SAFETY COMPLIANCE TESTING FOR FMVSS No. 218 MOTORCYCLE HELMETS

Brand: AGV
Model: 0F45H
Size: ML (57-58 cm)

Prepared By

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12 May 2020

Final Report 218-ACT-20-002

Prepared For

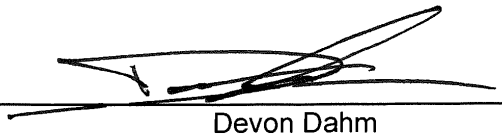
U.S. Department of Transportation

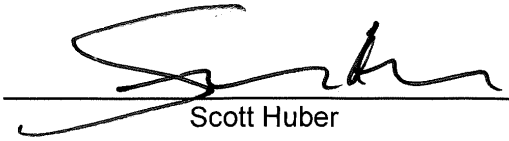
National Highway Traffic Safety Administration

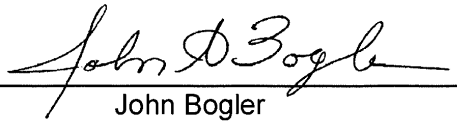
Office of Vehicle Safety Compliance (NEF-220)

1200 New Jersey Ave., S.E.

Washington, DC 20590

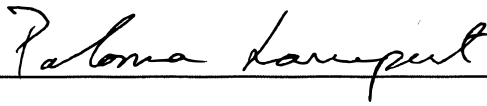
Technician: 
Devon Dahm

Project Manager: 
Scott Huber

Approved By: 
John Bogler

Approval Date: 12 May 2020

FINAL REPORT ACCEPTANCE BY OVSC

Accepted By: 

Acceptance Date: 07/09/2020

HS# 646677

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 218-ACT-20-002	**2. Government Accession No.**	**3. Recipient's Catalog No.**	
4. Title and Sub-Title FINAL REPORT OF FMVSS NO. 218 COMPLIANCE TESTING OF AGV, MODEL 0F45H, SIZE ML (57-58 cm) MOTORCYCLE HELMET		**5. Report Date** 12 May 2020	
		6. Performing Organization Code ACT	
7. Author(s) Scott Huber, Program Manager		**8. Performing Organization Report No.** 52.1102.001	
9. Performing Organization Name and Address ACT Lab LLC 3280 East 59th Street, Long Beach CA 90805		**10. Work Unit No.**	
		11. Contract or Grant No. 693JJ918D000022	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NEF-220) 1200 New Jersey Avenue, S.E. Washington, D.C. 20590		**13. Type of Report and Period Covered** Final Test Report	
		14. Sponsoring Agency Code NEF-220	

16. Abstract

Compliance tests were conducted on the subject model motorcycle helmet in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-218-07. Test failures identified were as follows: S5.1 Impact Attenuation. Accelerations in excess of 200g exceeded 2.0 ms on the ambient, low temperature and water immersed samples. S5.6.1 Labeling. The manufacturer's name is incomplete.

17. Key Words Helmet Compliance Testing Safety Engineering FMVSS No. 218	**18. Distribution Statement** Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division (NPO-120) 1200 New Jersey Avenue, S.E. Washington, D.C. 20590		
19. Security Classification (of this report) Unclassified	**20. Security Classification (of this page)** Unclassified	**21. No. of Pages** **35**	**22. Price**

Form DOT F1700.7 (8-69)

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PURPOSE OF COMPLIANCE TEST

1. PURPOSE OF COMPLIANCE TEST

This testing was conducted as part of the Department of Transportation, National Highway Traffic Safety Administration's Federal Motor Vehicle Safety Standard (FMVSS) No. 218, "Motorcycle Helmets"[1] Compliance Program. The purpose of the test was to determine if the production helmets supplied by the Office of Vehicle Safety Compliance satisfy the requirements of TP-218-07[2], as governed by the contract.

2. TEST PROCEDURE

The ACT Lab Helmet Testing Manual, Part I – Motorcycle Helmets[3] submitted to the Office of Vehicle Safety Compliance, National Highway Traffic Safety Administration, contains the specific procedures used to conduct this test. The ACT Lab Helmet Testing Manual, Part I – Motorcycle Helmets as modified by Project-Specific notations is in accordance with TP-218-07.

The test procedure shall not be in conflict with any portion of FMVSS No. 218 nor amendments in effect as noted in the applicable contract.

[1] NHTSA, FMVSS No. 218, Motorcycle Helmets, 49 CFR Chapter V Section 571.218, August 20, 1973 as last amended FR 28132 Vol. 76, No. 93, May 13, 2011.
[2] NHTSA, TP-218-07, Laboratory Test Procedure for FMVSS 218, Motorcycle Helmets, 13 May 2011.
[3] ACT Lab Helmet Test Manual, Version 4.2 – Motorcycle Helmets in accordance with FMVSS No. 218, 22 July 2013.

HELMET DATA

HELMET BRAND NAME: AGV

HELMET MODEL DESIGNATION: 0F45H

HELMET MANUFACTURER: DAINESE S.p.A.

HELMET SIZE: ML (57-58 cm)

HELMET COVERAGE: Partial: _____ Full: X Complete: _____

HELMET POSITIONING INDEX: 40 mm

SHELL MATERIAL: Composite Fiber Material

LINER MATERIAL: Polystyrene

BUCKLE DESCRIPTION: Double D-Rings

HELMET	A Ambient	B Low Temp	C High Temp	D Water Immersed	E Spare
SHELL COLOR/PATTERN	Black	Black	Black	Black	Black
WEIGHT (grams)	1023	1022	1049	1019	1041
MONTH & YEAR OF MANUFACTURE	07/2017	07/2017	07/2017	07/2017	07/2017

COMMENTS:

1. All helmets were received in undamaged condition and were appropriate for testing.
2. Weights listed above for helmets A-E are as tested, no attachments included.
3. NHTSA provided the HPI based on information obtained from the manufacturer.

SUMMARY OF TEST RESULTS

INDICATE Pass or Fail

HELMET	A	B	C	D
TEST	AMBIENT	LOW TEMP	HIGH TEMP	WATER IMMERSED
IMPACT	Fail	Fail	Pass	Fail
PENETRATION	Pass	Pass	Pass	Pass
RETENTION	Pass	Pass	Pass	Pass

INDICATE Pass or Fail

TEST	PASS/FAIL
PERIPHERAL VISION	Pass
LABELING	Fail

COMMENTS:

1. S5.1 Impact Attenuation: (b) Accelerations in excess of 200g exceeded a cumulative duration of 2.0 ms:
   ambient sample, right location, flat anvil, 2nd impact, 2.1 ms
   low temperature sample, right location, flat anvil, 2nd impact, 2.2 ms
   water immersed sample, right location, flat anvil, 2nd impact, 2.1 ms

2. S5.6.1 Labeling: As of the date of this report, the entity listed on the interior label, “Dainese S.P.A.”, has not filed in accordance with Part 566, Manufacturer Identification, and therefore cannot be verified as a recognized manufacturer.

SELECTION OF APPROPRIATE HEADFORM

Paragraph S6.1 - If the helmet size designation falls into more than one of three size ranges, it shall be tested on each appropriate headform.

HELMET SIZE DESIGNATION	HEADFORM SIZE
Less than or equal to 6-3/4 (European Size 54)	SMALL
Greater than 6-3/4, but less than or equal to 7-1/2 (European Size 60)	MEDIUM
Greater than 7-1/2 (European 60)	LARGE

COMMENTS:
The manufacturer marked the helmet with its corresponding discrete size: ML (57-58 cm), Headform Size: DOT Medium.

CONDITIONING FOR TESTING — Paragraph S6.4 — The protective headgear shall be conditioned for not less than 4 hours and no more than 24 hours, in the specified environmental condition shown below, prior to test.

Ambient Conditions	16°C to 26°C (61ºF to 79ºF); 30% to 70% Relative Humidity
Low Temperature	-15°C to -5°C (5ºF to 23ºF)
High Temperature	45°C to 55°C (113ºF to 131ºF)
Water Immersion	16°C to 26°C (61ºF to 79ºF)

The maximum time during which the protective headgear may be out of the conditioning environment shall not exceed 4 minutes. It must then be returned to the conditioned environment for a minimum of 3 minutes for each minute or portion of a minute in excess of 4 minutes out of the conditioning environment or 12 hours, whichever is less, prior to resumption of testing.

AVERAGE LAB TEMPERATURE : 22.5 ºC ; AVERAGE LAB HUMIDITY : 50.3 %

IMPACT ATTENUATION

SYSTEMS CHECK	TRIAL DROP	DROP (meters)	VEL. (m/s)	PEAK (g)	DWELL TIME (ms)		TEST RECORD	HEADFORM POSITION
					150 g	200 g		
PRETEST	1	1.30	4.89	403.3	2.42	2.06	Pre 1	Crown
	2	1.30	4.85	408.9	2.42	2.06	Pre 2	Crown
	3	1.30	4.88	407.5	2.39	2.06	Pre 3	Crown
PRETEST AVERAGE		XXXX	XXXX	408.6	XXX	XXX	XXXX	XXXX
POSTTEST	1	1.30	4.83	404.0	2.39	2.00	Post 1	Crown
	2	1.30	4.87	401.0	2.47	2.03	Post 2	Crown
	3	1.30	4.91	413.1	2.42	2.00	Post 3	Crown
POSTTEST AVERAGE		XXXX	XXXX	406.0	XXX	XXX	XXXX	XXXX
DIFFERENCE BETWEEN PRE-TEST AND POST-TEST AVERAGES				2.6	DIFFERENCE NOT TO EXCEED 15 g			

Helmet Designation	Helmet Condition	Impact Location	Front		Left		Right		Rear	
		Impact Number	1	2	1	2	1	2	1	2
A	Ambient	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	1	2	3	4	5	6	7	8
		Peak g	104	124	102	136	225	252	198	213
		ms @ 150	0.0	0.0	0.0	0.0	3.3	3.0	3.0	2.8
		ms @ 200	0.0	0.0	0.0	0.0	1.7	2.1	0.0	1.5
		Velocity m/s	5.16	5.19	5.18	5.18	6.05	6.05	6.00	6.00
B	Low Temperature	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	9	10	11	12	13	14	15	16
		Peak g	109	124	96	190	199	250	204	227
		ms @ 150	0.0	0.0	0.0	2.1	3.0	3.0	3.0	2.9
		ms @ 200	0.0	0.0	0.0	0.0	0.0	2.2	0.6	1.8
		Velocity m/s	5.16	5.21	5.19	5.17	6.04	6.06	6.00	5.99
C	High Temperature	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	17	18	19	20	21	22	23	24
		Peak g	101	119	106	140	219	253	196	206
		ms @ 150	0.0	0.0	0.0	0.0	3.2	2.7	6.7	2.8
		ms @ 200	0.0	0.0	0.0	0.0	1.1	1.9	0.0	0.8
		Velocity m/s	5.20	5.19	5.19	5.18	6.07	6.04	5.98	6.03
D	Water Immersed	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	25	26	27	28	29	30	31	32
		Peak g	98	108	109	123	233	269	191	212
		ms @ 150	0.0	0.0	0.0	0.0	3.0	2.9	2.9	2.9
		ms @ 200	0.0	0.0	0.0	0.0	2.0	2.1	0.0	1.1
		Velocity m/s	5.21	5.20	5.17	5.22	6.05	6.05	6.04	6.01

COMMENTS: 1. The actual drop heights were: flat anvil 201 cm, hemi anvil 148 cm.
2. Values reported in the above tables are rounded.

Contract File No.: 52.1102 Technician: Devon Dahm
Test File: 001 Test Date: 12 May 2020

PENETRATION

Paragraph S5.2 and S7.2

WEIGHT OF STRIKER: 2.95 to 3.06 kg (6 pounds, 8 ounces to 6 pounds, 12 ounces)

POINT OF STRIKER: Radius = 0.5 ± 0.1 mm (0.02 ± 0.004 in.), included angle of 60º ± 0.5°, hardness minimum of 60 Rockwell "C" Scale and a cone height of not less than 3.8 ± 0.038 cm (1.5 ± 0.015 in.).

HEIGHT OF FALL: 300 cm ± 1.5 cm, measured from the tip of the striker point to the outer surface of the mounted protective headgear.

FAILURE CRITERION: When tested, the protective headgear shall be failed if the penetrator has made an indentation in the headform.

TEST	HELMET	TEST LOCATION	PASS	FAIL	CONDITIONS
1	A	Crown	X		AMBIENT
2	A	Rear Right	X		AMBIENT
3	B	Crown	X		LOW TEMPERATURE
4	B	Rear Right	X		LOW TEMPERATURE
5	C	Crown	X		HIGH TEMPERATURE
6	C	Rear Right	X		HIGH TEMPERATURE
7	D	Crown	X		WATER IMMERSED
8	D	Rear Right	X		WATER IMMERSED

COMMENT: Photographs of penetration test locations are found in Appendix C.

RETENTION SYSTEM

Paragraph S5.3 and S7.3

REQUIREMENTS:

READING	APPLIED LOAD
INITIAL	22.68 kg, + 4.54 kg, - 0 kg (50.0 Lbs, + 10 Lbs, - 0 Lbs)
FINAL	136 kg, + 0 kg, - 2.3 kg (300.0 Lbs, + 0 Lbs, - 5 Lbs)

ELONGATION NOT TO EXCEED 2.5 cm (1.0 INCH) AFTER LOAD INCREASE

HELMET	CONDITIONS	INITIAL READING (cm)	FINAL READING (cm)	ELONGATION (cm)
A	AMBIENT	0.37	1.24	0.87
B	LOW TEMPERATURE	0.56	1.56	1.00
C	HIGH TEMPERATURE	0.35	1.25	0.90
D	WATER IMMERSED	0.66	1.59	0.93

CONFIGURATION - Paragraph S5.4 - Helmet shall provide a minimum peripheral vision of 105º to each side of the midsagittal plane. The brow opening shall be at least 2.54 cm (1 inch) above all points in the basic plane that are within the angles of peripheral vision.

	REQUIREMENTS	TEST RESULTS
PERIPHERAL VISION	> 105º	Pass
BROW OPENING	> 2.5 cm (1 inch)	Pass

COMMENT: Values in the above tables are rounded.

LABELING

S5.6.1 *Labeling* - Each helmet shall be permanently and legibly labeled, in a manner such that the label(s) can be easily read without removing padding or any other permanent part, with the following:

Required Information	Content/Format	Permanent
Manufacturer's name	Fail	Pass
Discrete size	Pass	Pass
Month and year of manufacture	Pass	Pass
Instructions to the purchaser as follows:	--------	--------
"Shell and liner constructed of (identify type(s) of materials)."	Pass	Pass
"Helmet can be seriously damaged by some common substances without damage being visible to the user."	Pass	Pass
"Apply only the following: (Recommended cleaning agents, paints, adhesives, etc., as appropriate."	Pass	Pass
"Make no modifications."	Pass	Pass
"Fasten helmet securely."	Pass	Pass
"If helmet experiences a severe blow, return it to the manufacturer for inspection, or destroy it and replace it."	Pass	Pass

COMMENT:

1. S5.6.1 Labeling: As of the date of this report, the entity listed on the interior label, "Dainese S.P.A.", has not filed in accordance with Part 566, Manufacturer Identification, and therefore cannot be verified as a recognized manufacturer.

LABELING

S5.6.2 Certification. Each helmet shall be labeled permanently and legibly with a label, constituting the manufacturer's certification that the helmet conforms to the applicable Federal motor vehicle safety standards, that is separate from the label(s) used to comply with S5.6.1, and complies with paragraphs (a) through (c) of this section.(a) Content, format, and appearance. The label required by paragraph S5.6.2 shall have the following content, format, and appearance:

Required Certification Information	Content/ Format	Permanent
The symbol ‘‘DOT,’’ horizontally centered on the label, in letters not less than 0.38 inch (1.0 cm) high.	Pass	Pass
The term ‘‘FMVSS No. 218,’’ horizontally centered beneath the symbol DOT, in letters not less than 0.09 inches (0.23 cm) high.	Pass	
The word “‘CERTIFIED,’’ horizontally centered beneath the term ‘‘FMVSS No. 218,’’ in letters not less than 0.09 inches (0.23 cm) high.	Pass	
The precise model designation horizontally centered above the symbol DOT, in letters and/or numerals not less than 0.09 inch (0.23 cm) high.	Pass	
The manufacturer's name and/or brand, horizontally centered above the model designation, in letters and/or numerals not less than 0.09 inch (0.23 cm) high.	Pass	
All symbols, letters and numerals shall be in a color that contrasts with the background of the label.	Pass	
No information, other than the information specified in subparagraph (a), shall appear on the label.	Pass	
The label shall appear on the outer surface of the helmet and be placed so that it is centered laterally with the horizontal centerline of the DOT symbol located a minimum of 1 inch (2.5 cm) and a maximum of 3 inches (7.6 cm) from the bottom edge of the posterior portion of the helmet.	Pass	

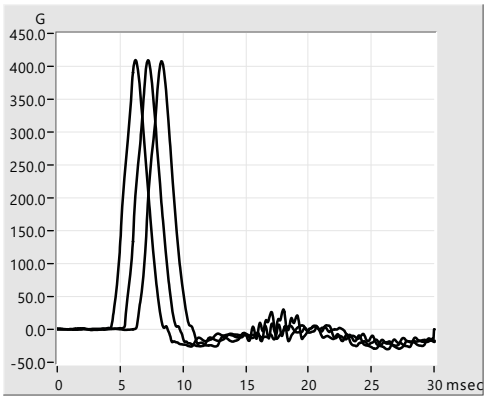
COMMENT:

1. Labels were determined to be both easily read and permanent based on the TP-218-07, Section 12.5.4.

TEST DATA

Uni-Axial System-Check

Helmet Manufacturer : NHTSA
Address : 1200 New Jersey Ave, S.E. Washington, DC 20590



Testing Laboratory : ACT LAB LLC
Address : 3280 East 59th Street
Long Beach, CA
90805

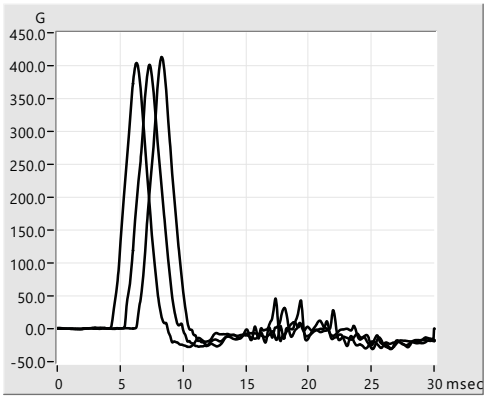
Laboratory Technician name : Devon Dahm
M.E.P. Pad Model : H0171
Laboratory Temperature : 22 deg C
Laboratory Humidity : 50 %
Selected Filter Frequency : CFC1000 # 1650 Hz
Acc. sensitivity (axis Z) : 10.47 mV/G
Acc. sensitivity (axis X) : 10.00 mV/G
Acc. sensitivity (axis Y) : 10.00 mV/G
Drop Device : D.O.T Size C (Uni-Axial) 23
Drop mass assembly : 5.036 kg Time gate flag height : 25.40 mm
Calibration peak : 400.0 G +/- 20.00 G

Impact #	Drop Height (cm)	Energy (Joules)	Friction (%)	Time Gate (msec)	Velocity IN (m/sec)	Peak Acc.(G)	Delta T 150G (msec)	Delta T 200G (msec)	HIC	SI	Test Time	Test Date	PASS or FAIL
1	130.5	59.2	4.2	5.24	4.8488	401.5	2.39	2.07	3050	4201	10:47:52	2020-05-12	Pass
2	130.5	59.7	3.8	5.22	4.8675	407.7	2.43	2.06	3092	4258	10:49:09	2020-05-12	Pass
3	130.5	60.5	3.1	5.18	4.9033	406.1	2.42	2.07	3019	4217	10:50:13	2020-05-12	Pass
4	130.5	60.1	3.4	5.20	4.8864	409.3	2.42	2.06	3036	4256	10:51:17	2020-05-12	Pass
5	130.5	59.2	4.1	5.24	4.8500	408.9	2.42	2.06	3040	4234	10:52:21	2020-05-12	Pass
6	130.5	59.9	3.6	5.21	4.8792	407.5	2.39	2.05	2987	4237	10:53:25	2020-05-12	Pass
Last 3#	130.50	59.73	3.70	5.22	4.87	408.57	2.41	2.06	3021.00	4242.33	10.00	2020.00	0.00

Curve impact #2 : shift of 1msec ; Curve impact #3 : shift of 2msec

Uni-Axial System-Check

Helmet Manufacturer : NHTSA
Address : 1200 New Jersey Ave, S.E. Washington, DC 20590



Testing Laboratory : ACT LAB LLC
Address : 3280 East 59th Street
Long Beach, CA
90805

Laboratory Technician name : Devon Dahm
M.E.P. Pad Model : H0171
Laboratory Temperature : 22 deg C
Laboratory Humidity : 50 %
Selected Filter Frequency : CFC1000 # 1650 Hz
Acc. sensitivity (axis Z) : 10.47 mV/G
Acc. sensitivity (axis X) : 10.00 mV/G
Acc. sensitivity (axis Y) : 10.00 mV/G
Drop Device : D.O.T Size C (Uni-Axial) 23
Drop mass assembly : 5.036 kg Time gate flag height : 25.40 mm
Calibration peak : 400.0 G +/- 20.00 G

Impact #	Drop Height (cm)	Energy (Joules)	Friction (%)	Time Gate (msec)	Velocity IN (m/sec)	Peak Acc.(G)	Delta T 150G (msec)	Delta T 200G (msec)	HIC	SI	Test Time	Test Date	PASS or FAIL
1	130.0	60.1	3.2	5.20	4.8874	408.0	2.39	2.03	3018	4265	14:46:50	2020-05-12	Pass
2	130.0	60.2	3.1	5.19	4.8914	411.3	2.39	2.01	3063	4295	14:47:55	2020-05-12	Pass
3	130.0	60.1	3.3	5.20	4.8849	405.1	2.37	2.02	2906	4146	14:50:03	2020-05-12	Pass
4	130.0	58.6	4.4	5.26	4.8259	404.0	2.39	2.00	2909	4132	14:51:18	2020-05-12	Pass
5	130.0	59.8	3.5	5.21	4.8729	401.0	2.47	2.03	2871	4028	14:53:05	2020-05-12	Pass
6	130.0	60.8	2.7	5.17	4.9125	413.1	2.42	2.00	2925	4215	14:54:15	2020-05-12	Pass
Last 3#	130.00	59.73	3.53	5.21	4.87	406.03	2.43	2.01	2901.67	4125.00	14.00	2020.00	0.00

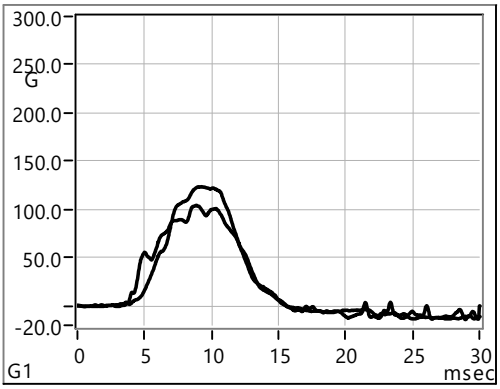
Curve impact #2 : shift of 1msec ; Curve impact #3 : shift of 2msec

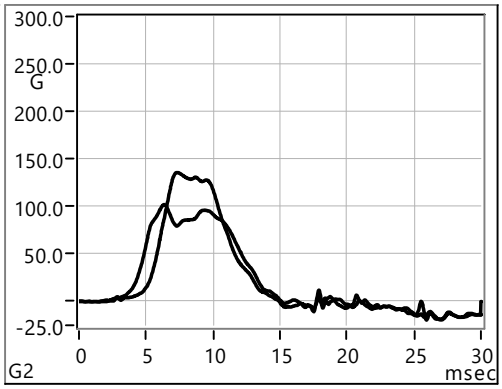
Impact Uni-Axial

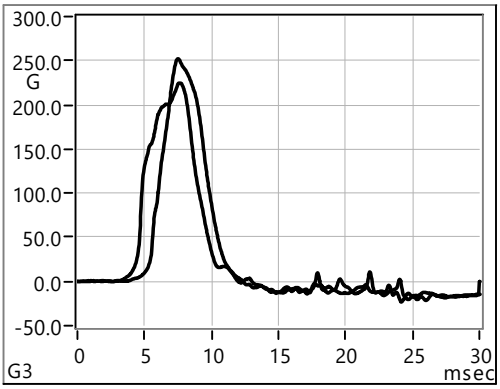
Testing Laboratory : ACT LAB LLC
Address : 3280 East 59th Street
Long Beach, CA
90805

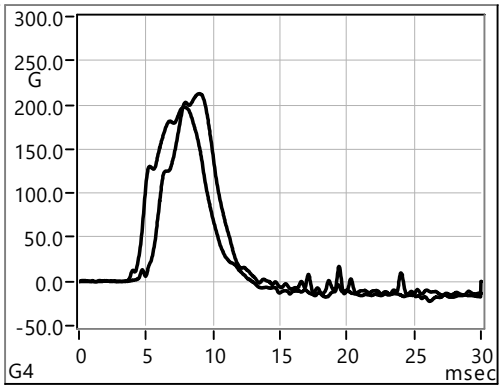
Helmet Manufacturer : NHTSA
Address : 1200 New Jersey Ave, S.E.
Washington, DC 20590

SystemCheckFile#: N/A
Laboratory Technician name : Devon Dahm
Batch Number :
Ref. P.O. Number : 2020
Model : 0F45H
Color : Black
Size : ML 57-58 cm
Weight : 1023.00 g
Manufacturing Date : 07/2017
Standard Request : FMVSS No.218
Identification Code : 521102001-A
Headform Model : D.O.T.
Headform Size : C D.O.T
Conditioning : Ambient
Laboratory Temperature : 22 deg C
Laboratory Humidity : 50 %
Selected Filter Frequency : CFC1000 # 1650 Hz (moto) 400
Maximum Peak G's authorized : 400 G
Maximum Peak m/s2 authorized : 3923 m/s2
Drop mass assembly : 5.036 kg
Time gate flag height : 25.40 mm
Acc. sensibility (axis Z) : 10.47









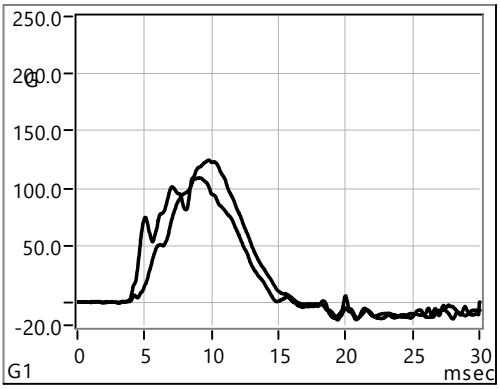
Impact #	Position	Anvil type	Drop Height (cm)	Energy (Joules)	Friction (%)	Time Gate (msec)	Velocity IN (m/sec)	Peak Acc.(G)	Delta T 150G (msec)	Delta T 200G (msec)	HIC	SI	Test Time	Test Date	PASS or FAIL	
1	Front	Hemi	147.5	67.1	4.0	4.92	5.1614	104.3	0.00	0.00	445	510	12:26:28	2020-05-12	Pass	
2	Front	Hemi	147.5	67.8	3.5	4.90	5.1877	123.6	0.00	0.00	609	710	12:27:40	2020-05-12	Pass	
3	Left	Hemi	147.5	67.5	3.8	4.91	5.1766	101.9	0.00	0.00	462	506	13:16:48	2020-05-12	Pass	
4	Left	Hemi	147.5	67.6	3.7	4.90	5.1822	135.9	0.00	0.00	692	0	13:17:55	2020-05-12	Pass	
5	Right	Flat	200.5	92.1	3.6	4.20	6.0482	224.8	3.27	1.66	1731	2022	13:34:35	2020-05-12	Pass	
6	Right	Flat	200.5	92.0	3.6	4.20	6.0452	252.4	3.00	2.10	1883	2324	13:35:45	2020-05-12	Fail	
7	Rear	Flat	200.5	90.6	4.3	4.23	5.9983	197.5	3.01	0.00	1401	1689	14:18:04	2020-05-12	Pass	
8	Rear	Flat	200.5	90.6	4.4	4.24	5.9971	212.6	2.76	1.46	1474	1813	14:19:08	2020-05-12	Pass	

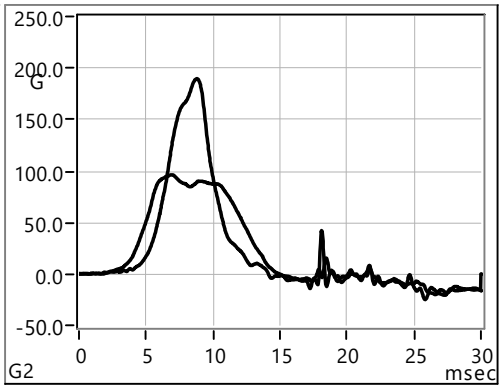
Impact Uni-Axial

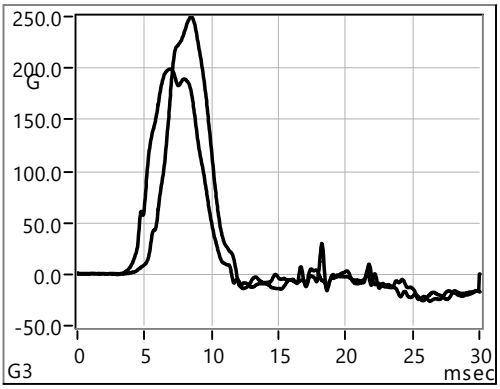
Testing Laboratory : ACT LAB LLC
Address : 3280 East 59th Street
Long Beach, CA
90805

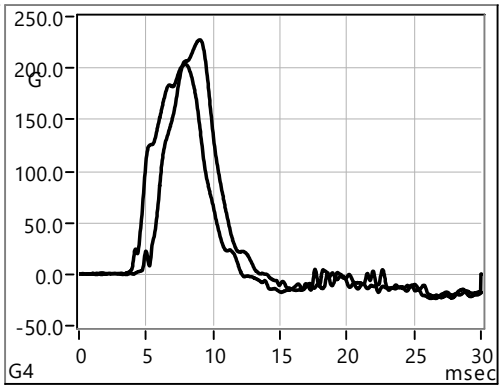
Helmet Manufacturer : NHTSA
Address : 1200 New Jersey Ave, S.E.
Washington, DC 20590

SystemCheckFile#: N/A
Laboratory Technician name : Devon Dahm
Batch Number :
Ref. P.O. Number : 2020
Model : 0F45H
Color : Black
Size : ML 57-58 cm
Weight : 1022.00 g
Manufacturing Date : 07/2017
Standard Request : FMVSS No.218
Identification Code : 521102001-B
Headform Model : D.O.T.
Headform Size : C D.O.T
Conditioning : Cold
Laboratory Temperature : 22 deg C
Laboratory Humidity : 50 %
Selected Filter Frequency : CFC1000 # 1650 Hz (moto) 400
Maximum Peak G's authorized : 400 G
Maximum Peak m/s2 authorized : 3923 m/s2
Drop mass assembly : 5.036 kg
Time gate flag height : 25.40 mm
Acc. sensibility (axis Z) : 10.47









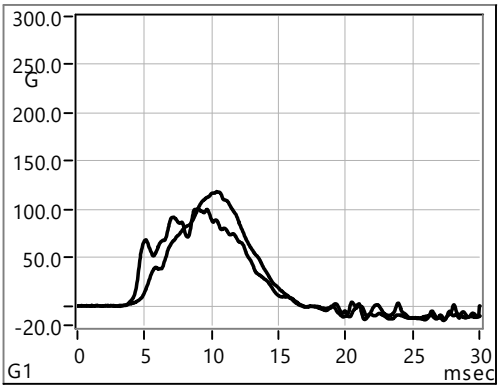
Impact #	Position	Anvil type	Drop Height (cm)	Energy (Joules)	Friction (%)	Time Gate (msec)	Velocity IN (m/sec)	Peak Acc.(G)	Delta T 150G (msec)	Delta T 200G (msec)	HIC	SI	Test Time	Test Date	PASS or FAIL	
1	Front	Hemi	147.5	66.9	4.1	4.93	5.1559	109.2	0.00	0.00	484	546	12:28:57	2020-05-12	Pass	
2	Front	Hemi	147.5	68.2	3.2	4.88	5.2051	124.3	0.00	0.00	575	0	12:30:05	2020-05-12	Pass	
3	Left	Hemi	147.5	67.9	3.5	4.89	5.1917	96.0	0.00	0.00	437	484	13:19:02	2020-05-12	Pass	
4	Left	Hemi	147.5	67.2	3.9	4.92	5.1674	189.7	2.09	0.00	965	0	13:20:12	2020-05-12	Pass	
5	Right	Flat	200.5	91.9	3.6	4.20	6.0421	199.2	2.95	0.00	1357	1658	13:36:53	2020-05-12	Pass	
6	Right	Flat	200.5	92.4	3.4	4.19	6.0569	250.0	2.97	2.21	2025	2301	13:37:58	2020-05-12	Fail	
7	Rear	Flat	200.5	90.7	4.3	4.23	6.0002	203.7	2.96	0.59	1399	1728	14:20:13	2020-05-12	Pass	
8	Rear	Flat	200.5	90.4	4.4	4.24	5.9933	227.4	2.94	1.84	1671	2019	14:21:20	2020-05-12	Pass	

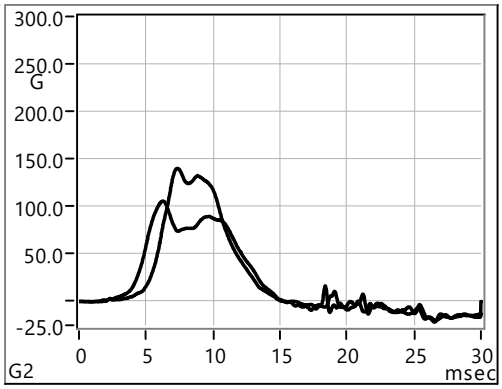
Impact Uni-Axial

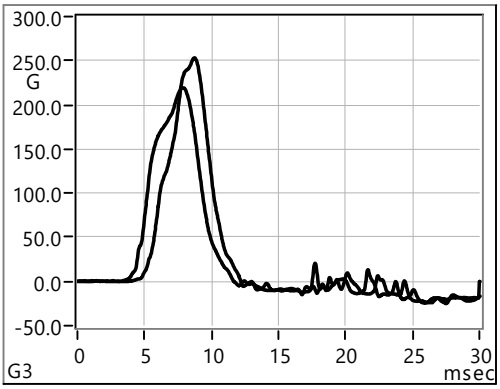
Testing Laboratory : ACT LAB LLC
Address : 3280 East 59th Street
Long Beach, CA
90805

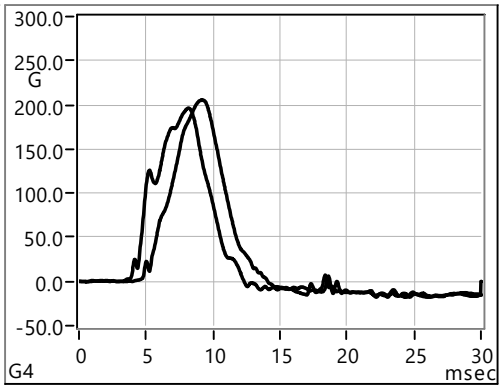
Helmet Manufacturer : NHTSA
Address : 1200 New Jersey Ave, S.E.
Washington, DC 20590

SystemCheckFile#: N/A
Laboratory Technician name : Devon Dahm
Batch Number :
Ref. P.O. Number : 2020
Model : 0F45H
Color : Black
Size : ML 57-58 cm
Weight : 1049.00 g
Manufacturing Date : 07/2017
Standard Request : FMVSS No.218
Identification Code : 521102001-C
Headform Model : D.O.T.
Headform Size : C D.O.T
Conditioning : Hot
Laboratory Temperature : 22 deg C
Laboratory Humidity : 50 %
Selected Filter Frequency : CFC1000 # 1650 Hz (moto) 400
Maximum Peak G's authorized : 400 G
Maximum Peak m/s2 authorized : 3923 m/s2
Drop mass assembly : 5.036 kg
Time gate flag height : 25.40 mm
Acc. sensibility (axis Z) : 10.47









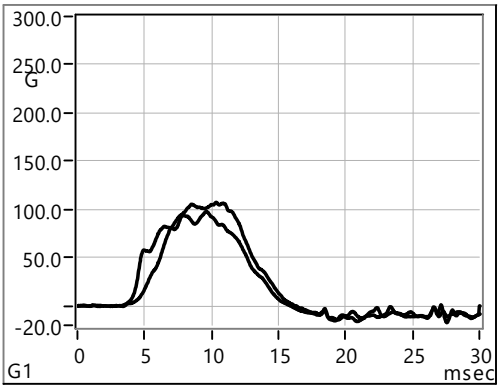
Impact #	Position	Anvil type	Drop Height (cm)	Energy (Joules)	Friction (%)	Time Gate (msec)	Velocity IN (m/sec)	Peak Acc.(G)	Delta T 150G (msec)	Delta T 200G (msec)	HIC	SI	Test Time	Test Date	PASS or FAIL	
1	Front	Hemi	147.5	68.2	3.2	4.88	5.2039	101.1	0.00	0.00	424	472	12:31:13	2020-05-12	Pass	
2	Front	Hemi	147.5	67.7	3.6	4.90	5.1850	118.5	0.00	0.00	508	588	12:32:26	2020-05-12	Pass	
3	Left	Hemi	147.5	68.0	3.4	4.89	5.1948	105.7	0.00	0.00	425	471	13:21:19	2020-05-12	Pass	
4	Left	Hemi	147.5	67.6	3.7	4.90	5.1815	139.9	0.00	0.00	685	805	13:22:28	2020-05-12	Pass	
5	Right	Flat	200.5	92.8	3.2	4.18	6.0694	219.2	3.18	1.14	1508	1832	13:39:22	2020-05-12	Pass	
6	Right	Flat	200.5	91.9	3.7	4.20	6.0418	253.3	2.72	1.85	1884	2219	13:40:28	2020-05-12	Pass	
7	Rear	Flat	200.5	90.0	4.7	4.25	5.9770	196.3	2.68	0.00	1326	1574	14:22:30	2020-05-12	Pass	
8	Rear	Flat	200.5	91.5	3.9	4.21	6.0290	205.6	2.78	0.81	1433	1679	14:23:36	2020-05-12	Pass	

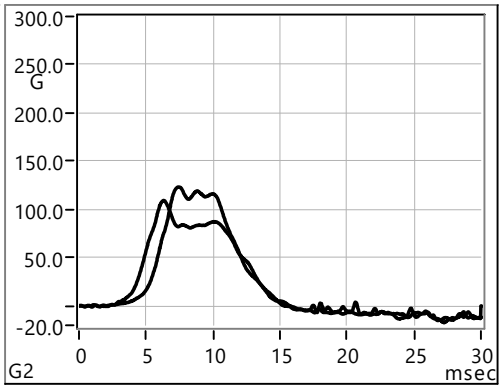
Impact Uni-Axial

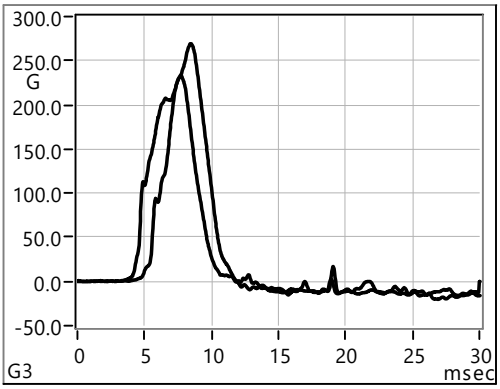
Testing Laboratory : ACT LAB LLC
Address : 3280 East 59th Street
Long Beach, CA
90805

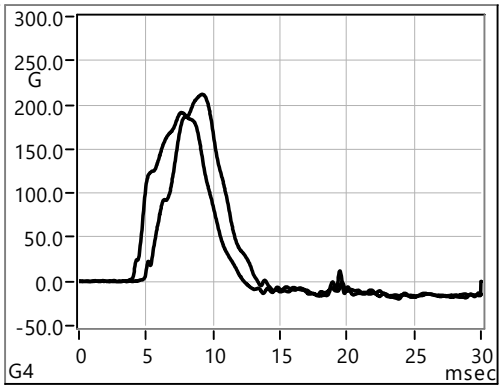
Helmet Manufacturer : NHTSA
Address : 1200 New Jersey Ave, S.E.
Washington, DC 20590

SystemCheckFile#: N/A
Laboratory Technician name : Devon Dahm
Batch Number :
Ref. P.O. Number : 2020
Model : 0F45H
Color : Black
Size : ML 57-58 cm
Weight : 1019.00 g
Manufacturing Date : 07/2017
Standard Request : FMVSS No.218
Identification Code : 521102001-D
Headform Model : D.O.T.
Headform Size : C D.O.T
Conditioning : Wet
Laboratory Temperature : 22 deg C
Laboratory Humidity : 50 %
Selected Filter Frequency : CFC1000 # 1650 Hz (moto) 400
Maximum Peak G's authorized : 400 G
Maximum Peak m/s2 authorized : 3923 m/s2
Drop mass assembly : 5.036 kg
Time gate flag height : 25.40 mm
Acc. sensibility (axis Z) : 10.47









Impact #	Position	Anvil type	Drop Height (cm)	Energy (Joules)	Friction (%)	Time Gate (msec)	Velocity IN (m/sec)	Peak Acc.(G)	Delta T 150G (msec)	Delta T 200G (msec)	HIC	SI	Test Time	Test Date	PASS or FAIL	
1	Front	Hemi	147.5	68.3	3.2	4.88	5.2073	97.9	0.00	0.00	429	475	12:34:12	2020-05-12	Pass	
2	Front	Hemi	147.5	68.1	3.3	4.88	5.2021	107.5	0.00	0.00	525	595	12:35:17	2020-05-12	Pass	
3	Left	Hemi	147.5	67.3	3.8	4.91	5.1717	109.3	0.00	0.00	436	487	13:23:33	2020-05-12	Pass	
4	Left	Hemi	147.5	68.6	2.9	4.86	5.2210	123.4	0.00	0.00	591	687	13:24:46	2020-05-12	Pass	
5	Right	Flat	200.5	92.2	3.5	4.20	6.0507	233.4	3.02	1.96	1723	2047	13:41:44	2020-05-12	Pass	
6	Right	Flat	200.5	92.1	3.5	4.20	6.0491	269.4	2.87	2.11	2111	2482	13:42:50	2020-05-12	Fail	
7	Rear	Flat	200.5	91.8	3.7	4.21	6.0366	191.2	2.92	0.00	1383	1618	14:24:44	2020-05-12	Pass	
8	Rear	Flat	200.5	90.9	4.2	4.23	6.0095	211.9	2.88	1.14	1535	1820	14:26:21	2020-05-12	Pass	

ACT DOT Strap Retention Acquistion
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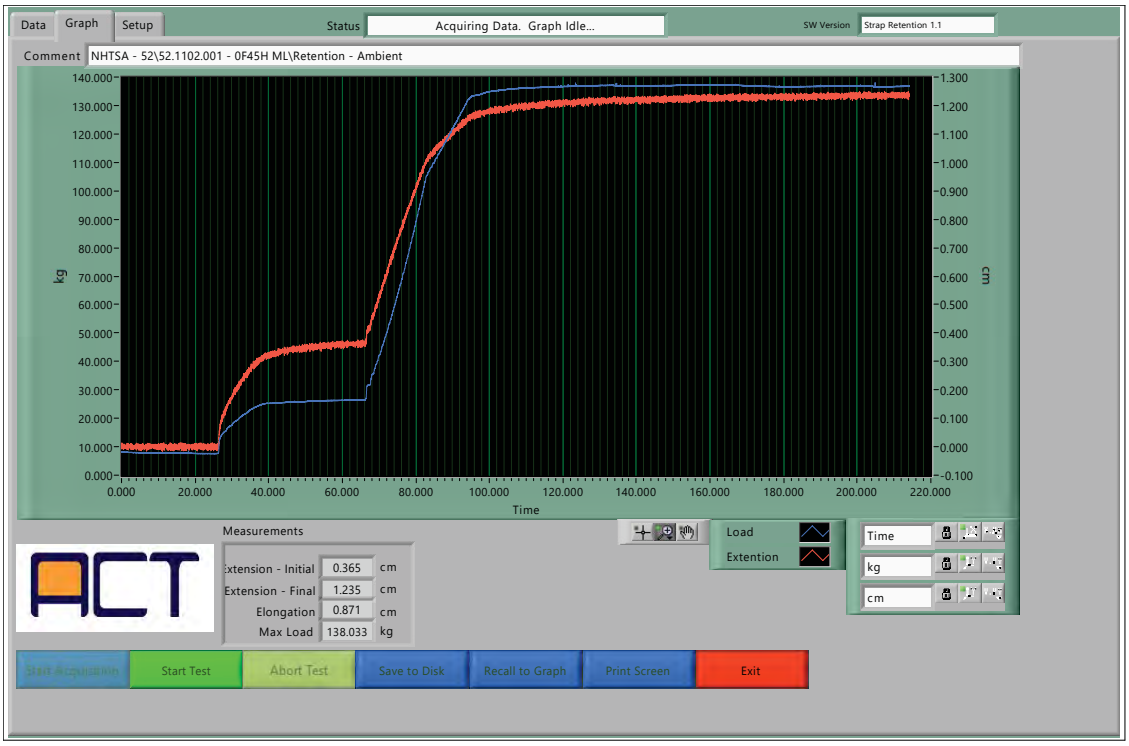
Printed on 2020-05-12 at 3:40 PM



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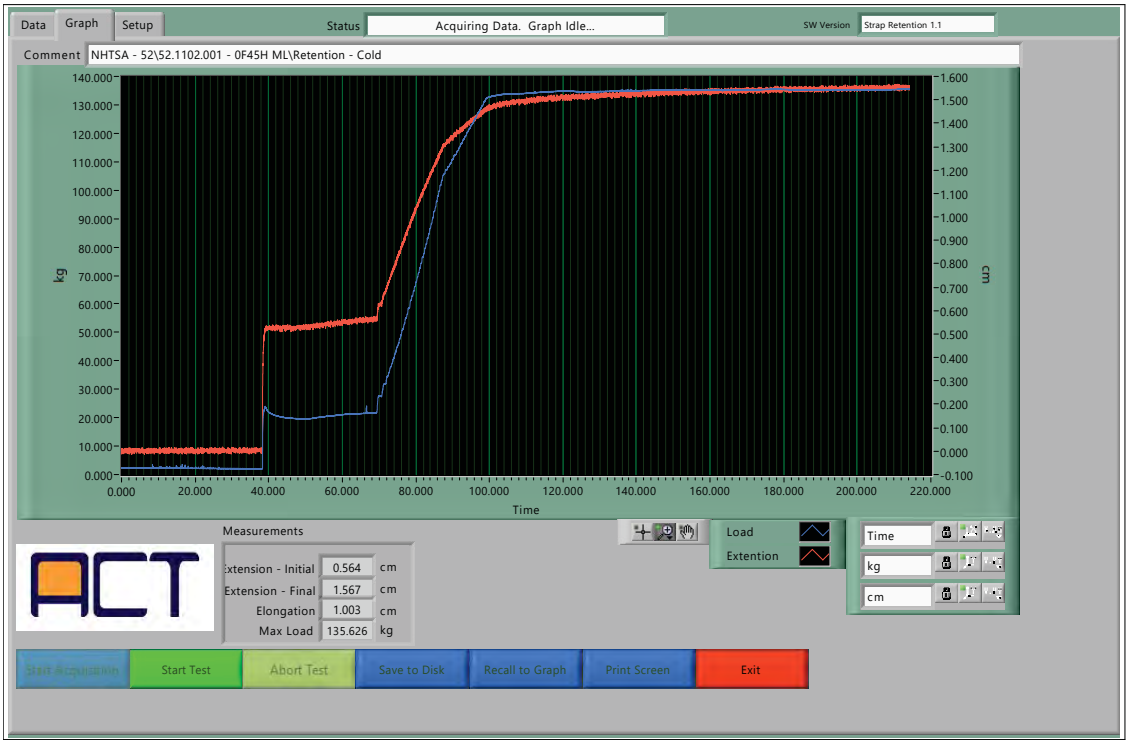

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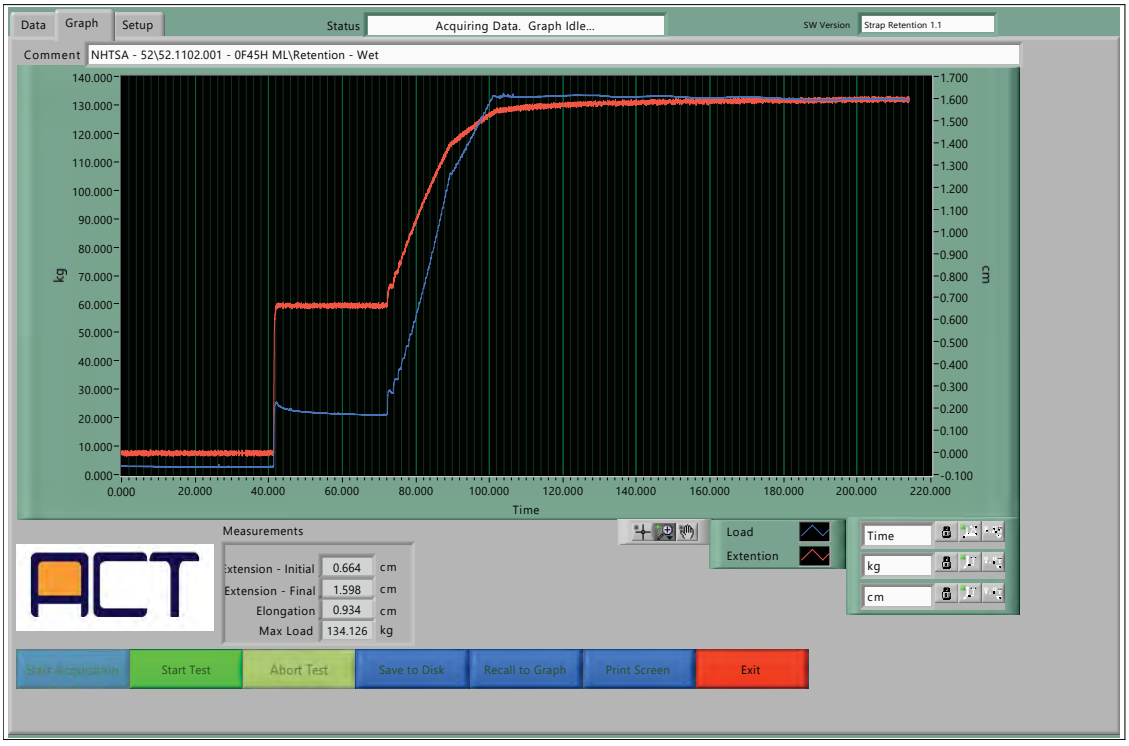
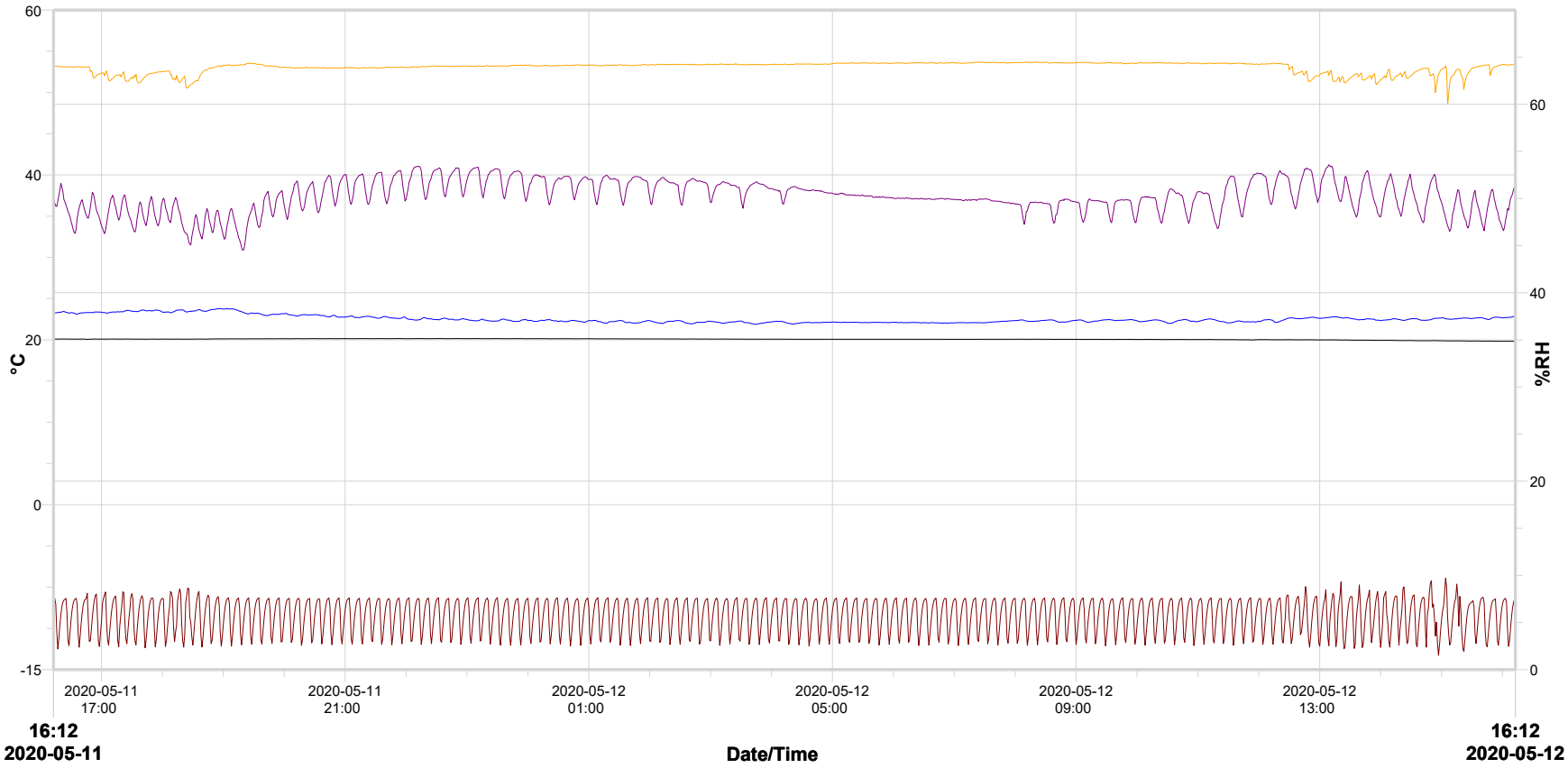




Report Summary Statistics

#	Location	Zone	Color	Units	Avg	Min	Max	STD	MKT	Samples
1	H0177 - Humidity (1044)	viewLinc/ACT-Helmet Lab (1041)		%RH	50.25	44.51	53.58	1.69	0.00	1440
2	H0177 - Lab Temp. (1042)	viewLinc/ACT-Helmet Lab (1041)		°C	22.52	21.88	23.78	0.45	22.53	1440
3	H0178 - Oven (1046)	viewLinc/ACT-Helmet Lab (1041)		°C	53.09	48.53	53.70	0.64	53.10	1440
4	H0178 - Water (1048)	viewLinc/ACT-Helmet Lab (1041)		°C	20.07	19.82	20.16	0.08	20.07	1440
5	H0179 - Freezer (1050)	viewLinc/ACT-Helmet Lab (1041)		°C	-11.45	-14.27	-8.91	2.04	-11.45	1440

Time zone: (UTC-08:00) Pacific Time (US & Canada)

APPENDIX A

INTERPRETATIONS OR DEVIATIONS FROM FMVSS No. 218

Excess water on the water immersed sample was allowed to drip off before testing to prevent water damage to test equipment.

APPENDIX B
EQUIPMENT LIST AND CALIBRATION SCHEDULES

ACT ID	Description	Make/Model	S/N	Last Check	Next Check
H0028	Anvil Hemispherical	Cadex	C070911-01	12/5/2019	12/5/2020
H0029	Anvil Flat	Cadex	C310811-02	12/5/2019	12/5/2020
H0171	Anvil MEP	Cadex	2141901	4/18/2019	4/18/2020
H0040	Clamp	Cadex	NA	12/3/2019	12/3/2020
H0146	Clamp	Cadex	NA	12/3/2019	12/3/2020
H0055	Clamp	Cadex	NA	12/3/2019	12/3/2020
H0144	Clamp	Cadex	NA	12/3/2019	12/3/2020
H0047	Clamp	Cadex	NA	12/3/2019	12/3/2020
H0145	Clamp	Cadex	NA	12/3/2019	12/3/2020
H0194	Drop Carriage	Cadex	NA	5/11/2020	12/3/2020
H0064	Penetration Striker #1	Cadex	NA	12/5/2019	12/5/2020
H0065	Penetration Striker #2	Cadex	NA	12/5/2019	12/5/2020
H0173	Drop Carriage	Cadex	NA	12/3/2019	12/3/2020
H0195	Magnesium Ball Arm	Cadex	NA	5/11/2020	12/3/2020
H0115	Steel Ball Arm	Cadex	NA	12/3/2019	12/3/2020
H0172	Aluminum Ball Arm	Cadex	NA	12/3/2019	12/3/2020
H0092	Environmental Chamber	Immersion Bucket	NA	NA	NA
H0174	Environmental Chamber	Heratherm OSG 750		NA	NA
H0186	Environmental Chamber	69K-035	9123314	NA	NA
H0187	Environmental Chamber	69K-031HC	9129337	NA	NA
H0079	Fixture	Mono Rail Tower	NA	12/5/2019	12/5/2020
H0080	Fixture	Penetration Tube	NA	12/5/2019	12/5/2020
H0081	Fixture	Positional Stability Stand	NA	12/5/2019	12/5/2020
H0082	Fixture	Retention	NA	12/5/2019	12/5/2020
H0087	Fixture	Penetration Heaform Mount	NA	NA	NA
H0088	Fixture	Penetration Height Stick	NA	NA	NA
H0089	Fixture	Peripheral Vision Stand	NA	NA	NA
H0096	Fixture	Positional Stability Ap.	NA	12/5/2019	12/5/2020
H0111	Fixture	Precision Brow Block	NA	12/5/2019	12/5/2020
H0114	Fixture	Peripheral Vision Protractor	NA	NA	NA
H0120	Fixture	Penetration Base	NA	NA	NA
H0148	Fixture	Headform Stand	NA	NA	NA
H0166	Fixture	Peripheral Vision Go-No-Go	NA	12/5/2019	12/5/2020
H0117	Headform Penetration: S	Cadex	7293	12/5/2019	12/5/2020
H0118	Headform Penetration: M	Cadex	7294	12/5/2019	12/5/2020
H0119	Headform Penetration: L	Cadex	7296	12/5/2019	12/5/2020
H0138	Headform Impact: S	Cadex	C04574 - 7567	12/5/2019	12/5/2020
H0139	Headform Impact: M	Cadex	C04575 - 7571	12/5/2019	12/5/2020
H0140	Headform Impact: L	Cadex	C04576 - 7573	12/5/2019	12/5/2020
H0093	Ballast Weight	NA	NA	12/3/2019	12/5/2020
H0188	Lab Computer	ASUS		NA	NA

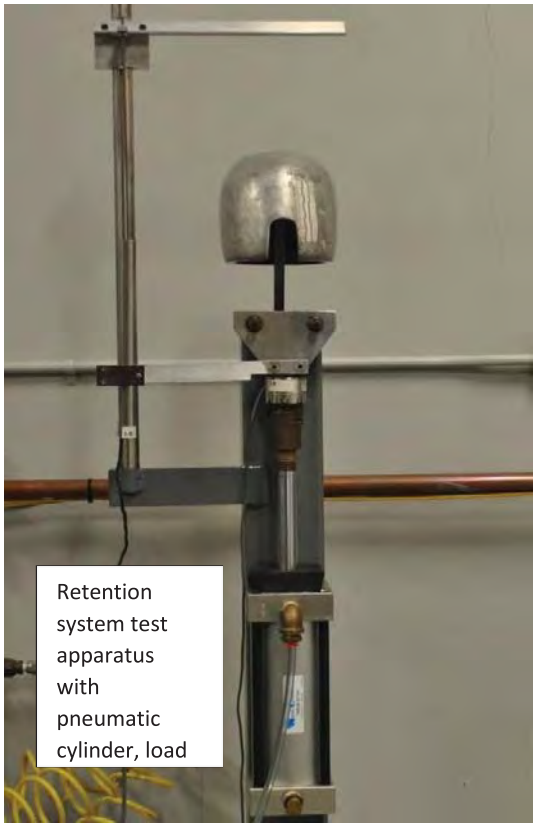
Calibrated Measurement Equipment								
ACT ID	**Description**	**Make/Model**	**S/N**	**Range**	**Accuracy from Cal. Certs**	**Last Calibration**	**Next Calibration**	**Calibration By:**
H0193	Velocity Gate	Velocimeter HVTG Short	HVTG120200 129-1	--	5.77E-02	1/29/2020	1/29/2021	CADEX
H0192	Accelerometer	PBC	LW226129	2000 g	±2.5%	8/23/2019	8/23/2020	PCB Piezotronics
H1089	Data Acquisition Box	353B18	CC120200129 -1		±2.84 mV	1/29/2020	1/29/2021	CADEX
H1089	Data Acquisition Box	PC--4400	CC120200129 -1		±2.84 mV	1/29/2020	1/29/2021	CADEX
H0098	LVDT - Retention	Schaevitz	16071	2 in	±0.5%	11/26/2019	11/26/2020	Micro Quality Calibration
H0180	Ohaus Scale	2000-HR	90921684	0-6000 gm	±1 g	10/28/2019	10/28/2020	Micro Quality Calibration
H0099	Load Cell - Retention	Futek	490706	0-500 lbs	±0.2%	11/25/2019	11/26/2020	Micro Quality Calibration
H0105	Height Gage	LSB350	3121016	0-12 in	±0.001 in	11/26/2019	11/26/2020	Micro Quality Calibration
H0180	Ohaus Scale	V11P6	90921684	0-6000 gm	±1 g	10/28/2019	10/28/2020	Micro Quality Calibration
H0124	Digital Measuring Tape	ADIR PRO	-	16.5 ft/192 in	±0.03125 in	11/26/2019	11/26/2020	Micro Quality Calibration
H0179	Environmental Data Logger	Etape	19381045	-90 To +95 ˚C	±0.05 ˚C	9/17/2019	9/17/2020	Vaisala
H0105	Height Gage	Mitutoyo	3121016	0-12 in	±0.001 in	11/26/2019	11/26/2020	Micro Quality Calibration
H0177	Environmental Data Logger	Veriteq	19382001	-25 To +70°C,	0.80%RH	9/16/2019	9/16/2020	Vaisala
H0181	Digital Caliper	SP-2000-20R	B19221219	0-100% RH	±0.06 ˚C	11/13/2019	11/13/2020	Micro Quality Calibration
H0178	Environmental Data Logger	Veriteq	19381048	-90 To +95 ˚C	±0.07 ˚C	9/17/2019	9/17/2020	Vaisala

APPENDIX C

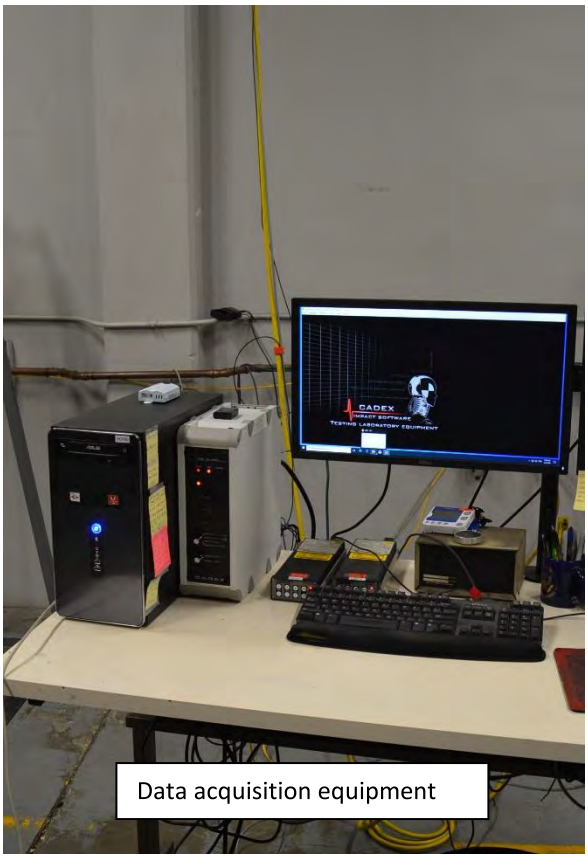
PHOTOGRAPHS

Impact attenuation test apparatus with three headforms (S, M, L), flat, hemi and MEP anvils

Penetration test apparatus with adjustable base



Retention system test apparatus with pneumatic cylinder, load



Data acquisition equipment

Low temperature conditioning cabinet

High temperature conditioning cabinet and water immersion equipment

AGV 0F45H helmet and box showing model designation

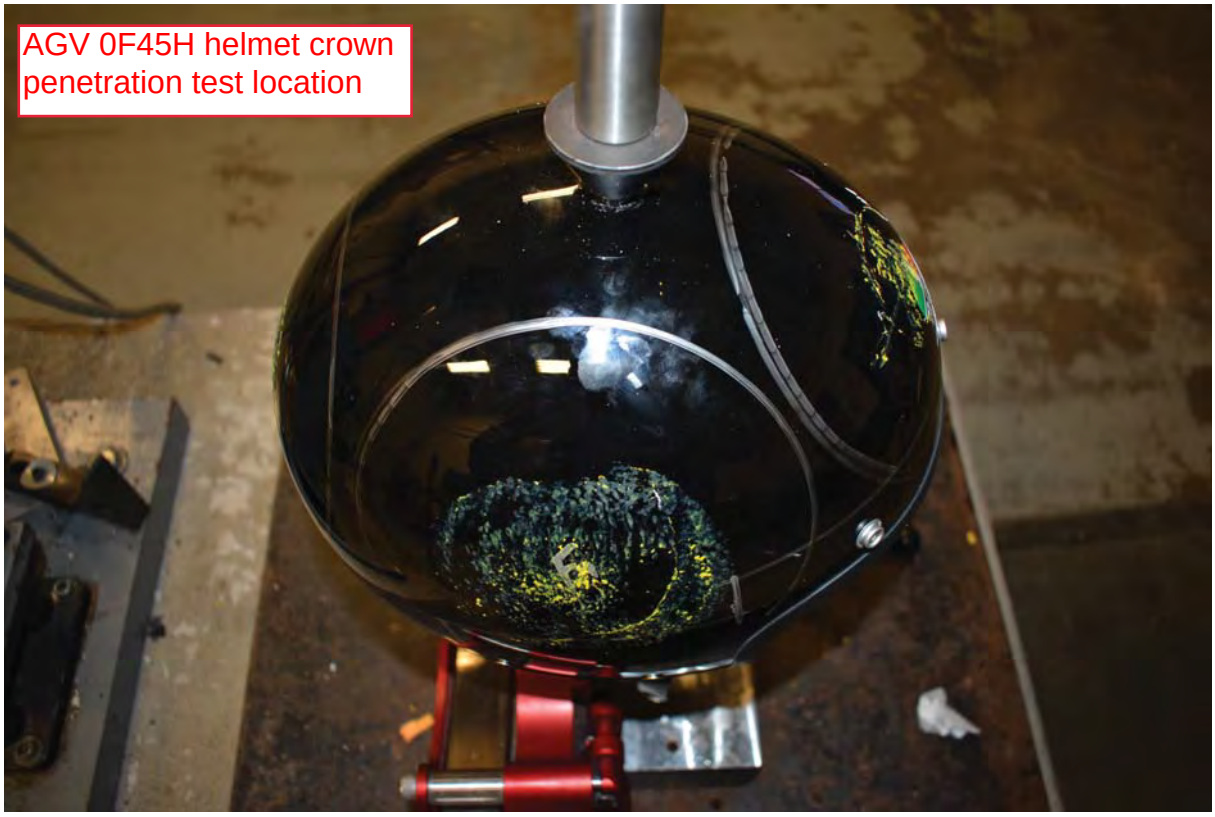
AGV 0F45H helmet with test line, front left view

AGV 0F45H helmet with test line, rear left view

AGV 0F45H helmet interior view

AGV 0F45H helmet front and left side hemispherical anvil impact locations

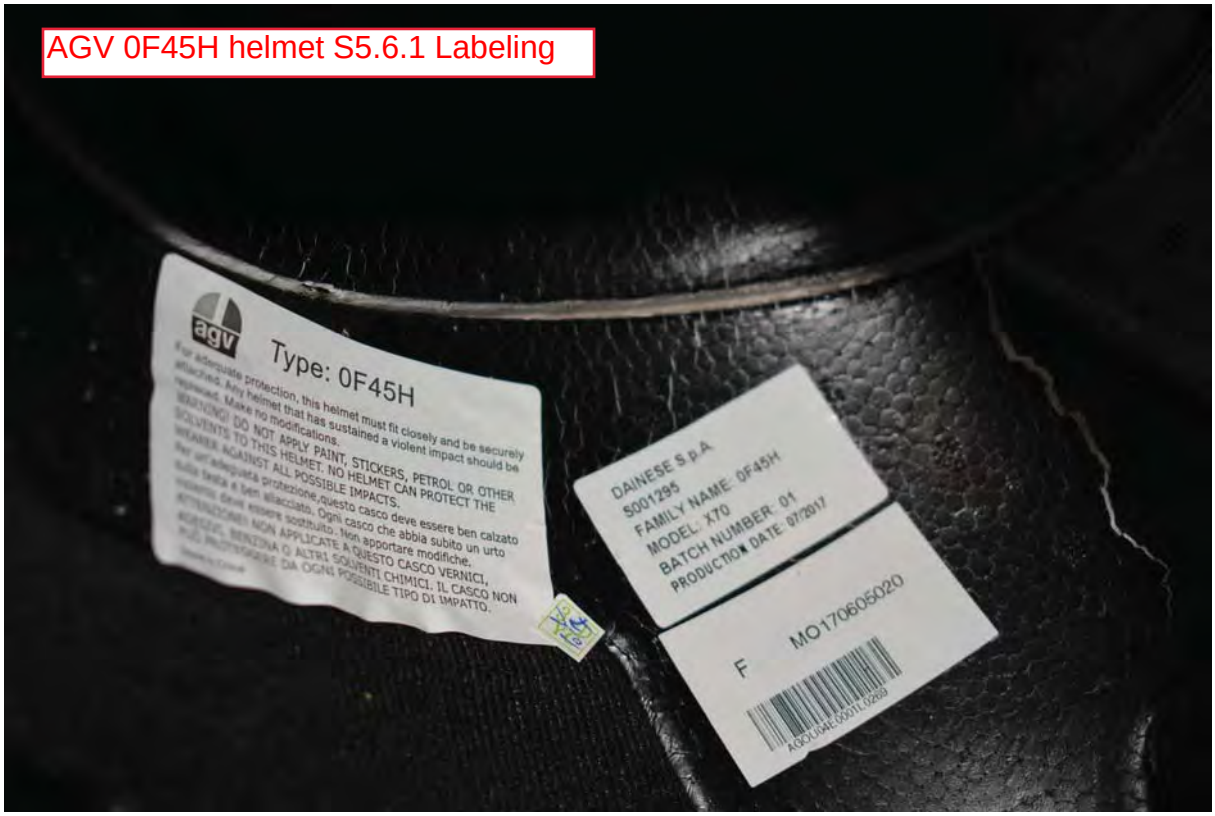
AGV 0F45H helmet right side and rear flat anvil impact locations

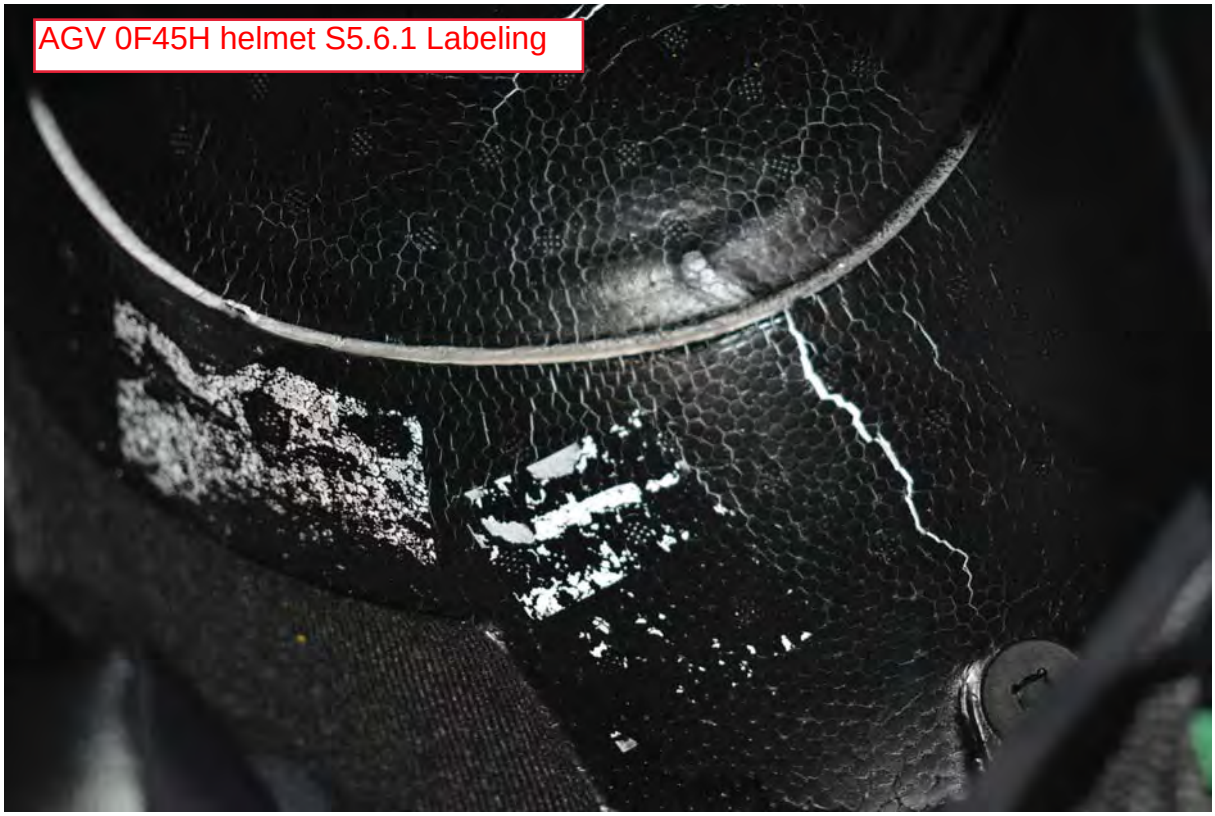

AGV 0F45H helmet crown
penetration test location

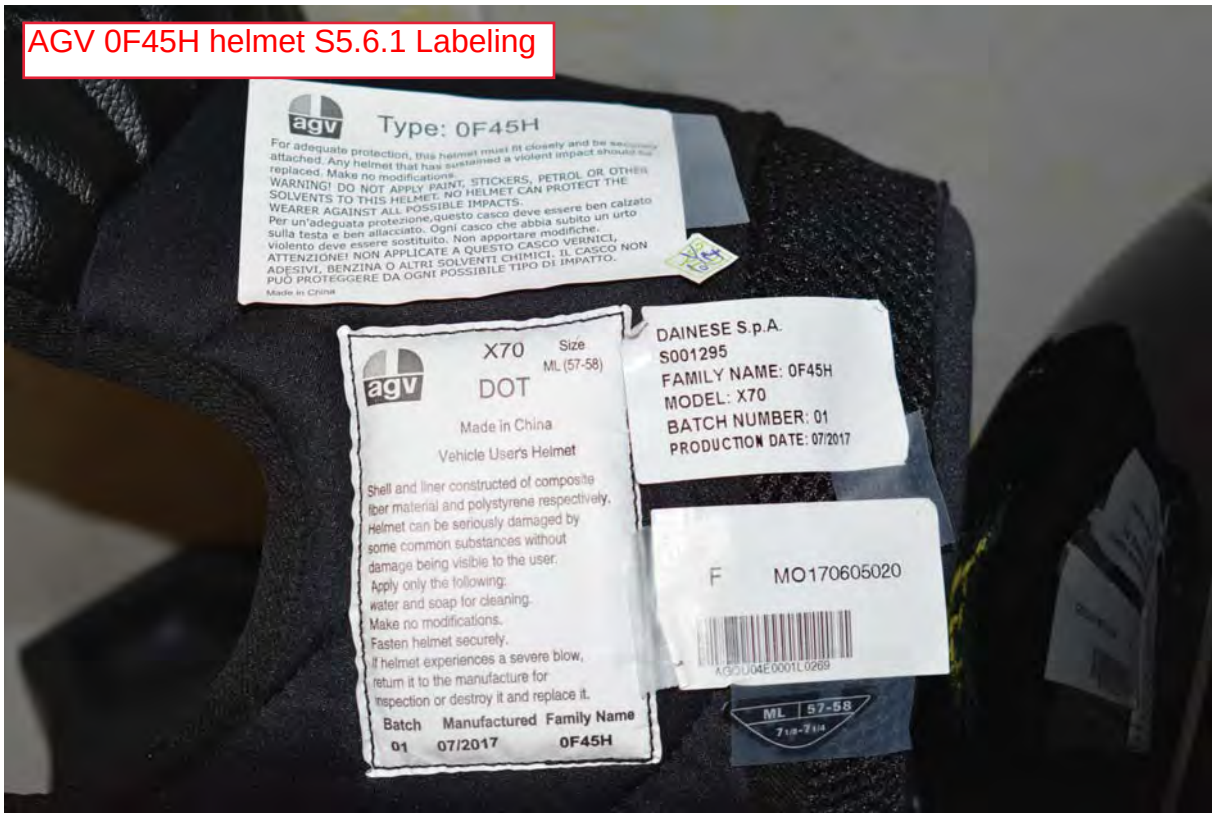

AGV 0F45H helmet rear right
penetration test location
DOT

AGV 0F45H helmet
S5.6.1 Labeling

AGV 0F45H helmet S5.6.1 Labeling




AGV 0F45H helmet S5.6.1 Labeling


AGV 0F45H helmet S5.6.1 Labeling
agv
Type: 0F45H
For adequate protection, this helmet must fit closely and be securely attached. Any helmet that has sustained a violent impact should be replaced. Make no modifications.
WARNING! DO NOT APPLY PAINT, STICKERS, PETROL OR OTHER SOLVENTS TO THIS HELMET. NO HELMET CAN PROTECT THE WEARER AGAINST ALL POSSIBLE IMPACTS.
Per un'adeguata protezione,questo casco deve essere ben calzato sulla testa e ben allacciato. Ogni casco che abbia subito un urto violento deve essere sostituito. Non apportare modifiche.
ATTENZIONE! NON APPLICATE A QUESTO CASCO VERNICI, ADESIVI, BENZINA O ALTRI SOLVENTI CHIMICI. IL CASCO NON PUÒ PROTEGGERE DA OGNI POSSIBILE TIPO DI IMPATTO.
Made in China
agv
X70
Size
ML (57-58)
DOT
Made in China
Vehicle User's Helmet
Shell and liner constructed of composite fiber material and polystyrene respectively.
Helmet can be seriously damaged by some common substances without damage being visible to the user.
Apply only the following:
water and soap for cleaning.
Make no modifications.
Fasten helmet securely.
If helmet experiences a severe blow, return it to the manufacture for inspection or destroy it and replace it.
Batch
Manufactured
Family Name
01
07/2017
0F45H
DAINESE S.p.A.
S001295
FAMILY NAME: 0F45H
MODEL: X70
BATCH NUMBER: 01
PRODUCTION DATE: 07/2017
F
MO170605020
ML 57-58


AGV 0F45H helmet
S5.6.2 Certification Label
ML
57-58
7 1/8-7 1/4
AGV
0F45H
DOT
FMVSS No.218
CERTIFIED