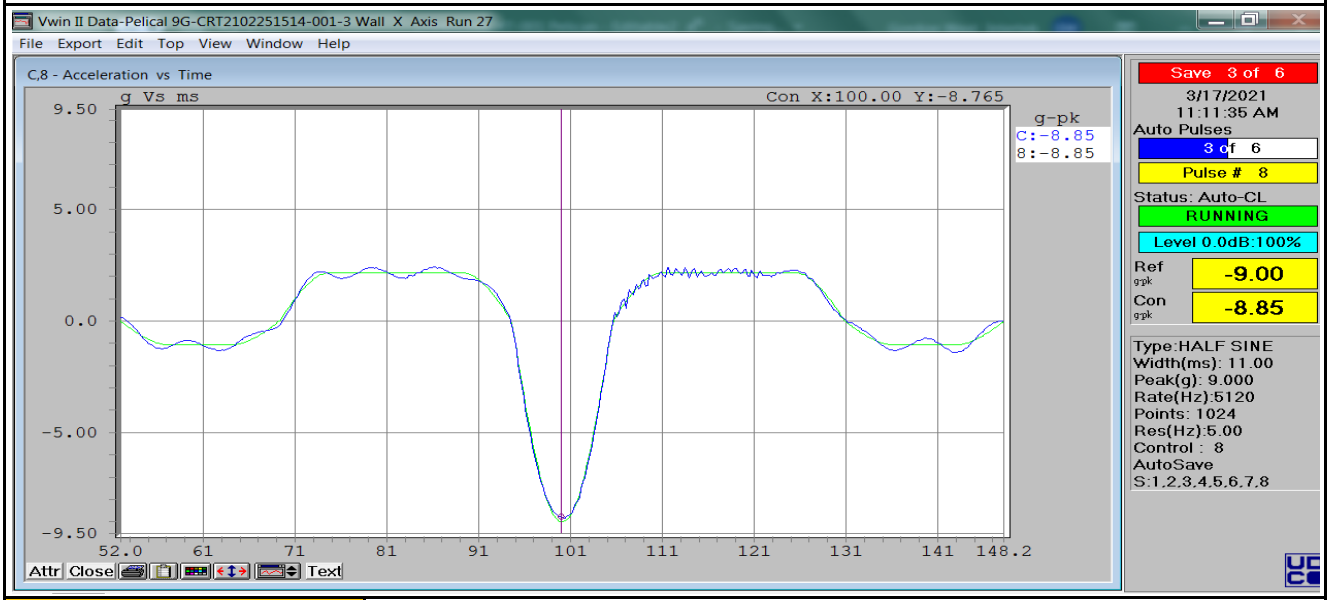


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3	X Axis	8	6	Wall Mount In Vertical	4 battery

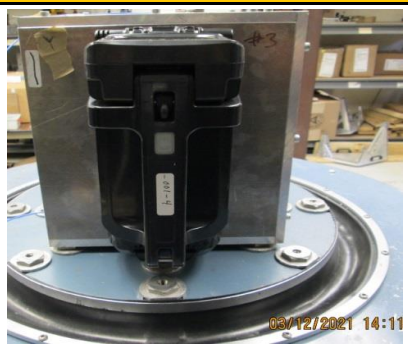




Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

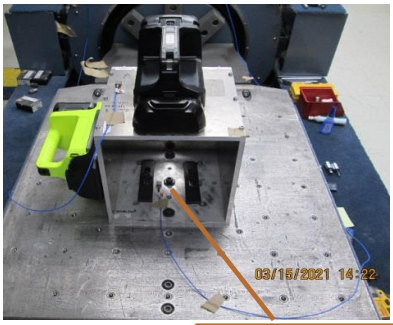
Photos:

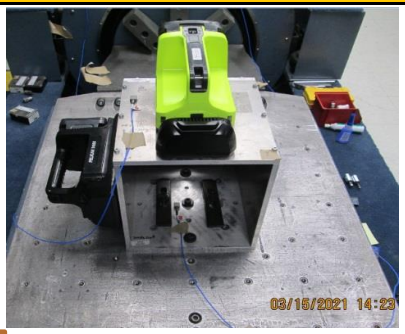
Photo: Y Axis according to the vehicle



CH8 Control Accelerometer

Photo: Z Axis according to the vehicle

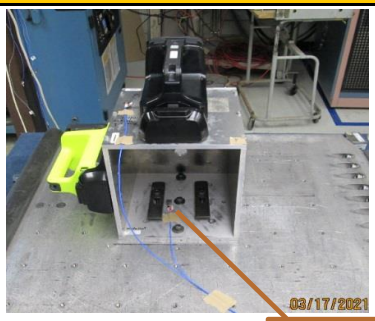




CH8 Control Accelerometer

Photos (cont'd):

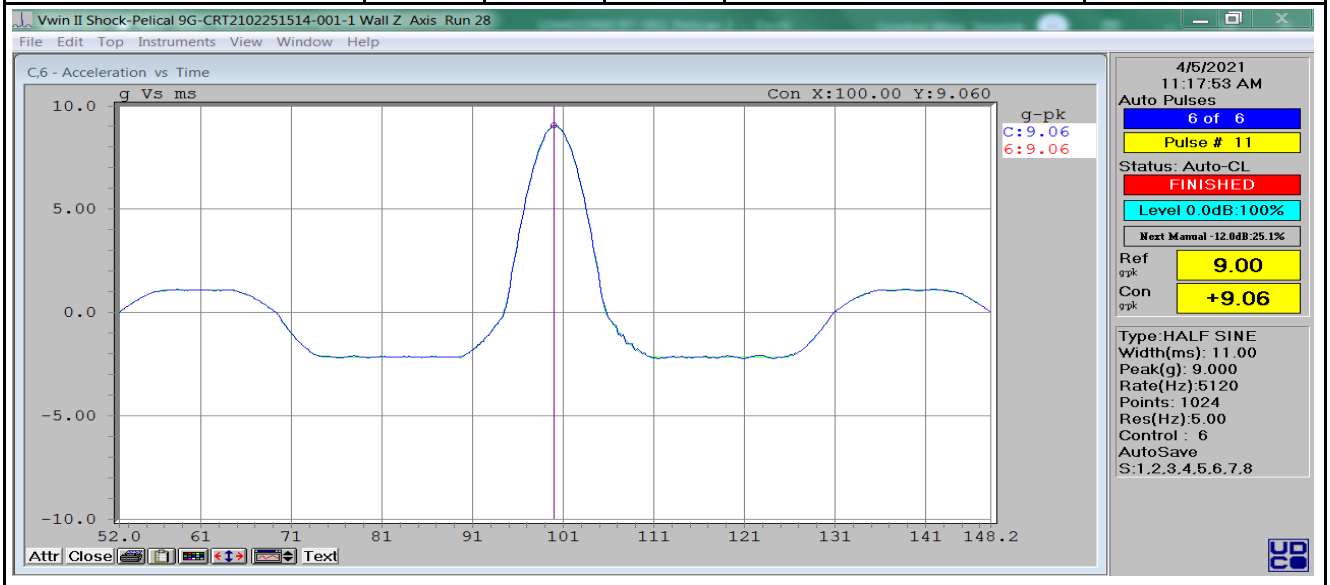
Photo: X Axis according to the vehicle

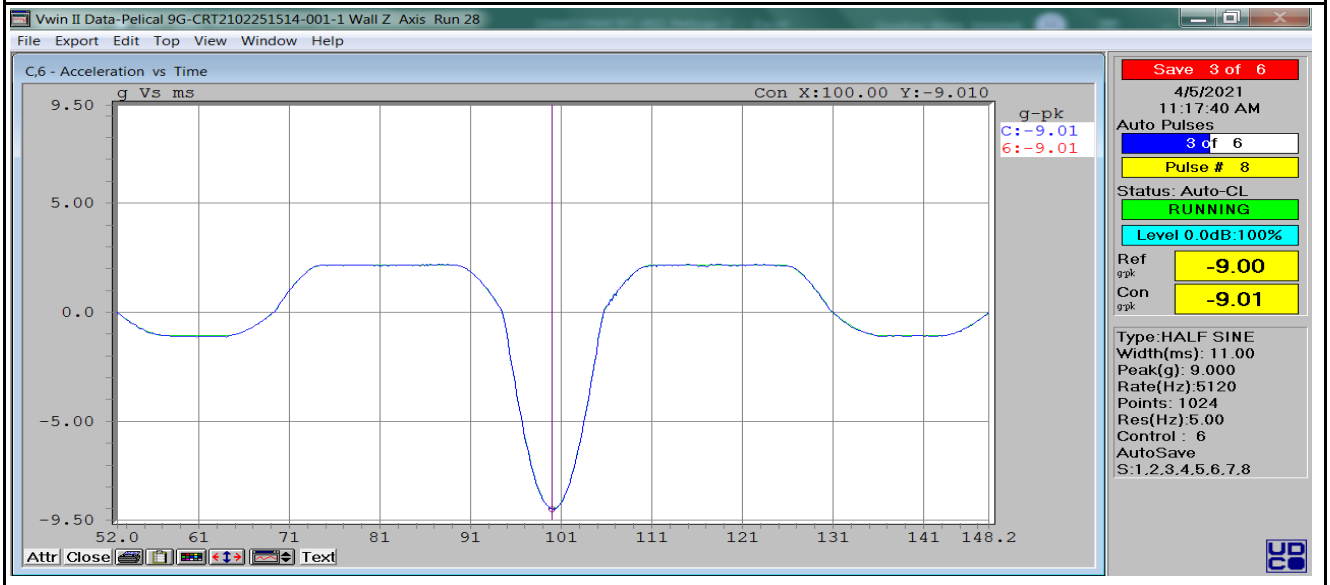


Sign Off Block					
Tested By:	Gordon West			**Signature or initials:**	
Engineer:	Peter Leshkiv			**Signature or initials:**	
Reviewed By:	cwm			**Signature or initials:**	
Test Equipment Used:	1,2,3,4,5			**Start Date:**	Friday, March 12, 2021
Amb (ºC):	22.9	**RH%**	20.8	**Completion Date:**	Wednesday, March 17, 2021

Results:

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3A	Z	6	N/A	Wall Mount Vertical	4 battery

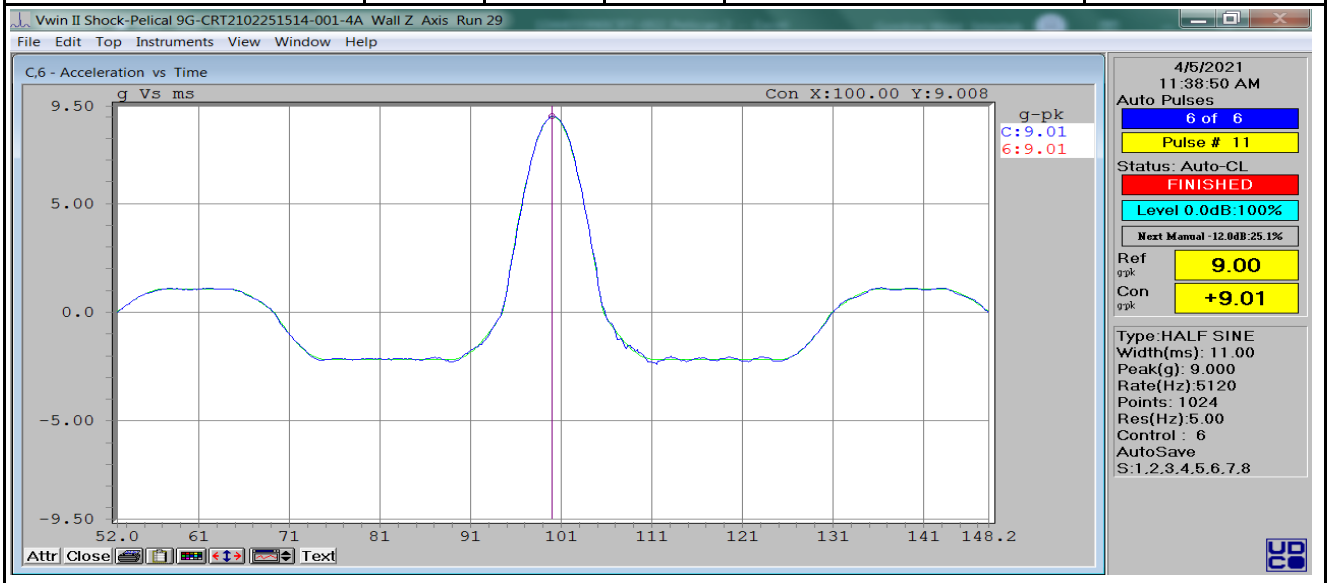


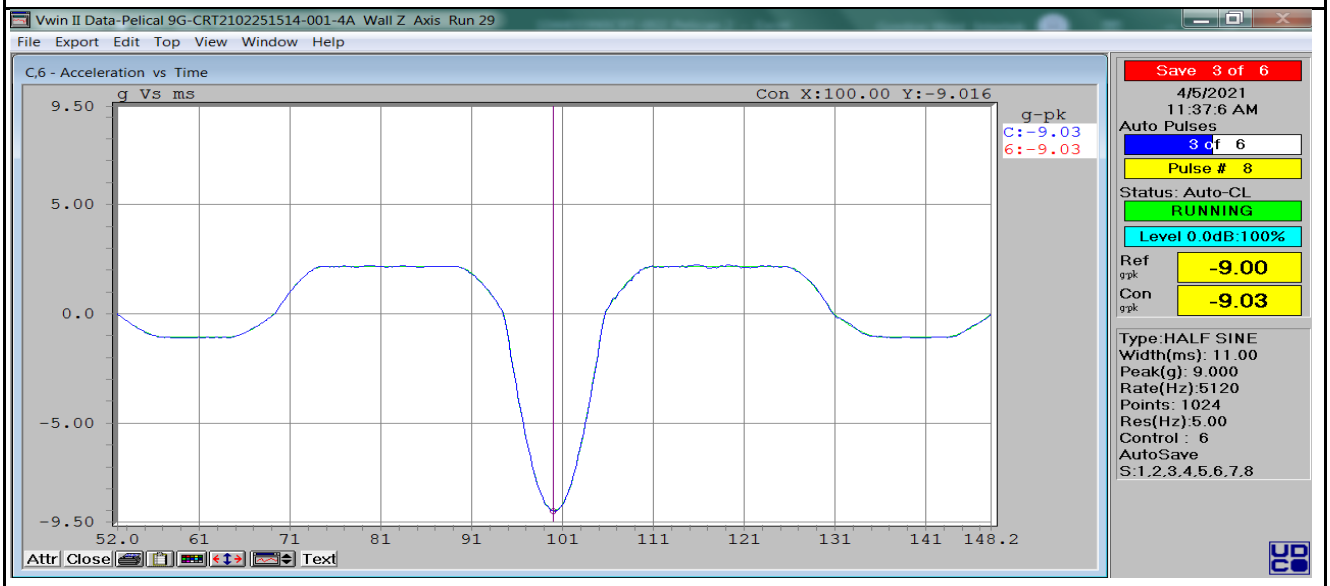


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4A	Z	6	N/A	Wall Mount Vertical	16 battery





Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Photos:

Photo: Z Axis according to the vehicle

Sign Off Block					
Tested By:	Gordon West			**Signature or initials:**	
Engineer:	Peter Leshkiv			**Signature or initials:**	
Reviewed By:	cwm			**Signature or initials:**	
Test Equipment Used:	1,2,3,4			**Start Date:**	Monday, April 05, 2021
Amb (ºC):	22.6	**RH%**	25	**Completion Date:**	Monday, April 05, 2021

Equipment Mounting - Mechanical Shock - Wall Mount in Horizontal

Method:

The test sample was mounted with the sample bracket to a test fixture which was mounted to the mechanical shock machine. The test sample was subjected to half sine shock pulses in the vertical axis in accordance with the following profile below:

Test Parameters:

Axis	Acceleration (G)	Width-Duration	Number of Pulses	Pulse Type
Longitudinal - Z	9G	11ms	3+, 3-	Half-sine
Vertical - Y	9G / 3G	11ms	3+, 3-	Half-sine
Horizontal - X	9G / 3G	11ms	3+, 3-	Half-sine

NOTE: Axis designation is according to the vehicle not the test sample.

Test Setup:

Control Accelerometer(s):	1 Control on Mounting Fixture / Vibration Table
Monitor Accelerometer(s):	1 on Mounting Fixture

Test Configurations: One sample for each configuration

- 1 lithium - Sample 1 - Wall Mount Horizontal
- 4 lithium - Sample 2 - Wall Mount Horizontal
- 4 battery - Sample 3 - Wall Mount Horizontal
- 16 battery - Sample 4 - Wall Mount Horizontal

Requirement:

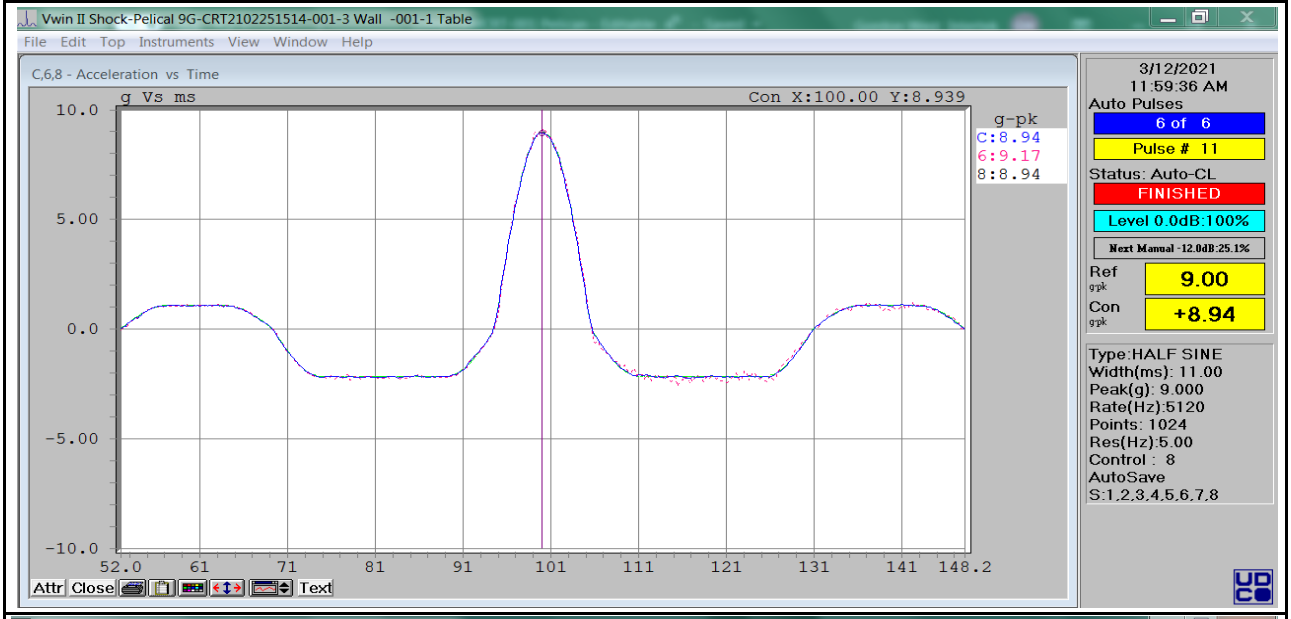
The bracket and charger shall contain the equipment when the equipment is subjected to 9g force in the longitudinal axis of the vehicle or a 3g force in any other direction.

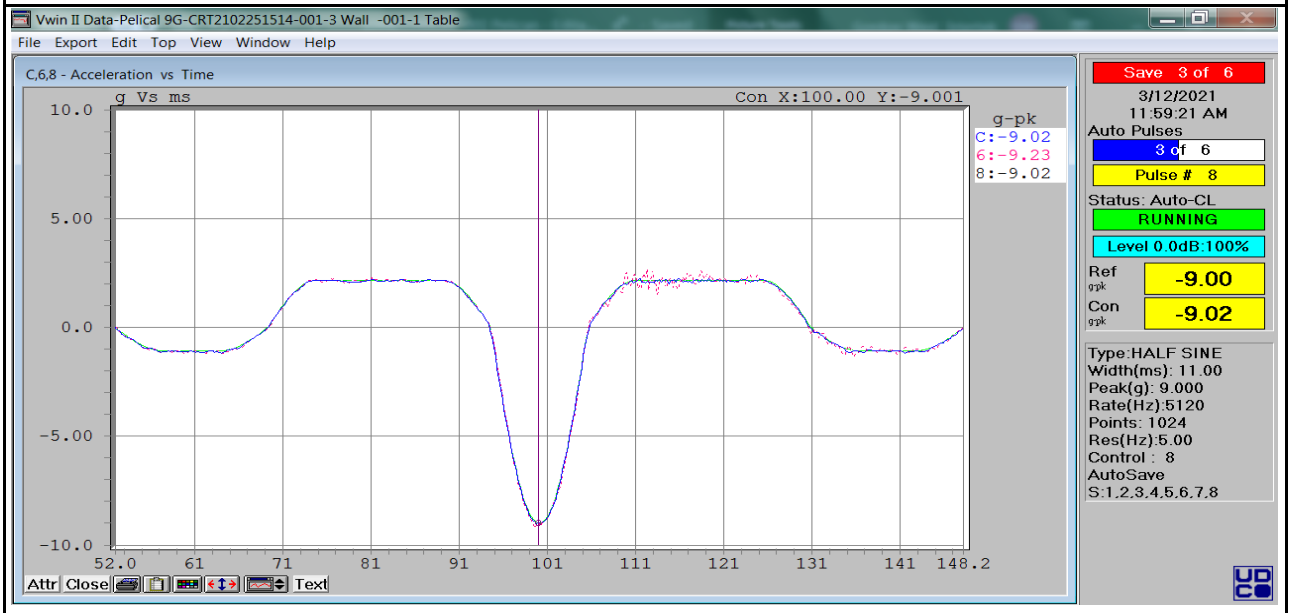
Compliance Test Summary

Sample	Configuration	Mounting	G level	X axis	Y Axis	Z axis	Compliance
1	1 lithium	Wall - Horizontal	9	p	p	p	Complies
2	4 lithium	Wall - Horizontal	9	p	p	p	Complies
3	4 batteries	Wall - Horizontal	9	p	p	p	Complies
4	16 batteries	Wall - Horizontal	9	p	p	p	Complies

Results:

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	Y Axis	8	6	Wall Mount In Horizontal	1 lithium

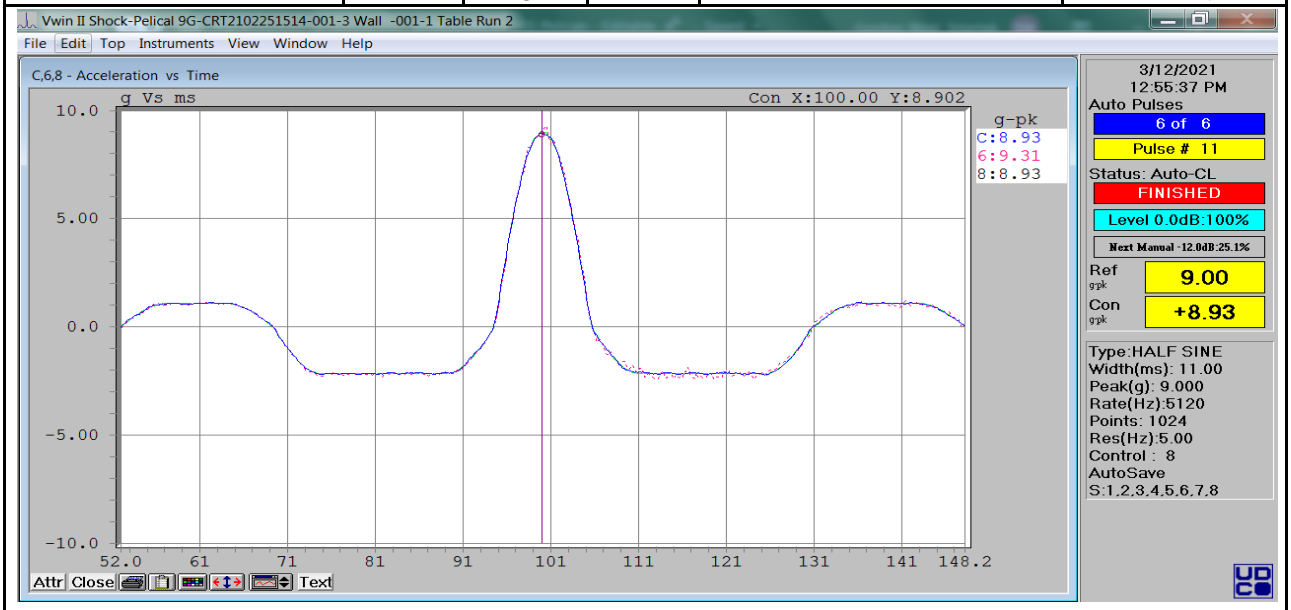


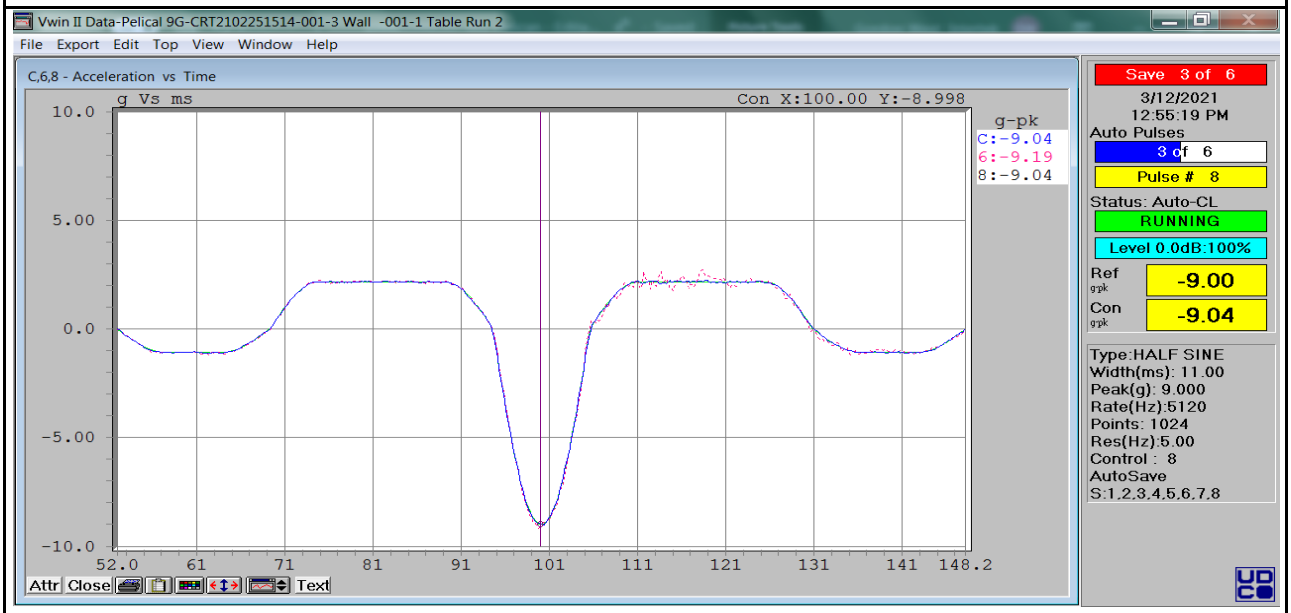


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3	Y Axis	8	6	Wall Mount In Horizontal	4 battery

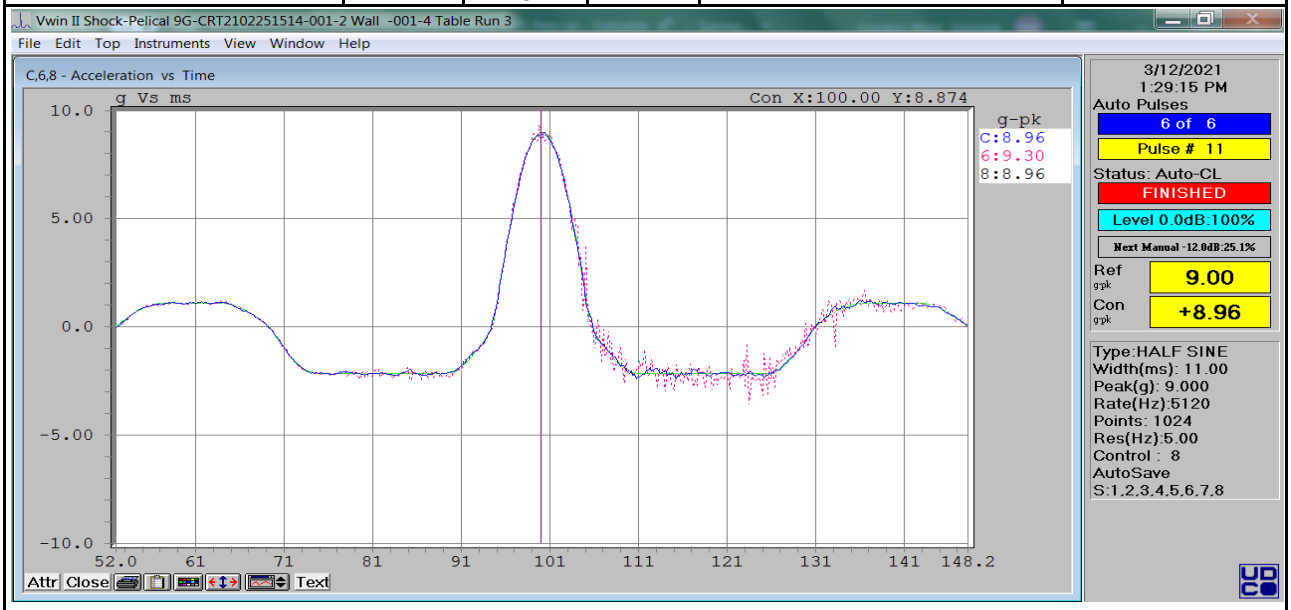


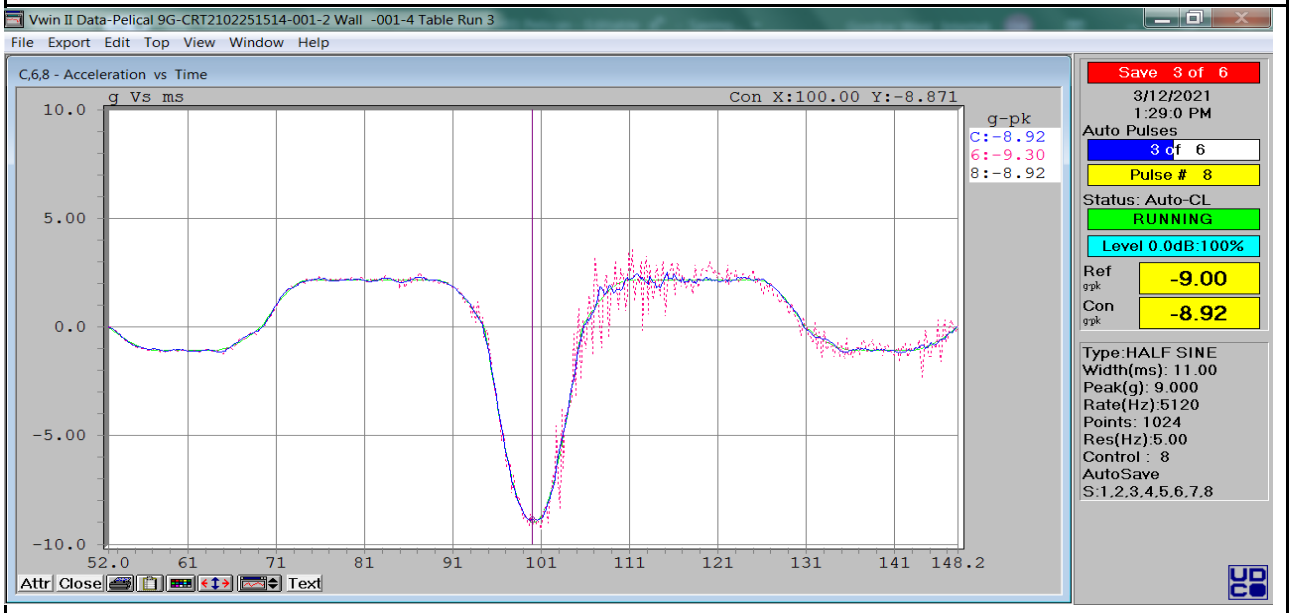


Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	Y Axis	8	6	Wall Mount In Horizontal	4 lithium

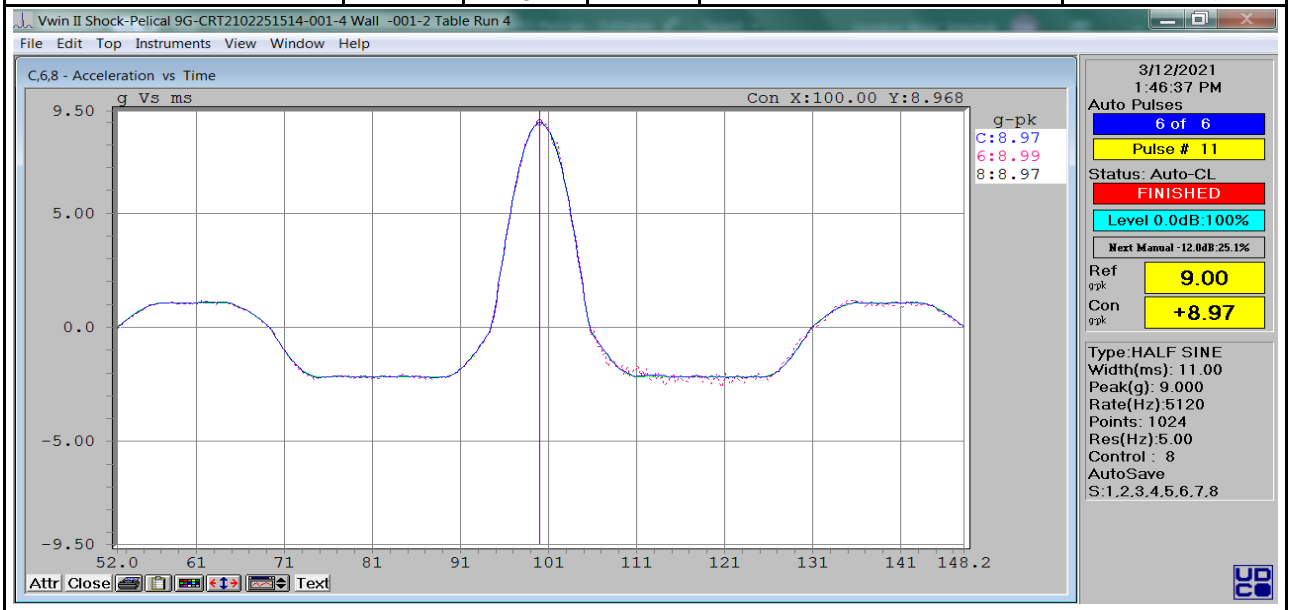


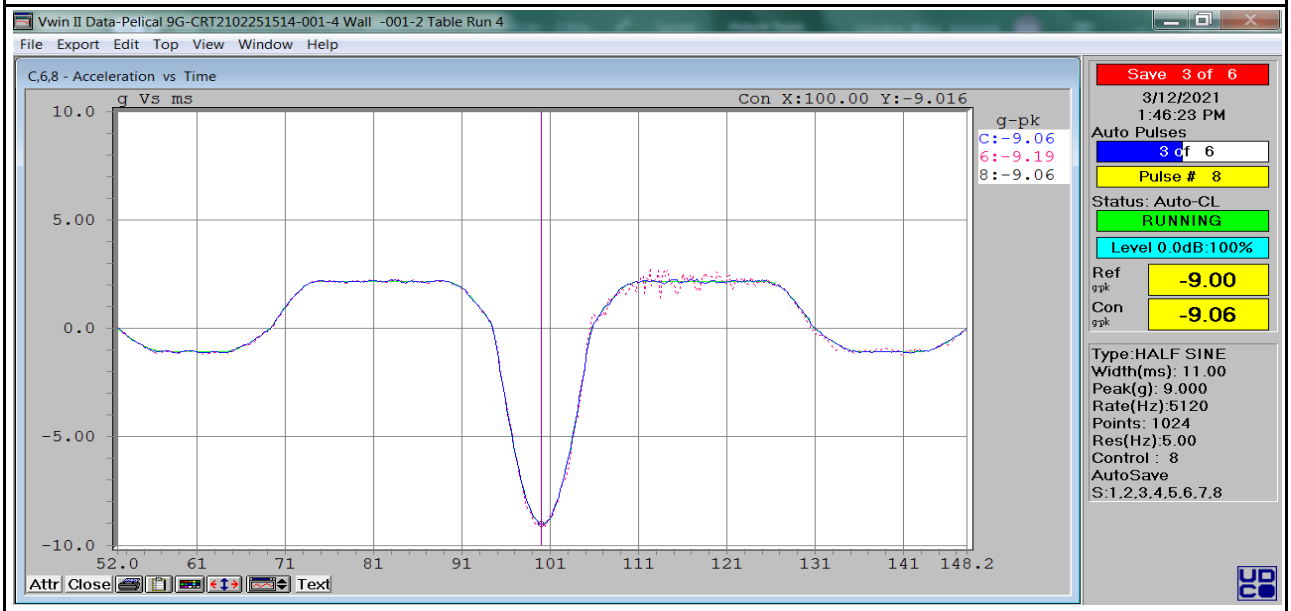


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	Y Axis	8	6	Wall Mount In Horizontal	16 battery

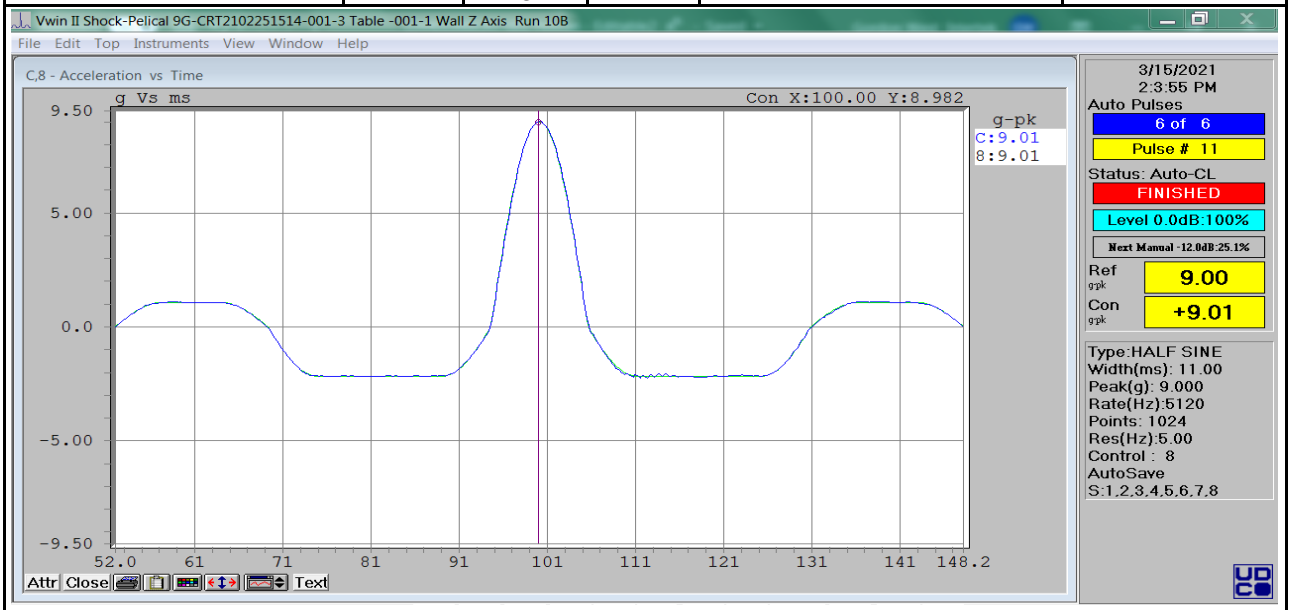


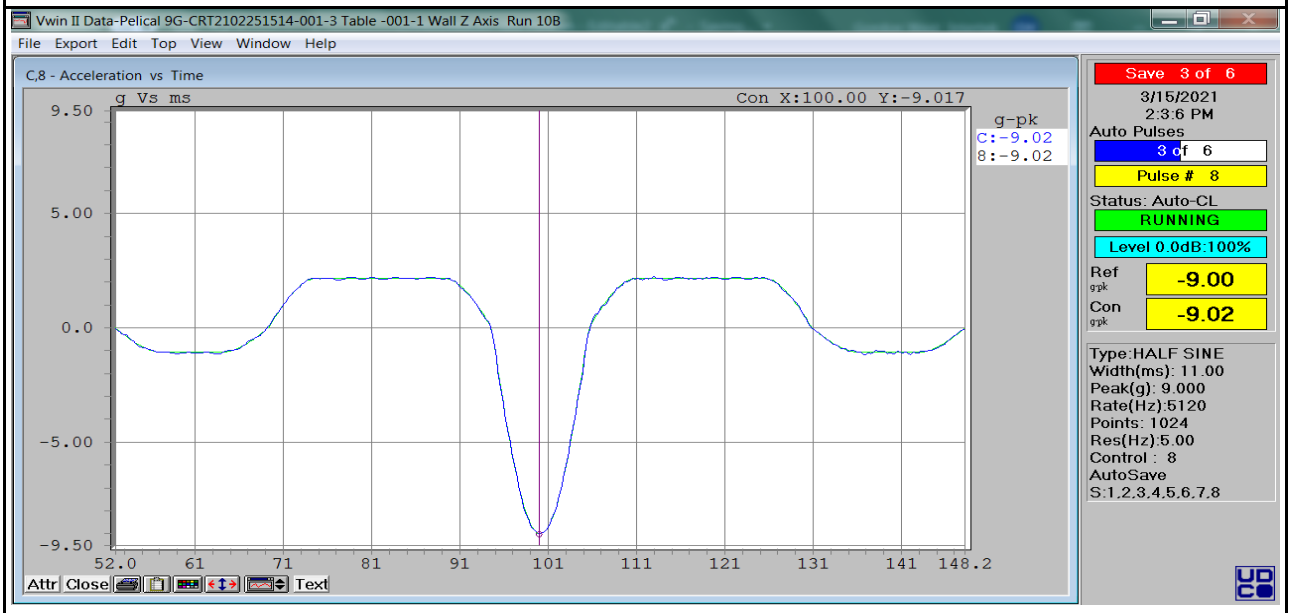


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	Z Axis	8	6	Wall Mount In Horizontal	1 lithium

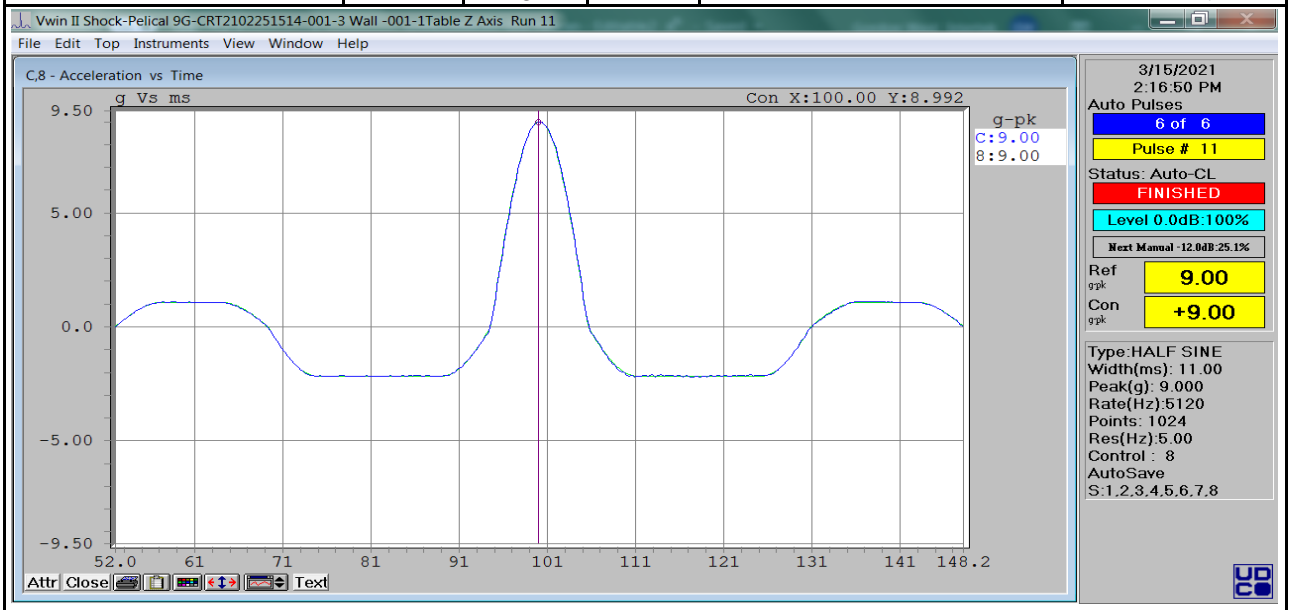


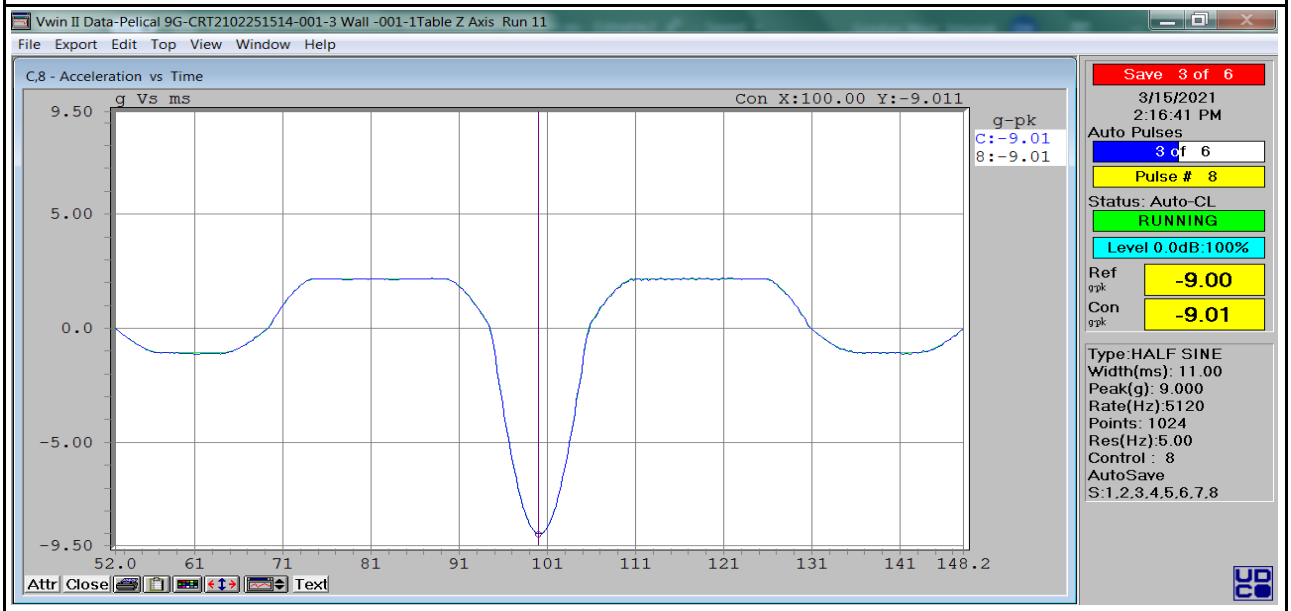


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3	Z Axis	8	6	Wall Mount In Horizontal	4 battery

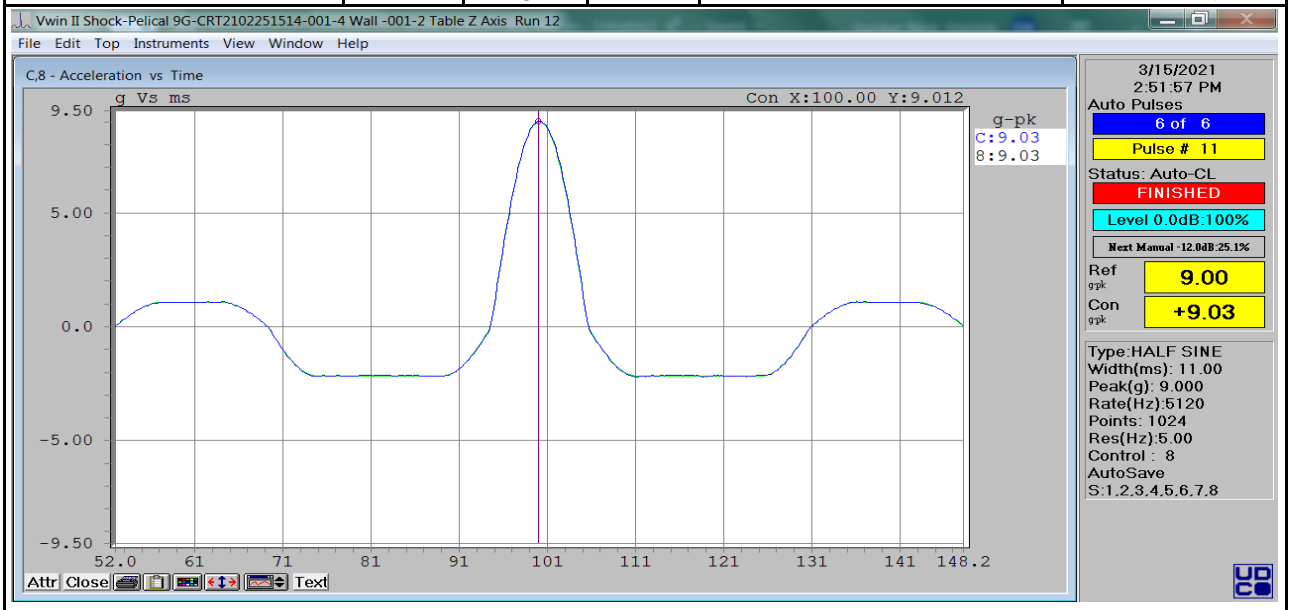


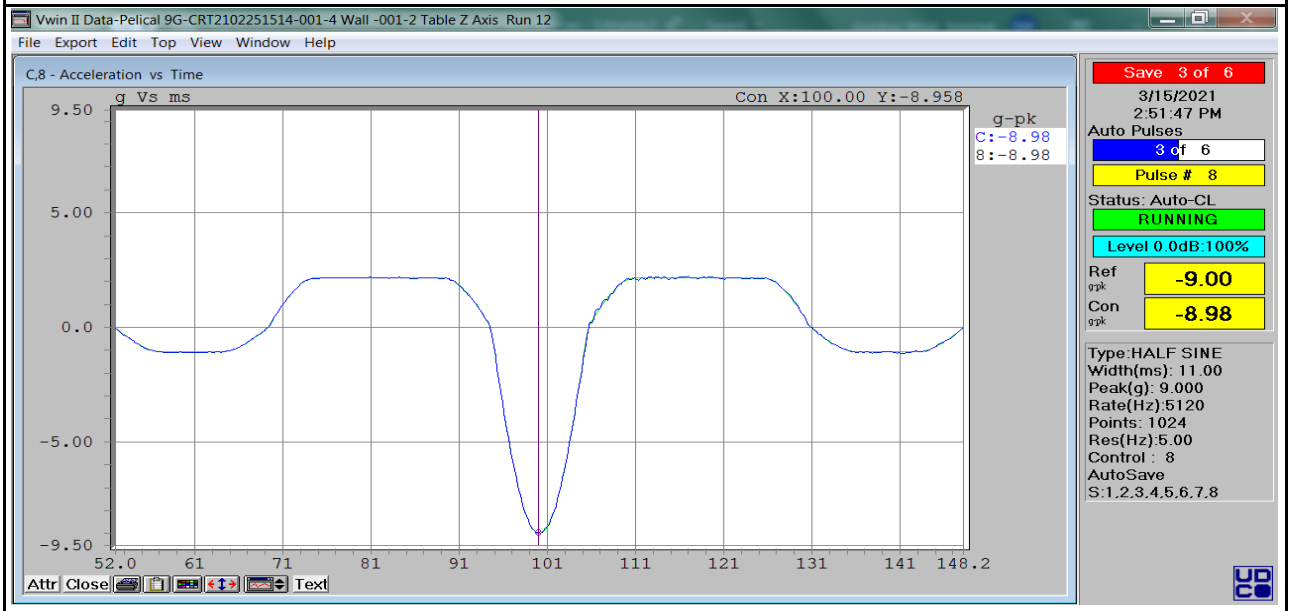


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	Z Axis	8	6	Wall Mount In Horizontal	16 battery

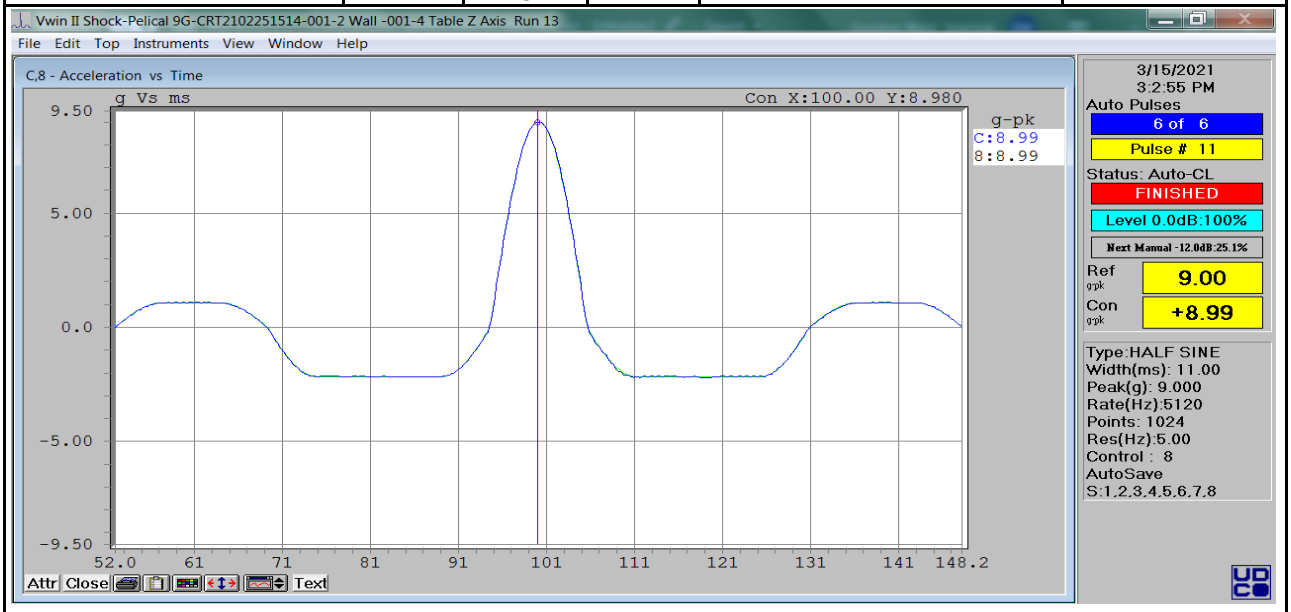


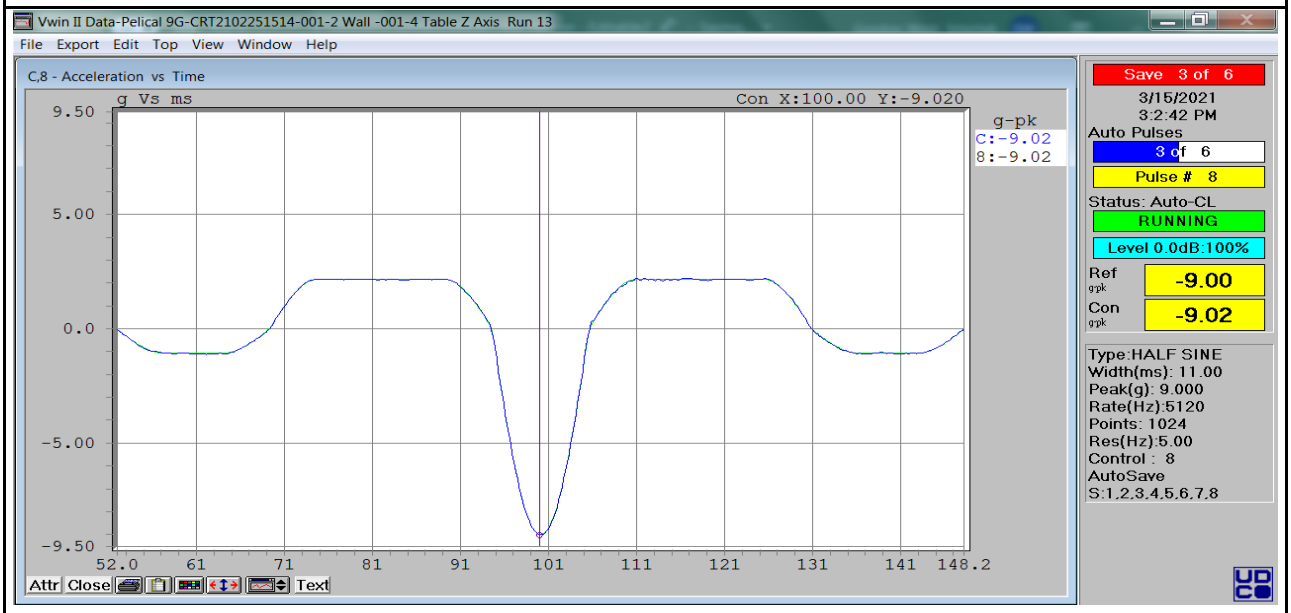


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	Z Axis	8	6	Wall Mount In Horizontal	4 lithium

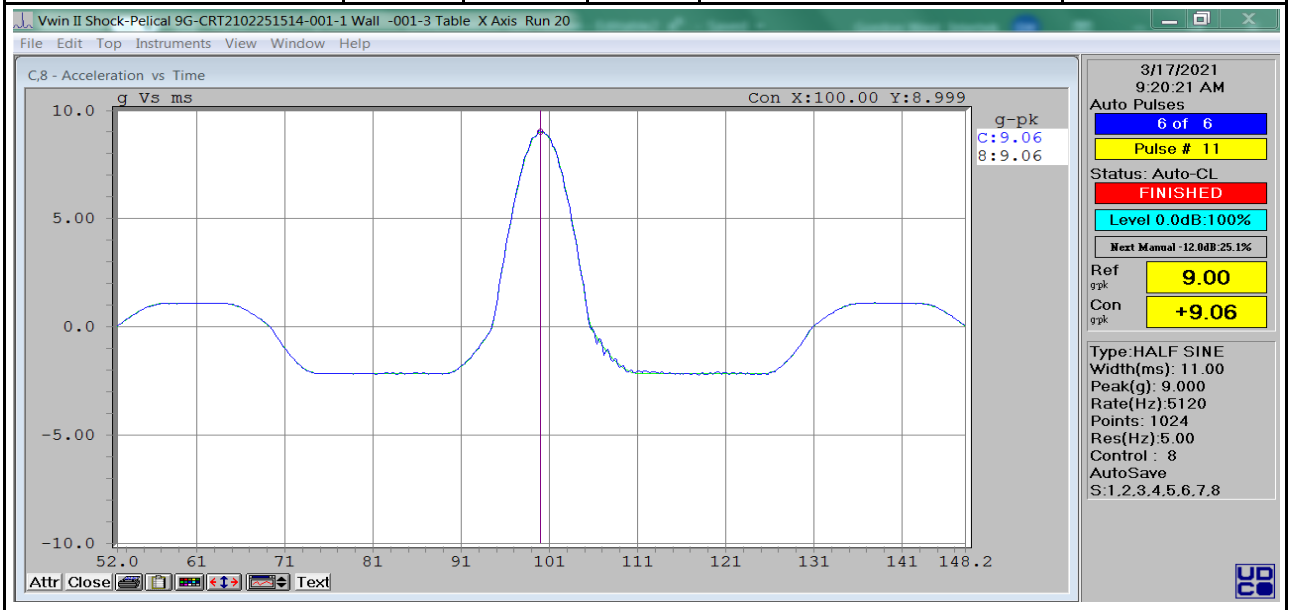


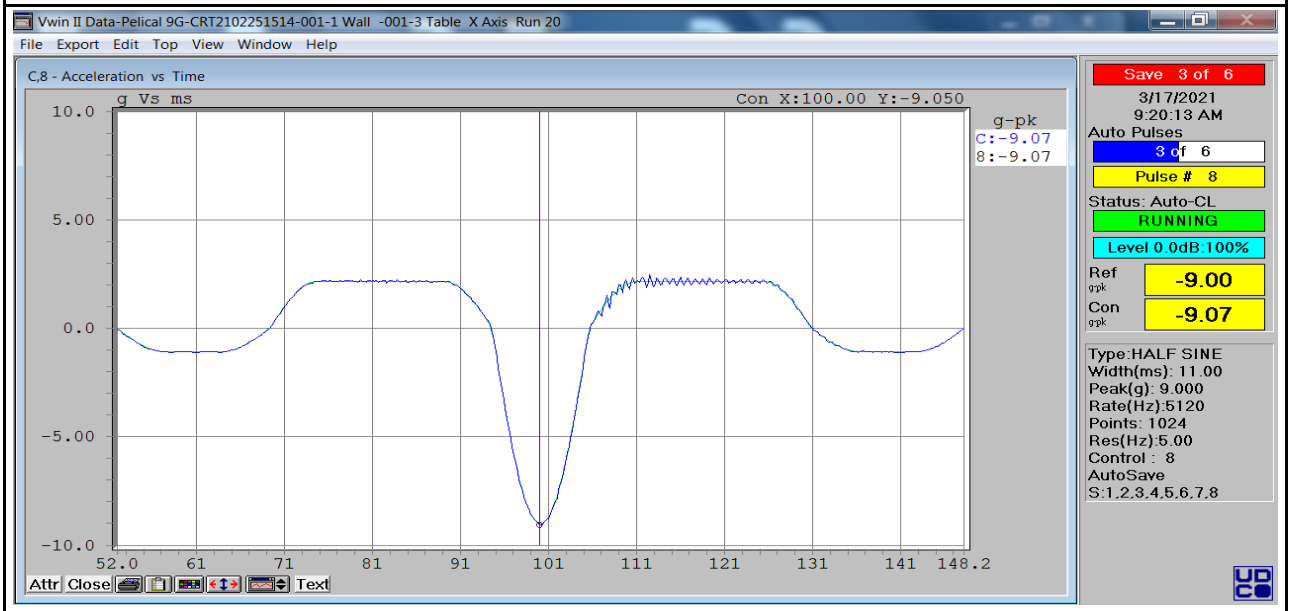


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	X Axis	8	6	Wall Mount In Horizontal	1 lithium

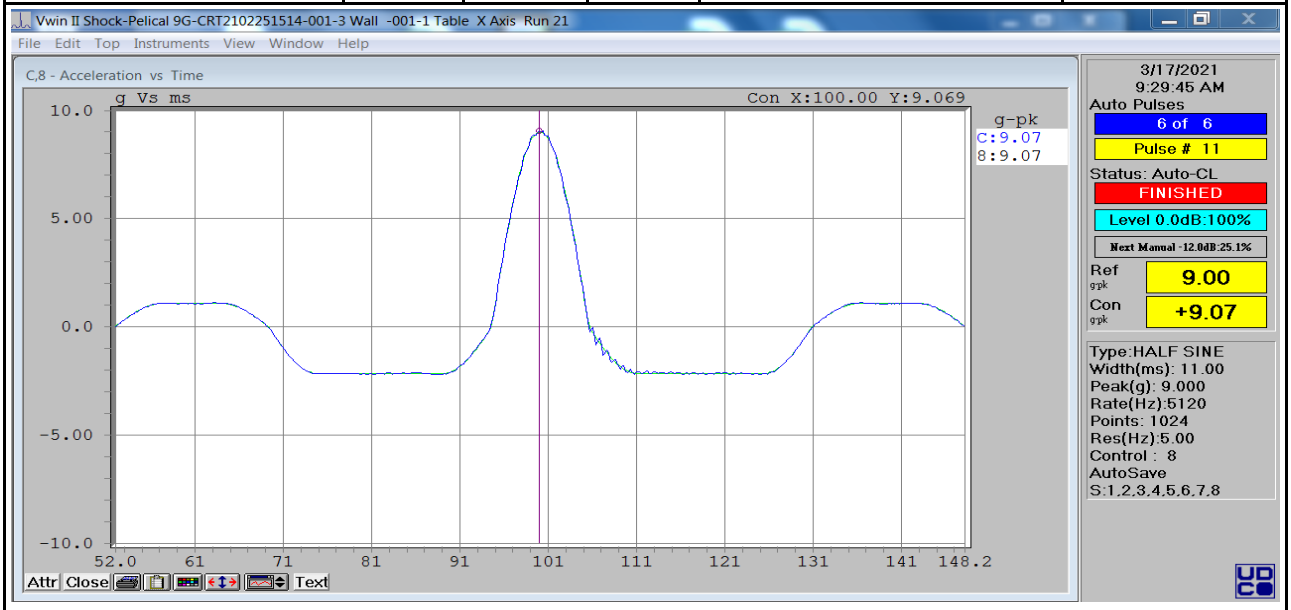


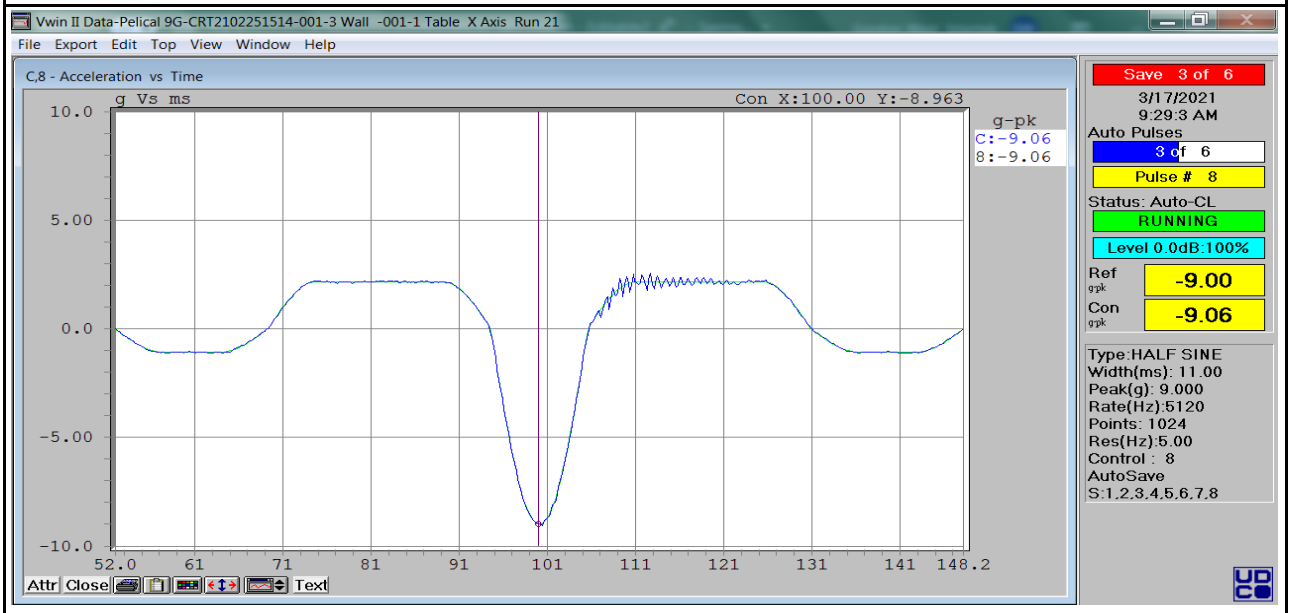


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3	X Axis	8	6	Wall Mount In Horizontal	4 battery

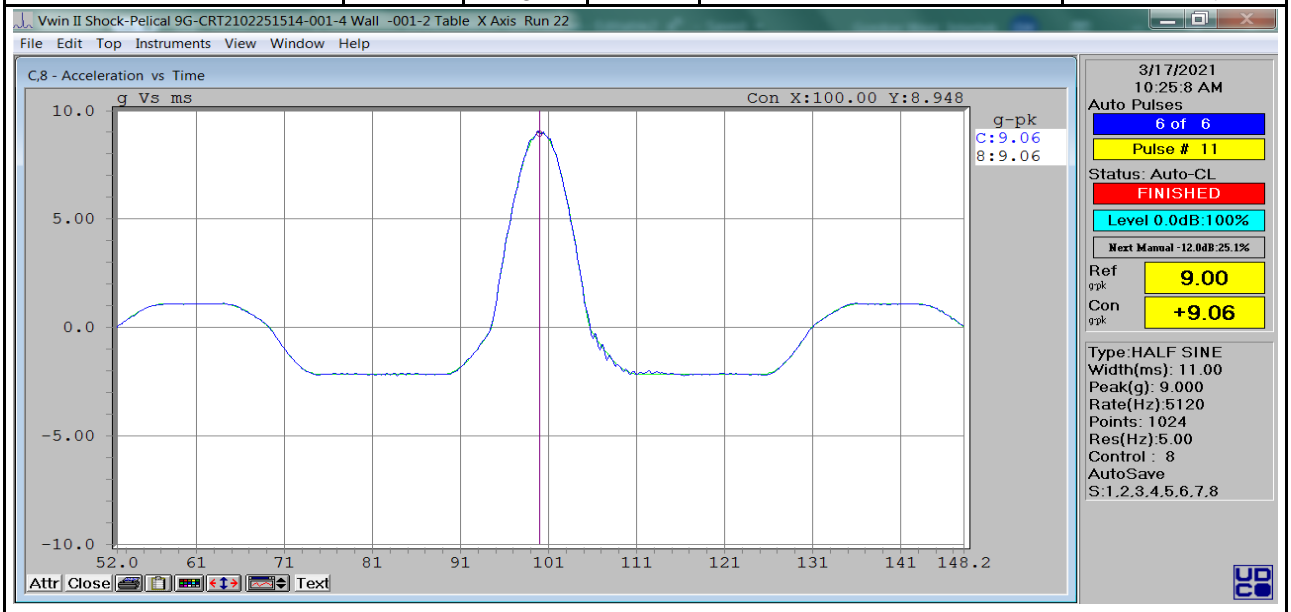


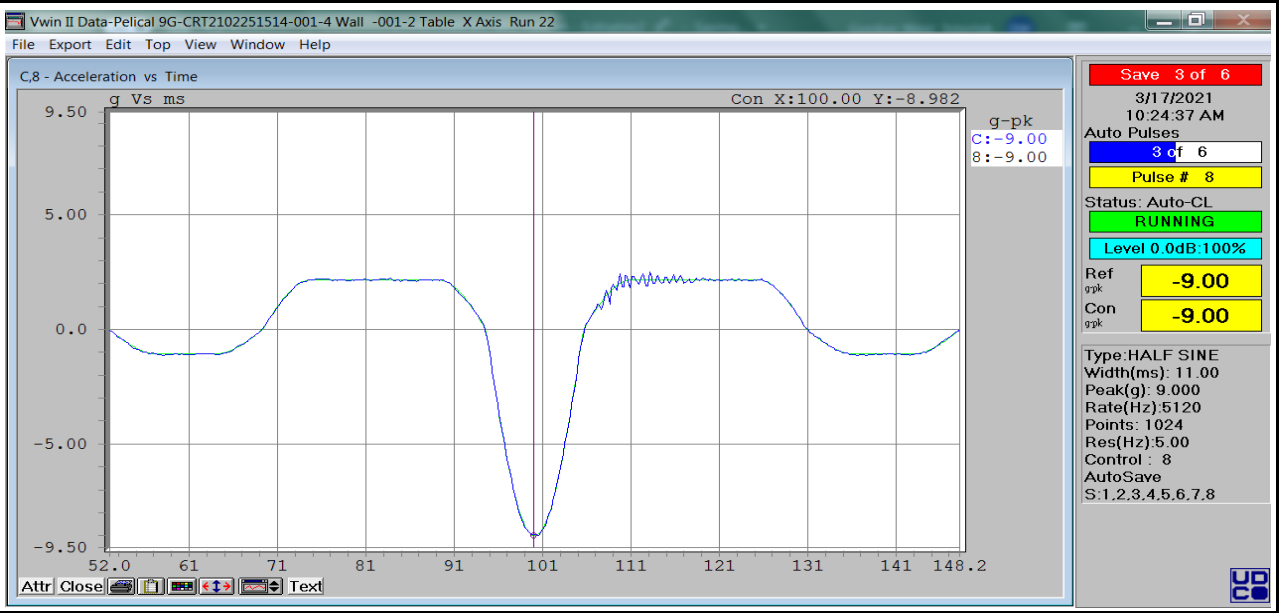


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	X Axis	8	6	Wall Mount In Horizontal	16 battery

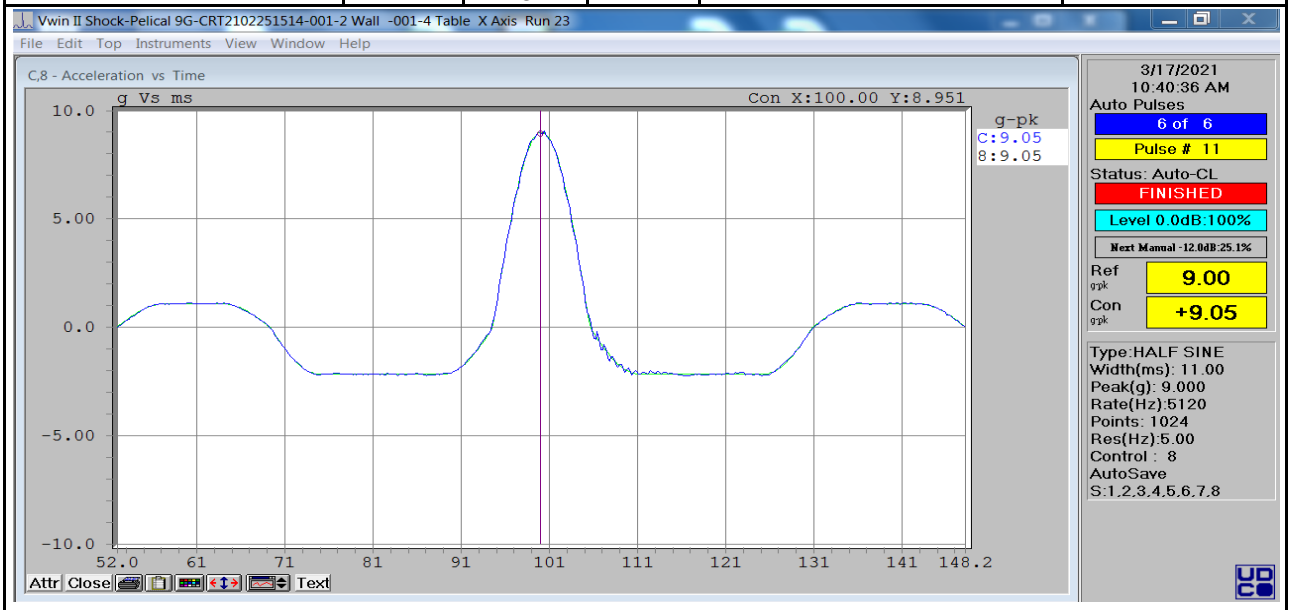


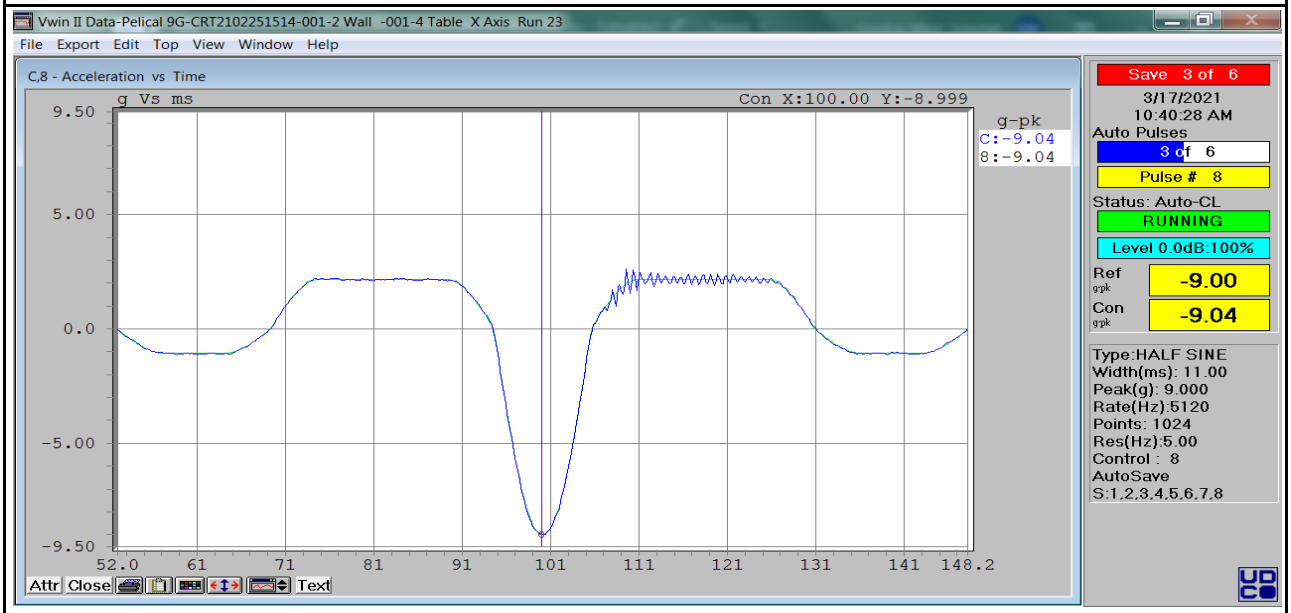


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	X Axis	8	6	Wall Mount In Horizontal	4 lithium

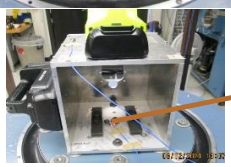




Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

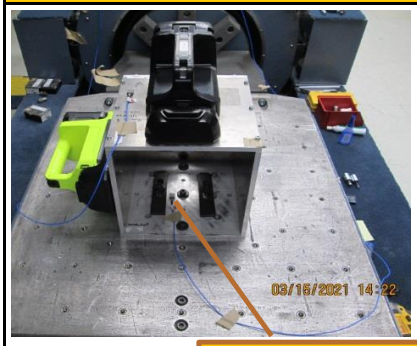
Photos:

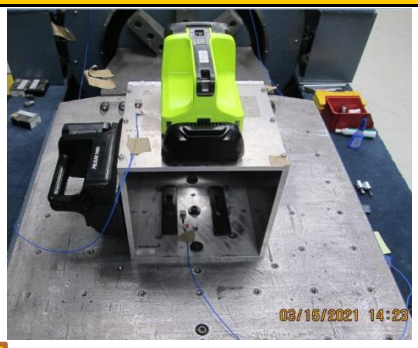
Photo: Y Axis according to the vehicle



CH8 Control Accelerometer

Photo: Z Axis according to the vehicle





CH8 Control Accelerometer

Photos (cont'd):

Photo: X Axis according to the vehicle

Sign Off Block					
Tested By:	Gordon West			**Signature or initials:**	
Engineer:	Peter Leshkiv			**Signature or initials:**	
Reviewed By:	cwm			**Signature or initials:**	
Test Equipment Used:	1,2,3,4,5			**Start Date:**	Friday, March 12, 2021
Amb (ºC):	22.9	**RH%**	20.8	**Completion Date:**	Wednesday, March 17, 2021

Equipment Mounting - Mechanical Shock - Table Top Mount

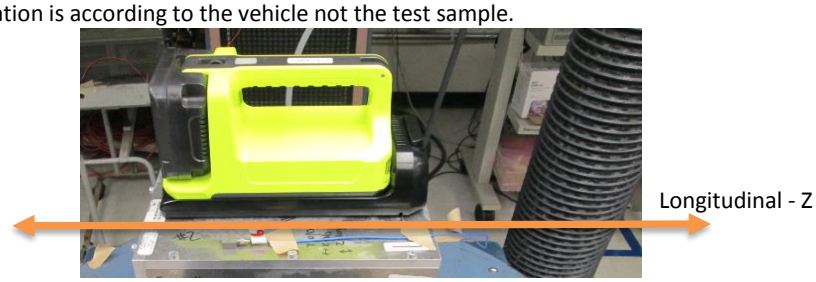
Method:

The test sample was mounted with the sample bracket to a test fixture which was mounted to the mechanical shock machine. The test sample was subjected to half sine shock pulses in the vertical axis in accordance with the following profile below:

Test Parameters:

Axis	Acceleration (G)	Width-Duration	Number of Pulses	Pulse Type
Longitudinal - Z	9G	11ms	3+, 3-	Half-sine
Vertical - Y	9G / 3G	11ms	3+, 3-	Half-sine
Horizontal - X	9G / 3G	11ms	3+, 3-	Half-sine

NOTE: Axis designation is according to the vehicle not the test sample.



Test Setup:

Control Accelerometer(s):	1 Control on Mounting Fixture / Vibration Table
Monitor Accelerometer(s):	1 on Mounting Fixture

Test Configurations: One sample for each configuration

- 1 lithium - Sample 1 - Table Top Mount
- 4 lithium - Sample 2 - Table Top Mount
- 4 battery - Sample 3 - Table Top Mount
- 16 battery - Sample 4 - Table Top Mount

Requirement:

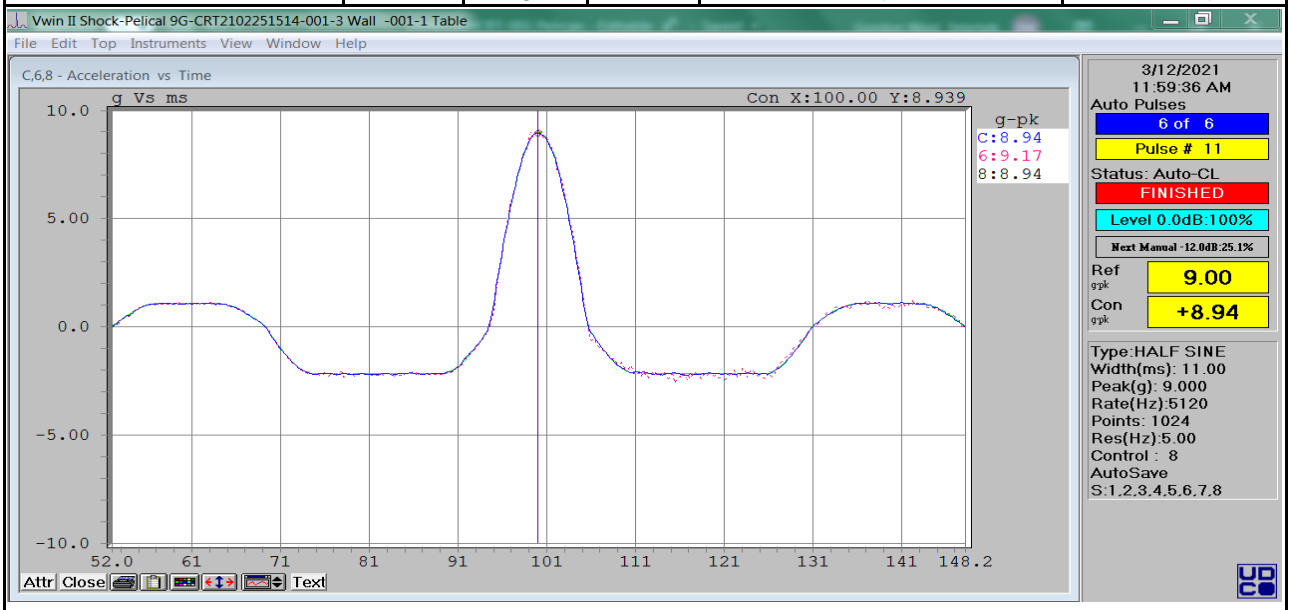
The bracket and charger shall contain the equipment when the equipment is subjected to 9g force in the longitudinal axis of the vehicle or a 3g force in any other direction.

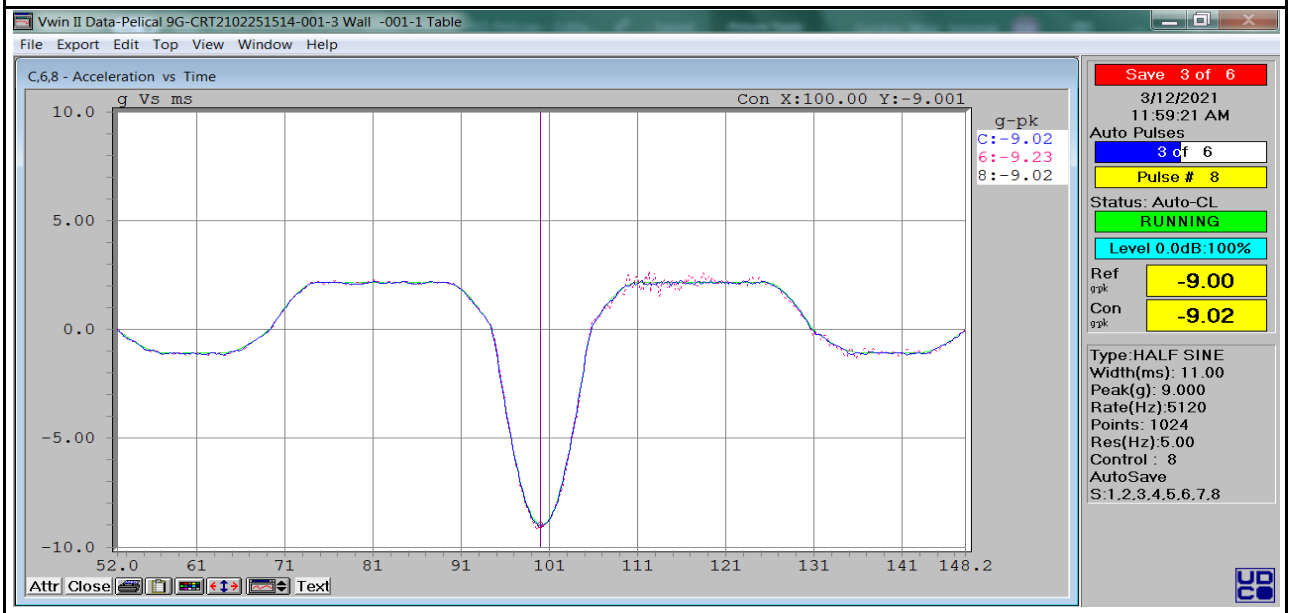
Compliance Test Summary

Sample	Configuration	Mounting	G level	X axis	Y Axis	Z axis	Compliance
1	1 lithium	Wall - Horizontal	9	p	p	p	Complies
2	4 lithium	Wall - Horizontal	9	p	p	p	Complies
3	4 batteries	Wall - Horizontal	9	p	p	p	Complies
4	16 batteries	Wall - Horizontal	9	p	f	p	NA
4	16 batteries	Wall - Horizontal	3	NA	p	NA	Complies

Results:

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3	Y Axis	8	6	Table Top Mount	4 battery

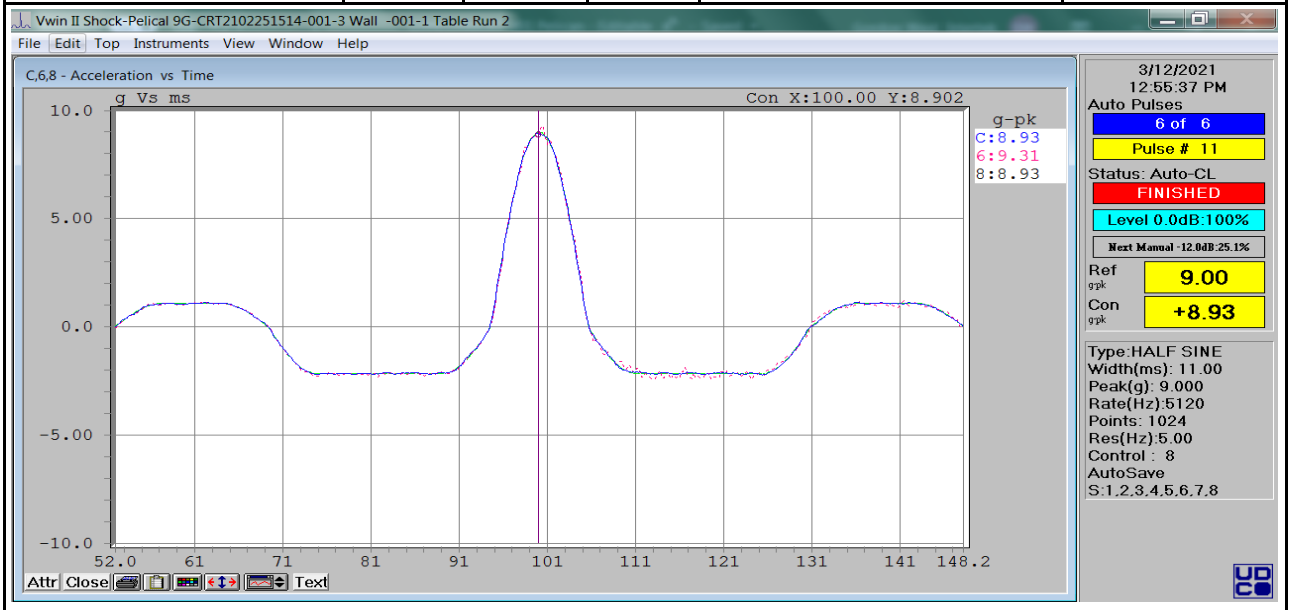


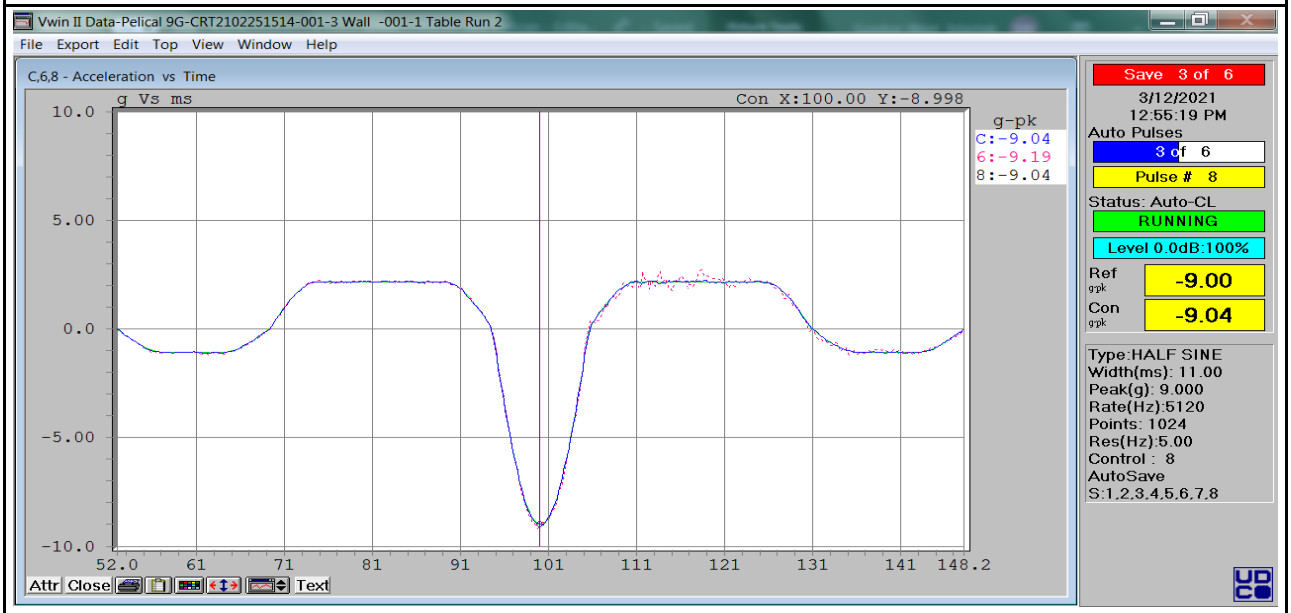


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	Y Axis	8	6	Table Top Mount	1 lithium

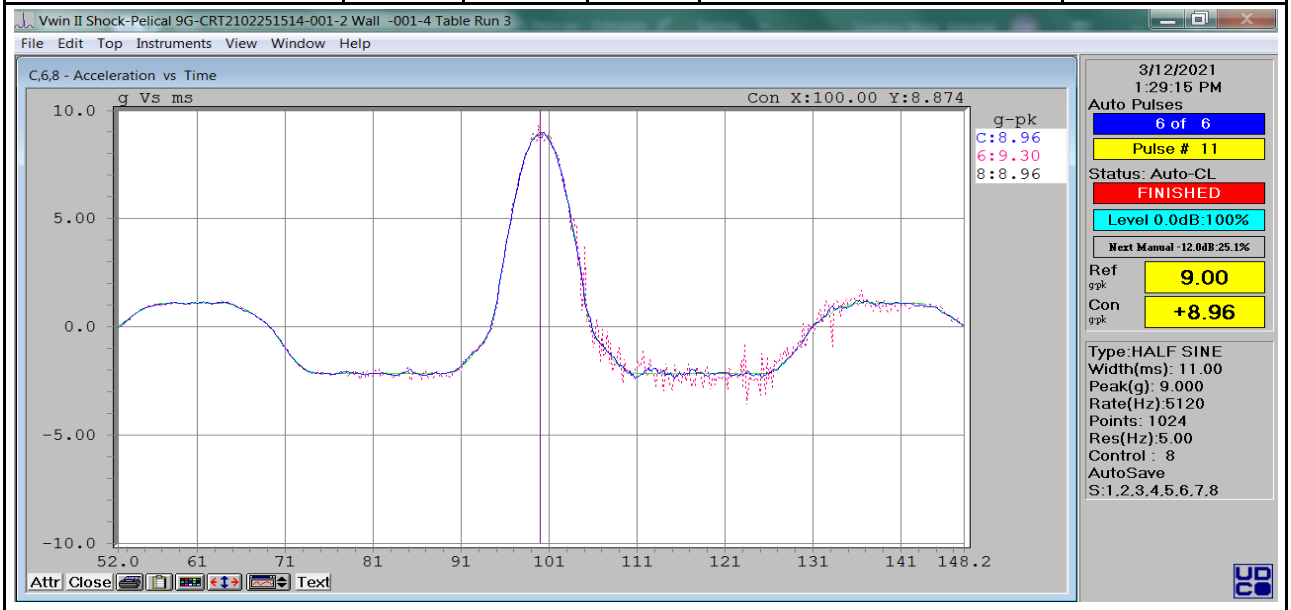


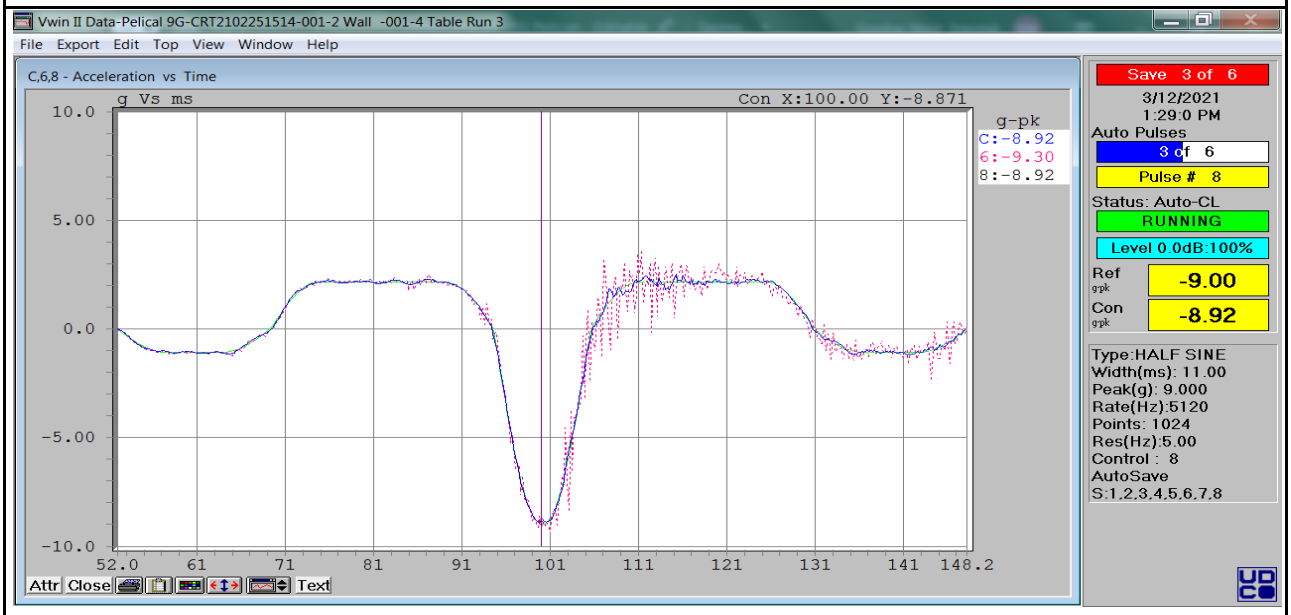


Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	Y Axis	8	6	Table Top Mount	16 battery



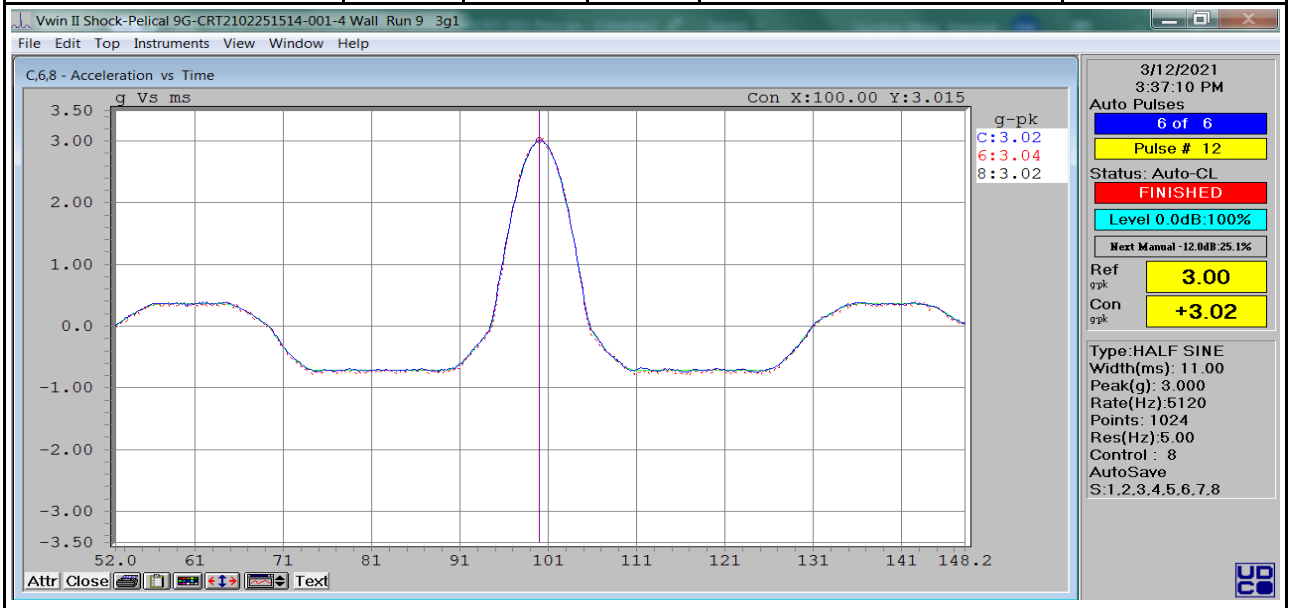


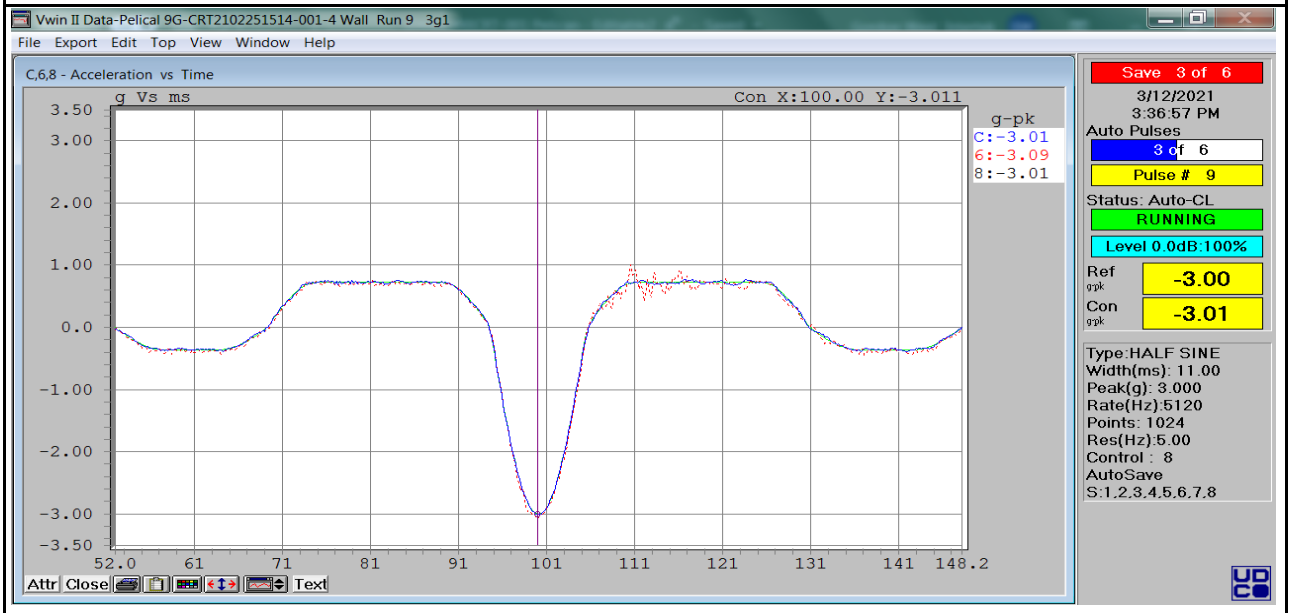
Post Test Results:	The sample ejected, no sign of physical damage.

Results(cont'd):

NOTE: Retested at 3g to verify compliance.

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	Y Axis	8	6	Table Top Mount	16 battery

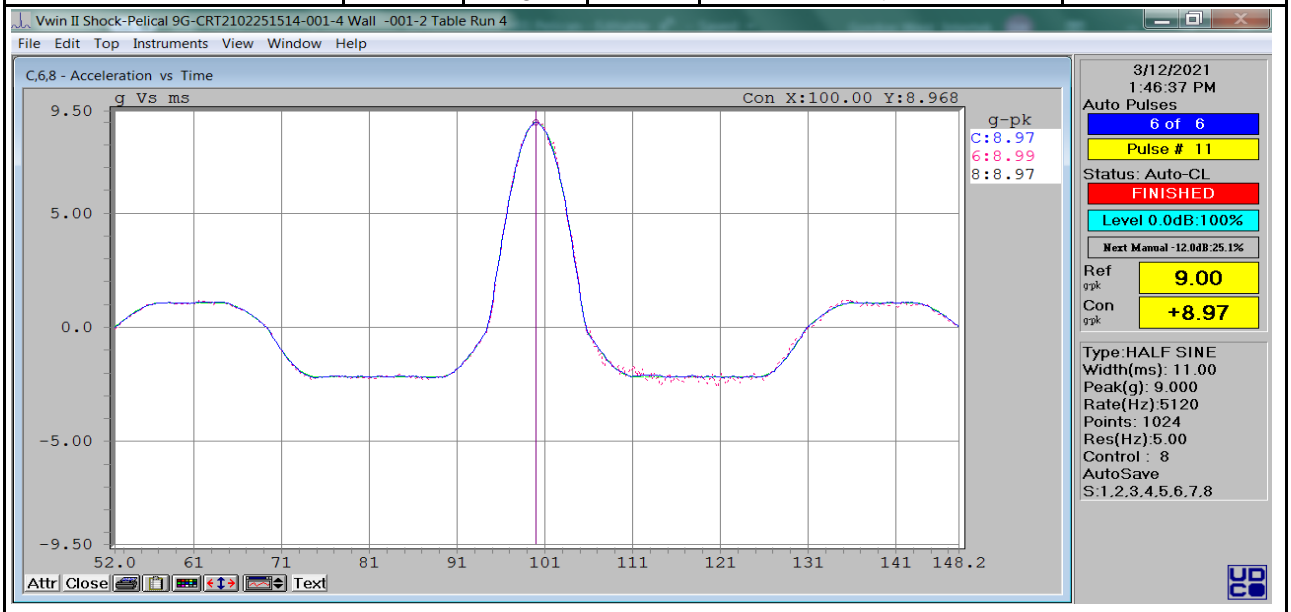


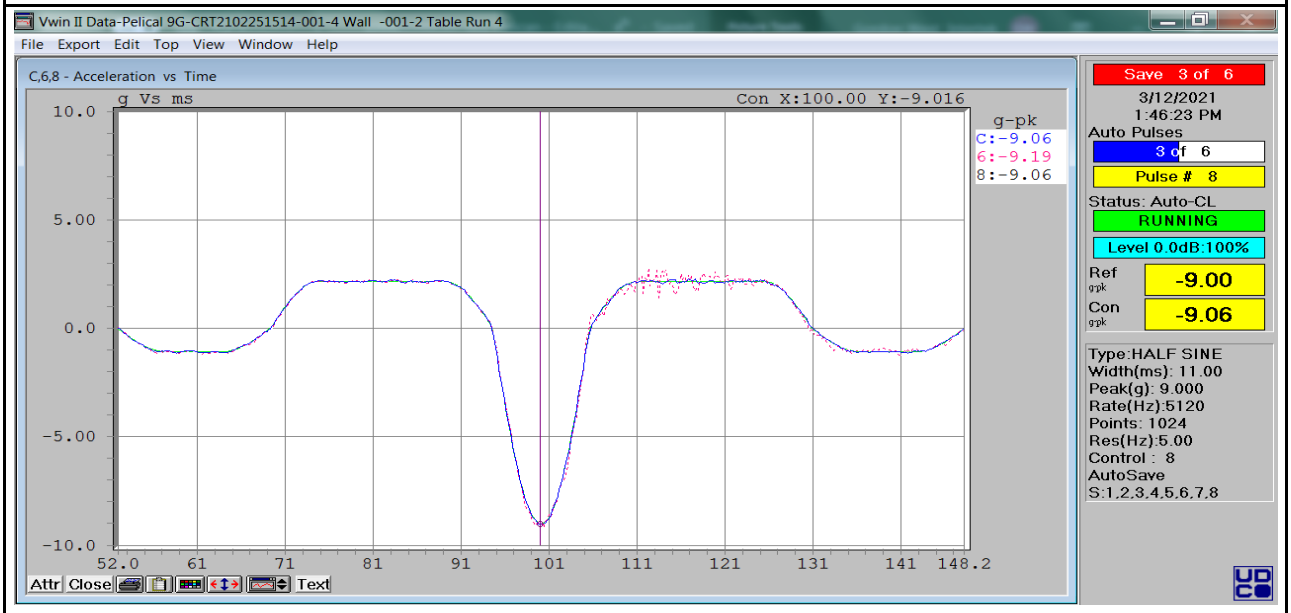


Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	Y Axis	8	6	Table Top Mount	4 lithium

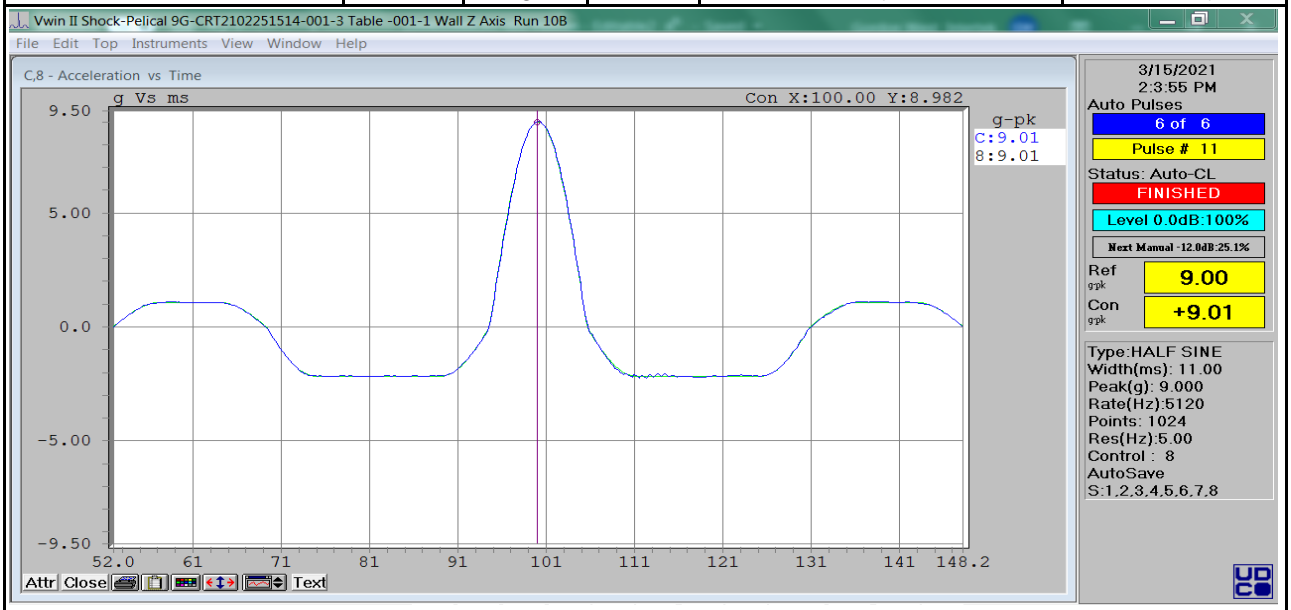


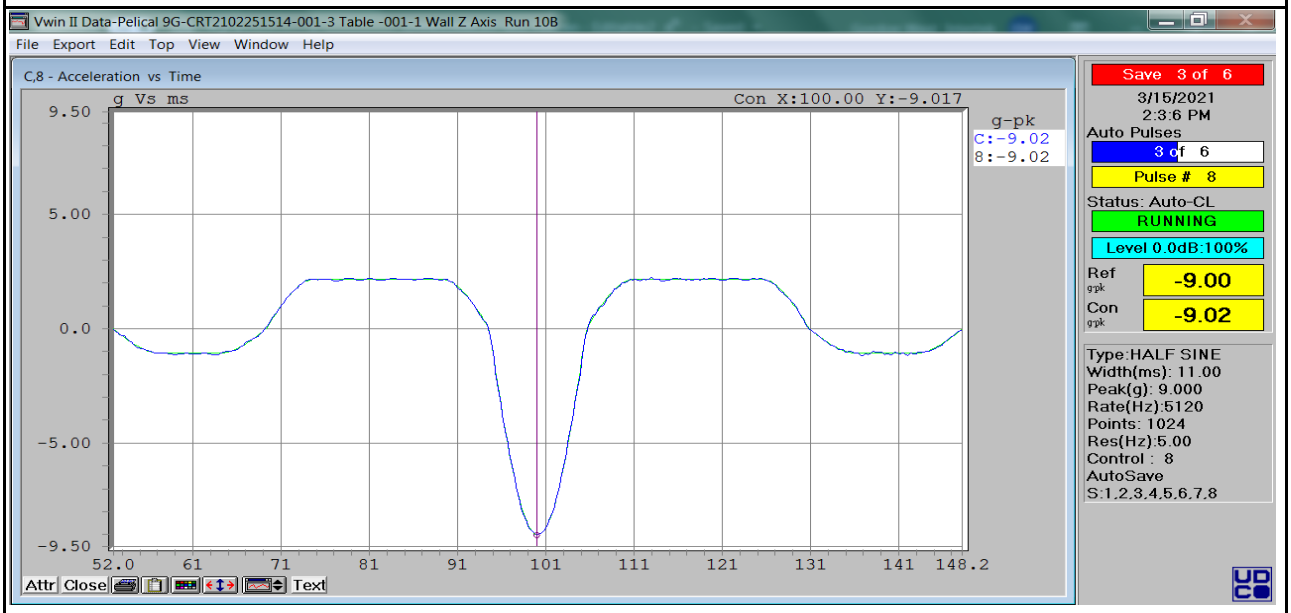


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3	Z Axis	8	6	Table Top Mount	4 battery

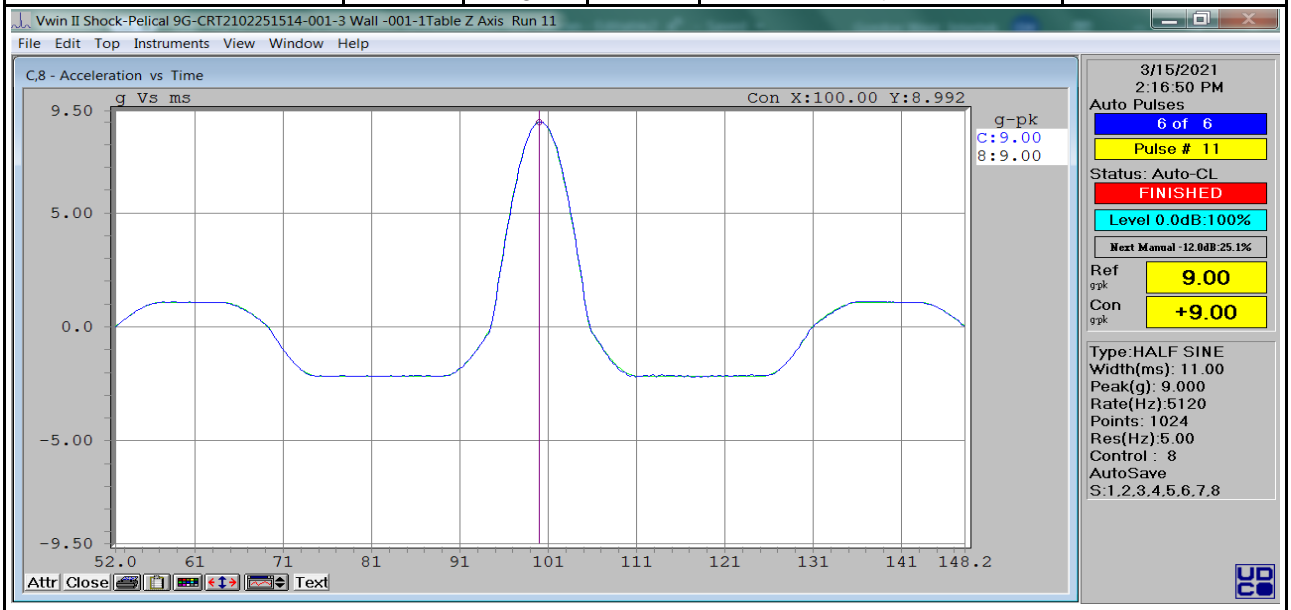


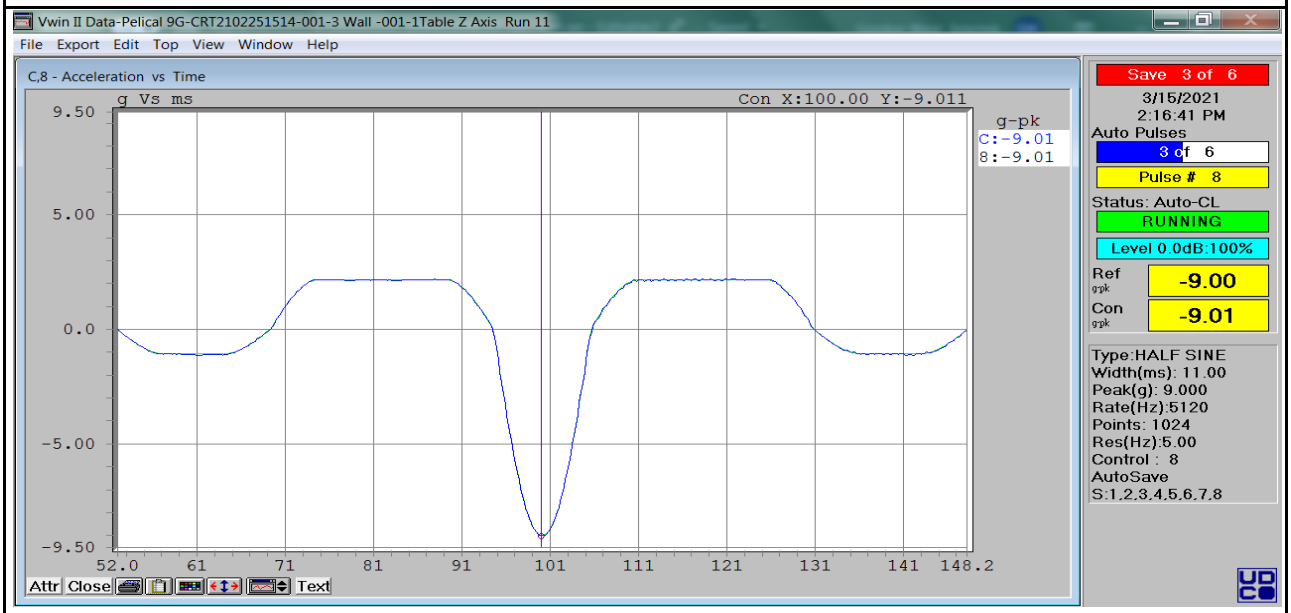


Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	Z Axis	8	6	Table Top Mount	1 lithium

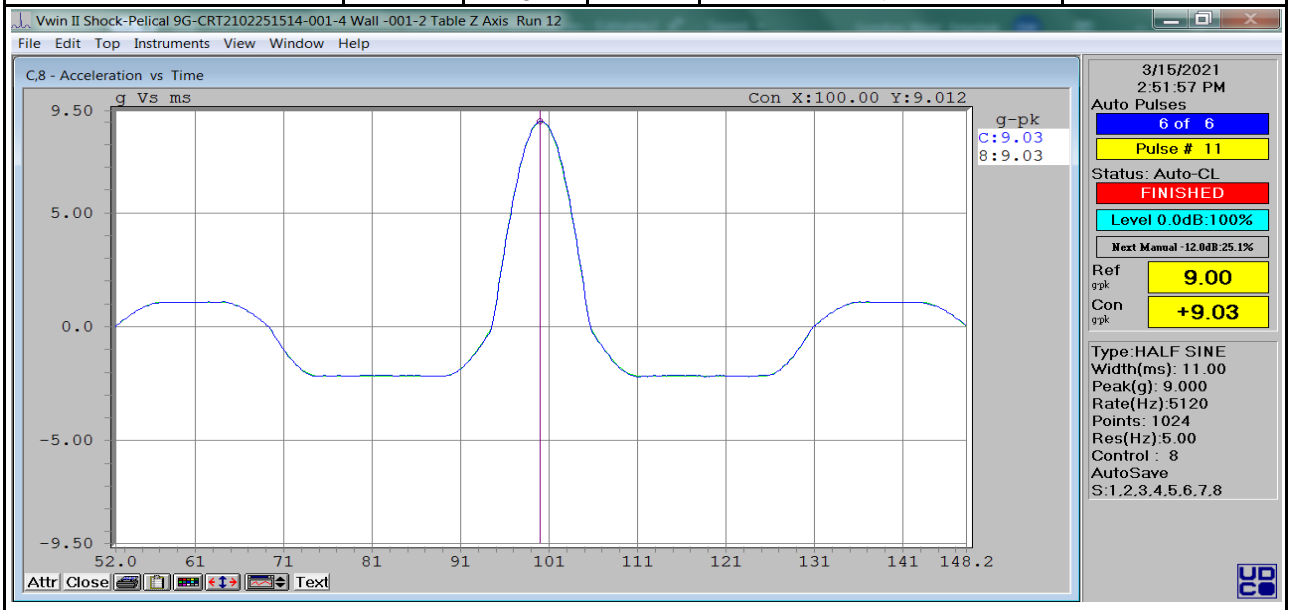


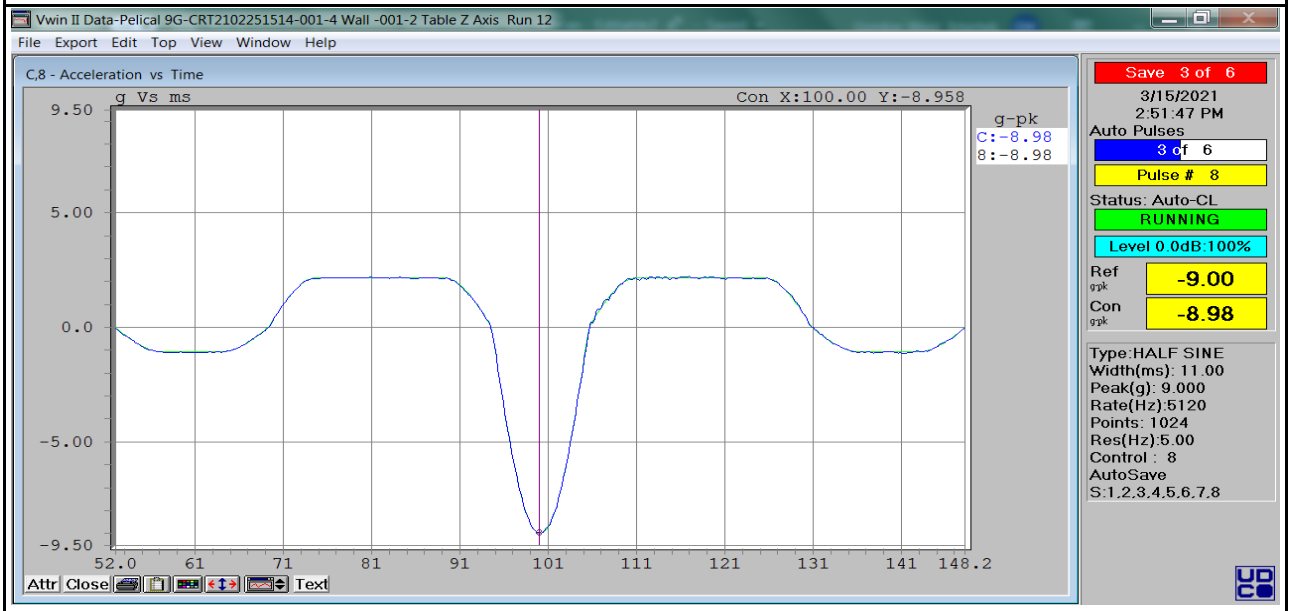


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	Z Axis	8	6	Table Top Mount	4 lithium

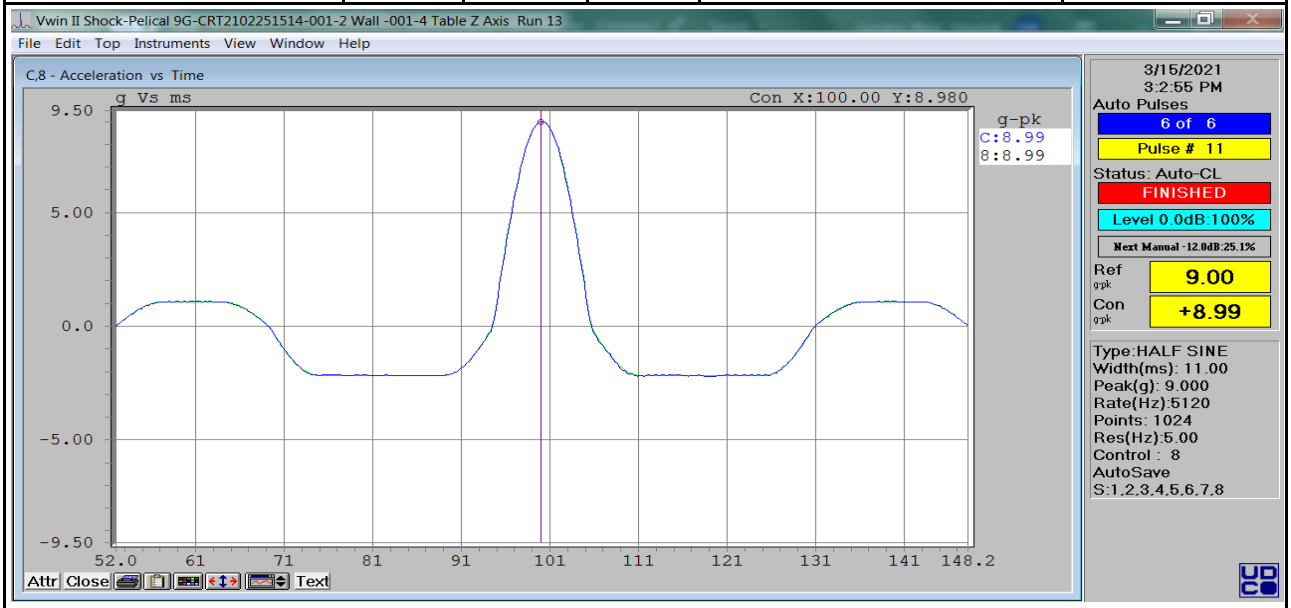


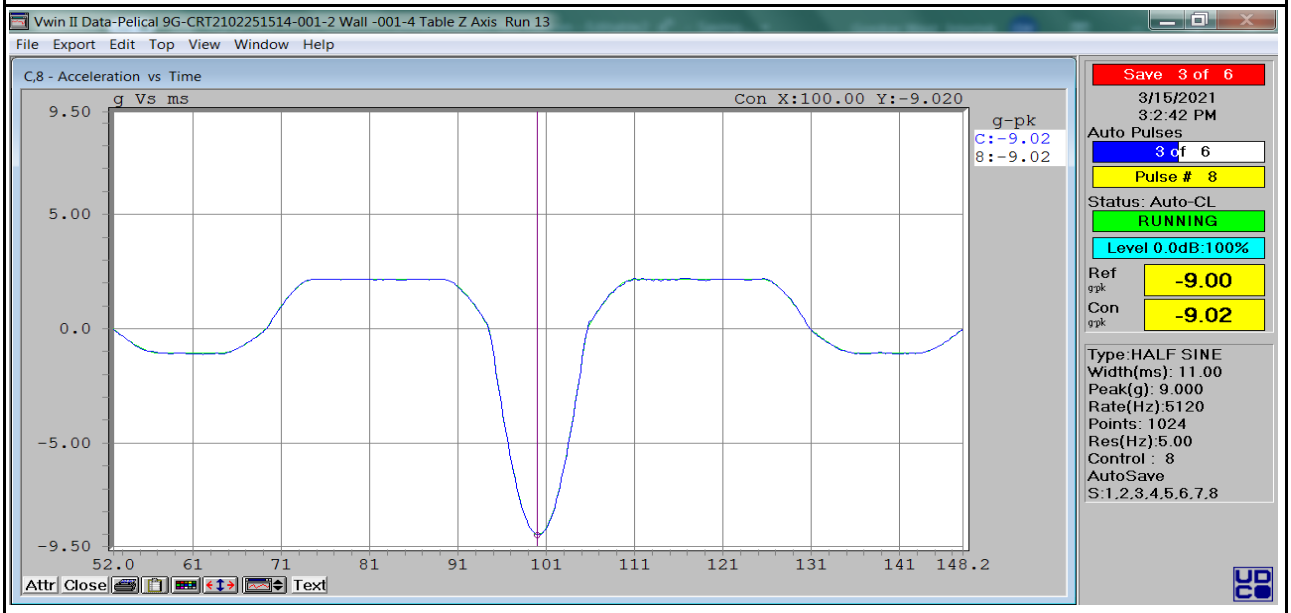


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	Z Axis	8	6	Table Top Mount	16 battery

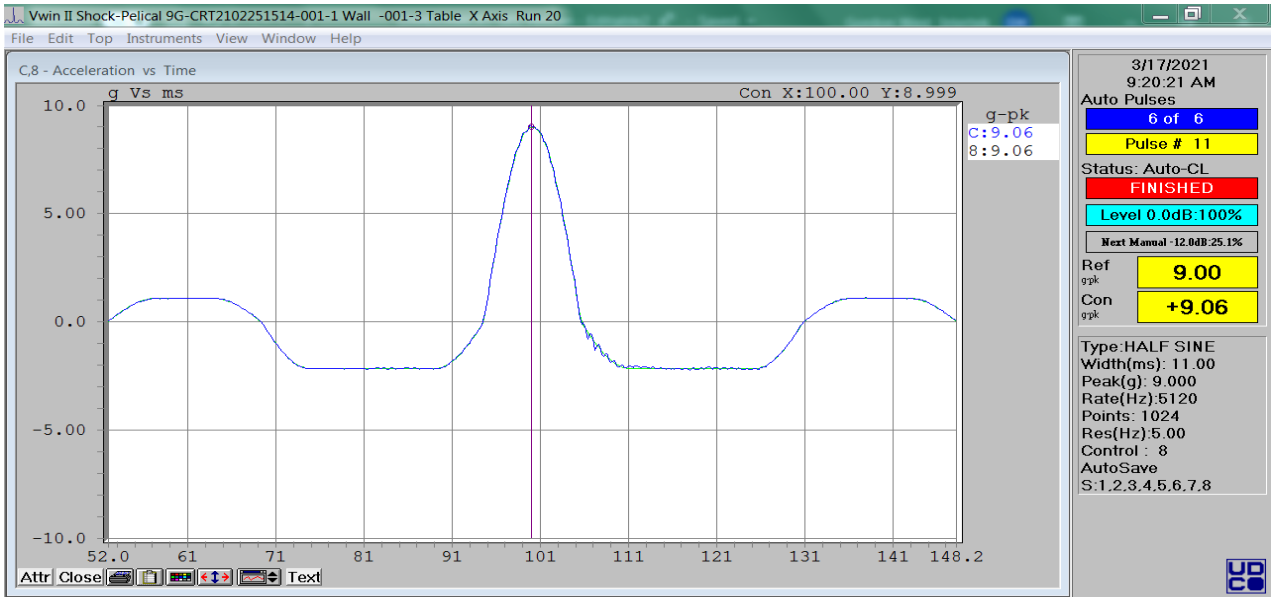


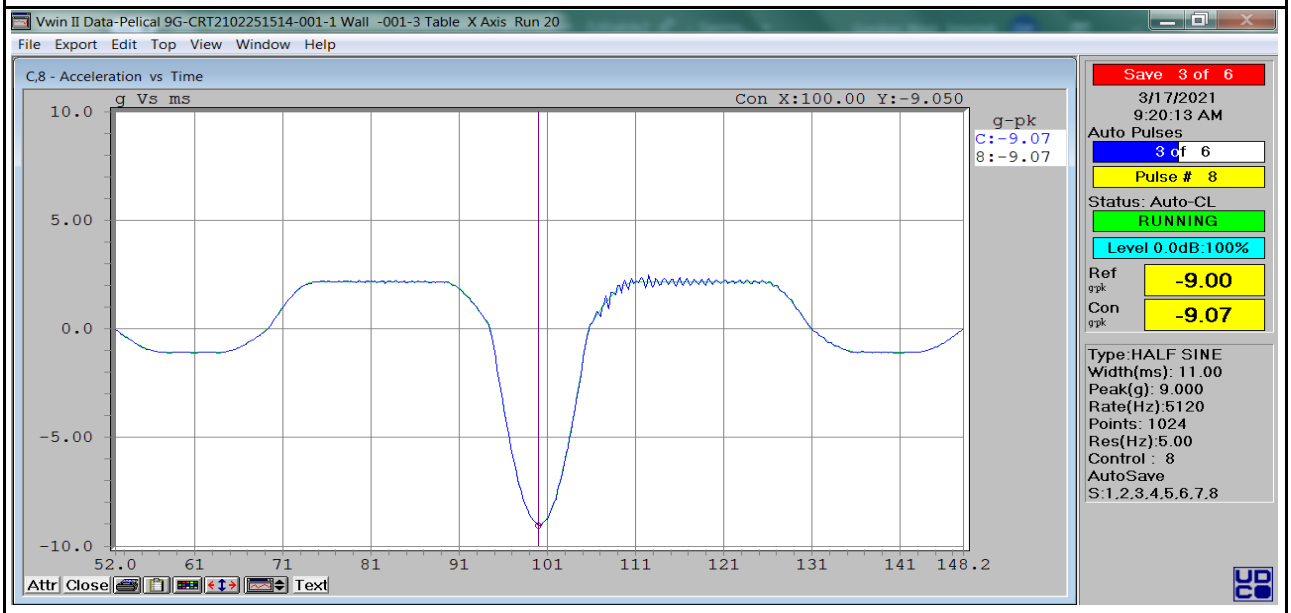


Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-3	X Axis	8	6	Table Top Mount	4 battery

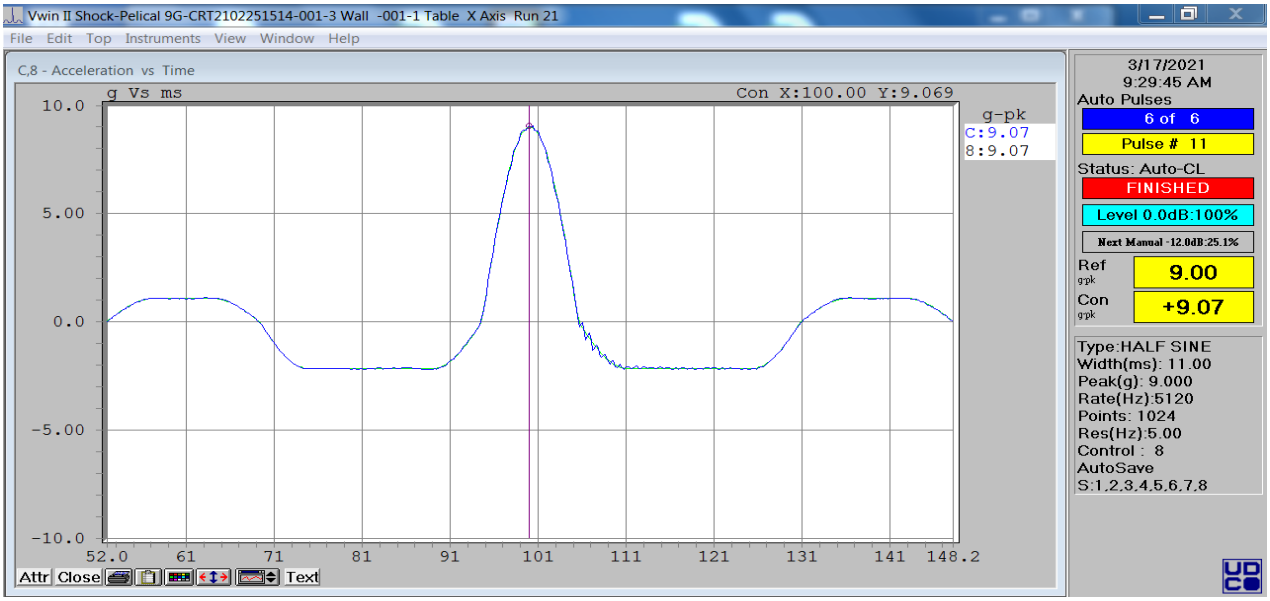


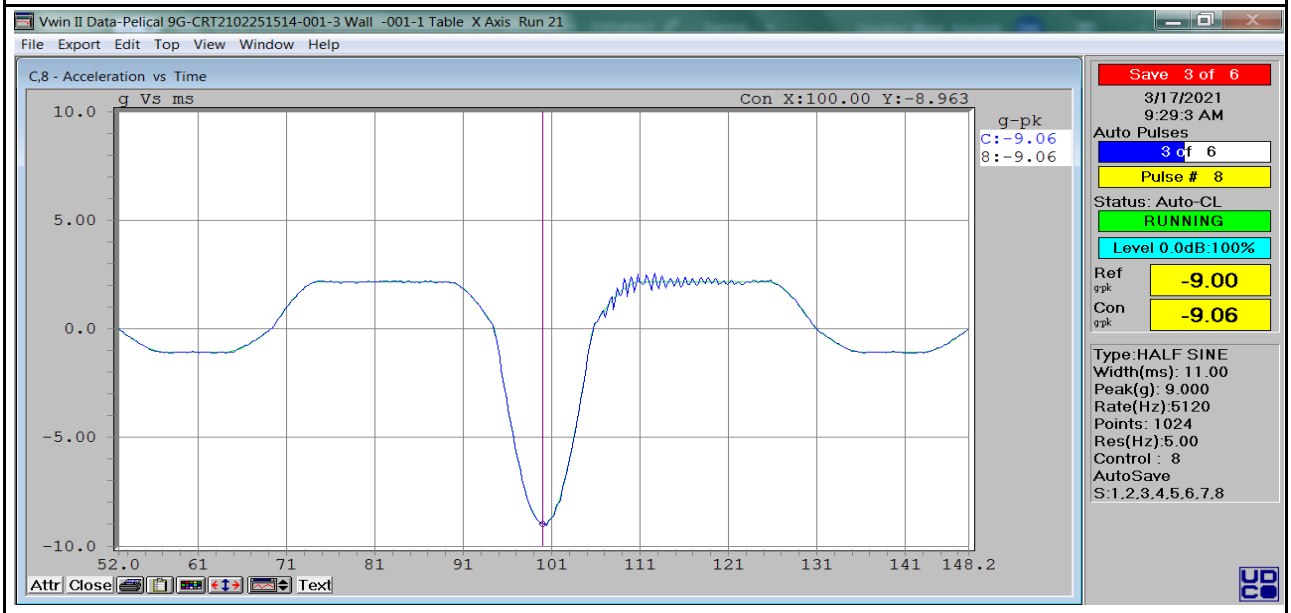


Post Test Results:	The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-1	X Axis	8	6	Table Top Mount	1 lithium

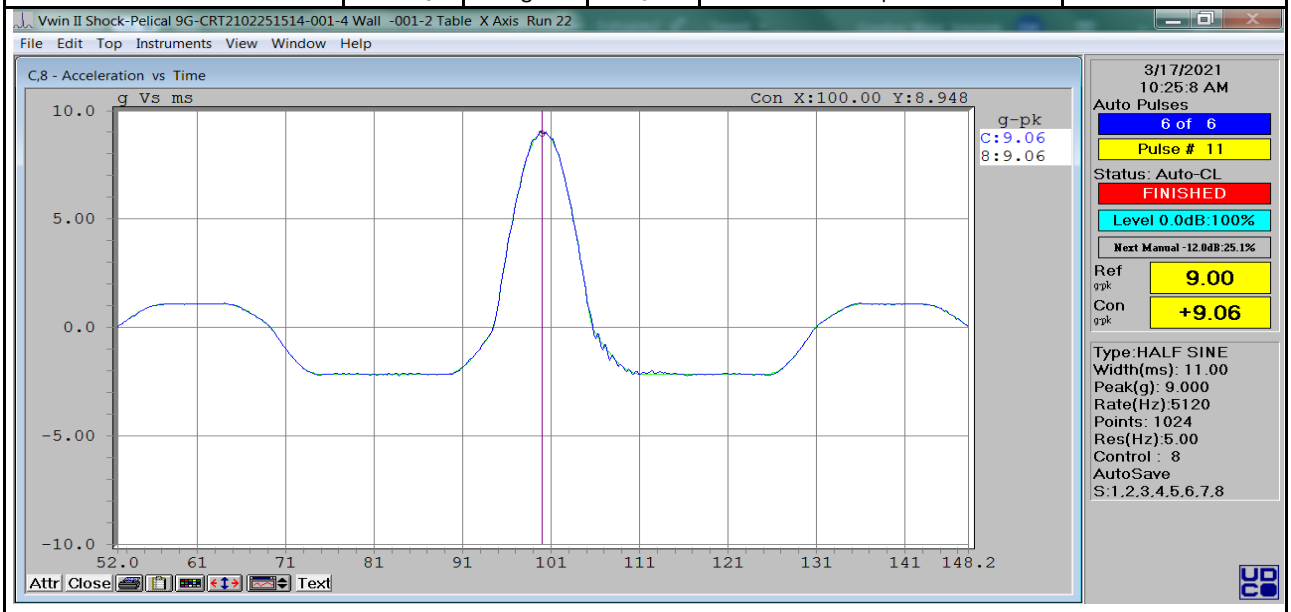


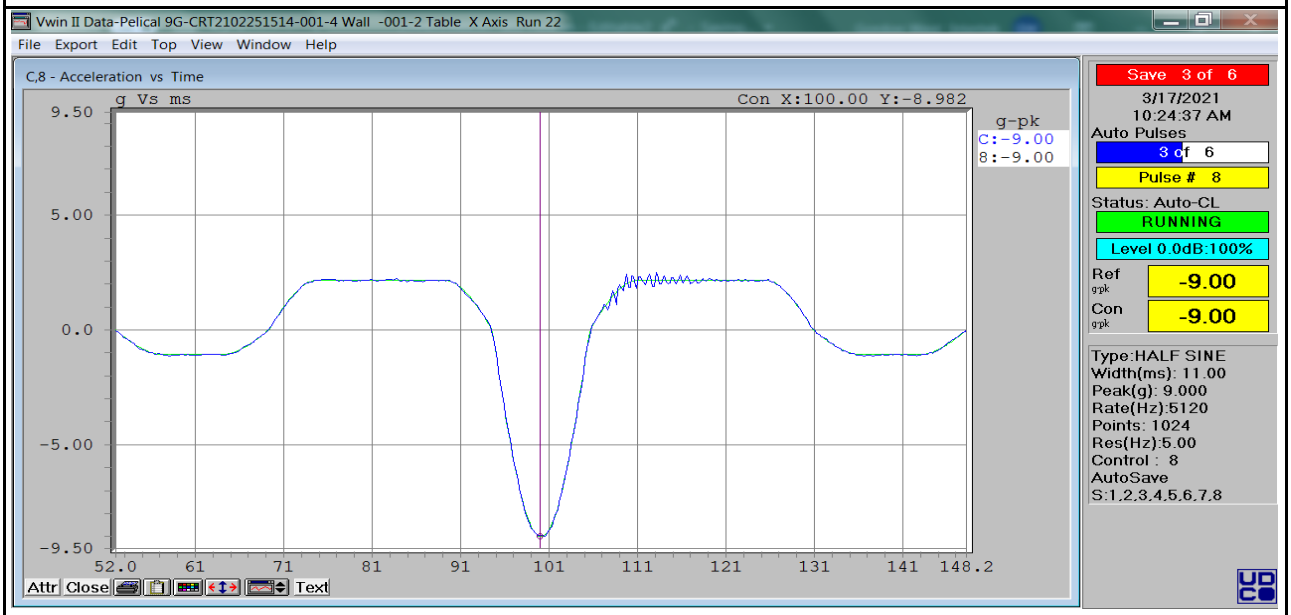


Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-2	X Axis	8	6	Table Top Mount	4 lithium

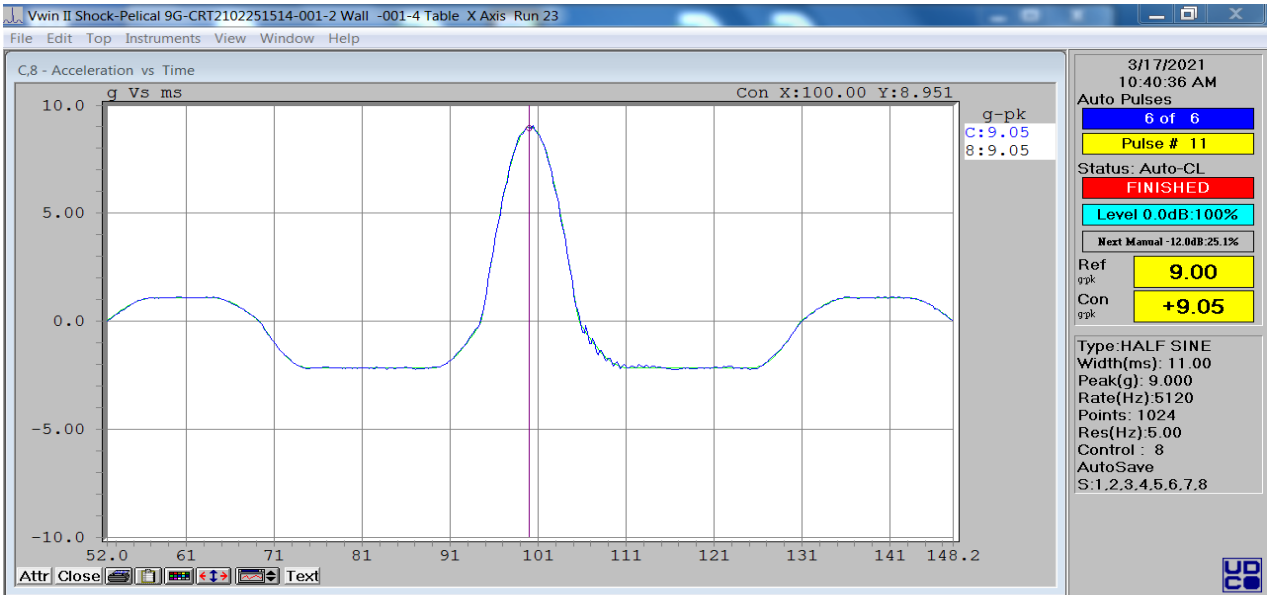


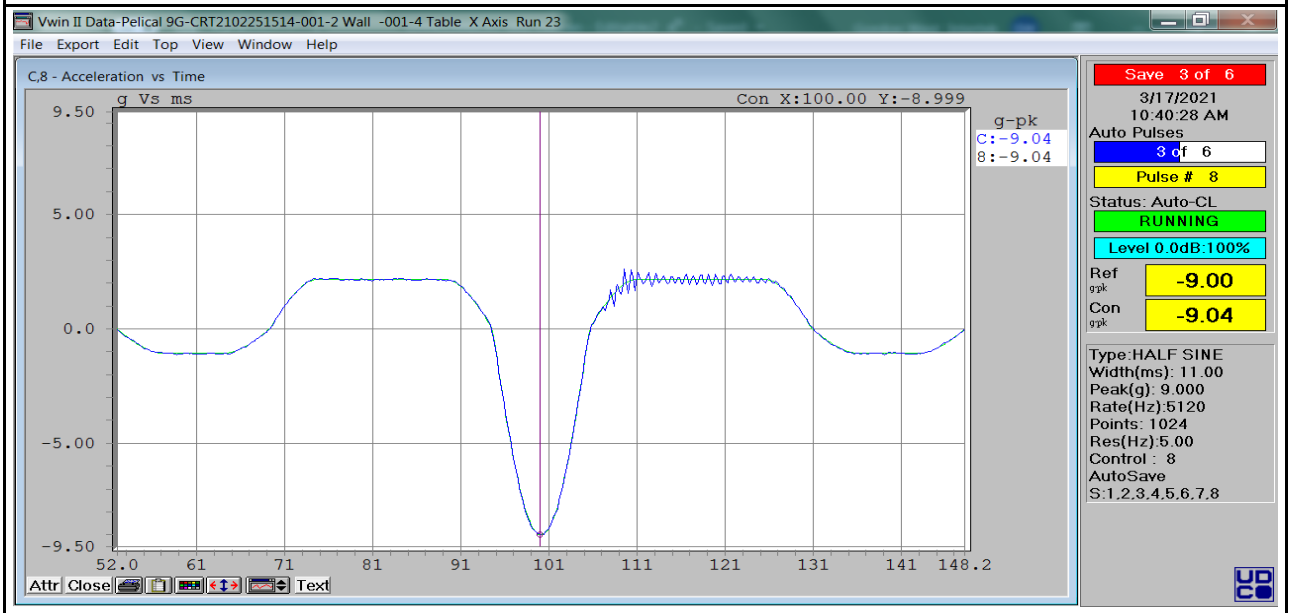


Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

Results(cont'd):

Sample Number	Test Axis	Control Channel	Monitor Channel	Bracket Mounting Location	Configuration
CRT2102251514-001-4	X Axis	8	6	Table Top Mount	16 battery

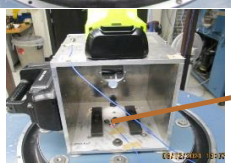




Post Test Results: The bracket and charger contained the sample, no sign of physical damage.

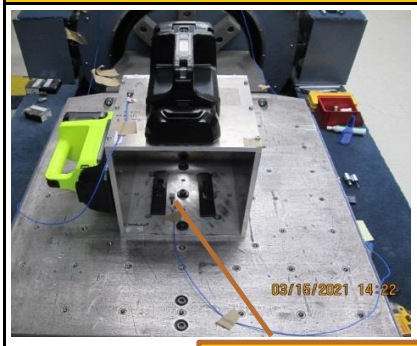
Photos:

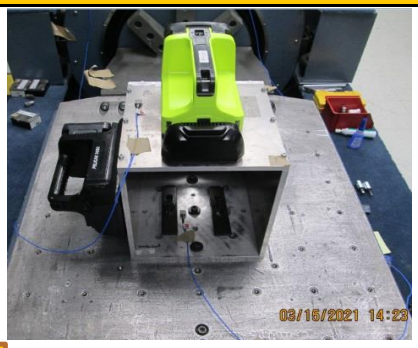
Photo: Y Axis according to the vehicle



CH8 Control Accelerometer

Photo: Z Axis according to the vehicle

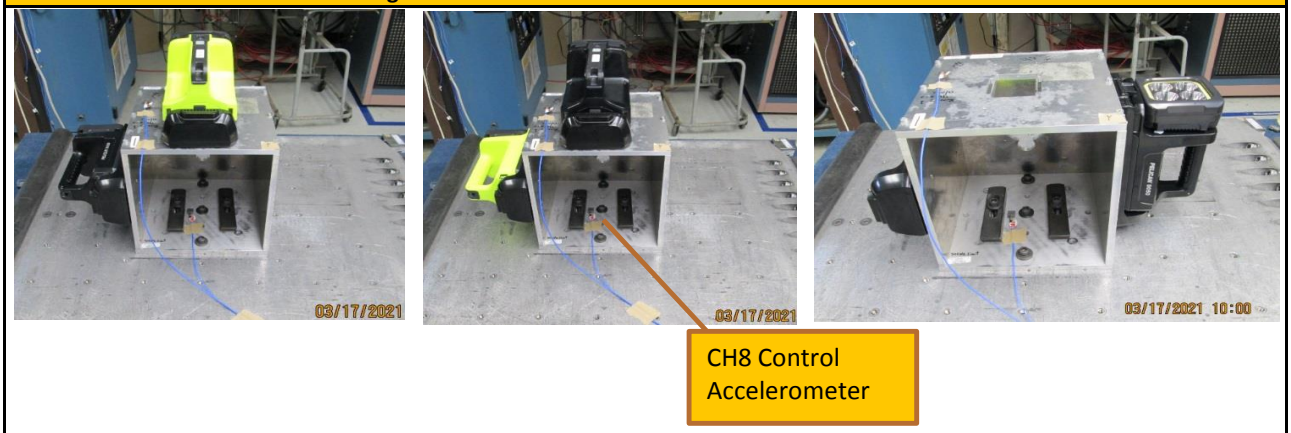




CH8 Control Accelerometer

Photos (cont'd):

Photo: X Axis according to the vehicle



Sign Off Block:					
Tested By:	Gordon West			**Signature or initials:**	
Engineer:	Peter Leshkiv			**Signature or initials:**	
Reviewed By:	cwm			**Signature or initials:**	
Test Equipment Used:	1,2,3,4,5			**Start Date:**	Friday, March 12, 2021
Amb (ºC):	22.9	**RH%**	20.8	**Completion Date:**	Wednesday, March 17, 2021

Equipment list					
#	Intertek ID No.		Description	Manufacturer	Calibration Due
1	M281	--	Digit Hygro-Thermometer	Testo 608-H1	24-Apr-2021
2	V393	--	Shaker Controller	Unholtz-Dickie 100291109	26-Jun-2021
3	L150	CH1-8	Signal Conditioner	Unholtz-Dickie CVA-8	01-Sep-2021
4	L193	CH6	Accelerometer	PCB Piezotronics 356A24/NC	17-Feb-2022
5	M284	CH8	Accelerometer	PCB Piezotronics 356A24/NC	21-Sep-2021
Note: For measurement uncertainty, refer to the calibration certificates for all the test equipment located in the equipment files					