

INCH-POUND

MIL-DTL-0045585E (AR)

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MIL-L-45585D (AR)

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DETAIL SPECIFICATION

LINK, CARTRIDGE: METALLIC BELT, 40MM - M16A2

This specification is approved for interim use by the U.S. Army Armament Research, Development and Engineering Center (ARDEC). Other activities in the Department of Defense may use this interim revision or may continue using MIL-L-45585D (AR).

1. SCOPE

1.1 Scope. This specification covers one type of link designated as Link, Cartridge: Metallic Belt, 40MM: M16A2.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 or 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all requirements of documents cited in sections 3 or 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2)

Comments, suggestions, or questions on this document should be addressed to: Commander, US Army ARDEC, ATTN: AMSRD-AAR-QES-E, Picatinny, New Jersey 07806-5000, or e-mailed to ardec-stdzn@pica.army.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil>

AMSC N/A

FSC 1310

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DEPARTMENT OF DEFENSE SPECIFICATIONS

| | |
|---------------|---|
| MIL-DTL-16232 | Phosphate Coatings, Heavy, Maganese or Zinc Base |
| MIL-W-46154 | Welding, Resistance, Spot and Projection for Fabricating Assemblies of Carbon Steel Sheets |

DEPARTMENT OF DEFENSE STANDARDS

| | |
|----------------|---|
| MIL-STD-1916 | DOD Preferred Methods for Acceptance of Product |
| MIL-STD-2073-1 | DOD Standard Practice for Military Packaging |

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

US ARMY (ARDEC) DRAWINGS (see 6.4)

PRODUCT AND PACKING DRAWINGS

| | |
|----------|--|
| 11691393 | Link Cartridge: Metallic Belt, 40MM: M16A2 |
| 11691394 | Coupling, Cartridge Link |
| 11691395 | Loop, Cartridge Link |
| 11691396 | Test Diagram and Requirements for M16A2 Link |

INSPECTION EQUIPMENT DRAWINGS

| | |
|----------|--|
| 8440212 | Gage, Location |
| 8440213 | Gage, Location |
| 8441408 | Gage, Indicator |
| 11017978 | Operating Instructions for Location Gage D8440213 |
| 11017979 | Operating Instructions for Location Gage D8440212 |
| 11017980 | Operating Instructions for use with Gage, Holding Fixture D11018357 |
| 11017981 | Operating Instructions for use with Gage, Holding Fixture D11018356 |
| 11018116 | Gage, Holding Fixture |
| 11018215 | Gage, Indicator |
| 11018216 | Gage, Width |
| 11018217 | Gage, Special Snap |

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| | |
|----------|--|
| 11018218 | Operating Instructions for use with Gage, Holding Fixture B11018116 |
| 11018350 | Gage, Simulated Cartridge |
| 11018351 | Gage, Functional |
| 11018354 | Gage, Flush Pin |
| 11018355 | Gage, Special Snap |
| 11018356 | Gage, Holding Fixture |
| 11018357 | Gage, Holding Fixture |
| 12989029 | Operating Instructions for Indicator Gage 8441408 |

(Copies of these drawings may be requested online at drawing-request@pica.army.mil, or from U.S. Army ARDEC, ATTN: AMSRD-AAR-AIS-TD, Picatinny NJ 07806-5000.)

2.3 Non-Government publications. The following document form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS
INTERNATIONAL (ASTM)

| | |
|-----------|--|
| ASTM B117 | Standard Method of Salt Spray (Fog) Testing |
| ASTM E18 | Standard Methods of Test for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials |

(Copies may be requested online at www.astm.org or ordered from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959).

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified in the solicitation or contract order (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.3.

3.2 Materials. Materials, parts and assemblies shall comply with requirements specified on the applicable drawings and referenced specifications.

3.3 Functioning. Links shall be assembled into belts using Government standard, M385 Practice ammunition and fired in intermittent bursts of 5 to 15 rounds from the MK19, MOD III, Grenade Machine Gun, without malfunctioning, cracking, breaking or separating.

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3.4 Workmanship. All parts and assemblies shall be fabricated, loaded and assembled in a thorough and workmanlike manner. They shall be free of burrs, chips, sharp edges, cracks, dirt, grease, rust and other foreign matter. The cleaning method used shall not be injurious to any parts, nor shall the cleaning agents contaminate the parts. Exterior surface coatings shall be continuous; however a few light scratches not exposing base material may be permitted. All marking and stamping shall be neat and sharply defined.

4. VERIFICATION

TABLE I. Requirement/Inspection Cross Reference Matrix

Method of inspection
 N/A - Not Applicable
 1 - Analysis
 2 - Demonstration
 3 - Examination
 4 - Test

Classes of inspection
 A - First article
 B - Conformance

| Section 3 Requirement | Inspection Methods | | | | | Inspection Class | | Section 4 Inspection Method |
|--------------------------|-----------------------|---|---|---|---|---------------------|---|-----------------------------------|
| | NA | 1 | 2 | 3 | 4 | A | B | |
| 3.1 | | | X | X | X | X | | 4.3 |
| 3.2 | | | | X | X | X | X | 4.4 |
| 3.3 | | | | | X | X | X | 4.5.15 |
| 3.4 | | | | X | | X | X | 4.5.18 |

4.1 Classification of inspection. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.3).
- b. Conformance inspection (see 4.4).

4.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in section 4.5.

4.3 First article. When specified in the solicitation or contract, a sample of the Link, Cartridge: Metallic Belt, 40MM: M16A2 shall be subjected to first article inspection in accordance with section 4.3.1 and Table II.

4.3.1 First article quantity. The contractor shall submit a first article for evaluation in accordance with the provisions of 4.3.2. The first article sample shall consist of the following items in sample quantities as indicated.

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| <u>Name</u> | <u>Drawing</u> | <u>Quantity</u> |
|--------------------------|----------------|-----------------|
| Coupling, Cartridge Link | 11691394 | 25 |
| Loop, Cartridge Link | 11691395 | 100 |
| Link M16A2 | 11691393 | 1500 |

4.3.2 Inspections to be performed. The first article inspection shall be 100% examination for defects of all drawing characteristics (listed and unlisted) including workmanship requirements for the parts and assemblies listed in 4.3.1 and the tests specified in Table II herein.

4.3.3 First article rejection. If any assembly, component or test specimen fails to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of an assembly, component or test specimen to comply with any of the requirements.

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TABLE II. First Article Inspection

CLASSIFICATION OF CHARACTERISTICS

| TITLE | SHEET 1 OF 1 | | DRAWING NUMBER |
|---|---------------------------|--------------------------|--------------------------------|
| Link M16A2 and Components | | | See Below |
| EXAMINATION OR TEST | NUMBER OF SAMPLE UNITS | REQUIREMENT PARAGRAPH | INSPECTION METHOD REFERENCE |
| <u>Coupling, Cartridge Link</u> (Dwg. 11691394) | | | |
| Tensile strength | 400 | 3.2 | 4.5.1 |
| Salt spray, prior to oil treatment | 5 | 3.2 | 4.5.2 |
| <u>Loop, Cartridge Link</u> (Dwg. 11691395) | | | |
| Weld test | 10 | 3.2 | 4.5.3 |
| Hardness, prior to protective coating | 100 | 3.2 | 4.5.4 |
| Test for carburization and decarburization, prior to coating | 10 | 3.2 | 4.5.5 |
| Salt spray, prior to oil treatment | 5 | 3.2 | 4.5.2 |
| <u>Link M16A2</u> (Dwg. 11691393) | | | |
| Nose fan, butt fan, twist and free hinging test <u>1</u> / | 500 | 3.2 | 4.5.6, 4.5.7, 4.5.8, 4.5.9 |
| Tensile load test <u>1</u> / | 500 | 3.2 | 4.5.10 |
| Breakaway force test <u>2</u> / | 500 | 3.2 | 4.5.11 |
| Stripping force test <u>2</u> / | 500 | 3.2 | 4.5.12 |
| Uncoupling force test <u>2</u> / | 500 | 3.2 | 4.5.13 |
| Functioning | 500 | 3.3 | 4.5.15 |
| Notes: <u>1</u> /. Fifty (50) belts of ten (10) links each. Same belts shall be used for these tests. <u>2</u> /. Same links shall be used for these tests. | | | |

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4.4 Conformance inspection.

4.4.1 Inspection lot formation. Lot formation shall be in accordance with MIL-STD-1916. In addition inspection lots shall not exceed 500,000 links per lot. Each inspection lot shall contain:

- a. Coupling from one interfix number from one manufacturer
- b. Loops from more than one (1) heat treat batch provided each batch has successfully passed the inspections specified in paragraph 4.4.2.2, 4.4.2.3, and 4.5.3.

4.4.1.1 Heat treat batch. The heat treat batch shall consist of loops heat treated in a batch type furnace at one charge or in a continuous type furnace during an uninterrupted period extending over not more than one eight hour shift.

4.4.2 Classification of characteristics.

a. Sampling requirements. Inspection sampling requirements for Critical, Major and Minor characteristics are defined in MIL-STD-1916. Unless specified otherwise, Verification Level IV shall be used for all characteristics defined as Majors and Verification Level II for all Minor characteristics; Critical characteristics shall be addressed in accordance with MIL-STD-1916.

b. Conformance inspection. Conformance inspection shall be performed in accordance with paragraph 4.4.2.1 through 4.4.2.3. For all conformance inspections the same sample specimen may be used for all non-destructive examinations or tests.

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Conformance Inspection

CLASSIFICATION OF CHARACTERISTICS

| PARAGRAPH | TITLE | SHEET 1 OF 1 | | DRAWING NUMBER 11691394 NEXT HIGHER ASSEMBLY 11691393 |
|---|---|-------------------------|--------------------------|---|
| CLASSIFICATION | EXAMINATION OR TEST | CONFORMANCE CRITERIA | REQUIREMENT PARAGRAPH | INSPECTION METHOD REFERENCE |
| <u>Critical</u> | NONE DEFINED | | | |
| <u>Major</u> | | | | |
| 101. | Length, head | Level IV | 3.2 | Gage/ 11018355 |
| 102. | Height, head | Level IV | 3.2 | Gage/ 11018355 |
| 103. | Thickness, head | Level IV | 3.2 | Gage/ 11018354 |
| 104. | Diameter, pivot lug | Level IV | 3.2 | 4.5.16 |
| 105. | Distance, inside between head and pivot lugs | Level IV | 3.2 | Gage/ 11018216 |
| 106. | Diameter, shank | Level IV | 3.2 | Gage/ 11018217 |
| 107. | Tensile strength | <u>2</u> / | 3.2 | 4.5.1 |
| 108. | Salt spray, prior to oil treatment | <u>1</u> / | 3.2 | 4.5.2 |
| <u>Minor</u> | | | | |
| 201. | Any radius missing | Level II | 3.2 | Visual |
| 202. | Evidence of poor workmanship | Level II | 3.4 | Visual/4.5.18 |
| Notes: <u>1</u> /. Sampling and rejection shall be in accordance with MIL-DTL-16232. <u>2</u> /. A random sample of 315 shall be tested. If the requirement on the drawing is not met, the lot represented by the sample shall be rejected and set aside for disposition in accordance with MIL-STD-1916. | | | | |

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Conformance Inspection

CLASSIFICATION OF CHARACTERISTICS

| PARAGRAPH | TITLE | SHEET 1 OF 3 | | DRAWING NUMBER |
|-----------------|--|-------------------------|-----------------------|------------------------------|
| 4.4.2.2 | Loop, Cartridge Link | | | 11691395 |
| | | | | NEXT HIGHER ASSEMBLY |
| | | | | 11691393 |
| CLASSIFICATION | EXAMINATION OR TEST | CONFORMANCE CRITERIA 1/ | REQUIREMENT PARAGRAPH | INSPECTION METHOD REFERENCE |
| <u>Critical</u> | NONE DEFINED | | | |
| <u>Major</u> | | | | |
| 101. | Improper forming, segment assembly and welding, distorted diameter. (The finished loop shall be capable of dropping over mandrel, detail A, with a maximum applied weight of two pounds) | Level IV | 3.2 | Gage/ 11018351 |
| 102. | Improper forming, segment assembly and welding, distorted width. (The finished loop shall be capable of dropping freely of its own weight through slot) | Level IV | 3.2 | Gage/ 11018351 |
| 103. | Diameter, pivot hole | Level IV | 3.2 | Gage/ 8440212 11017979 |
| 104. | Height, leaf spring | Level IV | 3.2 | Gage/ 8441408 12989029 |
| 105. | Height, coupling snap groove | Level IV | 3.2 | Gage/ 8440212 11017979 |
| 106. | True position, pivot slot | Level IV | 3.2 | 8440212 11017979 |
| 107. | Location, top guide surface from horizontal center line (min. and max.) | Level IV | 3.2 | Gage/ 8440213 11017978 |
| 108. | Location, bottom guide surface from horizontal center line (min. and max.) | Level IV | 3.2 | Gage/ 8440213 11017978 |

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CLASSIFICATION OF CHARACTERISTICS

| PARAGRAPH | TITLE | SHEET 2 OF 3 | | DRAWING NUMBER |
|----------------|---|----------------------------|--------------------------|--------------------------------|
| 4.4.2.2 | Loop, Cartridge Link (con't) | | | 11691395 |
| | | | | NEXT HIGHER ASSEMBLY |
| | | | | 11691393 |
| CLASSIFICATION | EXAMINATION OR TEST | CONFORMANCE CRITERIA 1/ | REQUIREMENT PARAGRAPH | INSPECTION METHOD REFERENCE |
| 109. | Location, square loop from vertical center line (min. and max.) | Level IV | 3.2 | Gage/ 8440213 11017978 |
| 110. | Location, coupling pivot surface from vertical center line min. and max.) | Level IV | 3.2 | Gage/ 8440213 11017978 |
| 111. | True position requirement not met, snap opening with horizontal center line | Level IV | 3.2 | Gage/ 8440213 11017978 |
| 112. | True position requirement not met, square loop height with horizontal center line | Level IV | 3.2 | Gage/ 8440213 11017978 |
| 113. | Diameter, coupling pivot hole | Level IV | 3.2 | Gage/ 8440212 11017979 |
| 114. | True position requirement not met, coupling pivot hole diameter with snap groove height | Level IV | 3.2 | Gage/ 8440212 11017979 |
| 115. | Length location, coupling pivot hole | Level IV | 3.2 | Gage/ 8440212 11017979 |
| 116. | Height, square loop | Level IV | 3.2 | Gage/ 8440212 11017979 |
| 117. | Outside width, top and bottom guides over (calculated) | Level IV | 3.2 | Gage/ 8440212 11017979 |
| 118. | Salt spray, prior to oil treatment | 2/ | 3.2 | 4.5.2 |
| 119. | Weld Test | 3/ | 3.2 | 4.5.3 |
| <u>Minor</u> | | | | |
| 201. | Thickness, stock | Level II | 3.2 | Gage/ 11018215 |

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Conformance Inspection

CLASSIFICATION OF CHARACTERISTICS

| | | | | |
|---|---|----------------------------|--------------------------|-------------------------------------|
| 4.4.2.2 | Loop, Cartridge Link (con't) | SHEET 3 OF 3 | | DRAWING NUMBER 11691395 |
| | | | | NEXT HIGHER ASSEMBLY 11691393 |
| CLASSIFICATION | EXAMINATION OR TEST | CONFORMANCE CRITERIA 1/ | REQUIREMENT PARAGRAPH | INSPECTION METHOD REFERENCE |
| 202. | Height, pivot slot coupling | Level II | 3.2 | Gage/ 8440212 11017979 |
| 203. | True position of top and bottom guides | Level II | 3.2 | Gage/ 8440213 11017978 |
| 204. | Marking misleading or unidentifiable | Level II | 3.2 | Visual |
| 205. | Evidence of poor workmanship | Level II | 3.4 | Visual/4.5.18 |
| Notes: 1/. Sample except for Major 118 and 119 shall be selected from each heat treat batch. 2/. Sampling and rejection shall be in accordance with MIL-DTL-16232. 3/. 5 Samples shall be selected from each hour's production from each welding machine. If any loop fails the weld strength requirement specified on the drawing, the hour's production represented by the sample per machine shall be rejected. | | | | |

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Conformance Inspection

CLASSIFICATION OF CHARACTERISTICS

| PARAGRAPH | TITLE | SHEET 1 OF 2 | | DRAWING NUMBER |
|--|---|-------------------------|-----------------------|-----------------------------|
| 4.4.2.3 | Link, M16A2 | | | 11691396 |
| | | | | NEXT HIGHER ASSEMBLY |
| | | | | 11691393 |
| CLASSIFICATION | EXAMINATION OR TEST | CONFORMANCE CRITERIA 1/ | REQUIREMENT PARAGRAPH | INSPECTION METHOD REFERENCE |
| <u>Critical</u> | NONE DEFINED | | | |
| <u>Major</u> | | | | |
| 101. | Breakaway Force Test 2/ | Level IV | 3.2 | 4.5.11, 11017981, 11018356 |
| 102. | Stripping Force Test 2/ | Level IV | 3.2 | 4.5.12, 11017981, 11018357 |
| 103. | Uncoupling Force Test 2/ 3/ | Level IV | 3.2 | 4.5.13, 11017980, 11018357 |
| 104. | Functioning | 144 4/ | 3.3 | 4.5.15 |
| 105. | Nose Fan, Butt Fan, Twist and Free Hinging Test | 5/ | 3.2 | 4.5.6, 4.5.7, 4.5.8, 4.5.9 |
| 106. | Tensile Test | 5/ | 3.2 | 4.5.10, 11018116, 11018218 |
| 107. | Hardness | Level IV | 3.2 | 4.5.4 |
| 108. | Carburization & Decarburization Test | 7/ | 3.2 | 4.5.5 |
| 109. | Cleanliness | 6/ | 3.2 | 4.5.14 |
| <u>Minor</u> | | | | |
| 201. | Evidence of poor workmanship | Level II | 3.4 | Visual/4.5.18 |
| Notes: 1/. Sample shall be selected from each heat treat batch except for Major 104. 2/. Same links shall be used for these tests. 3/. Coupling used for this test shall be from the same lot or lots being shipped with the loops. 4/. Sample shall be selected randomly from entire inspection lot by local Government representative. Accept on zero (0) and reject on one (1). | | | | |

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Conformance Inspection

CLASSIFICATION OF CHARACTERISTICS

| | | | | |
|--|---------------------|----------------------------|--------------------------|-------------------------------------|
| 4.4.2.3 | Link, M16A2 (con't) | SHEET 2 OF 2 | | DRAWING NUMBER 11691396 |
| | | | | NEXT HIGHER ASSEMBLY 11691393 |
| CLASSIFICATION | EXAMINATION OR TEST | CONFORMANCE CRITERIA 1/ | REQUIREMENT PARAGRAPH | INSPECTION METHOD REFERENCE |
| <p>Notes:</p> <p>5/. Ten (10) belts of 10 links each. Same links shall be used for these tests. Accept on zero (0) and reject on one (1). If the requirement on the drawing is not met, the lot represented by the sample shall be rejected and set aside for disposition in accordance with MIL-STD-1916.</p> <p>6/. Sampling and rejection shall be in accordance with MIL-STD-2073-1.</p> <p>7/. A random sample of 3 shall be tested. If the requirement on the drawing is not met, the lot represented by the sample shall be rejected and set aside for disposition in accordance with MIL-STD-1916.</p> | | | | |

4.5 Methods of inspection.

4.5.1 Tensile strength of coupling cartridge link. The coupling shall be tested for tensile strength in accordance with an approved fixture. The coupling shall be held by the pivot lugs and the head. This test is destructive test. Parts so tested shall not be returned to the lot.

4.5.2 Salt spray of coupling cartridge link and loop, cartridge link. This test shall be conducted in accordance with ASTM B117. This test is a destructive test. Parts so tested shall not be returned to the lot.

4.5.3 Weld test of loop, cartridge link. This test shall be conducted in accordance with MIL-W-46154 and the gradual loading requirement of the applicable drawing. This test is a destructive test. Parts so tested shall not be returned to the lot.

4.5.4 Hardness of loop, cartridge link. The test shall be conducted in accordance with ASTM E18 and shall comply with the requirements of the applicable drawing. This test is a non-destructive test. Parts so tested may be returned to the lot.

4.5.5 Test for carburization and decarburization of loop, cartridge link. A cross section of the loop shall be polished, etched with a 3 to 5 percent Nital solution and examined under a microscope of not less than 500 power to determine the requirements of the applicable drawing. This test is a destructive test. Parts so tested shall not be returned to the lot.

4.5.6 Nose fan test. Links shall be tested by assembling the links into 10-round belts using 10 simulated cartridge gages conforming to Drawing 11018350. Adjacent

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link assemblies shall be coupled together prior to inserting the simulated cartridge gages. The simulated cartridge gages shall be inserted into the links so that the link teeth are engaged in the labyrinthine grooves of the driving bands. Each belt shall be laid on one side on a level plane surface and drawn into its smallest circular arc with the nose tips of the simulated cartridge gage pointing toward the center of the arc (see Drawing 11691396). Observation shall be made for deformation of parts. This test is a non-destructive test. Parts shall be used for subsequent tests.

4.5.7 Butt fan test. Links shall be tested using the same procedure specified in 4.5.6 except that each belt shall be drawn into its smallest circle arc with the butt ends of the simulated cartridge gage pointed toward the center of the arc (see Drawing 11691396). Observation shall be made for deformation of parts. This test is a non-destructive test. Parts shall be used for subsequent tests.

4.5.8 Twist test. The test shall be conducted with the assembled belt attached by the first link of the belt to an approved holding fixture of the contractor's design. The holding fixture shall be attached to a rigid support in such a manner that will allow the belt to hang freely vertically. A torque shall be applied by hand to the tenth round of the free belt both in a clockwise and counterclockwise direction of rotation (see Drawing 11691396). Observation shall be made for evidence of partial or complete belt separation, disassembly of cartridges from the links or deformation of parts. This test is a non-destructive test. Parts shall be used for subsequent tests.

4.5.9 Free hinging test. Each belt shall be laid out horizontally to its full length and one end shall be drawn back upon the remainder of the belt until the belt is completely reversed. One end of the reversed belt shall then be drawn back upon the remainder of the belt until the belt is returned to its original position (see Drawing 11691396). Observation shall be made for the requirement of the applicable drawing. This test is a non-destructive test. Parts shall be used for subsequent tests.

4.5.10 Tensile load test. Each belt shall be inserted into a test fixture and a tensile load of 400 pounds shall be applied at a speed of 1 to 2 inches per minute on the center line of the belt as specified on Drawing 11691396. Observation shall be made for the requirement of the applicable drawing using Drawing 11018116 and 11018218. This test is a destructive test. Parts so tested shall not be returned to the lot.

4.5.11 Breakaway force test. Each link of the sample shall be tested using test equipment conforming to Drawing 11017981, 11018356, and 11691396. Links shall be assembled to the test mandrel with the leaf springs of the links seated in the groove of the mandrel. The test mandrel, with the assembled link, shall be inserted into the test fixture and the load shall be applied to the link in the direction to strip the link from the test mandrel. The maximum load required initially move the link shall be recorded as the breakaway force. Observation shall be made for the requirement of the applicable drawing. This test is a non-destructive test. Parts shall be used for, subsequent tests.

4.5.12 Stripping force test. Each link of the sample shall be tested using

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inspection equipment conforming to Drawing 11017981, 11018356, and 11691396. Links shall be assembled to the test, mandrel with the leaf spring areas of the link seated in the groove of the test-mandrel. The test mandrel, with assembled link, shall be inserted into the test fixture and the load shall be applied to the link in the direction to strip the link from the test mandrel (see Drawing 11691396). The maximum load required to strip the link from the test mandrel, excluding the initial force (breakaway) to move the link, shall be recorded as the stripping force. Observation shall be made for the requirement of the applicable drawing. This test is a non-destructive test. Parts shall be used for subsequent tests.

4.5.13 Uncoupling force test. Each link of the sample shall be tested using inspection equipment conforming to Drawing 11017980, 11018357, and 11691396. The links shall be inserted into the test fixture and the load shall be applied in the direction specified on Drawing 11691396 until the links are uncoupled. The maximum load required to uncouple the link shall be measured as the uncoupling force. The test shall be conducted so that each coupling and each loop in the sample is tested. Observation shall be made for the requirement of the applicable drawing. This test is a destructive test. Parts so tested shall not be returned to the lot.

4.5.14 Determination of cleanliness test. Links shall be tested for cleanliness requirements in accordance with MIL-STD-2073-1. This test is a non-destructive test. Parts so tested may be returned to the lot.

4.5.15 Functioning test. Links shall be tested by assembling the links into belts using Government standard 40mm, M385 practice ammunition. The belts shall be fired in intermittent bursts of 5 to 15 rounds from the MK19, MOD III, Grenade Machine Gun mounted in a Government approved mount with standard chuting.

4.5.16 Pivot lug diameter inspection. The pivot lug diameter, max., shall be inspected on each side of the coupling in two (2) places approximately 90 degrees apart for a total of four (4) measurements. Standard measuring and test equipment, a go ring (1 measurement per side), or a contractor designed gage shall be used. The pivot lug diameter, max., shall be inspected on each side of the coupling in two (2) places approximately 90 degrees apart for a total of four (4) measurements. Standard measuring and test equipment or a contractor designed gage shall be used. All gaging shall be approved by the Government.

4.5.17 Inspection Equipment. The inspection equipment required to perform the examination and tests prescribed herein is described in the Inspection Method Column in the tables starting with paragraph 4.4.2.1. Inspection equipment used for acceptance of product shall be capable of repeatable measurements, by various experienced inspection/test personnel, to an accuracy of 10% or better of the total tolerance of the characteristic being inspected. Any automated acceptance inspection equipment (AAIE) prove-out shall be performed in accordance with MIL-A-70625 (see 6.6).

4.5.18 Workmanship. Visually verify that all parts and assemblies meet requirements of paragraph 3.4.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DOD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The component covered by this specification is intended for use with 40mm ammunition in the form of flexible belts.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of this specification.
- b. Title, number (w/revision level) and date of all reference documents.
- c. ASSIST Online to be cited in the solicitation, and, if required, the specific issue of individual documents referenced (see 2.1.1).
- d. Requirements for submission of first article sample.
- e. Requirement for submission of design verification sample (if applicable).
- f. Requirement for submission of inspection equipment designs.
- g. Applicable national stock number.
- h. Packaging requirements, if other than specified in Section 5.
- i. Serialization requirements, if applicable.
- j. Certificate of conformance for each lot or shipment of product, if applicable.
- k. Government Furnished Material or equipment, if applicable.

6.3 Contractor acceptance inspection equipment (AIE). Provisions concerning the contractor's AIE used to verify the requirements of this specification should be specified in the contract.

6.4 Drawings. Drawings listed in /section 2 of this specification under the heading U.S. Army Armament, Research, Development and Engineering Center (ARDEC) may also include drawings prepared by, and identified as U.S. Army Armament, Research and Development Command (ARRADCOM), Frankford Arsenal, Rock Island Arsenal or Picatinny Arsenal drawings. Technical data originally prepared by these activities is now under the cognizance of ARDEC.

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6.5 Automated acceptance inspection equipment. Equipment for which no, or minimal, human involvement is required in the acceptance determination. This would include equipment employing probes/sensors/transducers that are automatically manipulated to perform measuring and detection functions. If readout is provided, the equipment will be categorized as automated even if operator interpretation is needed in the accept/reject decision.

6.6 Critical Inspection Equipment.

6.6.1 System Reliability. The contractor should provide for each defect identified as Critical, a manufacturing and inspection system that assured no more than one in a million contain the defect. This should be assured by controlling the maximum defect rate produced and the error rate of the inspection equipment such that the product of the two terms is less than one in a million.

6.6.2 Maximum defect rate produced. The maximum defect rate produced should be defined as the largest defect rate expected for the characteristics of concern on a monthly or lot basis. The contractor should establish the maximum defect rate, however, it may not exceed one percent without approval of the procuring contracting officer. Once established, the contractor should monitor the defect rate to assure it does not exceed the maximum rate allotted. If the established maximum defect rate is exceeded, the production of that feature should be terminated until the cause is determined and corrected. Additionally, all products for that period of time should be rejected and reinspected.

6.6.3 Maximum error rate of the inspection system. The error rate of the inspection equipment should be defined as the expected ratio of the number of defective parts accepted to the number of defective parts inspected by the equipment. The contractor, to meet the system reliability as defined in contract, defines the maximum error rate allowed. However, it may not exceed 1/500 without approval of the procuring contracting officer. Based on the maximum error rate defined for the equipment, the contractor should develop demonstration test procedure to demonstrate the error rate of the equipment. The test should be performed using defective parts or reject standards. No part or standard should be accepted during the test. If a part or standard is accepted, the cause for failure should be isolated and the corrected and the test rerun. Unless otherwise specified in the detailed item specification, the minimum number of test samples to be run should be equal to 0.7 divided by the error rate (e.g. If the required error rate is 1/1000, the sample size would be $0.7 \div (1/1000) = 700$.)

6.6.4 Periodic verification. Periodic verification of the system error rate should be performed.

6.6.5 Redundant inspection equipment. The contractor may elect to use redundant inspection equipment in lieu of using a single piece of equipment with a very low error rate. Where redundant equipment is used, the inspection system error rate is defined as

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the error rates of the multiple pieces of equipment multiplied together.

6.7 Key Word Listing.

M385 Cartridge
MK19, MOD III, Grenade Machine Gun

6.8 Revisions/Amendments History. The following is a record of changes incorporated into this document

| ECP | Description | Date Approved |
|----------|---|---------------|
| R2S2020 | Remove one piece Link design from drawing | 07/01/2002 |
| R04Q2020 | Initial release of M16A2 Link MIL-DTL Specification | Aug 2004 |

6.9 Interim Revision This interim revision has been prepared at Program Manager request to document in ASSIST Online the version of a draft specification that was placed on contract in 2004. This interim revision has been dated to match the date of the draft specification that was placed on contract. It has been modified slightly to comply with MIL-STD-961 requirements for format, but not content. A fully coordinated revision, compliant with both MIL-STD-961 format and content requirements, will be approved for publication.

6.10 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing Activity:
Army-AR
(Project 1310-2006-006)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil>.