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SAPD-253B
AMENDMENT-1
24 October 1966

SPRINGFIELD ARMORY PURCHASE DESCRIPTION

ACCEPTANCE TESTING SPECIFICATION FOR RIFLES, 5.56MM, M16 AND XM16E1

This amendment forms a part of Springfield Armory Purchase Description SAPD-253B, dated 29 April 1966.

Page 11, Paragraphs 10.3.2 and 10.3.3: Add the following sentence to each paragraph: "The magazines shall be selected from accepted magazines in the Contractor's inspection sample of current production lots".

Custodian:

Army-WC

Preparing activity:

Army-WC
(Rock Island Arsenal)

FSC 1005

SAPD-253B
29 April 1966
SUPERSEDING
SAPD-253A
5 August 1964
SAPD-253
18 July 1963

SPRINGFIELD ARMORY

PURCHASE DESCRIPTION

Acceptance Testing Specification

for

RIFLES, 5.56-MM: M16 AND XM16E1

1. Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any other commercial laboratory acceptable to 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.

2. Contractor's quality control system. The contractor shall provide and maintain a quality control system as prescribed in the contract.

3. Lot size. Unless otherwise specified herein, the first five lots shall each consist of 500 rifles or a month's production, whichever is smaller. When five successive lots meet the requirements, the lot size shall be increased to 5,000 rifles or a month's production, whichever is smaller. When five successive lots of the increased size have met the requirements, the lot size shall be further increased to 10,000 rifles or a month's production, whichever is smaller. If rejection of a lot occurs at any time, the next smaller test lot size criteria shall be reinstated and the above procedure repeated in returning to the larger lot size.

4. Ammunition. Cartridges for the high-pressure resistance test shall be in accordance with MIL-C-46936; cartridges for all other firing tests shall be in accordance with MIL-C-9963.

5. Headspace.

5.1 Requirement. The headspace shall be 1.4646 inch minimum to 1.4706 inch maximum as measured to a 0.330 inch datum diameter on the first shoulder.

5.2 Test method. Each rifle shall be tested by the contractor for headspace requirement during final examination (see 11.1.6), prior to acceptance, using approved inspection equipment. The gage shall be inserted in the barrel chamber and the bolt manually returned to battery position. The minimum gage and the maximum gage shall be used on each rifle. When the minimum gage is used the bolt shall fully close and when the maximum gage is used the bolt shall not fully close. Only light pressure shall be applied to close the bolt during this test. Light pressure (for referee purposes) shall be defined as that not to exceed one pound over that required to close the bolt without the gage inserted. Rifles failing to meet the requirement shall be rejected.

6. Firing pin indent.

6.1 Requirement.

6.1.1 When the bolt is closed and the firing mechanism is released, the firing pin indent shall be not less than 0.020 inch; and it shall not be off center more than one-half the diameter of the firing pin point.

6.1.2 When the bolt is closed and the firing mechanism is not released, the firing pin indent shall be not more than 0.008 inch.

6.2 Test method. A sample of 20 rifles from each inspection lot shall be tested by the contractor for firing pin indent requirement using approved inspection equipment similar to Drawings C7318984 and D7271741.

6.2.1 The rifles shall be tested for firing pin indent requirement specified in 6.1.1 as follows: The rifle shall be held in a vertical position (muzzle down) and the muzzle end of the rifle supported. The bolt shall be held open and the copper compression cylinder holding fixture containing the copper compression cylinder shall be inserted in the barrel chamber. The bolt shall be manually returned to battery position and the trigger pulled to release the hammer and indent the copper cylinder. The holding fixture shall be removed from the rifle 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. The location of the indent shall not be off center more than one-half the diameter of the firing pin point as evidenced by visual examination. (See 6.2.3.)

6.2.2 The rifles shall be tested for firing pin indent requirement specified in 6.1.2 as follows: The rifle shall be held in a vertical position (muzzle down) and the muzzle end of the rifle supported. The bolt shall be held fully open and the copper compression cylinder holding

fixture containing the copper compression cylinder shall be inserted in the barrel chamber. The bolt shall then be released from the full open position and under spring action allowed to go into battery position. (The trigger shall not be pulled to release the firing mechanism.) The holding fixture shall be removed from the rifle 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. (See 6.2.3.)

6.2.3 Failure of two (2) or more rifles in the sample of twenty (20) to meet the test requirements shall cause rejection of the inspection lot and shall cause the contractor to screen the represented lot and correct the noted deficiencies. Failure of one (1) rifle in the sample of twenty (20) to meet the test requirements shall cause a second sample to be tested. The second sample shall consist of forty (40) rifles, exclusive of the first twenty (20), (cumulative, 60 rifles). Failure of one (1) rifle of the second sample to meet test requirements shall cause the contractor to screen the represented lot and correct noted deficiencies.

7. Trigger pull.

7.1 Requirement. After partial or completed trigger pull, the trigger shall return to its normal forward position under spring action. The trigger pull shall be free of creep and shall be within the range of 5.5 to 8.5 pounds. Creep shall be interpreted to mean any perceptible rough movement between the time the trigger slack is taken up and the hammer is released.

7.2 Test method. Each rifle shall be tested by the contractor for trigger pull requirement during final examination using approved inspection equipment. The rifle shall be cocked and the selector shall be in the "Semi" position. The load shall be gradually applied to the center of the trigger and exerted in a line parallel to the axis of the barrel bore. When the minimum load is applied the hammer shall not release and when the maximum load is applied the hammer shall release. The rifle shall be recocked each time after a load is applied. The trigger pull shall also be checked for creep by applying pressure manually to the trigger at a uniform rate of increase over a period of not less than 3 seconds. Rifles failing to meet the requirements shall be rejected.

8. Interchangeability.

8.1 Requirement. 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.) Rifles and repair parts shall be capable of meeting the interchangeability tests specified below.

8.2 Test procedure. A sample of ten rifles selected by the Government representative from each inspection lot shall be tested by the contractor for interchangeability. Rifles taken for interchangeability testing shall have been found satisfactory in all other examinations and tests, and shall have been tested for cyclic rate of fire during the functioning test. The ten rifles shall be tested for and shall comply with the requirements for headspace, firing pin indent, and trigger pull before and after interchange of parts. In addition, each rifle shall be tested for functioning and targeting and accuracy requirements after interchange of parts. After interchanging of parts no malfunctions shall be allowed in the functioning firing test and the cyclic rate of fire shall be within the limits specified in 10.2.1. Failure of not more than two rifles shall be allowed in the targeting and accuracy firing test. However, rifles failing in the targeting and accuracy test within the limitations above shall be corrected by the contractor to meet the requirements before they are returned to the represented lot for final acceptance. Hand refinement of parts will be allowed on not more than two rifles throughout the interchange test provided that no part is altered beyond drawing requirements. Failure of the interchangeability test shall cause retest or rejection of the represented lot. At the discretion of the Government representative, an interchangeability retest may be allowed without reconditioning the lot of rifles. Failure in the retest shall cause rejection of the represented lot subject to reconditioning and further test as a reconditioned lot. A sample of 20 rifles from each retest or reconditioned lot shall be tested using the same procedure described above except that hand refinement and failure in the targeting and accuracy firing will be allowed on not more than 4 rifles.

8.3 Test method.

8.3.1 Rifles. Rifles shall be tested for interchange of parts by disassembling and then reassembling parts using the parts and prearranged system prescribed below. Interchange of parts shall be accomplished by dividing the parts of each rifle into 10 groups of nonmating parts as shown below and distributing the groups into 10 different trays until each tray contains a complete rifle. Groups of parts from rifle number 1 shall be taken in order and placed in trays 1 through 10; groups of parts from rifle number 2 shall be taken in order and placed in trays 2 through 10 to 1; groups of parts from rifle number 3 shall be taken in order and placed in trays 3 through 10 to 2, etc. The rifles shall be reassembled using only those parts which are in the same tray.

Groups of nonmating parts

Group I

Takedown Pin Detent (61698)
Receiver - Upper (62306 for M16 or 62278 for XM16E1)
Ejection Port Cover Assembly (62112)
*Rear Sight Windage Drum Pin (95101)
Magazine Catch Spring (61759)
Trigger (61955)
*Socket Head Cap Screw (Key) (92201)

Group II

Lower Receiver, Receiver Extension & remaining parts
Rear Sight Detent Spring (61754)
Barrel & Sight Assembly (62206) & remaining parts
Front Sight Post (61706)
Extractor Pin (61563)
Butt Cap Screw (92601)
Lockwasher (90001)

Group III

Bolt (61538) and remaining parts
Ejection Port Cover Pin (61658) and Snap Ring (90402)
Front Sight Detent (61705)
*Trigger Guard Pivot Pin (95106)
Trigger Spring (61657)
Takedown Pin (61655)
Magazine Catch Button (62032)
Barrel Nut (61902)

Group IV

Takedown Pin Detent Spring (61692)
Bolt Carrier (61544 for M16 or 62274 for XM16E1)
Hand Guard Slip Ring (61901)
Ejector & Safety Detent Spring (61569)
Trigger and Hammer Pin (61654) (2)
Front Sight Detent Spring (61709)

Group V

Butt Stock Assembly Complete (62302)
Ejection Port Cover Spring (61518)
Hand Guard Slip Ring Spring Ass'y. (61962)
Front Swivel (62280)
*Ejector Pin (95102)
Magazine Catch (61604)
Disconnect (61918)
Plunger Assembly (62266 for XM16E1 only)

Group VI

Action Spring Guide Assy (62119)
Rear Sight (61700)
Hand Guard Snap Ring (90403)
Spring, Disconnect (61925)
*Front Swivel Pin (95103)
Bolt, Cam Pin (61704)
Bolt, Catch (62301)
Pistol Grip (62194)

Group VII

Ejector (61564)
Rear Sight Spring (61708)
Pistol Grip Screw (92701)
Gas Tube Assembly (61645)
Hammer Detail Assembly (62317)
Flash Suppressor (62182)
Firing Pin Retaining Pin (61561)
Bolt Catch Plunger (62178)
Pawl (62269 for XM16E1 only)

Group VIII

Receiver Pivot Pin (62221)
Firing Pin (62294)
Rear Sight Windage Screw (61702)
*Gas Tube Pin (95108)
Hand Guard Assembly, L.H. (62196)
Flash Suppressor, Lock Washer (62126)
Bolt Catch Spring (62177)
Automatic Sear Pin (61615)
Pawl Detent (62270 for XM16E1 only)

Group IX

Rear Sight Windage Drum (61703)
Charging Handle Assembly (62290)
*Bolt, Catch Pin (95105)
Hammer, Spring (61697)
Safety (61959)
Bolt Spring (50381)
Key (61547)

Group X

Extractor (61562) W/Spring (61568)
Rear Sight Detent (61755)
Hand Guard Assembly, R.H. (62198)
Trigger Guard Assembly (61970)
Automatic Sear Assembly (61622)
Action Spring (61581)
Safety, Detent (61785)
Plunger Spring (62271 for XM16E1 only)

*These parts damaged during disassembly shall be replaced without penalty to the interchangeability test.

8.3.2 Concurrent repair parts. A sample of five parts selected by the Government representative from each month's production of each concurrent repair part shall be tested for interchangeability requirement by disassembling rifles, previously tested as specified in 8.2, as necessary and then reassembling them using the concurrent repair parts. No hand refinement of parts will be allowed, and the rifles shall operate and function properly when subjected to the function firing test specified in 10.2. The cyclic rate of fire shall be within the limits specified in 10.2.1. This test may be performed independently of the rifle interchangeability test and at more or less frequent intervals using accepted rifles taken from current production and which have been tested for cyclic rate of fire during the functioning test. 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. Tests of reconditioned lots shall be made using a sample size of ten.

8.3.3 Interchangeability control test. Five rifles of each type from the initial production lot shall be held in reserve and tested by the Government representative for interchangeability of parts with five rifles

from each month's production. The rifles shall be interchanged in a manner identical to the detailed plan specified in 8.3.1. The rifles shall be tested for and shall comply with the requirements for headspace, firing pin indent, and trigger pull before and after interchange of parts. In addition the rifles shall be tested by the contractor for functioning and targeting and accuracy after interchange of parts. The original parts shall be reassembled to their respective rifles at completion of the test. The contractor will be informed of any failure of the rifles to meet the requirements and shall take corrective action as necessary.

9. High-pressure resistance.

9.1 Requirement. Each barrel subassembly and bolt shall be capable of withstanding the high-pressure resistance test specified herein. Parts shall be free of cracks, seams, and other injurious defects after proof firing as evidenced by magnetic particle inspection.

9.2 Test method.

9.2.1 Barrel subassemblies and bolts. Each barrel subassembly and bolt shall be tested by the contractor for high-pressure resistance requirement by firing one high-pressure test cartridge in each barrel-bolt combination prior to assembly in the rifle. Proof firing shall be accomplished with the bolt and barrel subassembly held in an approved fixture. After proof firing, cartridge cases shall be examined for bulges, splits, rings, and other defects caused by defective barrels. The bolt and barrel subassembly shall be magnetic particle inspected as specified in 9.2.3 and 9.2.4 for evidence of cracks, seams, and other injurious defects. Proof marks and magnetic particle inspection marks shall be applied on barrels and bolts that have passed this test. Barrels and bolts failing to meet the requirement shall be rejected.

9.2.2 Repair parts. Each barrel and bolt to be used as repair parts shall be proof fired and magnetic particle inspected as specified in 9.2.3 and 9.2.4, and marked. Parts failing to meet the requirements shall be rejected. Proof cases shall be examined as specified in 9.2.1.

9.2.3 Barrel subassembly. Each barrel shall be magnetic particle inspected in accordance with Specification MIL-I-6868 using a current of 400 to 500 amperes for circular continuous magnetization.

9.2.4 Bolt. Each bolt shall be magnetic particle inspected in accordance with Specification MIL-I-6868 using a standard 5 turn magnetizing coil with a current of 200 to 300 amperes. Circular and longitudinal continuous magnetization and a wet fluorescent solution shall be used.

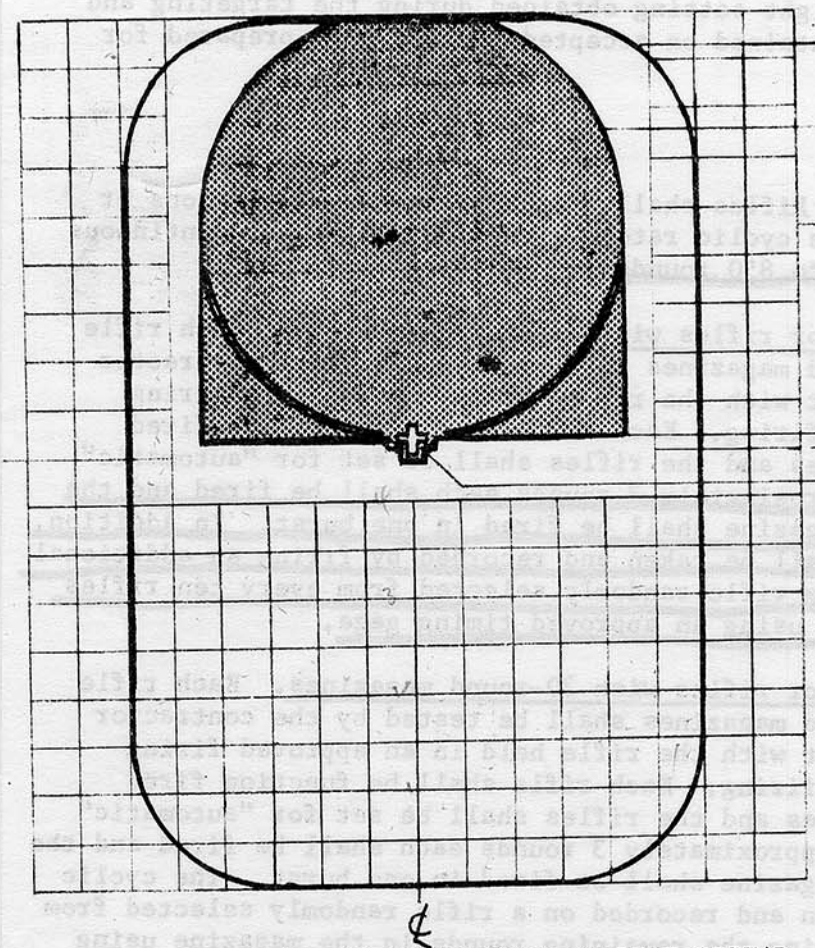
10. Targeting and accuracy, functioning, and reliability firing tests. The targeting and accuracy, functioning, and reliability firing tests shall be performed using the type of magazine (20-round or 30-round magazine) to be shipped with the rifle. (See 10.1, 10.2, and 10.3.)

10.1 Targeting and accuracy. Firing of rifles for targeting and accuracy may be conducted at a range of 50 yards or 100 yards. Maximum utilization shall be made of the 100 yard range. Cartridges for targeting and accuracy testing shall be in accordance with MIL-C-9963 and shall be certified by the Government to be of a quality within a mean radius of 1.2 to 1.4 inches at 200 yards as measured in accordance with the applicable specification.

10.1.1 Requirement. A series of 10 rounds fired from the rifle at a range of either 100 yards or 50 yards shall be within the extreme spread and targeting area (heavy outline) specified on figure 1, and rifles shall not be capable of firing double shots when set for semiautomatic firing.

10.1.2 Test method. Each rifle shall be tested by the contractor for targeting and accuracy requirement with the rifle held in an approved firing stand simulating shoulder firing. Firing of not more than three warmup shots off the target shall be allowed before the rifles are fired for targeting and accuracy. The normal rear peep sight shall be used and shall be set central in the slot for windage within plus or minus 2 clicks, the front sight shall be set with the top of the front sight flange flush with or not more than 0.030 inch below the front sight slot, and the rifle sights aligned on the point of aim specified on figure 1. A series of 10 shots shall be fired with the rifle set for semiautomatic. During firing, each rifle shall be checked to assure that no doubling occurs (i.e., two shots fired with a single trigger pull). The target shall then be checked to determine whether the targeting and accuracy requirements have been met. Rifles firing double shots or evidence of a flyer or keyhole shall be cause for the contractor to repeat the test by firing a 10-round complement. Rifles firing double shots or evidence of a flyer or keyhole in the second test shall be cause for rejection of the rifle. A "flyer" is defined as a shot hole which is a greater distance from the nearest shot hole than the extreme spread of the other nine shot holes (including the shot hole nearest the flyer). Failure of the second test shall be cause for rejection of the rifle. The contractor shall measure and record the extreme spread of each rifle meeting the targeting and accuracy requirements. Copies of records shall be kept complete and made available to the Government upon request.

10.1.3 Rifles failing to meet the requirements specified in 10.1.1 shall be rejected. Rejected rifles may be subjected to retest with or without reconditioning the rifles. Additional testing required after the first retest shall be performed at the contractor's expense.



A - 10 SHOT GROUP EXTREME SPREAD
B - SIGHTING IMAGE DIAMETER
C - DISTANCE POINT OF AIM ABOVE HORIZONTAL ℄ OF HEAVY OUTLINE
D - HEIGHT OF HEAVY OUTLINE
E - WIDTH OF HEAVY OUTLINE
F - RADIUS OF CORNERS OF HEAVY OUTLINE
G - GRID DIMENSIONS

TARGET DIAGRAM FOR		DIMENSIONS IN INCHES						
		GROUP	IMAGE		HEAVY OUTLINE			GRID
METERS	YARDS	A	B	C	D	E	F	G
91.4	100	4.8	8.0	0.5	17.6	11.6	2.8	1.00
45.7	50	2.4	4.4	0.14	8.95	5.95	1.5	.50

Figure 1. Targeting and accuracy diagram.

10.1.4 The optimum sight setting obtained during the targeting and accuracy test shall be maintained on accepted rifles being prepared for shipment.

10.2 Functioning.

10.2.1 Requirement. Rifles shall operate without malfunctions or unserviceable parts and the cyclic rate of fire for a 20-round continuous burst shall be within 650 to 850 rounds per minute.

10.2.2 Test method for rifles with 20-round magazines. Each rifle to be shipped with 20-round magazines shall be tested by the contractor for functioning requirement with the rifle held in an approved firing stand simulating shoulder firing. Each rifle shall be function fired using fully loaded magazines and the rifles shall be set for "automatic" firing. Two bursts of approximately 3 rounds each shall be fired and the remaining rounds in the magazine shall be fired in one burst. In addition, the cyclic rate of fire shall be taken and recorded by firing an additional 20 rounds in one burst on a rifle randomly selected from every ten rifles tested as specified herein using an approved timing gage.

10.2.3 Test method for rifles with 30-round magazines. Each rifle to be shipped with 30-round magazines shall be tested by the contractor for functioning requirement with the rifle held in an approved firing stand simulating shoulder firing. Each rifle shall be function fired using fully loaded magazines and the rifles shall be set for "automatic" firing. Three bursts of approximately 3 rounds each shall be fired and the remaining rounds in the magazine shall be fired in one burst. The cyclic rate of fire shall be taken and recorded on a rifle randomly selected from every ten rifles while firing the remaining rounds in the magazine using an approved timing gage.

10.2.4 Each rifle shall be manually examined for positive retention of the magazine by the magazine catch in the lower receiver.

10.2.5 Each rifle shall be examined to assure capability to disassemble magazine assembly from lower receiver. Manually examine function of magazine catch and visually examine function of bolt catch in assisting magazine ejection. Depressing of magazine catch button shall cause magazine assembly to be ejected, with spring assist from bolt catch, without binding.

10.2.6 Rifles shall be checked to assure that rifles cannot be fired when set in the "safe" position. During the interrupted burst firing, rifles shall be checked to assure that firing stops immediately when the trigger is released. Failure of any sample rifle to meet the cyclic rate of fire requirement shall be cause for measurement of the cyclic rate of fire on the other nine rifles represented.

10.2.7 Rifles failing to meet the requirements specified in 10.2.1 shall be rejected. Rejected rifles may be subjected to retest with or without reconditioning the rifles. Additional testing required after the first retest shall be performed at the contractor's expense.

10.3 Reliability.

10.3.1 Requirement. Rifles shall be capable of passing a 6,000-round reliability test as specified below with not more than the number of malfunctions and unserviceable parts allowed in table I. In addition, the average cyclic rate of fire for the entire test shall be within the limits specified in 10.2.1. 650 to 850 RPM

10.3.2 Test procedure for rifles with 20-round magazines. One rifle and twelve 20-round magazines selected by the Government representative from each lot shall be tested by the contractor for reliability.

10.3.3 Test procedure for rifles with 30-round magazines. One rifle and ten 30-round magazines selected by the Government representative from each lot shall be tested by the contractor for reliability.

10.3.4 The contractor shall provide replacement parts as required to complete the tests, and retests if required, at no additional cost to the Government. If the reliability requirements are not met the represented lot shall be rejected. The results of the reliability test shall be evaluated by the Government representative to determine if the cause of failure indicates serious defects in the item. A serious defect is defined as a defect that affects safety. If the cause for failure is not attributed to a serious defect, a reliability retest of two rifles from the same lot shall be made with or without reconditioning the lot. If the cause for failure is attributed to a serious defect, contractor correction shall be effected on all rifles in the lot and the lot of rifles shall be resubmitted as a reconditioned lot. A reliability retest of two other rifles from the reconditioned lot shall be made. Failure of either rifle in the retest of the same or reconditioned lot to meet the requirements shall be cause for rejection of the represented lot.

10.3.5 Test method.

10.3.5.1 Testing of rifles by the contractor for reliability requirement shall be accomplished with the rifles held in an approved firing stand simulating shoulder firing.

10.3.5.2 In the event the number of malfunctions or unserviceable parts listed in table I are exceeded during the initial reliability test or during the retest, the contracting officer shall have the option to suspend the test. Any unauthorized testing after suspension or additional tests other than specified in 10.3.4 shall be at the contractor's expense.

Table I. Malfunctions and unserviceable parts

Malfunctions[1]	Number permitted in the 6,000-round reliability test
Failure of forward assist assembly to assist bolt closure (XM16E1 only)	0 (See note 2)
Failure of bolt to lock	3
Failure of bolt stop to hold bolt open (last round of each magazine)	3
Failure to eject cartridge case	4
Failure to feed (cartridge visible)	4
Failure to feed (cartridge not visible)	3
Failure to fire semiautomatic (single rounds)	3
Light blow	3
Other malfunctions	1
Total malfunctions - above malfunctions combined	11

Unserviceable parts[1]	Number permitted in the 6,000-round reliability test	
	First 3,000 rounds	Second 3,000 rounds
Magazine assembly	0	1
Ejector spring	0	1
Extractor	0	1
Extractor spring	0	2
Other parts[3]	0	1
Total unserviceable parts - above unserviceable parts combined	0	3

[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 by the Government representative that previously recorded malfunctions are attributable to an unserviceable part, such malfunctions shall not be counted against the rifle 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. Malfunctions attributable to ammunition shall not be counted against the rifle however, such malfunctions shall be recorded.

[2]In the event of any failure of bolt to lock, the forward assist assembly shall be operated. Failure of the forward assist assembly to remain engaged with the bolt carrier assembly during manual attempt to lock the bolt shall be counted as a failure of forward assist assembly to assist bolt closure malfunction. All failures of bolt to lock shall be counted as malfunctions.

[3]One unserviceable part other than those specified shall be allowed if in the judgment of the Government representative the failure does not represent an unsafe or defective condition which is prevalent throughout the lot of items involved.

10.3.5.3 Testing of rifles with 20-round magazines. Sequence of testing shall be as follows:

a. Check headspace.

b. Fire rounds 1 through 2,000 in sequence of 60 rounds semiautomatic (at a rate of 20 to 30 rounds per minute), 20 rounds automatic (in bursts of approximately 5 rounds each), and 20 rounds automatic (in one burst). The instrumental velocity, at 20 feet, shall be taken and recorded for the first 10 rounds fired semiautomatic. The cyclic rate of fire shall be taken and recorded for the first and every tenth 20-round burst thereafter. The barrel may be cooled after each 100 rounds. Cleaning of the rifle, if necessary, shall be accomplished after each 1,000 rounds.

c. Check headspace.

d. Fire rounds 2,001 through 4,000 in sequence specified in step "b," except that the adverse handling test shall be conducted for rounds 2,001 through 2,040 outside of the approved firing stand by firing semiautomatic with weapon held loosely in hands, not touching shoulder and the instrumental velocity shall not be taken.

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e. Check headspace.

f. Fire rounds 4,001 through 6,000 in sequence specified in step "b" except that instrumental velocity shall be taken and recorded as specified in step "g."

g. Record instrumental velocity for rounds 6,001 through 6,010 at 20 feet.

h. Fire for targeting and accuracy for rounds 6,011 through 6,020.

i. Check headspace. (Headspace shall not exceed 0.005 inch over maximum.)

10.3.5.4 Testing of rifles with 30-round magazines. Sequence of testing shall be as follows:

a. Check headspace.

b. Fire rounds 1 through 1,920 in sequence of 60 rounds semiautomatic (at a rate of 20 to 30 rounds per minute), 30 rounds automatic (in bursts of approximately 5 rounds each), and 30 rounds automatic (in one burst). The instrumental velocity, at 20 feet, shall be taken and

recorded for the first 10 rounds fired semiautomatic. The cyclic rate of fire for a 20-round burst shall be taken and recorded for the first and every eighth 30-round burst thereafter. The barrel may be cooled after each 120 rounds. Cleaning of the rifle, if necessary, shall be accomplished after each 960 rounds.

c. Check headspace.

d. Fire rounds 1,921 through 3,840 in sequence specified in step "b," except that the adverse handling test shall be conducted for rounds 1,921 through 1,950 outside of the approved firing stand by firing semiautomatic with weapon held loosely in hands, not touching shoulder and the instrumental velocity shall not be taken.

e. Check headspace.

f. Fire rounds 3,841 through 6,000 in sequence specified in step "b" except that instrumental velocity shall be taken and recorded as specified in step "g."

g. Record instrumental velocity for rounds 6,001 through 6,010 at 20 feet.

h. Fire for targeting and accuracy for rounds 6,011 through 6,020.

i. Check headspace. (Headspace shall not exceed 0.005 inch over maximum.)

10.3.5.5 Fully loaded magazines shall be used and they shall be used in rotation so that approximately the same number of rounds will be fired from each. Should a given magazine be cause for more than one malfunction, it shall be removed, tagged and subsequently examined for defects. During semiautomatic firing, rifles shall be checked to assure that no doubling occurs (i.e., two shots fired with a single trigger pull; and during the interrupted burst firing, rifles shall be checked to assure that firing stops immediately when the trigger is released (uncontrolled fire shall be recorded as a malfunction).

10.3.5.6 At the close of each day's firing the rifles shall be protected against corrosion.

10.3.5.7 No parts shall be altered and only parts broken or worn to the extent that they are unserviceable shall be replaced.

10.3.5.8 Complete accurate records shall be kept for each reliability test, showing each malfunction and part replacement including the number of the round at which each occurred, and all measurements taken during the test shall be recorded.

11. Examination. The contractor shall be required to satisfy the Government representative that personnel assigned to final inspection have been adequately trained. Only personnel approved by the Government representative shall be used for final inspection.

11.1 Rifles.

11.1.1 Final examination of rifles shall be performed after completion of all testing and just prior to preservation and packaging. Unless otherwise specified herein, each rifle shall be examined as specified below. Each step in the examination shall include a visual examination for proper cleaning and presence of the specified protective coating and to determine the general quality, completeness of manufacture, assembly, clarity and legibility of markings, and workmanship. Rifles failing to meet the requirements shall be rejected.

11.1.2 Lower Receiver Pistol Grip and Stock Assembly Group

(a) Manually examine free pivoting of upper receiver group on pivot pin, when takedown pin is withdrawn to stop position.

(b) Disassemble lower receiver assembly group from upper receiver assembly group, manually examine its ready disassembly when takedown pins are withdrawn.

11.1.2.1 Automatic Sear Group

(a) Visually examine hammer catch surface and bolt contact of sear for burs, cracks, or mutilations.

(b) Visually examine sear spring for mutilations or distortion.

11.1.2.2 Hammer Group

(a) Visually examine trigger, disconnect and automatic sear catch surfaces for burs, cracks, or mutilations.

(b) Visually examine firing pin striking surface for burs, cracks, or mutilations.

(c) Visually examine hammer spring for mutilations or distortions and for proper seating on the trigger pin.

(d) Visually examine to assure that the hammer pin retaining spring is assembled.

11.1.2.3 Trigger group

(a) Visually examine hammer catch surface and safety contact surfaces for burs, cracks, or mutilations.

(b) Visually examine trigger spring for mutilations or distortion.

(c) Visually examine the hammer catch surface and safety contact surface of the disconnect for burs, cracks, or mutilations.

(d) Manually examine spring action of disconnect.

11.1.2.4 Safety Group

(a) Manually examine safety action for positive engagement of spring loaded plunger when safety is in safe, semi, and auto positions.

(b) Rotate safety and visually examine stop surfaces for burs, cracks, or mutilations.

11.1.2.5 Bolt Catch Group

(a) Visually and manually examine function of bolt catch. Pressing of lower button of catch shall pivot catch upward, and releasing of button shall allow catch to return under spring load.

(b) Visually examine bolt catch surface for burs, cracks, or mutilations.

11.1.2.6 Trigger Guard Assembly

(a) Visually and manually examine trigger guard release, pivot and retention actions. Trigger guard shall be capable of being released by depressing spring loaded plunger at front end. It shall be pivoted to stop position against pistol grip and retained in this position without manual assistance. The trigger guard shall be returned to its locked position and shall be locked by spring loaded plunger.

11.1.2.7 Takedown Pin

(a) Visually and manually examine takedown pin for secure assembly to lower receiver by engagement of spring loaded pin in groove.

11.1.2.8 Buffer Retainer Group

(a) Remove buffer group, manually examining spring loaded action of buffer retainer.

(b) Visually examine top of buffer retainer for burs, cracks, or mutilations.

11.1.2.9 Buffer Group

(a) Visually examine action spring for mutilations or distortion.

(b) Visually examine action spring guide assembly for burs, cracks, or mutilations.

11.1.2.10 Pistol Grip

(a) Visually and manually examine for secure retention to lower receiver and for presence of lockwasher.

(b) Visually examine pistol grip for cracks or mutilations.

11.1.2.11 Stock Assembly

(a) Visually and manually examine for secure retention to lower receiver.

(b) Visually examine for cracks or mutilations.

(c) Manually examine secure retention of swivel assembly to stock and pivot action of swivel.

11.1.2.12 Lower Receiver

(a) Visually examine magazine well and trigger mechanism housing for burs, cracks, and mutilations.

(b) Reassemble buffer assembly to this group.

11.1.3 Receiver Pivot Pin Assembly

(a) Visually and manually examine receiver pivot pin assembly for secure assembly to lower receiver by engagement of spring loaded pinion groove.

11.1.4 Charging Handle Assembly

(a) Manually examine spring loaded latching action of handle assembly to upper receiver. Handle assembly shall have positive latching action in forward travel without manual assist to latch, and unlatching for rearward travel shall require manual action on the spring loaded latch.

(b) Disassemble charging handle assembly and bolt from upper receiver, manually examining their free disassembly without binding.

(c) Visually examine latch, carrier key engagement, and guides for burs, cracks, or mutilations.

11.1.5 Bolt and Bolt Carrier Group

(a) Disassemble firing pin and visually examine firing pin retaining pin for burs, cracks, or mutilations.

11.1.5.1 Firing Pin

(a) Visually examine firing pin for cracks, burs, or mutilations.

(b) In addition, visually examine striker point for pits and erosion.

11.1.5.2 Bolt Cam Pin

(a) Rotate bolt cam pin, disassemble cam pin and bolt assembly from carrier, and visually examine cam pin for burs, cracks, or mutilations. (Cam pin shall be capable of being disassembled without removal of carrier key.)

11.1.5.3 Bolt Assembly

(a) Visually examine for secureness of all parts.

11.1.5.3.1 Extractor

(a) Manually examine spring load action of extractor.

(b) Visually examine extractor catch lip for burs, cracks, or mutilations.

11.1.5.3.2 Ejector

(a) Manually examine spring load action of ejector.

(b) Visually examine ejector tip for burs, cracks, or mutilations.

11.1.5.3.3 Bolt Rings

(a) Visually examine bolt rings for mutilation or distortion and proper position. (Rings shall not be positioned with slots in line.)

11.1.5.3.4 Bolt

(a) Visually examine bolt for burs, cracks, or mutilations. Particular attention shall be given locking lugs area.

(b) Visually examine bolt face for pits and erosion.

(c) Manually examine cam pin hole in bolt to assure against radially reversing bolt assembly. With the ejector side of bolt assembly facing inspector, the bolt cam pin shall not be capable of entering cam pin hole in bolt.

(d) Visually examine bolt for proof mark and magnetic particle inspection mark.

(e) Visually and manually examine free movement of firing pin in bolt. Firing pin shall drop in bolt hole and striker point shall protrude at bolt face.

11.1.5.4 Bolt Carrier and Key Assembly

(a) Visually and manually examine for secure retention and proper seating of key to body and for proper staking of socket head screws.

11.1.5.4.1 Bolt Carrier Key

(a) Visually examine key for burs, cracks, or mutilations.

11.1.5.4.2 Bolt Carrier

(a) Visually examine bolt carrier for burs, cracks, or mutilations. Particular attention shall be given the bolt cam area.

(b) Reassemble the bolt and carrier group and examine firing pin protrusion using Colt's gage No. T34537.

11.1.5.5 Upper Receiver and Barrel Assembly Group

(a) Manually examine spring action of hand guard slip ring.

11.1.5.5.1 Hand Guards, LH and RH

(a) Visually examine hand guards for cracks and mutilations.

(b) Visually examine for secure assembly of shields to guards.

11.1.5.5.2 Flash Suppressor

(a) Visually and manually examine flash suppressor for cracks, burs, or mutilations and for its secure assembly to barrel with lockwasher in place.

11.1.5.6 Front Sight Group

(a) Visually and manually examine front sight group for its secure assembly to barrel.

11.1.5.6.1 Front Swivel

(a) Visually and manually examine for retention of swivel to sight, and ability of swivel to be pivoted.

11.1.5.6.2 Front Sight Post Group

(a) Visually examine front sight post for burs or mutilations.

(b) Manually examine to assure sight adjustment can be made by depressing spring loaded detent and rotating sight post. Detent shall return to locked position in groove of post. The top of the front sight flange shall be flush with or not more than 0.030 inch below the front sight slot after the rifle is zeroed. Twenty clicks of downward travel shall remain after zeroing. Rotate sight downward and return to approximate original setting. This examination may be accomplished during the pre-functional check in order not to disrupt the optimum sight setting obtained during the targeting and accuracy firing test (see 10.1.4).

11.1.5.6.3 Front Sight

(a) Visually examine front sight for burs or deformations.

(b) Visually examine for proper marking of front sight.

(c) Manually examine assembleability of bayonet to bayonet lug by using a suitable gage.

11.1.5.7 Gas Tube

(a) Visually and manually examine for secure assembly of gas tube, it shall be securely assembled to front sight with no relative movement between tube and receiver, and tube and sight.

(b) Visually examine gas tube for mutilations.

11.1.5.8 Barrel Assembly

(a) Visually examine barrel bore for pockets, rings, bulges, or other deformations. Particular attention shall be given flash suppressor shoulder area of bore for rings or bulges.

(b) Visually examine bolt locking lugs for burs, cracks, or mutilations.

(c) Visually examine for proof mark and magnetic particle inspection mark.

(d) Examine grenade launching diameter of suppressor using Government approved gage.

(e) Check barrel bore with "GO" bore plug T35730.

11.1.5.9 Ejection Port Cover Assembly Group

(a) Visually examine for burs or deformations.

(b) Visually and manually examine spring action of latching plunger and spring action of opening spring.

(c) Visually examine for presence of retaining ring on port cover pin.

11.1.5.10 Rear Sight Group

(a) Visually and manually examine ability of rear sight drum to be rotated when spring loaded detent is depressed. Drum shall be capable of rotating six (6) complete revolutions, moving rear sight from extreme left to right. While in extreme left and right position, rear sight shall be capable of pivoting to vertical position for normal and long peeps. Return sight to original setting. This examination may be accomplished during the pre-function check in order not to disrupt the optimum sight setting obtained during the targeting and accuracy firing test (see 10.1.4).

(b) Visually examine drum for proper markings.

(c) Visually examine rear sight for proper markings.

11.1.5.11 Upper Receiver

(a) Visually examine upper receiver for burs, cracks, or deformations.

*(b) Manually examine function of forward assist assembly for ability to be depressed and returned to extended position under spring action without binding.

*(c) Manually examine pawl (62269) for ability to be depressed and returned under spring action without binding.

*(d) Visually examine catch surface of pawl (62269) for burs or deformations.

*Above examination applicable to XM16E1 rifle only.

11.1.6 Rifle Assembly

(a) Reassemble upper receiver assembly and bolt assembly groups and examine headspace using Government approved gages. The bolt shall fully lock on minimum plug and shall not lock on maximum plug. Sighting for headspace requirement shall be through magazine opening of upper receiver.

(b) Reassemble major groups into complete rifle assembly assuring that all parts are secure and assembled properly. Particular attention shall be given the hammer, trigger, and sear pins for secure assembly.

(c) Visually and manually examine cyclic hand functioning using one dummy round in magazine assembly. Insert magazine, assuring its retention, charge bolt, charging shall cause ejection port cover to open. Allow bolt to return to battery, bolt shall strip cartridge from magazine and feed it into chamber. Charge bolt, charging shall cause extraction and ejection of the dummy cartridge and cause follower of magazine to activate bolt catch to retain bolt in rear. Depressing of magazine catch button shall cause the magazine assembly to be ejected, with spring assist from the bolt catch, without binding. Pressing of bolt catch button shall allow release of bolt.

(d) Visually examine receiver markings. (Serial number, manufacturer's identification, etc.)

(e) Manually examine trigger pull as specified in paragraph 7.

(f) Visually and manually examine safety actions.

(f.1) With the hammer cocked and the safety set on "safe", the trigger shall not release the hammer when trigger is pulled.

(f.2) With the safety on "semi", charge the bolt with charging handle maintaining pressure on trigger, when bolt enters battery position, the hammer shall not have fallen, but shall be retained in cocked position by the disconnect. Releasing finger pressure on trigger shall allow hammer to disengage from disconnect but not from trigger. Pulling of trigger shall then cause hammer to fall.

(f.3) With the safety set on "auto" charge the bolt with charging handle maintaining pressure on trigger, hammer shall fall when bolt is permitted to return to battery position. This is evidenced by failure of trigger to be pulled. Charge bolt with charging handle with trigger released, release bolt, pulling of trigger shall cause hammer to fall.

*(g) Manually examine forward assist assembly for ability to engage bolt carrier. Manual engagement of the forward assist assembly with the bolt carrier notches at any point shall prevent retraction of the bolt carrier assembly. With the bolt carrier assembly retracted approximately one-fourth inch (as determined from the front of bolt carrier to the front of the receiver ejection port) and manually retained by the charging handle assembly, depressing and releasing of the forward assist assembly shall cause progressive movement of the bolt carrier to battery position.

*Above examination applicable to XM16E1 rifle only.

11.1.7 Rifles which have passed all examinations after successful completion of testing shall be rubber stamped by the contractor with the Department of Defense complete inspection approval stamp. The Government

representative will observe the stamping operation and control the stamps used for such stamping on the lower right hand side of the Lower Receiver.

11.2 Packaging. Examination to determine compliance with cleaning, preservation, packaging, packing, and marking requirements shall be in accordance with MIL-P-14232, and the level prescribed in the contract.

11.2.1 Examination to determine that all metallic (ferrous) surfaces of the rifle are coated with preservatives shall be in accordance with MIL-P-14232.

12. Rejections. Rifles, parts, and packages rejected individually or by lots because of inspection shall be returned to the contractor for reconditioning. Following corrective action by the contractor and Government verification, the rejected items shall be resubmitted for the inspection in which failure occurred and such other inspection deemed necessary by the Government representative.

13. The requirements of MIL-W-13855B, Section 3, shall apply.

14. Ordering data. Procurement documents should specify the following:

(a) Title, number, and date of this specification.
(b) Lists of drawings and specifications pertinent to the rifle, showing applicable revision dates.
(c) Quality control system.
(d) Index to lists of acceptance inspection equipment and parts gaged pertinent to the rifle, showing applicable revision dates.
(e) Number of initial production samples required.
(f) That packages opened for examination shall be repackaged by the contractor at the contractor's expense.
(g) Disposition of reliability tested rifles.
(h) Shipping instructions for production samples and pilot pack.
(i) Selection of applicable levels of preservation, packaging, and packing.
(j) Packaging instructions for repair parts.
(k) Place of final inspection and acceptance (see "Notes" in MIL-W-13855).
(l) List of acceptance inspection equipment to be furnished the contractor and responsibilities for other Government property to be furnished the contractor.
(m) Responsibilities for furnishing ammunition (high-pressure, standard, and dummy).
(n) Responsibility for test firing facilities and operating procedures (see 14.1).
(o) Disposition of Government furnished property.

14.1 Test firing facilities and operating procedures should be designed by the contractor in conformance with local, state, and federal regulations. They should be suitable for carrying out prescribed firing tests and insure the safety of operating and visiting personnel. Copies of these contractor designs should be forwarded to the contracting officer. Government facilities may be viewed upon application to the contracting officer.

14.2 When action by a testing agency is required, work programing will be effected with the testing agency at the earliest practicable date.

14.3 To avoid delay in test firing, the Government representative should maintain a minimum of 2 months' supply of high-pressure and standard ammunition as determined by anticipated firing requirements.

14.4 Monthly reports of the results of final examination and functioning firing, targeting and accuracy, reliability, and interchangeability tests should be made to Commanding Officer, Springfield Armory, ATTN: SWESP-RES, Springfield, Massachusetts 01101, and to Commanding General, U. S. Army Weapons Command, ATTN: AMSWE-QA, Rock Island, Illinois 61201.

This Acceptance Testing Specification (SAPD-253) for M16 and XM16E1 rifles is concurred in by the following:

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