

**STANDARD PERFORMANCE
SPECIFICATION FOR
NEWLY MANUFACTURED LACROSSE
HELMETS WITH FACEGUARD**

NOCSAE DOC (ND) 041 – 15m24

Prepared By

NOCSAE[®]

**NATIONAL OPERATING COMMITTEE
ON STANDARDS FOR ATHLETIC EQUIPMENT**

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1. Scope

- 1.1 This standard specification establishes performance requirements for new lacrosse headgear as supplied by manufacturers. Helmets are to be tested with attached compatible faceguard. Faceguards must be, or have been, tested to and comply with NOCSAE 045 on the same helmet model as presented for testing. The requirements of this standard shall be subject to Level 3 compliance criteria unless otherwise stated herein.
- 1.2 **All testing and requirements of this standard specification must be in accordance with NOCSAE DOC (ND) 001 and NOCSAE DOC (ND) 021 except where modified herein.**
- 1.3 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

- 2.1 NOCSAE DOC (ND) 001: *Standard Drop Test Method and Equipment Used in Evaluating the Performance Characteristics of Protective Headgear*
- 2.2 NOCSAE DOC (ND) 015: *Standard Test Method and Specification Used in Evaluating the Corrosion Characteristics and Effects on Metallic Hardware Disassembly.*
- 2.3 NOCSAE DOC (ND) 045: *Standard Performance Specification for Newly Manufactured Lacrosse Face Protectors*

3. Test Sample Size

- 3.1 For any standalone test report; at least four (4) of each model and in each critical size must be tested. Two (2) will be tested at ambient; two (2) will be tested at high temperature.

4. Helmet Preparation

- 4.1 Helmets shall be tested complete in the condition as offered for sale.
- 4.2 Helmets used for testing shall be selected in a random manner.
- 4.3 Faceguards: During all testing the helmets must be tested with a compatible faceguard that has been certified to meet ND 045 attached.
- 4.4 To obtain a reasonable fit (as determined by the test technician) for testing purposes, helmets larger than size 7 5/8 **may** require "shim" pads to be inserted between the largest NOCSAE headform and the interior of the helmet, opposite from the impact site.
- 4.5 Helmets of a given model with a size smaller than 6 5/8 may not fit the smallest NOCSAE headform. In that event, testing of that size is waived so long as the other sizes of that model have been tested and meet all requirements.

4.6 Conditioning Environments:

4.6.1 Ambient Temperature: Expose product to conditioned temperature of $72^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($22^{\circ} \pm 2^{\circ}\text{C}$) for a minimum of four hours.

4.6.2 High Temperature: Expose product to conditioned temperature of $100 \pm 3^{\circ}\text{F}$ ($39 \pm 1^{\circ}\text{C}$) for at least four hours and a maximum of twenty-four (24) hours.

4.6.2.1 When performing high temperature testing, the first impact shall occur between the first and second minute after removing the sample from the conditioning environment. Successive impacts in each location shall occur 75 seconds (± 15 sec) after the preceding impact. If the sample cannot be tested within these time constraints, the sample must be returned to the conditioning environment for a minimum of three minutes for each minute the sample is out of the conditioning environment. Conditioning must be complete before testing can resume on the sample.

5. Testing Sequence

5.1 The helmet stability/retention test described below shall be performed prior to any of the impact tests.

6. Helmet Stability/Retention Testing (Chin cup)

6.1 A helmet stability (roll-off) stand is depicted in Figure 1 and shall include a guide rod and stop anvil (see Figure 2) similar to that used in the Retention System test, minus the strap fixture (two rods). This guide apparatus shall weigh 2.5 ± 0.5 lb (1.13 ± 0.23 kg).

6.2 A cable and attached hook connect the guide rod to the far edge of the helmet. The cable and hook shall weigh less than 0.45 lb (0.2 kg). The hook shall engage no less than $\frac{1}{2}$ linear inches (12.7 mm) of the helmet edge.

6.3 The ambient helmet shall be affixed to the correct size NOCSAE headform in accordance with the manufacturer's instructions with only the primary retention system adjusted as described in those instructions. This helmet shall then be subjected to a positional stability test by allowing a 9 lb (4.08 kg) drop mass to pull on the back edge of the helmet when dropped from a height of 2.78 feet (0.85 m). During this test the headform will be canted downwards at a 45° angle from vertical and facing the floor. The helmet shall remain on the headform upon the completion of this test.

7. Impact Attenuation Tests

7.1 Helmet Drop Tests

7.1.1 Impact locations are described in ND 001 Section 19.

7.1.2 Drop tests shall be conducted using the procedures and equipment described in ND 001.

7.1.3 Each submitted sample designated for drop impact testing shall be impacted in accordance with Table 1 below and as depicted in Figure 3 (also see Figure 4).

7.1.3.1 Impacts must be conducted in sequence from the lowest drop velocity through the highest for each location specified in Table 1.

7.1.4 Impacts shall be conducted on the 1/2" *Test MEP Pad*.

7.1.5 At least two (2) locations, not to exceed four (4) locations, are to be selected for the high temperature impacts. This is accomplished by determining which of the 17.94 ft/s ambient temperature locations tested yielded the two highest severity indexes on each of the ambient samples. Those locations shall be tested at high temperature on both samples subjected to high temperature testing.

7.1.5.1 The high temperature condition impacts must be done after the ambient temperature impacts.

7.1.6 The random location chosen cannot be less than 1 inch (25 mm) away from any standard impact location.

TABLE 1
Drop Test Impact Location
Velocity - ft/s (m/s) +3%

Conditioning Environment	IMPACT VELOCITY FT/S (M/S)	FRONT	SIDE	FRONT BOSS	REAR BOSS	REAR	TOP	RANDOM
Ambient Temperature	11.34 (3.46)	X	X	X	X	X	X	X
	16.04 (4.88)	X	X	X	X	X	X	X
	17.94 (5.46)	X	X	X	X	X	X	X
High Temperature	17.94 (5.46)	Minimum of 2 Locations but no more than 4 Locations Based on Results from Ambient Testing. See Section 7.1.5						

8. Test Requirements

- 8.1 The peak severity index of any impact shall not exceed 1200 SI.
- 8.2 The 11.34 ft/s impacts designated in Table 1 must not exceed 300 SI*.
- 8.3 Helmet repositioning during testing is anticipated. Any structural changes or other changes that take place during impact testing which result in un-restorable loosening of the fit shall be cause for failure. In the case of helmets "shimmed", the replacement or repositioning of shims is allowed.
- 8.4 A passing helmet model is able to withstand all impacts at an acceptable SI and meets all other requirements when tested in accordance with this performance specification.

* This requirement shall be subject to Level 2 compliance criteria.

9. Construction

- 9.1 General: Headgear is worn on the head in an effort to reduce or minimize injury to that portion of the head which is within the specified area of coverage. Headgear shall be constructed to reduce the risk of injury to the wearer and to remain on the wearer during impact. Optional devices fitted to the headgear/equipment shall be designed so that they are unlikely to cause injury during use. For example: wire face protectors must not be designed with weld junctions and/or wire terminus ends in the ocular area, such that in the event of a weld separation, the wire ends could come into contact with the ocular area.
- 9.2 The protective equipment must survive all test protocols substantially intact and ready for use.
- 9.3 Projections: Internal rigid projections that may contact the wearer's head during impact shall be covered to reduce the likelihood of injury. Pressure sensitive film or electronic methods may be employed to evaluate the transmitted force of internal projections suspected to be a likely source of injury, such forces shall be limited to a maximum of 750 lbs/in².
- 9.4 Metallic Hardware as defined in ND 001 shall meet the requirements of ND015.

10. Materials

- 10.1 Materials used in the product shall be durable and resistant to exposure to sun, rain, cold, dust, vibration, perspiration, and products likely to be applied to the skin or hair. Materials known to cause skin irritation or disease shall not be used. Lining materials, if used, may be detachable for washing. If hydrocarbons, cleaning fluids, paints or transfers/decals or other additions may affect the equipment adversely, a warning shall be provided.

11. Labels and Warnings

- 11.1 Each helmet shall be permanently and legibly labeled or marked in a manner such that the following information can be easily read and is not obscured in any manner.
 - 11.1.1 Name of Manufacturer
 - 11.1.2 Model of Designation
 - 11.1.3 Size
- 11.2 Each helmet shall be permanently and legibly labeled or marked in a manner such that the following additional information can be easily read without removing any permanent component. The following labels shall contain a signal word which shall not be obscured in any manner:
 - 11.2.1 A label that warns the user that no helmet can protect against all possible impacts and the protective device must be fitted and attached properly in accordance with the manufacturer's fitting instructions.
 - 11.2.2 A label that warns the user that the helmet can be damaged by accidental, incidental, or intentional contact with common substances (for example, certain solvents, cleaners, hair treatments, etc.) and that this damage may or may not be visible to the user. This label should also list any recommended cleaning agents or procedures, or both.

- 11.3 Each helmet shall have permanently affixed to the exterior of the shell a clearly legible statement which can be easily read without removal of any decal tape, other temporary material or permanent part, which contains language which effectively communicates to the purchaser and user the following information, using the same or similar language:

WARNING

DO NOT USE THIS HELMET IF THE SHELL IS CRACKED OR DEFORMED; OR IF THE INTERIOR PADDING IS DETERIORATED. SEVERE HEAD OR NECK INJURY, INCLUDING PARALYSIS OR DEATH, MAY OCCUR TO YOU DESPITE USING THIS HELMET. NO HELMET CAN PREVENT ALL HEAD INJURIES OR ANY NECK INJURIES A PLAYER MIGHT RECEIVE WHILE PARTICIPATING IN LACROSSE

- 11.4 A permanent and legible label or mark that denotes the month and year of manufacture that can be easily read without removing any permanent component. If this mark or label requires a "code" to determine month and year, such code shall be made available upon request.

11.4.1 A label that denotes the first intended season of use may be used.

- 11.5. Headgear that are not to be recertified as mandated by the manufacturer shall bear a permanent and legible warning on the exterior of the headgear stating the following:

11.5.1. This headgear shall not be recertified

11.5.2. The life of certification, which shall be no longer than 5 years from the date of manufacture.

- 11.6. Manufacturers of headgear intended to be recertified shall have a recertification interval provided by the manufacturer.

- 11.7. Fitting instructions shall be provided including any attachment instructions for authorized accessories.

- 11.8. A permanent exact replica of this mark must appear legibly on the exterior of the shell.



NOTE: You must have an executed, valid license agreement with NOCSAE to use any of the NOCSAE marks at any time. NOCSAE, the NOCSAE marks, and the National Operating Committee on Standards for Athletic Equipment are registered marks and the exclusive property of the Committee. Use of the marks in any manner is prohibited without prior written permission of the NOCSAE Board of Directors.

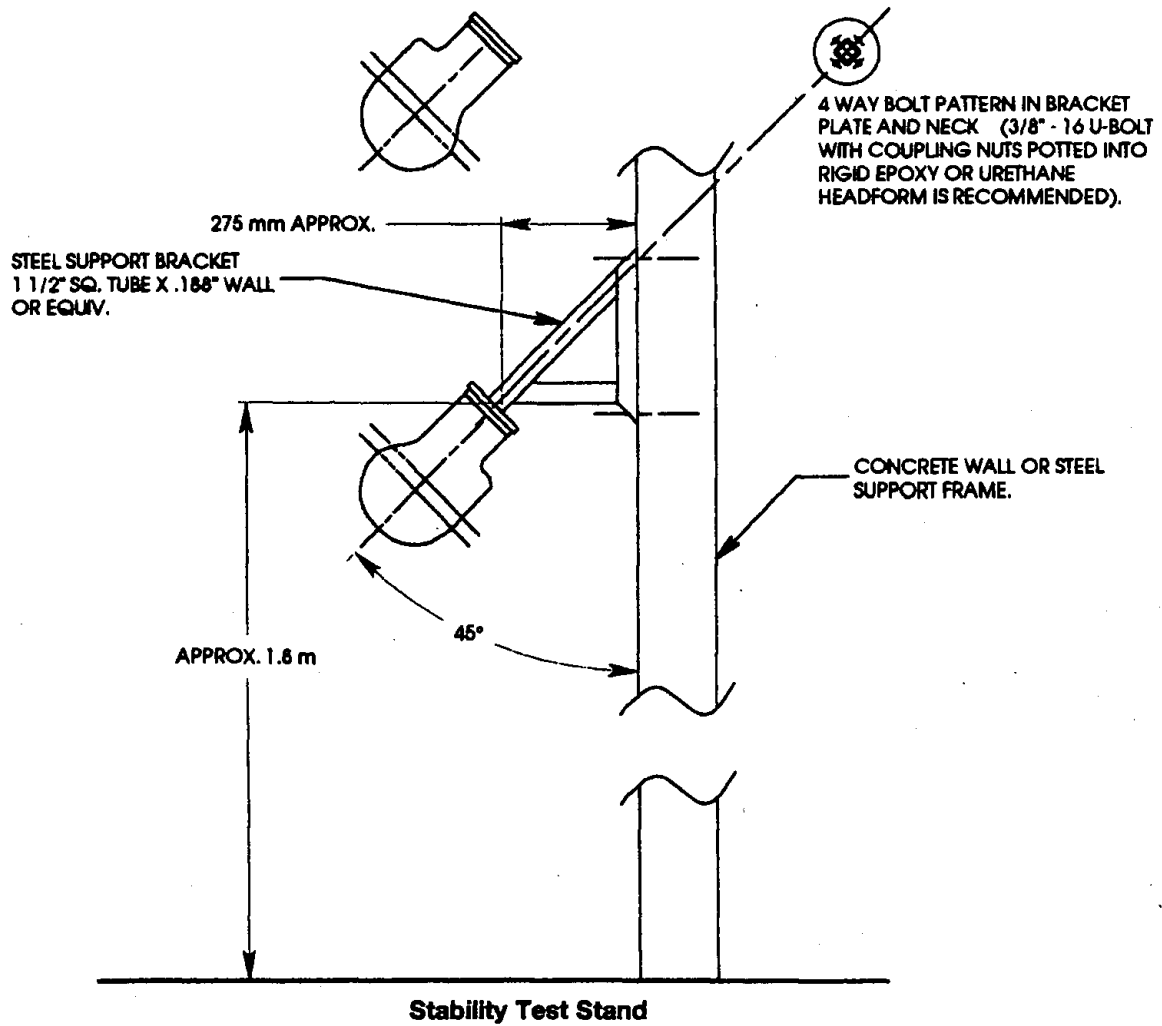


FIGURE 1

This standard is subject to revision at any time by the responsible technical authority and must be reviewed every five years and if not revised either reapproved or withdrawn. Your comments are invited either for revision, modification or creation of additional standards and should be addressed to NOCSAE's Executive Director. Check the web at www.nocsae.org to obtain the latest version of a standard.

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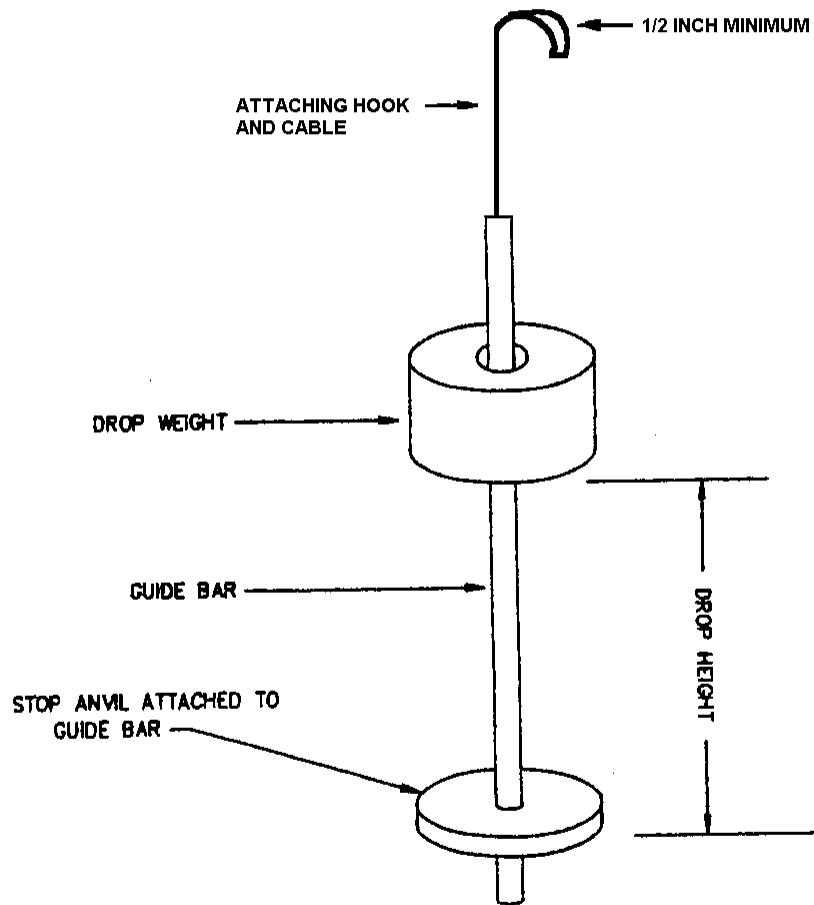


FIGURE 2



Front



Side



Front Boss



Rear Boss



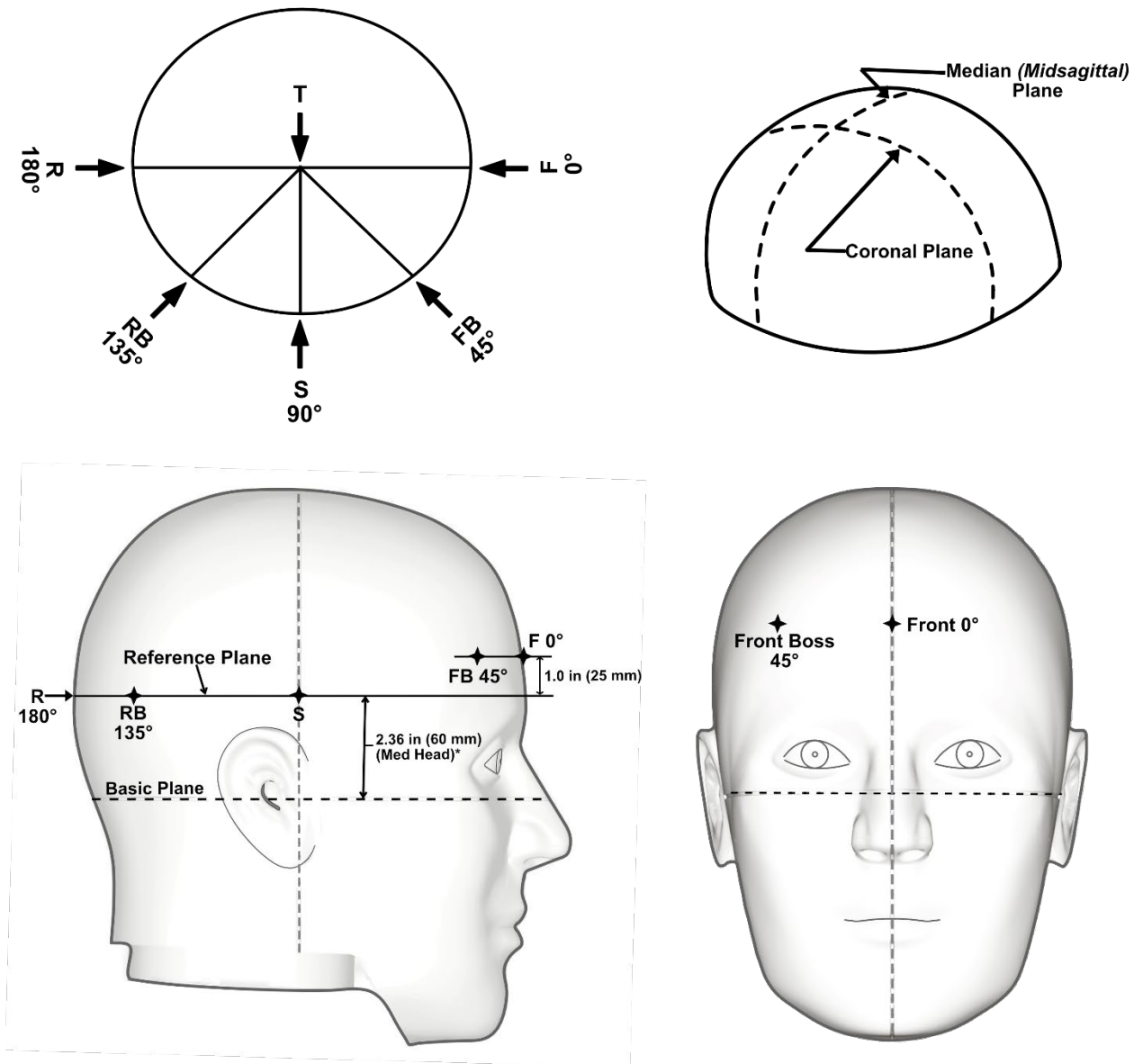
Rear



Top

FIGURE 3 – DROP TEST IMPACT LOCATIONS

IMPACT AREA – DROP TEST



*For the small headform, the REFERENCE PLANE is 2.16 inches above the BASIC PLANE. For the large headform, the REFERENCE PLANE is 2.48 inches above the BASIC PLANE.

Impact Area – For a helmet that is to be tested on the medium headform** the impact area must include all locations on the headform above the BASIC PLANE rearward of a location 2.5 inches (64mm) forward of where the BASIC PLANE intersects with the CORONAL PLANE and any point on or above the REFERENCE PLANE in front of that same intersection.

**For the small headform use 2.25 inches and for the large headform use 2.75 inches.

The random impact location may be selected from any point within the allowed impact area but not closer than 1 inch (25mm) from the edge of the helmet nor less than 1 inch (25mm) from any previous impact.

Random impact locations chosen must allow the rotator assembly to be locked in the position selected.

FIGURE 4

JULY 2004 MODIFICATIONS/REVISIONS

- Modified section 4.2 to clarify required number of helmets per test (set).
- Modified section 8.2.5 to clarify that each high temperature sample gets impacted at each of the highest SI locations based on the ambient test. This can be no less than two nor more than four locations.
- Modified Note associated with Table 1 to clarify high temp impact requirements.

AUGUST 2004 MODIFICATIONS/REVISIONS

- Modified Scope
- Added NOCSAE 045 as a referenced document

JUNE 2005 MODIFICATIONS/REVISIONS

- REVISION: Impact schedule Table 1 to eliminate the 60-inch impacts in the Random Location.
- REVISION: Projectile impact requirement, eliminated section 8.3 Helmet Projectile Tests, Figure 5 and references to Lacrosse Ball Impacts.
- Modified Note section 9.3 to clarify need for license agreement
- Modified NOCSAE contact information

JANUARY 2008 MODIFICATIONS/REVISIONS

- Modified section 8.2.2, corrected reference to face protector

FEBRUARY 2011 MODIFICATIONS/REVISIONS

- REVISION: Change drop heights to drop velocities. Moved test requirements to section
- Clarified test requirements.

MAY 2012 MODIFICATIONS/REVISIONS

- Moved requirements in section "Specific Terminology" to "Helmet Preparation", Deleted section.
- Clarified section 3 for standalone test report
- Moved requirements to section 4 from section 3 for clarity

OCTOBER 2014 MODIFICATIONS/REVISIONS

- Updated document to include level of compliance requirements.
- Added Date specification becomes effective
- Updated title name of NOCSAE DOC. 001
- Added SEI Certification NOCSAE Logo to Section 9, "Labels and Warnings"

JANUARY 2015 MODIFICATIONS/REVISIONS

- REVISION: Removed requirement to alter standard impact locations to avoid impact with visor and/or faceguard. Added requirement to impact random locations at 17.94 ft/s.
- Added photos of impact locations

JUNE 2015 MODIFICATIONS/REVISIONS

- Updated NOCSAE seal/logo artwork

JANUARY 2017 MODIFICATIONS/REVISIONS

- Modified text accompanying Figure 4 describing random impact locations.

FEBRUARY 2018 MODIFICATIONS/REVISIONS

- Removed reference to ND021 and corrected numbering in Section 9.

JUNE 2024 MODIFICATIONS/REVISIONS

- Replaced references to ND 001 with the referenced language
- Added Conditioning Environment, Construction, and Materials requirements from ND 001
- General formatting updates
- Replaced figure indicting impact locations on the helmet with one indicating impact locations on the headform.