METRIC

MIL-DTL-70446C
AMENDMENT 2
15 July 2016
SUPERSEDING
MIL-DTL-70446C
w/AMENDMENT 1
27 March 2009

DETAIL SPECIFICATION

MACHINE GUN, 5.56 MILLIMETER: M249

Inactive for new design after 14 February 1996.

This specification is approved for use by all Departments and Agencies of the Department of Defense within the distribution limitations noted at the bottom of the page.

1. SCOPE

1.1 Scope. This specification prescribes the detail requirements and identifies the verification procedures for the Machine Gun, 5.56MM: M249, hereafter referred to simply as the M249.

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 specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Comments, suggestions or questions on this document should be addressed to: U.S. Army ARDEC, ATTN: RDAR-EIQ-SA, Picatinny Arsenal, NJ 07806-5000 or emailed to ardecstdzn@conus.army.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database https://assist.dla.mil.

AMSC N/A FSC 1005

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.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-W-13855	Weapons, Small Arms and Aircraft Armament Subsystems, General Specification for
MIL-DTL-32530	Cartridge, 5.56mm, High Pressure Test (HPT), M197A1
MIL-D-60254	Dummy Cartridge, 5.56mm, Inert Loaded, M232
MIL-W-63150	Weapons and Support Material, Standard Quality Assurance Provision for
MIL-PRF-63460	Lubricant, Cleaner and Preservative for Weapons and Weapon Systems
MIL-DTL-32338	Cartridge, 5.56mm, Ball, M855A1
MIL-DTL-32395	Cartridge, 5.56mm, Tracer, M856A1

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-130	Identification Marking of US Military Property
MIL-STD-1916	DOD Preferred Methods for Acceptance of Product

(Copies of these documents are available on line at http://quicksearch.dla.mil)

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.

U.S. ARMY ARDEC DRAWINGS

8440219	Gage, Plug
9348199	Machine Gun, 5.56mm: M249, Automatic Rifle with Equipment
9348200	Machine Gun, 5.56mm: M249
9350100	Gage, Headspace, Minimum
9350101	Gage, Headspace, Maximum
9350128	Gage, Indicating, Firing Pin Protrusion
9350129	Gage, Setting, Firing Pin Protrusion
12556999	Machine Gun, 5.56mm: M249, Light Machine Gun with Equipment
13034340	Scraper Assembly
13051594	Cylinder, Indent, Firing Pin

(Copies of these drawings are available at U.S. Army ARDEC, ATTN: RDAR-EIS-PE, Picatinny, NJ 07806-5000, or email usarmy.picatinny.ardec.list.drawing-request-help-desk@mail.mil.)

2.3 Non-Government publications. The following documents 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.

ASTM INTERNATIONAL

ASTM E1444/E1444M Standard Practice for Magnetic Particle Testing

(Copies of ASTM standards may be ordered online at http://www.astm.org/ or from the ASTM International, 100 Barr Harbor Drive, Conshohocken, PA 19428-2959.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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, a sample of the M249 shall be subject to first article inspection in accordance with paragraph 4.2.

3.2 Conformance inspection. Unless otherwise specified, a sample of the M249 shall be subjected to conformance inspection in accordance with paragraph 4.3.

3.3 Small arms safety. The small arms safety, drawing 9348364, shall move manually without binding between the "safe" and "fire" positions and shall remain in the set position under spring pressure until reset. The trigger mechanism shall not function when the safety pin is set in the "safe" position (to the right). The trigger mechanism shall function when the safety is set in the "fire" position (to the left). When moving the safety between the two positions, there shall be an audible and tactile click. When in the "fire" position, the red warning ring shall be displayed.

3.4 Sear. When the trigger mechanism, drawing 9348350, is assembled into the weapon, the sear, drawing 9348368, shall be capable of full engagement with the sear engagement notches of the operating rod assembly, drawing 9348408, and of holding the piston assembly, drawing 9348405, in the rearward, cocked, position.

3.5 Trigger pull. The force on the trigger required to release the operating group from the sear with the bolt in the open position shall not be less than 35.0 Newtons and shall not be greater than 70.0 Newtons.

3.6 Proof firing. Each main and assigned barrel (see 6.7) and bolt assembly shall be capable of withstanding the firing of a Government standard 5.56mm M197A1 high pressure test cartridge in accordance with MIL-DTL-32530. After firing, each barrel and bolt assembly shall be subjected to visual and magnetic particle inspections to determine that these components are free from cracks, seams and/or other defects.

3.7 Headspace. Headspace in the assembled weapon shall be in accordance with Machine Gun, 5.56mm: M249, drawing 9348200.

3.8 Firing pin protrusion. The firing pin protrusion, in the assembled weapon, shall be in accordance with Machine Gun, 5.56mm: M249, drawing 9348200.

3.9 Firing pin indent. The firing pin indent, when utilizing firing pin indent cylinders, drawing 13051594 or Government approved equivalent, shall not be less than 0.51mm.

3.10 Dispersion and targeting. When fired at a target located 50 meters from the muzzle, the machine gun with its main and assigned barrel shall meet the following criteria. The weapon must be placed in a government approved mount. Nine out of ten rounds fired in a single burst shall realize a figure of merit H+L (height + length) not exceeding 33cm. No keyholing (defined in 6.7.5) shall be permitted. The mean point of impact of 9 rounds of a 10 round burst shall be within a 20cm by 20cm square. The center of this square shall be 5cm above the point of aim.

3.11 Belt pull. The machine gun shall be capable of functioning without failure (see 6.4) or unserviceable parts (see 6.7.4) while pulling 2.86 kilograms (the equivalent of a 200 round free hanging belt).

3.12 Thirty round magazine. The machine gun shall be capable of functioning without failure (see 6.4) or unserviceable parts (see 6.7.4) with its main and assigned barrel using a government furnished 30 round magazine (see 6.8).

3.13 Cyclic rate of fire. The cyclic rate of fire for each M249 machine gun with its main and assigned barrel shall be between 700 and 850 rounds per minute. This requirement shall be met without failure (see 6.4) or unserviceable parts (see 6.7.4).

3.14 Interchangeability. Unless otherwise specified on the drawings, all component parts or inseparable subassemblies shall be interchangeable.

3.14.1 Interplant. Unless otherwise specified on the drawing, all component parts or inseparable subassemblies shall be interchangeable with weapons representing production from each of the previous manufacturer(s).

3.14.2 Tooling. No tools shall be required to assemble/disassemble the following assemblies from the M249 receiver: Bipod, drawing 13022945, Trigger Mechanism, drawing 9348350, Lightweight Collapsible Buttstock Assembly, drawing 13026046, Gas Cylinder, drawing 9348345, Barrel Assembly, drawing 12011986, and Ejector, drawing 9348223. The Bolt Assembly, drawing 9348412, Slide Assembly, drawing 9348391, and Piston Assembly, drawing 9348405, shall not require any tools to assemble/disassemble from each other. The Heat Shield, drawing 12540405, shall not require any tools to be assembled/disassembled from the Barrel Assembly, drawing 12011986.

3.15 Endurance. When subjected to 10,000 rounds of firing using the 200 round magazine, each endurance weapon shall exhibit no more than 4 failures attributable to the machine gun. Of the 4 failures a maximum of 2 failures are allowed which take more than 10 seconds but less than 10 minutes to clear. All remaining failures must be immediately clearable within 10 seconds. No failures which require more than 10 minutes to clear and no instances of uncontrolled firing are allowed. When firing with the Government furnished 30 round magazine (see 6.8), each endurance weapon shall demonstrate no more than 3 failures attributable to the machine gun. Of the 3 failures, a maximum of 1 failure is allowed which takes more than 10 seconds but less than 10 minutes to clear. All remaining failures must be immediately clearable within 10 seconds. All incidents shall be recorded. Any incidents not chargeable to the weapon shall be substantiated and reported. No unserviceable parts are allowed during the endurance test. See Table I for endurance summary.

TABLE I. Endurance summary

TIME TO CLEAR FAILURES	WEAPON FAILURES PERMITTED	
	200 RD. MAG. (10,000 RDS)	30 RD. MAG. (750 RDS)
< 10 SECONDS	4	3
< 10 MINUTES	2	1
≥ 10 MINUTES	0	0
UNCONTROLLED FIRE	0	0
UNSERVICEABLE PARTS	0	0
MAXIMUM ALLOWED TOTAL :	4	3

3.16 Reliability. Each weapon shall exhibit the following Mean Rounds Between Failure (MRBF) as a point estimate over a receiver service life of 50,000 rounds in accordance with Table II.

TABLE II. Reliability

Failure Class	MRBF	Failures Permitted in 50,000 Rounds
I	1,600	31
II	3,300	15
III	16,000	3

3.17 Barrel life. The barrel shall exhibit a minimum service life of 15,000 rounds. A barrel is unserviceable if 1) the muzzle velocity drops more than 61 meters per second or 2) more than 20 percent of the rounds fired exhibit projectile yaw in excess of 15 degrees when measured 50 meters from the muzzle or 3) cracks develop.

3.18 Marking. Each M249 machine gun and each component thereof, for which markings are prescribed, shall be clearly marked in accordance with the drawings and MIL-STD-130. Each machine gun shall be marked with a serial number assigned by the procuring activity. When part of a complete weapon, each main and assigned barrel shall be identified to the specific weapon to which it was tested. Stamping of serial number, partial serial number, or any other identifier that assigns a barrel to a receiver is not permitted.

3.19 Workmanship. Workmanship shall be in accordance with the workmanship requirements of MIL-W-63150 and MIL-W-13855. In addition, the machine gun shall be free from dust, rust, corrosive products, and other foreign matter. The cleaning method used shall not be injurious to any parts nor shall the parts be contaminated by the cleaning agent. All parts shall function without binding. No parts shall fall off or be loose during the assembly or any of the firing in this specification.

4. VERIFICATION

TABLE III. Requirement/verification cross reference matrix

METHOD OF VERIFICATION 1 - Analysis 2 - Demonstration 3 - Examination 4 - Test			CLASSES OF VERIFICATION A - First article inspection B - Conformance inspection					
Section 3 Requirement		**Section 4 Method**	**Verification Methods**				**Verification Class**	
			1	**2**	**3**	**4**	**A**	**B**
3.1	First Article Inspection	4.2		X	X	X	X	-
3.2	Conformance Inspection	4.3		X	X	X	-	X
3.3	Small Arms Safety	4.4				X	100%	100%
3.4	Sear	4.5				X	100%	100%
3.5	Trigger Pull	4.6				X	100%	100%
3.6	Proof Firing	4.7				X	100%	100%
3.7	Headspace	4.8				X	100%	100%
3.8	Firing Pin Protrusion	4.9				X	100%	100%
3.9	Firing Pin Indent	4.10				X	100%	20-0-1[1]
3.10	Dispersion and Targeting	4.11				X	100%	100%
3.11	Belt Pull	4.12				X	100%	100%
3.12	Thirty Round Magazine	4.13				X	100%	100%
3.13	Cyclic Rate of Fire	4.14				X	100%	100%
3.14	Interchangeability	4.15			X	X	10-0-1	10-0-1
3.14.1	Interplant	4.15.1				X	10-0-1	-
3.14.2	Tooling	4.15.2		X			10-0-1	10-0-1
3.15	Endurance	4.16				X	3-0-1	1-0-1
3.16	Reliability	4.17				X	3-0-1	-
3.17	Barrel Life	4.18				X	100%	1-0-1
3.18	Marking	4.19			X		100%	16-0-1
3.19	Workmanship	4.20			X		100%	16-0-1
Note: 1. Test twenty (20) – Accept with zero (0) failures – Reject with one (1) failure.								

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

a. First article inspection (4.2)
b. Conformance inspection (4.3)

4.2 First article inspection. When specified, a sample of the M249 shall be subject to first article inspection in accordance with Table III.

4.2.1 First article quantity. The first article sample shall be representative of the manufacturing methods and processes to be used for quantity production. The first articles shall consist of the quantities specified in Table IV unless otherwise specified.

TABLE IV. First article quantity

Item	Quantity
Machine Gun, 5.56mm, M249 (9348199, AR or 12556999, LMG, as specified by contract)	10
All components (except unmodified commercial parts)	5
All subassemblies	5
All assemblies	5

4.2.2 Inspections to be performed. The first article sample shall be subjected to all tests in the order specified in Table III.

4.2.3 Rejection. If any assembly, component, or test specimen fails to comply with any of the applicable requirements, the first article sample shall be rejected.

4.3 Conformance inspection. Unless otherwise specified, all M249s shall be subjected to conformance inspection in accordance with Table III.

4.3.1 Lot formation. Unless otherwise specified, lot formation (see 6.9) shall be in accordance with MIL-STD-1916.

4.3.2 Conformance procedures. Unless otherwise specified, conformance procedures are specified in the requirement/verification cross-reference matrix, Table III. Alternative conformance procedures, methods or equipment may be proposed (see 6.6).

4.3.3 Inspections to be performed. The conformance quantity shall be subjected to all tests in the order specified in Table III.

4.4 Small arms safety. After cocking the weapon, the safety shall be placed in the safe position and the trigger shall be pulled to assure that the machine gun cannot be fired. After attempting to fire, the weapon shall not fire as the safety is returned to the fire position. The red ring shall be visible when in the fire position and not visible when in the safe position.

4.5 Sear. When the safety is in the "safe" position and the trigger is pulled, the sear shall remain engaged with the sear engagement notches of the operating rod assembly and hold the piston assembly in the rearward, cocked, position. When the safety is "off" (in the "fire" position), and the trigger is pulled, the sear shall disengage from the sear engagement notch on the operating rod assembly allowing the piston assembly to move forward under spring action. When the trigger is released, the sear shall remain in the disengaged position until the tripping lever is moved rearward. The sear shall then return to the engaging position by spring action.

4.6 Trigger pull. The unloaded machine gun shall be fully cocked with the safety off. The force shall be applied gradually, and measured through the use of SMTE, to the center of the trigger bow in a direction parallel to the barrel. The weapon shall also be manually tested to assure that the trigger returns under spring action to its normal forward position after partial or complete trigger pull.

4.7 Proof firing. Each barrel assembly, drawing 12011986, and bolt assembly, drawing 9348412, shall be tested in a Government approved fixture for high pressure resistance by firing a high pressure test cartridge conforming to MIL-DTL-32530. Visual and magnetic particle inspection in accordance with ASTM E1444/E1444M shall be performed on the bolt assembly and barrel assembly to ensure that no cracks, splits, or other defects are present. The magnetic particle inspection procedures are required to be submitted to the Government and approved prior to use. Examination of the high pressure test cartridge case for splits and other indications of defective barrels shall be performed immediately following the firing of each test cartridge. It shall be ascertained that no defects are present and the chamber and barrel remain within specified tolerances before the proof test acceptance mark is applied.

4.8 Headspace. Each machine gun with both its assigned barrel and main barrel (as defined in 6.7) shall be gaged for minimum and maximum headspace after proof firing using gages 9350100 and 9350101 or Government approved SMTE.

4.9 Firing pin protrusion. The M249 firing pin protrusion shall be tested using government approved SMTE or gages 9350128 and 9350129 with the firing pin in the fired position.

4.10 Firing pin indent. A random sample of 20 weapons from each inspection lot shall be subjected to the firing pin indent test using Government approved inspection equipment. The machine gun shall be cocked and then held in a horizontal position with the cover assembly opened. The holding fixture, drawing 8440219, containing the firing pin indent cylinder, drawing 13051594, or Government approved equivalent shall be inserted into the barrel chamber, the cover closed, and the trigger pulled to release the bolt and indent the copper cylinder. The holding fixture shall be removed from the machine gun and the depth of the indent in the copper cylinder computed by measuring the distance from the original surface of the copper cylinder (before indentation) to the bottom of the firing pin impression. All firing pin indent impressions shall not be off-center by more than one-half the diameter of firing pin point as evidenced by visual examination of two spent cartridges. Two cartridges shall be selected for examination from each weapon in a 20 weapon sample during the dispersion or cyclic rate tests.

4.11 Dispersion and targeting. This test shall be performed from a government approved hard mount for both the main and assigned barrels. Ballistic zeroing shall be realized by adjusting the front sight. The rear sight shall be adjusted to the nominal position in both elevation and windage and set at the 300m range setting. No more than 5 warming shots may be permitted prior to performing this test. Ten rounds of M855A1, in accordance with MIL-DTL-32338, ammunition shall be fired in a burst at a target located 50 meters from the muzzle. The target shall be examined after firing to determine compliance with the requirement. The most

unfavorable impact shall be deleted for the measurement of the extreme vertical and horizontal distances of the 9 remaining shots. The same unfavorable impact shall be deleted when evaluating compliance with the targeting requirements. No keyholing (defined by 6.7.5) shall be permitted. Weapons rejected because of failure to meet the requirements shall be corrected and resubmitted to the dispersion and targeting test. All corrective action shall be recorded. Weapons failing the retest shall be rejected.

4.12 Belt pull. The machine gun shall be held in a Government approved soft mount. Machine gun operation shall be monitored to determine that all firing is controlled by the trigger and that every spent cartridge case is properly ejected. The test shall be performed with a belt of 20 M855A1 cartridges, 5 M232 inert cartridges (MIL-D-60254) or equivalent, and a 2.86 ± 0.01 kg weight to provide a 200 round belt simulation. The weight shall be attached to one end of a cable which is suspended over a pulley. The other end of the cable shall be rigidly attached to the linked belt of ammunition. The linked belt of ammunition shall be supported with a horizontal feed tray leading to the weapon. Four bursts of approximately five rounds each shall be fired from the main barrel.

4.12.1 Belt pull retest. Should a weapon fail the belt pull test due to a weapon failure, the weapon may be corrected and resubmitted to test in accordance with Table V below. All corrective action shall be recorded. Weapons failing the retest shall be rejected.

4.13 Thirty round magazine. The machine gun shall be held in a Government approved soft mount. Machine gun operation shall be monitored to determine that all firing is controlled by the trigger and that every spent cartridge case is properly ejected. Thirty (30) rounds of M855A1 cartridges shall be fired from a fully loaded Government furnished 30 round magazine (see 6.8) in bursts of approximately 5 rounds each. Repeat test using the assigned barrel.

4.13.1 Thirty round magazine retest. Should a weapon fail the thirty round magazine test due to a weapon failure, the weapon may be corrected and resubmitted to test in accordance with Table V below. All corrective action shall be recorded. Weapons failing the retest shall be rejected.

4.14 Cyclic rate of fire. The machine gun shall be held in a Government approved soft mount. Machine gun operation shall be monitored to determine that all firing is controlled by the trigger and that every spent cartridge case is properly ejected. Twenty (20) rounds of linked M855A1 cartridges in 1 continuous burst shall be fired from the main barrel. Average cyclic rate shall be measured over the full 20 round burst.

4.14.1 Cyclic rate of fire retest. Should a weapon fail the cyclic rate of fire test due to a weapon failure, the weapon may be corrected and resubmitted to test in accordance with Table V below. All corrective action shall be recorded. Weapons failing the retest shall be rejected.

TABLE V. Retest allowed for

IF FAILED FOR:	CYCLIC RATE	BELT PULL	30 RD. MAG.
30 RD. MAG. COND. I			*
30 RD. MAG. COND. II	*	*	*
CYCLIC RATE	*	*	
BELT PULL	*	*	

Condition I - Rework affects only the following parts
Receiver Assembly (magazine well only)
P/N 9348202
Magazine opening cover P/N 9348232
Spring, Helical Torsion P/N 9348233
Pin, Grooved, Headless P/N 9348234
Condition II - Rework affects any other part

4.15 Interchangeability. The weapons for this test shall be selected at random, by the Government, from each lot and assigned a number. Only weapons that have been found satisfactory in all other examinations and tests shall be used. Each weapon shall be disassembled into 10 groups of parts as specified in Table VI. Interchange is accomplished by systematically distributing the groups of parts into 10 trays until each tray contains a complete weapon. Specifically, the 10 groups of parts from machine gun number 1 shall be taken in order (Group I, II, III, etc.) and placed in trays 1 through 10; the 10 groups of parts from machine gun number 2 shall be taken in order and placed in trays 2 through 10 to 1. Parts shall be distributed similarly for the remaining 8 guns. Replaceable parts (Table VII) such as screws, nuts, washers, and pins shall be placed in the same tray as their mating or associated part. Any replaceable part rendered unserviceable by disassembly shall be replaced without penalty to the interchangeability test. The extractor pin, drawing 9350086, shall be replaced as part of each part interchange during this test. The machine gun shall be reassembled using only those parts which are in the same tray.

4.15.1 Interplant. An interplant interchangeability test shall be performed using 5 Government Furnished Equipment (GFE) (see 6.8) weapons representing production from each of the previous manufacturers and 5 weapons of the contractor's manufacture. This test shall be conducted for each set of 5 GFE weapons. All GFE weapons shall be inspected, and the Government shall be informed of any non-compliance. Machine guns shall be given preliminary hand functioning to assure proper operation before parts are disassembled from the gun. Machine guns shall be interchanged in a manner similar to the in-plant interchangeability (see 4.15). When assembling, every other gun used shall be produced by a different manufacturer. Inspection, tests and acceptance criteria normally associated with interchange weapons (see 4.15) shall be performed. Parts shall be identified with their manufacturer and original weapon throughout the test. The weapons shall be returned to their original configurations at the completion of the test.

4.15.2 Tooling. A demonstration using government approved methods shall be conducted to determine conformance to the requirements in 3.14.2.

4.15.3 Interchange examinations and tests. Upon completion of the interchange, each weapon shall be subjected to the following verifications:

a. Trigger pull (4.6)
b. Headspace (4.8)
c. Firing pin protrusion (4.9)
d. Firing pin indent (4.10)
e. Dispersion and targeting (4.11)
f. Belt pull (4.12)
g. Thirty round magazine (4.13)
h. Cyclic rate of fire (4.14)

4.15.4 Interchangeability retest. Failure of the interchangeability test shall cause retest or rejection of the lot. An interchangeability retest may be allowed without reconditioning the lot. Failure in the retest shall cause rejection of the lot subject to reconditioning and further test as a reconditioned lot. A sample of 20 M249s from each retest or reconditioned lot shall be tested using the procedure described in 4.15.

TABLE VI. Groups of non-mating parts

Nomenclature (quantity per weapon)	Drawing		Nomenclature (quantity per weapon)	Drawing
Group I			**Group II**	
Receiver	9348202		Spring, Helical Torsion	9348231
Spring, Helical Compression	9348238		Ring, Retaining	9348291
Ring, Retaining (2)	9348235		Pawl, Cartridge Retaining, Front	9348294
Pin, Spring, Slotted (4)	9348240		Trigger Assembly	9348354
Feed Pawl Assembly	9348278		Pin, Grooved, Headless	9348367
Spring, Retaining	9348304		Spring, Helical Compression	9348415
Clip, Retaining Pin	9348314		Screw, Machine	9350006
Sear	9348368		Barrel Sub-Assembly	12011985
Pin, Spring, Slotted	9348394		Pin, Spring, Slotted	12557012
Screw, Base (2)	9350023		Latch, Bipod Leg (2)	13002205
Leg Assembly, Inner (2)	13002200		Body, Cocking Handle, Lt Wt	13013733
Pin, Pawl	13013739		Pawl, Feed (2)	13013741
Spring, Helical Compression	MS24585-C279		Pin, Upper Assembly	13020691
Pin, Spring – Tubular, Coiled, Heavy Duty (NASM39086)	MS39086-210		Detent, Adjustment	13026042
Screw, Cap, Socket Head, Self-Locking (2)	NAS1352-08LB10 or NAS1352-08LB10P		Ball Bearing (3)	MS19060-505
Group III			**Group IV**	
Clip, Retaining	9348219		Lever, Barrel, Locking	9348220
Clip, Retaining	9348225		Pin, Grooved, Headless	9348230
Plunger, Detent	9348239		Spring, Helical Compression (2)	9348296
Pawl, Cartridge Retaining, Rear	9348295		Slide	9348392
Safety, Small Arms	9348364		Leaf	9350000
Piston Assembly	9348405		Key, Base	9350047
Pin, Straight, Headless	9348416		Pin, Extractor	9350086
Base, Front Sight	9348441		Spring, Helical Compression (3)	9350088
Knob, Windage	9350007		Clip, Spring, Tension Feed Lever	11826202
Pin, Straight, Headless	11826255		Spring, Helical Torsion	12540414
Plate, Spring, Windage	12556975		Base, Rear Sight	12556989
Catch, Cover	12556984		Spring, Helical Compression, Latch, Bipod (2)	13002207
Pin, Straight, Headless, Latch (2)	13002206		Pin, Lower Assembly	13020690
Spring, Pawl	13013740		Sleeve	13026045
Detent, Retaining	13026043		E-Clip, Pawl (2)	NA3-59

TABLE VI. Groups of non-mating parts - Continued

Nomenclature (quantity per weapon)	Drawing		Nomenclature (quantity per weapon)	Drawing
Group V			**Group VI**	
Spring, Retaining	9348216		Ejector, Cartridge	9348223
Pin, Spring, Slotted, Retaining, Front (2)	9348218		Cover, Magazine	9348232
Spring, Helical Torsion	9348221		Clip, Retaining	9348306
Clip, Retaining (2)	9348245		Pin, Spring, Slotted	9348353
Spring, Helical Compression (4)	9348287		Pin, Firing	9348395
Clip, Retaining	9348298		Pin, Spring, Slotted	9348404
Guard, Trigger	9348370		Grip, Carry Handle	9348438
Pivot, Slide	9348393		Spring, Lock	9350004
Peep Sight	9350001		Spring, Helical Compression (3)	12556977
Pin, Spring, Slotted	9350048		Washer, Recessed	12557006
Bolt, Breech	12540412		Pin, Spring, Tubular, Slotted (2)	13002203
Plunger, Indexing (3)	12556976		Assembly, Buttplate	13026035
Accessory Rail, Left Assembly	12993773		Buffer and Back Plate Assembly	12556951
Stock, Outer	13026034		Spring, Helical Compression (SAEAS24585)	MS24585-C254
Pin, Spring – Tubular, Slotted (2)	MS16562-128		Pin, Spring – Tubular, Coiled, Heavy Duty (NASM39086) (2)	MS39086-93 or 13018129
Group VII			**Group VIII**	
Pin, Retaining, Front	9348217		Pin, Grooved, Headless	9348234
Pin, Grooved, Headless	9348222		Pin, Spring, Slotted	9348363
Spring, Retaining	9348300		Spring, Retaining	9348365
Latch, Cover (2)	9348305		Washer, Flat	9348439
Gas Cylinder Assembly	9348345		Spring, Helical Compression	9348452
Frame, Trigger	9348352		Cam Assembly, Elevator	9350011
Nut, Locking	9348440		Spring, Compression	11826046
Washer, Leaf	9350002		Screw, Windage Scale (2)	12556979
Spring, Helical Compression	9350090		Stop, Cocking Handle	12556980
Roller, Feed, Channel Assembly	11826042		Pistol Grip	12556995
Extractor, Cartridge	12540400		Stem, Handle	12557008
Scale, Windage	12556978		Cover Frame w/ Rollers, LT WT	13013734
Spring, Helical, Torsion, Bipod Leg (2)	13002204		Cheekrest	13026040
Compensator	13020739		Pin, Straight (NASM21143/1)	M21143/1-71
Rest, Wire	13026038		Stock, Inner	13025048

TABLE VI. Groups of non-mating parts - Continued

Nomenclature (quantity per weapon)	Drawing		Nomenclature (quantity per weapon)	Drawing
Group IX			**Group X**	
Pin, Ejector	9348224		Pin, Retaining (2)	9348303
Spring, Helical, Torsion	9348233		Pin, Spring, Slotted	9348398
Cover, Cocking Channel	9348302		Pin, Grooved	9350018
Pin, Shoulder, Headless	9348312		Washer, Locking (2)	9350022
Bolt, Machine	9348372		Cover, Ejection Port Opening	9350067
Pin, Spring, Slotted	9348397		Spring, Helical, Torsion	12556983
Post, Front Sight	9348442		Bushing, Handle	12557009
Knob Assembly	9350015		Accessory Rail, Right Assembly	12993772
Washer, Locking (2)	9350020		Leg Assembly, Outer (2)	13002197
Heat Shield Assembly	12540405		Assembly, Sling Mount Kit, Front	13006531
Return Rod & Transfer Mechanism Assembly	12540416		Feed Tray, Weldment Assembly	13013743
Ring, Indexing, Carrying Handle	12557020		Lever, Feed, LMG	13015462
Rod, Pivot, Bipod	13002195		Assembly, Head and Collar	13019970
Thumbscrew	13026041		E-Ring (ASME B18.27.1 Carbon Spring Steel, Phosphate)	NA3-Y18
Hex Socket Button Head Cap Screw (Metric) (ASME B18.3.4.M)	B1834A10020N			

4.15.4.1 Replaceable parts. Partial list of parts prone to damage or loss during disassembly for interchangeability testing that may be replaced without penalty as per Table VII.

TABLE VII. Replaceable parts

Nomenclature (quantity per weapon)	Drawing		Nomenclature (quantity per weapon)	Drawing
Spring, Retaining	9348216		Washer, Locking (2)	9350022
Pin, Spring, Slotted Retaining, Front (2)	9348218		Pin, Spring, Slotted	9350048
Ring, Retaining (2)	9348235		Pin, Extractor	9350086
Pin, Spring, Slotted (4)	9348240		Spring, Helical Compression (3)	9350088
Clip, Retaining (2)	9348245		Spring, Helical Compression (3)	12556977
Clip, Retaining Pin	9348314		Washer, Recessed	12557006
Pin, Spring, Slotted	9348353		Pin, Spring, Slotted	12557012
Pin, Spring, Slotted	9348363		Pin, Spring, Tubular, Slotted (2)	13002203
Pin, Spring, Slotted	9348394		Pin, Straight, Headless, Latch (2)	13002206
Pin, Spring, Slotted	9348397		Pin, Spring – Tubular, Coiled, Heavy Duty (NASM39086) (2)	MS39086-93 or 13018129
Pin, Spring, Slotted	9348404		Pin, Spring – Tubular, Slotted	MS16562-128
Post, Front Sight	9348442		Ball Bearing (3)	MS13060-505
Screw, Machine	9350006		E-Clip, Pawl (2)	NA3-59
Pin, Grooved	9350018		Screw, Cap, Socket Head, Self-Locking (2)	NAS1352-08LB10 or NAS1352-08LB10P
Washer, Locking (2)	9350020			

4.16 Endurance. The machine gun shall be held in a Government approved soft mount. Muzzle velocity and projectile yaw measurement (using 20 rounds of M855A1 ammunition) shall be taken prior to the start of the test and at the completion of endurance firing with the main barrel after cleaning and at ambient temperature. Velocity and yaw measurement shall then be performed from a hot barrel at 5,000 rounds and after the completion of the 10,000 rounds of the endurance firings. Projectile yaw shall be measured 50 meters from the muzzle. Inspection shall be performed as specified below.

4.16.1 Endurance inspection. Each weapon shall be inspected visually for any defects after 2000, 4000, 6000, 8000 and 10,000 endurance rounds have been fired. Only the rounds fired from the 200 round magazine count towards this total. Magnetic particle inspection with the wet fluorescent continuous method in accordance with ASTM E1444/E1444M shall be performed on the receiver, slide, bolt, operating rod assembly, and barrel assembly after the endurance firing and cleaning have been completed. The magnetic particle inspection procedures are required to be submitted to the Government and approved prior to use. No cracks shall be permissible. No unserviceable parts are allowed.

4.16.2 Endurance firing. Two hundred round magazines with M855A1/M856A1 ammunition in accordance with MIL-DTL-32338/MIL-DTL-32395 linked 4 to 1 shall be fired in bursts of 5-7 rounds each at a rate of 85 rounds per minute. Two government furnished 30 round (M855A1 ammunition) magazines shall be fired in 5-7 round bursts, following each 200 round magazine until 25 Government furnished 30 round magazines have been fired (see 6.8). After each 200/260 round cycle the barrel shall be cooled to the point that it can easily be handled with a bare hand. Forced air cooling is permitted. For the purpose of assessing barrel life, the entire endurance test shall be performed on only one barrel. Only the main barrel may be used unless the endurance test is followed by reliability testing.

4.16.3 Endurance maintenance. After approximately every 4000 rounds the weapon should be cleaned, inspected, and lubricated. After approximately 2000 rounds the weapon shall be re-lubricated without disassembling. The gas block shall be cleaned using the scraper assembly (13034340) or Government approved alternative. Semi-fluid lubricant conforming to MIL-PRF-63460 shall be used.

4.17 Reliability. The 3 weapons from the first article endurance test shall be used as the sample weapons for the reliability test. The machine gun shall be held in a Government approved soft mount. Each weapon shall be visually inspected for defects after every 4000 rounds of firing (i.e. 4000, 8000, 12000, etc.). Muzzle velocity and projectile yaw measurements shall be taken on the first 20 rounds of every 4000 round interval. Magnetic particle inspection with the wet fluorescent continuous method in accordance with ASTM E1444/E1444M shall be performed on the receiver, slide, bolt, operating rod assembly, and barrel assemblies after every 8,000 rounds starting at the completion of the endurance firing. The magnetic particle inspection procedures are required to be submitted to the Government and approved prior to use. No cracks shall be permissible for the slide, bolt, operating rod assembly, and barrel assemblies. If cracks are found on the slide, bolt or operating rod assembly during an 8000 round magnetic particle inspection cycle, the part shall be removed from the test and a class III failure shall not be scored

against the weapon. The receiver shall have no cracks in the parent metal or in any of the plug welds. Cracks in any other receiver welds should not present an imminent safety or catastrophic failure condition. All barrel assemblies shall be measured for muzzle velocity, projectile yaw, and magnetic particle inspected when subjected to a total of 15,000 rounds minimum and shall meet the barrel life requirements in accordance with paragraph 3.15.

4.17.1 Reliability firing. Two hundred round magazines with M855A1/M856A1 ammunition linked 4 to 1 shall be fired in bursts of 5-7 rounds at a rate of 85 rounds per minute. The barrel shall then be cooled to the point that it can easily be handled with a bare hand. Forced air cooling is permitted. Utilization of both the main and assigned barrels is permissible. Barrels may be replaced after having fired 15,000 rounds. The barrels shall be evaluated for the barrel life requirement after firing 15,000 rounds.

4.17.2 Reliability maintenance. After every 4000 rounds the weapon shall be cleaned and lubricated. After each 2000 rounds the weapon should be re-lubricated without disassembly and the gas block shall be cleaned using the scraper assembly (13034340) or Government approved alternative. Semi-fluid lubricant conforming to MIL-PRF-63460 shall be used.

4.18 Barrel life. The 15,000 rounds barrel life test shall be conducted simultaneously with the 10,000 round endurance test (and 50,000 reliability test when applicable). If only the endurance test is being performed, an additional 5000 rounds shall be fired on the barrel for a total of 15,000. The ammunition, firing schedule, and data recording for the additional 5000 rounds shall be identical to those specified for the endurance test except that use of the Government furnished 30 round magazines (see 6.8) is excluded. Likewise, the endurance maintenance schedule shall be continued. Acceptability of the barrel life test shall be determined at 15,000 rounds by the measurements of muzzle velocity, projectile yaw, and magnetic particle inspection in accordance with ASTM E1444/E1444M of the barrel for cracks. Magnetic particle inspection, muzzle velocity and projectile yaw measurements (using 20 rounds of M855A1 ammunition) shall be taken in accordance with the procedures specified for the endurance test.

4.19 Marking. Marking inspection in accordance with MIL-STD-130 shall be performed on the M249 and its subassemblies.

4.20 Workmanship. Workmanship shall be in accordance with the workmanship requirements of MIL-W-63150, MIL-W-13855, and visual inspections.

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 material is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service of 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 military unique M249 machine gun is intended to be utilized as a squad automatic weapon. It may also be utilized for automatic small arms or light machine gun fire in perimeter and vehicular (air and ground) roles.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of the specification.
b. Quantity and configuration (AR or LMG) required and delivery schedules.
c. Concurrent repair parts requirements.
d. Physical security requirements.
e. Serialization requirements.
f. Responsibility for test firing facilities and operating procedures.
g. Requirements for comparison test weapons.
h. Conformance procedures, plans, and inspections; such as statistical process control (SPC); if other than specified in section 4.
i. Procedures for submittal and approval of alternate quality assurance plans.
j. Certificates of conformance for each lot or shipment of product.
k. Responsibility for furnishing ammunition and links.
l. Packaging requirements, if other than specified in section 5.
m. Requirements for pilot pack, pilot lot pack, and inspection requirements if other than specified in 4.3.1 and 5.0.
n. Marking for shipment including bar code requirements.
o. List of repair parts required for refurbishment and refurbishment instructions for endurance weapons.
p. Disposition of endurance and reliability tested machine guns.
q. Requirements for first article.

6.3 Material and construction. Machine guns and parts should be in accordance with requirements specified herein, drawing 9348199 (AR) or 12556999 (LMG) and drawings applicable thereto, and the applicable provisions of MIL-W-13855 and MIL-W-63150.

6.4 Failure definition. A failure is any of the following:

a. A stoppage in weapon function not caused by trigger manipulation.
b. A failure to stop firing when trigger is released.
c. A malfunction where the weapon does not operate in accordance with design intent.

6.4.1 Failure classifications.

Class I: A failure that may be operator immediately clearable within 10 seconds or less while following prescribed immediate action procedures.

Class II: A failure that may be operator clearable requiring more than 10 seconds but not more than 10 minutes. Only the equipment and tools issued with the weapon may be used to clear the failure.

Class III: A failure of a severe nature. The failure; (1) is operator correctable but requires more than 10 minutes, (2) operator cannot correct and requires assistance (no time limit), (3) requires higher level of maintenance, or authorized operator correction cannot be accomplished because of unavailability of necessary tools, equipment or parts.

6.4.2 Failure scoring. A part determined to be unserviceable during the scheduled maintenance (every 4000 rounds), should be replaced and not scored a reliability failure. However, for each weapon, more than 4 changes of the same part should result in rejection of the reliability test. Failure to meet the barrel life requirements should result in rejection of the reliability test. Barrels becoming unserviceable after meeting barrel life requirements should not be considered as chargeable failures. Unserviceable parts discovered after the reliability firing is completed should not be scored as a reliability failure. If one or more Class I and/or Class II failures are found to be related to an unserviceable part, scoring will be as follows.

6.4.3 Scheduled maintenance - repetitive failures. If the unserviceable part is found during scheduled maintenance, all failures will be scored as one failure. No penalty should be scored for replacement of the unserviceable part. In the event that both Class I failures and Class II failures were previously scored because of the unserviceable part the failures will be scored as a single Class II failure.

6.4.4 Unscheduled maintenance - repetitive failures. If unscheduled maintenance is performed to correct the problem, replacement of the unserviceable part should be scored as a Class III failure and the related Class I and / or Class II failures not scored.

6.5 First article. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles (see 6.2). Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.6 Alternative inspection provisions. Alternative conformance procedures, methods or equipment, such as statistical process control, tool control, other types of sampling procedures, etc. may be used by the contractor when they provide as a minimum the level of quality assurance required by the provisions specified herein. Prior to applying methods or equipment, the contractor should describe them in a written proposal submitted to the government for evaluation (see 6.2). When required, the contractor should demonstrate that the effectiveness of each proposed alternative is equal to or better than the specified quality assurance provision(s) herein. In cases of dispute as to whether the contractor's proposed alternative(s) provides equivalent assurance, the provisions of this specification should apply. All approved alternative provisions should be specifically incorporated into the contractor's quality program or detailed inspection system, as applicable.

6.7 Definitions.

6.7.1 Barrel, assigned. The assigned barrel is the second of 2 barrels required to be shipped with each weapon.

6.7.2 Barrel, main. The main barrel is the first of 2 barrels required to be shipped with each weapon.

6.7.3 Barrel, spare. A spare barrel is procured as a separate item and is not identified to a particular weapon.

6.7.4 Unserviceable part. Parts should be considered unserviceable in accordance with the weapon technical manual (Army TM9-1005-201-23&P, Marine Corp. TM08671A-23&P/2A) except the velocity drop criteria may be used for determination of barrel unserviceability rather than the erosion gage method.

6.7.5 Keyholing. Keyholing is any projectile yaw exceeding 15 degrees.

6.8 Government furnished property. The contracting officer should arrange to furnish the property listed if required:

a. Ammunition and links (including the M197A1 high pressure proof rounds)
b. Weapons used for interplant interchange
c. 30 round magazine

6.9 Inspection lot. The number of machine guns in an inspection lot should be as follows:

a. First month's production - 200 weapons or one month's production, whichever is smaller.
b. After five consecutive acceptable lots of 200 each - 400 weapons or one month's production, whichever is smaller.

c. After five consecutive acceptable lots of 400 each - 800 weapons or one month's production, whichever is smaller.

d. When rejection of a lot occurs, the next smaller lot size should be reinstated and the above procedures should be repeated in returning to the next larger lot size. The contractor may request that the reduced lot size not be reinstated. Such a request should be submitted in writing to the Government and should substantiate why the smaller lot size and associated additional testing is not necessary or beneficial to the Government for the particular failure(s)involved.

6.10 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue

6.11 Subject term (key word) listing.

MINIMI
SAW
Weapon, Automatic

Custodians:
Army – AR
Navy – OS
Air Force – 99

Preparing activity:
Army - AR
(Project 1005-2019-002)

Review activities:
Navy – AS, MC, SH, CG
Air Force - 84,
DLA – CC
Other – FAS

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 https://assist.dla.mil.