

ENGINEERING TEST MANUAL

**Requirements for Toys and Other Articles Intended
for use by Children Under 8 Years of Age**

16 CFR Part 1500.48

1500.49

1500.50

1500.51

1500.52

1500.53

1501.4

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Engineering Sciences
Engineering Laboratory

Consumer Product Safety Commission
Washington, D.C.

This engineering test manual has been developed to provide guidance to Commission staff members who test toys and children's articles for compliance with the CPSC regulations listed above. The test manual is not intended to supersede or limit these regulations. In the case of discrepancy between the regulation and this test manual, the regulation will supersede the test manual.

Requirements for Toys and Other Articles Intended
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Approval Record

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I. BACKGROUND

This test manual covers four safety regulations promulgated by the Consumer Product Safety Commission (CPSC) for toys and other articles intended for use by children. These regulations and their effective dates are as follows:

16 CFR Parts 1500.50, 1500.51, and 1500.52 and 1500.53
Test Methods for Simulating Use and Abuse - effective date
February 6, 1975.

16 CFR Part 1500.48 - Technical Requirements for
Determining Sharp Points - effective date December 22, 1978.

16 CFR Part 1500.49 - Technical Requirements for
Determining a Sharp Metal or Glass Edge - effective date
March 26, 1979.

16 CFR Part 1501 - Method for Identifying Toys and
Other Articles Intended for Use by Children Under 3 Years
of Age which Present Choking, Aspiration or Ingestion
Hazards Because of Small Parts.

The regulations for both sharp edges and sharp points are known as "Technical Requirements Regulations." These differ from the Small Parts Regulation and some previously published toy regulations which contain a self-executing ban for a toy not meeting a certain criterion. The difference lies in the actions taken by the Commission when a toy fails to meet the requirements of the regulation. Consider the regulation for Baby Rattles. Any rattle which fails to meet

the requirements of the baby rattle test procedure automatically is declared a Banned Hazardous Article. Other banning regulations which have been published address electrically operated toys, cribs, bicycles, and pacifiers.

The technical requirements regulations for sharp edges and points differ from the self-executing banning regulations in that a toy will not be banned solely because it fails to meet the requirements of the regulation. Any toy failing these requirements will be subjected to a review by a panel comprised of staff members from the Bethesda office who will assess the hazard presented by the failing sharp edge or point and determine if it clearly presents an unreasonable risk of injury to children. This panel will recommend for or against banning the toy.

Specific details of how each test is to be conducted and reported are not contained within these regulations. Also, instructions are needed pertaining to the proper sequence in which to perform the tests. In order to provide a uniform system of testing and reporting within the CPSC, this detailed Engineering Test Manual has been developed. Additional guidelines, with regard to potential problems which might be encountered in performing the compliance tests, have also been incorporated into this document.

II. SCOPE

This Engineering Test Manual sets forth the detailed test procedures, test equipment, test flow, report format in the compliance testing of toys and other articles intended for use by children under eight years of age.

III. APPLICABLE DOCUMENTS

A. 16CFR PART 1500.48

Technical requirements for determining a sharp point in toys and other articles intended for use by children under eight years of age.

B. 16 CFR PART 1500.49

Technical requirements for determining a sharp metal or glass edge in toys and other articles intended for use by children under eight years of age.

C. 16 CFR PARTS 1500.50, 1500.51, 1500.52 AND 1500.53

Test methods for simulating use and abuse of toys and other articles intended for use by children.

D. 16 CFR PART 1501

Method for Identifying Toys and Other Articles Intended for Use by Children Under 3 Years of Age which Present Choking, Aspiration or Ingestion Hazards Because of Small Parts.

IV. GENERAL PROCEDURES

A. SAFETY PRECAUTIONS Use care in handling sharp edges and points. Protect your eyes from shattering material whenever brittle or fragile items are being tested.

B. EQUIPMENT CALIBRATION AND ACCURACY

The sharp point tester used in performance of these tests shall be calibrated both before and periodically throughout the testing session. The calibration procedure is described in Section VI. C. Sharp Point Test.

The calibration of the sharp edge tester must also be regularly checked. The procedure for this is described in Section VI.D.1. Operation of Hazardous Edge Tester. If the calibration of the sharp edge tester is not correct, the instrument must be returned to the Headquarters Engineering Laboratory for proper calibrations.

C. EQUIPMENT

The following list prescribes the general equipment to be used in the performance of the tests as well as any equipment or apparatus specified in the Standard.

1. General Equipment

- a. 1.35 lb. calibration weight for sharp edge tester.

- b. Clamps for holding test component firmly and transmitting the torsional force during performance of the torque test.
- c. Clamps for immobilizing rotating components during performance of the torque test.
- d. Clamps for use in performing tension and flexure tests.
- e. Compression disc, 1.125 inch diameter x 0.375 inch thick with 1/32" edge radius, to be attached to spring force gauge.
- f. Force gauge, capable of applying tensile or compressive forces as required by test (i.e. 10, 15, 20, 25 or 40 lb.) with an accuracy of ± 0.5 pounds.
- g. Measuring tape.
- h. Scale, capacity of at least 10 pounds with an accuracy of ± 0.01 pound.
- i. Timer.
- j. Thickness feeler gauge capable of measuring 0.020 inch and 0.040 inch gaps.
- k. Torque gauge or torque wrench capable of measuring up to 4 inch-pounds of torque with an accuracy of ± 0.2 inch pounds.
- l. Vise jaws to hold object while performing torque and flexure tests.

2. Specified Equipment

- a. Probe A constructed as shown in Figure 1.
- b. Probe B constructed as shown in Figure 1.
- c. Sharp point tester. See Figure 2
- d. Sharp edge tester. See Figure 3.
- e. Pressure sensitive polytetrafluoroethylene (TFE) high temperature electrical insulation tape as described in Military Specification MIL-I-23594B (1971). The thickness of the TFE backing shall be between 0.0026 inch and 0.0035

inch. The adhesive shall be pressure sensitive silicone polymer with a nominal thickness of 0.003 inch. The width of the tape shall not be less than 1/4 inch. All CPSC testing shall be conducted using Connecticut Hard Rubber Company (CHR) Type T tape. The tape must be less than one year old from its production date marked on the inside of the core of the roll of tape.

f. Impact Medium. It shall consist of 1/8 inch nominal thickness of Type IV vinyl-asbestos tile as specified in Federal Specification SS-T-312A, over at least a 2.5 inch thickness of concrete. The impact area shall be at least 3 square feet.

g. Vise Shields. The shields shall be fabricated from 13 gauge cold rolled steel or other similar material, bent to 60° and have a 0.375 inch inside radius (see Figure 4 - Flexure Tester).

h. Small Parts Cylinder. See Figure 8.

D. SAMPLE IDENTIFICATION

A "sample" includes all items received under one sample number and may consist of several subsamples (items). Upon receipt of a sample, each subsample shall be permanently marked if not already marked by the collecting investigator, so that the identification will remain throughout the tests. Such markings shall not affect the results of tests.

E. TEST SEQUENCE

The order in which the tests are performed is important. In general, the testing begins with using the accessibility probes followed by the sharp point and sharp edge tests and verified for small parts if intended for children under 3. After this, the article is subjected to the use and abuse tests followed again by accessibility, sharp point, sharp edge tests and verified for small parts if intended for children under 3. The number of subsamples required is described in the following paragraph, and the entire procedure for testing is given in detail in Section VI, Test Criteria and Procedures.

If a possible hazard is found during the initial sharp point, sharp edge or small parts tests, and if performing a use and abuse test on that sub will jeopardize losing or destroying the evidence, then do not conduct any use and abuse test on the sub. Similarly, if a hazard is discovered after a portion of a use and abuse test is performed, and if continued use and abuse testing could destroy the evidence of a hazard, then do not conduct further use and abuse testing on that sub.

F. SUBSAMPLES REQUIRED

A sample shall consist of at least 12 subsamples. All subsamples of each sample shall be tested. In the event only one test method under use and abuse is appropriate to the sample, all 12 subsamples shall be tested. Accordingly, the 12 subsamples shall be evenly apportioned between each test method under use and abuse which is appropriate to the sample. For example, if all of the methods under use and abuse are appropriate to the sample, then 3 subsamples of the sample shall be tested to each of the methods (note: torque and tension are both to be done on the same subsamples). If two methods are appropriate to the sample, then 6 subsamples shall be tested to each of the two methods, and if three methods are appropriate to the sample then 4 subsamples shall be subjected to each of the three methods. Except for torque and tension, no single subsample shall be subjected to more than one use and abuse test method. Where sharp points, sharp edges and small parts testing is appropriate, each subsample shall be subjected to the edge, point and small parts test both prior to and after each applicable use and abuse test.

G. DATA ACQUISITION AND REPORT FORMAT

The CPSC Test Report for Toys and Other Articles Intended for Use by Children Under 8 Years of Age and for Small Parts Testing of Toys and Other Articles Intended for Use by Children Under Three Years of Age (see Appendix) shall be used for all reporting of results. A copy of all field office test reports and data acquisition forms shall be sent to the Headquarters Engineering Laboratory.

H. LABORATORY ENVIRONMENT

Prior to testing, each subsample shall be subjected to a temperature of $73^{\circ} \pm 3^{\circ} \text{F}$ at a relative humidity of 20%-70% for a period of at least 4 hours. If the laboratory environment is not within this specification, a preconditioning chamber must be used; and testing shall commence within 5 minutes after the subsample has been removed from the chamber.

I. PERSONNEL AND TEST REPORT CERTIFICATION

All reports shall be prepared on the form specified herein and shall be certified as to the accuracy and conformance to all the requirements of the applicable regulation.

V. APPLICATIONS AND EXEMPTIONS

A. APPLICATIONS

The following guidelines are applied to determine which tests are to be performed on toys and other children's articles.

1. The use and abuse tests specified in §§1500.51, 1500.52, and 1500.53 apply to toys and other articles intended for use by children in three age categories. They are: (a) 18 months of age or less, (b) over 18 months but not over 36 months of age, and (c) over 36 months but not over 96 months of age. If an article is marked, labeled, advertised, or otherwise intended for children of ages spanning more than one of these age groups, the article will be subjected to the tests providing the most stringent requirements. If the article is not clearly age labeled or is inappropriately age labeled and is appropriate for children 96 months of age or less, it will also be subjected to the most stringent applicable test requirements. If testing for small parts, use tests appropriate (1500.51 or 1500.52) for children under 36 months.

2. Toys reasonably intended to be assembled by an adult and not intended to be taken apart by a child shall be tested after they have been assembled. The shelf package and the assembly instructions must prominently indicate that the article is to be assembled only by an adult.

3. Toys intended to be repeatedly assembled and disassembled by children shall have the individual pieces as well as the completed article subjected to these test procedures.

4. In situations where a test procedure may be applied in more than one way to a toy component, the point and direction of force or torque application which results in the most severe conditions shall be used.

B. EXEMPTIONS

The following articles intended for children under eight years of age are exempted from sharp points and sharp edges technical requirements.

1. Bicycles, full size and non-full size baby cribs are exempted from these tests (§§1500.48 and 1500.49).

2. Toys and other children's articles that by reason of their functional purpose necessarily present the hazard of sharp points or sharp metal or glass edges and that do not have any nonfunctional sharp points or sharp edges are exempt from the requirements of §§1500.48 and 1500.49. This exemption applies only if functional points or edges are identified by a conspicuous, legible and visible label at the time of sale. Examples of exempt toys and other children's articles are toy sewing machines with needles, ball point pens, toy scissors, and children's ice skates. Note that these types of children's articles are exempt only if they do not present any hazards due to nonfunctional sharp points or sharp edges. Nonfunctional sharp points and sharp edges on any toy or children's article are subject to ~~the requirements of~~ §§1500.48 and 1500.49.

C. EXEMPTIONS

The following articles intended for use by children under three years of age are exempted from the small parts testing of toys which present choking, aspiration, or ingestion hazards.

1. Balloons
2. Books and other articles made of paper
3. Writing materials such as crayons, chalk, pencils, and pens

4. Children's clothing and accessories, such as shoe lace holders and buttons
5. Grooming, feeding, and hygiene products, such as diaper pins and clips, barrettes, toothbrushes, drinking glasses, dishes and eating utensils
6. Phonograph records
7. Modeling clay and similar products
8. Fingerpaints, watercolors, and other paint sets
9. Rattles [as defined in 16 CFR 1510.2]
10. Pacifiers [as defined in 16 CFR 1511.2(a)]
11. Fabric, frizz, yarn, elastic, string and paper [as defined in CFR 1501.4(b)(2)]

VI. TEST CRITERIA AND PROCEDURES

A. INTRODUCTION

This section describes how to test for sharp points and edges using the sharp point and sharp edge test instruments. The instructions are separated into subsections describing specific procedures used to determine if a point or edge is accessible to a child, how to use the test instruments, and how to perform the use and abuse tests.

Before testing, one must determine the age group for the child's product; identify any functional points, or edges; determine if the article is exempt from any tests; and determine if the article is to be tested in an assembled or unassembled condition. Age groups and exemptions are discussed in the previous section of this manual.

Once the preliminary tasks are done, testing should begin. The sequence of tests is: (a) the accessibility test, (b) the sharp point test, (c) the sharp edge test, (d) small parts test, (e) the use and abuse test, and then a repeat of (a), (b), (c), and (d). The purpose of this sequence is to determine if there are any accessible sharp points, edges or small parts when the article is in new condition and after the article has been subjected to use and abuse. Each test procedure is described in detail in the following subsection.

It is pointed out that within this sequence of testing, there are five different use and abuse tests that may be performed. Each set of subsample is subjected to only one test, except that the set subsamples used for the torque test is also used for the tension test.

B. ACCESSIBILITY

In the regulations for sharp points and edges there are requirements that any point or edge must be accessible in order to be subjected to the sharp point and sharp edge tests. This accessibility test as well as the sharp point and edge test is done both prior to and after the use and abuse tests.

To perform the accessibility test, there are two probes that must be used. The probes are shown in Figure 1. A point or edge that can be contacted by any portion of the probe forward of the collar is an accessible point or edge.

Probe A or B is used according to the expected age of the children intended to use the toy or article. Probe A is used on toys or articles for children three years old or less, and Probe B is used on toys or articles for children over three years and up to eight years old.

If a toy or article contains a hole, recess, or opening, the probe shall be inserted into the hole, ect. in an attempt to contact possible sharp points or edges. The depth to which the probe is inserted is controlled by the size of the opening as measured by its minor dimension. The minor dimension of an opening is the diameter of the largest sphere that will pass through the opening. If the minor dimension of the opening is less than the diameter of the collar of the probe, then the insertion of the probe will be no greater than the length of the two-jointed "finger" of the probe. An opening with a minor dimension greater than the collar diameter will allow the probe to be inserted up to the depth as shown on Chart I.

For example, assume that the toy tested is intended for children over three but under eight years of age. The toy has a rectangular shaped opening, and the largest sphere that could pass through the opening has a diameter of three inches. The minor dimension of the rectangle is three inches.

Referring to Chart I, locate the correct row for the three to eight year age group and the minor dimension of three inches. Following this row to the right, the chart indicates that Probe B shall be used with the extension

handle, and the probe may be inserted up to a total depth of 2 1/4 times three inches or a total of 6 3/4 inches. This 6 3/4 inch distance shall be measured off from the "finger" tip of the probe and marked on the extension with a pencil or tape.

Now the probe may be inserted into the opening up to the marked depth. When inserting the probe, the mark must not pass into or beyond the plane of the opening. If a point or edge is located at the extremity of the probes reach, be very careful that the mark on the probe does not pass beyond the plane of the opening. In some cases the depth of the opening may not allow full insertion of the probe up to the mark.

The joints in the finger probe simulate the flexibility of a finger. The probe joints are designed to rotate up to 90° in one direction. When the probe is used in testing the accessibility of a point or edge, these joints may be rotated up to 90° in the attempt to touch the point or edge.

The preceding discussion describes how probes are used to determine if a point or edge is accessible. In some cases a point or edge can be determined to be inaccessible without resting with a probe. This situation occurs if the distance between any point or edge and an adjacent surface is equal to or less than 0.020 inch. In other words, if the gap between the point or edge and the closest surface is 0.020 inch or less, then the point or edge is declared inaccessible even if it can be reached with the accessibility probe.

Any point or edge adjacent to a surface should be tested for inaccessibility. The gap between the point or edge and the adjacent surface shall be measured using a 0.020 inch thickness gauge. If the thickness gauge will not easily slip into the gap, the point or edge is inaccessible. In cases where the gap is near 0.020 inch, either larger or smaller, the correct gap should be measured using the appropriate thickness gauge and the measurement should be recorded.

Examples of metal edges that may be inaccessible due to adjacent surface are lapped joints and hemmed edges. Figure 5 shows these two situations. A lap joint is a metal edge overlapped by a parallel surface. Any burr or feather edge on the side closest to the protective parallel surface is considered inaccessible if the gap between the edge and the parallel surface is no greater than 0.020 inch. A hemmed edge is formed when a portion of sheet metal is folded 180° back onto itself. Any burrs or feathering on the inside edge,

CHART I

AGE GROUP	MINOR DIMENSION OF OPENING	PROBE	INSERTION DEPTH
3 years or less	Equal to or less than 1.02 in.	A	Up to collar.
	Between 1.02 in. and 7.36 in.	A with extension	2 1/4 times minor dimension
	Equal to or greater than 7.36 in.	A	Unrestricted.
Over 3 years; up to 8 years.	Equal to or less than 1.51 in.	B	Up to collar.
	Between 1.51 in. and 9.00 in.	B with extension	2 1/4 times minor dimension
	Equal to or greater than 9.00 in.	B	Unrestricted.

the side closest to the parallel surface, is inaccessible if the gap between the edge and the parallel surface does not exceed 0.020 inch.

Once the accessibility of a point or edge has been determined, it may be tested with the sharp point tester or the sharp edge tester as described in the following sections.

Keep a careful record of accessibility measurements. When appropriate, record the minor dimension measurements and the calculated penetration depth. Record also which probe is used to locate the point or edge. This information should be placed under the comments section of the Test Report Form.

C. SHARP POINT TEST

The sharp point test is performed with the sharp point test instrument as shown in Figure 2. The instrument is basically a go/no go gauge. A sharp point will cause the red lamp on the sharp point tester to glow.

To use the instrument properly, it may be helpful to know how it works. A rectangular slot in the end cap of the instrument, known as the gauging slot, measures 0.040 by 0.045 inches. Into this slot we insert any point that we suspect to be sharp. Beneath the surface of the end cap is a sensing head which can be moved against the force of a spring. If the head moves far enough, electrical contacts will close to complete an electrical circuit from a battery and turn on a red indicator light.

Figure 6 shows a magnified section of a point being inserted into the gauging slot. The thickness of the face of the end cap is 0.015 inch. The regulation specifies that a point must enter the slot to a depth of 0.020 inch before it is declared to be sharp. The instrument must be calibrated both before and periodically throughout the testing session to ensure that the sensing head moves 0.005 inch before the red lamp will light.

The calibration procedure is explained with the aid of Figure 2. First loosen the lock ring by rotating it clockwise (when viewed from the gauging slot end of the instrument). If the ring is rotated several turns, it will expose a calibration reference mark scribed on the threaded portion of the barrel parallel to the axis. Rotate the end cap clockwise until the red indicator lamp lights. The gap between the electrical contacts has now been completely closed, and must be opened to 0.005 inch. Slowly turn the end cap counter-clockwise until the indicator lamp just extinguishes. It may be necessary to turn the end cap back and forth a few times

to establish the exact point at which the lamp goes out. This is critical to the calibration procedure. At this point note the position of the calibration reference mark with respect to the micrometer divisions scribed on the skirt of the end cap. A sharp pencil may be used to mark the position of the end cap. Now rotate the end cap counterclockwise exactly 5 micrometer divisions. Finally, to insure that the end cap does not move, tighten the lock ring up against the end cap skirt. The instrument is now ready for use. To test a possible sharp point, hold the tester in one hand and the toy, article, or toy part with the point in the other hand. Insert the point into the gauging slot in all directions in which it was accessible by the accessibility test. Apply a slight force enough to overcome the 1/2 pound internal spring force but no greater than one pound, to see if the point will depress the sensing head and light the red lamp. It is important not to apply more than one pound of force since some points could be extruded or squeezed through the gauging slot under excessive force.

Whenever possible, the test should be performed with a sharp point test instrument that has had ballast added so that its weight is 1 lb. With such an instrument, hold the point to be tested so that it is facing vertically upwards and place the gauging slot of the instrument over the suspect sharp point. With the axis of the instrument vertical, loosely hold it so that its mass is supported by the point being tested. Observe whether the red lamp illuminates.

In some cases, an accessible point will be recessed within a toy. When it is necessary, the point may need to be made more accessible to the tester by removing material surrounding the point or extracting the sample point altogether. If this is done, the point should be supported during the test so that its stiffness approximates, but is not greater than the stiffness in the assembled sample.

When testing flexible plastic toys, avoid supporting the flexible plastic point in a manner that would increase its stiffness. For example, a toy soldier may have a small, slender, point-like plastic gun. If the gun was grasped at the tip of the gun barrel and inserted into the sharp point tester, the tester could be made to indicate a sharp point. To correctly perform this test, the toy should be grasped at the body of the soldier. If the gun barrel tip is then inserted into the gauging slot, it may flex and collapse without moving the sensing head against the 1/2 pound spring. In this case, the tester will not indicate a sharp point. In doing all sharp point tests, care must be used to not support the point in a stiffer configuration than on the toy.

D. SHARP EDGE TEST

The sharp edge test specified by the regulation (1500.49) requires that a cylindrical, hardened steel mandrel capable of making one complete revolution shall be wrapped with a single layer of polytetrafluoroethylene (TFE) tape. The mandrel is then applied to the suspected sharp edge with a force that shall not exceed 1.35 pounds and without moving along the edge, it shall be rotated through one revolution. An edge is declared sharp if it produces a cut completely through the tape for a length of 1/2 inch or more.

The regulation specifies a method of conducting the test. The Hazardous Edge Tester shall be used in performing all tests.

1. Operation of Hazardous Edge Tester Mark 1 Mod 0

This instrument is a portable device powered by ordinary household 120 volt line current. The electric motor within the device powers a rotating mandrel. The motor and mandrel assembly are mounted in a cradle free to pivot on ball bearings and a pair of springs pull on this assembly to produce a 1.35 pound force on the mandrel end.

The calibration of the instrument shall be checked both before and periodically throughout the testing session. First the instrument must be inverted and the top surface of its body placed on the horizontal surface such as the table top. Place a piece of masking tape around the tip of the mandrel and with a pencil, mark 1/4 of an inch from the end. The wire loop attached to the calibration weight is slipped onto the mandrel and positioned at the 1/4 inch mark from the outboard end. When the weight is released, it should cause the mandrel to drop slowly to its upper stop. It shouldn't fall with a crash against the stop. If this occurs or if the weight is insufficient to cause the mandrel to move at all, the instrument is out of calibration. Recalibration must be done by the Headquarters Engineering Laboratory.

When the calibration check is done and the calibration is correct, the instrument is ready to be used to conduct a sharp edge test.

It is specified by the regulation that the temperature of the tape during the sharp edge test shall be between 70°F and 80°F. When the environment of the test laboratory is controlled to a temperature of 73°F + 3°F (see section H - Laboratory Environment), the tape and the test instrument should be allowed to condition in this ambient air for at least one hour before performing the test. As an alternative, the tape and test instrument may be conditioned in an environmental chamber.

If a large number of sharp edge tests are performed in quick succession it is possible that heat generated within the drive motor of the tester could be transmitted to the mandrel. This in turn could cause the tape to exceed the maximum specified temperature of 80°F and result in false indications of failure. Care should be exercised to ensure that the temperature of the tape remains within the limits specified by the regulation.

The test used as a cut indicator is made from TFE, also referred to as Teflon® tape. The regulation identifies a Military Specification that gives the performance specifications of this tape. Also in the regulation there is a footnote saying that the tape that the CPSC will use for its compliance tests will be Connecticut Hard Rubber Company (CHR) type "T" tape. The Headquarters Engineering Laboratory will maintain a supply of this tape for CPSC screening and compliance testing. Area offices should request this tape from the Engineering Laboratory.

To perform the test, first plug the line cord into a 120 volt grounded outlet and turn on the on/off switch at the rear of the top panel. The indicator light should glow red with the instrument on. Press the red button on the front of the handle to cause the mandrel to rotate and let the motor operate and stop without pressing the button a second time. This positions the mandrel ready for a test.

Wrap the tape by starting the tape at the bottom of the mandrel. One edge of the tape must be adjacent to the end of the mandrel. The joint or junction of the single wrap of tape must be at the bottom of the mandrel so that it will be the first section of tape to make contact with the edge being tested. If there is an overlap of tape, then this shall be the first section of tape to make contact with the edge. Without stretching the tape, one layer is wrapped completely around the mandrel, and cut off to insure that the two ends meet or that there is an overlap of not more than 0.1 inch (3/32 inch). The tape is very difficult to tear so it must be cut using a very sharp knife or razor blade.

The edge to be tested shall contact the tape 1/4 inch from the mandrel tip and at the midpoint of the tape.

The test is most easily done if the line of the sample edge is held horizontally. It is easiest to apply the mandrel to the edge in the downwards direction. In this manner look down on the mandrel to insure that its axis is at right angles to the line of the edge. Refer to Figure 7 for an illustration of how the mandrel is positioned against the edge. Note in this case that the angle in the horizontal plane must always be held as closely as possible to 90°. This is specified in

the regulation. The axis of the mandrel may be positioned anywhere in a plane which is at right angles to either the line of a straight test edge or to a tangent at the point of contact with the curved test edge. The test operator should seek the orientation most likely to cut the tape.

With the edge touching the mandrel at the center of the tape, press down on the instrument with just enough force to lift the mandrel off its lower stop. The mandrel is now pressing on the edge with a force of 1.35 pounds. Press the red button on the handle and allow the mandrel to rotate one full turn.

Lift up the instrument and remove the tape taking care that this does not cause either a cut to appear or an existing cut to become larger. To remove the tape, carefully lift up one end and peel it off the mandrel. Make sure that an even pull is exerted on the whole width of the tape.

Examine the tape for a cut of 1/2 inch or more. The edge is considered sharp if it produces a cut of a least 1/2 inch. Measure the length of the cut to the nearest 1/16 of an inch and preserve the tape by sticking it to a 3 x 5 inch index card. Cover the sample with a strip of Scotch tape. Identify on the card the sample and sub number, and the location of the edge tested.

In selecting edges on toys that should be tested, it is helpful to carefully feel the edge with a finger to find the sharpest part along the edge. You may also use a fingernail or thumbnail to indicate if an edge is likely to fail the test. Lightly drag the face of a thumbnail across the edge at right angles to the line of the edge. If the edge does not shave the thumbnail, it will probably not cut the TFE tape. However, not all edges that will shave a thumbnail will fail the sharp edge test. Once the edge has been felt with a finger, mark the locations where the sharp edge test will be performed.

E. SMALL PARTS TESTS

In determining which toys and other articles are intended for use by children under 3 years (36 months) of age, for purposes of this regulation, the following factors are relevant; the manufacturer's stated intent (such as on a label) if it is a reasonable one; the advertising, promotion, and marketing of the article; and whether the article is commonly recognized as being intended for children under 3.

3. The following articles are included, but are not limited to: squeeze toys; teething rings; crib exercisers; crib gyms; crib mobiles; other toys or articles intended to be affixed to a crib, stroller, playpen, or baby carriage; pull and push toys; pounding toys; blocks and stacking sets; bathtub,

wading pool and sand toys; rocking, spring, and stick horses and other figures; chime and musical balls and carousels; jacks-in-the-box; stuffed, plush, and flocked animals and other figures; preschool toys, games and puzzles intended for use by children under 3; riding toys intended for use by children under 3; infant and juvenile furniture articles which are intended for use by children under 3 such as cribs, playpens, baby bouncers and walkers, strollers and carriages; dolls which are intended for use by children under 3 such as baby dolls, rag dolls, and bean bag dolls; toy cars, trucks, and other vehicles intended for use by children under 3.

Prior to the Use and Abuse Tests described in part F, place the article and/or any parts that are intended to be detachable, without compressing it into the cylinder. If the article fits entirely within the cylinder, in any orientation, it fails to comply with the test procedures.

If the article does not fit entirely within the cylinder, subject it to the appropriate "use and abuse" tests of 16 CFR 1500.51 or 1500.52. Any components or pieces (excluding paper, fabric, yarn, fuzz, elastic, and string) which have become detached from the article as a result of the use and abuse testing shall be placed into the cylinder, one at a time. If any such components or pieces fit entirely within the cylinder, in any orientation and without being compressed, the article fails to comply with the test procedure.

F. USE AND ABUSE TESTS

Described in this section are the five different use and abuse tests: impact, flexure, torque, tension, and compression. Each subsample is subject to only one test, except that the sub used for the torque test must also be used for the tension test. It is necessary to use twelve samples to perform all of the use and abuse tests.

For all but the flexure test, the severity of each use and abuse test is a function of the age category for which the toy was intended. Table I shows that the toy is dropped in the impact test more times and from a higher distance for the lower age category compared to the upper age categories. If the toy is intended for an age category which spans more than one of the age categories shown on Table I, then the toy is subjected to the severest of the tests.

1. Impact Test. There are two tests within the impact test procedure. Depending on the weight and size of the sample, either the drop test or the tip-over test or neither test should be performed.

The drop test is applied only to toys and children's articles that are below the following weight limit:

<u>AGE CATEGORY</u>	<u>WEIGHT CRITERIA</u>
0 to 18 months	less than 3 pounds
over 18 to 36 months	less than 4 pounds
over 36 to 96 months	less than 10 pounds

Weigh the toy using a scale to determine if the toy meets the weight criteria. If the weight of the toy is near the weight limit, be careful that your reported accuracy does not exceed the accuracy of the instrument. For example, say the scale reads between 2.9 and 3.0, and the reading is in the upper half of the interval. This indicates that the weight is less than three pounds. However, if the accuracy of the scale is good to the nearest 0.1 pound, the reading is rounded up to 3.0. Had the sample been in the age category of 0 to 18 months, it would not be eligible for the impact drop test. If any sample is under the weight limit, it must be subject to the impact drop except for samples which qualify as large and bulky toys.

The tip-over test is applied to any large and bulky toy which meets the size or volume criteria. Unlike the drop test, there is no weight exclusion criteria for the tip-over test. A large toy is one that has a projected base area of 400 or more square inches. The base area for toys with permanently attached legs is measured by calculating the area enclosed by straight lines connecting the outermost edge of each leg of the perimeter. A bulky toy is one that has a volume of more than three cubic feet calculated by the major dimensions without regard to minor appendages.

To perform the drop test, first refer to Table I. In the left hand column find the appropriate age group for the sample. If the sample's age labeling spans more than one age group on Table I, then use the age group that produces the more severe test. In the column to the right of the age group under the "Impact" heading, find the number of drops and the drop height. Remember large and bulky toys are tipped over instead of being drop tested.

If a toy exceeds the specified weight criteria but does not fall into the category of large and bulky toys, no drop test or tip-over test shall be performed.

The impact medium onto which a sample is dropped is described in the equipment section. Measure now the correct drop height, either 4' 5 1/2" or 2' 11 1/2", putting the mark on the wall. Hold the sample in a random orientation and with the lowest part of the sample at the correct drop height mark. Release the sample and allow it to drop and come to rest. Examine the sample for possible sharp points, sharp edges and small parts. The examination for small parts, both here and in the tip-over test should be limited to those toys and other articles intended for use by children under 3 years of age. Use the test instruments, if necessary. Record any pertinent observations or failures.

TABLE I

USE AND ABUSE TESTS

AGE CATEGORY	IMPACT	FLEXURE	TORQUE	TENSION	COMPRESSION
0 to 18 months inclusive	10 drops from 4 1/2 feet ± 0.5 inch	120° arc 30 cycles	1.8 in-lb.*	9.5 lb.*	19.5 lb.*
Over 18 to 36 months inclusive	4 drops from 3 feet ± 0.5 inch	120° arc 30 cycles	2.8 in-lb.*	14.5 lb.*	24.5 lb.*
Over 36 to 96 months inclusive	4 drops from 3 feet ± 0.5 inch	120° arc 30 cycles	3.8 in-lb.*	14.5 lb.*	29.5 lb.*

*Value is no greater than the lowest allowable torque or force required by the regulation.

Do not continue with dropping the sub if a known sharp point or sharp edge could be dulled. Repeat the drops either 10 or 4 times as required, and reexamine the sample for sharp points, and small parts after each drop. Record the drop height, the number of drops, and the results of each drop and the weight of the toy on the Test Report Form.

The tip-over test is done also on the impact medium. Place the large and bulky toy on the impact medium. Slowly tip the sample over by slowly pushing it past its center of balance. Examine the sample for sharp points, small parts and sharp edges. Record any notable observations and failing test results. The tipping procedure can be performed in the direction most likely to occur in actual use or in the direction most likely to expose a hazard. Repeat the tipping procedure for a total of three times, and reexamine the subsample after each test.

2. Flexure Test. This test shall be applied to each component containing metal wire(s) or other metal material(s) for stiffening or for retention of form for toys intended for children 18 months of age or less. The component to be tested shall be capable of being bent through a 60° arc by a maximum force of 9.5 pounds. The force is applied perpendicular to the major axis of the component at a point two inches from the intersection of the component with the main body of the toy. If the component is less than two inches long, the force is applied at the end of the component. For toys intended for children over 18 and up to 96 months of age, a maximum force of 14.5 pounds shall be applied in place of the previously mentioned 9.5 pound force. The direction and point of application of the force is the same as for the younger age category.

To perform this test, first decide which component of the toy is to be flexed back and forth. Usually this will be either the arm or the leg of a human-like or animal-like toy. If the arm is to be tested, secure the body of the toy between the vise grips and vise shields with the arm pointing upward. Normally, the joint where the arm joins the body will be level with the top of the vise grips (not top of the vise shields).

Measure the force with a force gauge while bending the arm 60°. Apply the force as described in the first paragraph of this section. Record this force on the Test Report Form. If the force was less than the specified limit for this toy, proceed on with the test.

Start the flexing test by bending the arm in the reverse direction until it touches the opposite vise shield. Now, return it to the center position between the vise shields

which was its starting position. One cycle has now been completed. Repeat this process at the rate of one cycle per two seconds. After a total of ten cycles, allow the toy to rest for 60 seconds. After the first rest period, cycle the toy again for ten cycles, and again rest for 60 seconds. After the second rest period, cycle the toy again for ten cycles which will make a total of 30 cycles. The flexing has now been completed.

Examine the toy for broken wires and for other possible sharp points or edges that have protruded through the covering material. In some cases, the wire may break but remain protected by the covering material. If the wire is exposed or there are any accessible points or edges, test these for sharpness as described in the appropriate procedure. Record any breakage, broken wires internal to covering material, exposure of any wires, and any sharp point or edge test results on the Test Report Form.

3. Torque & Tension Tests. These tests, performed in combination on a single subsample of a product, are intended to ensure that a projection from the main body of a toy or article that may be grasped by the thumb and forefinger or teeth of a child will not be removed and thereby uncover an otherwise hidden hazard.

The regulation does not contain objective criteria to define which components may be grasped by a child and which, because of their shape, would be difficult if not impossible to grasp. For example, components which project from the main body of a toy and which are hemispherical or otherwise tapered, would not be expected to be grasped with sufficient force for a child to remove them by twisting and pulling. However, if such a component was assembled in a manner that left a gap between its rear face and the main body of the toy, it is conceivable that a child's teeth could be inserted behind the component and, regardless of shape, it could be removed.

To determine whether a hemispherical or tapered component is capable of being grasped 0.040 inch shall be used. If a 0.040 inch feeler gauge can be freely inserted between the component and the main body of the toy, the component shall be subjected to the torque and tension tests. This criterion shall be used for the eyes and noses of stuffed toys that are segments of spheres and for caps and plugs in tubing that are flush fitting or have no surface that would enable them to be grasped by gripping their outer diameter.

If it is determined that a component could be grasped by the thumb and forefinger or the teeth of a child, but the attachment of a clamp to the component could affect its

structural integrity, a means of attachment may be achieved by gluing or drilling a hole or any method that does not reduce its structural integrity.

3(a). Torque Test. This test applies a torque (twisting force) to any component that is a projection part or assembly that a child can grasp with at least the thumb and forefinger or the teeth.

The amount of torque that shall be applied to the component depends on the age category into which the toy falls. Refer to Table I to find the appropriate value for the maximum torque.

Graspable components that are rigidly attached to an accessible rod or shaft that is designed to rotate along with the rod or shaft are clamped to prevent rotation.

The main body of the test sample should be secured in a holding fixture such as a vise. The jaws should be protected in some way such as by the addition of rubber shields. This will prevent the clamping action from affecting the structural integrity of the bond between the component to be torqued and the main body of the toy. On some toys strapping tape may be a suitable means to anchor the toy to a work bench and hold it stationary during the test.

Due to the many sizes and uncommon shapes of components that may be subjected to this test many different clamps could be used to transfer the force from the torque gauge or wrench to the component. A torque test clamp found to be suitable for performing the test on many eyes and noses of stuffed toys is shown in Figure 9. Whatever clamp is used, care should be exercised that the action of securing the clamp to the component does not fracture the component or otherwise affect its retention to the main body of the toy.

Apply the required torque (see Table I) evenly within a period of five seconds in a clockwise direction until either the required torque limit is met or a rotation of 180° from the original position has been attained, whichever comes first. Maintain the torque or maximum rotation for an additional 10 seconds. For projections which do not rotate 180°, make a mark or note the maximum rotation of the torque wrench and measure this after the torque is released. Remove the torque and permit the test component to return to a relaxed condition. Repeat this procedure in a counterclockwise direction.

If the component is detached during the test, examine both the main body of the toy and the component for the presence of sharp edges and sharp points. Perform tests if necessary. If the toy is intended for use by children under three years of age, determine if the detached component is a small part.

If the component does not become detached during the torque test, proceed with the tension test on the same component as follows.

3(b). Tension Test.

3(b)(i). Components Previously Subjected to Torque Test.
For any projection, part or assembly on a toy that has been determined to be graspable by at least a child's forefinger and thumb or teeth, the tension test shall be performed subsequent to a torque test.

As with the torque test, in performing the tension test there is no single clamp that is suitable for all sizes and shapes of components that may be the subject of the test. Any clamp used to transfer the tensile force from the force gauge to the component being tested shall be applied in a manner that will not affect the structural integrity of the attachment between the component and the main body of the toy. For components that could not reasonably be expected to be grasped by their outer diameter, but which have a gap greater than .040 in. between the back face of the component and the main body of the toy, a clamp such as shown in Figure 10 has been found to be suitable. The teeth of this clamp may be inserted behind the component and are prevented from applying a wedging action by the presence of an adjustable stop screw. This clamp is especially effective for conducting tension tests on the eyes and noses of many stuffed toys.

To perform the tension test, first find the correct tensile force for the age category into which the toy falls. Table I lists the categories and forces. The tension test shall be conducted on the same component of the same sub-sample that was subjected to the torque test. The main body of the test sample should be secured in a holding fixture in a manner that does not affect the structural integrity of the bond between the component to be pulled and the main body.

Two independent tensile tests shall be conducted on the component. In the first test, the appropriate force shall be evenly applied in a period of 5 seconds parallel to the major axis of the component. The force shall be maintained

for an additional 10 seconds. Care should be exercised that the specified force is not exceeded. If a component separates during this test, note on the data sheet the force and time at which the separation occurred. If the component does not separate, repeat the test (if necessary using a different clamp) with the force applied in a direction that is perpendicular to the major axis of the test component. Components that are otherwise inaccessible and are exposed as a result of torque and tension testing shall not be subjected to additional testing. Again note on the data sheet the force and the time at which any component separation occurs.

3(b)(ii). Stuffed Toys and Beanbags. A separate test is specified for the seams of stuffed toys and beanbags. For these toys a single tension test shall be applied to the weakest seam in a direction that is perpendicular to the line of the seam or as close to perpendicular as is practical.

For the purpose of determining which is the weakest seam on a particular toy, one subsample shall be used. The results of tests conducted on this subsample shall not be considered a part of the official test record to be used for any compliance action. If the results of seam tests on this subsample do not conclusively indicate a weakest seam, the test personnel shall make a subjective judgement as to which seam shall be tested on the other subsamples.

The clamps used to grip the material on either side of the seam to be tested shall have jaws to which are attached 3/4 inch diameter washers. See Figure 11. The clamps shall be attached to the cover material of a completely assembled stuffed toy in a manner such that the outside diameter of the 3/4 inch washers at a point nearest the seam shall be close to, but no closer than 1/2 inch from the edge of the seam stitching thread. If the material adjacent to the seam cannot be grasped between the thumb and the forefinger of the test personnel sufficient for full clamping by the 3/4 inch diameter washer jaws, this seam test shall not be performed. If such is the case, in lieu of the seam test, a torque and tension test shall be performed on an arm, leg or other appendage to the toy.

In performing a seam test, the force appropriate for the age category into which the toy falls (see Table I) shall be evenly applied within 5 seconds and maintained for an additional 10 seconds. Upon completion of the test the seam should be examined for broken threads in the seam or separation of the cover material adjacent to the seam. The criteria for seam separation shall be the insertion of the 0-36 month old accessibility probe freely through any opening in the seam or cover material.

The stuffing material in stuffed toys or beanbags that show seam separation shall be screened for small parts. Typical stuffing materials that would be considered as violating the requirements for small parts are crushed nut shells, polystyrene foam and polypropylene pellets. The presence of any foreign material such as wires or other metal fragments may result in a violation of the requirements for sharp edges, sharp points and small parts if their accessibility through a failed seam has been determined in accordance with the previous paragraph.

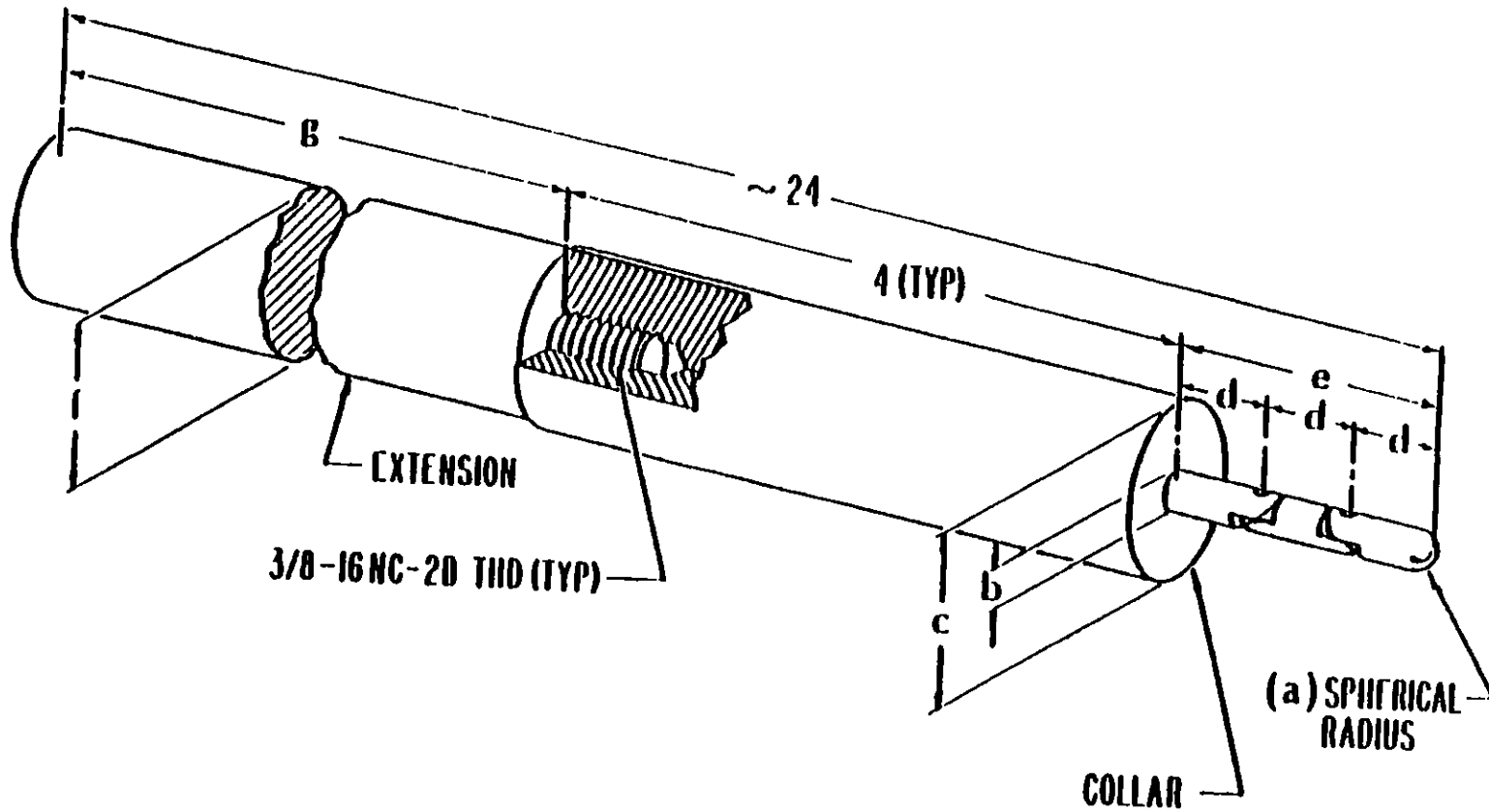
The force applied to a seam and the time it was sustained shall be recorded on the appropriate Test Report Form.

4. Compression Test. This test is intended to apply a compressive load to those surfaces on a toy which are easily accessible to a child, but were inaccessible to flat surface contact during the impact test. Typical areas could be the undercarriage of a toy, car, or truck and any recessed surfaces of a toy doll house.

To perform this test, first find on Table I the correct age category of the toy and read the corresponding amount of force to be applied to the subsample under the column headed "Compression". Next place the toy on a surface in a stable position or hold the toy in the jaws of a vise. Attach the compression disc to the spring force gage and position the disc so that its contact surface is parallel to the surface under test. Apply the required force evenly within five seconds and maintain the force for an additional 10 seconds. The direction of the force must be perpendicular to both the face of the disc and the contact surface. After the force has been applied, examine and evaluate the test sample for sharp points, sharp edges and small parts. Record the area tested, the amount of force used, and the results on the Test Report Form.

VII. FIGURES

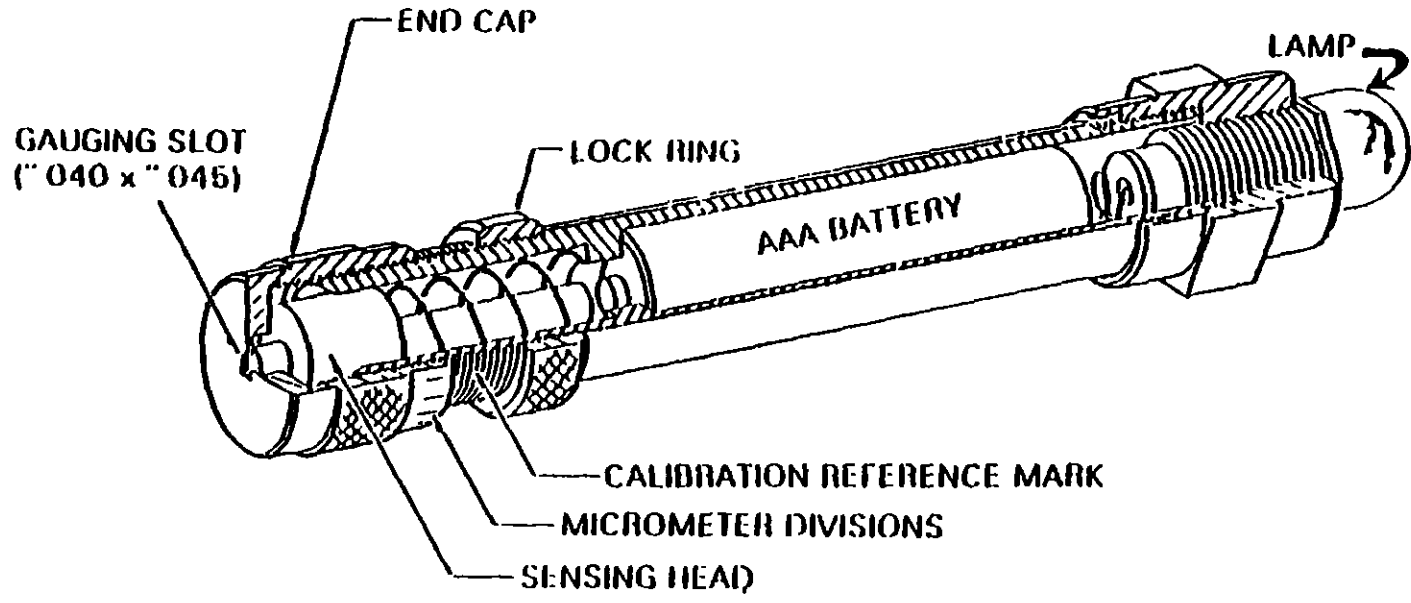
- Figure 1 - Accessibility Probe (2)
- Figure 2 - Sharp Point Tester
- Figure 3 - Hazardous Edge Tester Mark 1 Mod 0
- Figure 4 - Flexure Tester
- Figure 5 - Lapped Joint and Hemmed Edge
- Figure 6 - Enlarged View of Point Inserted Into Sharp Edge Tester
- Figure 7 - Principle of Sharp Edge Test
- Figure 8 - Small Parts Cylinder
- Figure 9 - Torque Test Adapter/Clamp
- Figure 10 - Tension Test Adapter/Clamp



	a	b	c	d	e	f	g
(CHILDREN 0-36 MONTHS INCL)	PROBE A	110	220	1020	577	1.731	1 18 9/32
(" 37-96 ")	PROBE B	170	340	1510	760	2.280	1 17 25/32

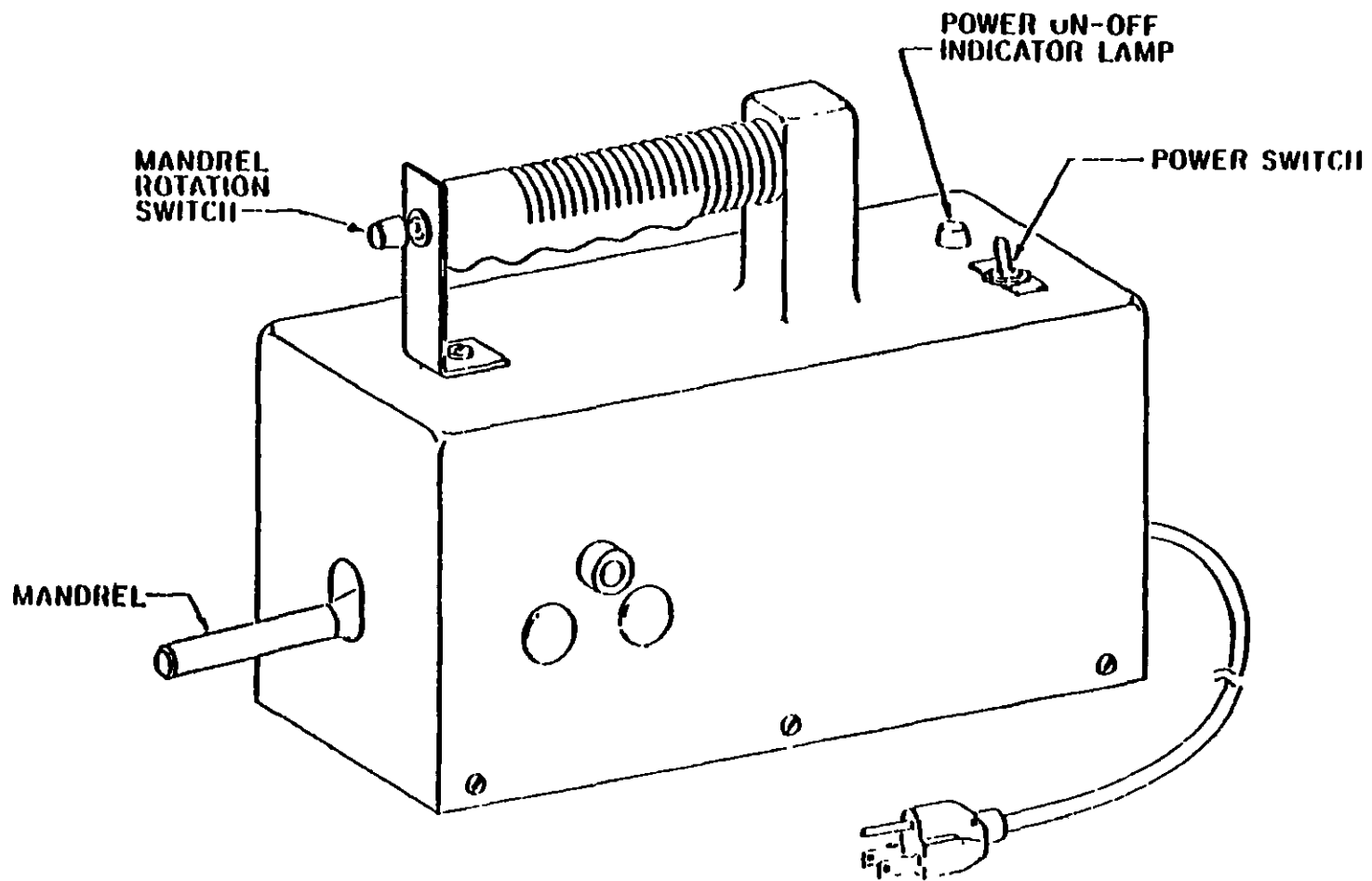
ALL DIMENSIONS IN INCHES

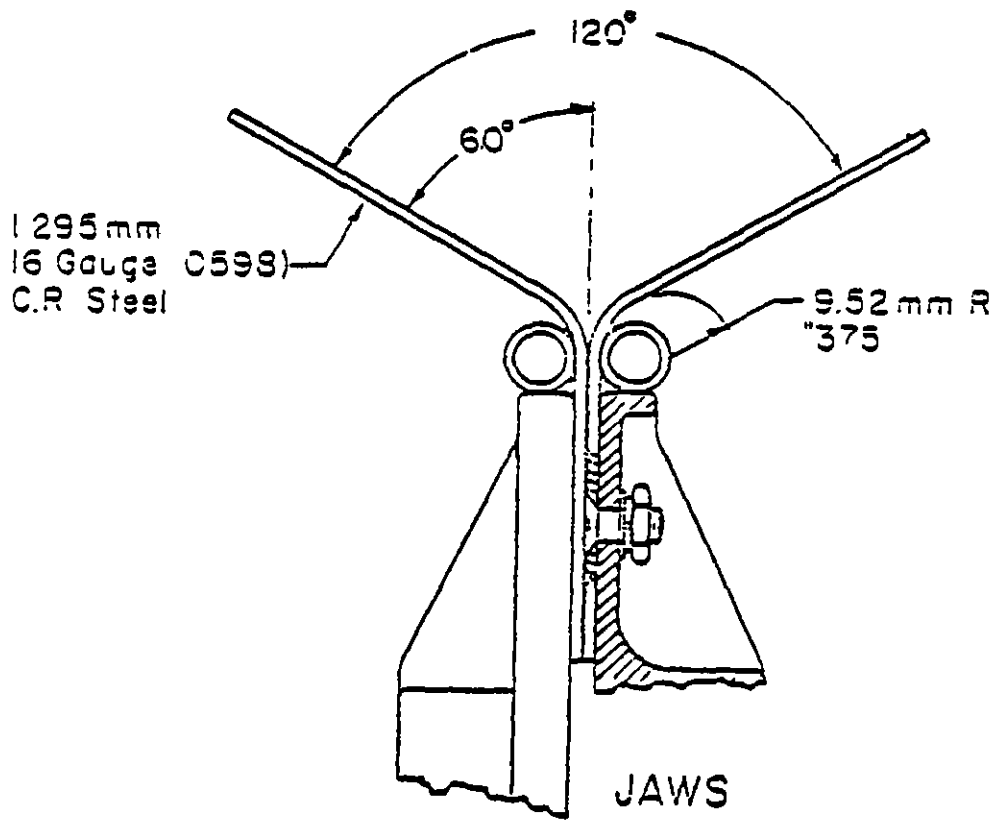
Figure 1 ACCESSIBILITY PROBES



SHARP POINT TESTER

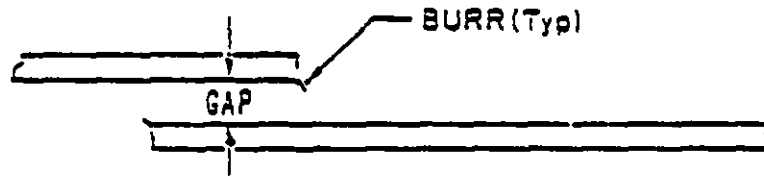
Figure 2



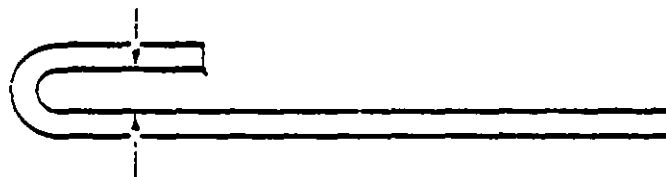


FLEXURE TESTER

Figure 4



(c) LAP JOINT

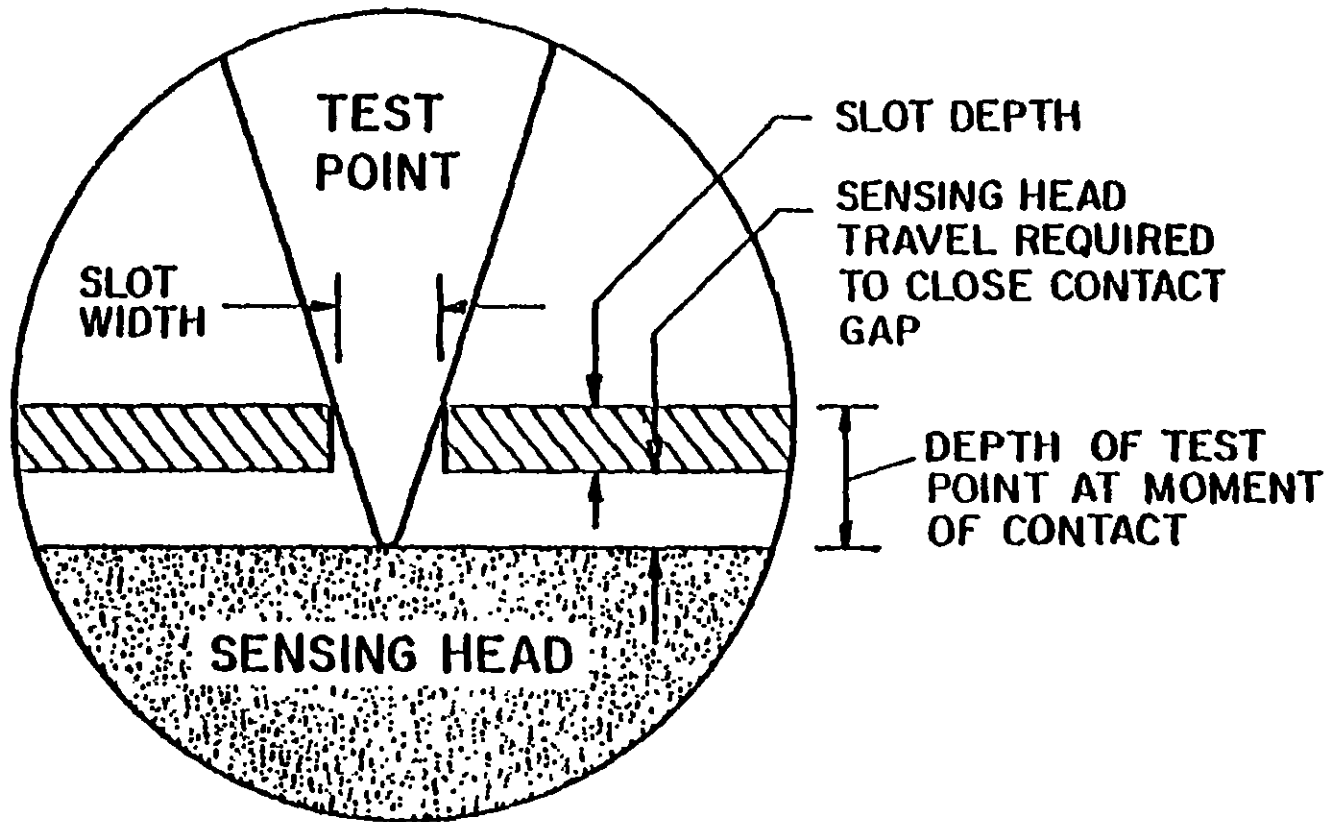


GAP \leq .020 OR (.5mm) Typ

(b) HEMMED EDGE

EXAMPLES OF INACCESSIBLE EDGES

Figure 5



VIEW OF TEST POINT
ENTERING GAUGE SLOT
IN END CAP

Figure 6

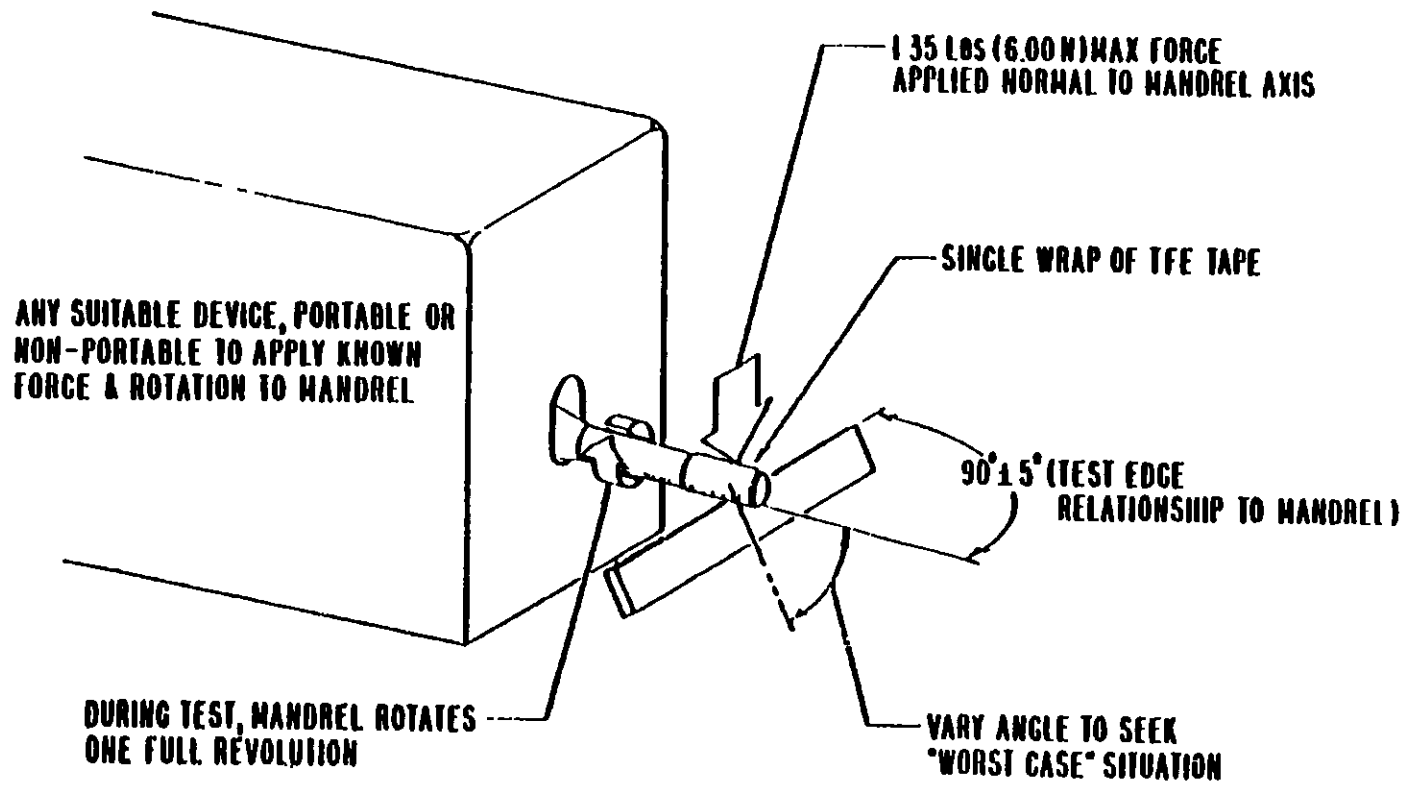
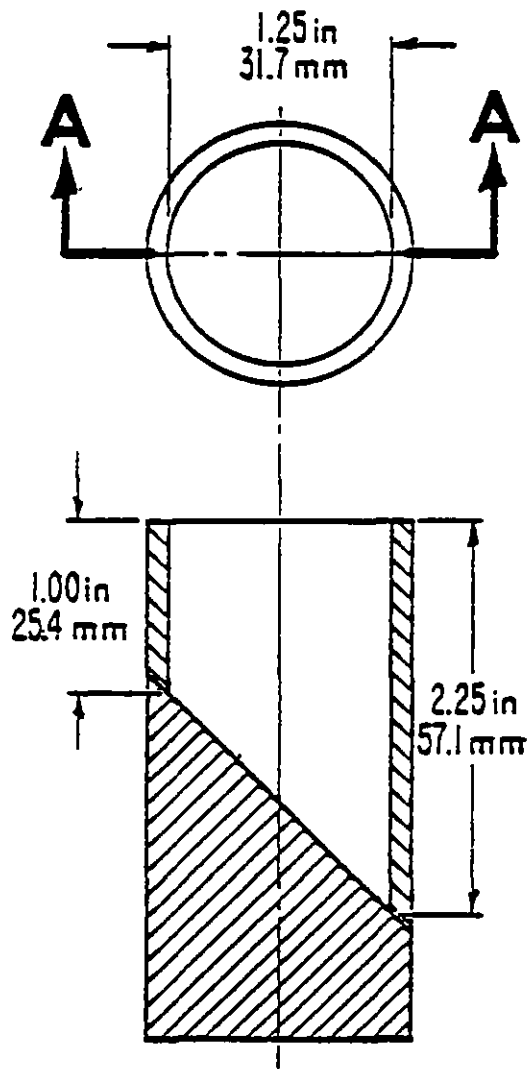


Figure 7 PRINCIPLL OF SHARP EDGE TEST



Section A-A

FIG 8 - SMALL PARTS CYLINDER

15 lb Max TENSION

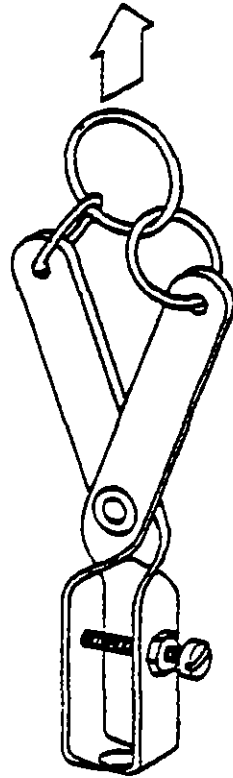


FIG 10-TENSION TEST ADAPTER/CLAMP

INSERT 1/4" Sq-drive OF
(1-5 in-lbs) TORQUE WRENCH

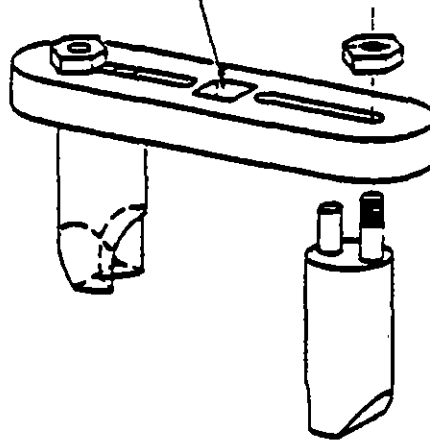


FIG 9-TORQUE TEST ADAPTER/CLAMP

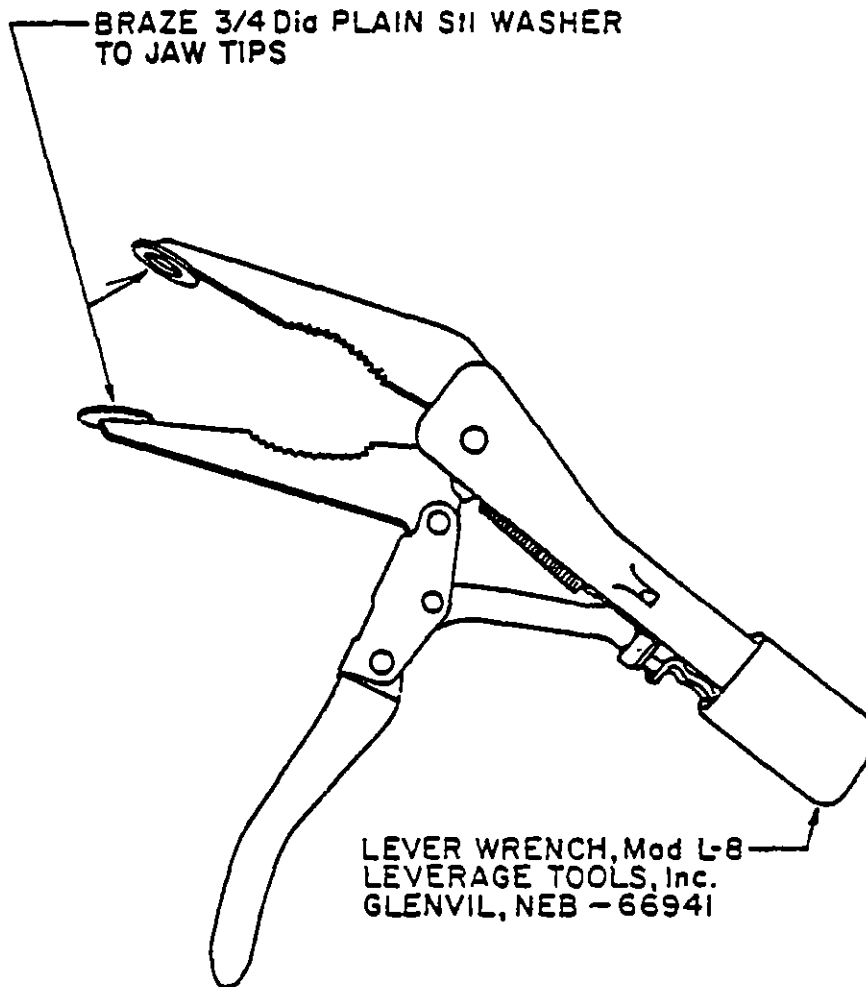


FIG II-SEAM CLAMP

VIII. REQUIREMENTS FOR CPSC TEST REPORT FOR TOYS
AND OTHER ARTICLES INTENDED FOR USE BY CHILDREN
UNDER 8 YEARS OF AGE

The toys and other children's articles report form used to report the results shall be per Appendix A. The names of the test personnel involved shall be inserted and final approval and responsibility shall rest with the Test Engineer.

APPENDIX A

CPSC TEST REPORT FOR TESTING OF TOYS AND OTHER
ARTICLES INTENDED FOR USE BY CHILDREN AGES 0 THRU 96 MONTHS

DATE(S) TESTED: _____

SEAL: INTACT: _____ BROKEN: _____

SAMPLE NO. OF PRODUCT: _____ OF C.R. _____

MANUFACTURER OR IMPORTER: _____

TOY OR ARTICLE NAME: _____

MODEL OR STYLE NO: _____

APPROVAL RECORD

TEST CONDUCTED BY: _____ DATE _____

APPROVED: _____ DATE _____

SAMPLE NO. _____

	YES	NO
IS THERE AGE LABELING?	---	---

WHAT DOES IT STATE?

AGE GROUP(S) TESTED TO:
 ___ 0 THRU 18 MONTHS (1500.51)
 ___ OVER 18 MONTHS THRU 36 MONTHS (1500.52)
 ___ OVER 36 MONTHS THRU 96 MONTHS (1500.53)

ARE THERE INSTRUCTIONS INDICATING ASSEMBLY BY AN ADULT?	---	---
---	-----	-----

WAS THE TOY OR ARTICLE TESTED IN AN UNASSEMBLED CONDITION?	---	---
--	-----	-----

IS THERE A LABEL WHICH INDICATES FUNCTIONAL SHARP POINTS OR SHARP EDGES?	---	---
--	-----	-----

BEFORE USE AND ABUSE TESTING DID THE TOY OR ARTICLE HAVE THE FOLLOWING?

SMALL PART	---	---
SHARP POINT	---	---
SHARP EDGE	---	---

AS A RESULT OF USE AND ABUSE TESTING DID THE TOY OR ARTICLE HAVE THE FOLLOWING?

SMALL PART	---	---
SHARP POINT	---	---
SHARP EDGE	---	---

SAMPLE NO. _____

SUMMARY OF USE AND ABUSE TEST RESULTS

SUB	SMALL PART		SHARP POINT		SHARP EDGE	
	YES	NO	YES	NO	YES	NO
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

COMMENTS:

ESDOC545958

IMPACT TEST DATA

SAMPLE NUMBER _____

TEST MANUAL

16 CFR

DROP HEIGHT

VI.F.3.

1500.51(b)

4 ft. 5 1/2 in.

1500.52(b)

2 ft. 11 1/2 in.

1500.53(b)

2 ft. 11 1/2 in.

SUB NO.	DROP #1	DROP #2	DROP #3	DROP #4	DROP #5
1					
2					
3					
4					
5					
6					

SUB NO.	DROP #6	DROP #7	DROP #8	DROP #9	DROP #10
1					
2					
3					
4					
5					
6					

Comments:

TORQUE TEST DATA¹

SAMPLE NUMBER _____

TEST MANUAL

16 CFR

VI.F.3

1500.51(e)

1500.52(e)

1500.53(e)

MAINTAINED TORQUE (In/lbs)/TIME (sec)						
Components Tested						
SUB NO.	<u>cw</u> ²	<u>ccw</u> ³	cw	ccw	cw	ccw
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

¹ Same sub number as tension test.
 ** @180 degrees rotation.
² Direction of torque clockwise.
³ Direction of torque counterclockwise.
 n/a - Parts separated; no test possible.
 NT - Not Tested.

TEST MANUAL

16 CFR

VI.F.3

1500.51(f)

1500.52(f)

1500.53(f)

MAINTAINED FORCE (lb)/TIME (sec)						
Components Tested						
SUB NO.						
	PARALLEL ²	PERPEN- DICULAR ³	PARALLEL	PERPEN- DICULAR	PARALLEL	PERPEN- DICULAR
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

¹ Same sub number as torque test.

² Direction of force parallel to major axis of component.

³ Direction of force perpendicular to major axis of component.

n/a - Parts separated; no test possible.

NT - Not Tested.

COMPRESSION TEST DATA

SAMPLE NUMBER _____

TEST MANUAL

16 CFR

.VI.F.5.

1500.51(g)

1500.52(g)

1500.53(g)

SUB NO.	AREA TESTED	MAINTAINED FORCE (lb.)/Time (sec)	TEST RESULTS
1			
2			
3			
4			
5			
6			

FLEXURE TEST DATA

SAMPLE NUMBER _____

TEST MANUAL

16 CFR

VI.F.3.

1500.52(d)

1500.53(d)

SUB NO.	COMPONENT TESTED	AMOUNT OF FORCE (lb.)	NO. OF CYCLES	TEST RESULTS
1				
2				
3				
4				
5				
6				

Comments: