

MIL-M-13529D(AR)
8 November 1985
 SUPERSEDING
 MIL-M-13529C
 6 July 1976

MILITARY SPECIFICATION

MOUNTS, GUNS: RING TYPE REVOLVING

This specification is approved for use by the U.S. Army Armament, Munitions and Chemical Command, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers revolving ring (revolving ring on fixed ring) machine gun mounts used on military trucks and combat vehicles (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitations, form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

- MIL-G-10924 - Grease Automotive and Artillery
- MIL-W-13855 - Weapons: Small Arms and Aircraft Armament Subsystems, General Specification for
- MIL-P-14232 - Parts, Equipment and Tools for Army Materiel, Packaging and Packing of
- MIL-W-63150 - Weapons and Support Material Standard Quality Assurance Provisions for

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, US Army Armament Research and Development Center, Attn: AMSNC-QA, Dover, New Jersey 07801-5001 by using 1) self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 1005

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STANDARDS

MILITARY

MIL-STD-105	-	Sampling Procedures and Tables for Inspection By Attributes
MIL-STD-109	-	Quality Assurance Terms and Definitions
MIL-STD-193	-	Paint Procedures, and Marking for Vehicles, Construction Equipment and Material Handling Equipment

2.1.2 Other Government documents, drawings and publications.

The following other Government documents, drawings and publications form a part of this specification to the extent specified herein.

DRAWINGS

U.S. ARMY RESEARCH AND DEVELOPMENT CENTER (ARDC)

7012810	-	Mount Assembly, Ring, M66
7028676	-	Mount Assembly, Ring, M68
7976451	-	Mount Assembly, Ring, M68E1
SPI-7012810	-	Packaging Data Sheet for Mount Assembly, Ring, Cal. .50, M66
SPI-7976451	-	Packaging Data Sheet for Mount Assembly, Ring, M68E1

(Copies of specifications, standards, drawings and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 First article inspection. This specification contains technical provisions for first article inspection. Requirements for the submission of the first article shall include the pilot pack (See 5.1.1 and 5.2.1).

3.2 Materials, construction and design. Mounts shall conform to the materials, construction and design specified herein, on the applicable drawings, and in MIL-W-13855.

3.2.1 Painting. Unless otherwise specified (see 6.2), all unmatched surfaces shall be painted in accordance with the applicable requirements of MIL-STD-193.

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3.2.2 Lubrication. Mounts shall be thoroughly lubricated with grease conforming to MIL-G-10924. Lubricating fittings shall permit passage of the lubricant to all bearing areas. Anti-friction bearings shall be properly lubricated with grease before assembly.

3.3 Performance characteristics.

3.3.1 Ring rotation and torque. With a M2, caliber .50 machine gun and full ammunition can of caliber .50 linked, 4 ball, 1 tracer, ammunition installed or with an approved simulator for the M2 machine gun and ammunition can installed, the torque required to rotate the ring in either direction shall not exceed 276 inch-pounds. The ring shall rotate 360 degrees in azimuth in either direction without binding. If the initial starting torque or if the running torque exceeds 276 inch-pounds during the full 360 degrees in azimuth in either the clockwise or counterclockwise rotation or if the ring binds during rotation the ring shall be rejected for failure to meet the performance requirements. Testing shall be specified in 4.6.1.

3.3.2 Pintle/cradle rotation and torque. With a M2 caliber .50 machine gun and full ammunition can of caliber .50 linked, 4 ball, 1 tracer ammunition installed or with an approved simulator for the M2 machine gun and ammunition can installed, the torque required to rotate the pintle/cradle assembly in either direction shall not exceed 72 inch-pounds. The pintle/cradle shall rotate 360 degrees in azimuth in either direction without binding. If the initial starting torque or if the running torque exceeds 72 inch-pounds during the 360 degrees in azimuth in either direction during rotation or if the pintle/cradle assembly binds during rotation in either direction, the ring shall be rejected for failure to meet performance requirements. Testing shall be specified in 4.6.2.

3.3.3 Functioning. With an M2, .50 caliber machine gun and full ammunition box installed, the mounts shall be capable of the full range of movements (i.e., 360 degree ring azimuth traverse each direction, 360 degree pintle azimuth traverse each direction, and full gun elevation and depression) without binding or damage to the gun, mount or support. The mounts shall be capable of the full range of movements without binding, and shall not be damaged after being subjected to the firing of not less than 300 rounds of Government standard .50 caliber, linked, 4 ball, 1 tracer ammunition. Testing shall be specified in 4.6.3.

3.3.4 Interchangeability. Unless otherwise specified on the applicable drawings or in 6.2, all parts shall be interchangeable. Testing shall be as specified in 4.6.4.

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3.4 Marking. Mounts shall be marked in accordance with MIL-W-13855. Each mount shall be identified by a serial number assigned by the procuring activity (see 6.2).

3.5 Workmanship. Workmanship shall be in accordance with MIL-W-63150.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2. Quality assurance terms and definitions. Quality assurance terms and definitions used herein are in accordance with MIL-STD-109.

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

- a. First article inspection (see 4.4)
- b. Quality conformance inspection (see 4.5)

4.4 First article inspection. The first article shall be submitted for inspection in accordance with the contract (see 6.2). The first article shall be representative of the production processes to be used during quantity production. The first article shall be subjected to the quality conformance inspection specified herein and such other inspection as necessary to determine that all requirements of the contract have been met.

4.4.1. Submission. The contractor shall submit a first article sample as designated by the contracting officer for evaluation in accordance with the provisions of 4.4.2 and the contract. The first article sample shall consist of the following items, including those specified in the contract, in sample quantities as indicated:

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<u>PART DESCRIPTION</u>	<u>DRAWING</u>	<u>QUANTITY</u>
Mount Assembly, Ring Cal. 50, M66	7012810	3
Mount Assembly, Ring, M68	7028676	3
Mount Assembly, Ring, M68E1	7976451	3

NOTE: Only the mount assembly being purchased shall be submitted for first article inspection.

4.4.2 Inspections to be performed. First article assemblies may be subjected by the Government to any or all of the examinations and tests specified in Table I and to any or all requirements of the applicable drawings.

4.4.3 Rejection. If any assembly of components fail to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate its inspection upon any failure of an assembly or component in the sample to comply with any of the stated requirements.

TABLE I. First article inspection.

CLASSIFICATION OF DEFECTS & TESTS

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PARAGRAPH	TITLE	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AGL OR 100%	SHEET		PARAGRAPH REFERENCE / INSPECTION METHOD
					1	OF 1	
	MOUNTS, Gun: Ring Type, Revolving						DRAWING NUMBER 7012810/7028676/7976451 NEXT HIGHER ASSEMBLY
CATEGORY		Ring Rotation and Torque Test	3	ACC 0 REJ 1	3.3.1	4.6.1	
		Pintle/Cradle Rotation and Torque Test	3	ACC 0 REJ 1	3.3.2	4.6.2	
		Function Test	3	ACC 0 REJ 1	3.3.3	4.6.3	
		Poor Workmanship	3	ACC 0 REJ 1	3.5	Visual	
NOTES							

AMSMC Form 1570, 1 Feb 85 Replaces DRSMC-QA (D) Form 160, 1 Aug 83, which may not be used.

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4.5 Quality conformance inspection.

4.5.1 Inspection lot. Unless otherwise specified (see 6.2), the formation, size and presentation of inspection lots shall be in accordance with MIL-STD-105 and MIL-W-63150. When Acceptable Quality Levels (AQL's) are specified, the AQL's shall be individually applied in accordance with MIL-STD-105.

4.5.2 Examination for defects. The examinations listed in the quality conformance inspection table 4.5.2.1 shall be performed on inspection lots. Prior to these examinations, the parts and assemblies comprising the mount shall have been inspected in accordance with the applicable quality assurance provisions and MIL-W-63150.

a. Critical defects. Unless otherwise specified, inspection for critical defects shall be 100 percent.

b. Major and minor defects. Examination for major and minor defects shall be performed in accordance with the quality conformation inspections specified herein. Inspection level II shall be used and individual AQL's applied in accordance with MIL-STD-105.

QUALITY CONFORMANCE INSPECTION

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CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE	SHEET 1 of 1		DRAWING NUMBER 7012810/7028676/7976451
		NO. OF SAMPLE UNITS	REQUIREMENT PARAGRAPH	
CATEGORY	EXAMINATION OR TEST	AQL OR 100%	PARAGRAPH REFERENCE / INSPECTION METHOD	NEXT HIGHER ASSEMBLY
4.5.2.1	Mounts, Gun: Ring Type, Revolving			
<u>Critical</u>	None Defined			
Major: 101. 102. 103.	Ring Rotation and Torque Test Pintle/Cradle Rotation and Torque Test Interchangeability	100% 100% ACC 0 REJ 1	3.3.1 3.3.2 3.3.4	4.6.1 4.6.2 4.6.4
Minor: 201. 202.	Marking Incorrect or Missing Poor Workmanship	2.5 2.5	3.4 3.5	Visual Visual
<u>Notes</u>	1/ The sample units shall be selected for this test at intervals of each 100 mount assemblies produced or every 60 calendar days, whichever comes first.			

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4.5.3 Testing.

4.5.3.1 Failure data. Unless otherwise specified herein, all tests shall be conducted on a complete mount. If test requirements cited herein are not met, acceptance of the mount shall be deferred and the contractor shall accomplish, as applicable, the following actions:

a. Conduct a failure analysis study performing a dimensional, physical, and visual examination of the components which are suspected to be the cause of failure or malfunction.

b. Evaluate and correct the applicable production processes and procedures to prevent recurrence of the same defect(s) in future production.

c. Examine mounts, partially assembled mounts, and components (including components and subassemblies at in-process or final assembly) to insure that material containing the same defect is purged from the inventory and not presented to the Government for acceptance.

d. Submit the results of the failure analysis and the corrective actions taken to the Government for review and approval prior to submitting a reconditioned lot or reconditioned mount for retest.

4.5.3.2 Interchangeability test of repair parts. Concurrent repair parts shall be selected and tested for interchangeability (see 3.3.4) as specified in the contract (see 6.2). Concurrent repair parts selected for interchangeability testing shall have met all other examination and test requirements specified herein. When repair parts are tested for interchangeability, the sample parts or assemblies shall be assembled into two mounts which have been randomly selected from an accepted production lot. Complete mounts and mounts used for interchange of concurrent repair parts shall also meet the requirements for torque after interchange of parts, using the test methods specified in 4.6.1, 4.6.2 and 4.6.4.

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4.5.4 Inspection for acceptance. The contractor shall perform inspection for acceptance upon completion of all manufacturing and in-process inspection operations, prior to preservation and packing. Inspection for acceptance shall include, but is not limited to, inspection for workmanship, protective finish, missing features (missing operations), characteristics not previously inspected, and characteristics that may have been altered or changed as a result of subsequent operations after prior inspections were completed.

4.5.5 Inspection of packaging. Unless otherwise specified (see 6.2), inspection to determine compliance with preservation, packing, and marking requirements of the applicable packaging documentation, for the level designated in the contract, shall be as specified in MIL-P-14232.

4.6 Methods of inspection. Unless otherwise specified, the contractor's written test and inspection procedures for the rotation and torque and function test shall be submitted to the contracting officer for review and approval prior to performing first article inspection and the quality conformance inspection. When rotation torque or function tests are specified, the contractor's inspection personnel shall witness the test. In addition, the following shall apply: Not less than 15 calendar days prior to performing the rotation and torque, functioning or interchangeability test, the contractor shall furnish written notice to the QAR of the time, date, location and number of rings being tested so the Government can witness the testing.

4.6.1 Ring rotation and torque test. The ring mount shall be tested by applying a force tangent to the ring passing through the pintle socket center line and lying in the plane of the ring mount. The following test conditions shall apply:

a. The mount shall be tested while installed on a suitable test stand, with the traverse brake released.

b. The ring mount shall be level within plus or minus one degree.

c. The pintle cradle assembly shall have an M2, .50 caliber machine gun with a full ammunition box installed or equivalent simulator.

d. The mount shall be fully lubricated with MIL-G-10924 grease.

e. The ring shall be rotated 360 degrees in azimuth several times prior to testing.

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f. The ambient temperature shall be 70 degrees plus or minus 20 degrees F.

4.6.2 Pintle/cradle rotation and torque test. The mount pintle/cradle shall be tested under the following conditions:

a. The mount pintle/cradle shall be tested while installed on a suitable test stand with traverse brake locked.

b. The ring mount shall be level within plus or minus five degrees, and the weapon horizontal (i.e. zero degrees elevation).

c. The mount pintle shank and socket shall have a light coat of MIL-G-10924 grease.

d. The ambient temperature shall be 70 degrees plus or minus 20 degrees F.

e. The pintle cradle shall have an M2, .50 caliber machine gun with a full ammunition box installed or equivalent simulator.

f. The pintle shall be rotated 360 degrees in azimuth, several times prior to testing.

4.6.3 Function test. The complete mount shall be tested under the following conditions:

a. Prior to performance of this test, the mount assembly shall have satisfactorily passed the tests specified in 4.6.1 and 4.6.2.

b. The M2, .50 caliber machine gun and mount shall be installed on a suitable test stand, with the traverse brake locked.

c. The mount shall be tested by firing 100 rounds through the gun at maximum, minimum, and nominal (0°) elevation and depression at a single quadrant in azimuth. The longitudinal axis of the gun shall not be rotated more than 45 degrees from the center line of the pintle and ring mount during function firing.

e. After function firing, the mount shall be tested for ring and pintle torque, and free movement in all directions.

4.6.4 Interchangeability. Mounts shall be tested for interchangeability by disassembling and then reassembling parts using a prearranged system submitted for review and approval to: Commander, ARDC, ATTN: AMSMC-QAF-S(D), Dover, NJ 07801-5001.

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Interchange of parts shall be accomplished by any convenient method which will insure that no mating parts in reassembled mounts are from the same mount. This shall be accomplished by dividing the parts of each mount assembly in the prearranged system into three groups and distributing the groups into three different trays until each tray contains the parts and assemblies for a complete mount. Observation shall be made for compliance with the applicable requirement.

5. PACKAGING.

5.1 Packing. Packing shall be in accordance with SPI-7012810 and SPI-7976451.

6. NOTES

6.1 Intended use. The ring mounts covered by this specification are intended for the use on trucks and combat vehicles designated on the applicable drawings to properly support and provide for the field use of a Browning machine gun, .50 caliber, M2 (heavy barrel-Flexible), M60 7.62MM machine gun with M142 mount and similar weapons.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Lists of drawings, publications and specifications pertinent to the gun mount, showing applicable revision dates.
- c. Painting of unmatched surfaces, if different (see 3.2.1).
- d. Responsibility for furnishing test machine gun, ammunition and links (see 3.3.3).
- e. Assignment of block of serial number (see 3.4).
- f. Inspection lot sizes, if different (see 4.5.1).
- g. Criteria for inspection of parts and assemblies (see MIL-W-63150)
- h. Interchangeability test instructions (see 4.6.4).
- i. Packaging instructions, if different (see 4.5.5).

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6.3 Drawings. Drawings listed in Section 2 of this specification under the heading US Army Armament Research and Development Center (ARDC) may also include drawings prepared by and identified as US Army Armament Research and Development Command (ARRADCOM), Edgewood Arsenal, Frankfort Arsenal, Rock Island Arsenal or Picatinny Arsenal drawings. Technical data originally prepared by these activities is now under the cognizance of ARDC.

6.4 Changes from previous issues. Astericks are not used in the revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:
Army-AR

Preparing activity:
Army-AR

(Project 1005-A653)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MTI-M-13529D		2. DOCUMENT TITLE MOUNTS, GUNS: RING TYPE REVOLVING	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
3b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER (Specify): _____	
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		7b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
8. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)