

MIL-G-45140B
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SUPERSEDING
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MILITARY SPECIFICATION

GUN, SPOTTING, CALIBER .50: M8C

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers one type of caliber .50 gas operated, magazine fed, semiautomatic gun designed to assist the gunner in determining range of the target for 106mm recoilless rifles.

2. APPLICABLE DOCUMENTS

2.1 Issues of documents. The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

SPECIFICATIONS

* <u>Federal</u>		
VV-L-800	-	Lubricating Oil, General & Purpose Preservative, (Water Displacing, Low Temperature)
* <u>Military</u>		
MIL-P-116	-	Preservation-Packaging, Methods of
MIL-C-372	-	Cleaning Comound, Solvent for Bore of Small Arms and Automatic Aircraft Weapons
MIL-W-13855	-	Weapons: Small Arms and Aircraft Armament Subsystems, General Specification for

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Rock Island Arsenal, ATTN: SARRI-LE-S, Rock Island, Illinois 61201 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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MIL-P-14232	Parts, Equipment and Tools for Army Materiel, Packaging and Packing of
MIL-I-45607	Inspection Equipment, Acquisition
MIL-Q-45970	Maintenance and Disposition of
	Quality Assurance for Weapons and
	Support Materiel
MIL-L-46000	Lubricant, Semi-Fluid (Automatic Weapons)
MIL-C-60167	Cartridge, Caliber .50, Test High-Pressure, T251
MIL-C-60168	Cartridge, Caliber .50, Practice T249E2
MIL-C-60813	Cartridge, Caliber .50, Spotter-Tracer, M48A2

STANDARDS

<u>Federal</u>	
Fed. Std.	Commercial Packaging of Supplies and
No. 356	Equipment
<u>Military</u>	
MIL-STD-105	Sampling Procedures and Tables for
	Inspection by Attributes
MIL-STD-109	Quality Assurance Terms and Determinations

* DRAWINGS

<u>Rock Island Arsenal</u>	
C7268261	- Diagram, Targeting and Accuracy
F7268115	- Rifle, Spotting, Cal. .50, M8C

* PUBLICATIONS

<u>Rock Island Arsenal</u>	
P7268115	- Packaging Data Sheet for Rifle, Spotting, Cal. .50, M8C
EL7268115-I	- List of Inspection Equipment Numbers, Rifle, Spotting, Cal. .50, M8C

(Inspection equipment drawings referenced in this specification form a part of EL7268115-I.)

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

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3. REQUIREMENTS

* 3.1 First article. Requirements for submission of first article shall be as specified in the contract (see 6.1). Unless otherwise specified, the first article shall include the pilot pack (see 5.1).

* 3.2 Materials, construction and design. The gun shall conform to the materials, construction and design requirements specified herein, on Drawing F7268115 and MIL-W-13855.

3.2.1 Barrel. The barrel shall be free of cracks, seams and mutilations. The bore and chamber shall be free of foreign matter, corrosion, pits, burrs, sharp edges, bulges and deformations. Scratches or marks, occurring in a chamber which otherwise meets the surface roughness requirements, shall be permitted provided they do not cause marks on the case of a high-pressure test cartridge fired in the chamber (see 3.3.2). The barrels shall be proof and magnetic particle inspection marked in accordance with the applicable drawings.

3.2.2 Barrel and receiver assembly. The barrel shall be drawn up securely in the receiver, and the barrel and receiver draw lines shall coincide.

* 3.2.3 Bolt and slide. The bolt and slide shall traverse the receiver assembly through their full range of travel without binding and shall lock and unlock in the receiver without binding. The bolt assembly (bolt, extractor, plunger spring, extractor plunger and spring pin) shall be proof and magnetic particle inspection marked in accordance with the applicable drawings. The slide keys shall be securely brazed to the slide if keys are used. The slide key shall have the radii as specified on the applicable drawings.

3.2.4 Bolt guides. The bolt guides shall assemble readily to the slide, shall be retained in the slide by the springs and shall engage in the bolt guide slots.

3.2.5 Bolt lock. The bolt lock shall be securely attached to the receiver and the bolt lock screws shall be staked to prevent loosening. The bolt lock shall be capable of locking the bolt in the firing position.

3.2.6 Buffer assembly. The buffer bushings shall be securely brazed to the buffer body and the buffer disc shall be securely riveted to the buffer bushing assembly. The buffer assembly shall readily assemble to, and disassemble from, the rear of the receiver and shall perform its function to absorb recoil.

3.2.7 Buffer catch. The buffer catch shall operate without binding through its full range of travel and when engaged in the buffer assembly under spring action shall prevent rotational movement of the buffer assembly.

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3.2.8 Charging handle. the charging handle shall be capable of assembly to, and disassembly from, the slide without the use of tools. The charging handle plunger shall snap into and lock the charging handle assembly to the slide.

3.2.9 Ejector. The ejector shall be securely attached to the bolt lock and shall eject cartridge cases.

3.2.10 Extractor. The extractor shall be retained in the bottom of its seat in the bolt by its spring and plunger. The extractor plunger shall be retained by the spring pin. The extractor shall function without binding under spring action through its full range of travel, shall extract cartridge cases, and shall return to its seated position after cartridge ejection.

3.2.11 Firing mechanism assembly. The firing mechanism assembly shall engage the retaining pin and shall be securely attached to the receiver with the front and the rear housing pins. The sear shall hold the hammer in the cocked position and when the firing rod is pulled, the sear shall release the hammer before the sear is disengaged from the sear release. When the hammer is released from the sear, the hammer spring shall rotate the hammer forward and shall hold the hammer against the stop bushings. The hammer spring shall return the sear to the full forward position when the hammer is held so that its face is at approximately 90 degrees from the top of the firing mechanism housing. When the hammer is returned for reengagement with the sear by the recoil action of the bolt, the hammer shall be engaged and held by the sear with or without the firing rod retracted.

3.2.12 Firing pin. The firing pin shall move through its full range of travel without binding. The striker point shall be free of lines that may induce fatigue fractures.

3.2.13 Firing pin retractor. The firing pin retractor shall move through its full range of travel without binding and shall cam, and hold the firing pin to the rear of the bolt face until the bolt and slide are in firing position.

3.2.14 Gas cylinder. The gas cylinder shall be securely retained in the gas cylinder body. The gas port of the gas cylinder body, the barrel, and the gas cylinder shall be in alignment.

3.2.15 Gas cylinder body. The gas cylinder body shall be securely attached to the barrel.

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* 3.2.16 Gas regulator group. The gas regulator group shall be securely locked to the gas cylinder body. When gas regulation is required it shall be possible to move the gas regulator when the locking nut is loosened. The gas regulator screw must be capable of being bottomed (the underside of the screw head bottomed on the lock nut and the lock nut in turn bottomed on the gas regulator bushing). After gas regulation is made, the locking nut shall securely lock the gas regulator in the position set.

* 3.2.17 Guide rods and springs. The guide rod pin and cap shall be securely brazed to the guide rod. The guide rod ends shall be driving springs in the slide and shall lock in the buffer assembly slots. The driving springs shall be straight and free of kinks and perform their recoil and counterrecoil functions.

3.2.18 Magazine assembly and magazine catches. The magazine follower shall function through its full range of travel under spring action without binding. The magazine shall readily assemble to the gun when the rear magazine catch is pressed forward. When the rear magazine catch is released, the magazine shall be securely retained by the rear and front magazine catches under spring action.

3.2.19 Mounting keys. The mounting keys shall be securely staked on the barrel and shall be oriented with respect to the barrel draw line.

3.2.20 Operating rod assembly. The operating rod assembly shall function without binding throughout its full range of travel on its spring stop.

3.2.21 Operating rod spring stop. The operating rod spring stop shall be securely staked on the barrel and shall be oriented with respect to the barrel draw line.

3.2.22 Receiver. The receiver shall be free of cracks and all functioning surfaces shall be free of burs and sharp edges.

3.2.23 Safeties. The manual safety shall move readily from one position to the other, and shall hold securely in position when set. With the manual safety in the "safe" position, the hammer shall not release when the firing rod pulled. With the manual safety in the "fire" position, the hammer shall release when the firing rod is pulled. In addition, guns shall be capable of being set on "safe" and "fire" positions by means of the solenoid safety. When the solenoid safety is assembled to the gun, the manual safety shall be in the "fire" position and it shall not be possible to move the manual safety to the "safe" position. With the solenoid safety in the "safe" position, the hammer shall not release when the firing rod is pulled. With the solenoid safety in the "fire" position, the hammer shall release when the firing rod is pulled.

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* 3.2.24 Operating rod protrusion. The operating rod protrusion (distance between the face of the receiver and the shoulder of the operating rod) shall be not less than .450 inch nor more than .680 inch. Testing shall be as specification 4.5.3.2.2."

* 3.2.25 Sear release disengagement. The sear release shall disengage from the sear within .200 inch travel (after taking up cable slack). Testing shall be as specified in 4.5.3.2.2.

* 3.2.26 Hammer release and spring return loads. The gun or firing mechanism shall meet the following requirements when in a horizontal position:

* 3.2.26.1 Hammer release. The cable load to release the hammer from a cocked position shall be not more than 12 pounds. Testing shall be as specified in 4.5.3.2.2.

* 3.2.26.2 Spring return. With the firing mechanism attached to the gun and the hammer in the released position or the firing mechanism detached from the gun and the hammer shank $90^{\circ} \pm 50$ from the top of the firing mechanism housing, the spring force returning the firing rod from the fully retracted position to engage the sear release with the sear shall be not less than 5 pounds. Testing shall be as specified in 4.5.3.2.2.

* 3.2.27 Firing pin indent. With the gun in a horizontal position, the firing pin indent shall be not less than .020 inch and it shall not be off center more than one-half the diameter of the firing pinpoint. Testing shall be as specified in 4.5.3.2.2.

3.3 Performance.

* 3.3.1 Functioning. The gun shall function without malfunction or unserviceable parts for 20 consecutive rounds with the gas regulator set between 1 and 1 1/2 turns from the closed position. Ammunition shall be government standard T249E2, caliber .50, practice cartridges conforming to MIL-C-60168. Testing shall be as specified in 4.5.3.2.1.

* 3.3.2 High-pressure resistance. The gun shall be capable of withstanding the firing of one round of government standard T251, caliber .50, test, high-pressure cartridge conforming to MIL-C-60167. Parts shall be free of cracks, seams and other injurious defects after proof firing. Testing shall be as specified in 4.5.3.2.1.

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* 3.3.3 Targeting and accuracy. At a range of 90 meters (100 yards), 10 consecutive shots shall fall within the 14 x 16 inch rectangle specified on Drawing C7268261 for targeting; and the 10 shots shall fall within an 8 inch circle for accuracy. Ammunition shall be government standard T249E2, caliber .50, practice cartridges conforming to MIL-C-60168. Testing shall be as specified in 4.5.3.2.1.

* 3.3.4 Endurance. The gun shall be capable of firing 2500 rounds of government standard T249E2, caliber .50, practice cartridges conforming to MIL-C-60168, with not more than the number of malfunctions and unserviceable parts allowed in Table I. Testing shall be as specified in 4.5.3.2.3.

3.3.4.1 Firing shall be single shots, deliberately spaced at approximately 2 second intervals, in series not to exceed 100 rounds using fully loaded magazines. The magazines shall be used in rotation so that approximately 500 rounds will be fired from each magazine.

3.3.4.2 The barrel shall be cooled to ambient temperature by air after each series. The gas system and barrel chamber shall be thoroughly cleaned after each 500 rounds and at the close of each day's firing. Cleaning and oiling of other parts at 500 rounds is permissible. No parts shall be altered or replaced during cleaning except that parts broken or worn to the extent that they are unserviceable shall be replaced.

Table I. Malfunctions and unserviceable parts (Notes: 1/ 2/)

Malfunctions <u>1/ 2/</u>	Number permitted in 2500-rounds
Failure to feed (cartridge visible)	8
Failure to feed (cartridge not visible)	2
Failure to eject cartridge case	4
Total malfunctions for above categories combined	11
Unserviceable parts <u>1/</u>	Number permitted in 2500-rounds
Extractor	2
Magazine assembly	1
Pin, firing	2
Pin, spring (bolt assembly)	1

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1/ When malfunctions are traceable to particular parts, it is permissible to replace such parts and record them as unserviceable, subject to limitations of Table I. When it is definitely established that previously recorded malfunctions are attributable to an unserviceable part, such malfunctions shall not be counted against the gun being tested, provided that they occurred not more than 200 rounds prior to replacement of the unserviceable part. These 200 rounds shall have been fired with the unserviceable part. However, such malfunctions shall remain recorded and properly identified. An unserviceable part is one that causes malfunctions or impairs the safety of the weapon.

2/ When malfunctions are attributable to improper gas regulation, it is permissible to adjust the gas regulator as necessary but the malfunctions shall be charged against the gun being tested. However, during the first 50 rounds of the test, malfunctions that are directly attributable to improper gas regulation shall not be counted against the gun being tested, but shall remain recorded and properly identified.

* 3.4 Interchangeability. Unless otherwise specified on the drawings, all parts shall be interchangeable. In normal assembly operations there shall be no objections interposed to preferential assembly of parts provided that all parts are dimensionally acceptable. Once a gun has been assembled and headspaced, the bolt, slide and barrel and receiver assembly shall remain together and not be mixed with those in other weapons. Testing shall be as specified in 4.5.3.2.4.

3.5 Marking. The gun shall be marked in accordance with MIL-W-13855. Each gun shall be identified by a serial number assigned by the procuring activity (see 6.1).

3.6 Workmanship. The workmanship shall be in accordance with MIL-W-13855.

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.

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4.1.1 The contractor shall perform, as a minimum, inspections in accordance with the specifications, quality assurance provisions, MIL-Q-45970 and the contract. These minimum inspections shall not be construed as relieving the contractor of his responsibilities under terms of the contract to furnish the Government with items complying with and conforming to the requirements of the contract, drawings and specifications.

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 inspections. The inspection requirements specified herein are classified as follows:

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

* 4.4 First article inspection. The first article (initial production unit(s)) shall be submitted for inspection in accordance with the contract (see 6.1). 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.

4.5 Quality conformance inspection.

4.5.1 Inspection lot.

4.5.1.1 Guns. Each of the first five lots shall consist of not more than 100 guns or a month's production, whichever is smaller. If five successive lots meet the requirements of this specification, the lot size shall be increased to 300 guns or a month's production, whichever is smaller. If five successive lots of 300 guns meet the requirement of this specification, the lot size shall be increased to a maximum of 500 guns or a month's production, whichever is smaller. If rejection of a lot occurs at any time, the initial five lot criteria shall be reinstated and the above procedure repeated in returning to larger lot sizes. Guns shall be assembled from lots of parts that have met all inspection requirements specified herein.

* 4.5.1.2 Parts. The formation, size and presentation of inspection lots of parts shall be in accordance with MIL-W-105 and MIL-W-13855.

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4.5.2 Examination.

4.5.2.1 Component parts and concurrent repair parts. Examination of component parts and concurrent repair parts shall be performed in accordance with the criteria specified in the contract (see 6.1). The contractor's examination of these parts shall be accomplished prior to their assembly into the end item or submission for acceptance as repair parts.

* 4.5.2.2 Guns. Each gun shall be examined as specified below. Guns failing to meet the requirements shall be rejected. Each step in the examination shall include a visual examination for proper cleaning, marking (identification, proof firing, and magnetic particle inspection), and presence of the specified protective coating and to determine the general quality, completeness of manufacture, assembly and workmanship. The examination provisions should be applied at the earliest practical point in manufacture at which it is feasible to inspect for acceptance without risk of change in the characteristics by subsequent operations. Reinspection of these characteristics on the completed product is not required provided assurance exists that the characteristic has not been changed, degraded or damaged by subsequent manufacturing, assembly or handling and that adequate inspection records are maintained.

4.5.2.2.1 Function of safeties.

- a. Manually examine the manual safety to assure proper function (see 3.2.23).
- b. Assemble the solenoid to the gun and examine to determine compliance with 3.2.23 (see 6.1).

* 4.5.2.2.2 Guide rods and springs.

- a. Disassemble guide rods and springs with slide in rear-most position. Examine locking action in buffer assembly slots (see 3.2.17).
- b. Visually and manually examine to assure secure brazing of cap and pin to guide rod (see 3.2.17).
- c. Visually examine straightness of guide rod pin.

4.5.2.2.3 Buffer catch. Manually examine buffer catch to determine compliance with 3.2.7.

4.5.2.2.4 Buffer assembly.

- a. Disassemble the buffer assembly from the gun, examining for ability to be readily disassembled (see 3.2.6).
- b. Visually and manually examine for secure brazing of bushings and riveting of disc to body (see 3.2.6).

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4.5.2.2.5 Charging handle assembly. Manually examine charging handle assembly to determine compliance with 3.2.8.

4.5.2.2.6 Bolt and slide.

- a. Manually examine full traversing action of bolt and slide group in receiver to assure freedom from binding (see 3.2.3).
- b. Manually examine bolt and slide locking and unlocking to assure freedom from binding (see 3.2.3).
- c. Disassemble bolt and slide group from receiver.
- d. Manually disassemble bolt guides from slide and visually examine the bolt guides to assure freedom from burs and mutilations (see 3.2.4).
- e. Visually examine bolt camming and locking surfaces of slide to assure freedom from burs and mutilations.
- f. Visually and manually examine keys in slide to assure secure brazing. Each slide key shall be examined for sound brazing by suspending the slide so that no damping effect is produced and tapping the slide key with a metal rod. This will cause a soundly brazed slide key to emit a clear ringing sound. Slide keys failing to emit a clear ringing sound shall be rejected (see 3.2.3).
- g. Visually examine for presence of proof and magnetic particle inspection mark.

* 4.5.2.2.7 Extractor.

- a. Visually examine bolt for presence of proof mark and magnetic particle inspection mark.
- b. Manually examine extractor to determine compliance with 3.2.10.
- c. Visually examine extractor lip to assure freedom from cracks, chips and mutilations.
- d. Visually examine the extractor plunger stop pin for secure retention and to assure it is flush or below the surfaces on each side of the bolt (see 3.2.10).
- e. Visually examine bolt camming and locking surfaces to assure freedom from burs and mutilations.

* 4.5.2.2.7.1 Firing pin.

- a. Manually examine the firing pin to assure that it moves through its full range of travel without binding (see 3.2.12).
- b. Visually examine striker point, retractor slot, and hammer impact area of firing pin to assure freedom from pits, burs, mutilations and lines that may induce fatigue failure.

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4.5.2.2.7.2 Firing pin retractor.

- a. Visually and manually examine firing pin retractor to determine compliance with 3.2.13.
- b. Visually examine firing pin retractor camming surfaces to assure freedom from burs and mutilations.

4.5.2.2.8 Magazine assembly and magazine catches.

- a. Manually examine magazine assembly to assure secure retention by magazine catches (see 3.2.18).
- b. Disassemble magazine from gun, examining spring action of catches (see 3.2.18).
- c. Visually examine magazine catches to assure freedom from burs and mutilations.
- d. Manually examine follower and spring of magazine assembly by depressing follower to assure proper functioning.
- e. Visually examine cartridge retaining lips of magazine assembly to assure freedom from burs and mutilations.
- f. Manually examine magazine base to assure ability to be disassembled.

4.5.2.2.9 Firing mechanism assembly.

- a. Disassemble firing mechanism assembly from receiver by removing cotter pins and retaining pins.
- b. Visually and manually examine full pivoting of hammer to determine compliance with 3.2.11.
- c. Manually examine to assure free pivoting of sear on pin.
- d. Visually and manually examine function of hammer spring to determine compliance with 3.2.11.
- e. Visually examine hammer catch faces (top and front) to assure freedom from burs and deformations.
- f. Visually examine hammer catch surface of sear to assure freedom from burs and deformations.
- g. Visually examine sear release catch surface to assure freedom from burs and deformations.
- h. Manually examine function of sear to determine compliance with 3.2.11.
- i. Manually examine function of sear release and sear release retainer to determine compliance with 3.2.11.

4.5.2.2.10 Receiver and barrel assembly. Visually and manually examine barrel and receiver assembly to determine compliance with 3.2.2.

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4.5.2.2.10.1 Barrel assembly.

- a. Visually examine barrel assembly to assure freedom from foreign matter, corrosion, pits, burs, deformations and bulges (see 3.2.1).
- b. Visually and manually examine mounting keys and operating rod spring stop to determine compliance with 3.2.19 and 3.2.21.

4.5.2.2.10.2 Receiver assembly.

- a. Visually examine receiver assembly to determine compliance with 3.2.22.
- b. Visually and manually examine secureness of bolt lock and ejector to determine compliance with 3.2.5 and 3.2.9.

4.5.2.2.10.3 Gas cylinder group (see 3.2.14, 3.2.15 and 3.2.16).

- a. Disassemble gas regulator assembly from gas cylinder body by loosening lock ring and removing regulator bushing assembly without disturbing setting.
- b. Visually examine tip of gas regulator to assure freedom from burs and deformations.
- c. Remove gas cylinder and visually examine internal and external walls to assure freedom from scratches, deformations, burs and powder fouling.

4.5.2.2.10.4 Operating rod assembly.

- a. Slide operating rod assembly forward and check piston to assure freedom from scoring, burs and powder fouling.
- b. Reassemble gas cylinder and gas regulator assembly and manually examine operating rod assembly to determine compliance with 3.2.20.

* 4.5.2.2.11 Gun assembly.

- a. Reassemble gun, insuring the positive retention of all parts and hand operate to assure proper function.
- b. Visually examine for presence of proof mark on receiver and for presence of magnetic particle inspection marks on barrel.
- c. Examine breeching space using gage in accordance with Drawing F7319998.
- d. Visually and manually examine function of safeties as specified in 4.5.2.2.1.
- e. Visually examine to assure presence of housing retaining pin in receiver assembly.

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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 gun. If test requirements cited herein are not met, acceptance of the gun 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 guns, partially assembled guns, 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 gun for retest.

* 4.5.3.2 Text

4.5.3.2.1 Functioning, high-pressure resistance and targeting and accuracy testing. Each gun shall be tested for functioning (see 3.3.1), high-pressure resistance (see 3.3.2), and targeting and accuracy (see 3.3.3) using the test methods specified in 4.6.1, 4.6.2 and 4.6.3 respectively. Failure of any gun to meet these requirements shall be cause for rejection.

* 4.5.3.2.2 Operating rod protrusion, sear release disengagement hammer release and spring return load, and firing pin indent testing. A random sample of 10 guns from each inspection lot shall be tested for operating rod protrusion (see 3.2.24), sear release disengagement (see 3.2.25), hammer release and spring return load (see 3.2.26), and firing pin indent (see 3.2.27), using the test methods specified in 4.6.4, 4.6.5, 4.6.6 and 4.6.7 respectively. Failure of any gun in the sample to meet these requirements shall be cause for rejection of the represented lot.

* 4.5.3.2.3 Endurance testing. One gun and five magazines shall be randomly selected from each inspection lot and tested for endurance (see 3.3.4) using the test method specified in 4.6.8. Failure of the gun to meet the requirements shall cause retest or rejection of the represented lot. A retest of two other guns and ten other magazines randomly selected from the same lot shall be made, unless the failure indicates

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serious defects in the item, in which case retest shall be made only if authorized by the procuring agency. Failure of any gun in the retest to meet the requirements shall cause rejection of the represented lot. Sample size and test methods for reconditioned lots shall be the same as for retest.

4.5.3.2.4 Interchangeability testing.

4.5.3.2.4.1 In plant.

* 4.5.3.2.4.1.1 Guns. A sample of ten guns selected from each inspection lot shall be tested for interchangeability (see 3.4) using the test method specified in 4.6.9. Guns taken for interchangeability testing shall have been found satisfactory in all other examinations and tests. Test frequency maybe reduced to not less than one test of ten guns each month when a record of consistently satisfactory results has been established. The ten guns shall be tested for and shall comply with the requirements for operating rod protrusion, sear release disengagement, hammer release and spring return load, and firing pin indent before and after interchange of parts, using the test methods specified in 4.6.4, 4.6.5, 4.6.6 and 4.6.7 respectively. In addition, the guns shall be tested for functioning firing and targeting and accuracy requirements after interchange of parts using the test methods specified in 4.6.1 and 4.6.3 respectively. Hand refinement of parts will be allowed on not more than two guns during interchanging of parts provided that no part is altered beyond drawing requirements. Failure of guns to meet the requirements of the interchangeability test or failure of any gun to meet the requirements of the functioning firing test and the targeting and accuracy test shall be cause for retest or rejection of the represented lot. Upon approval of the procuring activity, an interchangeability retest may be allowed without reconditioning the lot of guns. Failure in the retest shall cause rejection of the represented lot. A sample of 20 guns from each retest or reconditioned lot shall be tested using the same procedure described above except that hand refinement will be allowed on not more than 4 gun.

4.5.3.2.4.1.2 (Concurrent repair parts. The contractor shall subject at least two parts from each inspection lot of concurrent repair parts to the interchangeability test specified in 4.6.9.1.2. Failure of any part to meet the requirements shall be cause for rejection of the represented lot of parts subject to reconditioning and further test as a reconditioned lot. A sample of double the number of parts used in the original test shall be tested from each reconditioned lot using the test method specified in 4.6.9.1.2.

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4.5.3.2.4.2 Interplant. When guns are manufactured concurrently by more than one contractor, each contractor shall forward monthly eight guns for the interplant interchangeability test specified in 4.6.9.2 (see 6.1). The contractor will be informed of the results of the test which indicates failure of the guns to meet prescribed requirements.

4.5.3.3 Component parts and concurrent repair parts testing. Raw material testing, part testing, and certification shall be performed in accordance with the criteria specified in the contract (see 6.1). This will include chemical analysis and physical tests of materials, and tests of protective finish, heat treatment, bonding and functioning of parts as applicable. The contractor shall accomplish these tests prior to assembly of parts into the end item.

* 4.5.4 Packaging examination and testing. Unless otherwise specified (see 6.1), the packaging examination and testing shall be in accordance with MIL-P-14232.

4.5.5 Inspection equipment.

* Acquisition, maintenance and disposition. Unless otherwise specified (see 6.1), responsibility for acquisition, calibration, maintenance and disposition of acceptance inspection equipment prescribed on List of Inspection Equipment Numbers EL7268115-I and for all other inspection equipment required by applicable specifications, shall be in accordance with MIL-I-45607.

4.5.5.2 Accuracy of standard measuring equipment. When commercial and modified commercial inspection equipment is used, it must be capable of repetitive measurements to an accuracy of 10 percent of the total tolerance of the characteristic being inspected.

* 4.6 Test methods.

4.6.1 Functioning firing test.

4.6.1.1 Guns shall be tested using a contractor designed, Government approved mount.

4.6.1.2 The gun shall be prepared for firing using lubricant in accordance with VV-L-800. Apply light coat of oil to all surfaces of the bolt assembly, slide assembly and receiver.

4.6.1.3 With the gas regulator set at 1 1/2 turns from the closed position, the gun shall be accepted when 20 consecutive rounds are fired without a malfunction. If a total of 2 low-power malfunctions occur before 20 consecutive rounds are fired, the gun shall be rejected subject to reconditioning. If 2 high-power malfunctions occur before 20 consecutive rounds are fired, the gas regulator shall be turned towards the closed position (but not more than 1/2 turn) until 20 consecutive rounds are fired without malfunction.

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4.6.1.4 The magazine presented with the gun shall be fired at least on full magazine.

4.6.2 High-pressure resistance test.

4.6.2.1 Guns shall be tested by firing one round of government standard high-pressure test ammunition using a contractor designed, government approved mount. Guns shall be tested with complete bolt assemblies (extractor, plunger, etc.,) installed. Each barrel shall have been high-pressure tested and magnetic particle inspected before assembly to the gun for this test. The gas regulator shall be set at the closed position and the slide locked into battery (with an insert between rear of slide and rear of ejection port slot) before the gun is high-pressure tested.

4.6.2.2 Breeching space shall be gaged after proof firing, prior to acceptance, using the inspection equipment in accordance with Drawing F7319998 (see 4.5.2.2.11).

4.6.2.3 Each bolt shall be magnetic particle inspected as prescribed on the applicable drawing after proof firing for evidence of cracks and seams.

4.6.2.4 Cartridge cases shall be visually examined for bulges, splits, rings or other defects caused by defective barrels.

4.6.2.5 Proof marks and magnetic particle inspection marks shall be applied as indicated on the applicable drawings on guns that have passed this test.

4.6.3 Targeting and accuracy firing test. Guns shall be tested using the mount conforming to Drawing F7270736. The firing of one warmup shot off the target shall be allowed prior to boresighting and firing the gun for targeting and accuracy. The gun shall be boresighted on the sighting image depicted on Drawing C7268261 using the boresight in accordance with Drawing D7270727. The mounts shall then be locked in the boresighted position and the boresight removed. Ten consecutive shots shall be fired from one magazine and the target shall be checked to determine whether the targeting and accuracy requirements have been met.

4.6.4 Operating rod protrusion test. The guns shall be tested with the gun held in a horizontal position. The charging handle shall be operated several times to reciprocate and establish a stable position of the operating rod. When the operating rod has established a stable position and with the bolt held open, the distance between the face of the receiver and the shoulder of the operating rod shall be measured using the inspection equipment in accordance with Drawings A7270473 and A7270474.

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4.6.5 Sear release disengagement test. The gun shall be tested with the gun held in a horizontal position. The hammer shall be in the released position, and the firing rod shall be fully forward under spring action. The travel of the firing rod from the point where the firing rod slack is taken up to the point where the sear release disengages the sear shall be measured using the inspection equipment in accordance with Drawing D7270711.

4.6.6 Hammer release and spring return load tests. The gun shall be tested with the gun or firing mechanism in a horizontal position. The hammer shall be in the cocked position when the load required to release the hammer from the sear is applied and measured. The hammer shall be in the released position with the firing mechanism attached to the gun or, the hammer shank shall be $90^{\circ} \pm 5^{\circ}$ from the top of the firing mechanism housing with the firing mechanism detached from the gun when the spring force returning the firing rod from the fully retracted position to engage the sear release with the sear is measured. Inspection equipment in accordance with Drawing D7270711 shall be used.

4.6.7 Firing pin indent test. The gun shall be tested with the gun held in a horizontal position. The prescribed copper compression cylinder shall be inserted in the recess of a holding fixture in accordance with Drawing D7270710 and the holding fixture inserted in the barrel chamber while the bolt is held open. The bolt shall be manually returned to battery position and the firing rod pulled to release the firing pin. The holding fixture shall be removed from the gun and the depth of the indent in the copper compression cylinder computed by measuring the distance from the original surface of the cylinder (before indentation) to the bottom of the firing pin impression. The firing pin indent impression shall be visually examined to determine whether the concentricity and indent requirements have been met.

4.6.8 Endurance test.

4.6.8.1 Guns shall be tested using a contractor designed, government approved mount.

4.6.8.2 Firing shall be single shots, deliberately spaced at approximately 2 second intervals, in series not to exceed 100 rounds using fully loaded magazines. The magazines shall be used in rotation so that approximately 500 rounds will be fired from each magazine.

4.6.8.3 The barrel shall be cooled to ambient temperature by air after each series. The guns shall have been lubricated as specified below at the beginning of the test and cleaned and lubricated after each 500 rounds and at the close of each day's firing. No other cleaning and lubrication shall be performed during this test. No parts shall be altered or replaced during cleaning except that parts broken or worn to the extent that they are unserviceable shall be replaced.

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4.6.8.4 Guns shall have been lubricated using lubricant in accordance with MIL-L-46000. Apply a light coat of oil to all surfaces of the bolt assembly, slide assembly and receiver.

4.6.8.5 Guns shall be cleaned with a cleaning solvent in accordance with MIL-C-372 and the following procedure:

- a. Barrel. Brush bore thoroughly with a brush soaked in cleaning Solvent. Brush the bore from the chamber to the muzzle using straight through strokes. Do not reverse direction of brush until it extends beyond the muzzle. Continue brushing until the bore is covered with solvent. Dry the bore by pushing clean dry swabs through the bore. Continue until the swab comes out clean and dry. Clean, dry compressed air maybe used for preliminary drying.
- b. Barrel chamber. Insert the chamber brush that has been dipped in cleaning solvent into the chamber and use reciprocating plunge strokes and rotational, 360° motions. Dry chamber with cleaning swabs.
- c. Bolt assembly. Disassemble all parts, wash these parts in cleaning solvent and remove all carbon deposits. Remove excess solvent and dry.
- d. Receiver. Clean with cleaning solvent and remove all powder fouling. Remove excess cleaning solvent and dry.
- e. Firing mechanism assembly. Remove all carbon residue from firing mechanism assembly using cleaning solvent. Drain excess solvent and dry.

4.6.8.6 A complete record shall be kept for each endurance test, showing each malfunction and part replacement including the number of the round at which each occurred.

4.6.7.8 The contractor shall investigate causes of malfunction and unserviceable parts and indicate corrective action taken.

4.6.8.8 Upon completion of the endurance test, the contractor may reconditon the test gun. Reconditioned guns shall meet all the requirements of this specification. Test guns not suitably reconditioned shall be scrapped.

* 4.6.9 Interchangeability test.

4.6.9.1 In plant.

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4.6.9.1.1. Guns. Guns shall be tested by disassembling and then re-assembling parts using the parts and prearranged system specified below. interchange of parts shall be accomplished by dividing the parts of each gun into ten groups of nonmating parts as shown below and distributing the groups into ten different trays until each tray contains parts for a complete gun. Groups of parts from the first gun shall be taken in order and placed in trays 1 through 10; groups of parts from the second gun shall be taken in order and placed in trays 2 through 10 to 1; groups of parts from the third gun shall be taken in order and placed in trays 3 through 10 to 2, etc. Commercial parts such as screws, spring pins, etc., shall be placed in the same tray as their mating or associate part. Any commercial part rendered unserviceable by disassembly shall be replaced without penalty to the interchangeability test. The guns shall be re-assembled using only those parts which are in the same tray. After interchangeability testing, all original parts shall be reassembled to their respective guns and given a hand functioning test to assure proper operation.

Groups of Nonmating Parts

Group I

Receiver and barrel assembly
(7268255)
Nut, regulator lock (7266831).
Release, sear (7267838)
Spring, helical, compression
(7266416)

Group II

Bolt: Spotting rifle (7266340)
Pin, straight, headed (7266377)
Regulator gas (7790871)
Spring, helical, torsion
(7266417)

Group III

Buffer assembly (7266342)
Housing and catch assembly
(7268118)
R&actor, firing pin (7266400)

Group IV

Nut, plain round (7266830)
Magazine assembly (12003046)
Rod, guide (7267851)
Spring, sear release (7266422)

Group V

Bushing, regulator (7266833)
Pin, hammer (7266374)
Retainer, sear release (7266399)

Group VI

Catch assembly, buffer (7266348)
Pin, housing, front (7266497)
Rod operating, assembly (7267859)
Spring, helical, compression
(7266420)

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Groups of Nonmating Parts (cont.)Group VII

Extractor (7266357)
 Pin, housing, rear (7266498)
 Sear (7266408)
 Cylinder, gas (7790870)

Group VIII

Guide, bolt (7268393)
 Pin, grooved, headed (7266380)
 Spring, helical, compression
 (7266415)

Group IX

Handle assembly, charging
 Pin, straight, headless (7266383)
 Spring, helical, compression
 (7266413)
 Hammer (7266361)

Group X

Housing, firing cable (7266366)
 Plunger, extractor (7266393)
 Slide (7266409)

4.6.9.1.2 Concurrent repair parts. Concurrent repair parts shall be tested by disassembling two guns previously tested in 4.5.3.2.4.1, as necessary, and then reassembling them using the concurrent repair parts. No hand refinement of parts will be allowed, and the guns shall operate and function properly. This test may be performed independently of the gun interchangeability test specified in 4.5.3.2.4.1 and at more frequent intervals using accepted gun taken from current production.

4.6.9.2 Interplant. Guns to be subjected to the interplant interchangeability test shall be given a preliminary hand functioning to assure proper operation before parts are disassembled from the guns. Guns shall be interchanged in a manner similar to the detailed plan in 4.6.9.1.1 except that parts shall be divided into eight groups and, when disassembling, every other gun used shall be one produced by a different manufacturer. The guns shall be tested for and shall comply with the requirements for functioning, targeting and accuracy, operating rod protrusion, sear release disengagement, hammer release and spring return load, and firing pin indenturing the test methods specified in 4.6.1, 4.6.3, 4.6.4, 4.6.5, 4.6.6 and 4.6.7, respectively. Parts shall be identified with their manufacturer throughout the test. Before guns are returned to the contractors, the original parts shall be reassembled to their respective guns and given a hand functioning test to assure proper operation.

5. PACKAGING

5.1 Pilot pack. A pilot pack shall consist of a complete weapon preserved in accordance with Packaging Data Sheet P7268115 for the level of protection specified in the contract (see 6.1), packed Level B and forwarded as specified in 3.1.

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5.2 Levels A and B. Preservation, packing and marking shall be in accordance with packaging Data Sheet P7268115 for the level of protection specified in the contract (see 6.1).

5.3 Commercial packaging. Reservation, packing and marking shall be in accordance with Fed. Std. No. 356.

5.4 Repair parts. Repair parts shall be preserved, packed and marked in accordance with the Packaging Data Sheet or other packaging requirements, as specified in the contract (see 6.1).

6. NOTES

6.1 Ordering data. Procurement documents should specify:

- a. Title, number and date of this specification.
- b. Lists of applicable drawings, specifications and publications pertinent to the gun, showing applicable revision dates.
- c. Shipping instructions for first article and pilot pack (see 3.1, 4.4 and 5.1).
- d. Block of serial numbers for quantity of weapons on order (see 3.5).
- e. Examination and testing criteria for component parts and concurrent repair parts (see 4.5.2.1 and 4.5.2.1 and 4.5.3.3).
- f. Responsibilities for furnishing solenoid (see 4.5.2.2.1).
- g. Responsibility for acquisition, calibration, maintenance and disposition of acceptance inspection equipment, if different (see 4.5.5.1).
- h. Shipping instructions for guns and parts when an inter-plant interchangeability test is required (see 4.5.3.2.4.2).
- i. Packaging inspection, if different (see 4.5.4).
- j. Selection of applicable level of protection (A or B), or commercial packaging (see 5.1, 5.2 and 5.3)
- k. Packaging requirements for repair parts (see 5.4).

6.2 Certain provisions of this specification are the subject of international standardization agreement (ABCA-ARMY-STD-46). When amendment, revision or cancellation of this specification is proposed which affects or violates the international agreement concerned, the preparing activity will take appropriate reconciliation action through international standardization channels including departmental standardization offices, if required.

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6.3 Supersession data. This specification included the requirements of Springfield Armory Purchase Description SAPD-196A dated 7 January 1966.

* 6.4 The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications corrections, deletions) 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.

Custodians:

Army - WC

Navy-MC

Preparing activity:

Army - WC

Review activities:

Navy - OS

Project number:

1005-0467

Other interest:

International (see 6.2)

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