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SPECIFICATION FOR PROTECTIVE HELMETS FOR VEHICLE USERS

(Second Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

SPECIFICATION FOR PROTECTIVE HELMETS FOR VEHICLE USE

(*Second Revision)*

SLS 517: 2021
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SRI LANKA

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This Standard does not purport to include all the necessary provisions of a contract

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(*Second Revision)*

FOREWORD

This standard was approved by the Sectoral Committee on Materials, Mechanical Systems and Manufacturing Engineering and was authorized for adoption and publication as Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2021-01-13.

This Sri Lanka Standard specifies minimum requirements for protective helmets for vehicle users.

This is the 2nd revision of SLS 517 Specification for protective helmets for vehicle users published in 1994. This revision differs from the previous standard in the following areas:

a) Whilst, in the past, the nominal sizes of headforms, which is used to test the helmets, have been specified in multiples of millimeter (500, 510, 520 etc.), the actual circumferences are closer to five millimeters greater or less than nominal. In this revision therefore, the size designations have been specified according to the actual circumferences, in increments of ten millimeters (505, 515, 525 etc.). Hence helmet sizes depend on the headform sizes in general. As such helmet sizes have been specified as range of circumference of headform.
b) The range of helmet size have been increased from 445 to 645.
c) Product certification criteria for compliance of a lot is clearly given under criteria for conformity.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or an analysis shall be rounded off in accordance with SLS 102. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard.

The Sri Lanka Standards Institution gratefully acknowledges the use of the following publications of the British Standards Institution, Bureau of Indian Standards, Japanese Standards Association, Malaysian standard organization and ECE regulation number 22, revision 4 incorporating amendment 05 in the preparation of this standard.

BS EN	960	2006	Headforms for use in the testing of protective helmets.
BS	6658	1985	Protective helmets for vehicle users (Amendment no 1& 2)
IS	4151	2015	Helmets for Two Wheeler Riders
JIST	8133	2015	Protective helmets for vehicular users
MS	1-2	2011	Protective helmets and visors for vehicle users –Specification -Part 1 :Protective Helmets
ECE	22.05		ECE regulation number 22, revision 4 incorporating amendment 05

1. SCOPE

This standard specifies requirements for helmets to be worn by riders, drivers and passengers of motor vehicles, including participants in competitive events. Requirements for accessories such as goggles, detachable peaks and detachable face covers are not specified unless they are supplied with the helmet as original equipment.

This standard covers the requirements regarding the material, construction, performance, audibility & flammability.

2. REFERENCES

ISO	5272	Toluene for industrial use
ISO	6487	Measurement techniques in impact test instrumentations
SLS	102	Presentation of numerical values
SLS	428	Random sampling methods
SLS	1069	Headforms for use in the testing of protective helmets
SLS	×××*	Visors for Vehicle users

3. DEFINITIONS

For the purposes of this standard the following definitions shall apply (see Figure 1 & Figure 2).

3.1 helmet: Headwear primarily intended to protect against a blow to the part of the wearer's head that lies above the basic plane, without preventing adequate peripheral vision.

3.2 shell: The hard, smooth material that provides the general outer form of the helmet.

3.3 shock absorption liner: Liner materials provided to absorb impact energy.

3.4 buffer padding: Soft material provided to ensure a close fit to the wearer.

3.5 retention system: The complete assembly that prevents the helmet from coming off the head.

3.6 quick-release mechanism: A system attached to, or incorporated in, the helmet that allows the retention system to be fastened and unfastened quickly.

3.7 chin strap: A strap that passes under the wearer's chin or lower jaw and is intended to retain the helmet on the head under impact.

3.8 chin cup: A device that fits around the point of the wearer's chin.

3.9 chin guard: An extension or attachment of the shell covering the lower part of the face

3.10 face cover: An accessory protecting the lower part of the face against mud, stones and weather.

3.11 peak: A semi-rigid extension of the shell above the eyes.

3.12 visor (eye screen): A transparent protective screen extending over the eyes and covering part or all of the face.

3.13 goggles: Eye-protectors having a one-piece protective lens or individual lenses designed to cover the orbital cavities and to be in contact with the face around the eyes.

3. 14 basic plane: (see Figure 3)

3.14.1 of a human head: This corresponds to the basic plane of the human head being the longitudinal plane which passes through the lower level of the eye orbits and the upper level of the external opening of the ear canals.

3.14.2 of a headform: For a given headform, horizontal plane located at a vertical distance ‘x’ below and parallel to the reference plane

3.14.3 of a helmet: That plane relative to the helmet that corresponds to the basic plane of the head that the helmet is intended to fit.

3.15 reference plane: A plane relative to a headform, parallel to basic plane and at a vertical distance ‘y’ measured down the central vertical axis from the center of the crown.

3.16 central vertical axis: The line relative to a human head or headform or helmet that lies in the plane of symmetry, and that is normal to the basic plane at a point equidistant from the front and back of the head or the headform or (for helmets) of the headform that simulates the head that the helmet is intended to fit.

3.17 longitudinal vertical plane: The vertical plane of symmetry of a human head or headform or of a helmet as it is intended to be worm on the head.

3.18 central transverse vertical plane: A plane at right angles to the longitudinal vertical plane and passing through the central vertical axis.

3.19 size (of a helmet): The size of head which the inner parts and retention system of the helmet are designed to fit.

4. TYPES

Helmet type shall be classified based on severity of impact in the test of shock absorption and resistance to penetration as either Type A or Type B. Type of helmet shall be identified by marking (see 7).

Type A - Intended for competitive events and for use by wearers who demand an especially high degree of protection.
Type B - Intended for the ordinary motor cycle riders on public roads.

5. REQUIREMENTS

5.1 MATERIALS

5.1.1 Shell

The shell of the helmet shall be of metallic or non-metallic materials conforming to the test requirements.

The materials used in the manufacture of helmets shall be known not to be sensitive to ageing due to exposure of the helmet in use to influences such as sunlight, rain, road spray and fumes, and extremes of temperature.

If the shell material adversely affected by contact with hydrocarbons, cleaning fluids, paints, transfers or other extraneous additions, then the helmet shall carry on its information label an appropriate warning as specified in 9.1 (h).

NOTE
For information purposes a method for assessing the ageing of helmet shell material is described in Appendix B. This method is applicable to all shell material and to surface coated shells.

5.1.2 Shock absorption liner

It may be of expanded polystyrene or any other materials conforming to the test requirements.

5.1.3 Buffer padding

It may be of expanded polyurethane foam, polyethylene or any other suitable material having similar properties. For this parts of the helmet coming into contact with the skin, the material used shall be known not to undergo significant alteration in its performance due to contact with sweat or with substances likely to be found in toiletries. For those parts, materials shall not be used which are known to cause skin disorders

5.1.4 Chin strap

The criteria for selection of material for chin strap shall be sweat –resistant, no-irritant and shall not be known to cause any skin disease.

5.1.5 Visor

If provided, it shall conform to the material requirements of SLS ×××*.

NOTE :
SLS×××× Visors for vehicle users (Under preparation)*

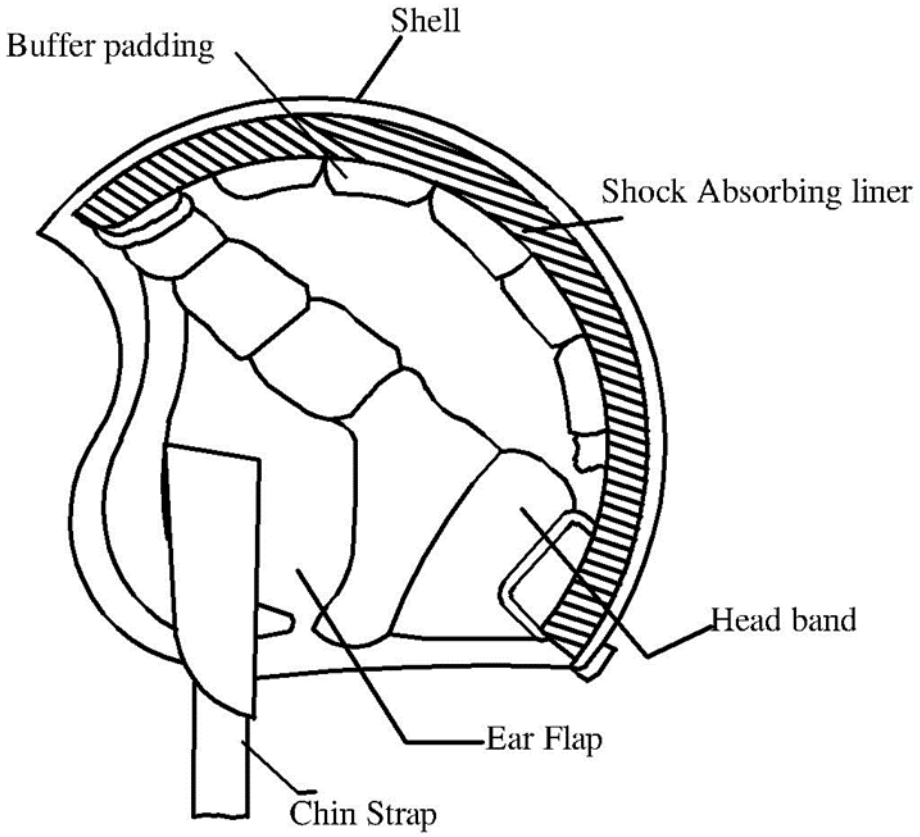


FIGURE 1**–Typical sketch of helmet without chin guard**

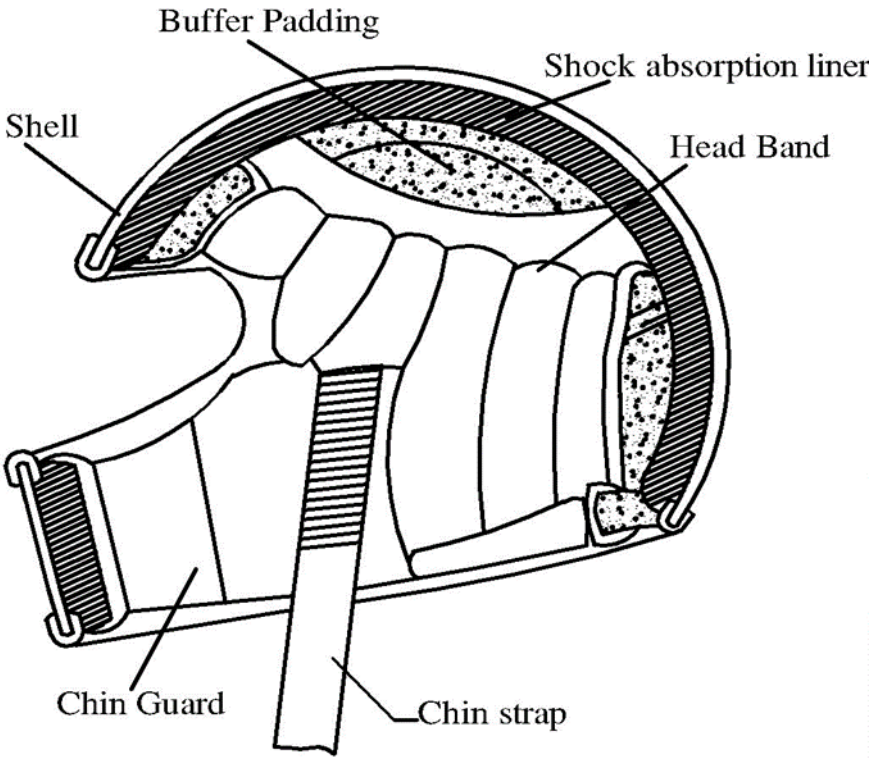


FIGURE 2- Typical sketch of helmet with chin guard

5.1.6 Metal part

The metal parts in helmet shall be either inherently corrosion resistant or shall have been treated for corrosion resistance.

5.1.7 Mass

The protective helmets with lesser mass are preferred and may be available with increasing availability of more advanced composites and materials. However, mass of the helmet including all accessories shall not exceed 1.5 kg.

NOTE :
The recommended typical mass of helmet with the age limit are given in Table 1. However, recommended mass of helmet may be varying with circumference of head of the people.

Table 1 – Typical mass of helmet

Description	Mass of helmet including all accessories, kg
For children aged over 1 year to 5 years	0.5 to 0.75
For children aged over 5 years to 12 years	0.75 to 1.0
For adults	1.2 to 1.5

5.2 SIZES

Helmets shall be the sizes matching to the sizes of headform. Helmets are classified based on the size of the head forms as per the table 2.

TABLE 2 –Size of Helmets

Headform size in mm	Code letter/s (Size of helmet)	Size range of protective helmet (inside circumferences length) in mm
445	XS (Extra small)	445 to 455
455		455 to 465
465		465 to 475
475		475 to 485
485		485 to 495
495		
505	S (Small)	495 to 505
515		505 to 515
525		515 to 525
535		525 to 535
545		535 to 545
555		545 to 555
565	M (Medium)	555 to 565
575		565 to 575
585		575 to 585
595		585 to 595
605	L (Large)	595 to 605
615		605 to 615
625		615 to 625
635		625 to 635
645		635 to 645

NOTE *: Several different sizes of helmet may be manufactured from one size of outer shell.*

5.3 CONSTRUCTIONAL REQUIREMENTS

5.3.1 General

The construction of the helmet shall be essentially in the form of a shell containing the necessary additional means of absorbing impact energy secured within the shell. Anchorages for the tethers for a head and neck support system as used in motor car sports are permitted

5.3.1.1 Helmet shall be made with or without chin guard. Typical form of component parts of the helmet is given in Figure 1 & Figure 2.

5.3.1.2 The protective helmet may be fitted with earflaps and a neck curtain. It may also have a detachable peak, chin guard, a visor and a lower face cover. Visor, if fitted shall meet the SLS ×××* requirements. If fitted with a non-protective detachable chin guard, it covers the lower part of the face and does not protect the chin of user against impact.

5.3.1.3 No components or device shall be fitted to or incorporated in the protective helmet unless it is designed in such a way that it shall not cause injury and that, when it is fitted to or incorporated in the protective helmet, the helmet still complies with the performance of this standard.

5.3.2 Shell

The extent of the protection provided shall be as given in 5.3.2.1 to 5.3.2.6.

5.3.2.1 The shell shall cover all areas above plane AA/ and shall extend downwards at least as far as the lines CDEF on both side on the headform (see Figure 3) when assed by method described in Appendix C.

5.3.2.2 The helmet shall not dangerously affect the wearer's ability to hear and the sound transmission loss shall not be more than 10 dB over the frequency range 250 Hz to 200 Hz when assed by method described in Appendix R.

5.3.2.3 The temperature in the space between the head and the shell shall not rise inordinately. To prevent this ventilation holes may be provided in the shell. Ventilation may be provided for increasing the comfort of the rider.

5.3.2.4 Above the reference plane, the shape shall be in the form of continuous, convex curve, except where shaping is provided for functional purposes. Below the reference plane, irregularities in the curve shall be smoothly faired. The shell shall not incorporate an integral peak, but may incorporate in integral lower face cover. Where means for attaching a visor are not provided, the profile at the front edge shall not prevent the wearing of goggles.

5.3.2.5 All projections from or irregularities in the outer surface of the shell greater than 2 mm shall be tested for shear assessment according to test for oblique impact as per 6.7. The outer surface of the helmet shall be tested for friction assessment according to test for oblique impact.

5.3.2.6 All external projection shall be used and any external projections other than press fasteners shall be smooth and adequately other than press fasteners shall be smooth and adequately faired.

Rivet heads shall be used and shall not project more than 2 mm above the outer surface of the shell and shall have a radius of minimum of 1 mm. All external projections more than 2 mm above the outer surface of the shell shall have a radius of minimum of 2 mm. The latter specific requirements shall not apply if a projection satisfies the requirement in 6.7 or 7.4.

5.3.2.7 There shall be no inward-facing sharp edges on the inside of the helmet. Rigid projecting internal parts shall be covered with padding so that any stresses transmitted to the head are not highly concentrated.

5.3.2.8 The various components of the protective helmets shall be assembled that they are not liable to become easily detached as a result of an impact.

NOTE
A recommendation on minimum radii for thermoplastics materials is given below.
Where thermoplastics materials are used for the shell, the blend radius of any irregularity in the internal or external surface should be not less than half the thickness of the shell at that point.

This recommendation need not be applied to holes for fasteners, the edges of the shell or to protrusions as specified in 5.3.2.7.

5.3.3 Shock absorption liner

The shock absorption liner shall cover all the areas defined in 5.3.2.1 taking in to account the requirements given in 5.3.2.2 & 5.3.2.3.

5.3.4 Retention system

5.3.4.1 General

The helmet shall be held in place on the wearer's head by means of a retention system which may be in the form of chin strap with quick release mechanism or double D ring or sliding bar or any other similar locking device, which is secured under the lower jaw. All parts of the retention system shall be permanently attached to the system or to the helmet or shell.

5.3.4.2 Chin straps

a) If the retention system includes a chinstrap, the chin straps shall be at least 20 mm wide to enhance comfort for the wearer.

b) A chin cup shall not be fitted to any system consisting of a single chin strap. Where a helmet is fitted with additional straps (one of which may carry a chin cup) to improve performance or provide comfort, the strap or straps which are necessary to meet the, performance requirements of this standard shall be positively indicated by durable marking or other durable means.

5.3.4.3 Fastening devices

a) Chin straps shall be fitted with a device to adjust and maintain tension in the strap.

b) Chin strap fastening and tensioning devices shall be positioned on the straps either so that there are no rigid parts extending more than 130 mm vertically below the headform reference

plane with the helmet mounted on the appropriate sized headform, or so that the whole of the device is between the bony projections of the underside of the lower jaw.

c) If a retention system includes either a double D ring or sliding bar fastening device or any other similar locking device, then, means shall be provided to prevent the retention system being completely undone and also retain the free end of the strap when the retention system is adjusted.

d) Double D ring or sliding bar fastening device or any other similar locking device shall be fitted with a pulling type flap to be used for releasing the retention system. Its colour shall be red and its minimum dimensions shall be 10 mm × 20 mm.

e) If the retention system includes a quick –release mechanism, then the method of release of this mechanism shall be self-evident. Any levers, tabs, buttons or other components which need to be operated to release the mechanism shall be coloured red, those parts of the rest of the system which are visible when closed shall not be similarly coloured, and the mode of operation shall be permanently indicated.

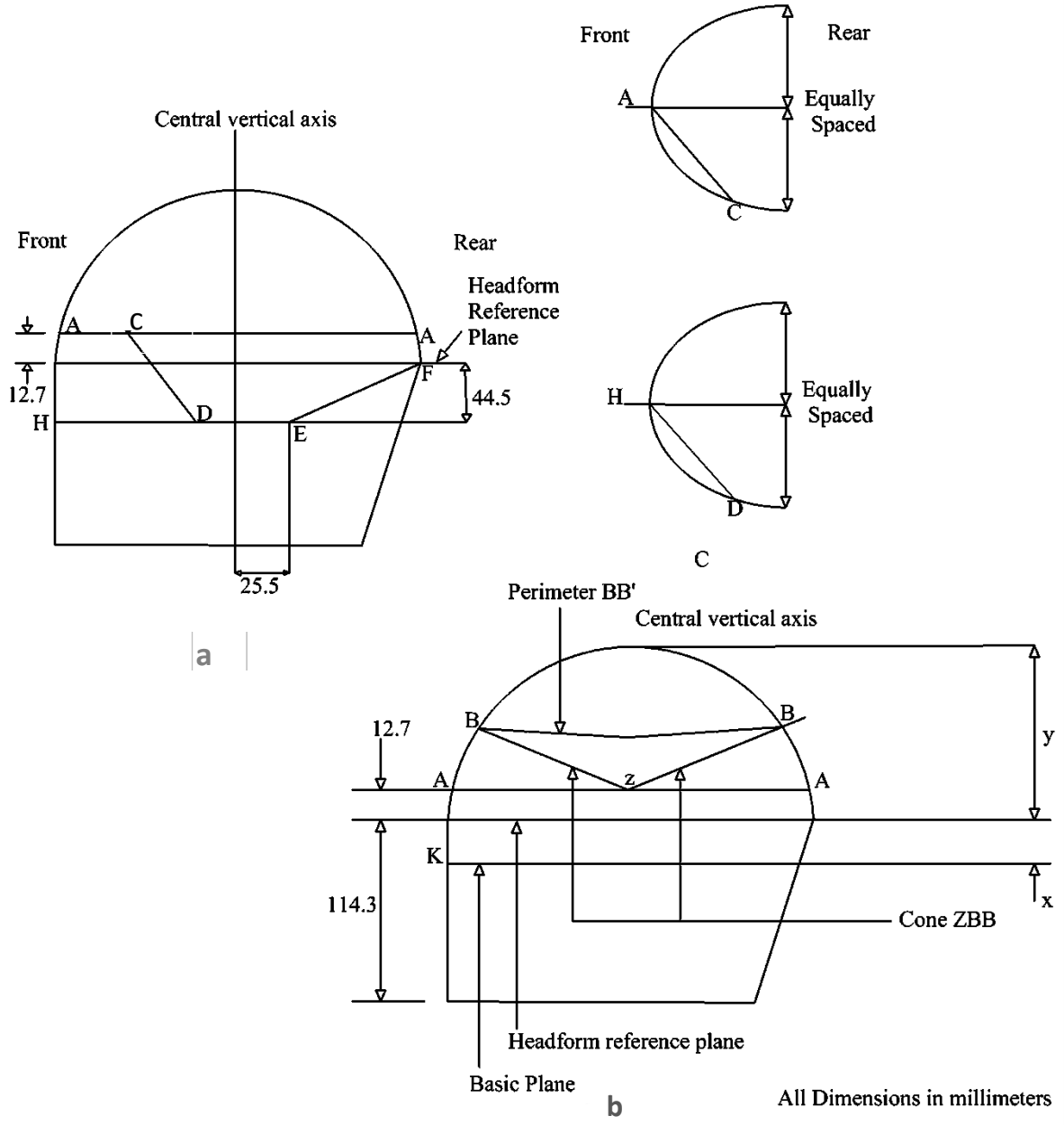
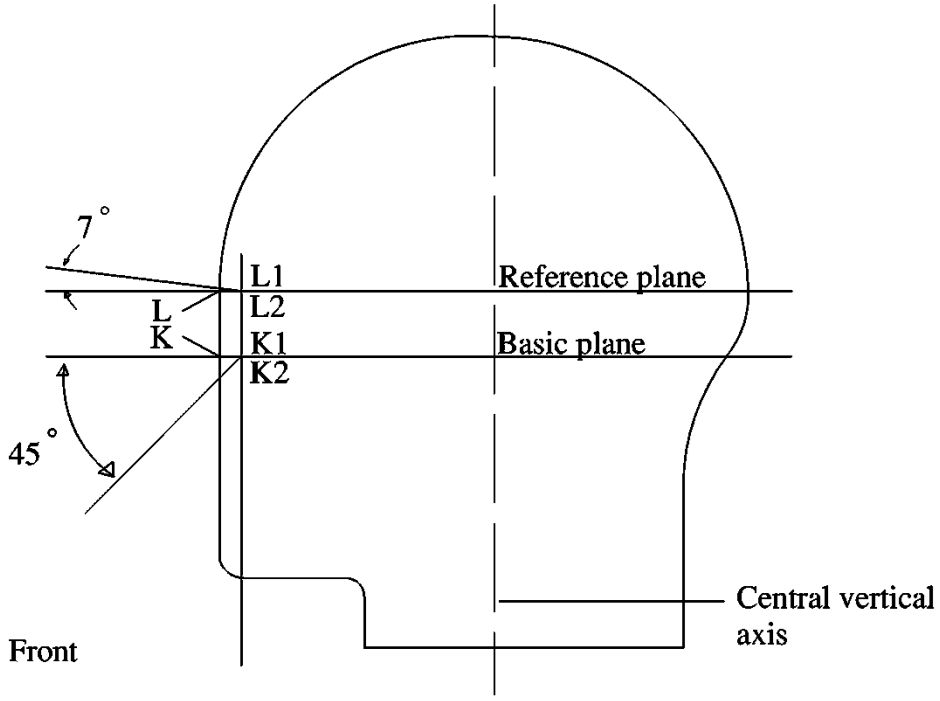
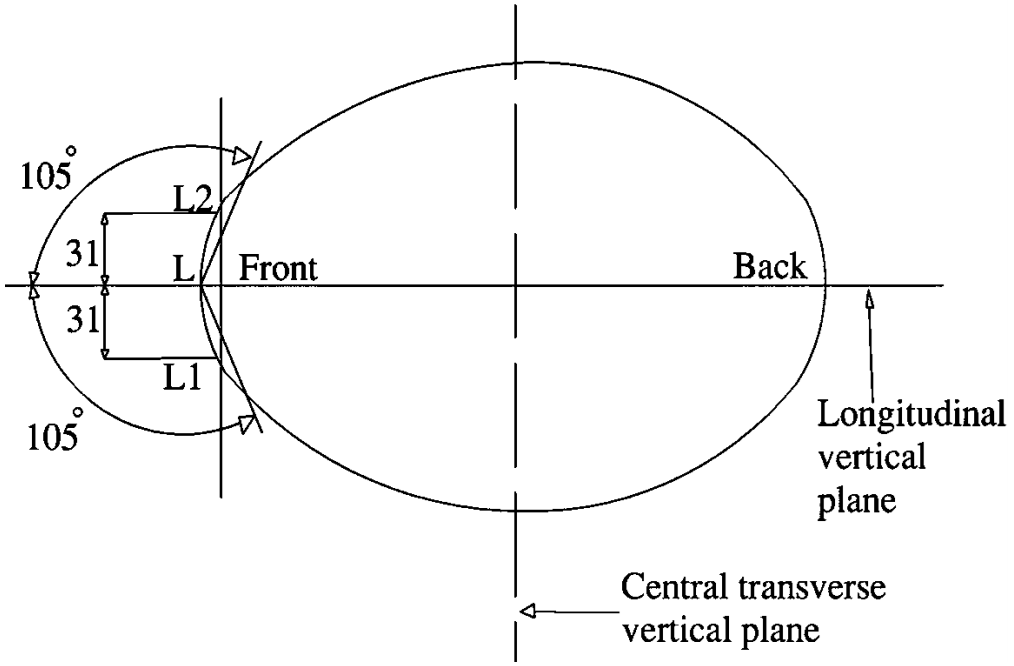


FIGURE 3 - Headform and helmet reference points



a. Section of headform in longitudinal vertical plane.



b. Section of headform in reference plane

FIGURE 4 – Peripheral vision regions

5.4 PERIPHERAL VISION

5.4.1 The helmet shall be placed on the head from corresponding to its size of a helmet by the procedure specified in Annex C.

5.4.2 In the condition mentioned in 5.4.1, there shall be no occultation in the field of vision bounded by the planes of horizontally, upwards and downwards and shall satisfy the requirements as given in 5.4.2.1, 5.4.2.2 and 5.4.2.3.

5.4.2.1 Horizontally

The space between the reference plane and the basic plane, forward of two vertical planes each angled backwards from the line LK, at an angle of 105^0 to the longitudinal vertical plane. The line LK lies on the front surface of the headform in the longitudinal vertical plane. (see Figure 4)

5.4.2.2 Upwards

Within the angle between the reference plane and a plane intersecting it along the line L1 L2 and sloping upwards at an angle of 7° above the reference plane. The points L1 and L2 lie on the surface of the headform and 31 mm to either side of the longitudinal vertical plane. The points L1 and L2 represent the left and right eyes respectively. (see Figure 4)

5.4.2.3 Downwards

Within the angle between the basic plane and a plane intersecting it along the line K1K2 and sloping downwards at an angle of 45° below the plane. The points K1 and K2 lie on the surface of the headform and 31 mm to either side of the longitudinal vertical plane. (see Figure 4)

5.5 EYE PROTECTION

A helmet intended for use with goggles shall carry on its information label an appropriate warning, as specified in item 9.1 (i)

A helmet not intended for use with goggles shall be fitted with a visor or with means for fitting one and shall carry on its information label an appropriate warning as specified in item 9.1 (j)

Where a helmet' is fitted or supplied by the manufacturer with a visor, the visor shall not be tinted and shall comply the requirements given in 5.1.5. Opening of the visor shall not cause abrasion of the visor within the field of peripheral vision as specified in 5.4 when the visor is closed.

5.6 HEADFORMS

5.6.1 General

For the purposes of testing in accordance with the specifications of this standard and to establish the extent of protection, it is necessary to define a range of artificial headforms whose fitting sizes are given in Table 1. The headform and helmet reference points are shown in Figure 3.

Only that part of each headform above the reference line is designed to represent the human head. Below the reference line all the headforms have a common height of 114.3 mm. In all the sizes of headform, the inclined axis passes through a point Z on the central vertical axis, 12.7 mm above the headform reference line. This point has been taken as the centre of gravity of the human head.

When the headform is rotated about its central vertical axis the inclined axis describes a 'circumference' BB' on the surface of the headforms. The 'circumference' is prescribed by the magnitude of the angle between the inclined axis and a horizontal plane of the headform, which for this standard shall be 20^{o}. Because the headform is not spherical the 'circumference' so defined does not lie strictly in a horizontal plane, but is somewhat lower at the sides of the headform compared with the front and rear positions, as indicated in Figure 3 (b). Circumference AA', which is that prescribed when the angle between the inclined axis and the horizontal plane of the headform is 0^{o}, does lie in a horizontal plane.

The headform shall be marked with the basic plane [Figure 1(b)], and the circumference AA' and on each side of the headform the lines CDEF and the lines G_1 G_2 [(Figure 3 (a)]. It shall also be marked with the longitudinal and transverse planes through the central vertical axis. The headform is notched either side of the point K on the basic plane to enable the peripheral vision requirement to be checked with an appropriate mechanical gauge, and the two points equispaced 31 mm each side of point K are marked on the basic plane.

Constructional details of headforms are given in SLS1069 : ××××.

5.6.2 Positioning of the helmet on the headform

The helmet is placed on a headform of appropriate size. A load of 50 N is applied on the crown of the helmet in order to adjust the helmet on the headform. It is ascertained that the vertical median plane of the helmet coincides with the median vertical plane of the headform.

The front edge of the helmet is placed against a gauge to check the minimum angle for the upward field of Vision. The following points are then checked:

a) that the line AC and the ACDEF zone are covered by the Shell
b) that the requirements for the minimum downward angle and the horizontal field of vision are satisfied
c) requirements of 5.3.2.1 relating to the rear projection should be respected.

If one of these conditions is not met, the helmet is moved slightly from front to rear to seek a

position where all the requirements are met. Once such a position is determined, a horizontal line is drawn on the shell at the level of the AA' plane. This horizontal line shall determine the reference plane for the positioning of the helmet during the tests.

6.0 PERFORMANCE REQUIREMENTS

6.1 SHOCK ABSORPTIONS TEST

The maximum deceleration of the headform shall not exceed 300 g when the helmet is tested by the method described in Appendix D. Where the shell is of multipart construction, the shell shall remain intact when any joint line above the line ACDEF, as shown in Figure 3 is tested as described in Appendix D by impacts appropriate for the type of helmet.

NOTES

1. *Symbol 'g' signifies unit of deceleration equal to 9.81 m/s*

2. *An additional helmet may be required for testing the joints of a multipart shell.*

6.2 PENETRATION TEST

When the helmet is tested by the method described in Appendix E the striker shall not make contact with the test block at any point on the helmet from· its uppermost point down to the limit of rotation of the helmet on the test block.

6.3 RETENTION SYSTEM EFFECTIVENESS TEST

An appropriate size of helmet shall be subjected to the test either by method A or by method B as prescribed in Annex F and shall meet the requirements given in 6.3.1or 6.3.2.

6.3.1. Retention system effectiveness test (Method A)

The helmet, selected, to be of appropriate size, shall not come off the modified head form when tested by method A of Appendix F.

6.3.2 Retention system effectiveness test (Method B)

The helmet shall be tested by the method B of Annex F & shall meet the requirements given in 6.3.2.1.

6.3.2.1 after the test the angle between the reference line situated on the shell of the helmet and the reference plane of the headform shall not exceed 30^0.

6.4 TEST FOR RETENTION SYSTEMS RELYING ON A CHIN STRAP

6.4.1 *Retention system strength*

If the retention system relies on a chin strap, the system shall be tested by the method given in Appendix G. the values observed. for dynamic extension and residual extension shall not exceed 32 mm and 16 mm, respectively, for the first impact and 25 mm and 8 mm, respectively, for the second impact. Following the test, the retention system shall still permit the helmet to be released from the head by normal operation of the release system.

NOTE

In this test slippage of the fastening device may be measured and recorded separately from other contributions to the extension, but this for information only and is not subject to a separate requirement.

6.4.2 ***Strap slippage test***

If the retention system relies for its main tension of the frictional grip of a rigid part on a strap, the total slippage through: the grip shall not exceed 10 mm when tested by the method in Appendix H.

6.4.3 ***Strap abrasion test***

If removal of the helmet from the wearer's head is intended to be achieved by sliding a strap through an adjuster, or if the slippage occurring in the slippage test is greater than 5 mm, the strap shall be capable of withstanding a tension of 3 kN, without breaking, when tested by the abrasion and tensile test described in Appendix J.

6.5 TEST FOR RETENTION SYSTEMS WITHOUT CHIN STRAPS

If the helmet is designed to be retained on the head without a chin strap, the helmet shall retain the lower part of the headform system when tested by the method described in Appendix K. and shall still be capable of being released from the headform after the test by operation of the release mechanism.

6.6 TEST FOR RETENTION SYSTEMS RELYING ON QUICK-RELEASE MECHANISMS

6.6.1 ***Inadvertent release by pressure***

If the retention system· is designed to be released by pressure on a certain part, the system shall not release when a rigid sphere of diameter 40 mm is pressed with a force of 100 ± 5 N directly in the line of movement of that part.

If such a system incorporates more than one quick-release mechanism, or one such mechanism requiring more than one operation to release it, the system shall be deemed not to comply with this standard if any release operation is caused by the pressure of the sphere.

6.6.2 *Inadvertent release by inertia*

When tested by the method in Appendix L, quick-release mechanisms shall comply with the following

a) the mechanism shall remain engaged after each impact;
b) no fracture or distortion shall occur which could enable the mechanism subsequently to disengage; and
c) the mechanism shall remain capable of normal engagement, disengagement and use in wear.

6.6.3 *Ease of release*

Quick-release mechanisms for the retention system shall be capable of being operated by a force not exceeding 15 N when the helmet is mounted on the apparatus described in Appendix G and the retention system is loaded by a downward force of 500 ± 10 N either through a stirrup, as described in Appendix G, or a full headform, as appropriate.

6.6.4 *Partial engagement*

Partial engagement is the condition in which the looking sub-assembly of a quick-release mechanism appears to be correctly engaged even though the load-bearing members are not mechanically looked into their intended load-bearing condition.

If partial engagement is possible, then the parts partially engaged shall disengage completely when a tensile load of $10\ ^{+0}_{-1}$ N is applied to the load-bearing members.

NOTES

1. *In some designs the load-bearing members or their locking parts may be hidden from view.*

2. *If partial engagement is possible, there shall be some positive indication to the wearer that correct engagement has occurred.*

3. *This may be achieved by an indication continuously accessible to the wearer after engagement, or by an indication only at the moment of engagement. This momentary indication might, for example, be given by the feel of the action of the mechanism, but it is unlikely that an indication by sound would be adequate because of noise in the environment.*

6.6.5 *Durability of quick-release mechanisms*

When tested in accordance with Appendix M, quick-release mechanisms shall neither be fractured nor disengaged by the final loading procedure and shall then still be capable of operation.

6.7 TEST FOR PROJECTIONS AND SURFACE FRICTION (OBLIQUE IMPACT TEST)

6.7.1 These tests are not applicable to the head and neck support system as used in motor car sports.

6.7.2 An appropriate size of helmet shall be subjected to the test either by method A or by method B as prescribed in Annex N and shall meet the requirements given in 6.7.3 or 6.7.4.

6.7.3 Test for projections and surface friction (Method A)

6.7.3.1 Bar anvil

When the helmet is tested by the method described in Appendix N using the bar anvil, the peak longitudinal force measured on the anvil shall not exceed 2.5 kN, nor shall its integral with time exceed 12.5 N s for any of the specified impacts.

NOTE

This test is intended to assess the force caused by ··projections, for example visor fittings, screws, press studs and steps in the shell surface.

6.7.3.2 Abrasive anvil

When the helmet is tested by the method described in Appendix N using the bar anvil, the peak longitudinal force measured on the anvil shall not exceed 4 kN, nor shall its integral with time exceed 28 Ns for any of the specified impacts.

NOTE

This test is intended to assess the force caused by friction against the surface of the helmet. It is particularly applicable to selected areas of helmets, the shells of which either have significant variations of curvature or are made of more than one material.

6.7.4 Test for projections and surface friction (Method B)

6.7.4.1 For shear assessment the tested projection, shall shear away, shall be detached or alternatively shall not prevent the assessment bar from sliding past the projection. In all cases the bar on the horizontal carriage shall travel past the projection.

6.7.4.2 For friction assessment the abrasive carriage shall not brought to rest the helmet.

6.8 TEST FOR CHIN GUARD

When any chin guard is tested by the method described in Appendix Q, the maximum deceleration of the striker shall not exceed 300 g. The chin guard shall not develop or generate any additional hazard for the wearer and any internal padding shall remain in place.

NOTE
A second impact may be carried out from a drop height of 1. 5 m with the chin strap slack and 'the rear of the shell unsupported, but this is for information only and is not subject to a separate requirement.

6.9 AUDIABILITY TEST (OPTIONAL)

The helmet shall be tested for their sound attenuation properties by the method prescribed in Annex R and shall meet the requirements given in 5.3.2.2.

6.10 FLAMMABILITY (OPTIONAL)

If compliance with this clause is claimed (see 7.1 (g) and 7.2 (d), when subjected to the flame test described in Appendix S, the materials of the shell, the edge trim, any part of the lining that could be exposed to flame when the helmet is worn, and any part of the retention system, except for any strap, shall not burn with the emission of flame for a period exceeding 5 s after removal of the igniting flame. Any of these parts which would be in contact with the wearer shall not melt during the application of the igniting flame.

7 MARKING

7.1 Each helmet shall be legibly and durably marked in such a way that the following information is accessible to the user:

a) the type of helmet, i.e. type A or type B;
b) the year and either the quarter or the month of batch release;
c) the name or trademark of the manufacturer;
d) the country of origin of the helmet;
e) the code letter/s (size of helmet) and size range of the helmet;
f) the designation of the model; and
g) a claim of compliance with the optional flammability performance requirement if such a claim is made for the helmet (see 6.10).
h) either a statement that any helmet fitted with the head and neck support system (see 5.3.1) is for motor car sports use only: or a pictogram showing that the helmet is NOT for use by motor-cyclists
i) mass of the helmet including all accessories
j) to be marked as “Does not provide any additional protection to chin from impacts” if applicable (see 5.3.1.2)

NOTE
It is the intention that the marking remain legible throughout the lifecycle of the helmet.

7.2 Each helmet shall be legibly and durably marked in such a way that the following information is protected from obliteration and is accessible to the test examiner:
a) the type of helmet i.e. type A or type B.
b) the name or trademark, of the manufacturer;
c) the code designation for the production date or batch; and
d) a claim of compliance with the optional flammability performance requirement if such a claim is made for the helmet (see 6.10).

NOTES
1. It is the intention that the marking remain legible throughout the life cycle of the helmet.

2. The two types of marking required by 7.1 and 7.2 are for the information of the user and the test examiner respectively, and compliance may be achieved by a single type of marking satisfying both sets of requirements.

8 SAMPLING

Helmets for testing shall be sampled as specified in Appendix A.

9 INFORMATION TO USERS (LABELS)

9.1 Information label

Every helmet offered for sale shall bear on a single label attached to the helmet the following information.
a) The designation of the model;
b) Words to the following effect;
For adequate protection this helmet must fit closely. Purchasers are advised to secure the helmet and to ensure that it cannot be pulled or rolled off the head.
c) Words to the following effect:
This helmet is made to absorb some of the energy of a blow by partial destruction of its component parts and, even though damage may not be apparent, any helmet which has suffered an impact to the head in an accident or received a similarly severe blow or other abuse should the replaced.
d) Words to the following effect:
To maintain the full efficiency of this helmet there must be no alteration to the structure of the helmet or its component parts.
e) For helmets fitted with a single chin strap but no auxiliary strap, words to the following effect:
The chin strap must pass underneath the jaw and must be securely fastened to maintain tension all the time the helmet is in use; for helmet which are intended for use by motor – cyclists, be securely fastened to the head.

On no account must a chin cup be used with this helmet.

f) For helmets fitted with more than one strap, words to the following effect:

All those straps identified as essential must be securely fastened to maintain tension all the time the helmet is in use; for helmet which are intended for use by motor-cyclist, be securely fastened to the head.

For maximum safety and comfort all straps should be fastened.

g) For helmet& having a quick-release mechanism in the retention system, a detailed description of the methods of locking and unlocking and the method of adjustment, if any, of the mechanism.

h) The manufacturer's cleaning instructions and where required by 5.1.1, words to the following effect:

The protection given by this helmet may be severely reduced by the application of paint, adhesive stickers and transfers, cleaning fluids and other solvents.

USE ONLY MATERIALS RECOMMENDED BY THE HELMET MANUFACTURER

NOTE

It is preferable that the warning in the second sentence should be in either capital letters or bold type.

i) Where required by 5.5. words to the following effect:

This helmet has been designed for use with goggles but it may not accept all goggles, especially the larger ones. The user is advised to check the compatibility of goggles and helmet before buying.

j) Where required by 5.5 words to the following effect:

This helmet has been designed for use with a visor and may not be suitable with some types of goggles.

k) Where required by 5.3.1, words to the following effect:

This helmet has been designed for use with a head and neck support system and is intended for motor car sports use only. It must not be used by motor-cyclists.

9.2 Warning label

Every helmet having a shell made of a thermoplastics material shall bear a warning label, attached to the chin strap or to a suitable stud, bearing the words and in the layout of the label shown in Figure 5. The label shall consist of stiff card measuring at least 45 mm x 120 mm. The lettering shall be red on a white background and shall consist of the legend "WARNING" in 12 point bold capitals and 'Do not paint or apply solvents' in 24 point bold capitals. No other inscription or mark shall be placed on the same side of the card as this warning.

WARNING

DO NOT PAINT
OR APPLY SOLVENTS

FIGURE 5 – Warning label

9.3 Warning label for helmets with head and neck support systems

a) Every helmet fitted with a head and neck support system shall bear a warning label attached to the chin strap or to a suitable stud, bearing the words and in the layout of the label shown in Figure 6. The label shall consist stiff card measuring at least 45 mm x 120 mm. The lettering shall be red on a white background and shall consist of the legend “WARNING” in 24 point bold capitals and “This helmet has been designed for use with a head and neck support system and it intended for motor car sports use only. It must not be used by motor-cyclists.” in 12 point bold capitals. No other inscription or mark shall be placed on the same side of the card as this warning.

b) The point of sale packaging or box for the helmet shall carry the above detailed warning information in the described format. This shall be on the top and one side of the packing or box.

NOTE
The requirements of 9.1, 9.2, and 9.3 for two types of label may be achieved by two labels complying with all sets of requirements.

WARNING

THIS HELMET HAS BEEN DESIGNED FOR USE WITH A HEAD AND NECK SUPPORT SYSTEM AND IS INTENDED FOR MOTOR CAR SPORTS USE ONLY. IT MUST NOT BE USED BY MOTOR CYCLISTS.

FIGURE 6 – Warning label for helmet for motor car sports use

APPENDIX A
SAMPLING AND CRITERIA FOR CONFORMITY

The sampling scheme given in this Appendix should be applied where compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assured based 'on manufacturer's control systems coupled with type testing and check tests or any other procedure, appropriate schemes of sampling and inspection should be adopted.

A.1 DEFINITION

A.1.1 lot: In any consignment all the helmets for the' same type, size and of same material belonging to one batch of supply or manufacture shall constitute a lot.

A.2 SCALE OF SAMPLING

A.2.1 The samples shall be tested from each lot for ascertaining the conformity to the requirements of this specification.

A.2.2 The number of helmets to be selected from a lot shall be in accordance with the following table 3.

Table 3 – Scale of sampling

No. Of helmets In the lot (1)	No. of helmet To be selected (2)
Up to 500	8
501 to 1200	13
1201 to 3200	20
3201 to 10000	25
10000 to above	32

A.2.3 The helmets shall be selected at random. In order to ensure randomness of selection random numbers as given in SLS 428 shall be used.

A.3 TEST SEQUENCE

Tests and procedures to determine compliance with the requirement specified in 5.3.2.1, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 & 6.8 shall be carried out on each individual helmet in the following sequence:

a) removal of visors, goggles, detachable peaks and detachable face covers
b) examination for shell as specified in 5.3.2.1

c) solvent conditioning as described in A.4.1
d) exposure to the appropriate environmental conditions as described in A.4.2
e) tests of the helmet as specified in 6.1 and 6.2
f) tests of the chin guard as specified in 6.8
g) tests of the retention system as specified in 6.3, 6.4, 6.5, 6.6
h) visors, detachable peaks and detachable face covers may be refitted, if applicable, at the discretion of the test authority, and
i) oblique impact tests as specified in 6.7, unless the manufacturer has opted to supply additional helmets for this test.

If the manufacturer has opted to supply extra helmets for the oblique impact test the sequence for such helmets shall be (c), (d), (h), (i).

The retention system shall remain closed when impact absorption test, dynamic test of retention system and retention test are carried out.

NOTE

1. *Helmets shall be supplied for testing in the condition in which they are offered for sale and shall be accompanied by any accessories which are part of their original equipment.*
2. *Additional helmets and/or components may be required in order to carry out the other performance tests.*

A.4 TYPE OF CONDITIONING

Each type of helmet shall be conditioned as per the test requirement specified in this standard**.**

A.4.1 Solvent conditioning

Take a cotton cloth approximately 150 mm square and a quantity, approximately 25 ml, of a solvent consisting of a 50: 50 V/V mixture of Iso-Octane and Toluene (grade- 1) complying with ISO 5272. Using the cloth soaked in the solvent, apply the solvent to all those regions of the outside surface of the helmet shell within 50 mm of the chin strap fixings, and keep these regions wet with the solvent for not less than 5 s. Repeat the procedure on the remainder of the external surface including any chin guard, keeping these regions wet for not less than 10 s. Do not carry out any further conditioning or testing during the following 30 min.

NOTE
This conditioning is considered to seek out materials the strength of which is vulnerable to solvents, and may not be appropriate or necessary for quality control testing in the manufacture of helmet shells from materials which are known not to suffer significant degradation by the conditioning.

A.4.2 Environmental conditioning before testing

A.4.2.1 Temperature

Place the helmet in a conditioning enclosure, fitted with a fan which provides effective air circulation, so that the helmet touches only the support on which it rests. Maintain the temperature in the enclosure at 50 ± 2 ^{o}C for high temperature conditioning or -20 ± 2 ^{o}C,
For low temperature conditioning for a period of not less than 4 h and not more than 24 h.

A.4.2.2 Water immersion

Totally immerse the helmet in an inverted position in water at a temperature of (15 ± 5) °C for a period of not less than 4 h and not more than 24 h. After removal from the water, allow the helmet to drain in an upright position for a period of not less than 15 min and not more than 45 min before testing.

NOTE
The oven and the refrigerator must be large enough to ensure that the helmet do not touch one another or the sides of the equipment, and shall be fitted with a fan to provide effective air circulations.

A.5 TIME SCHEDULE FOR TESTING

The first test loadings for shock absorption shall be applied within 3 minutes of removal from the low and high temperature conditioning equipment. A draining time of 15 minutes to 45 minutes shall elapse after water immersion and before the first test loadings for shock absorption are applied.

The tests for shock absorption, penetration and retention system strength shall be completed within a total time of 20 minutes after removal from the low and high temperature conditioning equipment or after the elapsed draining time.

For helmets conditioned by water immersion, complete the shock absorption as well as the tests for penetration test and retention system strength within 60 minutes of completing the drainage procedure.

A. 6 NUMBER OF TESTS

A.6.1 Each helmet selected as in A.2.2 shall be inspected for marking requirements.

A.6.2 Each helmet inspected as in A.6.1 shall be tested for the requirements given in .5.1, 5.2, 5.3,5.4, 5.5 & 5.6.2

A.6.3 Two set of three helmet samples shall be tested for the performance requirements given in 6.1 to 6.8.

A.6.4 If necessary one helmet tested as in A.6.2 shall be tested for the requirement given in 6.9.

A.6.5 If necessary one helmet tested as in A.6.2 shall be tested for the requirement given in 6.10.

A.7 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied.

A.7.1 Each helmet inspected/testing as in A.6.1, A.6.2 and A.6.3 satisfies the relevant requirements

NOTES

1. *Visors, goggles, detachable face covers shall be removed before testing.*

2. *A helmet that has been tested shall neither be offered for sale nor worn by vehicle users.*

APPENDIX B
RECOMMENDED METHOD FOR ASSESSING AGEING OF HELMET SHELL MATERIALS

B.1 PRINCIPLE

A selection of helmets representative of those made with the material or surface coating to be investigated is exposed to natural sunlight and weather for 1 year. The helmets are then subjected to some of the test procedures specified for new helmets.

B.2 APPARATUS

The apparatus consists mainly of a stand located out of doors in an open unshaded position away from sources of gross pollution such as chimneys or heavy industrial works. The location is not more than 300 m above sea level. Means such as polyethylene sheeting are provided to protect the interior of the helmets against the ingress of rain. The stand is fitted with means for rigidly supporting the helmets at an appropriate angle.

B.3 SELECTION OF TEST SPECIMENS

Select a sufficient number of helmets to be representative of the shell material or surface coating under test.

If possible, choose colours which are likely to be most susceptible to weathering and avoid black or white helmets containing inorganic pigments.

B.4 PROCEDURE

Mount each complete helmet up right on the stand with its central vertical axis in the North to South plane and inclined towards the midday sun at 45^0 to the vertical. Protect the interior of the helmet against the ingress of rain. Leave the helmet exposed to sun and weather for one calendar year. Subject the helmet to low temperature conditioning as described in A.4.2.1. Subject the conditioned helmet to the shock absorption test described in Appendix D for helmet number 2 in Table 3 and using the appropriate impact velocity for its type. Record the condition of the shell and collect, for information purposes only, all the information which would normally be available as a result of carrying out the shock absorption test. Subject the same helmet to the retention system strength test either in Appendix J, for helmets with a chin strap, or in Appendix K for helmets without a chin strap and collect, for information purposes only, all the information which would normally be available as a result of carrying out the retention system strength test.

APPENDIX C
EXTENT OF SHELL AND PERIPHERAL VISION

C.1 PROCEDURE

a) Place the helmet on a headform of appropriate size which conforms to SLS 1069 (see 5.6).

c) Level the helmet so that the front horizontal edge of the shell above the wearer's face is, as far as possible, parallel to the basic plane at the front and sides of the headform and then secure the helmet.

d) Record the vertical distance at the front midpoint of the headform between its basic plane and the edge of the helmet above the face.

e) Check the provision for peripheral vision and assess visually the extent of the area of the shell against the lines marked on the headform.

APPENDIX D
SHOCK ABSORPTION TEST

D.1 PRINCIPLE

Impact attenuation is determined from the deceleration imparted to a helmeted headform when, after dropping in guided free fall, it impacts upon a fixed steel anvil having a flat or hemispherical impact face.

D.2 APPARATUS

The apparatus is shown in Figure 7.

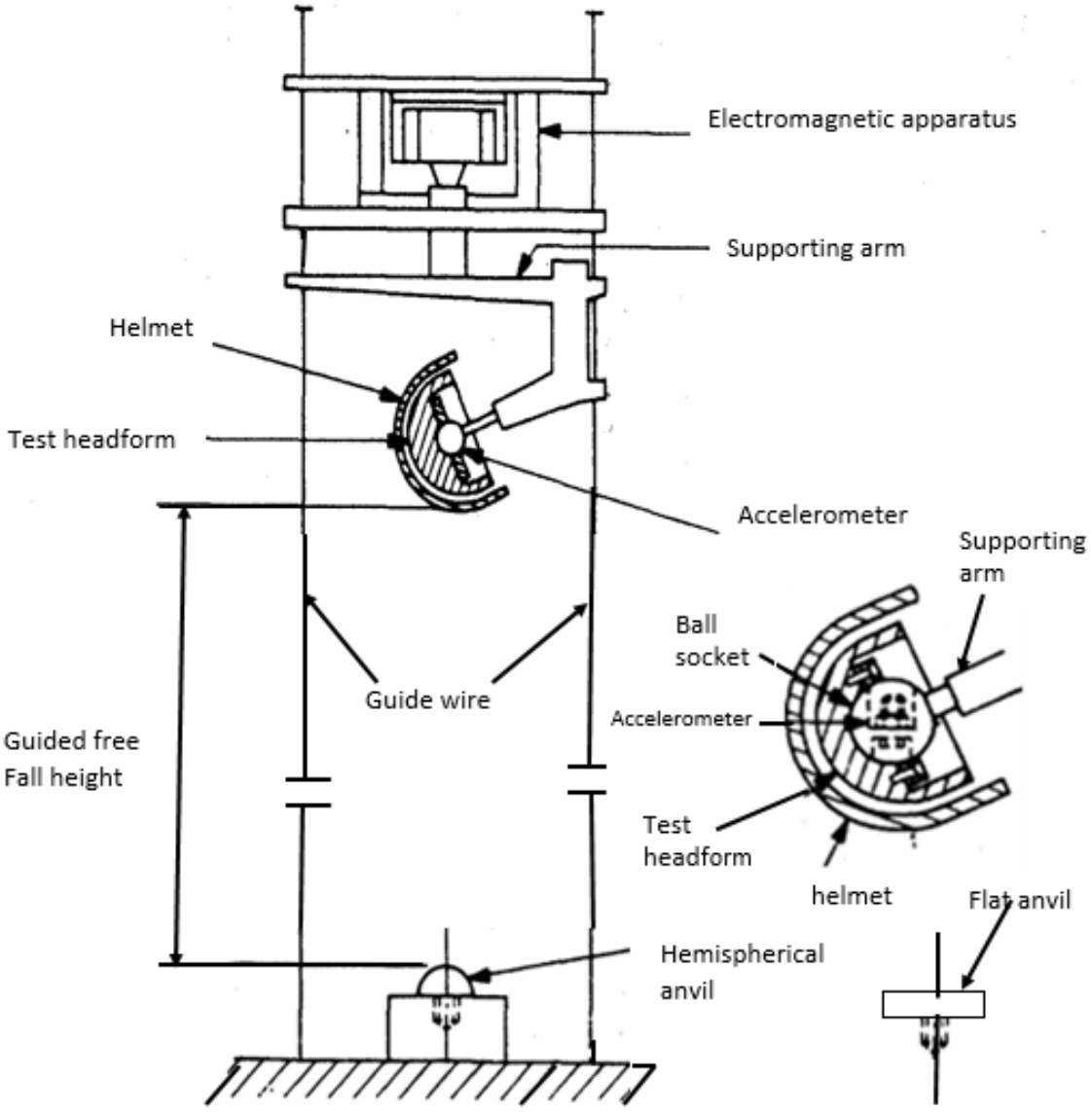


FIGURE 7 - Apparatus for testing shock absorption

An instrumented headform sizes complying with SLS 1069, down to the plane HH' is mounted on a carriage. The carriage can be dropped in substantially frictionless guided free fall onto an anvil mounted on a rigid base having a mass of at least 500 kg. The upper surface of the, base consists of a steel plate at least 25 mm thick with a minimum surface area of 0.1 m^2.

The headform can be rotated about a central ball-joint to present any part of a helmet to the rigid anvil. A deceleration transducer is mounted at the centre of gravity of the combined test headform and supporting assembly, with it sensitive axis aligned to within 5^o of vertical. The centre of gravity of the combined test headform and supporting assembly lies within a cone of 10^o included angle, having a vertical central axis and its vertex at the point of impact.

The total mass of the drop assembly without helmet is $5^{+0.2}_{-0}$ kg and the mass of the supporting assembly is not more than 20 % of the total mass of the drop assembly.

The flat steel Anvil has a circular impact face of diameter 130 ± 3 mm; the hemispherical steel anvil has an impact face of radius 50 ± 2 mm.

The velocity of the drop assembly is measured at a distance not exceeding 60 mm prior to impact, to an accuracy of ± 1 %.

The deceleration transducer is capable of withstanding a 2000 g shock without damage.

The measuring system, including the drop assembly, has a frequency response in accordance with channel frequency class (CFC) 1000 of ISO 6487.

D. 3 PROCEDURE

D.3.1 Instrumentation check

Check the measuring system before commencing helmet tests by impacting a suitable test piece with the head form, dropped from an established height, to produce a nominal deceleration of 300 g. Record at least three such impacts on each occasion of checking, these results shall lie within a range of ± 15 g.

D. 3.2 Sequence

Test two sets each consisting of three helmets in the sequence given in Table 3. Test each helmet by the procedure described in D.3.3 at three separate impact sites, separated on the helmet by a distance not less than one fifth of the maximum circumference of the helmet and located as follows:

a) at the rear or side, on or above the line AA^1 as described in D.3.4;
b) at any other site above the line AA and
c) at the front on the perimeter BB 1as described in D.3.4.

Make the front and rear impacts within 25 mm of the central longitudinal axis of the headform, and make the side impacts not more than 25 mm rearwards of the transverse plane through the central vertical axis of the headform.

D.3.3 Time schedule

For temperature-conditioned helmets, apply the first test loading to each helmet, as described in D.3.4, 40 ± 5 s after its removal from the conditioning enclosure. For immersion-conditioned helmets, complete the tests for shock absorption as well as those for penetration and retention system strength within 60 min of completing the drainage procedure.

TABLE 3 - Sequence of testing

Set Number (1)	Helmet number (2)	Conditioning (3)	Anvil face (4)
Set 1	1 2 3	High temperature Low temperature High temperature Or water immersion	Hemispherical Hemispherical Hemispherical Or flat
Set 2	4 5 6	High temperature Low temperature Low temperature Or water immersion	Flat Flat Hemispherical Or flat

D.3.4 Testing

Make the line AA' and the perimeter BB' on the outside of the helmet. The line AA' on the helmet is the line where the outer surface of the helmet intersects the horizontal plane AA' as defined in SLS 1069.

The perimeter BB' on the helmet is the line where the outer surface of the helmet intersects a cone ZBB' generated by rotating the -line ZB (see Figure 1. b) through 360^0 about an axis coincident with the central vertical axis. of the helmet. The 1ine ZB is a 1ine sloping upwards at an angle of 20^0 to the horizontal from the point Z, as defined in SLS 1069.

After conditioning, securely fasten the helmet on the test headform, then lock the headfrom in position with the required impact site presented to the anvil.

Deliver two impacts on the same impact site using the same anvil. If necessary, the helmet may be adjusted on the headform after the first impact to ensure that the second impact is on the same site. For each impact use a drop height such that the complete assembly strikes the anvil at the appropriate velocity specified in Table 4 with a tolerance of $^{+0.15}_{-0}$ m/s.

Measure the velocity of the impacting mass. Record the deceleration against time.

TABLE 4 – Impact velocities

Impact (1)	Anvil face (2)	Impact velocity	
		Type A helmet m/s (3)	Type B helmet m/s (4)
1st impact	Flat	7.5	6.5
	Hemispherical	7.0	6.0
2nd impact	Flat	5.3	4.6
	Hemispherical	5.0	4.3

APPENDIX E
PENETRATION TEST

E.1 PRINCIPLE

A spiked striker is dropped onto the upper part of the helmet. If the spike succeeds in reaching a simulated head inside, the helmet is deemed not to comply with this standard.

E.2 APPARATUS

A suitable apparatus is shown in Figure 8.

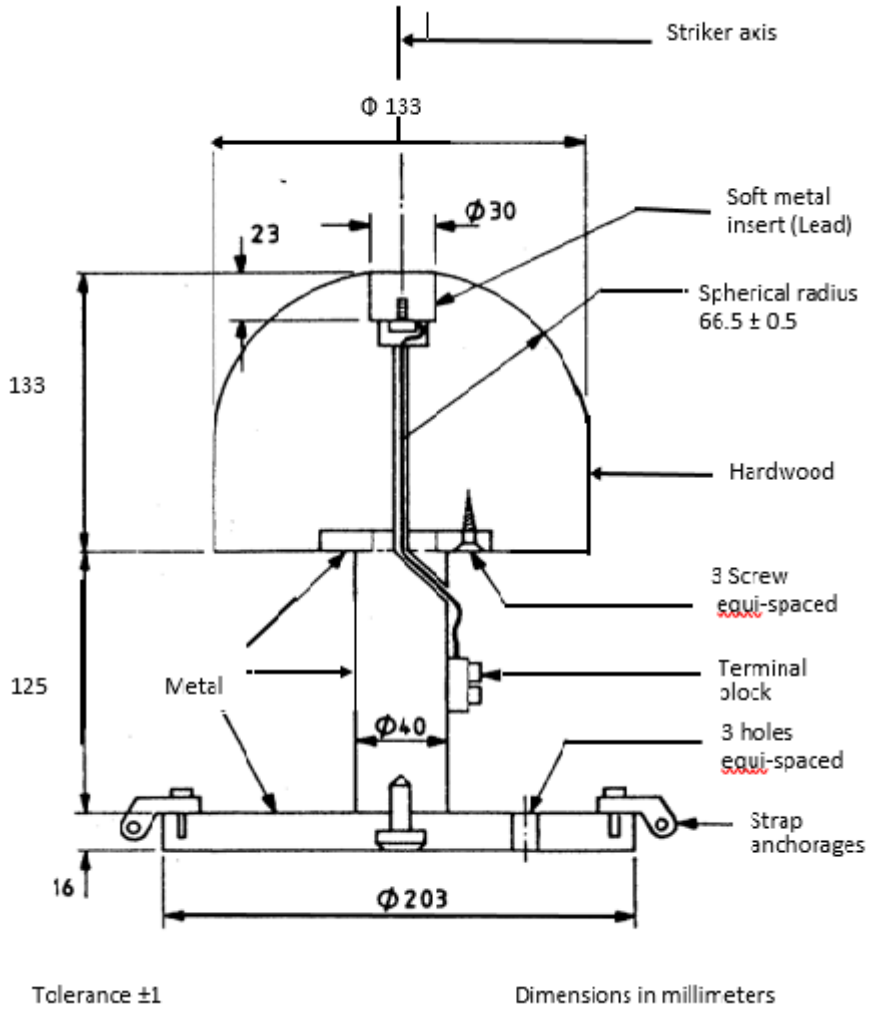


FIGURE 8 - Test block for testing penetration resistance

A hemispherical test block of hardwood with a soft metal insert at the top of its central axis is mounted on a rigid base. Straps are provided for securing the helmet. A pointed striker is mounted, point downwards, so that it can be dropped in substantially frictionless guided fall onto the centre of the soft metal insert. The striker and the soft metal insert are so connected that any electrical contact between them is indicated.

The striker has the following characteristics:

Mass	3.0 kg $^{+45}_{-0}$ g
Angle of point	60 ± 0.5^0
Radius of point	0.5 ± 0.1 mm
Minimum height of cone	40 mm
Hardness of tip	Between 50 and 45 Rockwell

E.3 PROCEDURE

Secure the helmet to the rigidly mounted test block by anchoring the straps over the helmet. Allow the striker to fall freely from a height of 3 m ± 5 mm for Type A helmets or 2.0 m ± 5 mm for Type B helmets (measured from the tip of the striker to the point of impact) on to the, helmet at two sites at least 75 mm from each other and from the centers of the impact sites used for the shock absorption test (see 6.1). Note whether or not electrical contact is made between the striker and the soft metal of the test block. After each impact restore the original flat surface of the soft metal if necessary.

For helmets conditioned by water immersion, complete the penetration test as well as the tests for shock absorption and retention system strength within 60 min of completing the drainage procedure.

APPENDIX F
TEST FOR EFFECTIVENES OF RETENTION SYSTEM

F.1 TEST FOR EFFECTIVENES OF RETENTION SYSTEM (METHOD A)

F.1 PRINCIPLE

The helmet, mounted firmly on an appropriate modified headform by means of its retention system, is subjected to a tangential shock load in a forward direction, at the crown of the helmet, which simulates the inertial tendency of the helmet to lift and roll forward over the wearer's face when the wearer stops suddenly.

F.1.1 APPARATUS

F.1.1.1 Modified headform

A suitably modified headform is illustrated in Figure 9 before modification the headform complies with SLS 1069 size 565 mm. The top of this headform down to the line LCEH/ in Figure 9 is covered by an acrylic wig cut to a hair length of 70 mm simulating a human head of hair.

The point L is 40 mm above the line AA', and the point H' lies on the backward extension of the line DE (see Figure 3 (a). The circumference of the headform outside the wig is 575 ± 5 mm, which lies with $^{+0}_{-10}$ mm of the circumference of the headform which the helmet is intended to fit, and correction to size 585 mm.

The neck of the standard headform is lengthened by 50 mm. The front of the throat and the underside of the jaw are replaced by polyethylene foam of density 40 kg/m^3 • The foam extends

12 mm below the chin of the unmodified headform, while above and to the rear it is bounded by two, planes perpendicular to the longitudinal vertical plane. One boundary plane is vertical and is located 30 mm rearward of the front of the neck, while the other slopes upwards towards the rear of the headform at an angle of 70° to the vertical and passes through the point of the chin of the unmodified headform.

A simulated collar-bone is rigidly fixed to the front of the neck at the base. It consists of a rectangular block of wood 16 ± 1 mm thick protruding 40 ± 1 mm from the cut-away face of the neck and with its lower face coplanar with the base of the neck (see Figure 9).

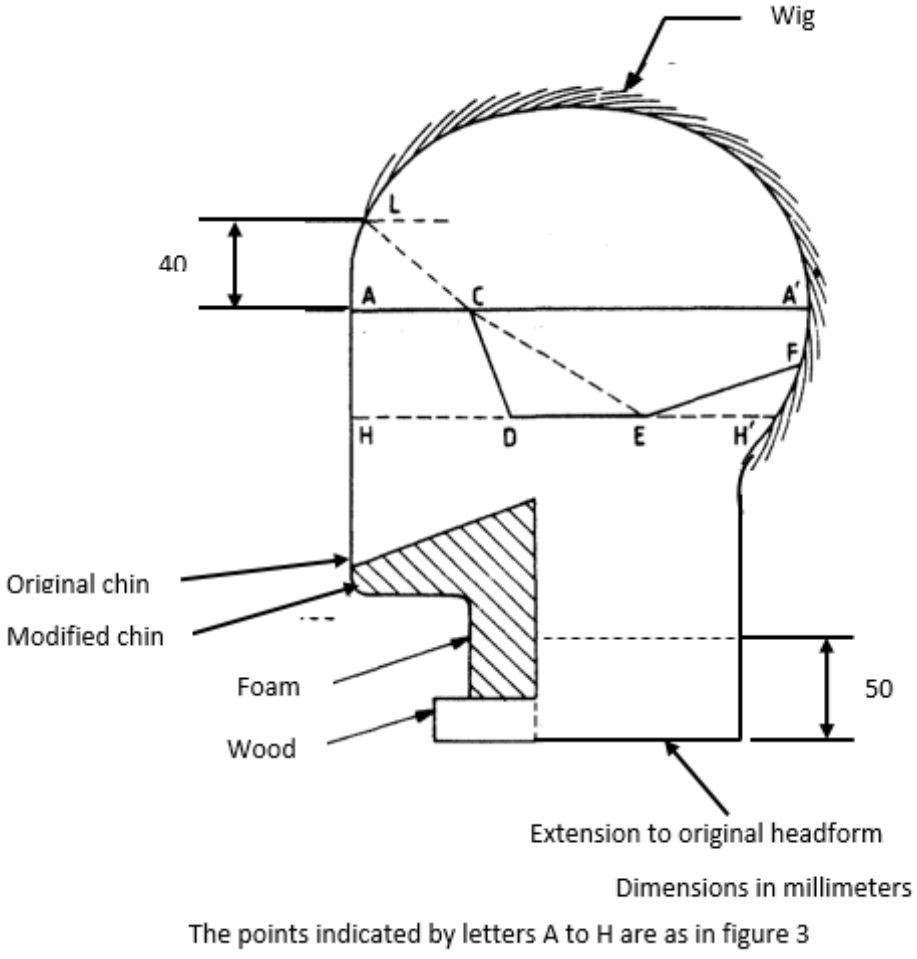


FIGURE 9– Modified headform for testing retention system effectiveness

F.1.2 Test Rig

A suitable test rig is illustrated in Figure 10.
The modified headform is rigidly mounted, facing downwards, with its central vertical axis tilted downwards 45^0 below the horizontal. A drop weight of as $4\ ^{+0.2}_{-0}$ kg can slide freely on two vertical guide wires close to the crown of the headform. The drop weight is connected to

a hook by a flexible strap 0.9 ± 0.1 m long which increases in length by no more than 18 mm when subjected to a tension of 1000 N.

NOTE
Vehicle seat-belt webbing has been found suitable.

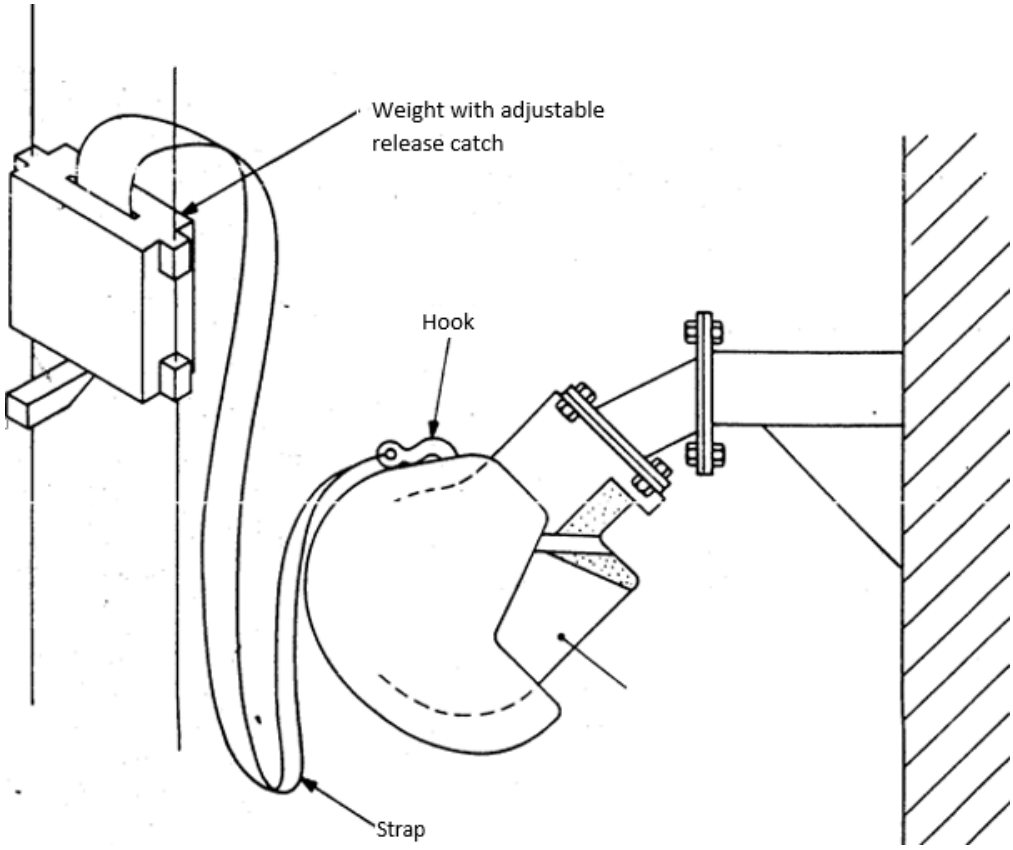


FIGURE 10 - Apparatus for testing retention system effectiveness

F.1.3 PROCEDURE

Select a helmet complying with SLS 1069 and of nominal size 585 mm, and check the internal dimensions of the helmet with a suitable instrument such as a hatter's band.

The helmet should have, an internal circumference of at least 580 mm and an internal length of at least 204 mm.

Mount the helmet on the modified headform (F.2.1) in the rig (F.2.2) and fasten the retention system. If there is no chin strap, or there is more than one strap, fasten the retention system in accordance with the manufacturer's instructions. Adjust the retention system so that it compresses the chin or neck foam by 5 ± 1 mm.

Raise the drop weight and engage the hook in the centre of the rear edge of the helmet and drape the strap over the crown of the helmet, keeping strap and hook in the longitudinal vertical plane. Release the weight from such a point that it falls through 1 $^{+0.1}_{-0}$ m before the strap becomes taut. Repeat the drop twice more, readjusting the retention system before each drop.

Observe whether the helmet has rolled forward off the headform and if possible, note those factors in the design or behavior of the helmet which have contributed to success or failure in this test.

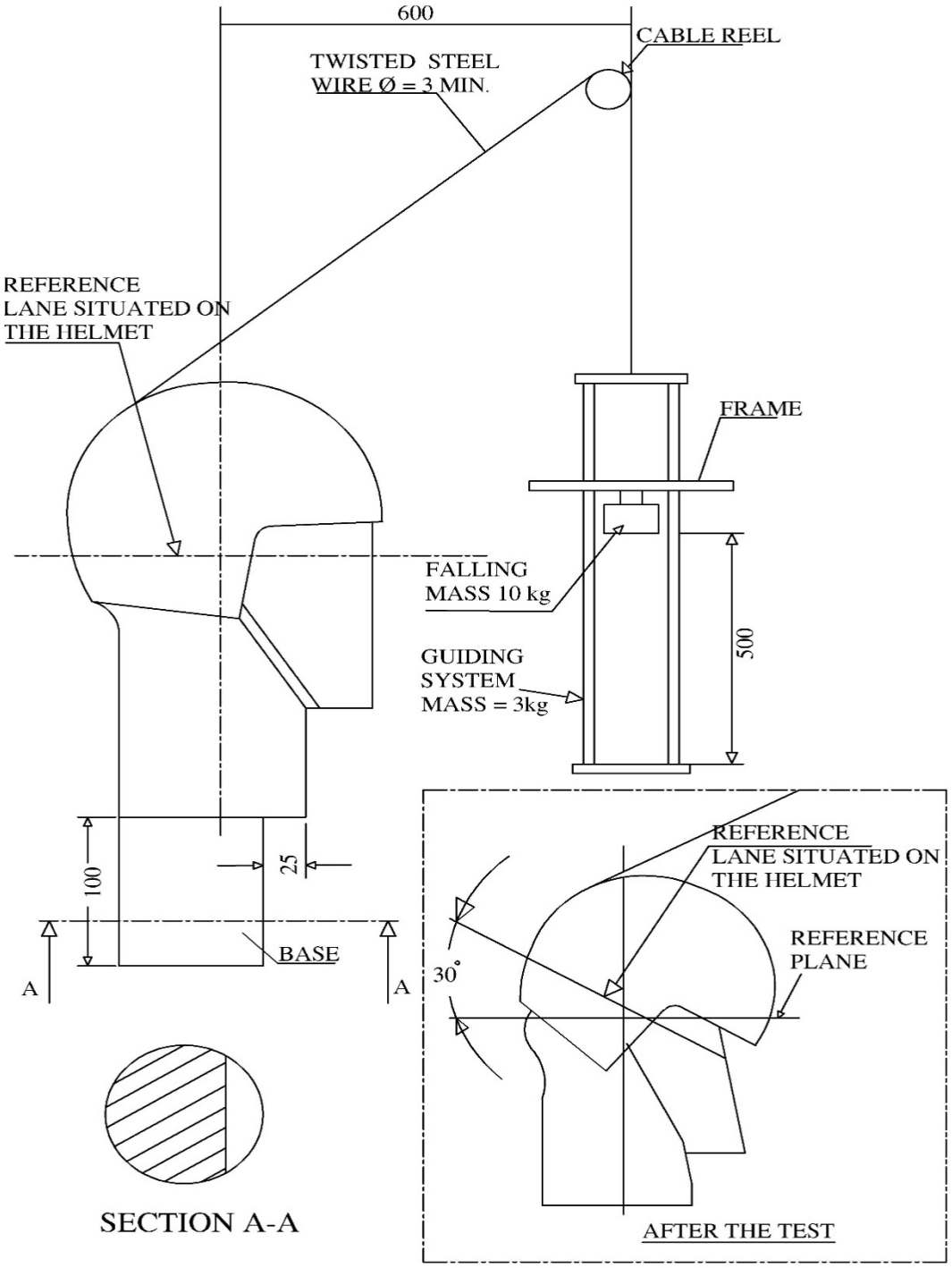
F.2 TEST FOR EFFECTIVENES OF RETENTION SYSTEM (METHOD B)

F.2.1 PROCEDURE

The helmet shall be placed on and secured to the appropriate headform, selected from those listed in Table 1 in accordance with 5.6.2. The helmet shall then be tipped towards the rear so that the front edge of the helmet in the median plane is displaced by 25 mm, the retention system includes an adjustable chinstrap, and the strap is tightened as for normal use.

.
A device to guide and release a failing mass (the total mass being 3 kg ± 0.1 kg is hooked on the rear part of the shell in the median vertical plane of the helmet as shown in Figure 11.

The falling mass of 10 kg ± 0.1 kg is then released and dropped in a guided free fall from a height of 0.50 m ± 0.1m. The guiding device shall be such as to ensure that the impact speed is not less than 95 % of the theoretical speed.



All dimensions in Millimeters.

Figure 11: Retention test apparatus

APPENDIX G
TEST FOR STRENGTH OF RETENTION SYSTEMS WITH CHIN STRAPS

G.3 PRINCIPLE

A downward shock load is applied twice to the chin straps on a helmet. Dynamic and static extensions and slippage of the strap are observed.

G.2 APPARATUS

A suitable apparatus is shown in Figure 12.

A support is provided for the base of the brim of the helmet under test and an additional support is provided for a headform.

NOTE

For this test the headform is used only for positioning purposes and is not required to withstand a substantial loading. It may, therefore, be made of material other than metal or wood (for example polyurethane) and need be of the shape described in SLS 1069 down to the reference plane only.

Below the approximate chin strap position, a guide bar is mounted in guides which maintain it in a vertical position while permitting substantially frictionless vertical movement. The upper end of the bar carries two parallel horizontal rollers capable of free rotation, each 12.5 ± 0.5 mm in diameter and at 76.0 ± 0.5 mm canters separation this arrangement is considered to approximate to the bone structure of a human lower jaw.

Means are provided for measuring both the maximum dynamic vertical extension and the static residual vertical extension of any chin strap looped under the rollers. This may be achieved by attaching to the guide bar a displacement transducer and a pointer indicating against a fixed vertical scale.

An anvil having a horizontal upper surface cushioned by a pad of foam 10 ± 2 mm thick ls rigidly mounted on the guide bar.

NOTE

Polyethy1ene foam with a bulk density of 40 kg/m3 has been found suitable.

A drop weight of mass $10\ ^{+0.25}_{-0}$ kg can be slid up the bar and dropped onto the anvil in substantially frictionless fall through a distance of at least 750 mm.

The total mass of the guide bar and all its attachments excluding the drop weight is $7.0\ ^{+0}_{-.25}$ kg.

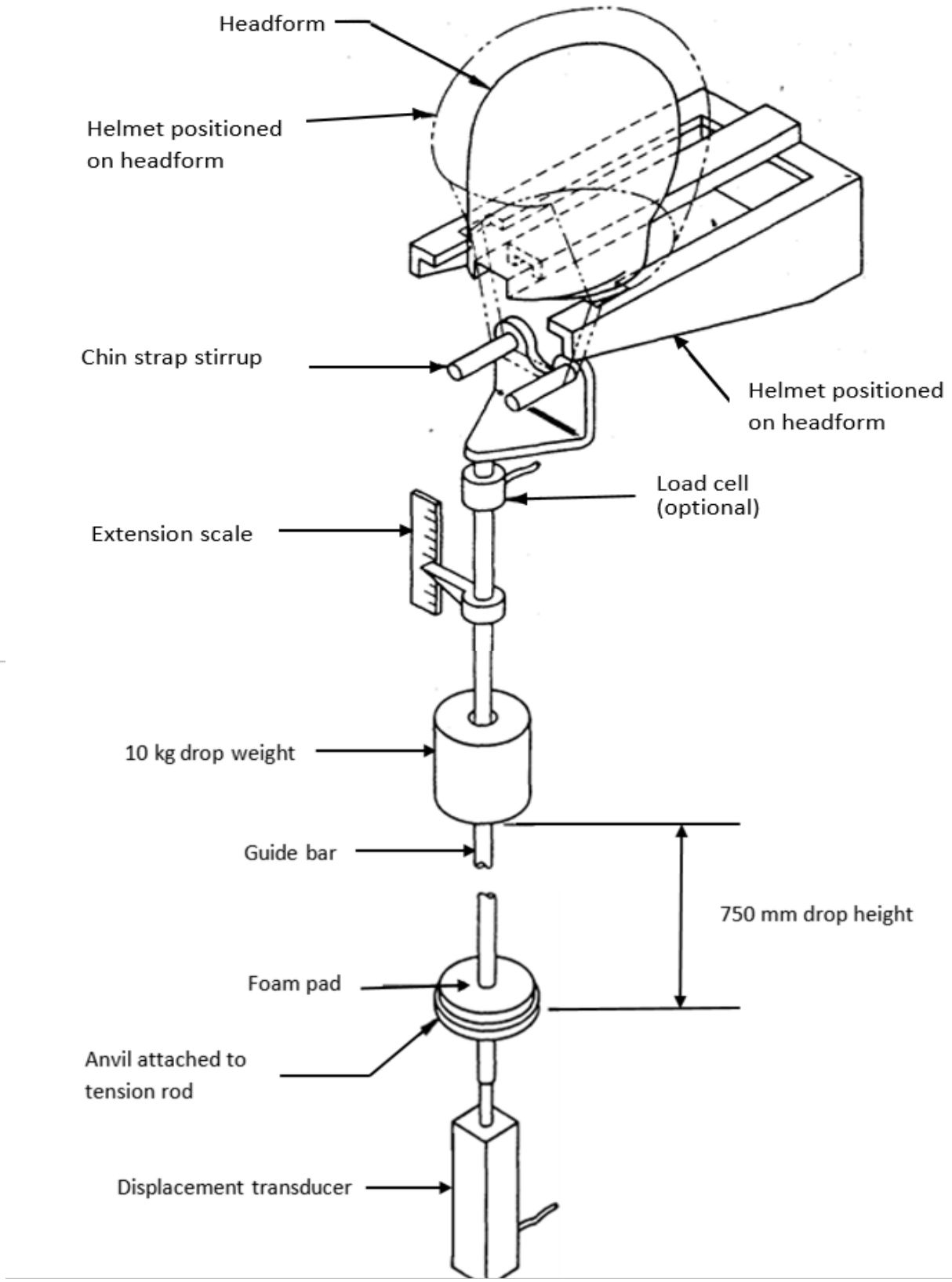


FIGURE 12 – Apparatus for testing retention system strength

G.3 PROCEDURE

Place the helmet with its base resting on the helmet support and adjust the headform to steady the helmet in such a position that when the fastened chin strap is pulled vertically downwards it lies in the same ' vertical plane as the guide bar. With the drop weight in its raised position, the chin strap is fastened under the rollers so that-the chin strap supports the weight of the guide bar and anvil, and the buckle is not in contact with the rollers. It is recommended that the rollers should be approximately 130 mm below the headform reference line.

Read or set to zero the static extension measuring device and mark the position of the buckle on the chin strap. Allow the drop weight to fall on to the anvil through a height of 750 ± 5 mm, including the thickness of the foam pad. Read the peak dynamic extension and while the drop weight rests on the anvil re-read, or read and set to zero, the static extension measuring device.

NOTE
Extension includes any slippage of the buckle.

Without disturbing the helmet or chin strap, raise the drop weight and repeat the impact. Read the peak dynamic extension and, while the drop weight rests on the anvil, note the static extension. Re-mark the position of the buckle on the chin strap.

Record the peak dynamic extension and static extension for each impact separately and the total slippage of the buckle.

For helmets conditioned by water immersion, complete the test for retention system strength as well as those for shock absorption and penetration within,60 min of completing the drainage procedure.

APPENDIX H
TEST FOR CHIN STRAP SLIPPAGE

H.1 Principle

Tension in the fastened strap is repeatedly applied and relaxed. Any progressive movement of the fastener along the strap is observed.

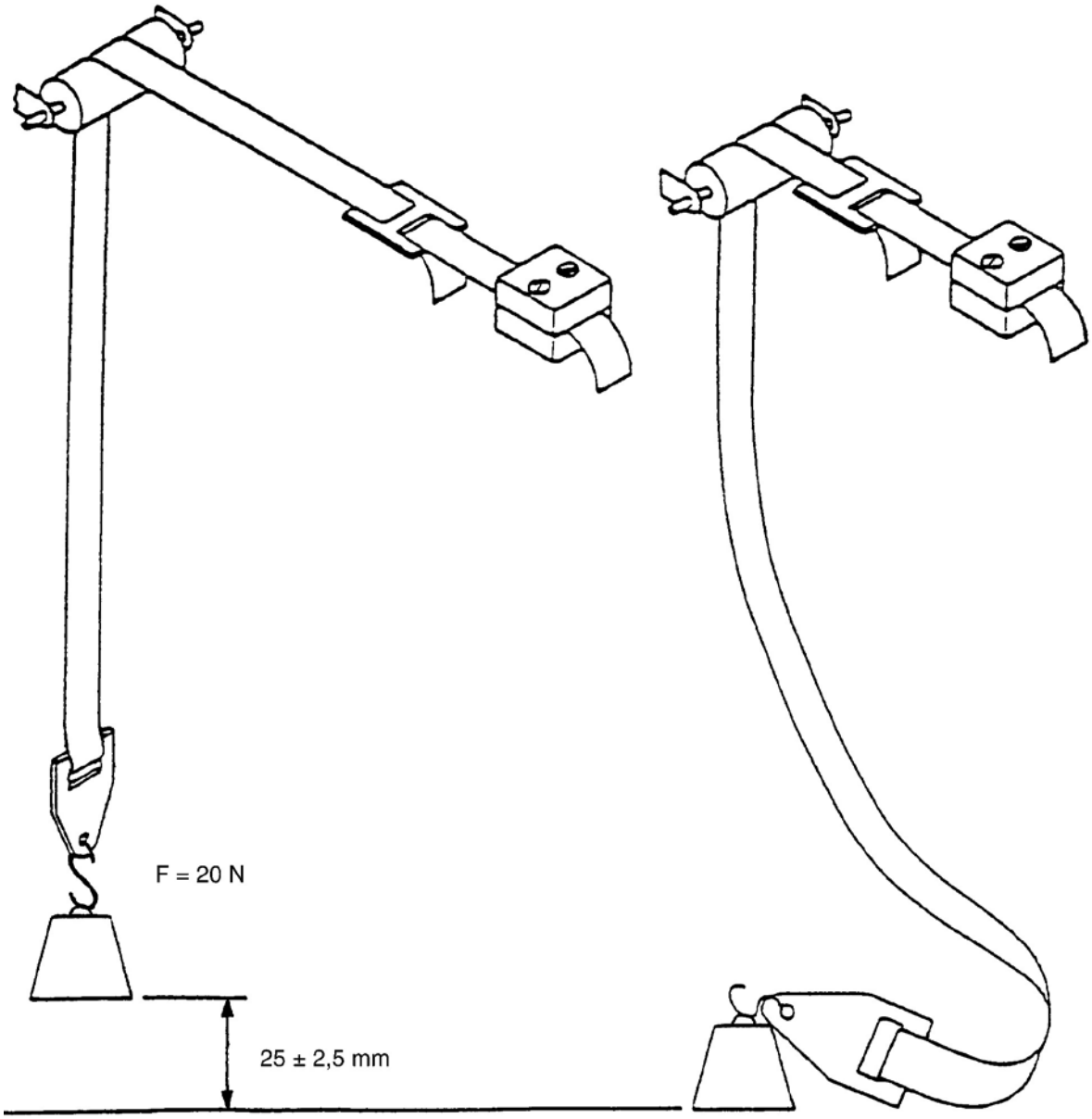


FIGURE 13 - Apparatus for testing slippage of the chin strap

H.2 APPARATUS

A suitable apparatus is shown in Figure 13.

The apparatus consists of a flat horizontal robust base. a weight for applying a load. a freely rotatable horizontal roller of diameter not less than 20 mm, and in the same horizontal plane as

the top of the roller a clamp capable of reciprocating horizontal motion at right angles to the axis of the roller with a total amplitude of 50 ± 5 mm at a frequency between 0.5 Hz and 2 Hz.

H.3 PROCEDURE

Take a sample of the strap at least 300 mm long. including the tensioning and adjusting device and any additional strap fastening. Fix the upper end of the strap to the reciprocating clamp level with the top of the roller and drape the strap over the roller. Attract a weight to the lower end of the strap so that when the weight is lifted by the strap it impose a tensile force of 20 ± 1 N. Adjust the apparatus so that when the reciprocating clamp is at the centre of its motion the weight is just resting on the base with the strap barely in tension and the strap buckle is between the clamp and roller and will not touch the roller during reciprocation.

Operate the reciprocating clamp for 20 cycles. Note the position of the components on the strap. Operate the reciprocating clamp for 500 cycles then record the distance through which the components have slipped along the strap.

APPENDIX J
TEST FOR RESISTANCE TO ABRASION OF THE CHIN STRAP

J.1 PRINCIPLE

The strap is repeatedly slid through its own adjuster or fitting and significant abrasion of the strap by the adjuster or fitting is detected by a tensile strength test.

J.2 APPARATUS

A suitable apparatus for the abrasion procedure is shown in Figure 14. It is similar to that described in Appendix H except that the amplitude of motion is 100 ± 10 mm and the strap passes over a representative surface of the associated adjuster or other strap fitting through an appropriate angle.

J.3 PROCEDURE

Select an arrangement of the apparatus appropriate for the particular design of both the strap and the fitting likely to cause abrasion. Grip one end of the strap in the oscillating clamp, arrange the strap to be threaded through the fitting as designed and hang a weight on the end to tension the strap with a force of 20 N. Mount or otherwise steady the fitting in such a position that movement of the oscillating clamp slides the strap through the fitting, in a manner simulating slippage of the fitting on the strap when the helmet is on the head.

Oscillate the clamp for a total of 5000 cycles at a frequency between 0.5 and 2 Hz'

Mount the abraded strap in a tensile testing machine using clamps which avoid local breakage of the strap, and so that there is a length of 150 ± 15 mm of strap, including the abraded portion,

between the clamps. Operate the machine to stretch the strap at a speed of 100 ± 20 mm per minute until the tension in the strap is 3 kN (or to prior failure).

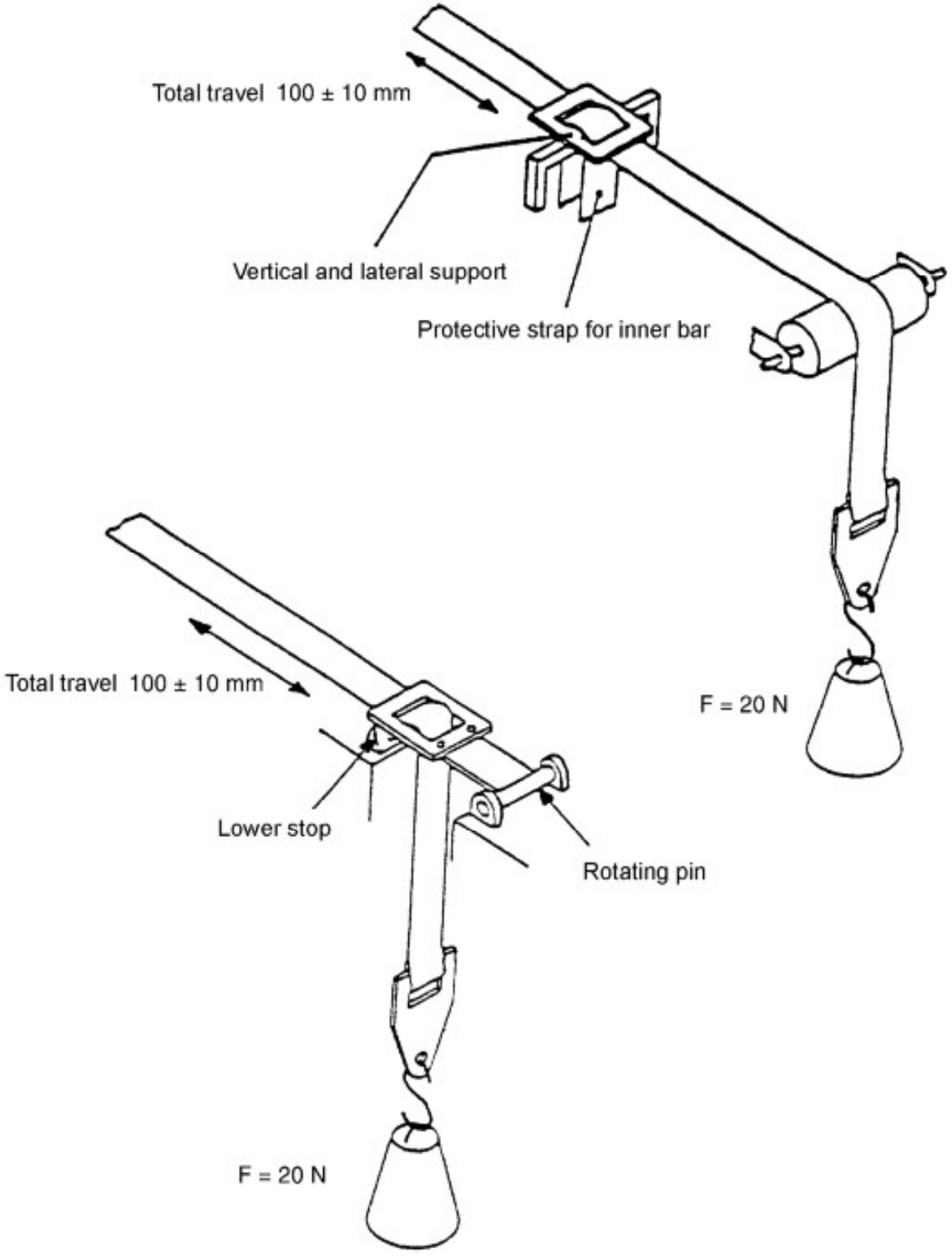


FIGURE 14 -Apparatus for testing abrasion of the chin strap

APPENDIX K
TEST FOR STRENGIH OF RETENTION SYSTEMS WITHOUT CHIN STRAPS

K. 1 PRINCIPLE

A downward shock load is applied twice to the retention system by means of the lower part of a horizontally divided headform. Displacement of the lower part of the headform is observed.

K. 2 APPARATUS

A suitable apparatus consists of that described in Appendix G and shown in Figure 12 but with the chin strap stirrup and all parts above it replaced by the following as shown in Figure 15.

A full headform complying with SLS 1069 size is divided horizontally along the plane AA' (see Figure 3). The upper part is rigidly mounted on vertical supporting bars which pass through slots in the lower part. The lower part contains a pivot to which the guide bar of the testing apparatus (see Figure 15) can be attached. The support bars, the slots and the pivot allow the lower part of the headform to slide freely up and down, and to rotate through ± 22.5^0 off the vertical in the longitudinal vertical plane.
The total mass of the guide bar, the anvil and the lower part of the headform is 7.0 $^{+0}_{-0.25}$ kg.

K.3 PROCEDURE

Place the helmet so that it is supported on the upper half of the headform. Adjust the angle of the lower headform and fasten the retention system so that it makes contact with the lower headform in the manner that it is intended to make contact with the human head in use, and so that it supports the weight of the guide bar.

-
Allow the drop weight to fall on to the anvil through a height of 750 ± 5 mm including the thickness of the foam pad.

Without disturbing the helmet or retention system, raise the drop weight and repeat the impact. Note the displacement of the lower part of the headform.

For helmets conditioned by water immersion, complete the test for retention system strength as well as those for shock absorption and penetration with 20 min of completing the drainage procedure.

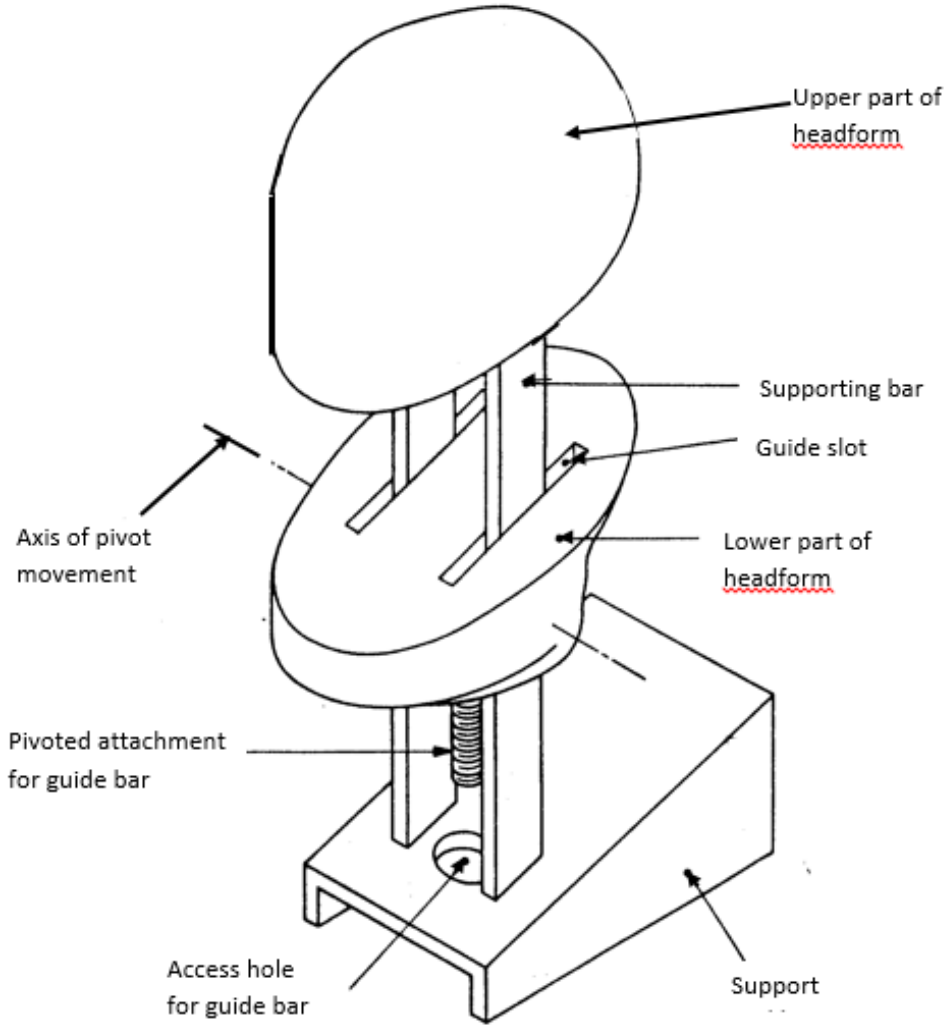


FIGURE 15 - Headform arrangement for testing strength of retention systems without chin straps

APPENDIX L
TEST FOR RESISTANCE TO INERTIAL RELEASE OF QUICK-RELEASE MECHANISM, OR 'BUCKLE'

L.1 Principle

The buckle is given a sharp jerk in any direction likely to jerk it open. Any disengagement is observed.

L.2 Apparatus

A suitable apparatus is shown in Figure 16.

The apparatus consists mainly of a base carrying vertical low-friction guides between which slides a carriage having projecting brackets on its upper surface for mounting the buckle under test.

The base has a mass of at least 200 kg and the top of the base consists of a flat horizontal plate of steel at least 25 mm thick. The guides may be wires, on which low friction bushes slide, guiding and orientating a stirrup to which the carriage is attached to maintain a horizontal lower surface.

The carriage is of aluminium and has a mass of 5.0 ± 0.2 kg, and its lower surface is shaped to present a flat horizontal impact surface of the carriage measures 100 ± 5 mm. the upper horizontal surface of the carriage measures 100 ± 5 mm by 140 ± 5 mm and carries projections for mounting the test buckle in any appropriate orientation.

Means are provided for lifting and releasing the carriage.

L.3 PROCEDURE

Separate the buckle from any straps and from the helmet and mount the buckle in contact with the upper surface of the carriage, so orientated that the inertial shock will have a maximum tendency to trigger the disengagement mechanism of the buckle.

If mounting the buckle in this orientation either obstructs the motion of its operating parts of fail to support the main body of the buckle securely on the flat surface of the carriage, then additional rigid supports may be inserted between the buckle and the carriage to permit such motion or to prevent movement of the main body of the buckle on impact.

Connect the strap-attachment points of the buckle to the mounting projections of the carriage by elastic bands which apply a disengagement force of 2.5 ± 0.5 N.
Raise the carriage and allow it to fall freely onto the base through a vertical distance of $1.0\ ^{+0.01}_{-0}$ m. Note whether the mechanism has disengaged. If a further test drop is to be carried out, readjust the mechanism and its supports as necessary.

Carry out a total of three such drops for each orientation of the buckle which ‘is likely to cause inertial disengagement.

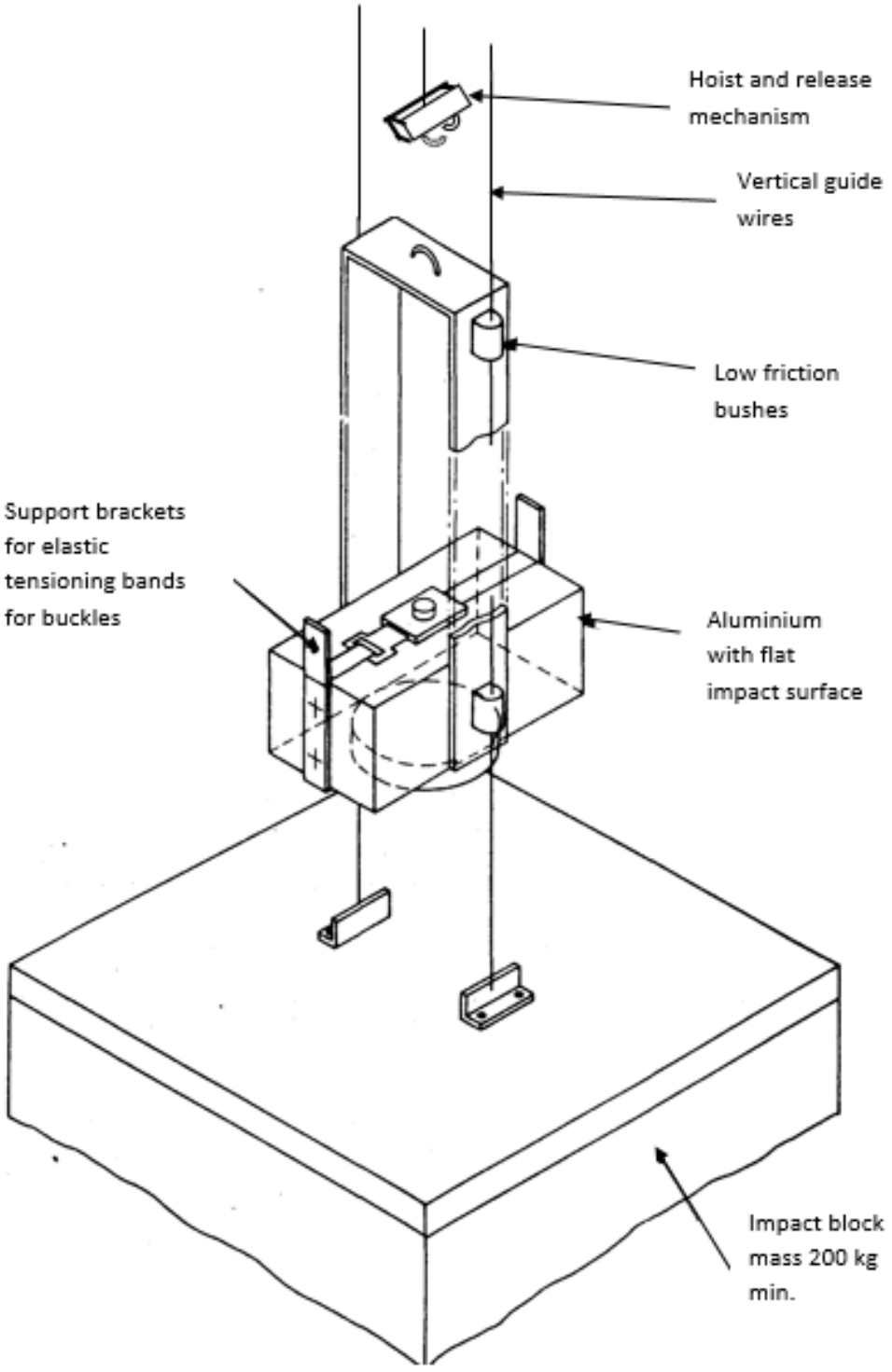


FIGURE 16 - Apparatus for testing resistance to inertial release of buckles

APPENDIX M
TEST FOR DURABILITY OF QUICK-RELEASE MECHANISM

M. 1 PRINCIPLE

The mechanism is repeatedly fastened and unfastened under load both before and after a corrosion procedure. A tensile strength test is then applied.

M.2 PROCEDURE

Subject the quick-release mechanism to the following procedures in the order given.

a) using apparatus appropriate to the particular design of mechanism carry out the following procedure. Close and lock the mechanism. Apply a loading force of 20^{+5}_{-0} N in the direction in which the mechanism is designed to bear load, then unlock and disengage the mechanism under load. Complete this cycle in not less than 2 s. Repeat for a total of 5000 cycles.

b) If the quick-release mechanism incorporates metal components carry out the following procedure.

Place the complete mechanism in a closed cabinet so that the mechanism can be continuously wetted by a spray while still allowing free access of air to all parts of the mechanism. subject the mechanism to a spray of a solution consisting of 4 per cent (m/m) to 6 per cent (m/m) of reagent grade sodium chloride in distilled or deionized water for a period of 48 ± 1 h at a temperature of 35 ± 5 ° C. Rinse the mechanism thoroughly in clean running water to remove salt deposits and allow it to dry for 24 ± 1 h.

Repeat the procedure in (a) above.

d) Apply a loading force to the mechanism of 2 kN ± 50 N in the direction in which the mechanism is designed to bear load.

APPENDIX N
PROJECTIONS AND SURFACE FRICTION (OBLIQUE IMPACT TEST)

N.1 TEST FOR PROJECTIONS AND SURFACE FRICTION (METHOD A)

N.1.1 PRINCIPLE

The rotation-including forces which result when an unrestrained helmeted headform is dropped vertically on to an inclined anvil are measured in the longitudinal axis of the anvil. Both the-peak force and its integral with time over the duration of the positive impulse
are used as performance criteria.

N.1.2 APPARATUS

A suitable apparatus is illustrated in Figure 17. It is comparable to that used for the shock absorption test (Appendix D) except that the helmeted headform is suspended within a webbing harness permitting free rotation and the anvil is inclined. The headform is a full headform complying with size 575 mm of SLS 1069 and of mass 5 $^{+0.2}_{-0.2}$ kg and is effectively of uniform density.

The apparatus has a rigid base having a mass of at least 500 kg and a minimum surface area of 0.1 m^2. An anvil is mounted securely at· an angle of 15^0 to the vertical with provision for fore-and-aft adjustment. The anvil has a minimum width of 200 mm and is adaptable to carry either of two different impact surfaces as follows. The bar anvil consists of a series of at least 5 horizontal bars at 40 mm centers. Each bar is made from a 6 x 25 mm steel strip with its uppermost edge machined to a 1 mm radius and the lower 15 mm of its face chamfered at an angle of 15° so that, as mounted, the upper edge of each bar is fully exposed from vertically above. The bars are case hardened to a depth of approximately 0.5 mm. The abrasive anvil is a sheet of grade 80 closed-coat aluminium oxide abrasive paper with a minimum supported length of 225 mm and is securely clamped to the base of the anvil to prevent slippage.

The anvil is fitted with force transducers connected to recording apparatus so that its transmitted longitudinal force component can be measured and continuously recorded with an accuracy of ± 5 % during a glancing blow to any part of its exposed surface.

The measuring system including the anvil assembly as a frequency response in accordance with channel frequency class (CFC) 1000 of ISO 6487.

A suitable energy-absorbing base and catch net are provided to prevent damage to the helmet after the impact.

N.1.3 PROCEDURE

Check the measuring system by the use of suitable commercial calibration apparatus before starting tests.

Fasten the helmet securely to the headform by means of its retention system so that the peripheral vision requirements of 5.4 are satisfied. Orientate the helmeted headform in its guiding apparatus so that the required impact site is in contact with the upper part of the face of the anvil. Raise the helmet assembly and allow it to drop from such a height (approximately 5.2 m) that its velocity when contacting the anvil is $10^{+0.2}_{-0}$ m/s . Observe by means of the recording apparatus the. continuously changing transmitted anvil force during the impact. Examine the helmet for damage to confirm that impact occurred at the intended size on the helmet.

Tests may be carried out on a single size of helmet to suit the size 575 mm headform, provided that other sizes of the same helmet type are, identical in all respects other than shell size. Test the helmets as many times as necessary to ensure that all significant projections are evaluated. Re-orientate the helmet as necessary to allow impact from any relevant direction. The rim of the shell does not constitute a projection for the purpose of this test. Test a helmet in any condition in which it may be worn, that is both with and without detachable components such as visors, peaks, etc. that are supplied as original equipment, except that if a visor is fitted for the test, keep it in the closed position.

When the abrasive anvil is used as specified in 6.7.3.2 evaluate area of shell which cover the greatest range in the shell's radius of curvature.

NOTES

1. *Helmets which have complied with the requirements for the shock absorption, penetration and retention system strength specified in 6.1, 6.2 and 6.4.1 may be used for oblique impact testing unless the manufacturer has opted to provide sufficient number of additional helmets.*

3. *If valid comparisons are to be made for information purposes between absolute values observed with the two anvils, it is important that the areas tested with the two anvils should be adjacent and of the same material.*

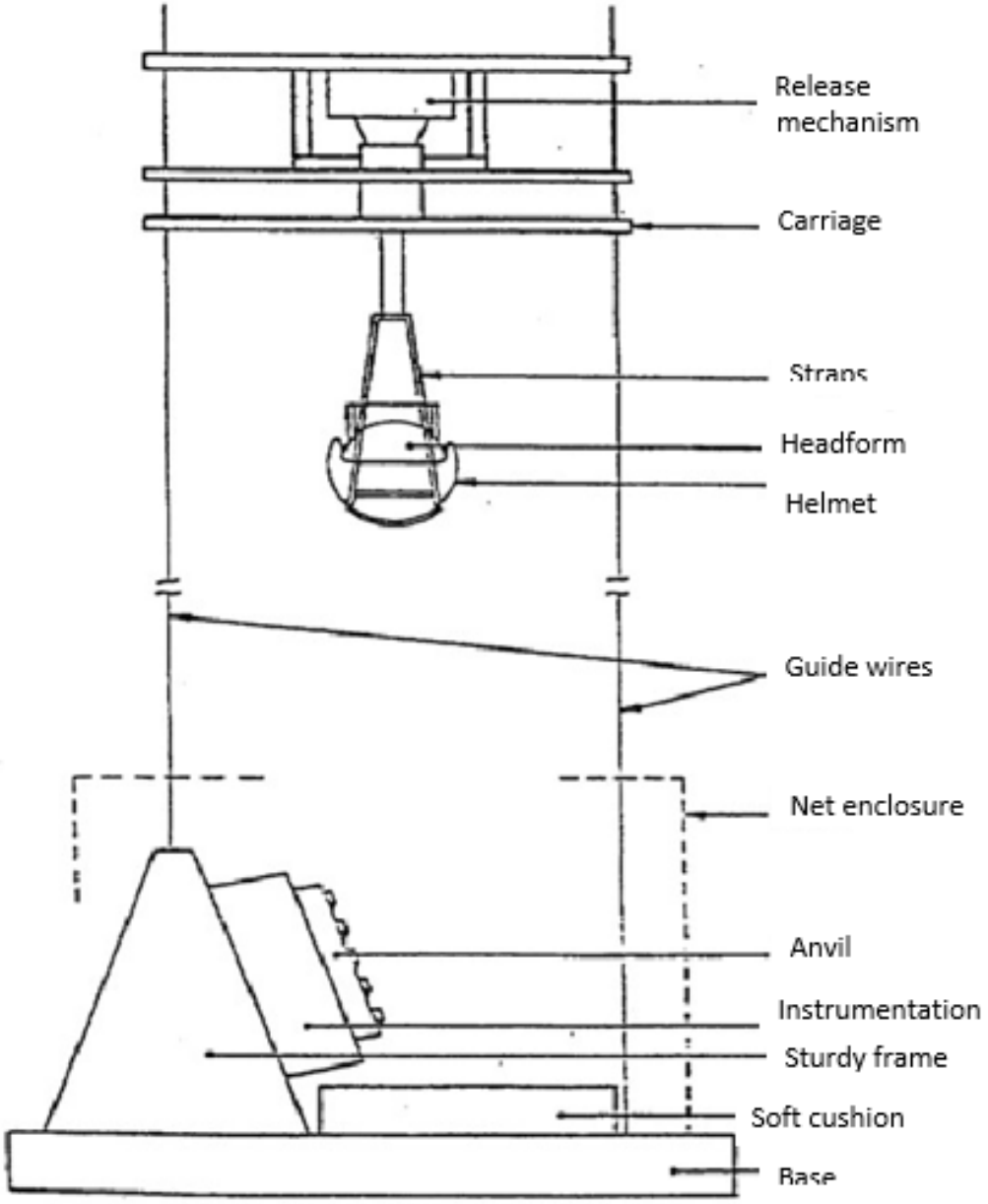


FIGURE 17 - Apparatus for oblique impact test

N.2 TEST FOR PROJECTIONS AND SURFACE FRICTION (METHOD B)

N.2.1 Principle

The rotation-inducing forces caused by projections on the helmets and friction against the outer surface of the helmets are assessed firstly by a shear impact on the projections using a shear edge against which the projections shall shear away, be detached, or permit the shear edge to slide past the projections. The friction is assessed by the displacement of a carriage abrading the outer surface of the helmet. The shear impact and abrading carriage displacement are generated by a drop weight device.

N2.2 Apparatus (see Fig. 18)
The test apparatus shall comprise:

a) a horizontal guided carriage with interchangeable attachments for abrasive paper or a shear edge.
b) a horizontal guide and support for this carnage.
c) a roller with a wire rope or a strap or a similar flexible connection.
d) lever connecting the headform to the test apparatus with a hinge.
e) an adjustable system supporting the headform.
f) a drop weight to load the lower end support of the wire rope, or a strap, after the weight is released.
g) a system to support a headform and to apply a force to the helmet normal to the carriage.

N 2.2.1 ***Carriage***

N 2.2.1.1 For friction assessment the carriage bears a sheet of grade 80 closed-coat aluminium oxide abrasive paper with a supported length of 300.0 (-0.0/+3.0) mm and securely clamped to the carriage to prevent slippage. At its end towards the drop weight and in this direction the carriage has a 80 mm ± 1 mm long smooth steel area not being covered by the abrasive paper and higher than the rest of the carriage by the thickness of the abrasive paper plus 0.5 ± 0.1 mm.

N 2.2.1.2 For shear assessment the carriage is provided in the middle, with a bar made form a steel strip of height 6 mm and width 25 mm with is uppermost edges machined to a 1 mm radius. The bar is casehardened to a minimum depth of 0.5 mm.

N 2.2.1.3 The carriage and either attachment shall have a total mass of $5.0\ ^{+0}_{-0.2}$ kg.

N 2.2.2 ***Horizontal Guide***

The horizontal guide, which guides and supports the carriage, may consist of two cylindrical bars on which the ball bearings of the carriage may freely travel.

N 2.2.3 ***Roller with a Wire Rope or Strap***
The rollers shall have a diameter of at least 60 mm and lead the wire rope or strap from the horizontal into the vertical direction. The horizontal end of the wire rope or strap is fixed to the carriage; the vertical end is fixed to the drop weight.

N 2.2.*4 Drop weight*
The drop weight shall have a mass of $15.0^{+0.5}_{-0}$ kg. For shear assessment the free drop height shall be $500.0^{+0.5}_{-0}$ mm with provision for further possible travel of at least 400 mm. For testing the friction assessment the free drop height shall be $500.0\ ^{+0.5}_{-0}$mm with provision for further possible of at least 400 mm.

N 2.2.5 ***Headform Support***
The system supporting the headform shall be such that any point on the helmet can be positioned in contact with the upper surface of the carriage.

N 2.2.6 ***Lever and Hinge***
A rigid lever shall connect the headform support of the test apparatus with a hinge. The height of the hinge pivot above the upper surface of the carriage shall not be greater than 150 mm.

N 2.2.7 ***Loading Mass***
A loading system is used to generate a force of $400.0\ ^{+10}_{-0}$ N on the helmet normal to the surface of the carriage. This force shall be measured before each test.

N 2.2.8 ***Verification of the Test Apparatus***
With the unloaded carriage and a drop height of 450 mm the velocity of the carriage after 250 mm of travel shall be 4.0 ± 0.1 m/s. The requirements shall be verified after every 500 helmet tests or once every 6 months whichever is sooner.

N 2.3 Procedure

N 2.3.1 ***Positioning of the Helmets***

N 2.3.1.1 The helmet is placed on a headform of appropriate size in accordance with the requirements of 5.6.2. The helmet is tipped towards the rear so that the front edge of the helmet in the median plane is displaced by 25 mm; if the helmet includes an adjustable chin strap, the strap shall be tightened as much as possible. The headform shall be so positioned that the chosen location on the helmet can be positioned in contact with the upper surface of the horizontal carriage.

N 2.3.1.2 The helmet shall be tested in any condition in which it may be placed on the market, that is both with and without accessories if they are supplied as original equipment. Helmets placed on the market with a visor shall be tested with the visor in the closed position.

N 2.3.2 ***Test of Projection***

The headform is adjusted in order to have the chosen projection on the carriage so that the shear edge is positioned 50 mm from the projection and makes lateral contact with the projection after the drop weight is released from its upper position.

N 2.3.3 ***Test of Outer-surface***
The abrasive paper is mounted on the carriage in the position specified in **N 2.2.1**. The chosen outer surface of the helmet is lowered on to the abrading carriage at the centre of the flat surface without abrasive paper. A loading mass is applied in accordance with **N-2.2.7**.
The drop weight is released from its upper position in accordance with **N 2.2.4**. The abrasive paper shall be changed after every test.

N 2.3.4 ***Selection of Test Points***

N 2.3.4.1 Any point on the helmet may be selected for friction and/or shear assessment. A helmet shall be tested as many times as necessary to ensure that all notable features are evaluated with one test only per feature. Re-orientate the helmet as necessary to allow every feature to be tested. For shear assessment evaluate all different external projections greater than 2 mm above the outer surface of the shell. For friction assessment, evaluate areas of the outer surface that are likely to produce the greatest friction.

N 2.3.4.2 The rim of the shell and the upper and lower edge of the visor situated within an area bounded by a sector of 120^0 divided symmetrically by the vertical longitudinal plane of symmetry of the helmet do not constitute a projection for the purpose of this test.

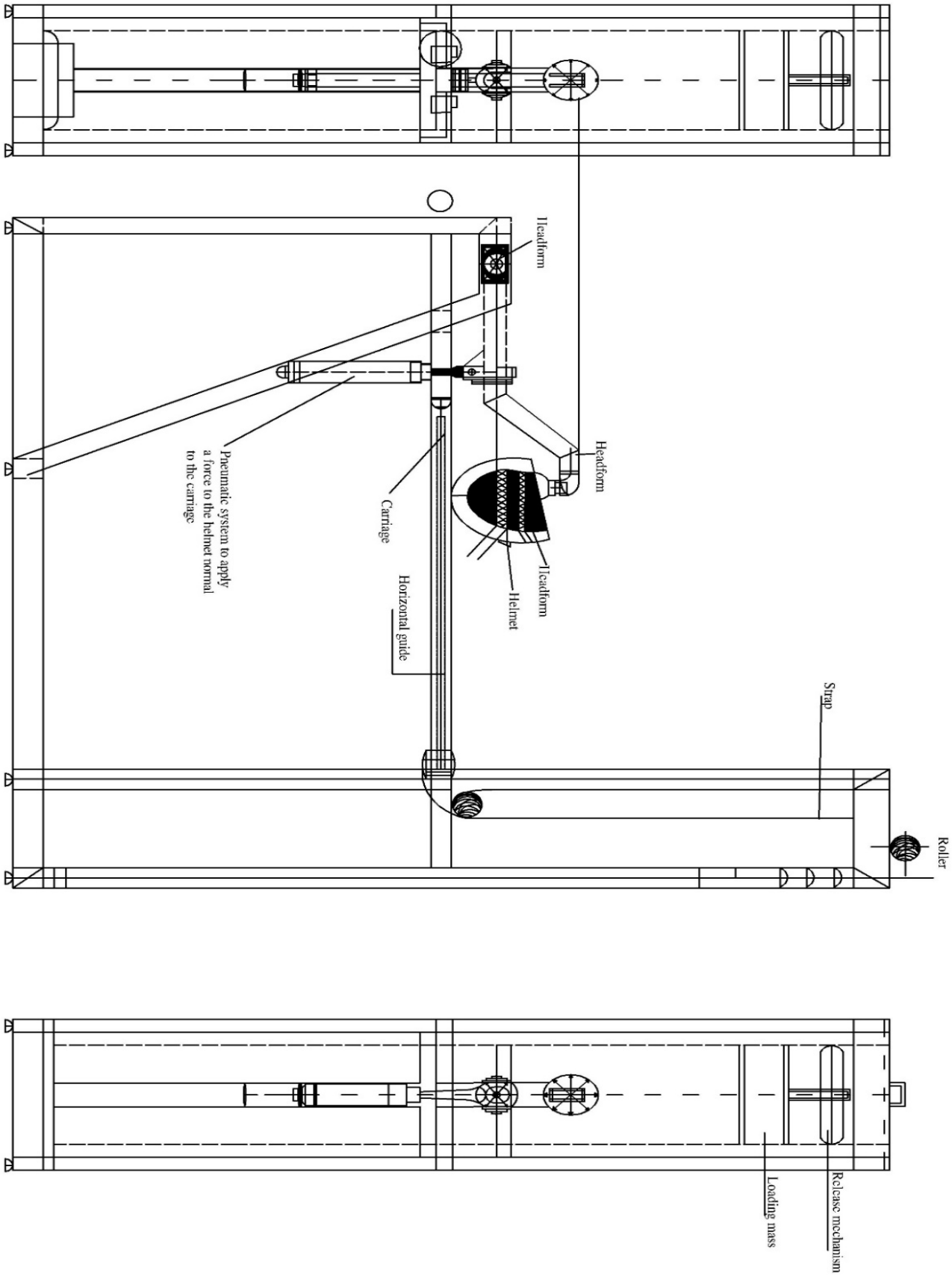


Figure 18 – Typical Projection & surface Friction machine

APPENDIX Q
TEST OF CHIN GUARD

Q. 1 PRINCIPLE

The deceleration of a striker hitting the chin guard provides a measure of the ability of the guard to cushion blows. Any damage is observed.

Q.2 APPARATUS

A suitable apparatus is shown in Figure 19.

A solidly built rig allows a complete headform complying with SLS 1069 to be supported from its neck, with the chin uppermost, so that the central transverse vertical plane of the headform makes an angle of 28^0 below the horizontal. The rear of the test helmet shell receives additional support from an adjustable block, topped by a layer 23 + 1 mm thick of natural vulcanized rubber, having a Shore hardness (Group Z) of $70\ ^{+5}_{-4}$ kg.

The apparatus is mounted on a rigid base. A striker of mass $5.0\ ^{+\ 0.2}_{-\ 0}$ kg and having a flat impact face of diameter 130 ±3 mm carries an accelerometer with its sensitive axis within 5^0 of the vertical, and can be dropped in guided fall as for the shock absorption test in Appendix D.

Q. 3 PROCEDURE

Test the helmet under ambient conditions. Helmets for this test may have undergone other tests (for example shock absorption, oblique impact) but shall, in any case, have undergone solvent conditioning as specified in Appendix A. Place the helmet on the headform and adjust it to satisfy the peripheral vision requirements of 5.4. Secure the restraint system firmly and raise the adjustable support to contact the rear of the helmet shell. Drop the striker from a height of 2.5 m ± 5 mm (measured from the striker face to the highest point of the chin guard). Record the peak deceleration of the striker, and examine the chin guard and its lining for damage.

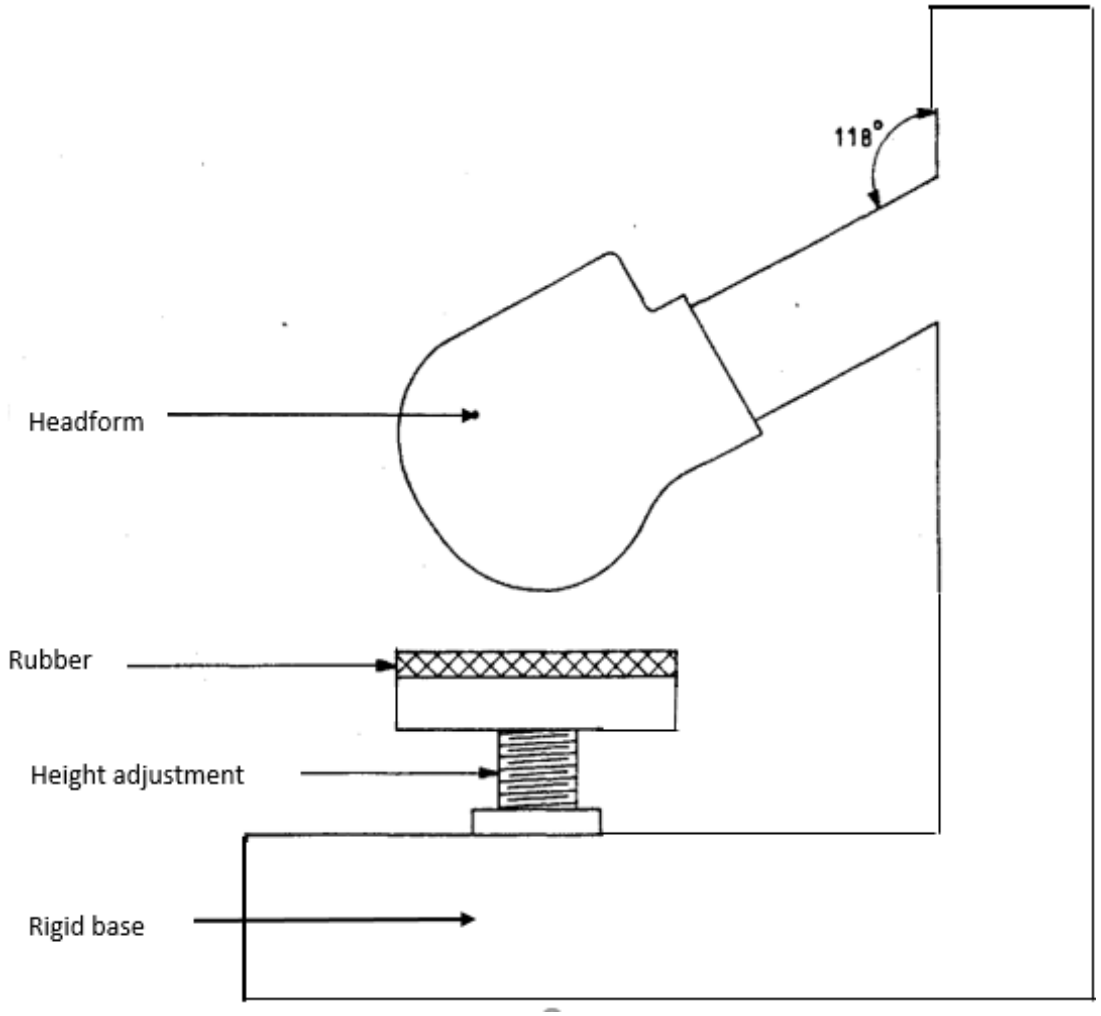


FIGURE 19 - Apparatus for testing chin guard

APPENDIX R
TEST FOR AUDIBILITY TEST

R.1 APPARATUS

R.1.1 Measuring apparatus

Measuring apparatus shall consist of a headform and sound level meter in accordance with IEC 61672-1. The micro phone of sound level meter shall be fitted at a place corresponding to the right or left human ear's location.

R.1.2 Sound source

The sound surface shall be a horn conforming to Type 2A of IEC 60651 (ac horn of high frequency type intended for two and three Wheelers using storage battery (which has sound pressure level range of 90 to 115 dB (A).

The sound source shall be located so that sound is incident from back of the headfrom.

R.2 PROCEDURE

S.2.1 This test shall be carried out under the prevailing atmospheric conditions and the back-ground noise level shall be such that the reading indicated on the sound level meter by the noise is at least 10 dB of below that of the horn sound level.

This test shall be carried out in an open space in which there is no obstacle within a radius of 12 m and no acoustical focusing affects or nearby parallel walls.

Q.2.2 the horn shall be mounted 1.2 m above the ground and shall be fixed in a rigid manner on a base whose mass shall be at least 10 times that of horn and not less than 15 kg and shall be adjustable sideways and up and down. The sound waves are emitted from the horn by using suitable 12 V dc power supply and are directed towards the rear of the haedform at the distance of 2 m. The two readings are taken with and without helmet. The difference shall be recorded to the nearest dB.

APPENDIX S
TEST FOR FLAMMABILITY

S.1 PRINCIPLE

A flame is applied to various parts of the helmet. Melting, burning, and continued burning are observed.

S.2 APPARATUS

The apparatus consists of a supply of gas containing at least 95 propane with an on/off tap, a pressure-controlling device, manometer, and a suitable Bunsen burner with a bore diameter of 10 ± 1 mm.

S.3 PROCEDURE

Light the burner and adjust the gas pressure to 3.5 kPa. Adjust the air supply to the flame so that the inner blue cone is clearly defined, turbulent and 15 ± 3 mm in length, and so that the outer flame is entirely free of-visible yellow areas.

Support the burner so that the flame makes an angle of 45 ± 10°with the vertical. Support the complete helmet under test so that at the point to be tested the plane tangent to the surface is horizontal.
Maintaining these angle, apply the outer part of the flame to the\point to test for 30 ± 2 s for the helmet shell or 10 ± 1 s for the other components of the helmet.

Observe whether the material melts or burns during application of the flame and whether it continues to burn for at least 5 s after removal of the Bunsen flame.

AMD No. 563 : 2022

Amendment No. 1 to **SLS 517: 2021** approved on 2022-03-24**.**

Sri Lanka Standard Specification for Protective helmets for vehicle users (Second Revision)

Page 6

4. TYPES

Delete existing Type B - Intended for the ordinary motor cycle riders on public roads and substitute with the following;

Type B - Intended for the ordinary motor cycle riders on roads

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