MILITARY STANDARD

VISUAL INSPECTION STANDARDS

FOR

TERNE PLATE CANS AND

STEEL BOXES USED IN SMALL

ARMS AMMUNITION PACKAGING



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE WASHINGTON 25, D. C.

Supply and Logistics

Visual Inspection Standards for Terne plate Cans and Steel Boxes Used in Small Arms Ammunition Packaging MIL-STD-406

1. This standard has been approved by the Department of Defense and is mandatory for use by the Departments of the Army, the Navy, and the Air Force, effective 1 March 1957.

2. In accordance with established procedure, the Standardization Division has designated the Ordnance Corps, the Bureau of Ordnance, and the Air Force, respectively, as Army-Navy-Air Force custodians of this standard.

3. Recommended corrections, additions, or deletions should be addressed to the Standardization Division, Office of the Assistant Secretary of Defense (Supply and Logistics), Washington 25, D. C.

FOREWORD

This standard was prepared under the direction of the Office, Chief of Ordnance, to be used to supplement specifications for steel boxes and terne plate cans used in the packaging of small-arms ammunition. It replaces the following publications on the same subject: ORD-SIP-S327, 1 April 1954, and ORD-SIP-S327, Amendment 1, 1 November 1955.

This publication serves to create a military standard which evaluates and illustrates a practical majority of defects assembled as a result of extensive surveys covering box, can and small arms ammunition manufacturing facilities.

The format used retains most of the features of the formats of the publications it replaces because experience has proved that the numbering of illustrations to conform to the numbering of visual defects in the applicable detail specifications, special treatment of indexes and specialized grouping have served to facilitate inspection, training, and general use.

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1. SCOPE AND PURPOSE

1.1 Scope. This standard provides procedures for determining and evaluating defects in steel boxes and terne plate cans used in the packaging of small-arms ammunition and the standard shall be used as a supplement to pertinent specifications.

1.2 Purpose. The purpose of this standard is to---

- a. Create standardization of defect nomenclature and establish the limits of defectiveness for steel box and terne plate can acceptance inspection at vendors' plants, and receiving inspection at ammunition facilities.
- b. Provide visual defect standards for use in connection with acceptance inspection of packed ammunition.
- c. Serve as a visual aid in the training of personnel engaged in the manufacture and inspection of boxes and cans.
- d. Provide visual standards to be used as a guide in the evaluation of the resistance to corrosion of surface treated, painted steel boxes.

2. REFERENCED DOCUMENTS

2.1 Standards.

MIL-STD-105-Sampling Procedures and Tables for Inspection by Attributes.

3. DEFINITIONS

3.1 General. Definitions of Standard MIL-STD-105 are applicable.

3.2 Specific. For the purpose of this standard the following definitions shall apply:

3.2.1 Permissible defect. A condition which, though not desirable from an appearance standpoint, may be permitted for reasons of economy.

3.2.2 Incidental defect. A condition least desirable from an appearance standpoint, and the frequency of occurrence of boxes and cans having such defects is limited for acceptable lots by means of an Acceptable Quality Level.

4. GENERAL REQUIREMENTS

4.1 General. The descriptions and definitions of defects established in this standard are those commonly occurring. Any other defects not listed, present in the lot, shall be reported. If, in the opinion of the Government inspector, the other defects be serious, complete information, recommendations and request for disposition shall be submitted through proper channels.

5. DETAIL REQUIREMENTS

5.1 Classification.

5.1.1 Defect grouping. For convenience in referencing, the defect lists, defect photographs, and color tolerances are grouped as follows:

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.50, M2A1, List of Defects
Boxes, Ammunition, Cal30, M19A1, and Cal.
.50, M2A1, Defect Photographs 4 thru 30
Boxes, Ammunition, Cal30, M19A1, and Cal.
.50, M2A1:
Rust Tolerances (After Corrosion Resist-
ance Test)
Color Tolerances
Cans, Ammunition, Universal, M20 and M21,
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LIST OF DEFECTS

Boxes, Ammunition, Cal. .30, M19A1, and Cal. .50, M2A1

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	1-B. Cover Emboss and/or Embossed Stop Missing	4
	1-C. Hinge Pin Missing.	4
	1-D. Gasket Retainer Improperly Flanged	4
	1-E. End Handle Missing	5
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	2-D. Body Hinge Off-Center More Than 1/52"	5
	2-E. Incomplete Spot Welding	5
	2-F and 2-G. Cover Handle Clip Misaligned.	6
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	2-I. Cover Handle Clip Not Welded	6
	2-J. Cover Handle Inverted	6
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	2-N and 2-O. Gasket Out of Retainer	7
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	2-Q. Gasket Improperly Seated	8
	2-R. Gasket Incorrectly Seated on Body Hem	8
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	2-T. Hasp Misaligned	
	2-U. Hasp Not Welded	9
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	2-Z. Latch Link Retainer Off-Center More Than 1/32"	10
	2-AA. Latch Link Retainer and/or Cover Hinge Not Flush With Cover With Gap Exceeding 3/2"	10
	2-BB. Radius Outside Bottom	10
	2-CC. Body Seam on Opposite End	10
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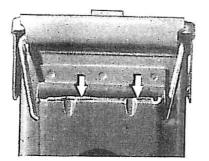
Rust Tolerances (After Corrosion Resistance Test)	31, 32, 33, 34
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NorE.—In general, except for defects where severity is not pertinent, the illustrations define the follow of defectiveness:	wing degrees

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"Worst" Permissible "Worst" Incidental Example of Major (Minor when applicable).

BOXES, AMMUNITION, CAL. .30, M19A1 AND CAL. .50, M2A1

· No. 1. Incomplete Manufacture —

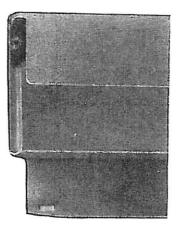


Defect

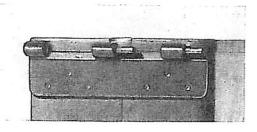


Perfect

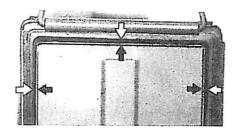
1-A. Incomplete Latch-Major



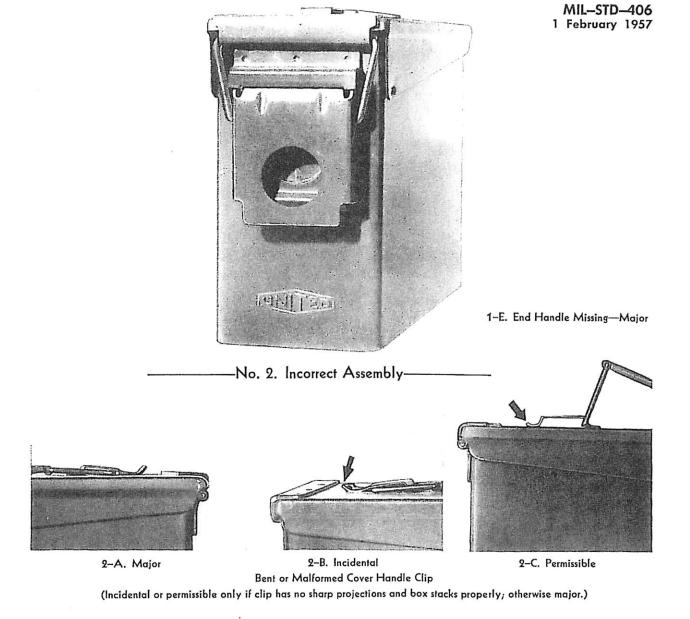
1-B. Cover Emboss and/or Embossed Stop Missing—Major

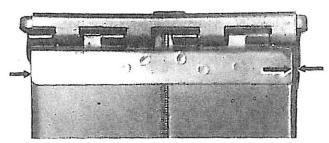


1-C. Hinge Pin Missing—Major

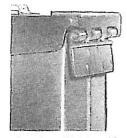


1-D. Gasket Retainer Improperly Flanged—Major

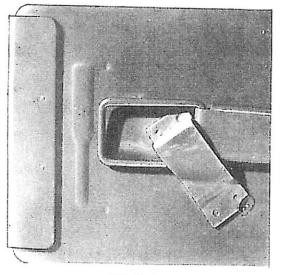




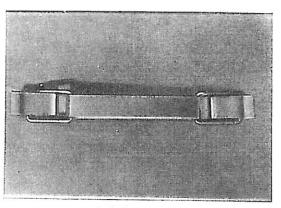
2-D. Body Hinge Off-Center More Than 1/32"—Major (Defect is also applicable to cover hinge.)



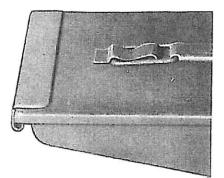
2–E. Incomplete Spot Welding, Hinge—Major (Body hinge illustrated; defect is also applicable to cover hinge and latch link retainer.)



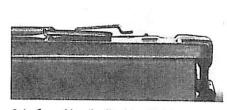
2-F. Major



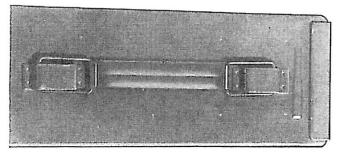
2-G. Permissible



2-H. Cover Handle Clip Deformed—Major

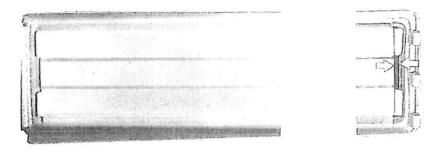


2–1. Cover Handle Clip Not Welded—Major



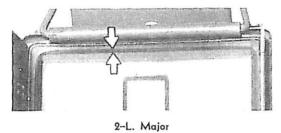
Cover Handle Clip Misaligned

2–J. Cover Handle Inverted—Incidental

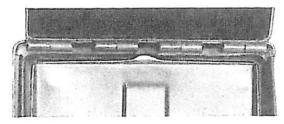


2-K. Major

(Both ends of cover assembly illustrated, showing gasket retainer too far to left.)



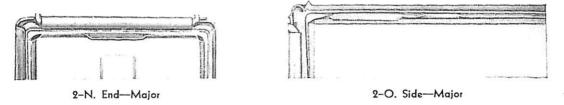
(Causing poor seating of gasket on body hem.)



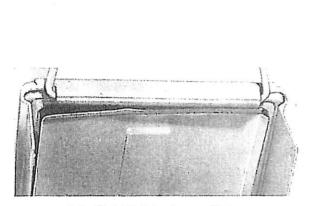


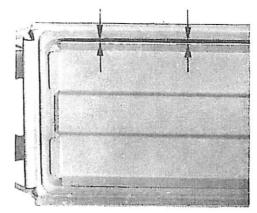
(Gasket retainer located too close to cover hinge, resulting in flange interference with body hem.)

Gasket Retainer Not Centered









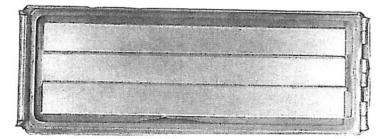
2-P. Gasket Retainer Loose-Major

2-Q. Gasket Improperly Seated—Incidental



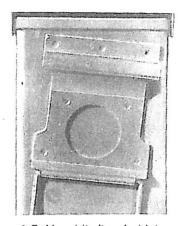
2-R. Gasket Incorrectly Seated on Body Hem-Incidental



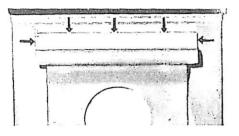


2-S. Gasket Retainer Bent or Not Properly Seated at Hasp End-Incidental

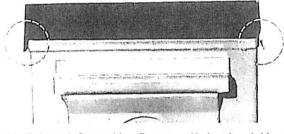
(Two defects are illustrated, either of which defines a defective box. Comparable improper seating at hinge end constitutes a major defect.)



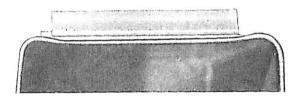
2—T. Hasp Misaligned—Major



2–U. Hasp Not Welded, Top—Major



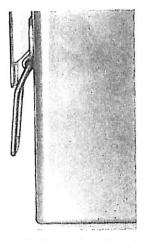
2–V. Embossed Stops Not Engaging Underside of Hem-Major



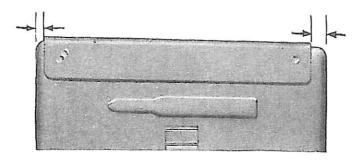
2-W. Front of Body Distorted at Hem-Major



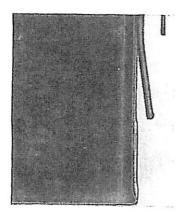
2-X. Manufacturer's Symbol Reversed—Incidental



2-Y. End Handle Reversed—Incidental

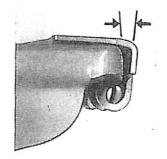


2-Z. Latch Link Retainer Off-Center More Than 1/32''-Incidental



2-BB. Radius Outside Bottom—Permissible (One or more bottom corners flared, not exceeding 1/32'' each

corner.)

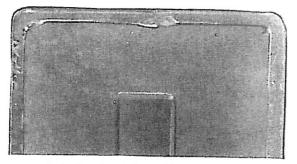


2–AA. Latch Link Retainer and/or Cover Hinge Not Flush With Cover With Gap Exceeding 1/32''— Incidental

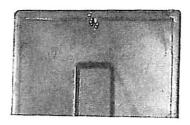
(Not Illustrated)

2-CC. Body Seam on Opposite End—Incidental

Burrs, Rough Spots, Sharp Projections, Cracks, Splits, Buckles

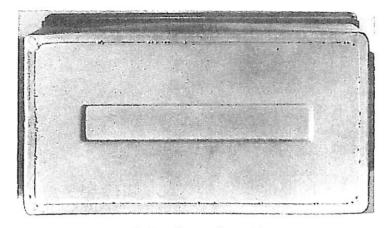


3-A. Burred and Sintered Bottom-Major



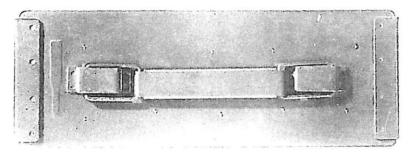
3-B. Burr, Bottom-Incidental

(Incidental only if there are no sharp projections, otherwise major.)



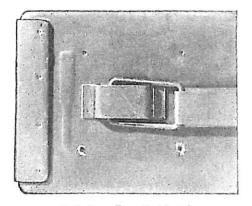


(Permissible only if there are no sharp projections, otherwise major.)

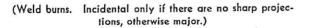


3-D. Burrs, Top-Incidental

(Incidental only if there are no sharp projections, otherwise major.)



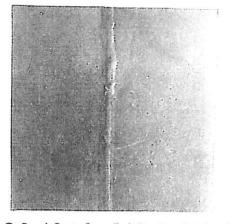
3-E. Burrs, Top-Incidental



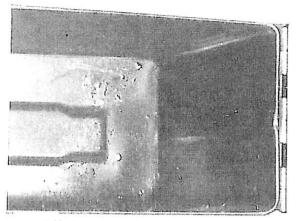


3-F. Burr, Back-Permissible

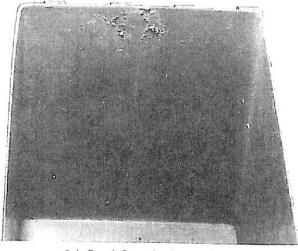
(Permissible only if there are no sharp projections, otherwise major.)



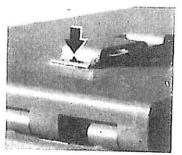
3–G. Rough Spots, Seam End, Exterior—Incidental



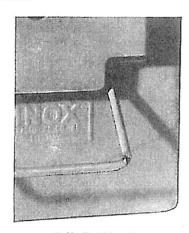
3–H. Rough Spots, Inside Bottom—Incidental



3-1. Rough Spots, Inside—Incidental

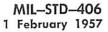


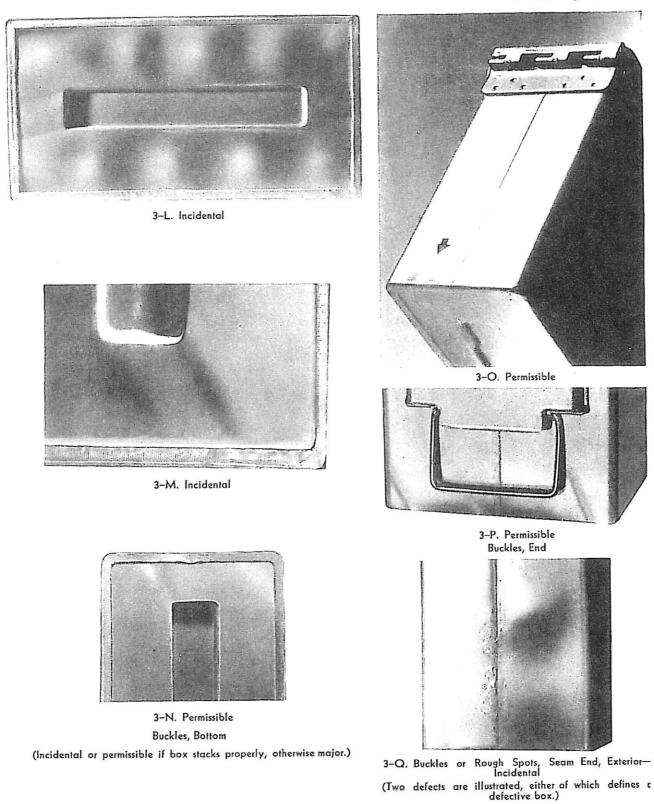
3-J. Cover Handle Clip



3–K. End Handle Sharp Projection—Major

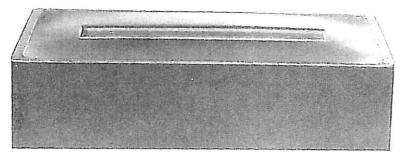
(Any sharp projection on box interior or exterior, regardless of location, is a major defect.)



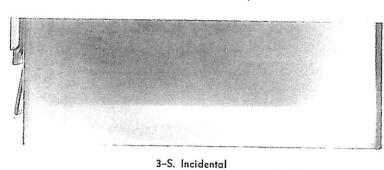


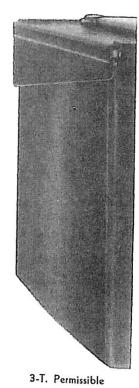
13



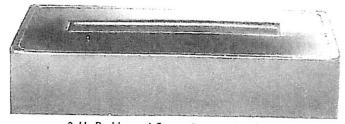


3-R. Convex Bottom-Major

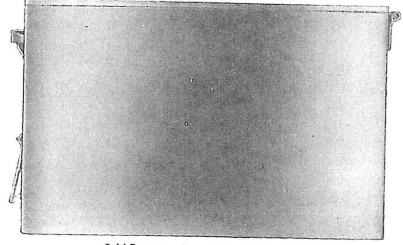




5. Incidental Buckle, Side



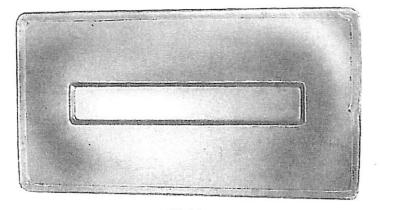
3–U. Buckles and Convex Bottom—Incidental (Incidental if box stacks properly, otherwise major. Two defects are illustrated, either of which defines a defective box.)



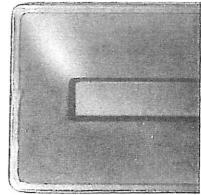
3–V Pronounced Convexity, Side—Major 14

Concave Bottom

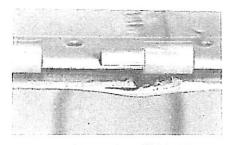
MIL-STD-406 1 February 1957



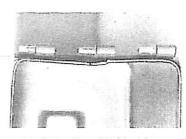
3-W. Major



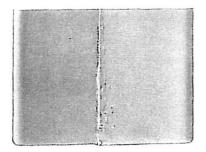
3-X. Incidental



3-Y. Split Hem at Seam Weld—Major

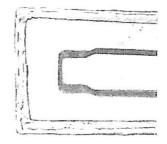


3-Z. Offset Seam Weld—Major



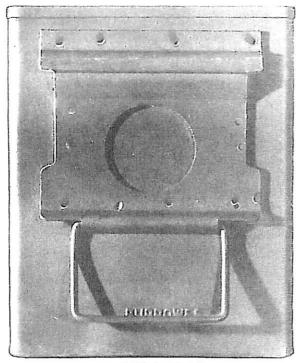
3-AA. Rough Seam Edge—Major

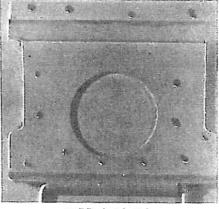
(Illustration also shows improperly turned bottom flange at seam weld, which is a major defect.)



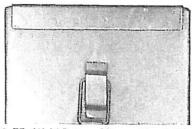
3–BB. Rough Bottom Mash Weld—Incidental

(Incidental only if there are no sharp projections, otherwise major.)





3-DD. Incidental

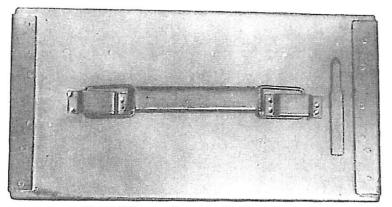


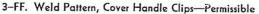
3–EE. Weld Pattern, Hinge—Permissible (Cover hinge illustrated but comparable improper weld pattern on body hinge or latch link retainer is also permissible.)

3–CC. Incidental

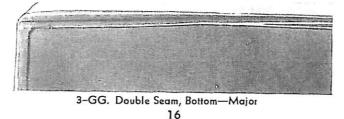
Improper Weld Pattern, Hasp

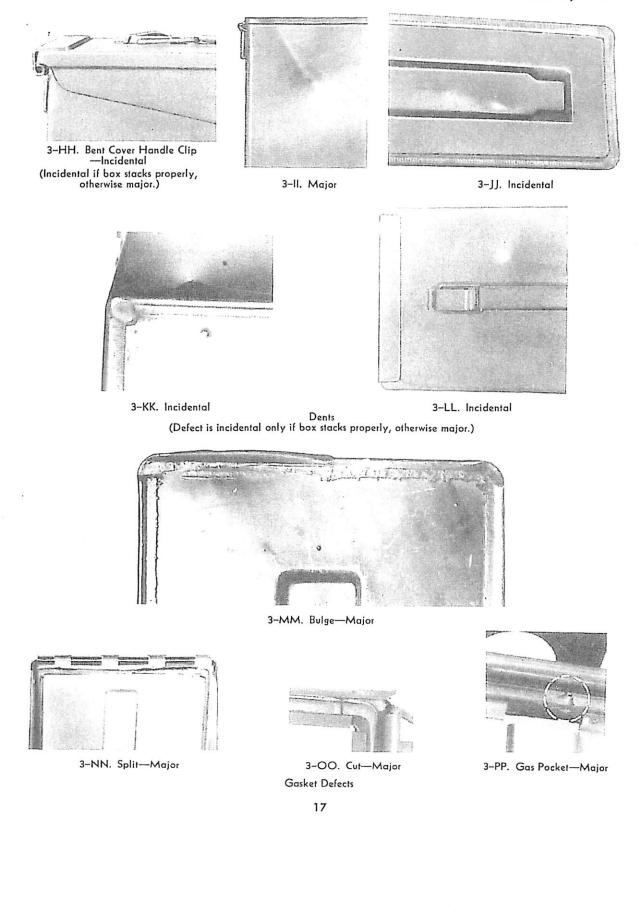
(Box shall be included in inspection Sample B and subjected to hasp weld strength test. Defect is major if test is unsatisfactory, otherwise incidental. Box also shall be considered a defective in Sample B if it fails the strength test)

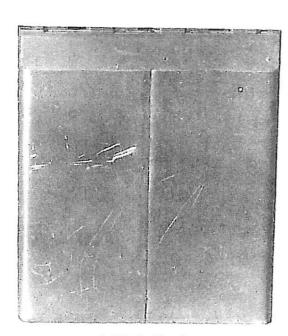




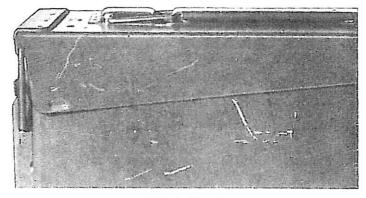
(Box shall be included in inspection Sample B and subjected to pertinent weld and assembly strength test. Defect is major if test is unsatisfactory, otherwise permissible. Box also shall be considered a defective in Sample B if it fails the pertinent weld and assembly strength test.)



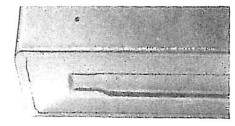




3-QQ. Incidental



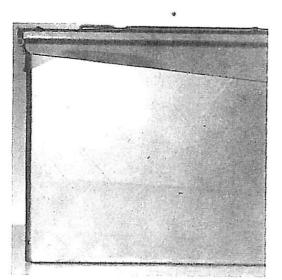
3–RR. Incidental



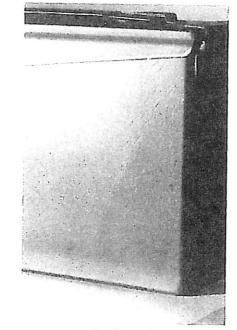
3-SS. Permissible

(Bottom Edge)

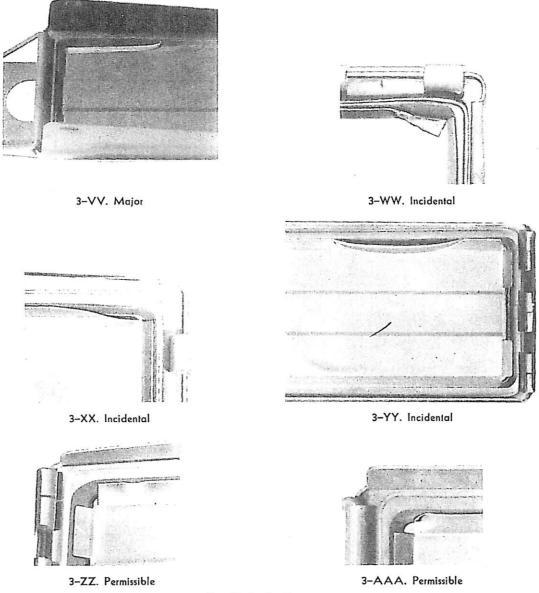
Scratches



3–TT. Incidental

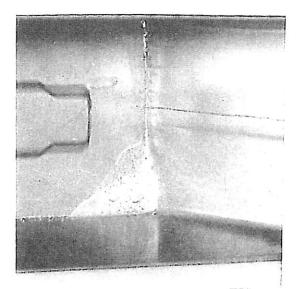


3-UU. Permissible

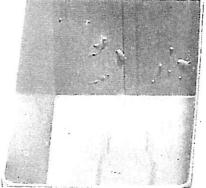


Bent Gasket Retainer

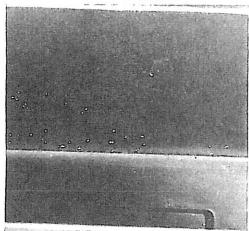
(Defect is permissible or incidental only if there are no sharp projections. See 3-J and 3-K.)

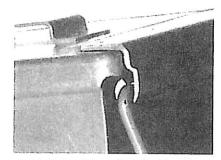






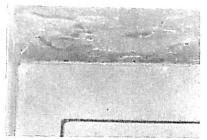
4-B. Incidental

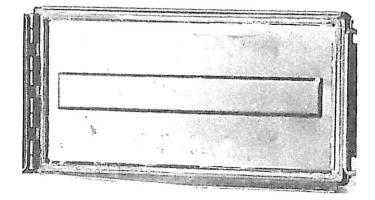






(Applicable also to body and cover hinge. Permissible up to 1/32" gap for Cal. .50 and 1/32" for Cal. .30. If gap exceeds allowance, box shall be subjected to latch, cover and hinge assembly strength test. Defect is minor if test is unsatisfactory, otherwise incidental. Box also shall be considered a defective in Sample B if it fails the strength test.)





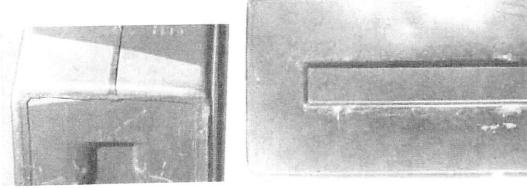
4–F. Foreign Material, Gasket and Gasket Retainer—Minor

4–C. Permissible Foreign Material, Interior (Defect includes imbedded as well as surface adhering foreign material.) 20



4-G. Shallow Embossed Stops—Permissible (Permissible only if both stops engage body hem, otherwise minor.)

-No. 5. Paint Defects: Incomplete or Inadequate Coverage and Rust—

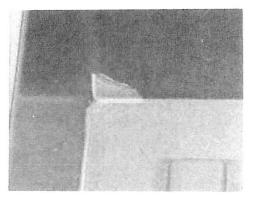


5-A. Major

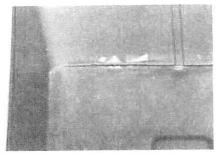
5-B. Incidental



(No permissible incomplete coverage on exterior of body or cover except slight scratches such as illustrated in 3-SS. Any degree of incomplete coverage, exceeding permissible, up to 1/4 square inch is incidental. The 1/4 square inch allowance is applicable to either a single spot or the sum of several spots.)

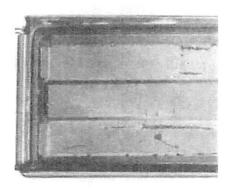




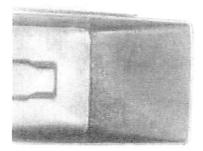




Incomplete Coverage, Interior (Incomplete coverage exceeding 1/4 square inch, either a single spot or the sum of several spots, is a major defect.)



5-E. Gasket Retainer—Major

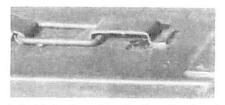


5-F. Body-Major

5-H. Body-Incidental

Rust, Interior

(Any amount of rust on interior shall be considered a major defect.)

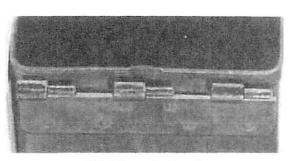


5-G. Under Cover Handle Clip—Incidental

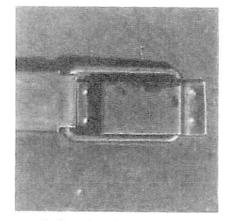
Rust, Exterior



(Rust up to 1/4 square inch incidental, either a single spot or the sum of several spots--cover or body. Rust exceeding 1/4 square inch -major.)



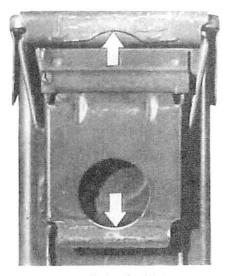
5-1. Hinge—Incidental



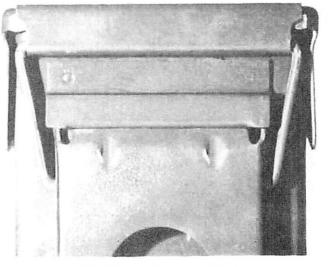
5-J. Cover Handle Clip—Incidental

Rust, Hardware (Rust on any hardware greater than amount shown is a major defect.)

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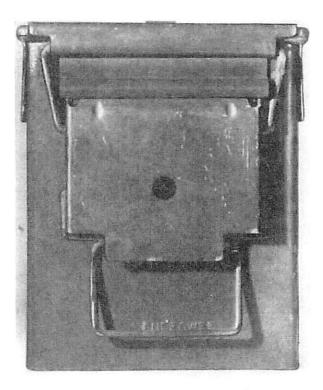
5-K. Latch—Major



5-L. Hasp and Latch-Incidental



5-M. Outside Corner—Incidental

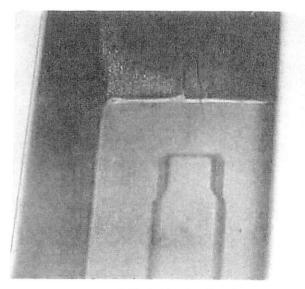


5-N. Front, Exterior-Incidental

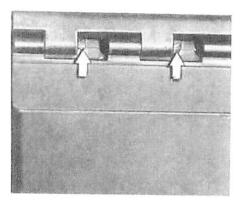
(Incomplete and inadequate coverage both illustrated, either of which defines a defective box.)

Inadequate Coverage

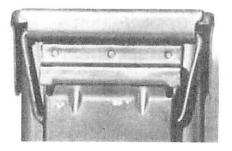
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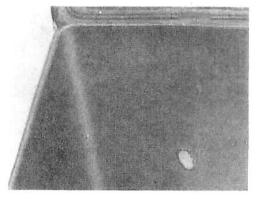
5-O. Inside-Incidental



5-P. Body Hem-Permissible



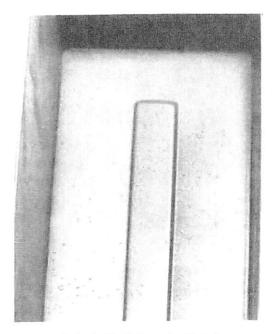
5-Q. Bare Spots, Latch-Permissible



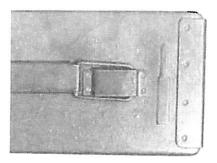
5-R. Inadequate Coverage—Permissible (Broken Blister)

No. 6. Paint Defects:

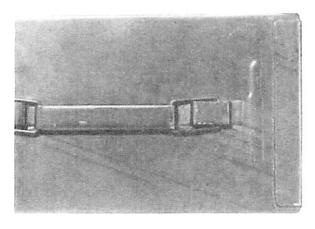
Surface Imperfection, Excessive Paint, Paint Not Dry

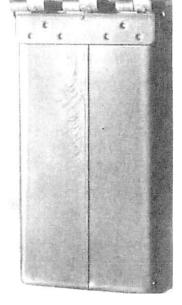


6-A. Inside Bottom-Incidental

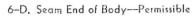


6-B. Cover-Incidental

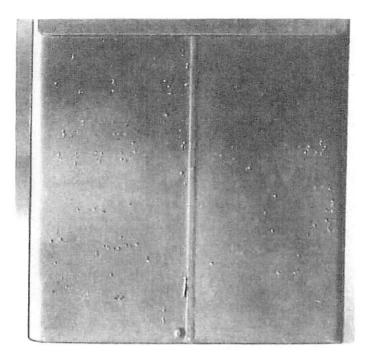




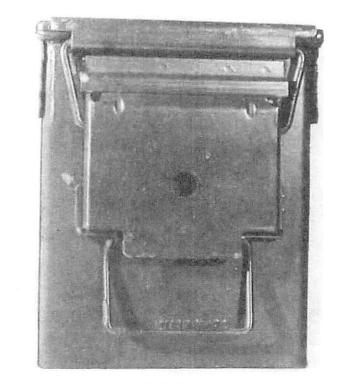
6-C. Cover-Permissible



Surface Imperfection



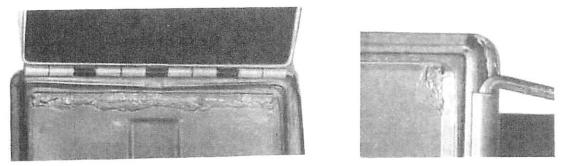
6-E. Roughness, Interior or Exterior Body-Permissible



6-F. Minor



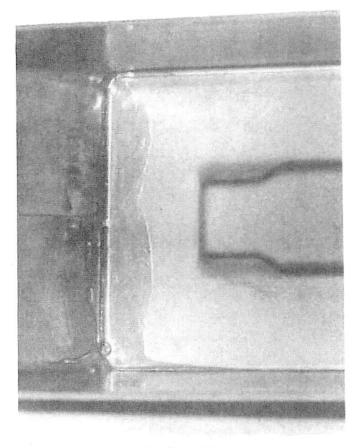




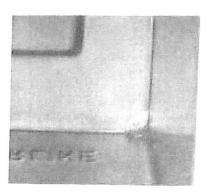
6-H. Minor

6-1. Permissible

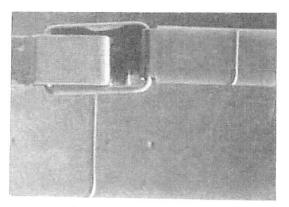
Excessive Paint, Gasket Retainer



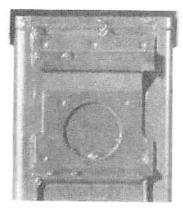
6-J. Permissible



6—K. Permissible Excessive Paint, Interior



6-L. Cover and/or Handle-Permissible



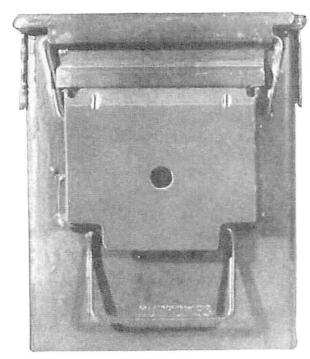
6-M. Hardware and Adjacent Box Areas—Permissible

Excessive Paint

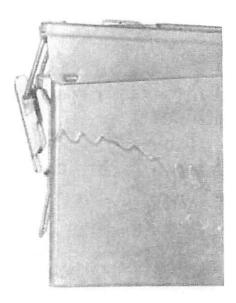


6-N. Paint Appearance-Permissible

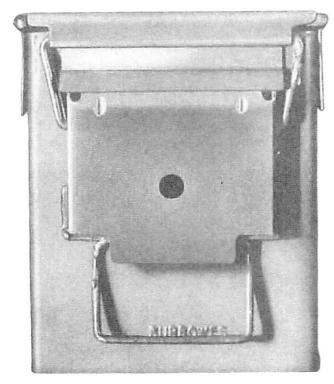
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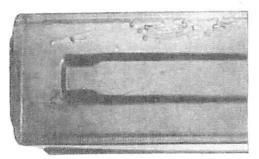
6-O. Minor



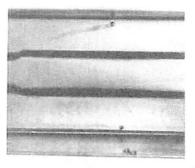
6-P. Minor



6-Q. Incidental

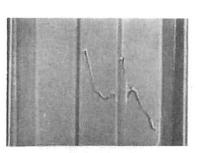


6--R. Incidental (Incidental if box stacks properly, otherwise minor.)

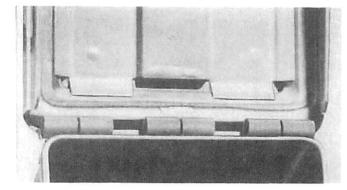


6-S. Incidental

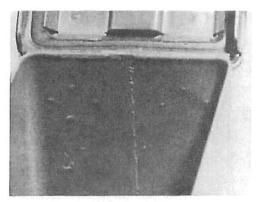
Paint Runs



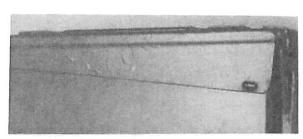
6-T. Incidental



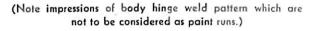
6-U. Permissible



6-V. Permissible

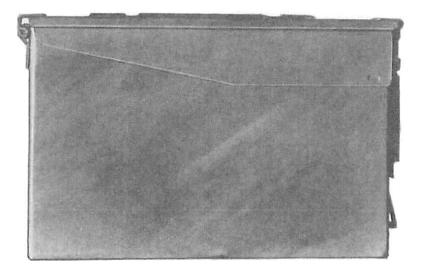


6-W. Permissible



Paint Runs

(If runs are soft, defect is minor.)



6-X. Incomplete Paint Agitation-Incidental

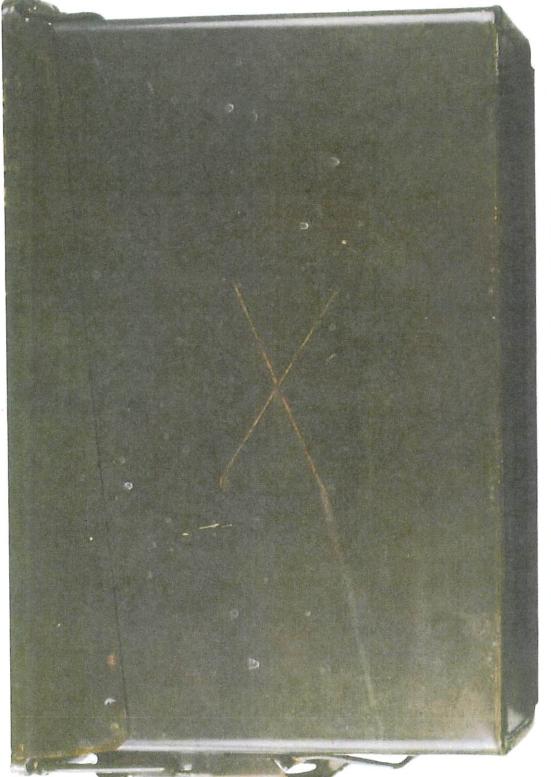


"WORST" PERMISSIBLE DEGREE OF RUST AFTER CORROSION RESISTANCE TEST



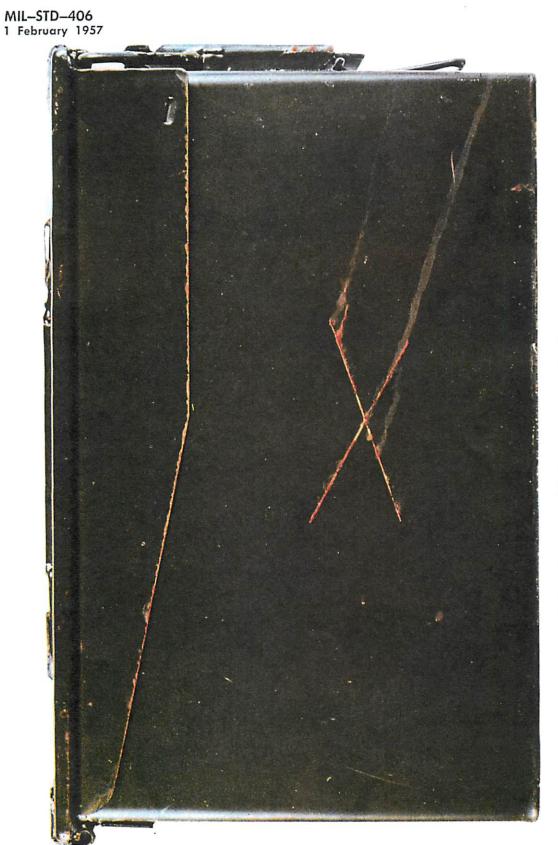
32

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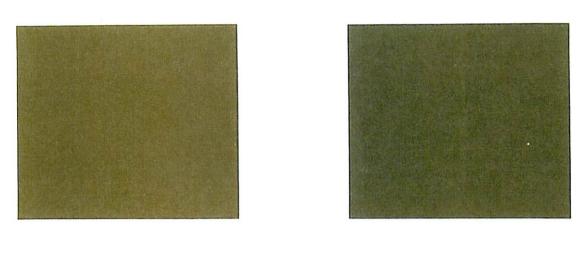


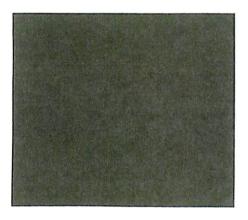
"WORST" PERMISSIBLE DEGREE OF RUST AFTER CORROSION RESISTANCE TEST

33



"WORST" PERMISSIBLE DEGREE OF RUST AFTER CORROSION RESISTANCE TEST







Color Tolerances

(Paint chips show permissible variation in color from that specified-Semi-Gloss Green No. 2430, Federal Specification TT-C-595.)

LIST OF DEFECTS

Cans, Ammunition, Universal, M20 and M21

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÷.	2-A. Absence of Curl	. 37
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	13-S. Weld Burns	. 50
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	NOTE.—In general, except for defects where severity is not pertinent, the illustrations define the following degrees of defectiveness:	1e
	"Worst" Permissible	
	"Worst" Incidental	

Example of Major (Minor when applicable).

CANS, AMMUNITION, UNIVERSAL, M20 AND M21

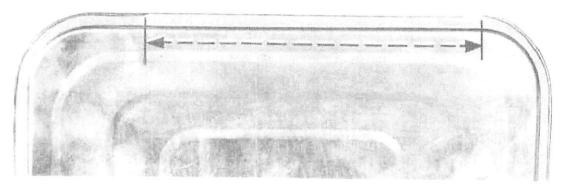
BOTTOM COVER

-----No. 1. Absence of Lining Compound or Presence of Skip One Inch or More in Length



1-A. Skip One Inch or More in Length---Major

-----No. 2. Absence of Curl or Grossly Incorrect Curl-----



2-A. Absence of Curl-Major

(Insufficient metal in blank to form curl. Defect is major regardless of length.)

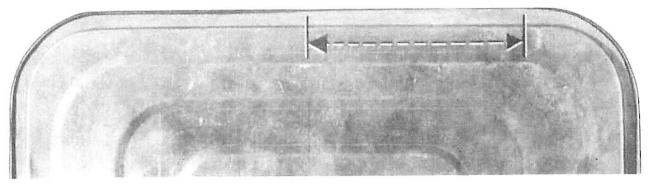


2-B. Major

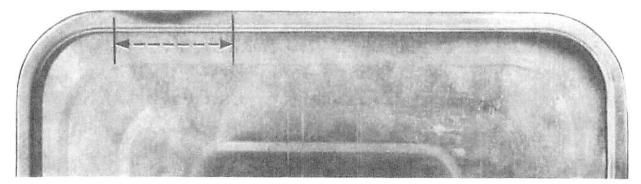


2-C. Major

Grossly Incorrect Curl



2-D. (Bottom View)-Major

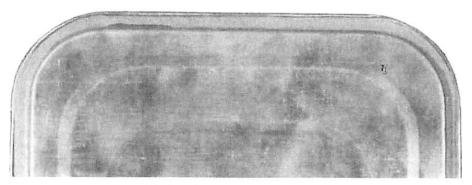


2-E. (Top View)

(Area marked indicates only presence of defect. Judgment as to length of defective curl is to be made from reverse side of cover as indicated in 2-D.)

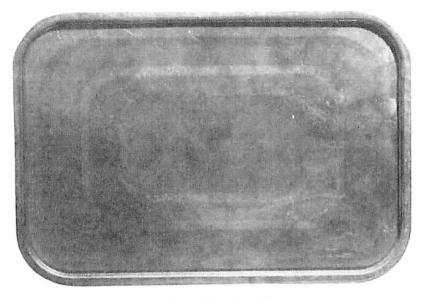
Grossly Incorrect Curl

(Up to one and one-half inches per bottom cover is an incidental defect. Defect, regardless of length, is major on corners.)



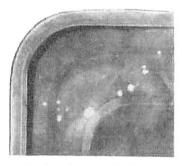
2-F. Partially Formed Curl-Permissible (Defect is shown on right corner. Permissible on all four corners.)

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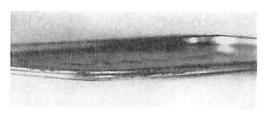


-No. 3. Chips, Dirt, Grease or Other Foreign Material

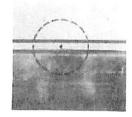
3-A. Dirt, Either Side-Minor



3–B. Spattered Lining Compound, Interior or Exterior— Permissible



3-C. Rust-Incidental

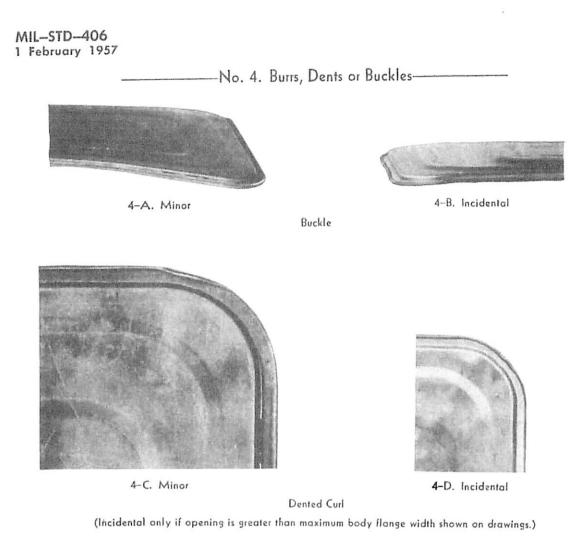


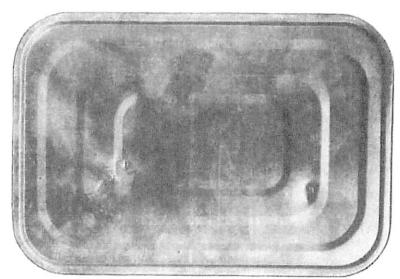
3–D. Incidental



3-E. Incidentol

Imbedded Chip





4-E. Dents-Minor



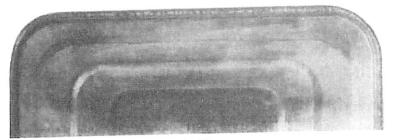
4-F. Dent-Permissible



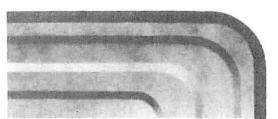
4-G. Small Buckles on Radius—Permissible (All four corners)

_____No. 5. Lining Compound Containing Skips_____ Less Than One Inch in Length; Excessive Overlap, Incomplete or Inadequate Coverage

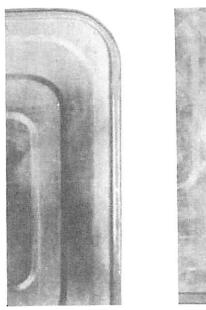
Inadequate Lining Compound



5-A. Minor



5-B. Permissible



5-C. Minor

5-D. Minor





5-F. Lining Compound Containing Skips

Less Than One Inch in Length-Minor

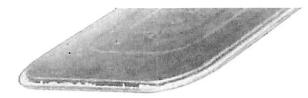
5-E. Permissible

Incomplete Lining Compound

(5-E illustrates "worst" permissible condition and may be present on one or more areas of a bottom cover. A condition more pronounced than that shown in 5-E, but where the incompleteness of coverage is confined to inside edge of flange and not more than half the width of the finished flange, shall be considered an incidental defect provided that the cover be included as an assembled can component in the airtightness test sample and the assembly be satisfactory. Assembly shall also be considered as defective in the airtightness test if it fails the test.)



5-G. Minor

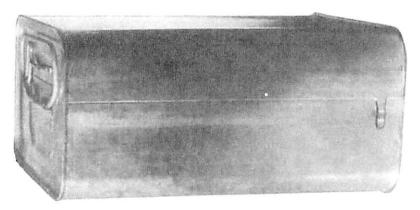


5-H. Permissible

Excessive Overlap

ASSEMBLY, ONE END OPEN

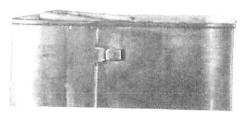
-No. 10. Missing or Incorrectly Positioned Component-



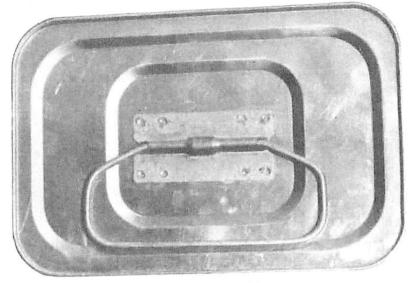
10-A. Top on Wrong End-Major



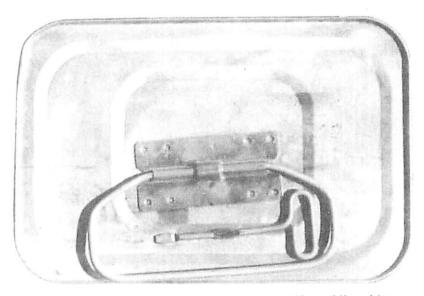
10—B. Incorrectly Positioned Tear Strip Tongue—Major



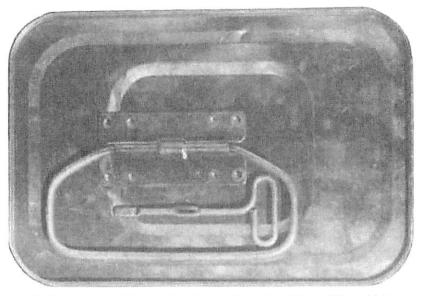
10-C. Bent Tear Strip Tongue—Major



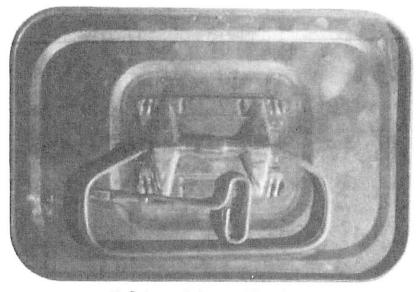
10-D. Missing Key-Major



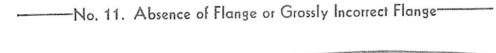
10-E. Incorrectly Positioned Handle and Cleat Assembly, and Key-Major

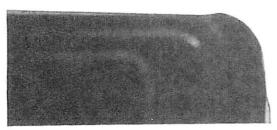


10-F. Incorrectly Positioned Handle and Cleat Assembly, and Key-Major

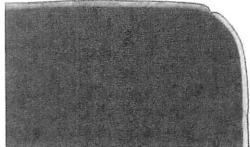


10-G. Incorrectly Positioned Key-Major



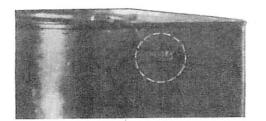


11-A. Absence of Flange-Major



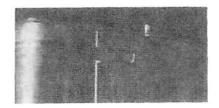
11-B. Grossly Incorrect Flange-Major

------No. 12. Chips, Dirt, Grease and Other Foreign Material----



12-A. Excessive Solder, Tear Strip Tongue-Minor

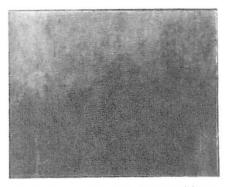
(Defect is permissible only if thickness of tongue with solder is less than minimum key slot.)



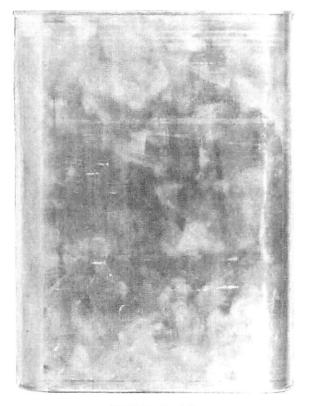
12-B. Metal Chip in Rolled Seam-Minor

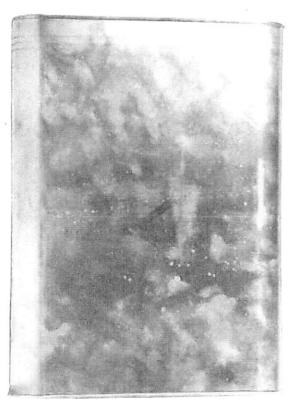


12-C. Grease-Minor (Interior or Exterior)



12-D. Foreign Material, Interior-Minor



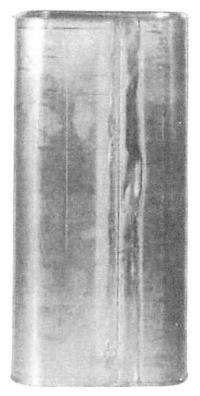


12–E. Incidental

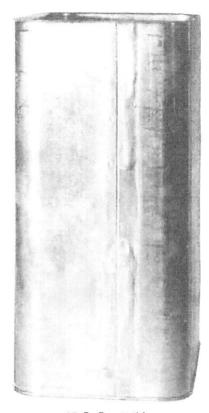
12–F. Incidental



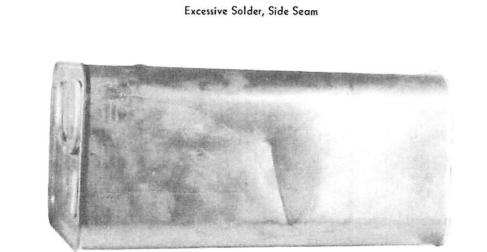




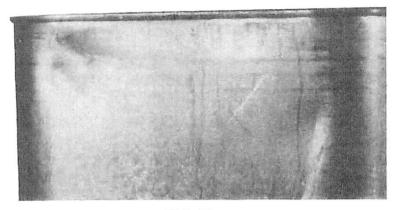
13-A. Incidental



13-B. Permissible

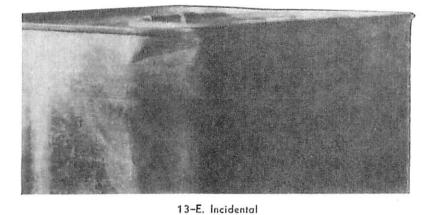


13-C. Minor



13-D. Minor

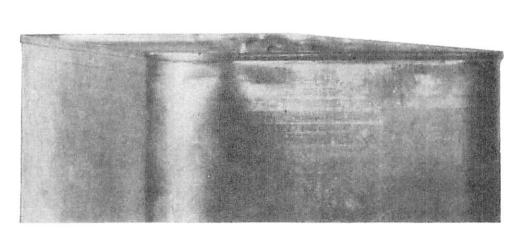
(Minor only if on tear strip as shown, if not on tear strip, defect is permissible.)



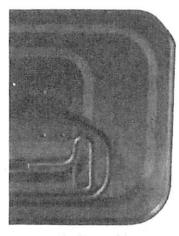
(Incidental only if not on tear strip as shown; if on tear strip, defect is minor.)



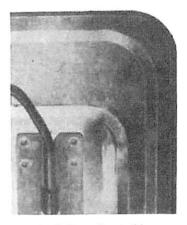
13-F. Permissible



13-G. Permissible (Permissible only if not on tear strip as shown; if on tear strip, defect is minor.) Dent

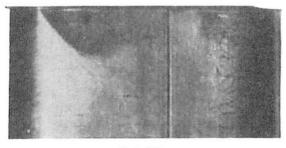


13-H. Corner-Minor

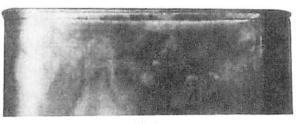


13-1. Top-Permissible

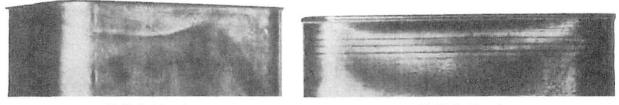
Dent



13-J. Minor



13-M. Minor

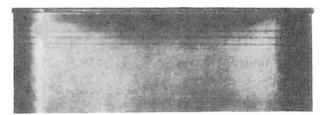


13–K. Incidental

13-N. Incidental

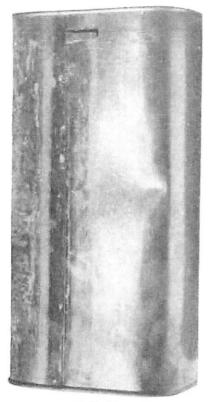


13-L. Incidental Buckle

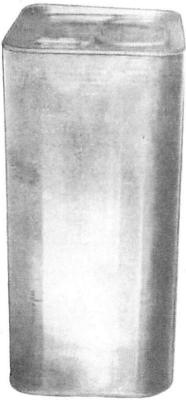


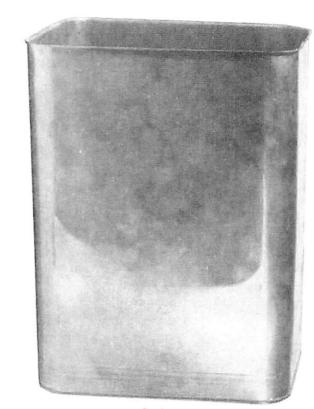
13-O. Permissible

Buckle



13-P. Minor

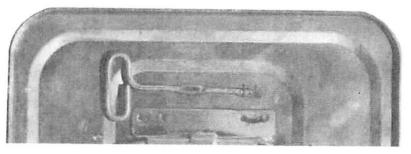




13-Q. Permissible

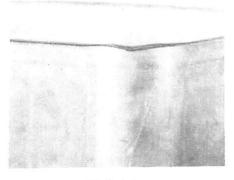


Buckle

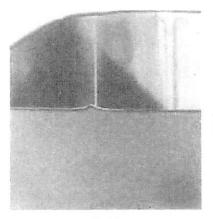


13-S. Weld Burns-Minor

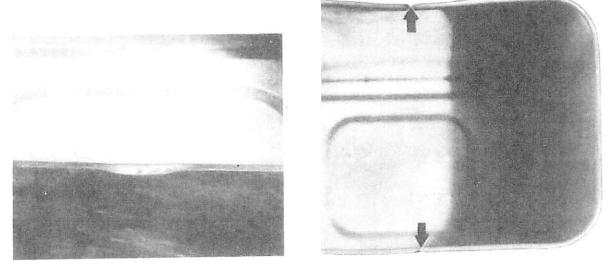
13-R. Fluting-Permissible



13-T. Minor



13-U. Minor



3-V. Incidental

13-W. Permissible

Deformed Flange

(Note 13–T which illustrates a deformed flange on a corner radius. The defect in that location, although less pronounced than 13–V, is classified minor because it is more likely to result in airtightness failure.)

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