AMSWE-WE-P-702-103

QUALITY ASSURANCE PAMPHLET

FOR PROCUREMENT PROGRAMS

RIFLE, 5.56mm, M16/M16A1

(M16) FSN 1005-856-6885
(M16A1) FSN 1005-073-9421

U.S. ARMY WEAPONS COMMAND **SEPTEMBER 1970**

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U. S. ARMY WEAPONS COMMAND
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SEPTEMBER, 1970

1. AMSWE-WE-P-702-103, Quality Assurance Pamphlet for procurement of Rifle, 5.56MM, M16/M16A1 is published:

a. For use by U. S. Army Materiel Command and contractor personnel in accomplishing required on-site inspection and testing.

b. As a textbook for specialized programs of instruction relative to accomplishing final acceptance inspection and the utilization of final acceptance and test equipment during production of a major item.

c. As a preparedness measure for expanded use by Government and contractor quality assurance personnel during mobilization.

2. This Quality Assurance Pamphlet is an integral part of the procurement technical data package.

3. Basic information contained in applicable specifications and USAMC policy directives will govern in the event conflict with this pamphlet is encountered.

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TABLE OF CONTENTS

INDEX OF ILLUSTRATIONS

REFERENCE DATA

SPECIFICATIONS

Federal

MMM-A-132	Adhesive, Heat Resistant, Airframe Structural, Metal to Metal
P-D-680	Dry Cleaning Solvent
QQ-A-200/11	Aluminum Alloy Bar, Rod, Shapes, and Tube, Extruded, 7075
QQ-A-225/8	Aluminum Alloy Bar, Rod, Wire, and Special Shapes, Rolled, Drawn, or Cold Finished, 6061
QQ-A-225/9	Aluminum Alloy Bar, Rod, Wire, and Special Shapes, Rolled, Drawn, or Cold Finished, 7075
QQ-A-250/2	Aluminum Alloy 3003, Plate and Sheet
QQ-A-250/11	Aluminum Alloy 6061, Plate and Sheet
QQ-A-367	Aluminum Alloy Forgings, Heat Treated
QQ-W-470	Wire, Steel, Carbon, Spring, Music
QQ-A-591	Aluminum Alloy Die Castings
TT-C-490	Cleaning Methods and Pretreatment of Ferrous Surfaces
VV-K-220	Kerosene, Deodorized
VV-L-800	Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature)

Military

MIL-C-5541	Chemical Films and Chemical Film

	Materials for Aluminum and Aluminum Alloys
MIL-C-6021	Castings, Classification and Inspection of
MIL-S-6758	Steel, Chrome-Molybdenum (4130) Bars and Reforging Stock (Aircraft Quality)
MIL-I-6868	Inspection Process, Magnetic Particle
MIL-I-6870	Inspection Requirements, Nondestructive, for Aircraft Materials and Parts
MIL-S-7742	Screw Threads, Standard, Optimum Selected Series, General Specification for
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-Q-9858	Quality Program Requirements
MIL-S-11595	Steel, Bars and Blanks (under 2 Inches in Dia.) for Barrels of Small-Arms Weapons
MIL-A-12545	Aluminum Alloy Impact Extrusions
MIL-S-13165	Shot Peening of Ferrous Metal Parts
MIL-W-13855	Weapons, Small Arms, General Specification for
MIL-P-16232	Phosphate Coatings, Heavy, Manganese or Zinc Base (for Ferrous Metals)
MIL-I-45208	Inspection System Requirements
MIL-R-45587	Rifles, 5.56 MM, M16A1
MIL-I-45607	Inspection Equipment, Supply and Maintenance of
MIL-C-45662	Calibration System Requirements

MIL-G-46003	Grease, Rifle
MIL-W-46078	Wire, Steel, Spring, Corrosion Resistant (17-7PH) Solution Treated, Round, Cold Drawn
MIL-D-70327	Drawings, Engineering and Associated Lists

STANDARDS

Federal

FED-STD-151	Metals, Test Methods

Military

MIL-STD-9	Screw Thread Conventions and Methods of Specifying
MIL-STD-10	Surface Roughness, Waviness and Lay
MIL-STD-12	Abbreviations for Use on Drawings and in Technical-type Publications
MIL-STD-23	Nondestructive Testing Symbols
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-109	Inspection Terms and Definitions
MIL-STD-120	Gage Inspection
MIL-STD-130	Identification Marking of U. S. Military Property
MIL-STD-171	Finishing of Metal and Wood Surfaces
MIL-STD-410	Qualification of Inspection Personnel (Magnetic Particle and Penetrant)

Industry

USASI Y14.5-1966	Dimensioning and Tolerancing for

Engineering Drawings

USASI B18. 6. 3-1962	Slotted and Recessed Head Machine Screws and Machine Screw Nuts
ASTM E 192	Standard Reference Radiographs of Investment Steel Castings for Aerospace Application
ASTM D 1796-62	Method of Test for Water and Sediment in Fuel Oils by Centrifuge
AMS 2301	Aircraft Quality Steel Cleanliness, Magnetic Particle Inspection Procedure

ADDITIONAL REFERENCE DATA

SQAP-APPENDIX-RIA	General Supplementary Quality Assurance Provisions

CONVERSION LISTING

All part numbers referenced in the text of this pamphlet were assigned by Colt Industries; if desired, each of these numbers can be converted to its WECOM equivalent by use of the listing given below. It should be noted, however, that all gages in this text are referenced by WECOM designators.

Item	Colt Number	WECOM Number
Spring, Bolt	50381	8448542
Spring, Cover	61518	8448532
Bolt	61538	8448510
Ring, Bolt	61540	8448511
Key, Bolt Carrier	61547	8448506
Extractor	61562	8448512
Pin, Extractor	61563	8448513

Item	Colt Number	WECOM Number
Ejector	61564	8448515
Spring, Extractor	61568	8448514
Spring, Ejector and Safety Detent	61569	8448516
Extension, Receiver	61574	8448581
Spring, Action	61581	8448629
Retainer, Buffer	61582	8448582
Catch, Magazine	61604	8448638
Pin, Automatic Sear	61615	8448599
Automatic Sear Assembly	61622	8448595
Gas Tube Assembly	61645	8448567
Pin, Hammer and Trigger	61654	8448609
Pin, Takedown	61655	8448584
Spring, Trigger	61657	8448593
Pin, Cover Hinge	61658	8448533
Spring, Detent, Takedown Pin	61692	8448586
Spring, Buffer Retainer	61694	8448583
Spring, Hammer	61697	8448611
Detent, Takedown Pin	61698	8448585
Sight, Rear	61700	8448539
Screw, Rear Sight Windage	61702	8448534
Drum, Windage	61703	8448535

Item	Colt Number	WECOM Number
Pin, Cam	61704	8448502
Detent, Front Sight	61705	8448573
Post, Front Sight	61706	8448572
Spring, Rear Sight	61708	8448536
Spring, Front Sight Detent	61709	8448574
Spring, Rear Sight Detent	61754	8448538
Detent, Rear Sight	61755	8448537
Spring, Magazine Catch	61759	8448637
Detent, Fire Control Selector	61785	8448631
Spring, Charging Handle Latch	61875	8448520
Slip Ring, Hand Guard	61901	8448554
Nut, Barrel	61902	8448553
Spring, Disconnect	61925	8448594
Trigger	61955	8448592
Selector, Fire Control	61959	8448630
Spring Weld Assembly - Hand Guard Slip Ring	61962	8448555
Trigger Guard Assembly	61970	8448587
Button, Magazine Release	62032	8448636
Sight, Front	62068	8448566
Pin, Taper, Front Sight	62086	8448575

Item	Colt Number	WECOM Number
Cap, Handguard	62087	8448564
Ejection Port Cover Assembly	62112	8448525
Barrel Nut Assembly	62113	8448552
Bolt Assembly	62116	8448509
Hammer Assembly	62117	8448610
Washer, Lock	62126	8448577
Trigger Assembly	62157	8448591
Spring, Bolt Catch	62177	8448633
Plunger, Bolt Catch	62178	8448634
Barrel and Barrel Extension Assembly	62180	8448548
Buttstock and Buttstock Cap Assembly	62193	8448622
Grip, Pistol	62194	8448632
Handguard Assembly Left Hand	62196	8448557
Handguard Assembly Right Hand	62198	8448561
Pin, Receiver Pivot	62221	8448621
Receiver, Lower Model M16A1	62222	8448580
Forward Assist Assembly	62265	8448541
Plunger Assembly	62266	8448545
Pawl, Forward Assist	62269	8448543
Detent, Pawl	62270	8448544
Spring, Plunger	62271	8448540

Item	Colt Number	WECOM Number
Lower Receiver and Buttstock Assembly	62272	8448578
Lower Receiver and Receiver Extension Assembly	62273	8448579
Carrier, Bolt	62274	8448507
Upper Receiver and Barrel Assembly	62276	8448522
Upper Receiver Assembly	62277	8448523
Receiver, Upper	62278	8448524
Swivel, Sling	62280	8448571
Swivel and Swivel Base Assembly	62282	8448625
Key and Bolt Carrier Assembly	62286	8448505
Bolt Carrier Assembly	62287	8448501
Latch, Charging Handle	62289	8448519
Charging Handle Assembly	62290	8448517
Pin, Firing	62294	8448503
Catch, Bolt	62301	8448628
Buttstock and Swivel Assembly	62302	8448622
Sight and Gas Tube Assembly	62310	8448565
Hammer and Hammer Pin Retainer Assembly	62317	8448612
Disconnect	62334	8448635
Pin, Retaining, Firing Pin	62335	8448504

Item	Colt Number	WECOM Number
Buffer Assembly	62339	8448615
Suppressor, Flash	62348	8448576
Replacement Barrel and Front Sight Assembly	62516	8448648
Screw, Cap, Hex Socket Head	92201	8448508
Screw, Butt Cap	92601	8448627
Screw, Pistol Grip	92701	AN501D-416-18
Pin, Roll	95101	8448521

LIST OF SUPPLEMENTARY QUALITY ASSURANCE PROVISIONS (SQAP's)

The designation "M16" is used as a prefix for each SQAP number to provide compatibility with Government configuration control procedures.

Item	SQAP Number
Spring, Bolt	M1650381
Spring, Cover	M1661518
Bolt	M1661538
Ring, Bolt	M1661540
Key, Bolt Carrier	M1661547
Extractor	M1661562
Pin, Extractor	M1661563
Ejector	M1661564
Spring, Extractor	M1661568

Item	SQAP Number
Spring, Ejector and Safety Detent	M1661569
Extension, Receiver	M1661574
Spring, Action	M1661581
Retainer, Buffer	M1661582
Catch, Magazine	M1661604
Pin, Automatic Sear	M1661615
Automatic Sear Assembly	M1661622
Gas Tube Assembly	M1661645
Pin, Hammer and Trigger	M1661654
Pin, Takedown	M1661655
Spring, Trigger	M1661657
Pin, Cover Hinge	M1661658
Spring, Detent, Takedown Pin	M1661692
Spring, Buffer Retainer	M1661694
Spring, Hammer	M1661697
Detent, Takedown Pin	M1661698
Sight, Rear	M1661700
Screw, Rear Sight Windage	M1661702
Drum, Windage	M1661703
Pin, Cam	M1661704
Detent, Front Sight	M1661705

Item	SQAP Number
Post, Front Sight	M1661706
Spring, Rear Sight	M1661708
Spring, Front Sight Detent	M1661709
Spring, Rear Sight Detent	M1661754
Detent, Rear Sight	M1661755
Spring, Magazine Catch	M1661759
Detent, Fire Control Selector	M1661785
Spring, Charging Handle Latch	M1661875
Slip Ring, Hand Guard	M1661901
Nut, Barrel	M1661902
Spring, Disconnect	M1661925
Trigger	M1661955
Selector, Fire Control	M1661959
Spring Weld Assembly - Hand Guard Slip Ring	M1661962
Trigger Guard Assembly	M1661970
Button, Magazine Release	M1662032
Sight, Front	M1662068
Pin, Taper, Front Sight	M1662086
Cap, Handguard	M1662087
Ejection Port Cover Assembly	M1662112

Item	SQAP Number
Barrel Nut Assembly	M1662113
Bolt Assembly	M1662116
Hammer Assembly	M1662117
Washer, Lock	M1662126
Trigger Assembly	M1662157
Spring, Bolt Catch	M1662177
Plunger, Bolt Catch	M1662178
Barrel and Barrel Extension Assembly	M1662180
Buttstock and Buttstock Cap Assembly	M1662193
Grip, Pistol	M1662194
Handguard Assembly Left Hand	M1662196
Handguard Assembly Right Hand	M1662198
Pin, Receiver Pivot	M1662221
Receiver, Lower Model M16A1	M1662222
Forward Assist Assembly	M1662265
Plunger Assembly	M1662266
Pawl, Forward Assist	M1662269
Detent, Pawl	M1662270
Spring, Plunger	M1662271
Lower Receiver and Buttstock Assembly	M1662272

Item	SQAP Number
Lower Receiver and Receiver Extension Assembly	M1662273
Carrier, Bolt	M1662274
Upper Receiver and Barrel Assembly	M1662276
Upper Receiver Assembly	M1662277
Receiver, Upper	M1662278
Swivel, Sling	M1662280
Swivel and Swivel Base Assembly	M1662282
Key and Bolt Carrier Assembly	M1662286
Bolt Carrier Assembly	M1662287
Latch, Charging Handle	M1662289
Charging Handle Assembly	M1662290
Pin, Firing	M1662294
Catch, Bolt	M1662301
Buttstock and Swivel Assembly	M1662302
Sight and Gas Tube Assembly	M1662310
Hammer and Hammer Pin Retainer Assembly	M1662317
Disconnect	M1662334
Pin, Retaining, Firing Pin	M1662335
Buffer Assembly	M1662339
Suppressor, Flash	M1662348

Item	SQAP Number
Replacement Barrel and Front Sight Assembly	M1662516
Screw, Cap, Hex Socket Head	M1692201
Screw, Butt Cap	M1692601
Screw, Pistol Grip	M1692701
Pin, Roll	M1695101

GLOSSARY

Absorption	The function of the flash suppressor in minimizing flash at the muzzle when the weapon is fired.
Alignment	The proper positioning of components in line with each other.
Battery	Full forward position of the recoiling parts.
Blowback	Gas leakage from the cartridge case.
Bore	The internal cylindrical cavity in the barrel through which the bullet travels.
Broken	Pertaining to the opening of the weapon to permit cleaning, etc.
Cam	A surface which is shaped to impart a particular pattern or direction of motion to a mating part.
Chamber	The space provided in the rear of the barrel for housing the cartridge.
Choking	The restriction of gas flow which reduces operating pressure.

Clearance	A space provided between two or more parts.
Coining	A method of forming a metallic component by impact.
Component	An individual part of an assembly or of the weapon.
Compression Spring	A spring whose coils must be forced together in order to obtain work from the spring energy.
Concentricity	The having of a common center, one with another. The opposite of eccentricity.
Counter Recoil	The forward movement of the parts of the weapon subsequent to recoil.
Contour	The outline of a component. A profile.
Defect	Any deviation from drawing requirements.
Detent	A spring loaded pin which seats in a depression on a moveable part, thereby holding the part in position.
Diffusion	The controlled dispersion of muzzle flash by the flash suppressor when the weapon is fired.
Ejection	The expelling of a spent cartridge from the weapon.
Elevation	Vertical sight adjustment.
Extraction	The withdrawal of the spent cartridge from the chamber.
Firing	The act of discharging the weapon.
Flange	A rib or rim for guiding, or for attaching to another object.
Flash Suppressor	A device for reducing evidence of muzzle flash when the weapon is fired.

Flat	A flat bottomed notch in a cylindrical surface.
Flush Pin Gage	A gage on which the acceptability of component dimensions is determined by the position of a protruding pin in relation to two (2) step surfaces.
Flute	A channel or groove along a cylindrical part.
Fouling	The jamming of a cartridge in such a way that the bolt cannot be closed (even when the forward assist is used).
Gage	A device for determining whether or not one or more of the dimensions of a manufactured part are within specified limits.
Groove	A furrow or channel machined into the barrel of a weapon becoming part of the rifling.
Guide	A means of confining the motion of a part of a particular path or plane.
Hangfire	Delayed discharge of the cartridge.
Head	A flanged or upset configuration located at a component end.
Headspace	The longitudinal difference between the datum distance on the chamber and the datum distance on the cartridge.
Key	Any type of lug or tab which serves to prevent motion.
Land	1. A clearance (relief) surface between two (2) parts. 2. The areas between rifling grooves in the barrel.
Lateral	Pertaining to the side or to the short axis. Movement from side to side.
Left	Lateral direction in relation to the weapon as

	taken from the rear. Looking toward the muzzle with the weapon in its normal operating position.
Longitudinal	Pertaining to length. Extending along the long axis. The opposite of lateral.
Lug	A projecting ear.
Malfunction	Any deviation from the normal and proper performance of the weapon.
Mating	The fitting together of matching components.
Misfire	Failure of the cartridge primer to ignite after indentation.
Oversize	Greater than the allowable size.
Pawl	A piece which pivots or otherwise moves into position either to impart or prevent the motion of another piece.
Peening	The manual striking of a peening hammer on a metal surface to cause the surface to be changed, hardened, or reshaped.
Port	A hole through which gas passes to functionally operate the weapon.
Profile	See contour.
Proofmark	An acceptance symbol indicating that the weapon or its components have passed the high pressure cartridge test.
Ramp	A short slope or inclined plane serving as a way between different levels.
Recoil	The rearward movement of the weapon or its parts as a result of the force of discharge.
Rifling	The spiral grooves machined into a bore to

	impart rotation to the bullet in flight.
Right	See left.
Seize	Failure of the spent cartridge to move freely from the chamber.
Serration	A notch or tooth like shape on a surface.
Setting Check	A master part duplicating a component but with dimensional qualifications. Used as a standard for accurately setting up and/or adjusting tolerance limits or checking parts of a specific gage or piece of gaging equipment.
Spall	The flaking or chipping of a surface coating.
SQAP	Supplementary Quality Assurance Provisions. A SQAP is a contractual document which supplements item specifications to provide quality assurance for locally controlled requirements specified in an ordnance detail drawing.
Staking	A method of permanently attaching one component to another by deformation under impact.
Striker Point	The portion of the firing pin which strikes and indents the cartridge primer.
Surveillance	The observing of the performance of a test or operation.
Swaging	A method of permanently attaching one cylindrical component to another by simultaneous peening and rotation.
Targeting	The ability of a weapon to place a number of shots consistently within a given area with the center of impact correctly aligned with the sights.
Transverse	A direction perpendicular to the principal centerline of a component.

Undersize	Smaller than the allowable size.
Wave Washer	A formed spring washer used to provide an axial load.
Well	The rectangular cavity in the lower receiver which accommodates the magazine.
Windage	Horizontal sight adjustment.
Zero Setting	1. The rear sight setting at an elevation and windage which will place the center of a shot group within the specified target area when the weapon is fired on a windless day. 2. The adjusting of the dial on a dial indicator needle coinciding with a predetermined setting.
Note:	The terminology as defined in this Glossary is interpreted as used throughout this pamphlet.

SECTION I

INTRODUCTION

1. PURPOSE.

The purpose of this document is to provide U. S. Army Weapons Command Inspection Personnel with the operating characteristics and methods of inspecting and testing of the M16A1 Rifle and its components.

2. SCOPE AND APPLICATION.

The contents of this document are applicable to the basic M16A1 and its components only, and to no other configuration or weapons type.

3. FUNCTIONAL CHARACTERISTICS.

a. The M16A1 (Fig. 1) is a gas operated, air cooled, magazine fed, rotating bolt, shoulder or hip fired weapon which accomodates bayonet knife M7. Functioning consists of eight basic steps, more than one of which takes place at a time; these eight steps are firing, unlocking, extracting, ejecting, cocking, feeding, chambering, and locking. The weapon may function in either the semiautomatic or automatic mode.

b. Semiautomatic Fire.

(1) Firing. With a round in the chamber, the hammer cocked, and the selector turned to SEMI, the operator pulls the trigger. The trigger rotates on the trigger pin, depressing the nose of the trigger and disengaging the notch on the bottom of the hammer. The hammer is thrown forward by the action of the hammer spring. The hammer strikes the head of the firing pin, driving the tip of the firing pin into the primer of the round. The weapon operates with such rapidity that the operator cannot release the trigger soon enough to prevent multiple firing. Therefore a mechanism - the disconnect - is incorporated into the weapon to enable the operator to fire single rounds. The disconnect is attached to the trigger and is rotated forward by the action of the disconnect spring. When the hammer is cocked by the recoil of the bolt carrier, the disconnect engages and retains the lower hook of the hammer until the trigger is released. When the trigger is released the disconnect rotates to the rear and downward, disengaging the hammer and allowing it to rotate forward until caught by the nose of the trigger thus

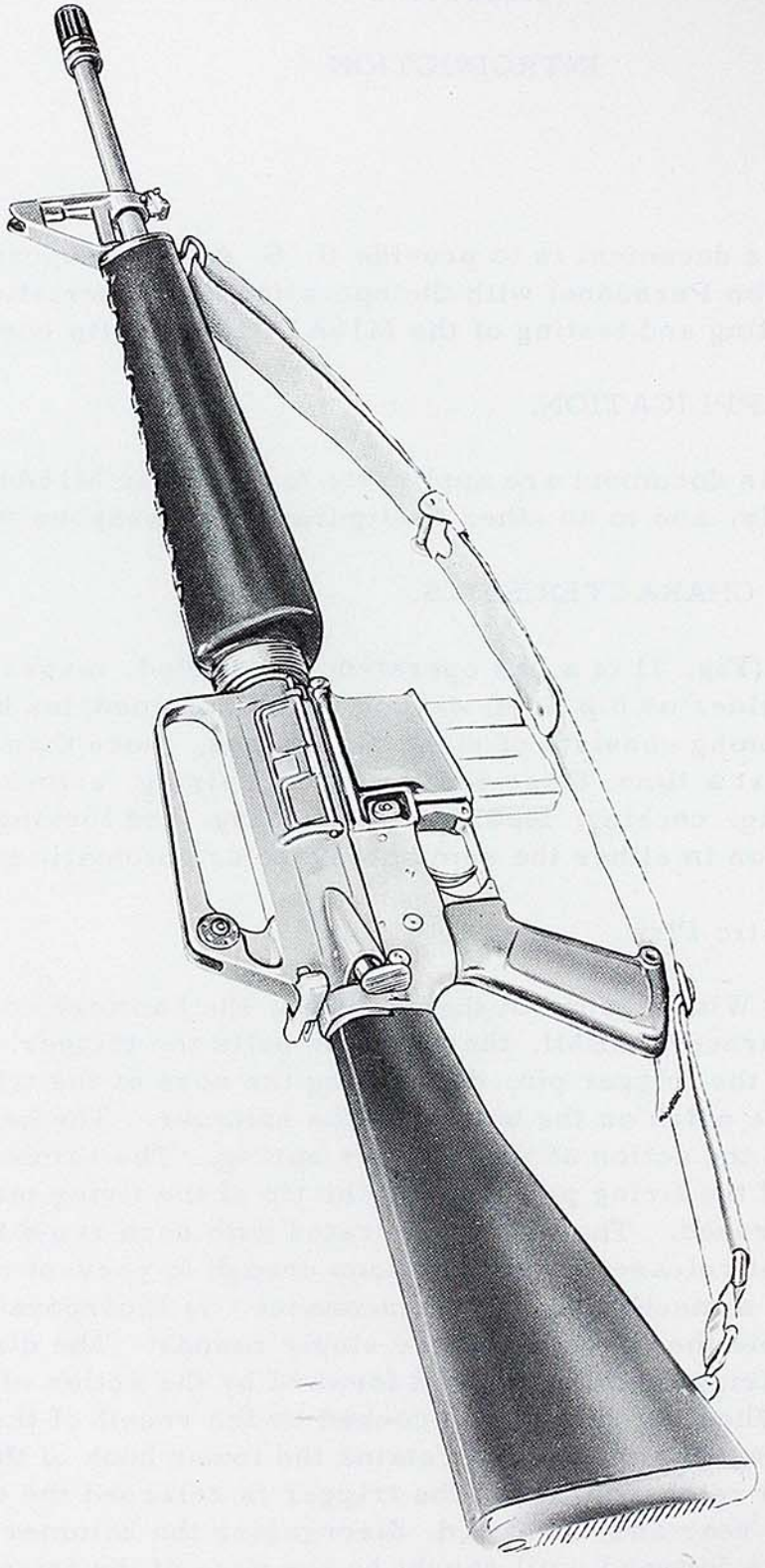


Figure 1. Assembled M16A1 Rifle

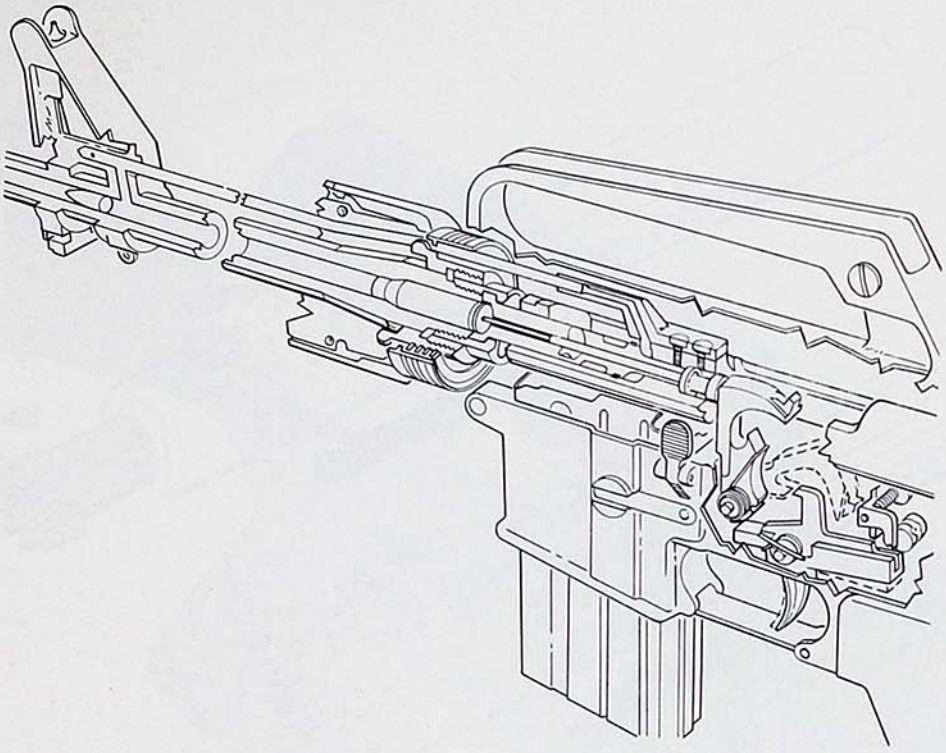


Figure 2. Automatic Firing and Gas Action.

preventing the hammer from following the bolt carrier forward and causing automatic firing (Fig. 2).

(2) Gas Action. When the primer ignites the powder the bullet is forced through the barrel; at the same time the gas moves through the barrel. When the gas reaches the gas port located on the upper surface of the barrel (under the front sight), a small portion passes through the gas port and into the gas tube (Fig. 2); this tube directs the gas into the cylinder between the bolt and bolt carrier, causing the bolt carrier to move rearward.

(3) Unlocking. As the bolt carrier moves rearward, the cam track in its upper surface acts on the bolt cam pin, rotating the cam pin and bolt until the locking lugs of the bolt are no longer in line with the locking lugs of the barrel extension (Fig. 3).

(4) Extracting. The bolt carrier assembly continues to the rear. By means of the extractor, attached to the bolt, the expended cartridge is withdrawn from the chamber. The claw of the

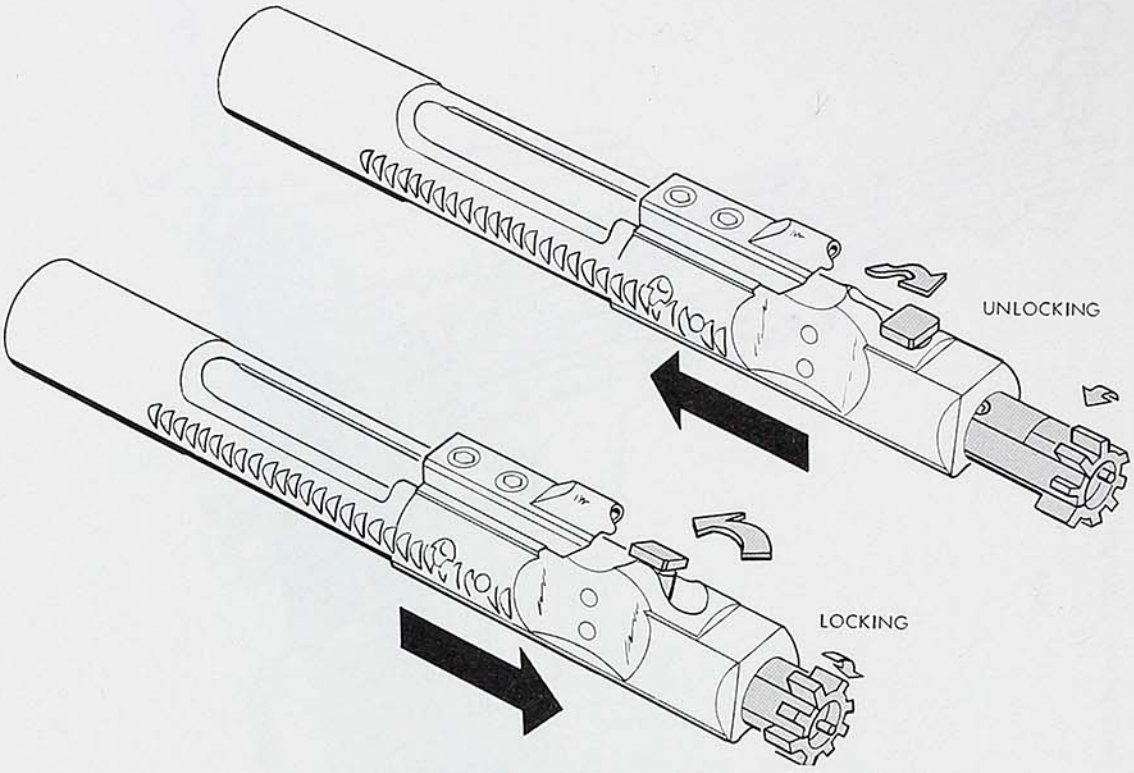


Figure 3. Locking and Unlocking of the Bolt.

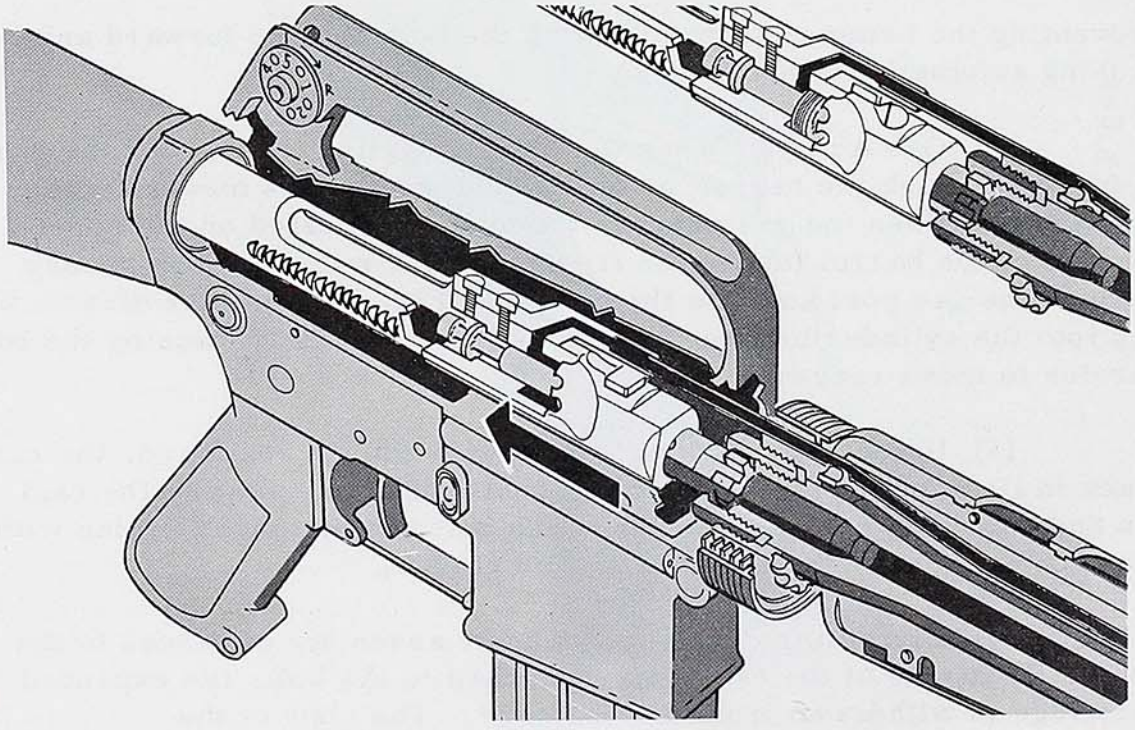


Figure 4. Extracting the Expended Cartridge

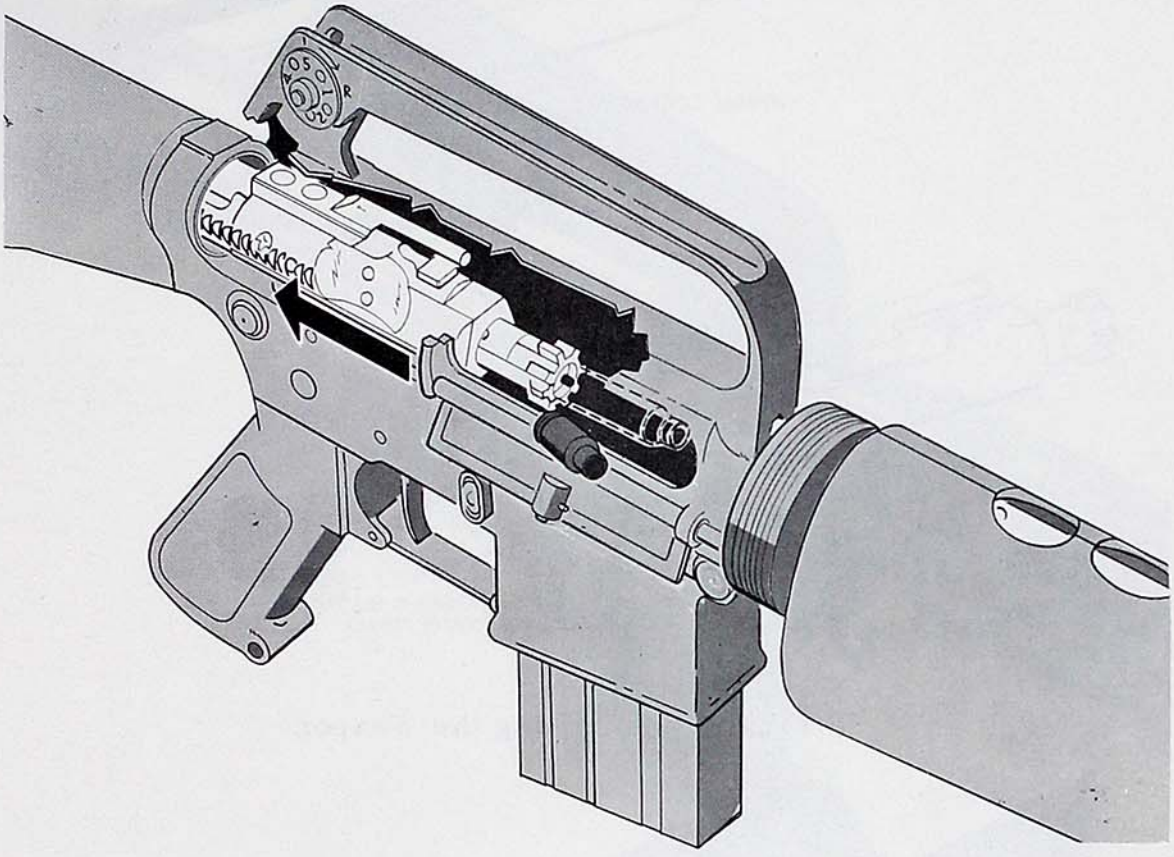


Figure 5. Ejecting the Expended Cartridge.

extractor grips the rim of the cartridge, holding the base of the cartridge against the face of the bolt (Fig. 4).

(5) Ejecting. When the base of the cartridge is against the face of the bolt, the ejector is compressed. As the bolt carrier clears the ejection port, the expended cartridge is thrown out by action of the ejector and the spring (Fig. 5).

(6) Cocking. The rearward movement of the bolt carrier overrides the hammer, forcing it down into the receiver and compressing the hammer spring. The lower hook of the hammer is engaged by the disconnect. When the trigger is released, the hammer slips from the disconnect and is caught by the nose of the trigger. The trigger must be pulled again before the next round will fire (Fig. 6).

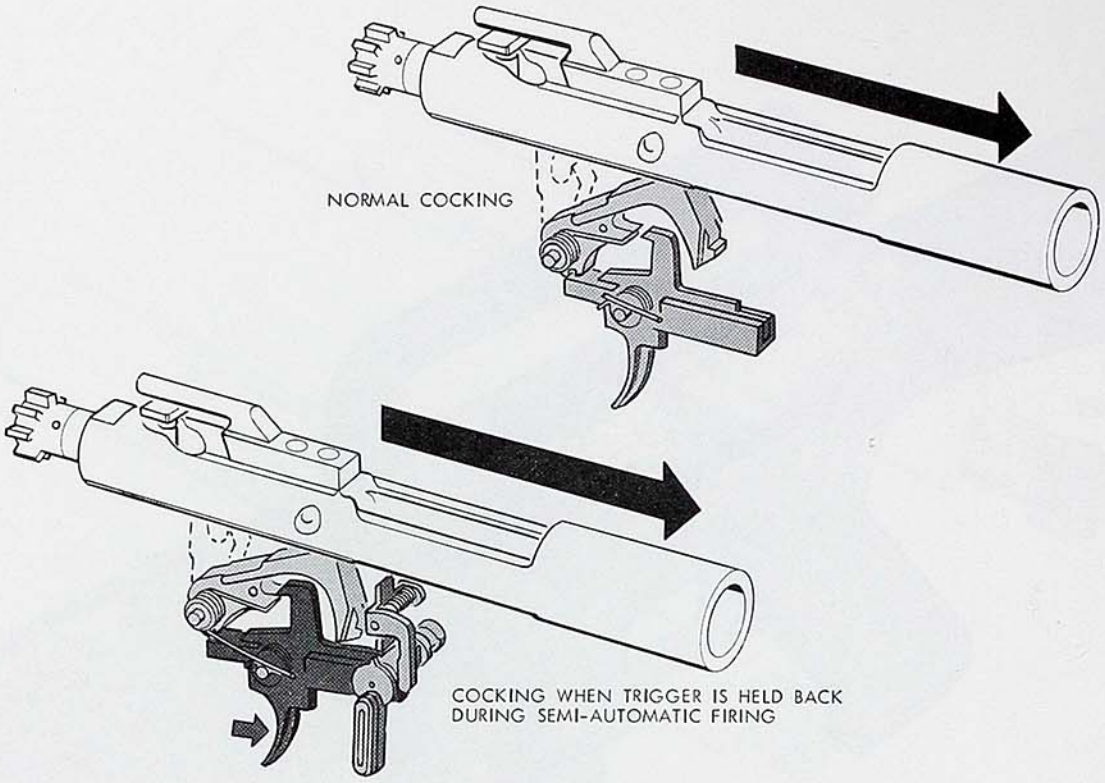


Figure 6. Cocking the Weapon

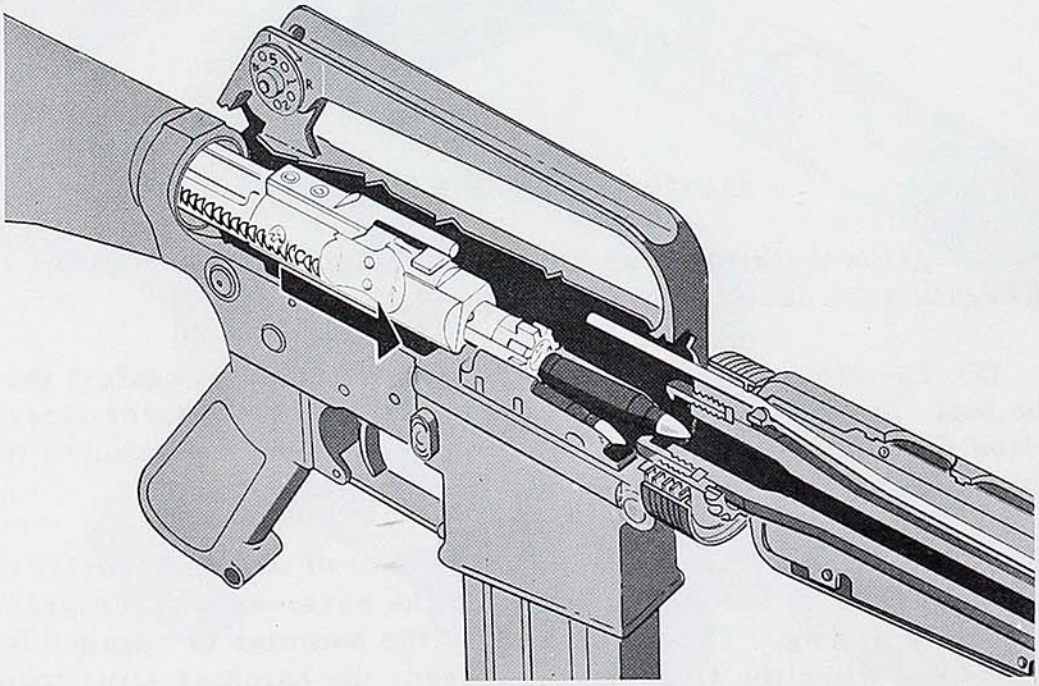


Figure 7. Feeding the Cartridge

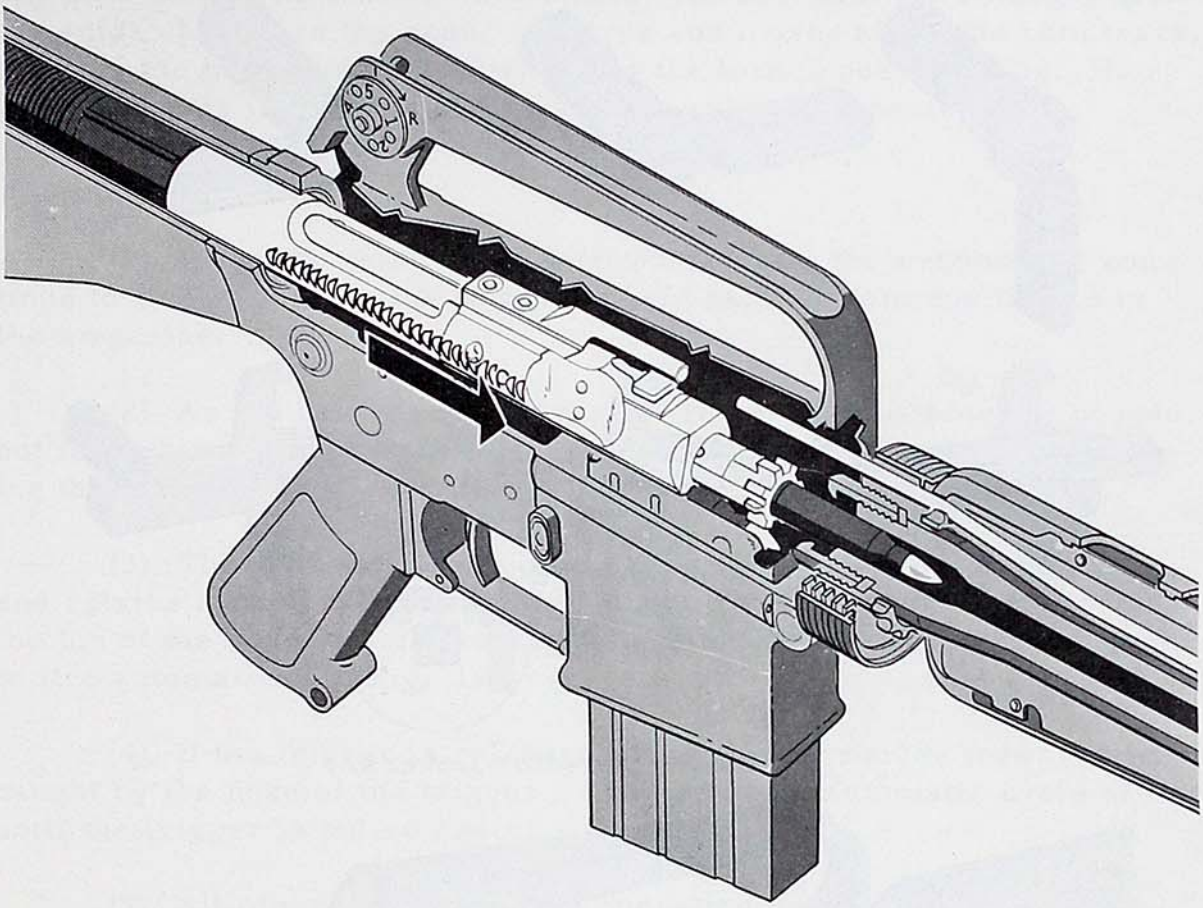


Figure 8. Chambering the Cartridge

(7) Feeding. As the bolt carrier assembly clears the top of the magazine, the follower and spring in the magazine pushes a new round upward and into the path of the bolt (Fig. 7).

(8) Action of the Buffer Assembly. As the bolt carrier assembly moves rearward, the head of the action spring guide assembly is struck; this sends the action spring guide assembly and action spring rearward into the receiver extension. The expansion of the action spring sends the action spring guide assembly forward with enough force to drive the bolt carrier assembly forward toward the chamber. The buffer assembly is designed to reduce the recoil of the weapon.

(9) Chambering. On the forward stroke of the bolt carrier assembly, the face of the bolt strips a round from the magazine and thrusts it into the chamber. At the same time the extractor claw grips the rim of the cartridge and the ejector is compressed (Fig. 8).

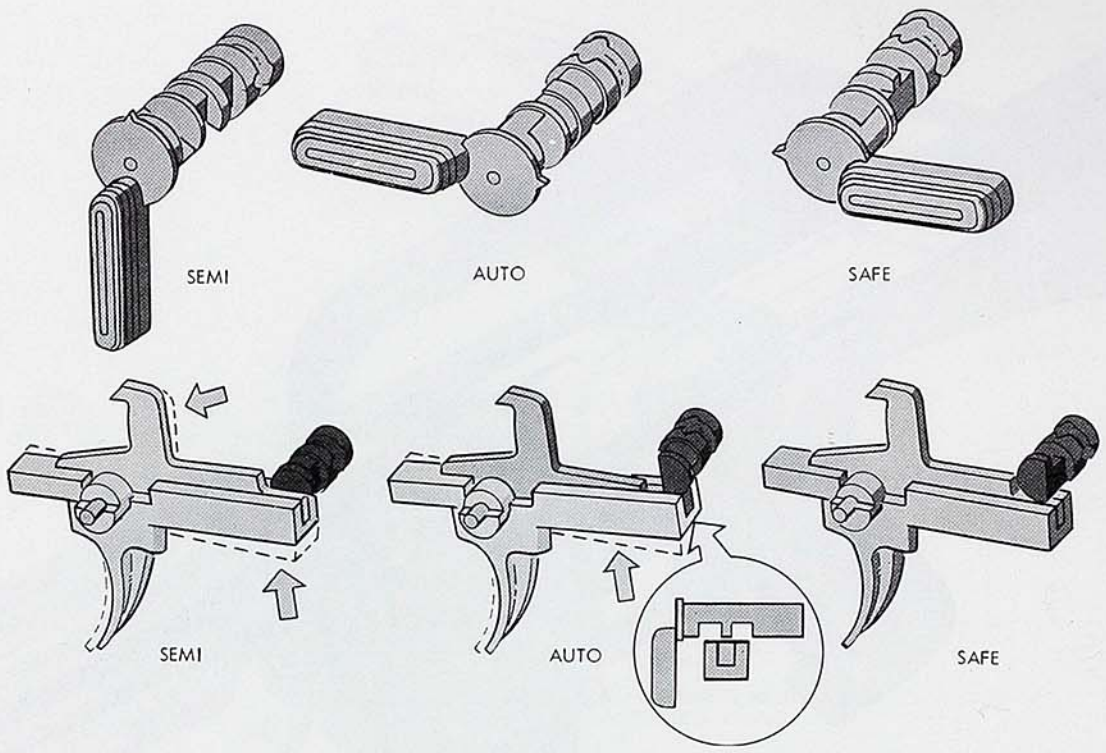


Figure 9. Selector Levers.

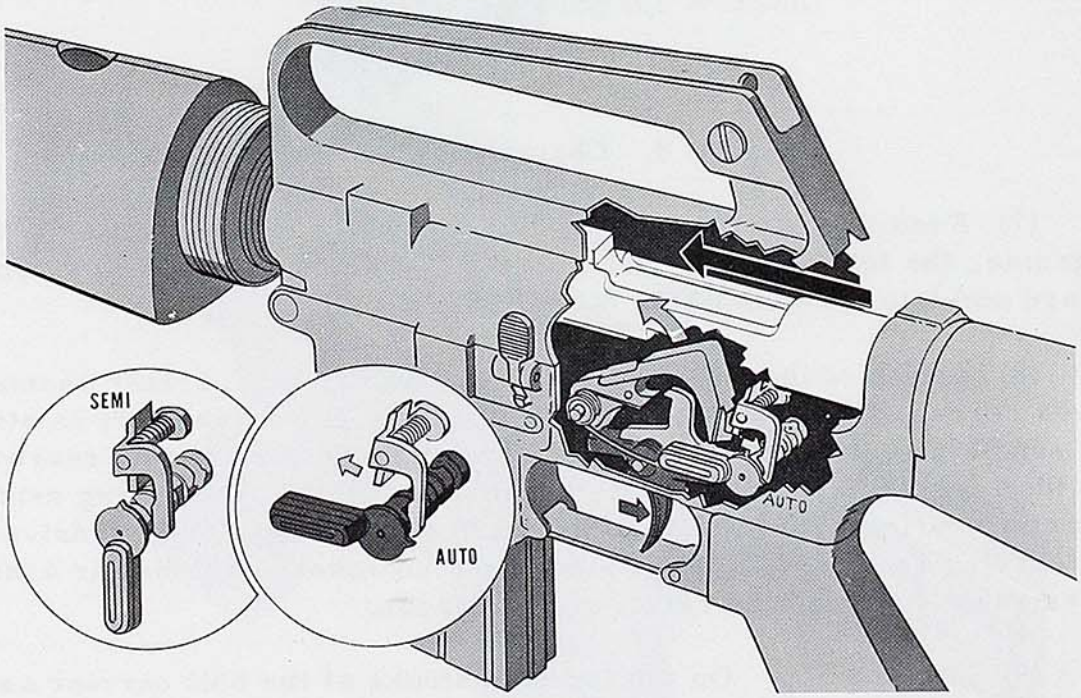


Figure 10. Automatic Sear Operation.

(10) Locking. When the bolt carrier assembly enters the last one-half inch of its forward movement, the bolt cam pin emerges from the guide channel in the upper receiver and moves along the cam track, rotating the bolt counterclockwise into the locked position (Fig. 3). The weapon is then ready to fire and the cycle is repeated.

c. Automatic Fire.

(1) When the selector is turned to AUTO, the weapon will continue to fire as long as the trigger is held back and ammunition is in the magazine.

(2) As the bolt carrier assembly recoils the hammer is cocked, but the center cam of the selector prevents the disconnect from engaging the hammer (Fig. 9).

(3) The automatic sear catches the upper hook of the hammer and retains it until the bolt carrier assembly moves forward, striking the top of the sear, which releases the hammer and causes the weapon to fire automatically (Fig. 10).

(4) If the trigger is released, the hammer moves forward and is caught by the nose of the trigger. This ends the automatic cycle of fire until the trigger is pulled again.

(5) All other portions of the operating cycle remain the same as in the semiautomatic mode of fire.

d. Safety Mode. When the selector is turned to SAFE, the trigger is locked and the weapon will not fire.

e. Removing and Inserting the Magazine. The weapon will not function when the magazine is empty. When the last round of a magazine has been chambered, the magazine follower rises to the top of the magazine and contacts the bolt stop. As the bolt carrier assembly recoils after the last round is fired, the bolt stop is forced into the path of the bolt face by action of the magazine spring. This holds the bolt carrier assembly to the rear.

(1) The magazine is removed by pushing the magazine release button on the right side of the lower receiver. Removal of the magazine does not release the bolt carrier assembly due to the force of the action spring holding the face of the bolt tightly against the catch. To release the bolt carrier assembly the operator presses the head of the bolt catch

located on the left side of the receiver.

(2) The weapon is loaded by inserting a magazine containing cartridges into the magazine well until the magazine catch is engaged. If, after insertion of the magazine, the bolt carrier assembly goes forward, the weapon is charged and ready to fire.

f. Use of the Forward Assist. If, when a round is chambered, the bolt does not fully close, the bolt may be manually advanced by depressing the forward assist plunger on the right side of the upper receiver; this causes the pawl at the front of the forward assist to engage the serrations on the side of the bolt carrier.

4. INSPECTION OF THE WEAPON.

a. Subsequent sections of this document deal with inspection methods and procedures, the inspection of materials and material processes, component parts, assemblies, and the complete weapon. Packaging, packing, marking, care, and preservation of the complete weapon are also provided.

b. The purpose of inspection and related responsibilities and relationships are defined in Section II. This section also provides data on the use of Quality Standards, various types of tests, and special methods and procedures.

c. The control of materials and material processes are defined in Section III.

d. Components and assemblies are defined in Section IV and Section V respectively. Each of these items is described, and its function and interrelation is given; important functioning points and areas are also covered. Instructions are provided detailing important inspection points. The use of special inspection equipment is described, and these items are illustrated where applicable. A detailed plan of inspection is provided by means of Supplementary Quality Assurance Plans (SQAP's) and SQAP-APPENDIX-RIA; the use of these documents is defined in Section II.

e. Inspection of the complete weapon after it has been qualified in accordance with MIL-R-45587 is defined in Section VI.

f. Packaging, packing, marking, care, and preservation inspection procedures are defined in Section VII.

SECTION II

INSPECTION METHODS AND PROCEDURES

5. GENERAL.

The purpose of this section is to familiarize the Government Inspector with the proper methods and procedures to be used in the inspection and acceptance of the M16A1 Rifle and its components. Quality Assurance comprises all procedures necessary to determine that product requirements are met. Quality Assurance Provisions consist of the methods used to evaluate product quality, and may extend to all matters relating to product acceptability including material quality, method of manufacture, manufacturer's inspection, and compliance with Government standards for workmanship, quality, performance, and interchangeability. These provisions, which are contained in MIL-R-45587 or material specifications and Supplementary Quality Assurance Provisions (SQAP's), represent the minimum amount of inspection to be performed by the contractor prior to submission of the product for Government inspection; acceptance criteria included therein represents the maximum severity to be used by the Government in determining product compliance with specifications and drawings. Specifications and component drawings provide the basic characteristics of the item being purchased and detail performance requirements; drawings also specify dimensions which are necessary solely for part manufacture. The contractor is contractually required to produce material in accordance with the contract and all applicable drawings and specifications.

6. SUPPLEMENTARY QUALITY ASSURANCE PROVISIONS (SQAP's).

a. General. The SQAP is an integral part of the quality assurance system and, as a contractural document which supplements MIL-R-45587, provides quality assurance for locally controlled requirements specified in detailed Government drawings. The SQAP document also is a means of issuing the specific inspection procedure to be used under varying procurement patterns. General information covering the scope of SQAP's and the condition and control of materials is contained in SQAP-APPENDIX-RIA and referenced in the basic SQAP document.

b. Purpose. A SQAP is a companion industrial engineering document to a drawing; it provides a means of retaining local control of inspection procedures applicable to locally controlled requirements. SQAP's facilitate the improvement of quality assurance provisions in those instances where local control may provide substantial economic benefits.

c. Scope. SQAP's prescribe exactly what is to be inspected to adequately determine the compliance of material lots with performance requirements. These procedures specify inspection of the most important requirements and identify probable trouble points which can directly affect item performance. The objectives of these procedures are to provide clear and detailed instructions on a shop level for acceptance inspection, to conserve manpower by the application of practical sampling utilizing quality control, to provide for standardized inspection with resultant uniformity of accepted quality, and to assure equitable treatment of all contractors. The fact that all requirements are not included in the SQAP does not release the contractor from the responsibility of inspecting a requirement. The Government reserves the right to inspect any requirement, whether or not it is listed in the SQAP.

d. Policy. The policy followed in the preparation of SQAP's is based on the Government's primary interest in the end product. Consequently, in the case of subassemblies, most inspection is applicable to the final assembly. Certain subassemblies, issuable as repair parts, are made up of components which are also individually issuable as repair parts. In such cases, the individual SQAP's for components which are repair parts must be applied prior to acceptance inspection of the subassemblies. Individual component SQAP's which must be applied are listed in Part I of the SQAP for the particular subassembly under consideration. Other subassembly SQAP's make use of inspection positions; these positions provide for the inspection of certain important points which will be inaccessible after the subassembly has been assembled. In some cases, a SQAP will provide detailed data for use at an inspection position; usually, however, drawings only will be referenced for this purpose. Components and subassemblies which are found acceptable during inspection may be used to fill orders for repair parts; if necessary, parts sufficient to fill orders may be taken from accepted lots without further inspection.

7. SQAP-APPENDIX-RIA.

This document forms a part of each SQAP when referenced therein. The Quality Assurance provisions given in the appendix, together with those contained in SQAP's and applicable documents, outline the minimum Government prescribed final inspection necessary to assure compliance with established requirements. Significant areas covered are responsibility for inspection, inspection records, certification, definition of types of characteristics, explanation of inspection terms and methods, and data on inspection equipment.

8. SURVEILLANCE.

Surveillance by the Government Inspector is not intended to mean continuous observation by him. He can effect adequate control by frequent and unexpected spot checks of processes such as heat treatment and the application of finishes. When deviations from requirements are discovered by the Government Inspector the contractor must take corrective action. Failure of the contractor to properly correct such deficiencies shall be cause for suspension of acceptance until correction has been made or conformance of the item to prescribed criteria has been demonstrated. In no case shall a Government Inspector perform work which is the sole responsibility of the contractor. The contractor's inspection data shall be utilized to the fullest possible extent.

9. CLASSIFICATION OF CHARACTERISTICS (CC).

a. General. The CC as presented in the SQAP's enumerates possible defects, classified according to their importance, with an Acceptable Quality Level (AQL) for each characteristic; this AQL represents the approximate maximum defect percentage that will be continuously accepted under a sampling plan. The method of inspection and dimensions or requirements associated with each characteristic are included in the CC.

b. Preparation of the CC. Because of the importance of the CC in the SQAP, an explanation of its content and preparation is as follows:

(1) Every requirement pertinent to the unit of product is listed on an analysis sheet.

(2) Each requirement is then analyzed and classified. Characteristics are divided into major and minor groups. A major characteristic is a characteristic other than critical, which could result in failure or materially reduce the usability or durability of the unit of product for its intended purpose. A minor characteristic is one which departs from established standards and which may slightly reduce product usability; characteristics which may interfere with subsequent assembly, repair operations, or tend to decrease durability are also classified as minor characteristics.

(3) Following careful study, an appropriate AQL is assigned for each characteristic, based on dimensional tolerance design safety factors and clearance between mating parts; due regard is taken concerning necessary quality for proper functioning, interchangeability, and durability of the product.

(4) A detailed description of each characteristic, along with the inspection method employed, is provided. Requirements may be described in functional terms, such as "location, sear camming surface". This type of description eliminates confusion when similar requirements are present in the same unit; in addition, identification in this manner functionally identifies the particular requirement. When an ordnance gage which will check a requriement is available, the gage number is listed with the requirement so checked. Additional instructions pertaining to inspection methods employed for small arms items are contained in SQAP-APPENDIX-RIA.

(5) Finally, listings are grouped by classification. This arrangement presents the information in a form which will contribute to an efficient inspection procedure.

SECTION III

INSPECTION OF MATERIALS AND MATERIAL PROCESSES

10. GENERAL.

Firm control of materials and material processes is required in the production of weapons of high and uniform quality. In addition, like components of all like weapons must be as nearly identical as possible. To be acceptable, a component must conform not only to the dimensional requirements of the drawing, but also to the various non-dimensional requirements as well. The quality of the particular materials from which a component is made has a decided effect on its serviceability. The characteristics of different materials, steels in particular, vary widely, making the inspection of materials very important. Each component drawing specifies the material from which the part must be made. The Supplementary Quality Assurance Provisions (SQAP) document pertaining to each individual component lists the tests for determining the quality of material or material process and necessary inspection controls. In tropical climates unprotected aluminum surfaces are subject to a phenomenon known as exfoliation - a flaking or scaling of the surface. Because of this, it is important that the anodize coating on aluminum components be thorough and according to drawing and specification requirements.

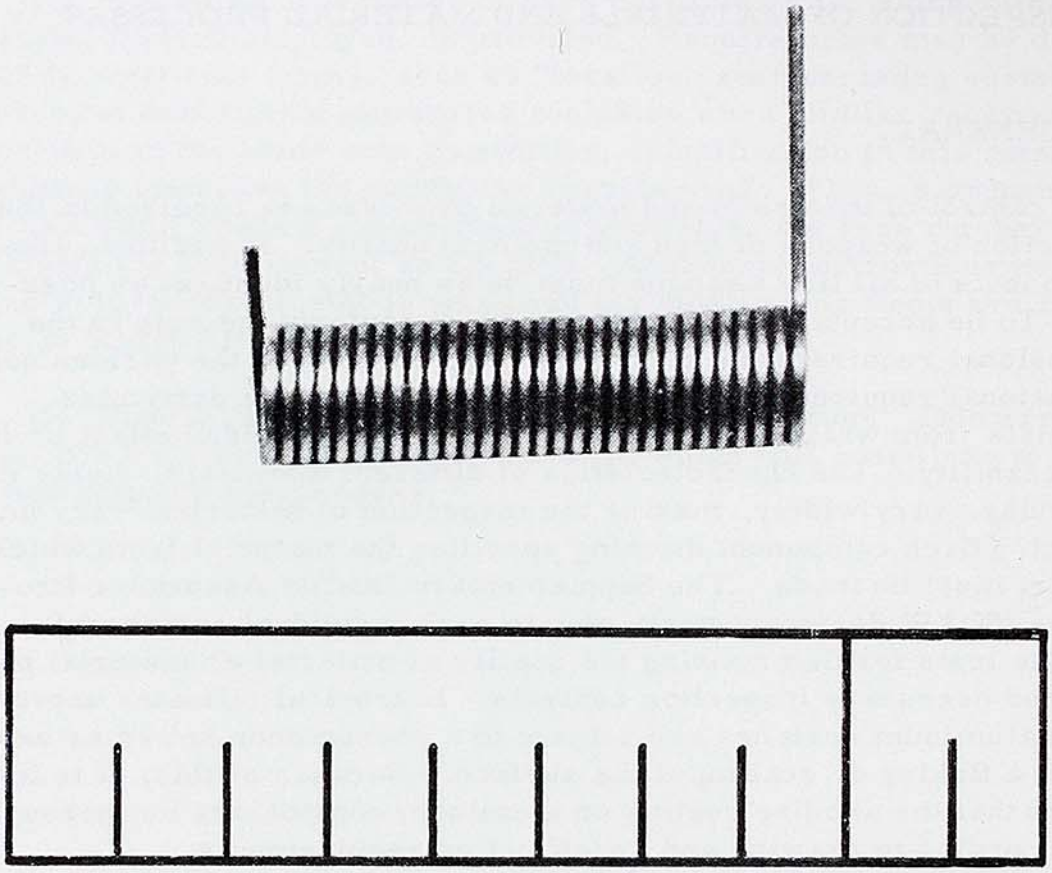


Figure 11. Cover Spring.

SECTION IV

INSPECTION OF COMPONENT PARTS

11. GENERAL.

This section describes the inspection procedures to be followed for the individual components which are used in the weapon. A description of each component, and its function and interrelationship with other components is also provided, and important functioning points and areas are identified. Certain closely related components which function as part of an assembly are discussed in Section V.

12. COVER SPRING - 61518.

a. Description, Function, and Interrelationship. The cover spring is located on the ejection port cover (see Fig. 124). This component (Fig. 11), a steel single coil torsion spring approximately 11/16 of an inch in free length, holds the ejection port cover clear of the ejection port when the port is open.

b. Important Functioning Points and Areas. The cover spring must develop sufficient force to hold the ejection port cover in the open position.

c. Inspection. Detailed inspection procedures and test equipment to be used in the final acceptance of this component are given in SQAP M1661518. Routine test procedures and standard visual inspection methods are to be followed.

13. BOLT - 61538.

a. Description, Function, and Interrelationship. The bolt is located in the bolt carrier assembly (see Fig. 127). This component, a cylinderically shaped steel piece, is approximately 1/2 of an inch in diameter and 2 13/16 inches in length. The cartridge seat (Fig. 12-1), a counterbore located at the front of the bolt, provides a seat for the head of the cartridge. The bolt lock (Fig. 12-2), consisting of lugs located about the periphery of the front end of the bolt, provides the means for locking the bolt in the barrel extension. Two of the bolt lock lugs function as cartridge pickoff lugs (Fig. 12-3); their purpose is to provide a means for stripping a cartridge from the magazine. Bearing

diameters (Figs. 12-4 and 12-5) provide guides for the bolt in the bolt carrier. The bolt ring groove (Fig. 12-6), located near the rear of the bolt, provides a seat for the bolt rings. The extractor slot (Fig. 12-7), running from the front end to approximately the middle of the bolt, accommodates the extractor. The extractor pin hole (Fig. 12-8), located in the extractor slot, provides a pivot for the extractor. The cam pin hole (Fig. 12-9), located behind the extractor slot, accommodates the cam pin. The firing pin hole (Fig. 12-10), located on the centerline of the bolt, provides a guide for the firing pin in the bolt. The ejector hole (Fig. 12-11), located radially opposite the extractor slot, provides a guide for the ejector and ejector spring. The small transverse roll pin hole (Fig. 12-12), which intersects the extractor hole, accommodates a roll pin which provides a retainer for the ejector.

b. Important Functioning Points and Areas. These are as follows:

(1) The diameter of the cartridge seat and its concentricity to the firing pin hole must be within tolerance to insure free rotation of the bolt when the bolt is locking into the barrel extension.

(2) The location, parallelism, and flatness of the cartridge seat with respect to the back face of the bolt lock lug must be as specified to insure proper headspace.

(3) The location of the cartridge seat with respect to the rear face of the bolt must be within tolerance to insure proper protrusion of the firing pin when the weapon is fired.

(4) The contour dimensions of the bolt lock lugs and their angular location with respect to the cam pin hole must be within tolerance to insure smooth engagement and disengagement of the bolt with the barrel extension.

(5) The edge of the cartridge pickoff lugs (Fig. 12-3) must be as specified to prevent overriding or tearing of the cartridge lip.

(6) The bearing diameters and their concentricities to the firing pin hole must be within tolerance to insure free motion of the bolt in the bolt carrier and, in the case of the small diameter, to minimize blowback.

(7) The diameter and groove width of the bolt ring groove and its concentricity to the firing pin hole must be as specified to insure proper seating of the bolt rings.

(8) The width of the extractor slot and its symmetry and parallelism to the centerline of the bolt must be within tolerance to insure free motion of the extractor in the bolt and proper engagement of the extractor with the cartridge lip.

(9) The perpendicularity of the extractor pin hole to the centerline of the bolt and firing pin hole must be as specified to insure proper engagement of the extractor with the cartridge lip.

(10) The depth of the extractor stop surfaces (Fig. 12-13) must be within tolerance to insure sufficient motion of the extractor and to provide for proper extractor engagement with the cartridge lip.

(11) The end of the cam pin hole which is furthest from the extractor slot must be staked (Fig. 12-14) to assure proper assembly of the bolt in the bolt carrier.

(12) The diameter and straightness of the firing pin hole and its concentricity with the centerline of the bolt must be as specified to insure free motion of the firing pin in the bolt.

(13) The diameter of the ejector hole must be within tolerance to insure free motion of the ejector.

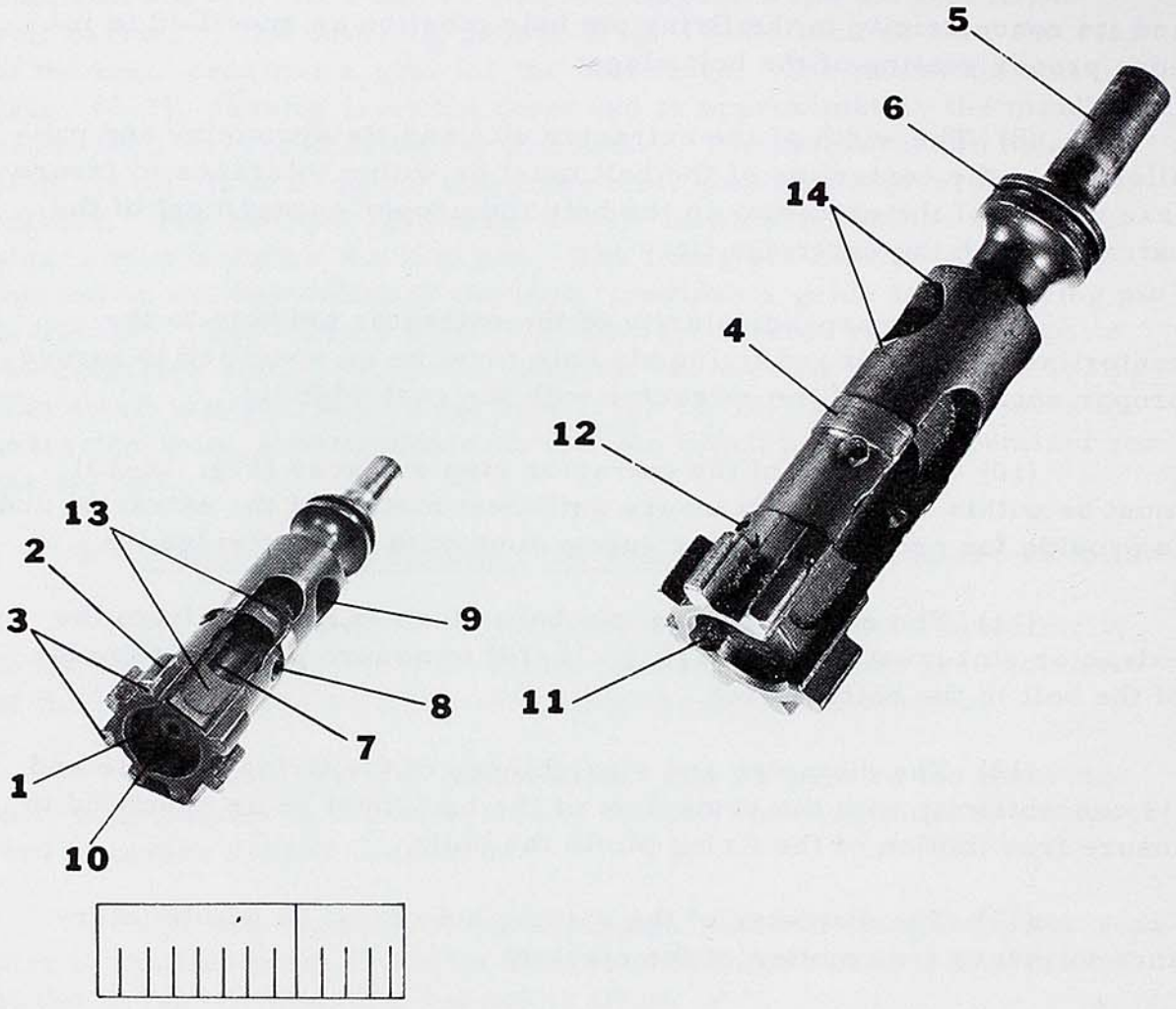
(14) The locating dimensions of the ejector hole must be within tolerance to insure that the ejector properly engages the spent cartridge.

(15) The finish of the bearing diameters must be as specified to insure free motion of the bolt in the bolt carrier.

(16) Material hardness must be as specified to insure adequate strength and service life.

(17) Since the bolt is subjected to severe loading, it is essential that the bolt be proof fired and magnifluxed to insure that it is free of any hidden metallurgical defects.

c. Inspection. Detailed inspection procedures and gages to be used



1. Cartridge seat
2. Bolt lock
3. Cartridge pickoff lugs
4. Bearing diameter
5. Bearing diameter
6. Bolt ring groove
7. Extractor slot
8. Extractor pin hole
9. Cam pin hole
10. Firing pin hole
11. Ejector hole
12. Transverse roll pin hole
13. Extractor top surfaces
14. Staking on cam pin hole

Figure 12. Bolt

in the final acceptance of this component are given in SQAP M1661538. Special gages, some of which are described below, are used to check significant characteristics. Routine test procedures and standard visual inspection methods are to be followed for additional characteristics given in the above referenced SQAP which are not listed below.

(1) Location Gage - 8440745. This gage (Fig. 13) is used to check the following characteristics, which are detailed in the above referenced SQAP:

(a) Symmetry of the ejector pin hole.

(b) Perpendicularity of the extractor pin hole.

The following procedure is to be used:

(a) Locate the bolt in the gage with the extractor slot (Fig. 14-1) facing up as follows:

1 Position the bolt until its front face seats against the stop (Fig. 14-2).

2 Rotate the bolt in the "V" grooves (Fig. 14-3) until the lug (Fig. 14-4) on the bolt seats against the locator (Figs. 13-5 and 14-5).

(b) Clamp the bolt into position as follows:

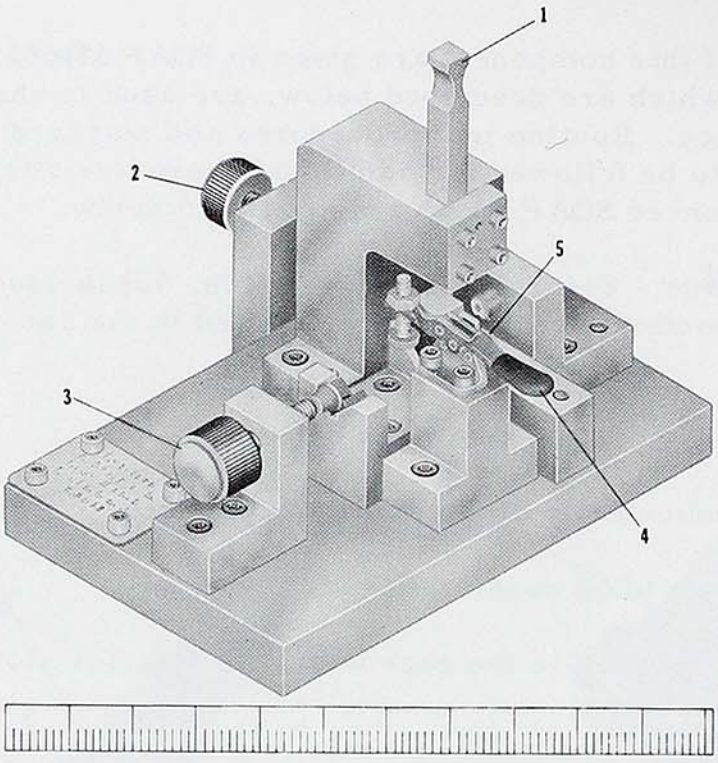
1 Tighten the torque screws (Figs. 13-2 and 13-3).

2 Lock the toggle clamp (Fig. 13-4).

(c) Lower the slide (Fig. 13-1) until it is completely seated in the bottom of the extractor slot (Fig. 14-1).

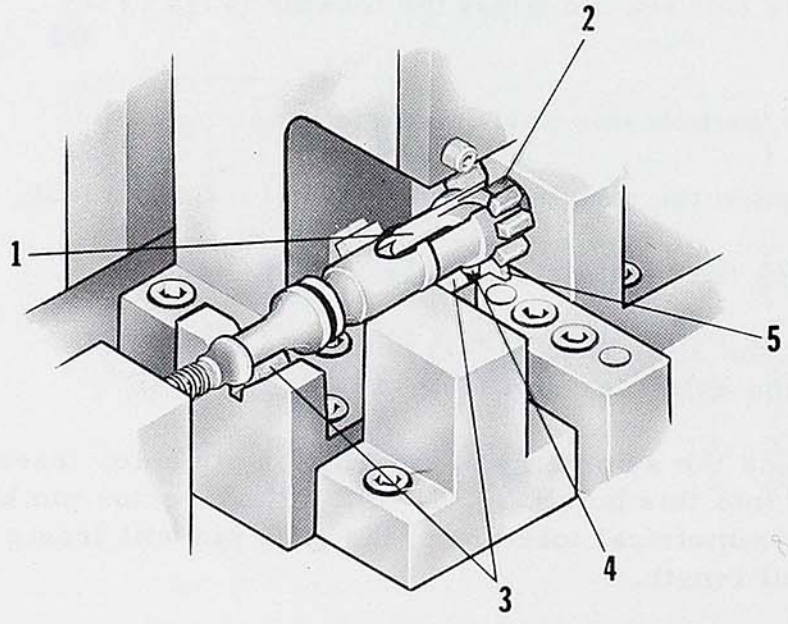
(d) To check the symmetry of the ejector pin hole, insert the gage pin (Fig. 15-1) into this hole (Fig. 15-2). If the ejector pin hole is within the specified symmetrical tolerance, the gage pin will freely enter this hole for its full length.

(e) To check the perpendicularity of the extractor pin hole, insert the gage pin (Fig. 15-3) into this hole (Fig. 15-4). If the extractor pin is within the specified perpendicularity tolerance, the gage pin will



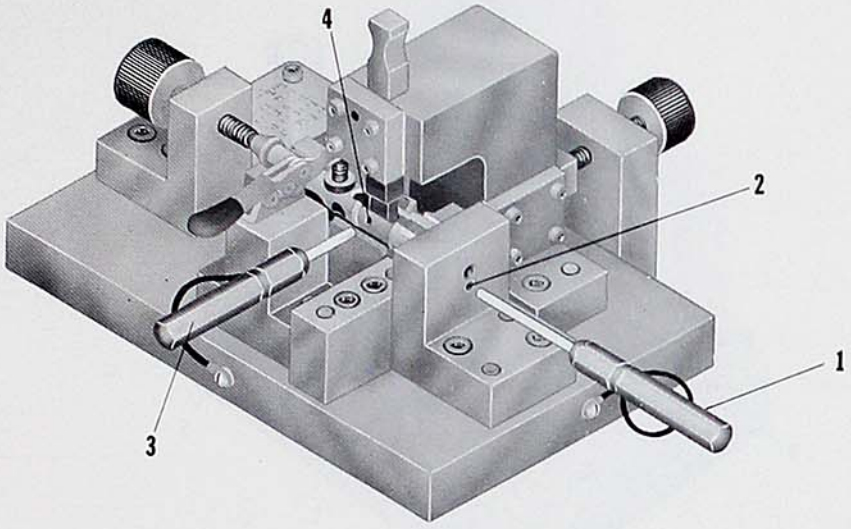
1. Slide
2. Torque screw
3. Torque screw
4. Toggle clamp
5. Locator

Figure 13. Location Gage in Position to Receive Bolt.



1. Extractor slot
2. Stop
3. "V" grooves
4. Lug on bolt
5. Locator

Figure 14. Bolt Positioned in Location Gage



1. Gage pin
2. Ejector pin hole
3. Gage pin
4. Extractor pin hole

Figure 15. Location Gage Showing Insertion of Gage Pins.

freely enter this hole for its full length.

(2) Receiver Gage - 8440758. This gage is used to check the following characteristics, which are detailed in the above referenced SQAP:

(a) Location of the locking lugs.

(b) Symmetry of the extractor slot.

(c) Symmetry and perpendicularity of the cam pin hole

The following procedure is to be used:

(a) To check the location of the locking lugs, insert the bolt into the gage with the extractor slot (Fig. 16-1) facing the flange (Fig. 16-2). If the locking lugs are properly located, the bolt will freely enter the grooves (Fig. 16-3) and seat on the stop (Fig. 16-4).

(b) To check the symmetry of the extractor slot, insert the extractor gage (Fig. 17-1) into the slot (Fig. 17-2) with the projecting portion of the gaging blade (Fig. 17-3) facing down. If the extractor slot

1. Extractor slot
2. Flange
3. Grooves
4. Stop
5. Extractor gage storage block
6. Cam pin gage storage block

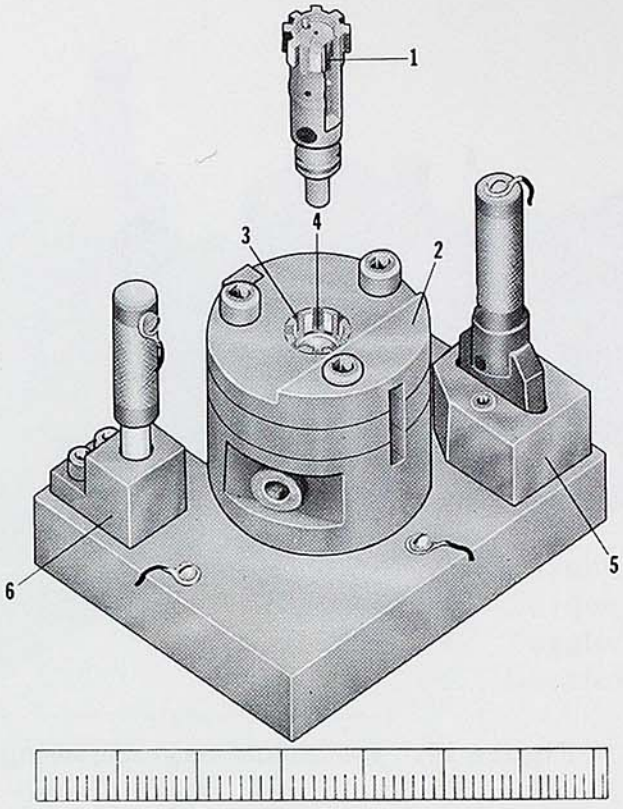
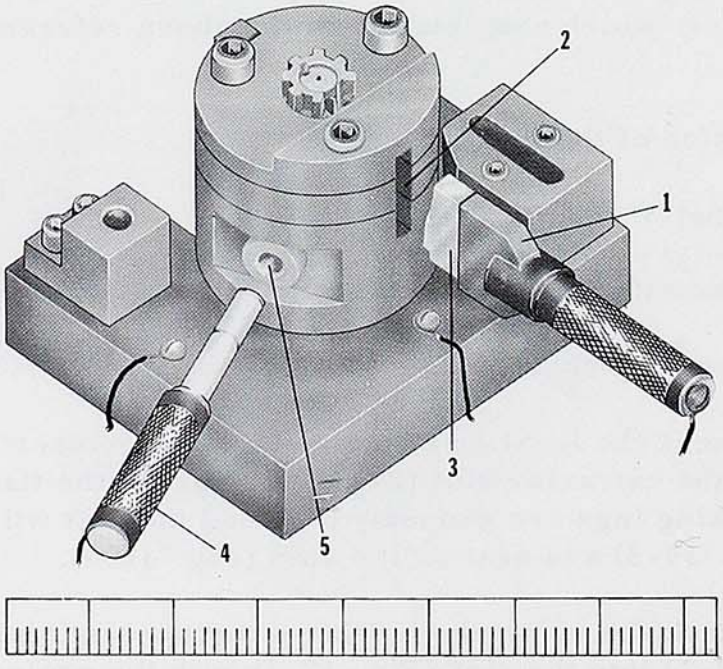
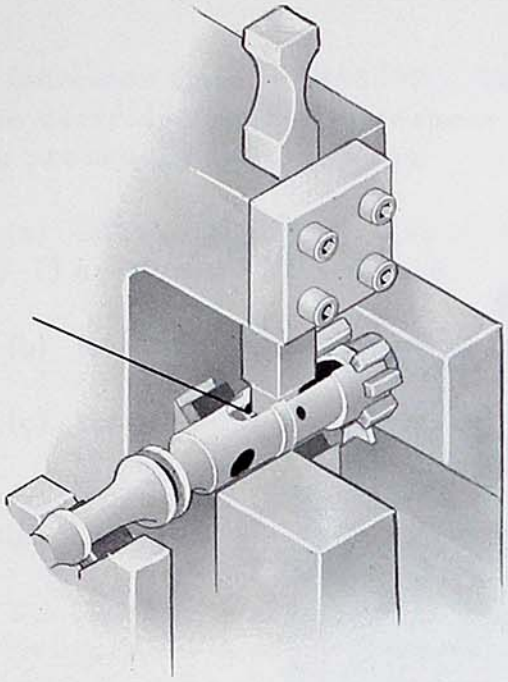


Figure 16. Receiver Gage Showing Insertion of Bolt.



1. Extractor gage
2. Slot
3. Gaging blade
4. Cam pin gage
5. Bushing

Figure 17. Receiver Gage Showing Insertion of Gage Pin and Gaging Blade.



1. Point at which blade must seat in extractor slot.

Figure 18. Seating of Gaging Blade in Extractor Slot.

is within specified symmetrical tolerance, the gaging blade will freely enter and seat on the bottom of the ejector slot; this can be visually observed from the top of the gage (see Fig. 18).

(c) To check the symmetry and perpendicularity of the cam pin hole, insert the cam pin gage (Fig. 17-4) into the bushing (Fig. 17-5). If the cam pin hole is within the specified symmetry and perpendicularity, the gage pin will freely enter the bushing for its full length.

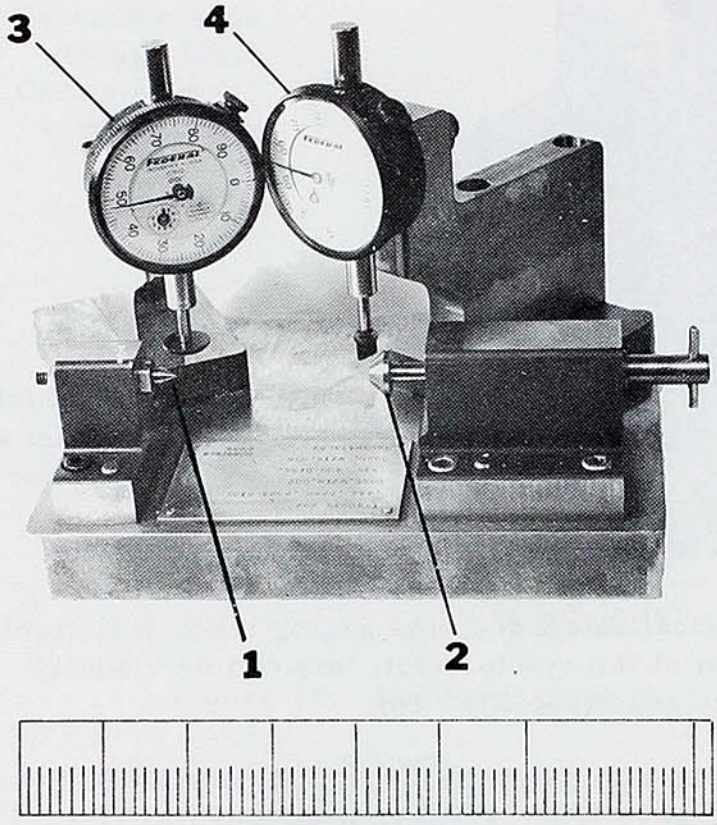
(3) Concentricity Gage - 11837928. This gage is used to check the following characteristics, which are detailed in the above referenced SQAP:

(a) Concentricity of the bearing diameters to the firing pin hole.

(b) Concentricity of the bolt ring flanges to the firing pin hole.

(c) Concentricity of the bolt ring groove diameter to the firing pin hole.

(d) Concentricity of the slot diameter to the firing pin hole.



1. Center
2. Center
3. Dial indicator gage
4. Dial indicator gage

Figure 19. Concentricity Gage.

The following procedure is to be used:

(a) Insert the bolt between the centers (Figs. 19-1 and 19-2) on the concentricity gage.

(b) Check the concentricities of the bearing diameters and bolt ring flanges to the firing pin hole with the applicable dial indicator gage (Figs. 19-3 and 20).

(c) Check the concentricities of the bolt ring groove diameter to the firing pin hole with the applicable dial indicator gage (Figs. 19-4, 21 and 22).

(4) Indicator Gage - 8443997. This gage is used to check the location of the cartridge seat with respect to the rear face of the bolt. The following procedure is to be used:

(a) Set the gage indicator to zero by inserting the setting gage (Fig. 23-1) as shown in Figure 24.

(b) Remove the setting gage from the indicator gage.

(c) Insert the bolt into the gage as shown in Figure 25.

(d) Press the bolt down in the gage as shown in Figure 26 and read the indicator.

(5) Test Firing Fixture - 11837944. This fixture is used during proof firing of the bolt in conjunction with the barrel and barrel extension assembly. The procedure to be used is described in the inspection procedure given in Paragraph 63.

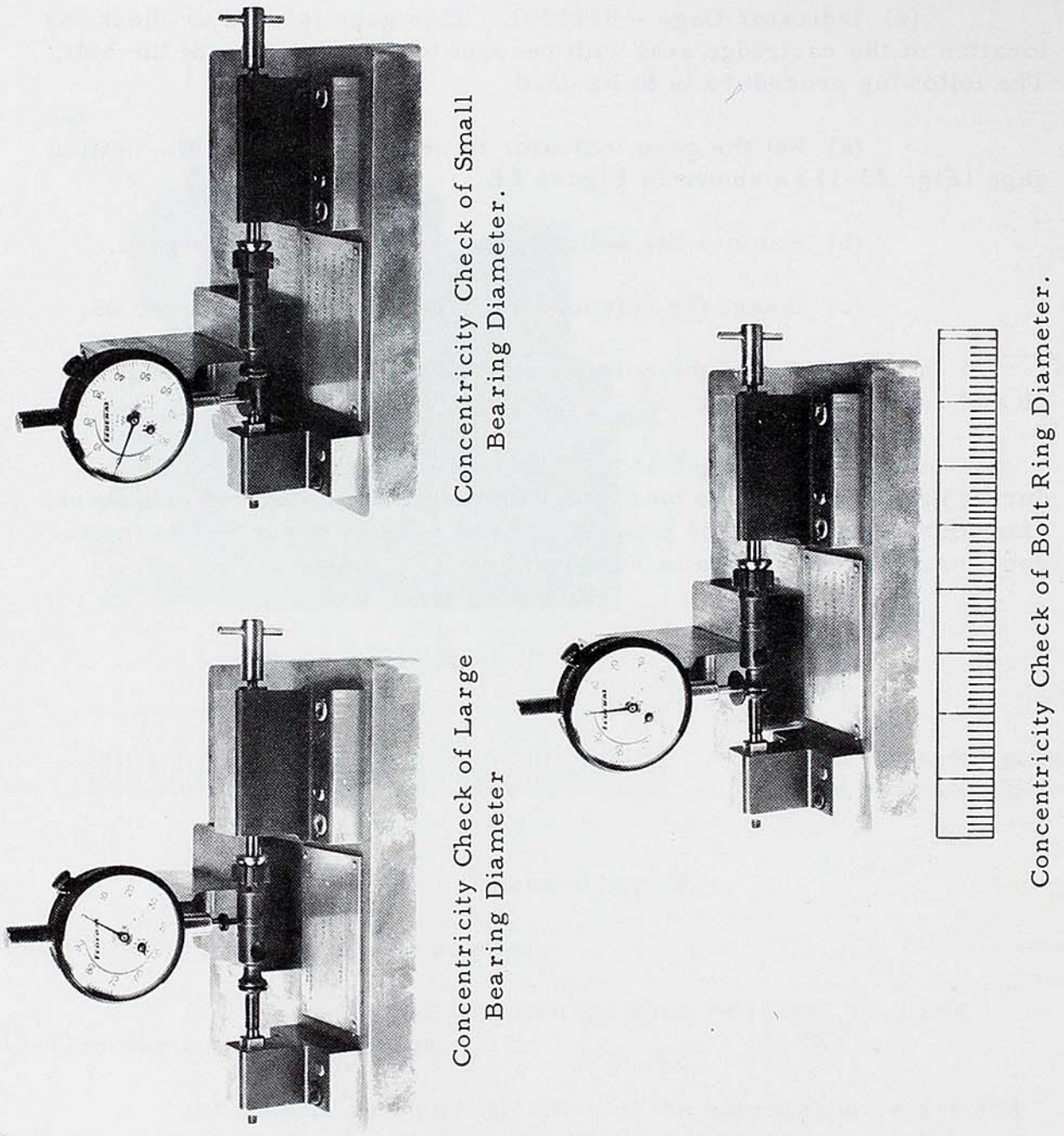


Figure 20. Dial Indicator Gage in Position for Checking Concentricities of Bearing and Bolt Ring Diameters.

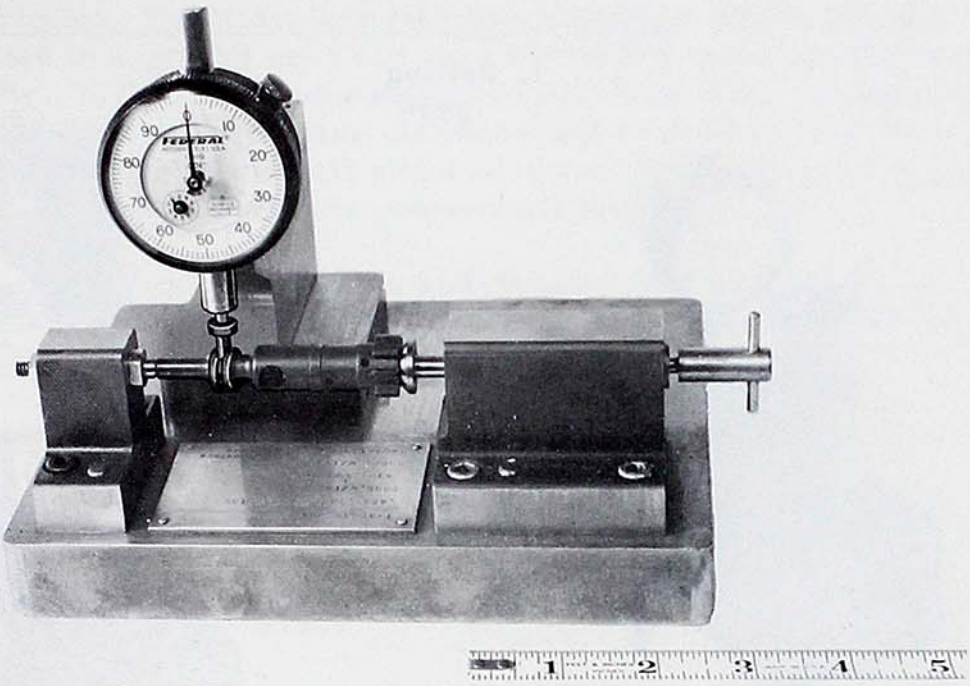


Figure 21. Dial Indicator Gage in Position for Checking Bolt Ring Groove Diameter Concentricity.

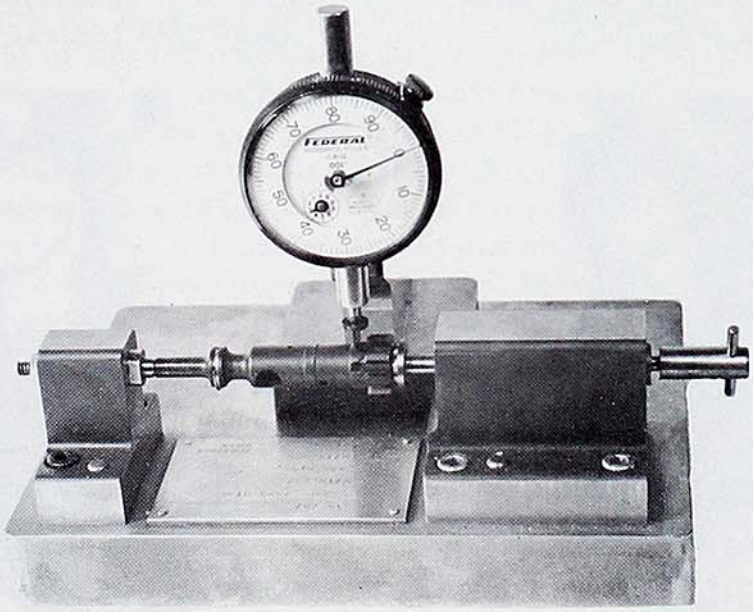


Figure 22. Dial Indicator Gage in Position for Checking Slot Diameter Concentricity.

1. Setting gage

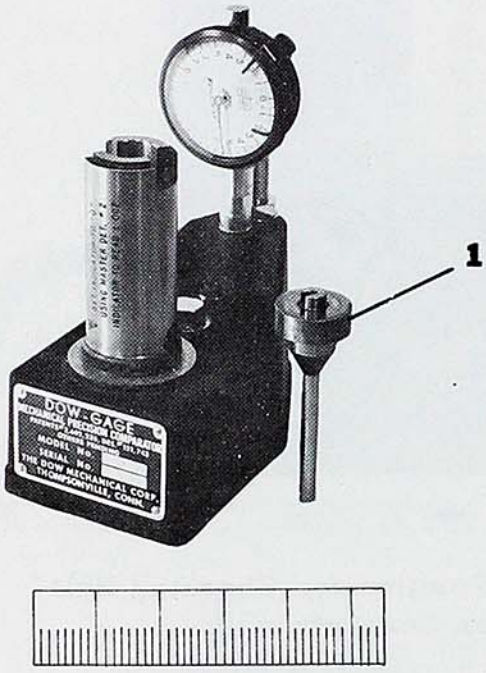


Figure 23. Indicator Gage with Setting Gage.

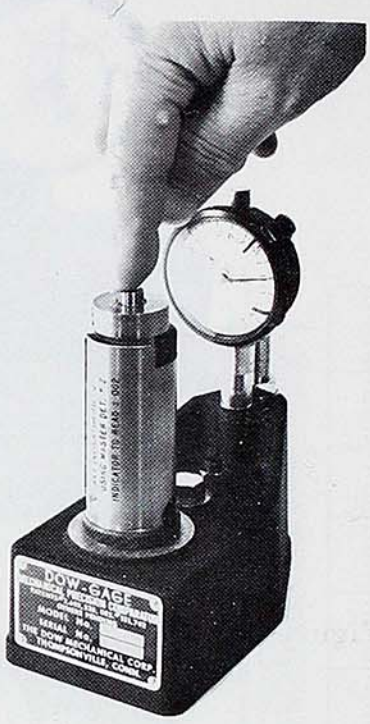


Figure 24. Insertion of Setting Gage into Indicator Gage.

Figure 25. Insertion of Bolt into Indicator Gage.

Figure 26. Pressing the Bolt Down in the Indicator Gage.

14. BOLT RING - 61540.

a. Description, Function, and Interrelationship. Three (3) bolt rings are located in a groove near the rear end of the major diameter of the bolt (see Fig. 127). This component, a split steel ring, is approximately 1/2 of an inch at its outside diameter and 1/64 of an inch in thickness. The purpose of the bolt rings is to seal the guiding surfaces between the bolt and bolt carrier to prevent gas leakage.

b. Important Functioning Points and Areas. The width, outside diameter, and internal contour dimensions must be within tolerance to prevent gas leakage past the large bearing diameter of the bolt.

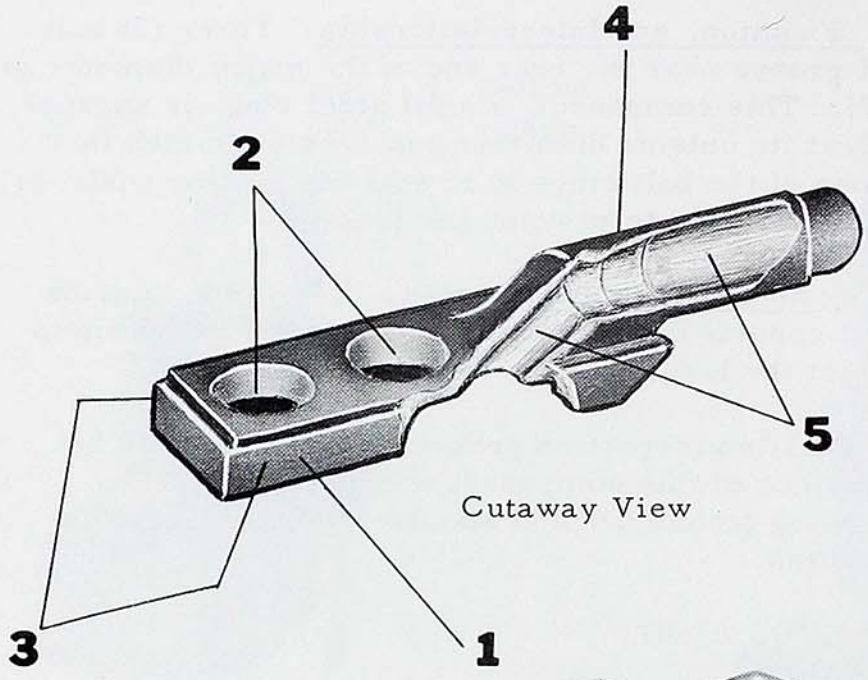
c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661540. Routine gaging techniques and standard visual inspection methods are to be followed.

15. BOLT CARRIER KEY - 61547.

a. Description, Function, and Interrelationship. The bolt carrier key is located longitudinally at the top of the bolt carrier (see Fig. 127). This component, a steel piece, is approximately 2 1/2 inches in length. One portion of the bolt carrier key, the base (Fig. 27-1), contains two (2) clearance holes (Fig. 27-2) for cap screws; these screws are used to attach the bolt carrier key to the bolt carrier. The side faces (Fig. 27-3) of the base act as a key to prevent rotation of the bolt carrier suring recoil and counter recoil motions. A second portion of the bolt carrier key, the gas port portion (Fig. 27-4), is offset and engages the gas tube when the bolt carrier is in the battery position; two (2) intersecting holes (Fig. 27-5), one (1) drilled longitudinally and the other drilled into the mounting face at approximately a 45 degree angle, form a port for directing gas pressure from the gas tube into the bolt carrier. A relief flat (Fig. 27-6) is located on one side of the gas port portion of the bolt carrier key; the purpose of this flat is to provide clearance for the insertion of the cam pin (Fig. 27-7) into the bolt and key assembly.

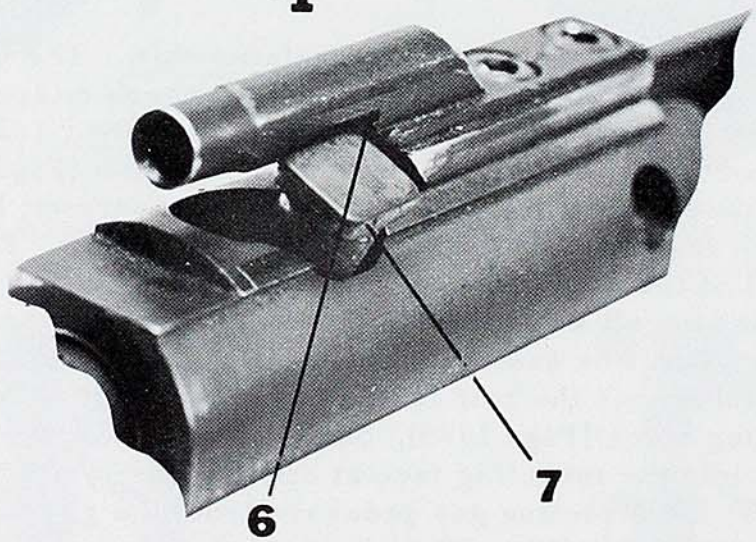
b. Important Functioning Points and Areas. These are as follows:

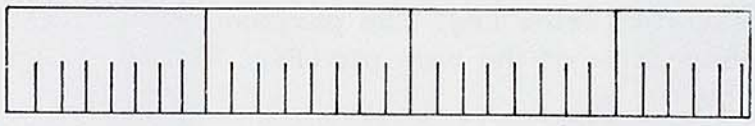
(1) The width of the base must be held within tolerance to insure proper alignment of the key in the bolt carrier.



Cutaway View

1. Base
2. Clearance holes
3. Base side face
4. Gas port
5. Gas pressure port holes
6. Relief flat
7. Cam pin





Relief for Cam Pin

Figure 27. Bolt Carrier Key

(2) The symmetry of the screw holes to the base must be as specified to insure proper alignment of the key with the bolt carrier.

(3) Gas port location dimensions and gas port countersink dimensions must be within tolerance to insure smooth engagement of the gas port portion of the bolt carrier key with the gas tube.

(4) Continuity through the gas holes in the bolt carrier key must be maintained to avoid gas choking.

(5) The locating dimension of the relief flat must be within tolerance to assure assembly of the cam pin in the bolt carrier assembly.

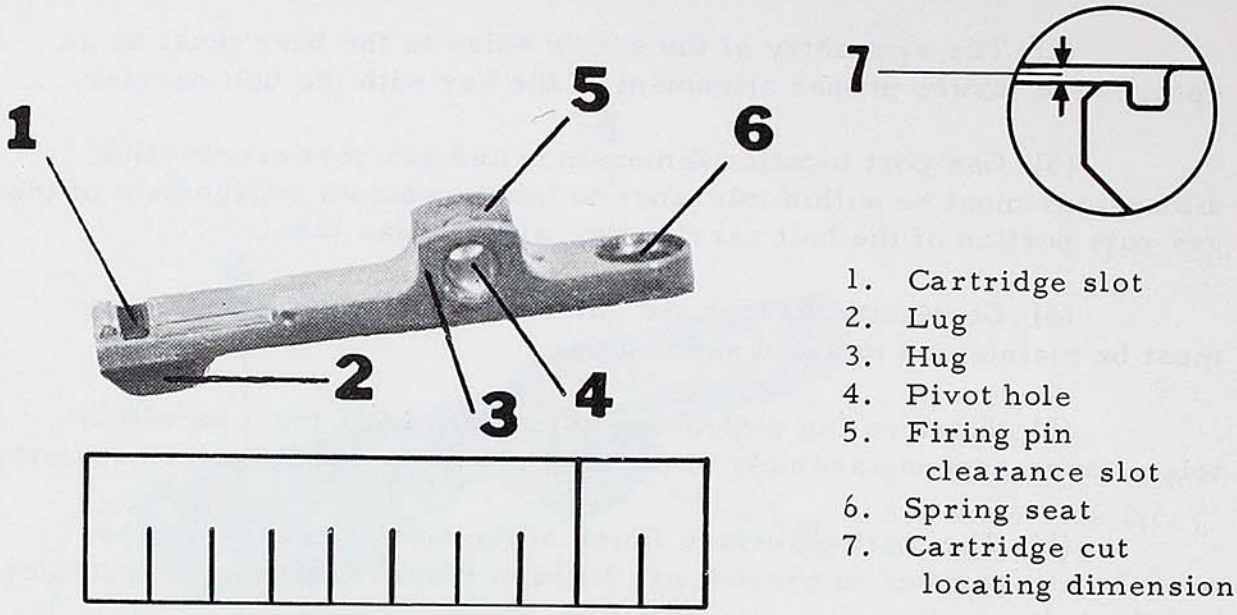
(6) The mating surface finish of the bolt carrier key base must be as specified to prevent gas leakage between the bolt carrier key and the bolt carrier.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661902. Routine gaging techniques and standard visual inspection methods are to be followed.

16. EXTRACTOR - 61562.

a. Description, Function, and Interrelationship. The extractor is located in the bolt (see Fig. 127). This component, a steel part, is approximately 1 1/4 inches in length and 1/4 of an inch in width. A concave cartridge slot (Fig. 28-1) is located at one end of the extractor. The purpose of this slot is to engage the lip of the cartridge so that the extractor will withdraw the spent cartridge from the chamber during recoil. A lug (Fig. 28-2) is located on the same end of the extractor as the cartridge slot, but on the opposite face. A hub (Fig. 28-3) is located approximately one-third of the component's length from the opposite end of the extractor. A pivot hole (Fig. 28-4), located in the extractor hub, provides a pivot for the extractor in the bolt. The firing pin clearance slot (Fig. 28-5), located in the hub, provides clearance for the firing pin when the extractor is assembled in the bolt. The spring seat (Fig. 28-6), a shallow flat bottomed hole, is located at the opposite end of the extractor from the cartridge slot. The spring seat hole provides a seat for the extractor spring; this hole also retains the extractor spring by means of a press fit over an oversize coil at one end of the spring.

b. Important Functioning Points and Areas. These are as follows:



1. Cartridge slot
2. Lug
3. Hug
4. Pivot hole
5. Firing pin clearance slot
6. Spring seat
7. Cartridge cut locating dimension

Figure 28. Extractor.

(1) All dimensions pertaining to the cartridge slot must be within tolerance to insure proper engagement of the extractor with the cartridge lip.

(2) The locating dimensions of the pivot hole and its perpendicularity to the side face of the extractor must be as specified to insure free rotation of the extractor in the bolt and proper engagement of the extractor with the cartridge.

(3) The width of the extractor must be within tolerance to insure free motion of the extractor in the bolt and proper engagement of the extractor with the cartridge.

(4) The depth of the spring seat must be within tolerance to insure sufficient extractor motion for proper engagement of the extractor with the cartridge lip.

(5) The diameter of the spring seat must be within tolerance to insure retention of the extractor spring.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661562. Special gages, some of which are described below, are used to check significant characteristics. Routine test procedures and standard visual inspection methods are to be followed for those characteristics given in

the above referenced SQAP which are not listed below.

(1) Indicator Gage - 8440752. This gage is used to check the locating dimension (Fig. 28-7) of the cartridge cut in relation to the surface of the extractor. The following procedure is to be used:

(a) To set the gage indicator to zero, slide the adapter body (Fig. 29-1) off center on the gage. Adjust the indicator to read zero.

(b) To check the cartridge cut locating dimension, insert the extractor into the slot (Fig. 30-1) on the adapter so that the hub (Fig. 30-2) on the extractor seats against the front surface (Fig. 30-3) of the adapter body. When the extractor is seated firmly against the bottom of the slot, the direct indicator reading must not exceed allowable tolerance as marked on the gage base.

(2) Staging Fixture - 8440754, and Comparator Plate - 8440753. The staging fixture, in conjunction with the comparator plate, is used in an optical comparator to check the following characteristics, which are detailed in the above referenced SQAP.

(a) Location of the pivot hole from the top surface of the extractor.

(b) Location of the stop surface from the pivot hole.

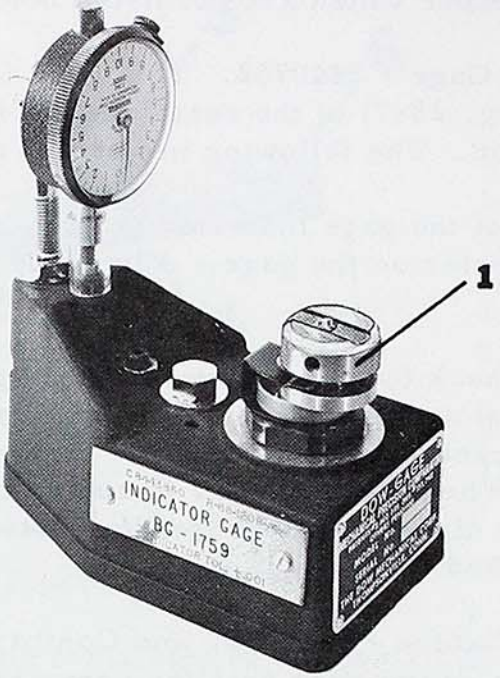
(c) Location of the pivot hole from the cartridge slot end of the extractor.

The following procedure is to be used:

(a) Align the staging fixture with the comparator plate by centering the shadow of the hub of the locating pin (Fig. 31-1) on the setting check lines of the comparator as shown in Figure 32.

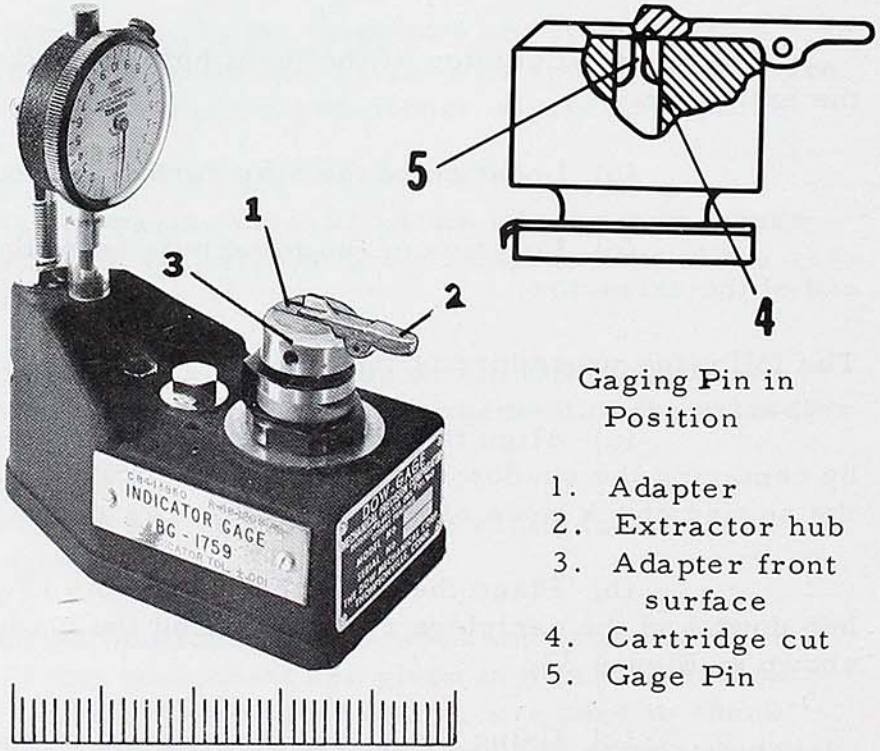
(b) Place the extractor on the pin (Fig. 31-1) with the hub down and the cartridge slot end facing the blade (Fig. 31-2) as shown in Figure 33.

(c) Using the vertical adjusting screw (Fig. 31-3), align the extractor so that it is parallel with the horizontal lines on the



1. Adapter

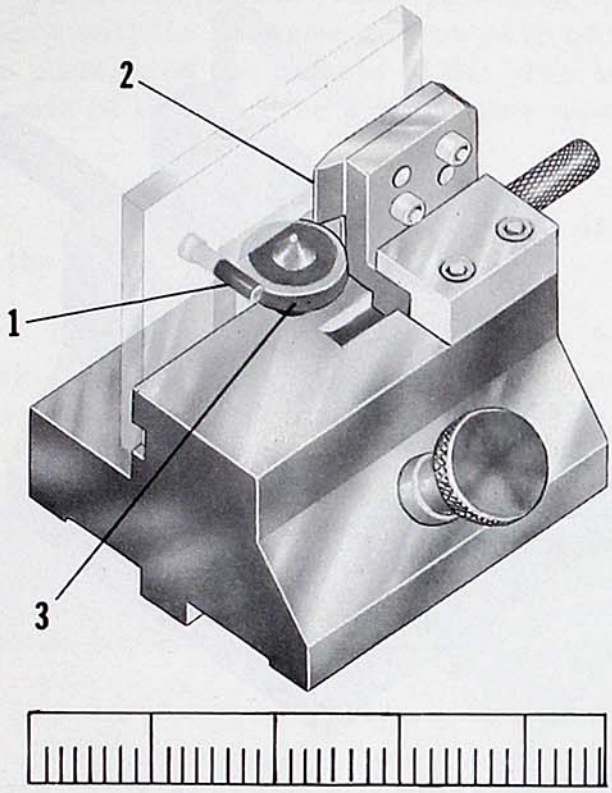
Figure 29. Zero Setting of Indicator Gage.



Gaging Pin in Position

1. Adapter
2. Extractor hub
3. Adapter front surface
4. Cartridge cut
5. Gage Pin

Figure 30. Positioning of Indicator Gage.



1. Locating pin
2. Blade
3. Vertical adjusting screw

Figure 31. Staging Fixture

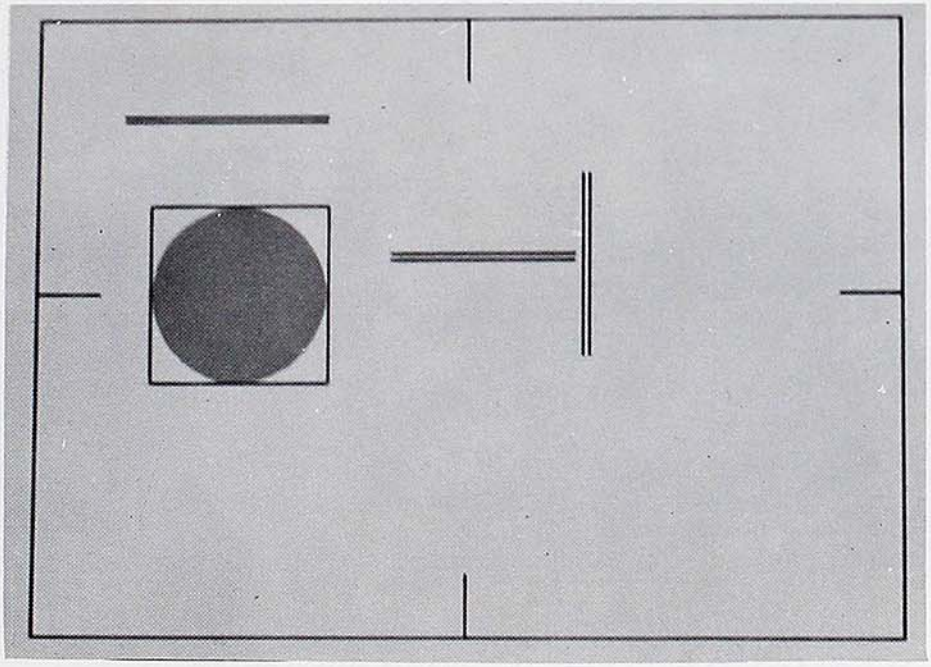


Figure 32. Initial Comparator Setting Check.

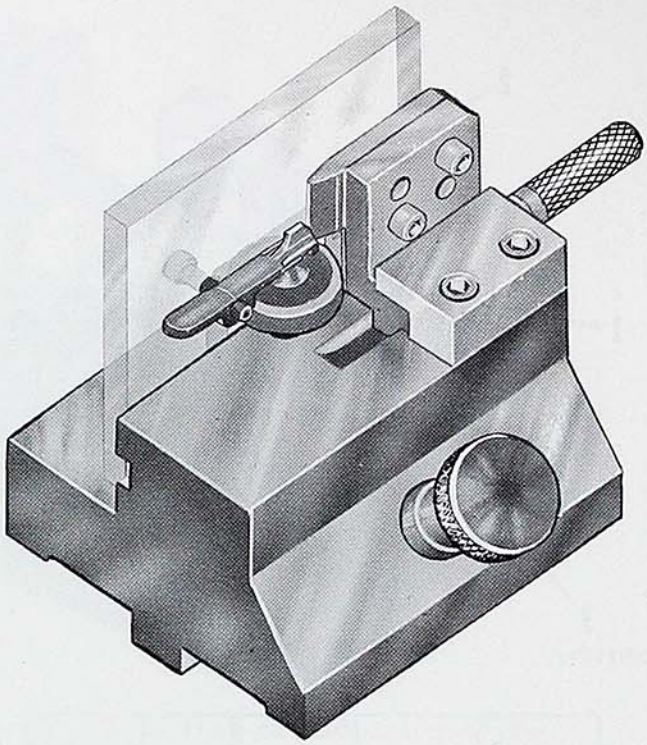


Figure 33. Extractor Positioned in Staging Fixture.

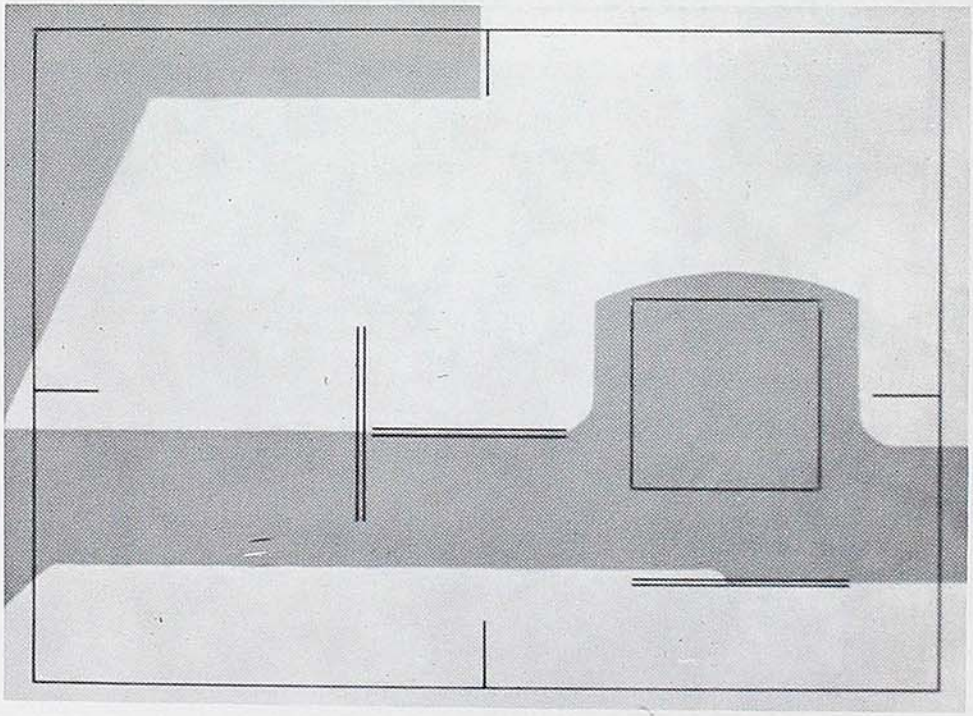


Figure 34. Component Setting for Checking Location of Pivot Hole from Top Surface and Location of Stop Surface from Pivot Hole.

comparator plate. If the extractor is within tolerance, the outline of its top surface will lie between the top pair of horizontal lines on the comparator plate, and the outline of the stop surface will lie between the bottom pair of lines on the comparator plate; this is illustrated in Figure 34.

(d) Slide the blade (Fig. 31-2) against the cartridge slot end of the extractor.

(e) Shift the shadow pattern to the left, using a 0.500 spacer block. If the extractor is within tolerance, the outline of the fixture blade will lie between the vertical lines on the comparator plate, as shown in Figure 35.

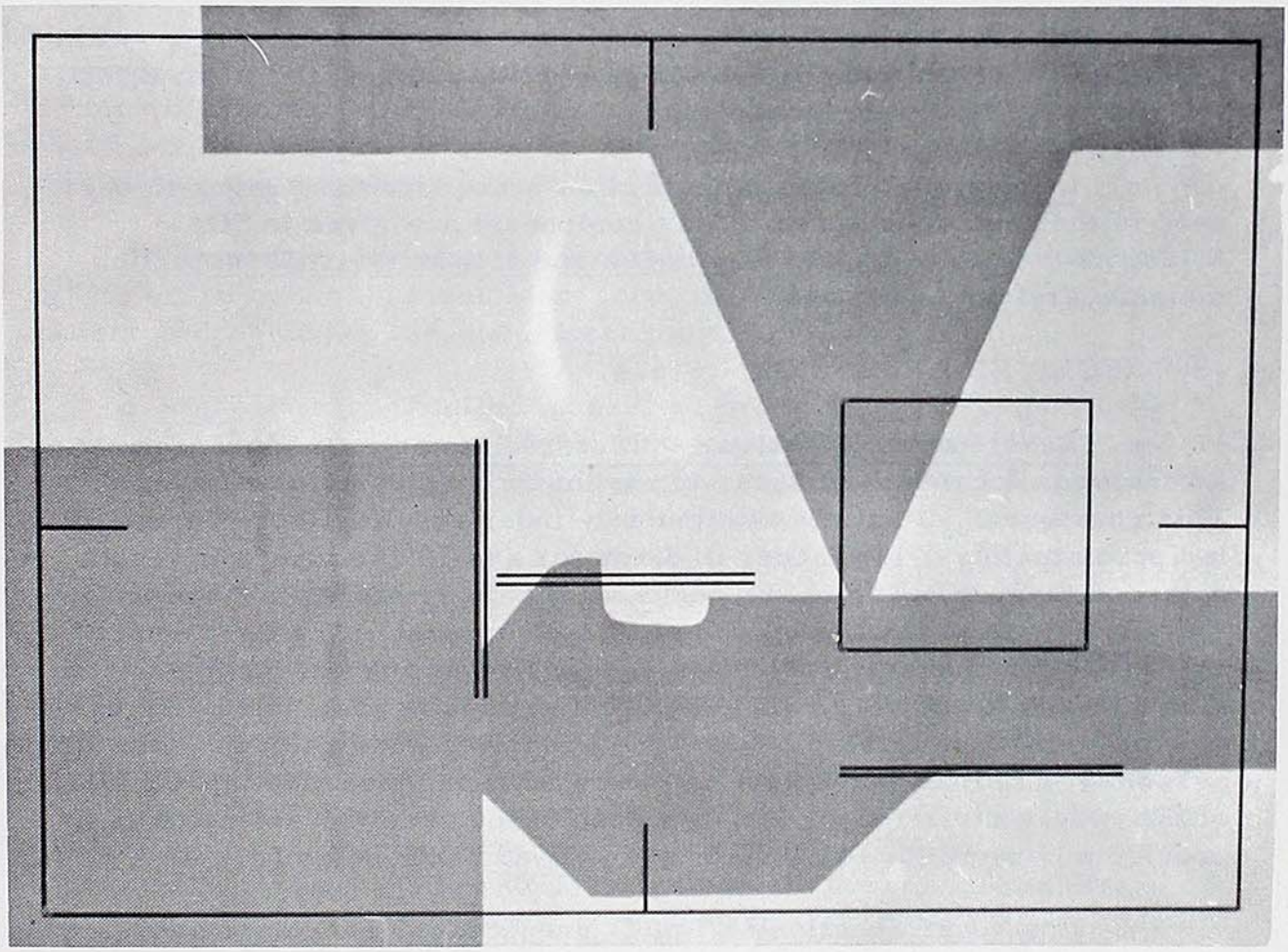


Figure 35. Component Setting for Checking Location of Pivot Hole from Cartridge Slot End of Extractor.

17. EJECTOR - 61564.

a. Description, Function, and Interrelationship. The ejector is located in the bolt (see Fig. 127). This component, a steel pin, is approximately 3/32 of an inch in diameter and 7/16 of an inch in length. A cutout, approximately one-half of the diameter in depth, extends from a point approximately 1/16 of an inch from one end to about the center of the component. The purpose of the ejector is to eject the spent cartridge.

b. Important Functioning Points and Areas. These are as follows:

(1) The ejector must move freely within the bolt.

(2) The length locating dimensions of the cutout must be within tolerance to insure that the ejector can be fully depressed without fouling a cartridge during chambering.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661564. Routine gaging techniques and standard visual inspection methods are to be followed.

18. RECEIVER EXTENSION - 61574.

a. Description, Function, and Interrelationship. The receiver extension is located at the rear of the lower receiver (see Fig. 123). This component, a hollow aluminum cylinder which is closed at one end, is approximately 1 1/8 inches in diameter and 10 1/8 inches in length. A tapped through hole and stepped down diameter having two wrench flats is located at the closed end of this component. The open end is externally threaded to provide a means for mounting the receiver extension onto the lower receiver. When the weapon is assembled, the buttstock assembly is located on the lower receiver assembly; the buttstock assembly is held in place by a capscrew which is threaded into the rear of the receiver extension. The purpose of the receiver extension is to provide a housing for the buffer assembly and action spring.

b. Important Functioning Points and Areas. These are as follows:

(1) The inside diameter must be within tolerance to insure proper fitting and operation of the buffer assembly and action spring in the receiver extension.

(2) The outside diameter, concentricity of the tapped through hole to the outside diameter, and the symmetry of the flats to outside diameter must be as specified to insure proper fitting of the buttstock assembly on the receiver extension.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661574. Routine gaging techniques and standard visual inspection methods are to be followed.

19. BUFFER RETAINER - 61582.

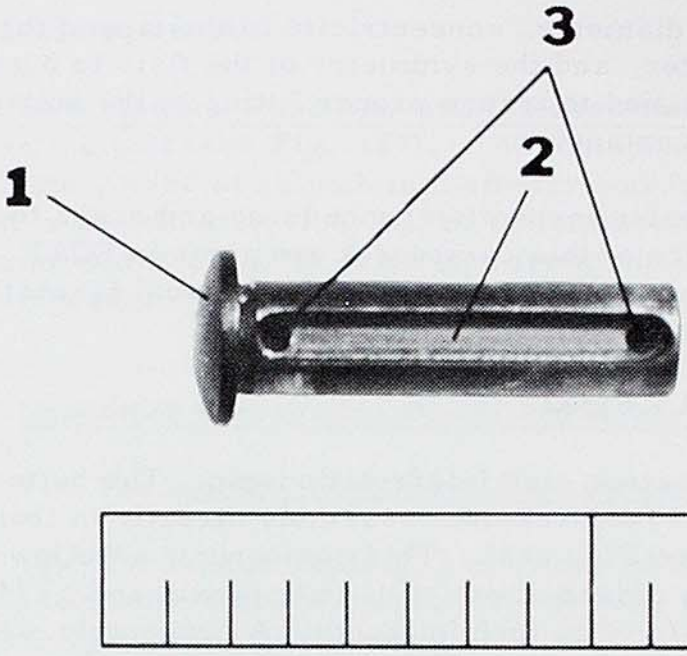
a. Description, Function, and Interrelationship. The buffer retainer is located in the lower receiver assembly directly in front of the receiver extension (see Fig. 123). This component, a hollow steel cylinderical part which is closed at one end, is approximately 1/4 of an inch in diameter and 1/2 of an inch in length. A concentric stem, located on the closed end, retains the buffer in the receiver extension; this allows the weapon to be broken.

b. Important Functioning Points and Areas. The diameter and length of the buffer retainer stem must be within tolerance to insure proper positioning of the buffer assembly.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661582. Routine gaging techniques and standard visual inspection methods are to be followed.

20. TAKEDOWN PIN - 61655.

a. Description, Function, and Interrelationship. The takedown pin is located at the rear of the receiver assemblies (see Fig. 123). This component, a steel pin, is approximately 1/4 of an inch in diameter and 1 inch in length. A head (Fig. 36-1) is located at one end. A detent slot (Fig. 36-2), approximately 3/32 of an inch in width and 1/16 of an inch in depth, runs most of the length of the takedown pin's shank. A detent seat (Fig. 36-3) is located at each end of the detent slot; the purpose of these seats is to index the takedown pin in either its open or closed position. The purpose of the takedown pin is to lock the receiver assemblies together in a closed position.



1. Head
2. Detent slot
3. Detent seat

Figure 36. Takedown Pin.

b. Important Functioning Points and Areas. These are as follows:

(1) The shank diameter must be within tolerance to insure smooth engagement and disengagement in the upper and lower receivers.

(2) The dimensions and locations of the detent slot and the two detent seats must be within tolerance to insure proper seating and smooth operation of the detent pin in the takedown pin.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661655. Routine gaging techniques and standard visual inspection methods are to be followed.

21. TRIGGER SPRING - 61657.

a. Description, Function, and Interrelationship. The trigger spring is located on the trigger in the lower receiver and buttstock assembly (see Fig. 123). This component (Fig. 37) is a steel double coil torsion spring having one and one-half coils per side; each coil measures approximately 7/16 of an inch at its outside diameter. The outside legs of the trigger spring are approximately 1 inch in length.

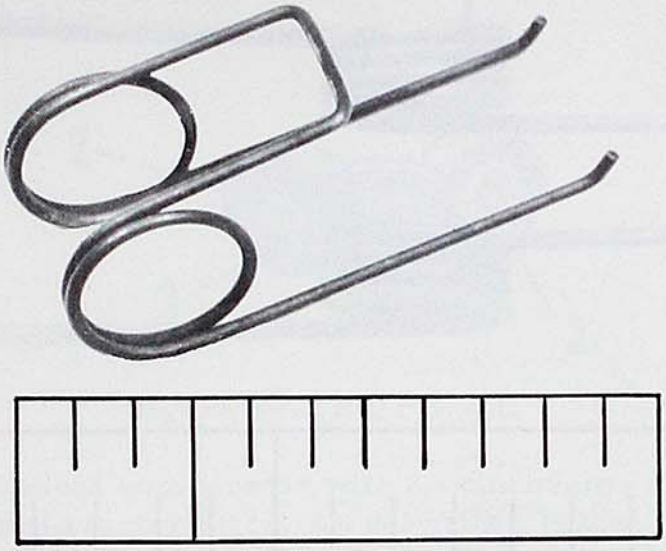


Figure 37. Trigger Spring.

The purpose of the trigger spring is to hold the trigger in the trigger slot on the hammer until the weapon is fired.

b. Important Functioning Points and Areas. The trigger spring must develop sufficient force to hold the trigger in position under shock loading to prevent accidental discharge of the weapon.

c. Inspection. Detailed inspection procedures and test equipment to be used in the final acceptance of this component are given in SQAP M1661657. Routine test procedures and standard visual inspection methods are to be used.

22. HAMMER SPRING - 61697.

a. Description, Function, and Interrelationship. The hammer spring is located on the hammer in the lower receiver and buttstock assembly (see Fig. 123). This component (Fig. 38) is a steel double coil torsion spring having four coils per side; each coil measures approxiamtely 7/16 of an inch at its outside diameter. The outside legs of the hammer spring are approximately 1 5/16 inches in length. The purpose of the hammer spring is to rotate the hammer against the firing pin when the trigger is pulled.

b. Important Functioning Points and Areas. The hammer spring must develop sufficient force to assure sufficient firing pin detent.

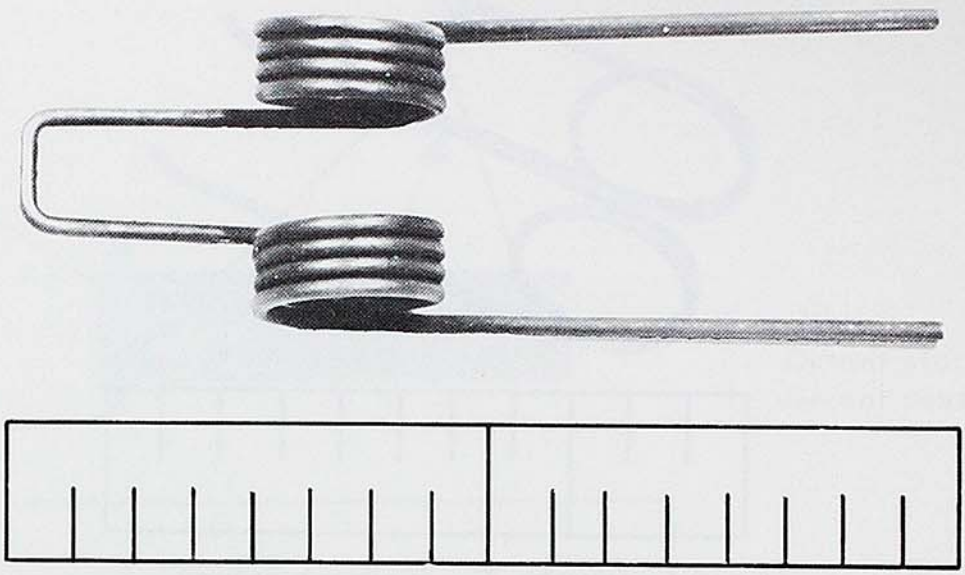


Figure 38. Hammer Spring.

c. Inspection. Detailed inspection procedures and test equipment to be used in the final acceptance of this component are given in SQAP M1661697. Routine test procedures and standard visual inspection methods are to be followed.

23. REAR SIGHT - 61700.

a. Description, Function, and Interrelationship. The rear sight is threaded onto the rear sight windage screw (see Fig. 124). This component, a steel casting approximately 5/16 of an inch in width, consists of a hub from which two sight rings (Fig. 39-1) extend at right angles to each other. Sighting holes (Fig. 39-2) located in each ring provide for a two position range adjustment. A tapped mounting hole (Fig. 39-3) extends through the hub. The purpose of the rear sight is to form, in conjunction with the front sight post, the weapon's sighting system.

b. Important Functioning Points and Areas. The locating dimensions of the sighting holes, with respect both to the centerline of the tapped hole and to each other, must be held within tolerance to assure the accuracy of the weapon in either range adjustment position.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP

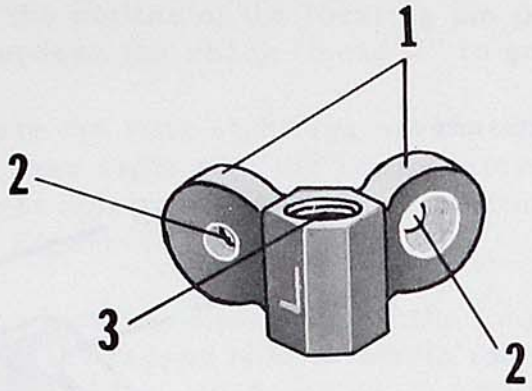


Figure 39. Rear Sight.

M1661700. An optical comparator with a comparator plate is used to check significant characteristics, as described below. Routine test procedures and standard visual inspection methods are to be followed for additional characteristics given in the above referenced SQAP.

(1) Staging Fixture - 8443844, and Comparator Plate - 8443845. The staging fixture, in conjunction with the comparator plate, is used in an optical comparator to check sight hole location dimensions; this characteristic is detailed in the above referenced SQAP. The following procedure is used.

(a) Thread the rear sight onto the staging fixture locating pin with the "L" positioned as shown in Figure 40-1.

(b) Position the rear sight against the stop indicated (Fig. 40-2).

(c) Align the rear sight with the comparator plate by centering the shadow of the sight hole (Fig. 41-1) on the setting check lines (Fig. 41-2) on the comparator. Vertical alignment is accomplished by adjusting the screw (Fig. 40-3).

(d) If the locating dimensions of the short range sight hole are within tolerance, the outline of the hub (Fig. 41-3) will fall between its check lines.

(e) Rotate the rear sight against the stop indicated (Fig. 40-4).

1. Correct positioning of "L"
2. Stop
3. Vertical alignment screw
4. Stop
5. Locating pin point

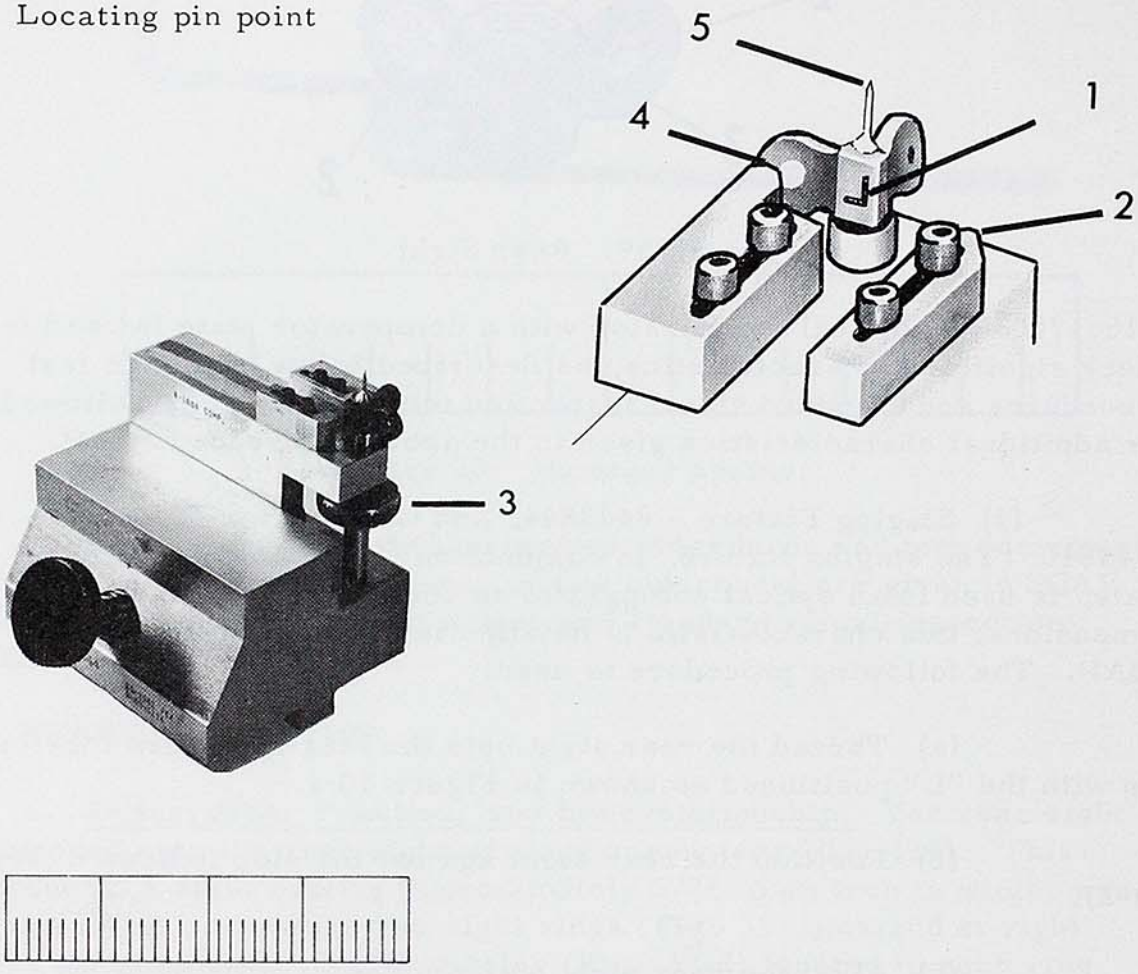


Figure 40. Initial Position of Rear Sight on Staging Fixture.

(f) If the locating dimension of the long range sight hole from the face of the hub is within tolerance, the outline of the sight hole (Fig. 42-1) will fall between the check lines.

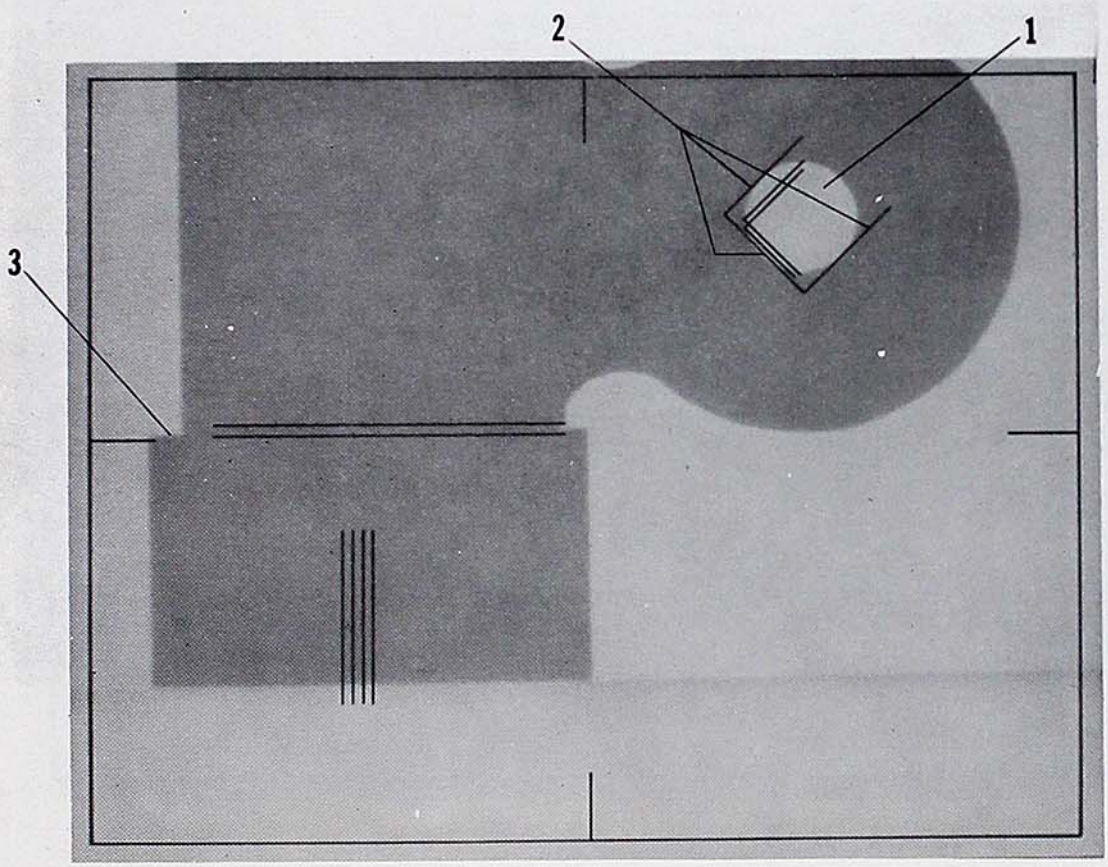
(g) Rotate the rear sight against the stop (Fig. 40-2).

(h) If the locating dimension of the short range sight hole

is within tolerance, the outline of the locating pin point (Figs. 40-5 and 43-1) will fall between the check lines.

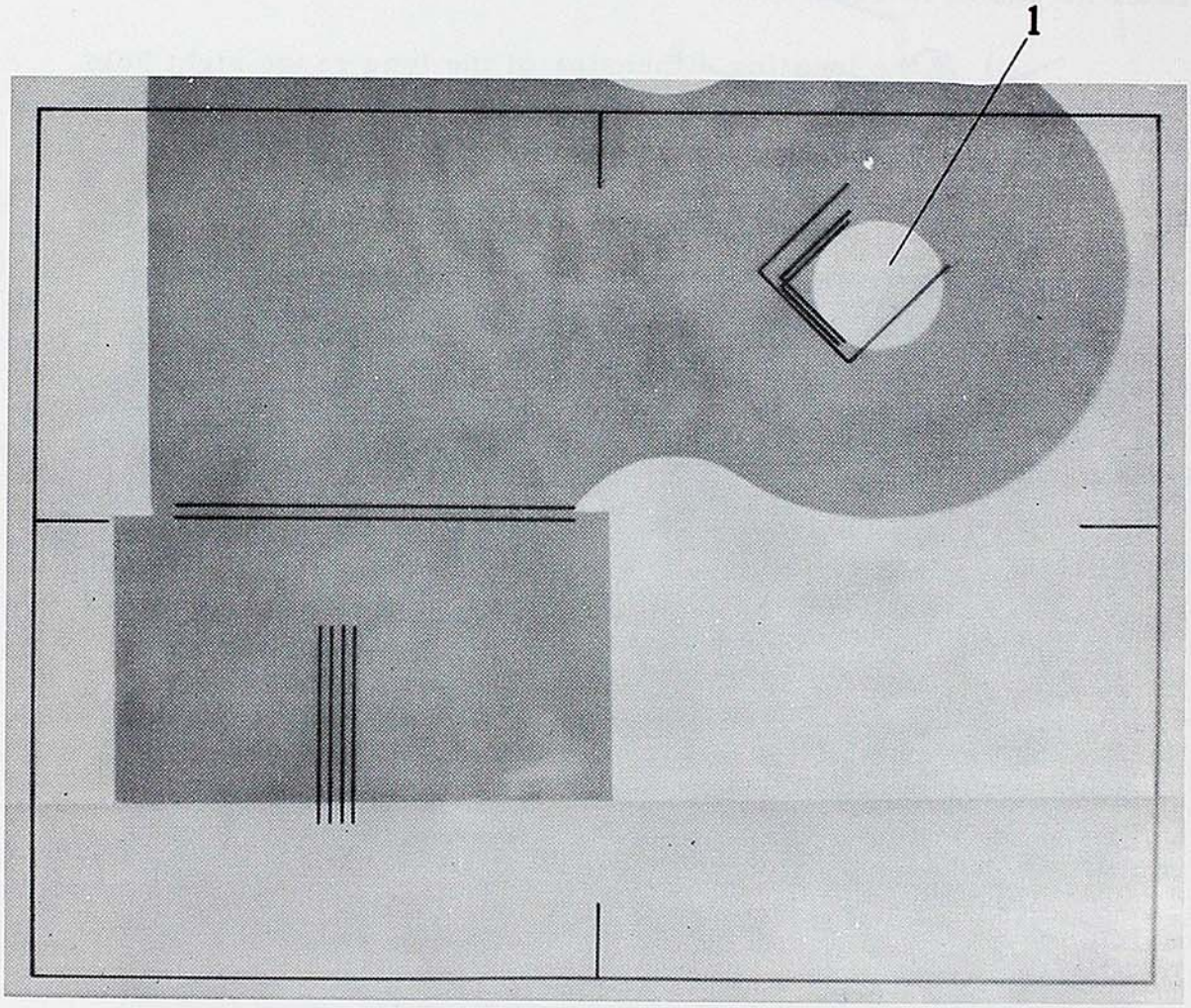
(i) Rotate the rear sight against the stop indicated (Fig. 40-4), and slign the rear sight with the comparator plate by centering the shadow of the sight hole on the setting check lines on the comparator as shown in Figure 41.

(j) If the locating dimension of the long range sight hole from the centerline of the tapped hole is within tolerance, the outline of the locating pin point (Figs. 40-5 and 44-1) will fall between the check lines.



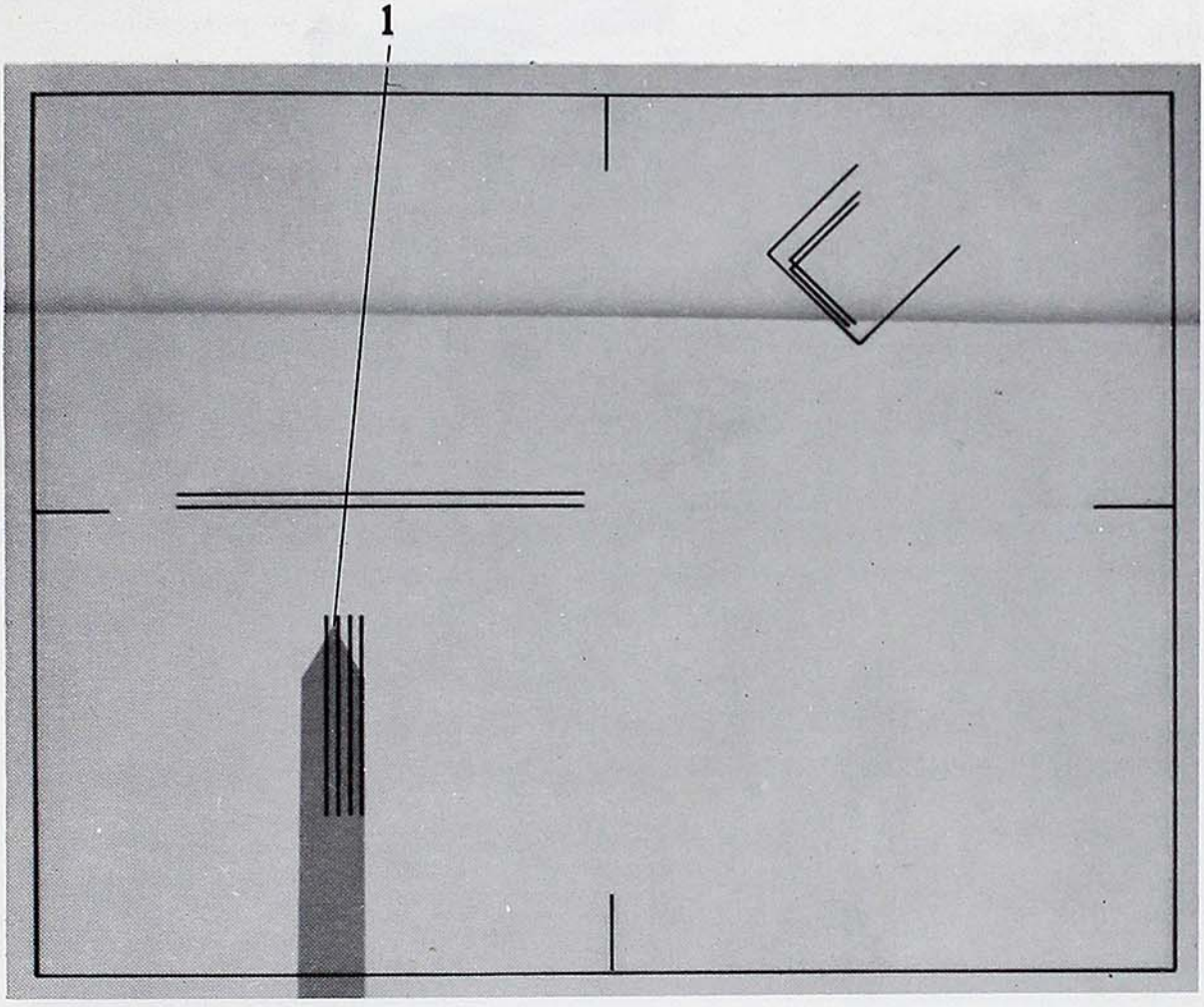
1. Sight hole shadow
2. Setting check lines
3. Hub outline

Figure 41. Rear Sight - Initial Setting and Check of the Short Range Sight Hole Locating Dimension from the Hub Face.



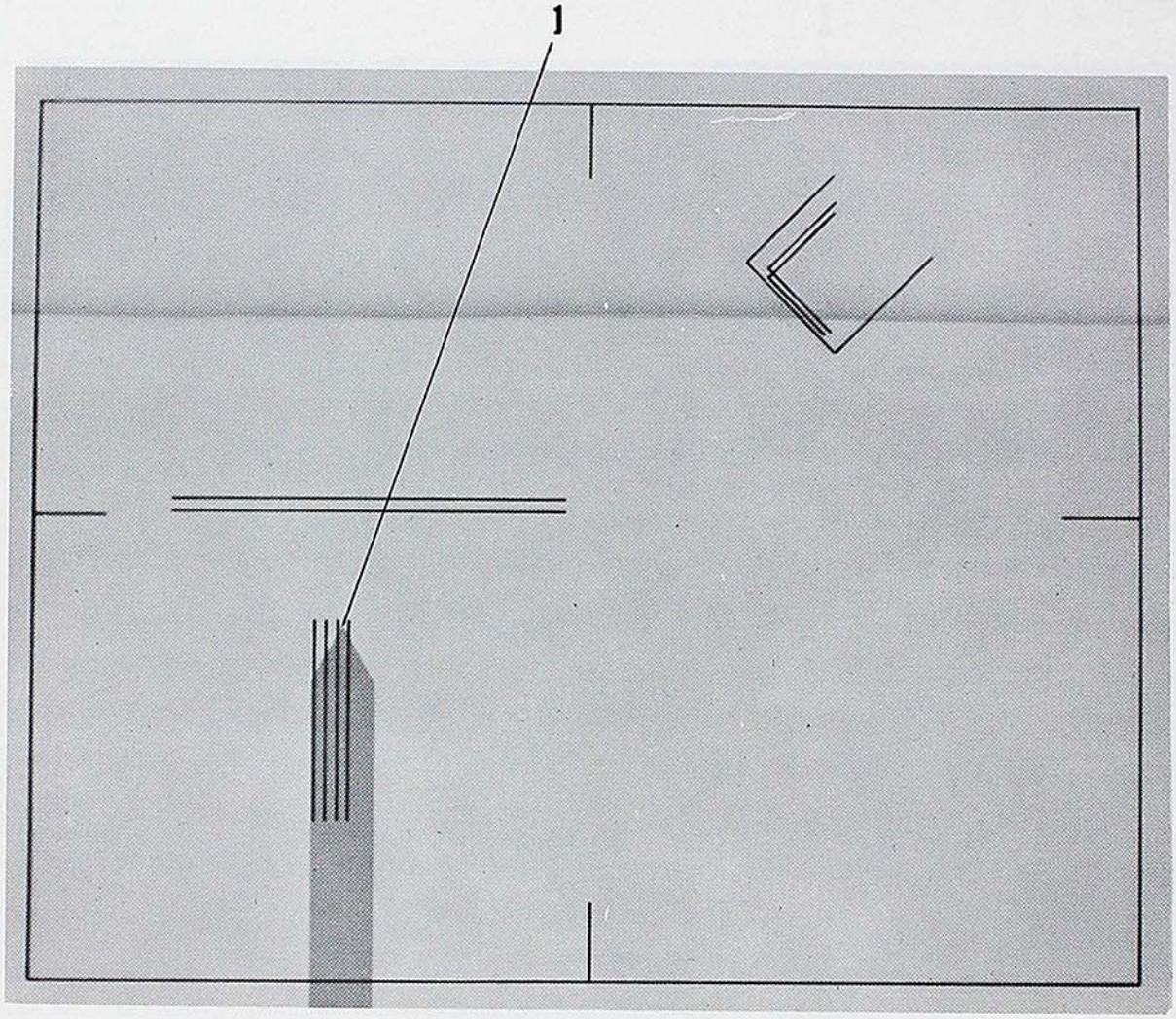
1. Sight hole outline

Figure 42. Rear Sight - Check of the Long Range Sight Hole Locating Dimension from the Hub Face.



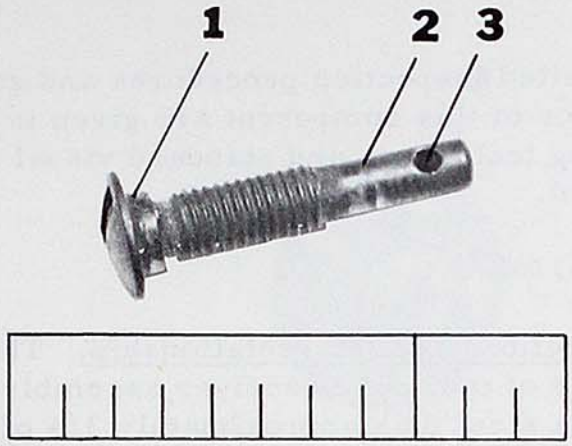
1. Locating pin point outline

Figure 43. Rear Sight - Check of the Short Range Locating Dimension from the Pivot Centerline.



1. Locating pin point outline

Figure 44. Rear Sight - Check of the Long Range Locating Dimension from the Pivot Centerline.



1. Shoulder
2. Stem
3. Transverse roll pin hole

Figure 45. Rear Sight Windage Screw.

24. REAR SIGHT WINDAGE SCREW - 61702.

a. Description, Function, and Interrelationship. The rear sight windage screw is located in a channel at the rear of the handle in the upper receiver assembly (see Fig. 124). This component is approximately one (1) inch in length and is in the form of a steel truss head screw except for the following:

(1) A shoulder (Fig. 45-1) is located directly behind the screw head.

(2) The end of the screw is stepped down for approximately one-half of its length to a stem (Fig. 45-2) approximately 5/32 of an inch in diameter.

(3) A transverse roll pin hole (Fig. 45-3) is located near the end of the stem.

The rear sight windage screw, in conjunction with the windage drum and rear sight detent, provides a means for horizontally adjusting the rear sight. This component rotates in the upper receiver assembly, moving the rear sight back and forth on the screw head.

b. Important Functioning Points and Areas. The locating dimension and symmetry of the roll pin hole with the centerline of the screw must be held within tolerance to assure that the windage drum can be properly mounted on the rear sight windage screw.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661702. Routine gaging techniques and standard visual inspection methods are to be followed.

25. WINDAGE DRUM - 61703.

a. Description, Function, and Interrelationship. The windage drum is located on the right side of the upper receiver assembly (see Fig. 124). This component is a steel disk approximately 3/4 of an inch in diameter; a hub (Fig. 46-1) is located on the face of the windage drum; a transverse roll pin hole (Fig. 46-2) is located in this hub. Five (5) indexing holes (Fig. 46-3) which are equally spaced on a common diameter run through the windage drum; these holes are numbered on the windage drum face. The windage drum is pinned through the roll pin hole to the rear sight windage screw. The windage drum, in conjunction with the rear sight windage screw and rear sight detent, provides a means for horizontally adjusting the rear sight. The rear sight windage screw is indexed by selecting one of the five (5) numbered settings on the windage drum.

b. Important Functioning Points and Areas. These are as follows:

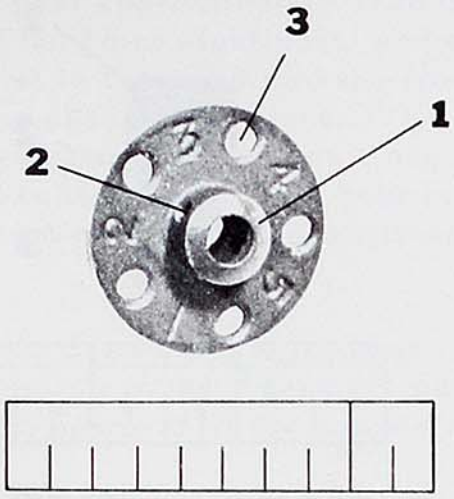
(1) The location and diameter of the five (5) indexing holes must be held within tolerance to insure that the rear sight detent can be properly seated.

(2) The location and symmetry of the roll pin hole to the centerline of the windage drum must be held within tolerance to insure that the windage drum can be properly mounted on the rear sight windage screw.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661703. Routine gaging techniques and standard visual inspection methods are to be followed.

26. CAM PIN - 61704.

a. Description, Function, and Interrelationship. The cam pin is located in the bolt carrier assembly (see Fig. 127). This component,



1. Hub
2. Transverse roll pin hole
3. Indexing holes

Figure 46. Windage Drum .

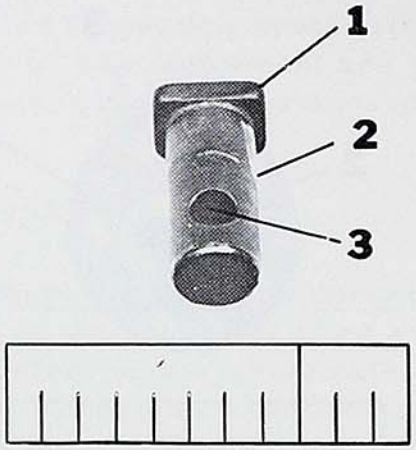
a steel pin, is approximately 5/16 of an inch in diameter and 13/16 of an inch in length. A rectangular head (Fig. 47-1), located at one end of the cam pin, engages the key and cam pin guide in the upper receiver. The cam pin shank (Fig. 47-2) engages the cam pin slot in the bolt carrier. The firing pin hole (Fig. 47-3), located in the shank of the cam pin, allows the firing pin to intersect the cam pin; this retains the cam pin when the bolt carrier assembly is removed from the weapon, and prevents cam pin rotation when the cam pin is disengaged from the key and cam pin slot (i.e., when the bolt is in the battery position). The purpose of the cam pin is to maintain the alignment of the bolt with the barrel extension during recoil and counter recoil and to rotate the bolt into and out of the locked position.

b. Important Functioning Points and Areas. These are as follows:

(1) The shank diameter of the cam pin must be within tolerance to insure free motion of the cam pin in the cam pin slot on the bolt carrier.

(2) The wide dimension of the head must be within tolerance to insure free motion of the cam pin in the upper receiver and to insure proper engagement of the bolt with the barrel extension.

(3) The parallelism of the wide dimension of the head with respect to the firing pin hole must be as specified to insure proper engagement of the bolt with the barrel extension.



1. Head
2. Cam Pin Shank
3. Firing pin hole

Figure 47. Cam Pin.

(4) The symmetry of the wide dimension of the head with respect to the shank diameter must be as specified to insure proper engagement of the bolt with the barrel extension.

(5) The diameter of the firing pin hole must be within tolerance to insure free motion of the firing pin and to insure proper engagement of the bolt with the barrel extension.

(6) The location and symmetry of the firing pin hole to the centerline of the cam pin shank must be as specified to insure free motion of the firing pin.

(7) Material hardness must be as specified to insure adequate strength and service life.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661704. Routine gaging techniques and standard visual inspection methods are to followed.

27. FRONT SIGHT POST - 61706.

a. Description, Function, and Interrelationship. The front sight post is located in the front sight (see Fig. 127). This component is a cylindrical steel part approximately 3/4 of an inch in length. A flange, approximately 3/8 of an inch in diameter and having five (5) equally spaced serrations at its rim, is located near the midpoint of

this component; a small post approximately 1/16 of an inch in diameter forms one side of the front sight post, and a thread the opposite side. The front sight post is threaded into the front sight post mounting hole located at the top of the front sight. The front sight post provides for vertically adjusting the weapon's sighting system by the extent of its engagement in this hole. It is held in its set position by a spring loaded detent, which engages the serrations on the rim of the front sight post.

b. Important Functioning Points and Areas. The front sight post must be concentric in relation to the thread diameter; any deviation will affect the horizontal alignment of the weapon's sighting system.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661706. An optical comparator with a comparator plate is used to check significant characteristics, as described below. Routine test procedures and standard visual inspection methods are to be followed for additional characteristics given in the above referenced SQAP.

(1) Comparator Plate - 11838399. This plate is used to check the outline dimensions of the front sight post which are detailed in the above referenced SQAP. The procedure to be followed is outlined on Drawing Number D11838399. Figure 48 shows the initial comparator setting check. Figure 49 shows the component setting for checking rim and post end dimensions. Figure 50 shows the component setting for thread end dimensions.

28. REAR SIGHT SPRING - 61708.

a. Description, Function, and Interrelationship. The rear sight spring is located directly beneath the rear sight in the upper receiver and barrel assembly (see Fig. 127). This component, a steel spring in the form of a bowed rectangular plate, is approximately 5/8 of an inch in length and 1/2 of an inch in width. The purpose of the rear sight spring is to hold the rear sight in either one of its two operating positions.

b. Important Functioning Points and Areas. Material thickness must be within tolerance so that the rear sight spring is able to provide sufficient force to hold the rear sight in the selected position under shock loading.

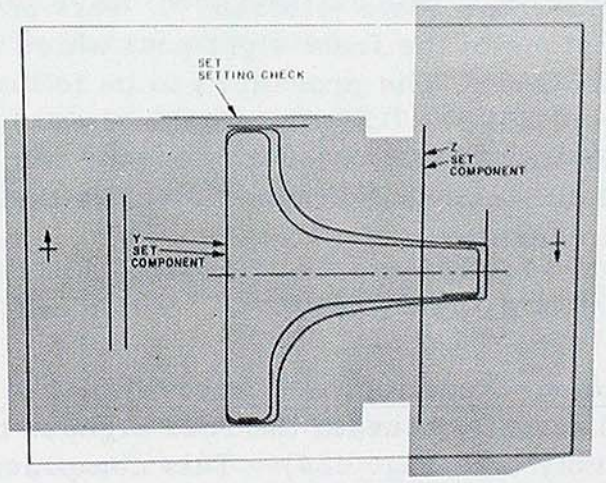


Figure 48. Initial Comparator Setting Check.

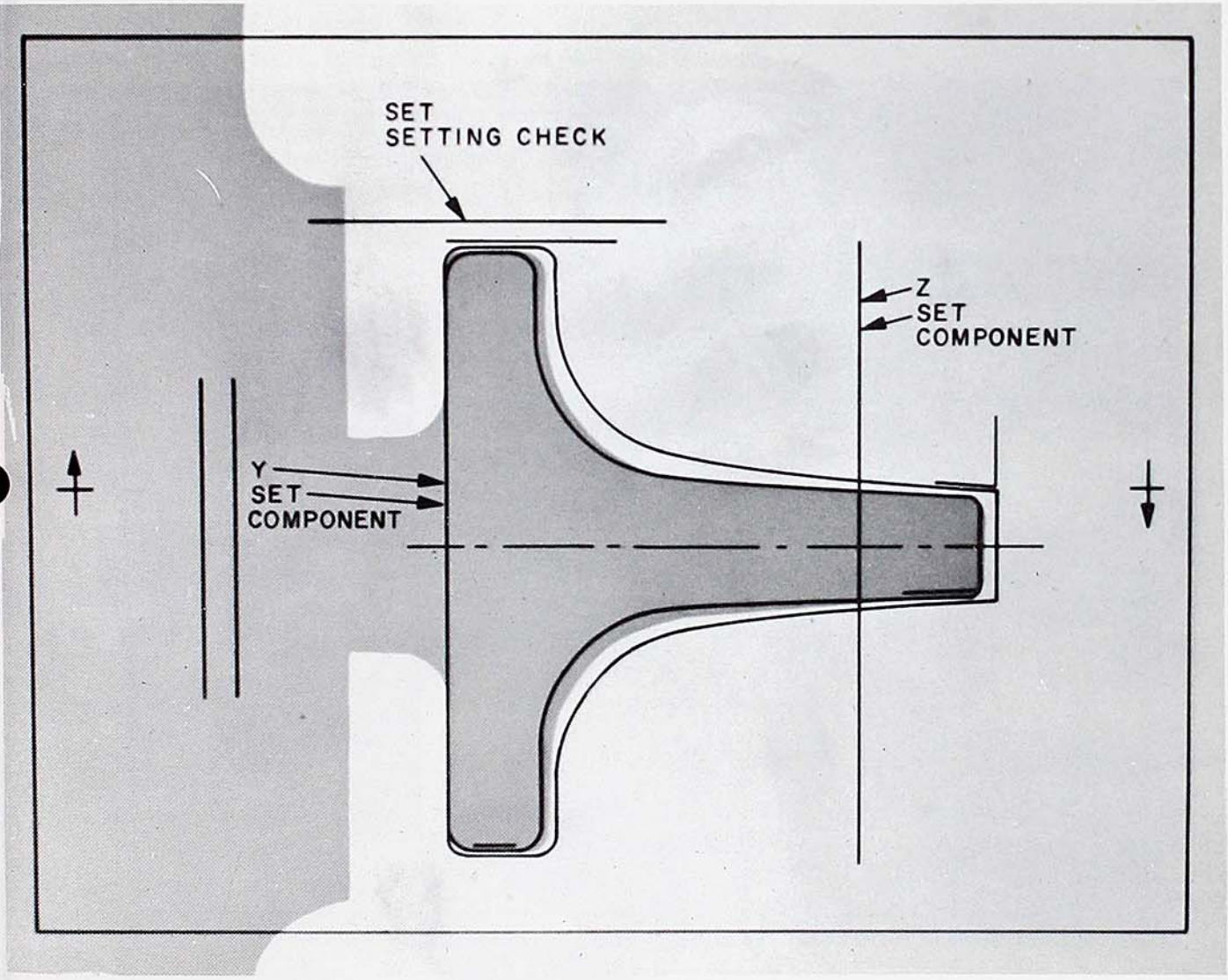


Figure 49. Component Setting for Checking Rim and Post End Dimensions.

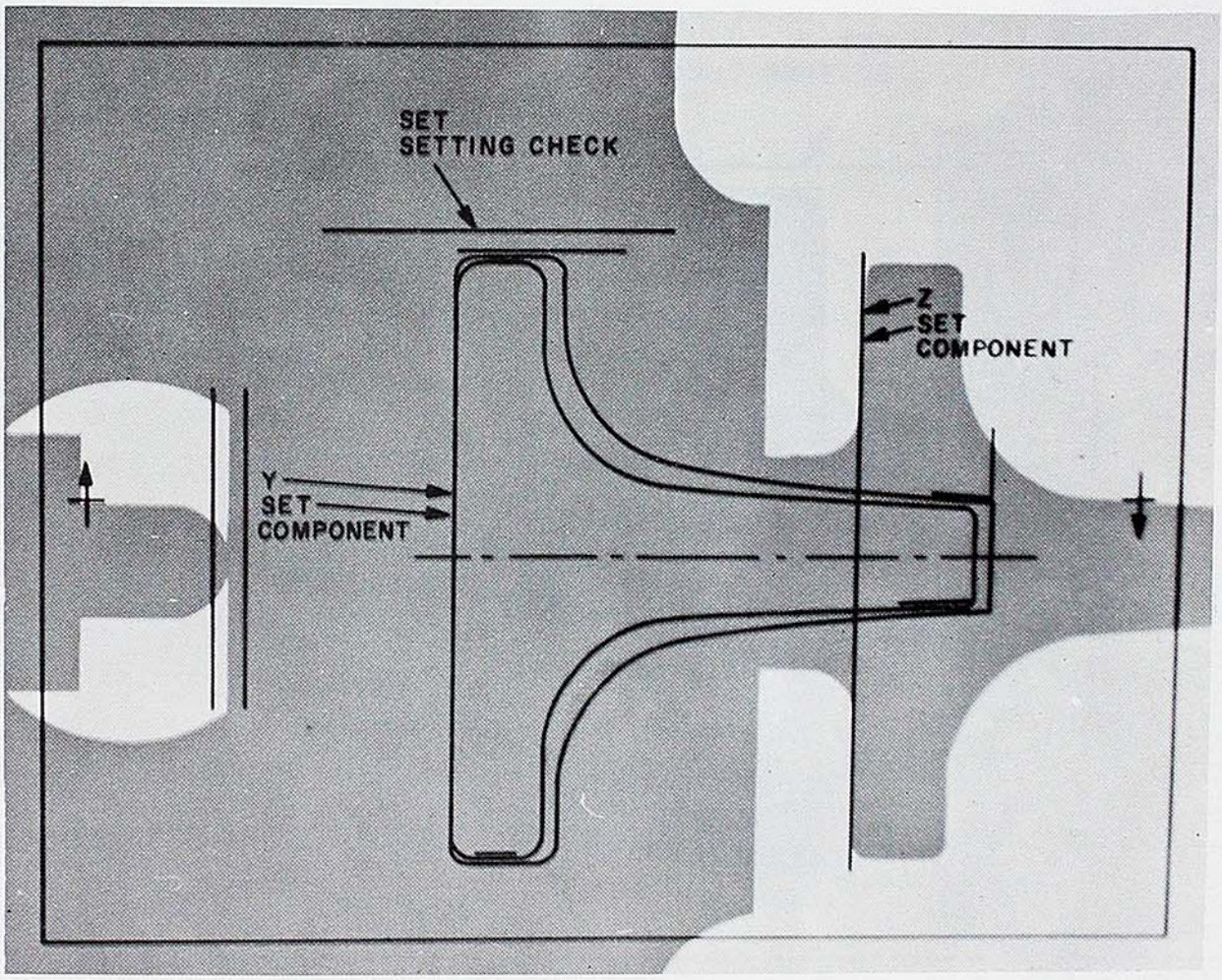


Figure 50. Component Setting for Thread End Dimensions.

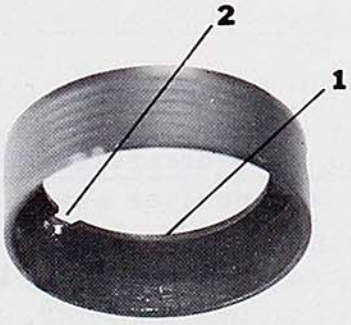
c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661708. Routine gaging techniques and standard visual inspection methods are to be followed.

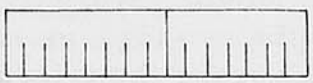
29. HANDGUARD SLIP RING - 61901.

a. Description, Function, and Interrelationship. The handguard slip ring, which forms a part of the barrel nut assembly, is located in the upper receiver and barrel assembly (see Fig. 127). This component, a hollow aluminum cylinder, is approximately 5/8 of an inch in length and 1 7/8 inches in diameter. An internal flange (Fig. 51-1), located approximately one-third of the length from the front end, provides a seat for the handguard slip ring spring welded assembly. A radial notch (Fig. 51-2), located on the internal flange, provides clearance for the gas tube. The purpose of the handguard slip ring is to retain the handguards in position on each side of the barrel.

b. Important Functioning Points and Areas. The contour dimensions of the handguard slip ring must be within tolerance to insure proper engagement with the left and right handguards.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661901. Routine gaging techniques and standard visual inspection methods are to be followed.





1. Internal flange
2. Radial notch

Figure 51. Handguard Slip Ring.

30. BARREL NUT - 61902.

a. Description, Function, and Interrelationship. The barrel nut, which forms a part of the barrel nut assembly, is located in the upper receiver and barrel assembly (see Fig. 124). This component, a hollow steel cylinder, is approximately 1 3/8 inches in diameter and 7/8 of an inch in length. A fluted external flange (Fig. 52-1), located at the front end of the barrel nut, provides a wrench grip and clearance for the gas tube. An external locking ring groove (Fig. 52-2) is located a short distance from the rear of the barrel nut. An internal thread (Fig. 52-3), located at the rear of the barrel nut, mates with the upper receiver. An internal flange (Fig. 52-4), located approximately one-third of the length from the front end of the barrel nut, seats against the locating flange on the barrel extension. The purpose of the barrel nut is to attach the barrel and barrel extension assembly to the upper receiver.

b. Important Functioning Points and Areas. These are as follows:

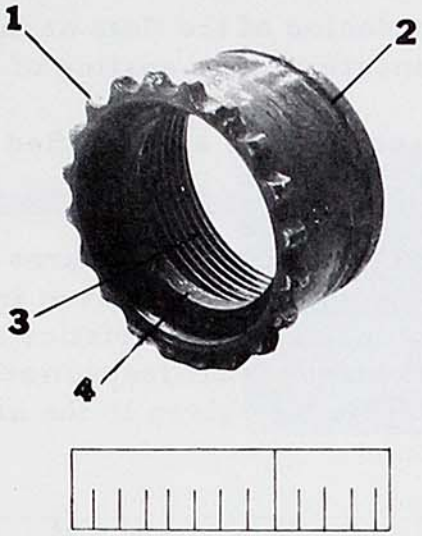
(1) Al thread dimensions must be within tolerance to insure proper mating with the threads on the upper receiver.

(2) All diameters and the concentricities of all diameters to the thread diameter must be within tolerance to insure proper mating with the upper receiver assembly and barrel extension.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661902. Routine gaging techniques and standard visual inspection methods are to be followed.

31. TRIGGER - 61955.

a. Description, Function, and Interrelationship. The trigger is located at the bottom of the lower receiver assembly (see Fig. 123). This component, a steel casting, consists of two (2) legs. One (1) leg, in the approximate shape of a rectangle (Fig. 53-1), is approximately two (2) inches in length, 5/16 of an inch in width, and 7/16 of an inch in height; the other leg, which forms a curved finger grip (Fig. 53-2), is approximately 1 1/4 inches in length. A hub (Fig. 53-3) is located approximately at the junction of the two (2) legs; a hole (Fig. 53-4), located in this hub, provides a pivot for the trigger and disconnect. A clearance slot (Fig. 53-5) in the rectangular leg accommodates the disconnect; a spring seat (Fig. 53-6), located at the midpoint of this slot,



1. External flange
2. External locking ring groove
3. Internal thread
4. Internal flange

Figure 52. Barrel Nut.

provides a seat for the disconnect spring. A machined surface (Fig. 53-7) is located at the forward end of the rectangular leg; this surface, which mates with a notch on the hammer, holds the hammer in a cocked position until the trigger is pulled. The top face (Fig. 53-8) of the rectangular leg seats against the safety cam on the fire control selector when the fire control selector is in the safety position; this prevents trigger movement. Flats (Fig. 53-9) located at each end of the top of the boss provide a seat for the hammer spring. The purpose of the trigger is to provide a means for firing the weapon.

b. Important Functioning Points and Areas. These are as follows:

(1) The locating dimension of the top face of the rectangular leg must be as specified to insure proper functioning of the fire control selector.

(2) The diameter and perpendicularity of the hole in the hub to the machined trigger surface must be within tolerance to insure smooth trigger action.

(3) The width, depth, and symmetry of the clearance slot to the rectangular leg must be within tolerance to insure smooth disconnect action.

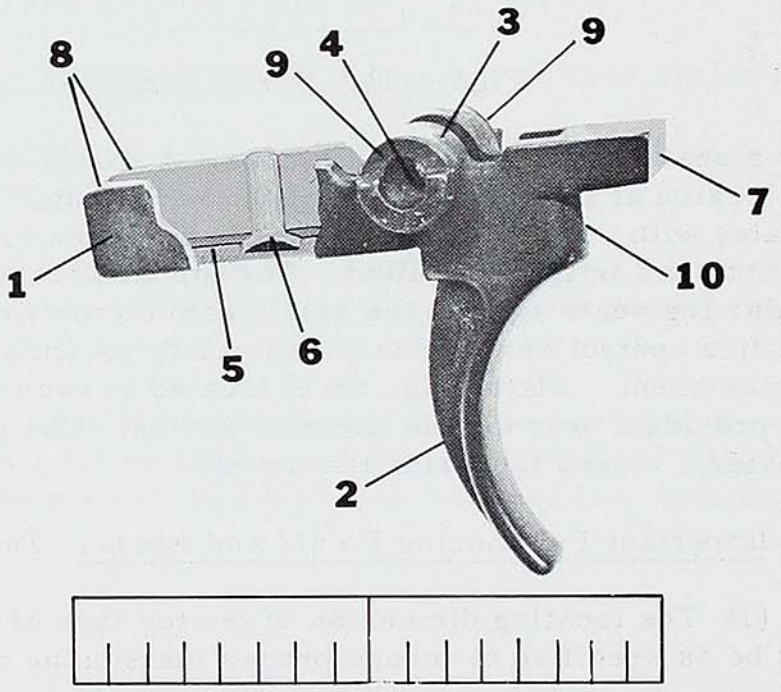
(4) The locating dimension of the spring seat must be within

tolerance to insure proper seating of the disconnect spring.

(5) The locating dimension of the flats at the ends of the hub must be within tolerance to insure proper seating of the hammer spring.

(6) Material hardness must be as specified to insure adequate service life of this component.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661955. A location gage is used to check the characteristics listed below. Routine gaging techniques and standard visual inspection methods are to be followed for additional characteristics given in the above referenced SQAP.



1. Rectangular leg
2. Finger grip leg
3. Hub
4. Hub hole
5. Clearance slot
6. Spring seat
7. Machined surface
8. Rectangular leg top face
9. Flats
10. Finger grip base

Figure 53. Trigger.

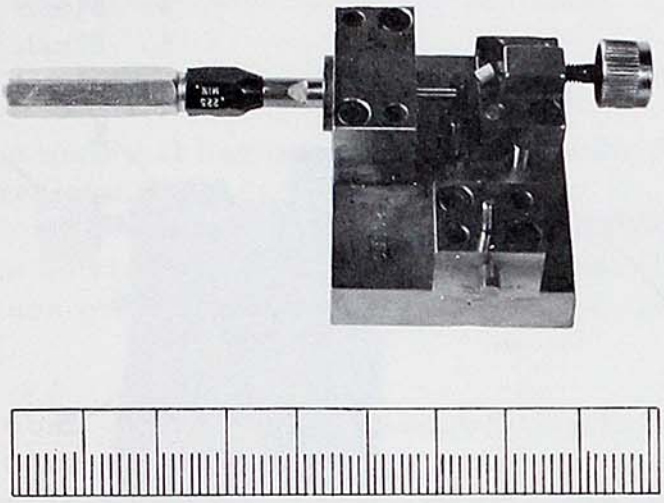


Figure 54. Location Gage in Position to Accept the Trigger.

(1) Location Gage - 8443884. This gage (Fig. 54) is used to check the following characteristics:

(a) Location and depth of the disconnect spring seat.

(b) Location of the base of the finger grip (Fig. 53-10).

The following procedure is to be used:

(a) Place the trigger on the locating pin (Fig. 55-1) on the location gage so that it is seated against the stop (Fig. 55-2).

(b) Clamp the trigger in place by tightening the clamping screw (Fig. 55-3).

(c) Check the location and depth of the disconnect spring seat with the applicable flush pin gage (Fig. 55-4).

(d) Check the location of the base of the finger grip with the applicable flush pin gage (Fig. 55-5).

1. Locating pin
2. Stop
3. Clamping screw
4. Flush pin gage
5. Flush pin gage

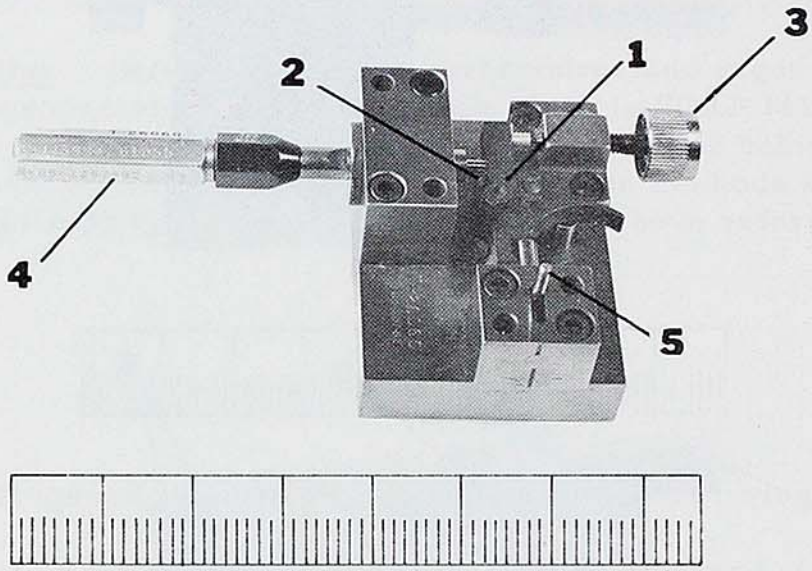


Figure 55. Trigger in Position in Location Gage.

32. FIRE CONTROL SELECTOR - 61959.

a. Description, Function, and Interrelationship. The fire control selector is located in the lower receiver and buttstock assembly above the pistol grip, with the handle positioned on the left side of this assembly (see Fig. 123). This component, a cast steel piece, consists of a shaft (Fig. 56-1) approximately 15/16 of an inch in length with a handle (Fig. 56-2) and a pointer (Fig. 56-3) located at one end. The handle provides the means for rotating the shaft from outside the weapon. The pointer provides a visual indication of the mode (semiautomatic, automatic, or safety) in which the weapon is set. The shaft consists of three (3) cams, each of which incorporates one or more flats. The automatic sear cam (Fig. 56-4), located nearest the handle, positions the automatic sear for either the automatic or semiautomatic mode of operation. The trigger cam, consisting of two (2) sections (Fig. 56-5), engages the trigger when the fire control selector is in the safety position. The disconnect cam (Fig. 56-6), located between the two (2) sections of the trigger cam, engages the disconnect when the fire control selector is in the automatic position. A "V" shaped groove (Fig. 56-7), located opposite

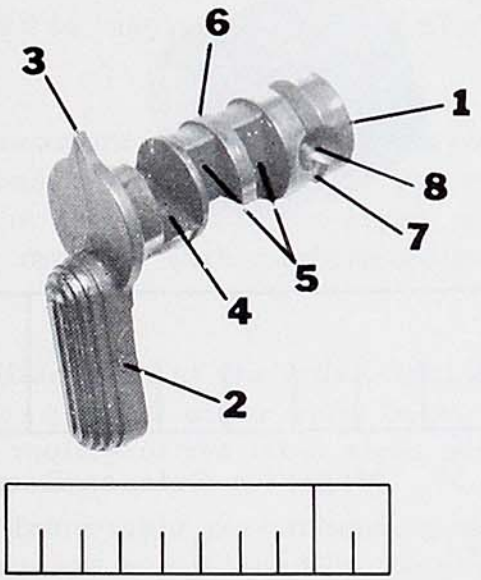
the fire control selector handle, engages the fire control selector detent; this retains the fire control selector in the lower receiver. Three (3) indentations (Fig. 56-8), located 90 degrees from each other, are contained in the "V" shaped groove; these indentations index the fire control selector in one of the three selective positions.

b. Important Functioning Points and Areas. These are as follows:

(1) The material hardness must be as specified to provide adequate wear resistance.

(2) The outside diameter of the shaft must be held within tolerance to insure proper functioning of the firing mechanism components.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1661959. Routine gaging techniques and standard visual inspection methods are to be followed.



1. Shaft
2. Handle
3. Pointer
4. Automatic sear cam
5. Trigger cam sections
6. Disconnect cam
7. "V" shaped groove
8. "V" shaped groove indentations

Figure 56. Fire Control Selector.

33. MAGAZINE RELEASE BUTTON - 62032.

a. Description, Function, and Interrelationship. The magazine release button is located on the right side of the lower receiver (see Fig. 123). This component (Fig. 57), an aluminum extrusion, has a cross section measuring approximately 1/2 by 5/16 of an inch, and is approximately 5/16 of an inch in length. A tapped hole through the magazine release button engages the magazine catch. The purpose of the magazine release button is to provide a means for releasing the magazine.

b. Important Functioning Points and Areas. The magazine release button must move freely in the lower receiver.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1662032. Routine gaging techniques and standard visual inspection methods are to be followed.

Figure 57. Magazine Release Button.

34. FRONT SIGHT - 62068.

a. Description, Function, and Interrelationship. The front sight is located on the barrel at a point approximately one-third of the barrel length from the muzzle end (see Fig. 124). This component, a forged steel part, is approximately 1 1/4 inches in overall length, 7/8 of an inch in overall width, and 3 5/8 inches in overall height. The mounting hole (Fig. 58-1), which runs through both legs of this component, fits over the front sight mounting diameter on the barrel, thus locating the

sight on the weapon. The bayonet mounting lug (Fig. 58-2) is located at the bottom of the sight's front leg. The front sight post mounting hole (Fig. 58-3), a counterbore tapped hole located at the top of the front sight, provides for the mounting and vertical adjustment of the front sight post. The front sight detent hole (Fig. 58-4), located in front of the front sight post mounting hole provides a guide for the front sight post detent and detent spring. Two (2) intersecting gas port holes, one located in the rear leg (Fig. 58-5) and one in the crossbar (Fig. 58-6), provide for the passage of gas from the barrel to the gas tube. A small transverse roll pin hole (Fig. 58-7), located in the crossbar, provides a means for pinning the gas tube to the front sight. The sling swivel hinge (Fig. 58-8), located at the bottom of the rear leg, provides a mounting for the sling swivel.

b. Important Functioning Points and Areas. These are as follows:

(1) The mounting hole diameter must be within tolerance to insure proper fitting of the front sight on the barrel.

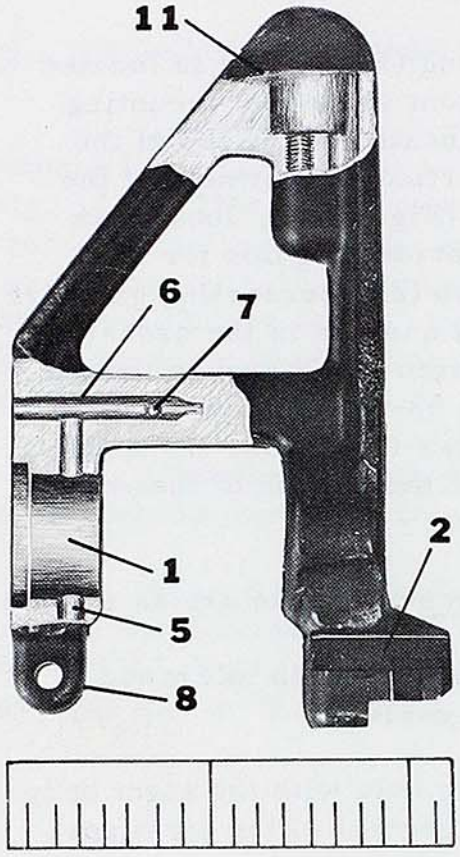
(2) The concentricity of the mounting hole with the sight body must be as specified to insure that proper alignment of the sight post can be achieved.

(3) The locations of the vertical bayonet slot (Fig. 58-9) and the horizontal bayonet slot (Fig. 58-10), the symmetry of the vertical bayonet slot with the centerline of the sight, and the width of the horizontal bayonet slot must be within tolerance to insure proper mating with the bayonet.

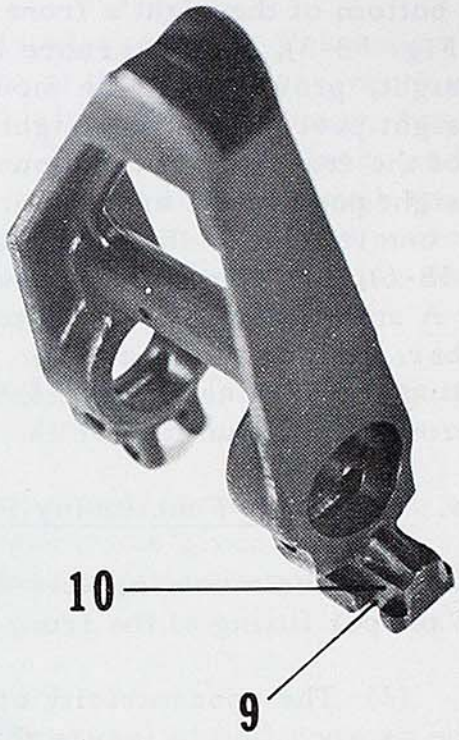
(4) The diameters of the front sight post mounting holes and their concentricities to each other must be as specified to insure proper fit and smooth motion of the front sight post in the front sight.

(5) If the front sight post mounting hole is not symmetrical with respect to the plane established by the centerline of the mounting hole (Fig. 58-1) and the slot (Fig. 58-11) in the top of the front sight, any vertical adjustment of the front sight post will result in a change in the horizontal alignment of the sighting system; in order to minimize this effect, the specified symmetry of the hole must be maintained.

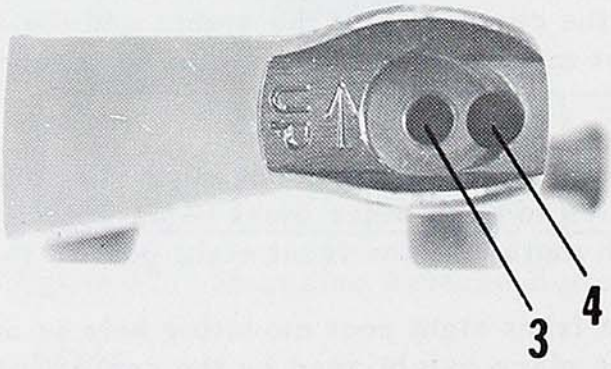
(6) The diameter of the front sight detent hole must be within tolerance to insure smooth motion of the front sight detent and front sight detent spring in the front sight.



Side View



Bayonet Lug View



Top View

Figure 58. Front Sight.

(7) The locating dimension of the front sight detent hole and its symmetry to the slot (Fig. 58-11) must be as specified to insure proper seating of the front sight post detent in the front sight post.

(8) The diameters and locating dimensions of the gas port holes and their symmetry to the centerline of the front sight must be as specified to prevent gas choking due to the misalignment of components.

(9) The diameter of the gas port hole in the crossbar must be as specified to insure as tight a fit as is practical; this is necessary to minimize gas leakage.

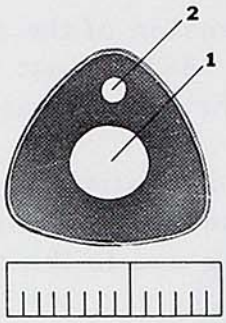
(10) The location of the transverse roll pin hole and the depth of the gas port hole in the crossbar must be as specified to insure proper mating of the gas tube assembly with the front sight.

(11) The diameter of the sling swivel mounting hole must be within tolerance to insure proper mating of the sling swivel to the front sight.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1662068. Routine gaging techniques and standard visual inspection methods are to be followed.

35. HANDGUARD CAP - 62087.

a. Description, Function, and Interrelationship. The handguard cap fits over the front sight mounting diameter on the barrel, with its cupped face against the locating flange on the barrel (see Fig. 124). This component, a steel stamping in the form of a shallow cup, has three (3) identical lobes equally spaced about its perimeter. The distance across the cup is approximately 1 5/8 inches; the depth of the cup is approximately 1/4 of an inch. An extruded hole (Fig. 59-1), located in the center of the cup, positions the handguard cap on the barrel. A short radial slot (Fig. 59-2), located along the centerline of one of the lobes, provides clearance for the gas tube. The handguard cap provides the means for retaining the front end of each handguard assembly. The slotted lobe in the handguard cap is positioned toward the top of the barrel to accommodate the gas tube in the front sight and gas tube assembly. The front sight, when pinned to the barrel, holds the handguard cap in place.



1. Extruded hole
2. Radial slot

Figure 59. Handguard Cap.

b. Important Functioning Points and Areas. The dimensions of the handguard cap must be within tolerance to insure proper fit with its mating parts.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1662087. Routine gaging techniques and standard visual inspection methods are to be followed.

36. BOLT CATCH PLUNGER - 62178.

a. Description, Function, and Interrelationship. The bolt catch plunger is located in the lower receiver (see Fig. 123). This component, a cylindrical steel pin, is approximately 5/32 of an inch in diameter and 7/16 of an inch in length; one end is a full spherical radius, and the other is stepped down to approximately 3/32 of an inch in radius for approximately one-half of its length. Its purpose is to transmit spring pressure to the bolt catch.

b. Important Functioning Points and Areas. The bolt catch plunger must move freely in the lower receiver assembly.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1662178. Routine gaging techniques and standard visual inspection methods are to be followed.

37. PISTOL GRIP - 62194.

a. Description, Function, and Interrelationship. The pistol grip is located on the bottom of the lower receiver assembly (see Fig. 123).

This component, a cylindrically shaped molded phenolic piece, is approximately four (4) inches in length; it has a hollow elliptical cross section approximately 1 3/4 inches in width and 1 1/4 inches in depth. A diamond pattern (Fig. 60-1) is molded on the elongated faces. Two (2) triangularly shaped locating lugs (Fig. 60-2), projecting from the top of the pistol grip, provides the means for mounting this component. A screw hole (Fig. 60-3), positioned between the locating lugs, accommodates the pistol grip screw. The fire control selector detent hole (Fig. 60-4) is located in the right hand locating lug; this hole provides a guide for the fire control selector detent and detent spring. The purpose of the pistol grip is to provide a means for holding the weapon.

b. Important Functioning Points and Areas. These are as follows:

(1) The location of the mounting surfaces on the locating lugs must be within tolerance to insure proper seating of the pistol grip on the lower receiver assembly.

(2) The width dimension between the locating lugs must not be undersize in the area near the base of the lugs; if the slot is undersize in this area, pistol grip breakage may result from wedging action when the pistol grip mounting screw is tightened.

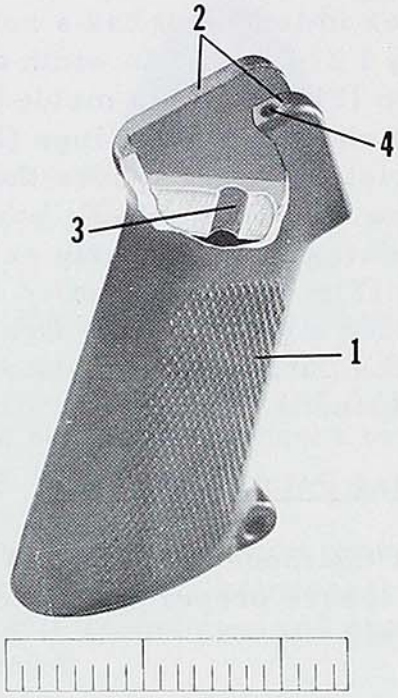
(3) The locating dimension of the mounting hole must be within tolerance to insure assembly of the mounting screw.

(4) The locating dimension of the fire control selector detent hole must be within tolerance to insure proper mating and retention of the fire control selector with the fire control selector detent.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1662194. Routine gaging techniques and standard visual inspection methods are to be followed.

38. RECEIVER PIVOT PIN - 62221.

a. Description, Function, and Interrelationship. The receiver pivot pin is located at the front end of the lower receiver assembly (see Fig. 123). This component, a steel pin, is allroximately 1/4 of an inch in diameter and 1 5/16 of an inch in length. A head (Fig. 61-1) having a single flat is located at one end of the receiver pivot pin. A



1. Molded diamond pattern
2. Locating lugs
3. Pistol grip screw hole
4. Fire control selector detent hole

Figure 60. Pistol Grip.

slot (Fig. 61-2) runs along the pin shank from approximately the center of the head of the component; a shallow hole (Fig. 61-3) is located at each end of the slot. The purpose of the receiver pivot pin is to provide a pivot for the upper and lower receiver assemblies.

b. Important Functioning Points and Areas. These are as follows:

(1) The shank diameter must be within tolerance to insure free movement between the receivers.

(2) The dimensions and locations of the slot and the two (2) shallow holes and their symmetry to the shank diameter must be within tolerance to insure proper seating and smooth operation of the detent pins.

(3) The location of the flat on the head must be within tolerance to insure proper assembly of the component in the lower receiver assembly.

c. Inspection. Detailed inspection procedures and gages to be

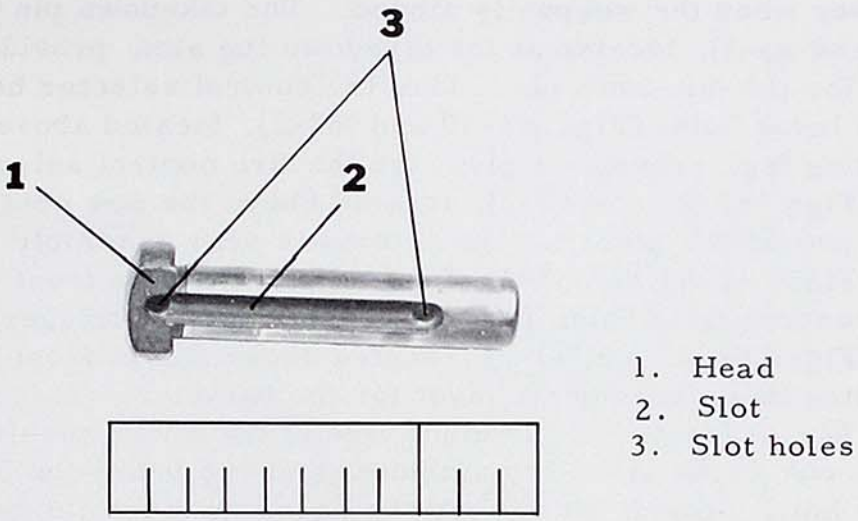


Figure 61. Receiver Pivot Pin.

used in the final acceptance of this component are given in SQAP M1662221. Routine gaging techniques and standard visual inspection methods are to be followed.

39. LOWER RECEIVER - 62222.

a. Description, Function and Interrelationship. The lower receiver is located in the lower receiver and buttstock assembly (see Fig. 123). This component, a forged aluminum piece, is approximately eight (8) inches in length, 1 3/8 inches in width, and four (4) inches in overall height. The receiver hinge (Fig. 62-1), located at the front end of the lower receiver, provides a pivot for the upper and lower receivers. The magazine well (Fig. 62-2), located toward the front end of the lower receiver, houses and positions the magazine. The magazine release slot (Fig. 62-3), located behind the magazine well in the right side of the lower receiver, provides a guide for the magazine release button. Two (2) trigger guard pivot holes (Fig. 62-4), located at the bottom of the lower receiver, provide a mounting for the trigger guard. The pistol grip lug (Fig. 62-5), located near the rear and at the bottom of the lower receiver, provides a mounting for the pistol grip. The buttstock locating hole (Fig. 62-6), a shallow hole located in the rear face of the lower receiver, aids in positioning the buttstock assembly on the lower receiver. The receiver extension hole (Fig. 62-7), a threaded hole located in the rear face of the lower receiver, provides a mounting for the receiver extension. The takedown lug slot (Fig. 62-8), located near the rear and at the top of the lower receiver, engages a lug on the lower

receiver when the weapon is closed. The takedown pin hole (Figs. 62-9 and 63-1), located at the takedown lug slot, provides a mounting and guide for the takedown pin. The fire control selector hole (i.e., the safety lever hole) (Figs. 62-10 and 62-2), located above the pistol grip mounting lug, provides a pivot for the fire control selector. The sear hole (Figs. 62-11 and 63-3), located above the fire control selector hole, provides a pivot for the automatic sear assembly. The trigger hole (Figs. 62-12 and 63-4), located below and in front of the fire control selector mounting hole, provides a pivot for the trigger. The hammer hole (Figs. 62-13 and 63-5), located above and in front of the trigger mounting hole, provides a pivot for the hammer. Three (3) detent holes (Fig. 62-14) located in the right side of the lower receiver, one at the hinge, one at the takedown pin hole, and one below the fire control selector hole, provide guides for the receiver pivot pin detent, takedown pin detent, and fire control selector detent. The bolt catch slot (Fig. 63-6), located behind the magazine well and on the left side of the lower receiver, provides a guide for the bolt catch. The bolt catch hole (Fig. 63-7), located at the top of the bolt catch slot, provides a pivot for the bolt catch. The bolt catch plunger hole (Fig. 63-8), located below the bolt catch slot, provides a guide for the bolt catch plunger. The magazine catch slot (Fig. 63-9), located on the left side of the magazine well, provides a guide for the magazine catch. The buffer retainer hole (Fig. 63-10), located on the top surface of the lower receiver behind the takedown pin, provides a mounting for the buffer retainer.

b. Important Functioning Points and Areas. Reference planes for the lower receiver are as follows:

(1) The plane through the vertical centerline of the receiver hinge.

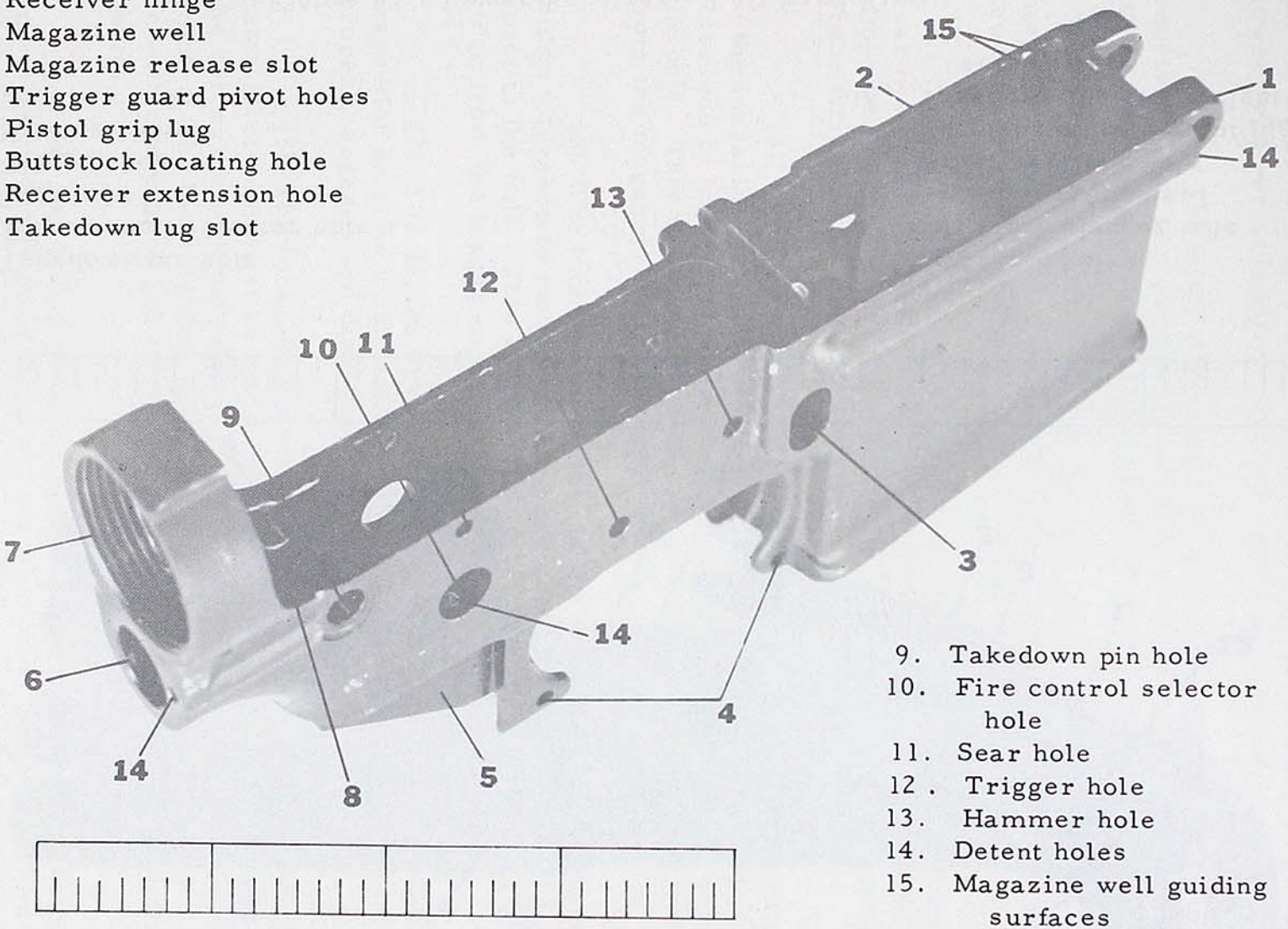
(2) The plane containing the horizontal centerline of the receiver hinge and takedown pin hole.

(3) The plane formed by the inside surface of the right lug of the receiver hinge (Fig. 63-11) and the right side surface of the takedown lug slot (Fig. 63-12).

Important functioning points and areas are as follows:

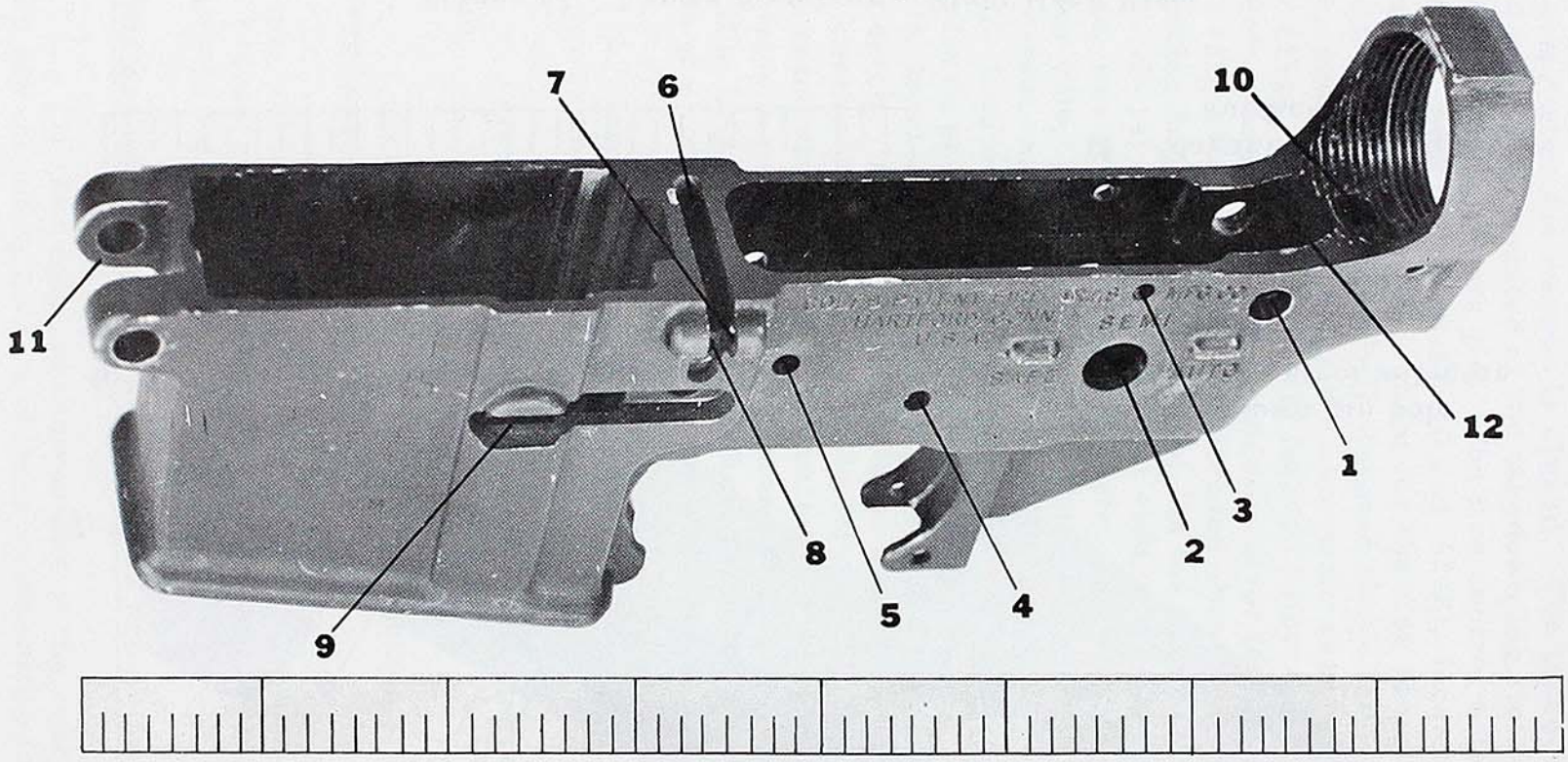
(1) The locating dimensions of the receiver hinge and the takedown pin mounting hole, and their relationship to the above referenced

1. Receiver hinge
2. Magazine well
3. Magazine release slot
4. Trigger guard pivot holes
5. Pistol grip lug
6. Buttstock locating hole
7. Receiver extension hole
8. Takedown lug slot



9. Takedown pin hole
10. Fire control selector hole
11. Sear hole
12. Trigger hole
13. Hammer hole
14. Detent holes
15. Magazine well guiding surfaces

Figure 62. Lower Receiver - Right Hand View.



1. Takedown pin hole
2. Fire control selector hole
3. Sear hole
4. Trigger hole
5. Hammer hole
6. Bolt catch slot
7. Bolt catch hole
8. Bolt catch plunger hole
9. Magazine catch slot
10. Buffer retainer hole
11. Receiver hinge - right lug
12. Takedown lug slot - right side surface

Figure 63. Lower Receiver - Left Hand View.

planes must be within tolerance to insure proper mating of the upper and lower receiver assemblies when the weapon is closed.

(2) The width and symmetry of the takedown lug slot to the receiver hinge slot must be as specified to insure proper mating of the upper and lower receiver assemblies when the weapon is closed.

(3) The parallelism of the takedown lug slot to the receiver hinge slot must be as specified to insure proper mating of the upper and lower receiver assemblies when the weapon is closed.

(4) The locating dimensions of the fire control selector hole, sear hole, hammer hole, and trigger hole, and their relationship to the above referenced planes must be within tolerance to insure proper mating of the firing mechanism components.

(5) The locating dimensions of the guiding surfaces (Fig. 62-15) in the magazine well and their parallelism to each other must be within tolerance to insure proper positioning of the magazine with respect to the bolt. This is essential to insure proper stripping of the cartridge from the magazine during counter recoil.

(6) The locating dimension of the magazine catch slot must be within tolerance to insure proper positioning of the magazine with respect to the bolt. This is essential to insure proper stripping of the cartridge from the magazine during counter recoil.

(7) The depths of the magazine catch slot and the magazine release slot must be within tolerance to insure that the magazine catch properly engages and disengages the magazine.

(8) The locating dimensions of the bolt catch slot and the bolt catch pivot hole must be within tolerance to insure proper engagement of the bolt catch with the magazine and with the bolt when the magazine is empty. The locating dimensions of the bolt catch pivot hole must also be within tolerance to insure proper clearance of the bolt with the bolt catch.

(9) The locating dimensions of the trigger guard pivot holes and their parallelism to their related slots must be as specified to insure proper mating of the trigger guard assembly with the lower receiver.

(10) The width of the pistol grip mounting lug must be within tolerance to insure proper mating of the pistol grip with the lower receiver.

(11) The thread on the receiver extension hole must be within tolerance to insure proper mating of the receiver extension with the lower receiver.

(12) The alignment of the fire control detent hole with the fire control selector hole (i.e., the safety lever hole) must be within tolerance to insure proper positioning of the firing mechanism components in any one of the three selected modes.

(13) The locating dimension of the buffer retainer hole must be within tolerance to insure proper positioning of the buffer.

(14) All hole diameters must be within tolerance to insure free motion of their mating parts.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1662222. Special gages, one of which is described below, are used to check significant characteristics. Routine test procedures and standard visual inspection methods are to be followed for those characteristics given in the above referenced SQAP which are not listed below.

(1) Location Gage - 11837905. This gage is used to check the following characteristics detailed in the above referenced SQAP:

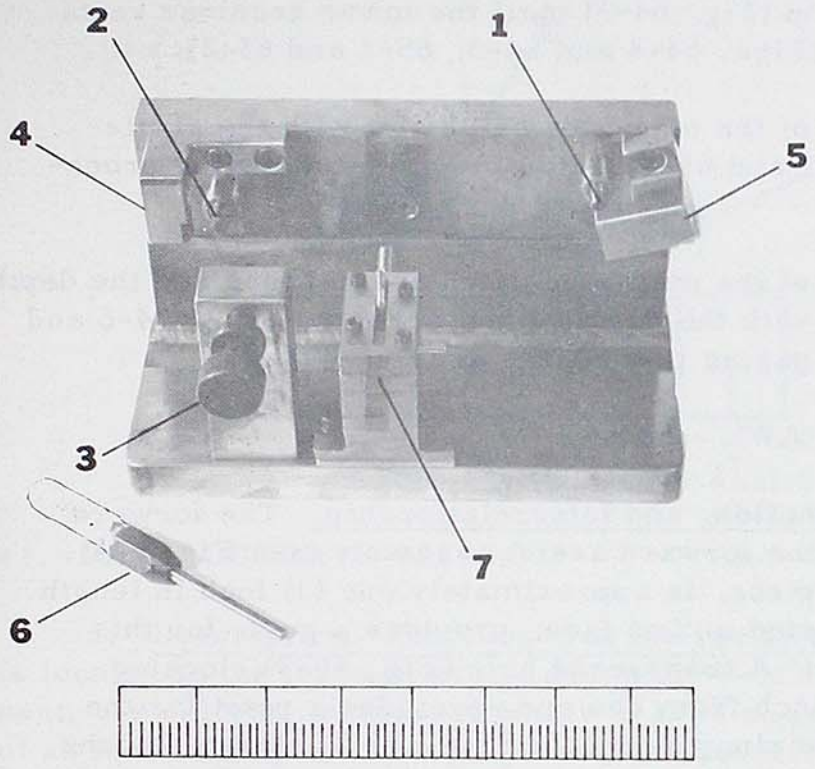
(a) Depth of the magazine catch slot.

(b) Depth of the magazine catch counterbore.

(c) Depth of the magazine button slot.

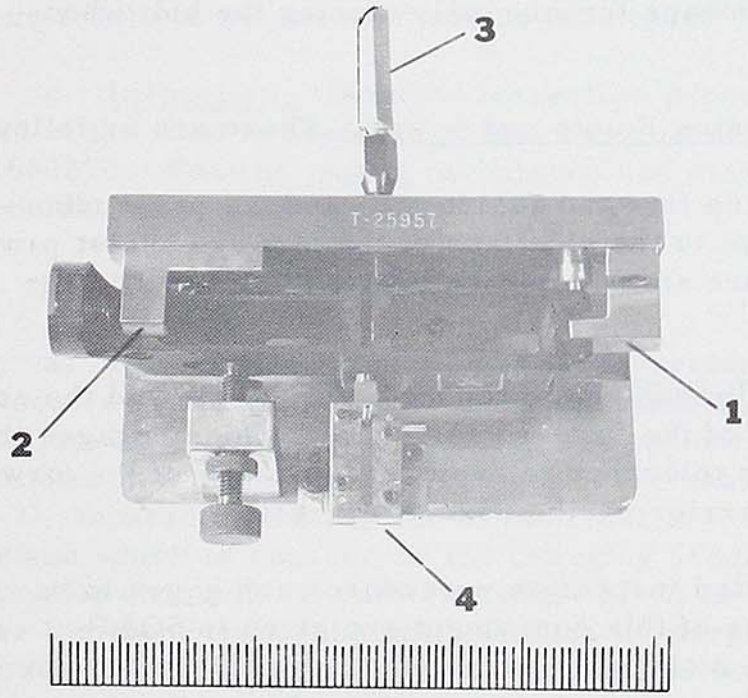
The following procedure is to be used:

(a) Place the lower receiver in the location gage with the receiver hinge hole (Fig. 62-1) positioned on its locator pin (Fig. 64-1) and the fire control selector hole (Figs. 62-10 and 63-2) positioned on its locator pin (Fig. 64-2).



1. Locator pin for receiver hinge hole
2. Locator pin for fire control selector hole
3. Clamp
4. Stop
5. Stop
6. Single flush pin gage
7. Double flush pin gage

Figure 64. Location Gage.



1. Stop
2. Stop
3. Single flush pin gage
4. Double flush pin gage

Figure 65. Lower Receiver Positioned in Location Gage.

b. Tighten the clamp (Fig. 64-3) until the lower receiver seats firmly against the stops (Figs. 64-4 and 64-5, 65-1 and 65-2).

c. Check the depth of the magazine catch slot with the single flush pin gage (Figs. 64-7 and 65-4). Routine flush pin gaging procedures are to be used.

d. Check the depth of the magazine catch counterbore and the depth of the magazine bolt slot with the double flush pin gage (Figs. 64-6 and 65-3). Routine flush pin gaging procedures are to be used.

40. FORWARD ASSIST PAWL - 62269.

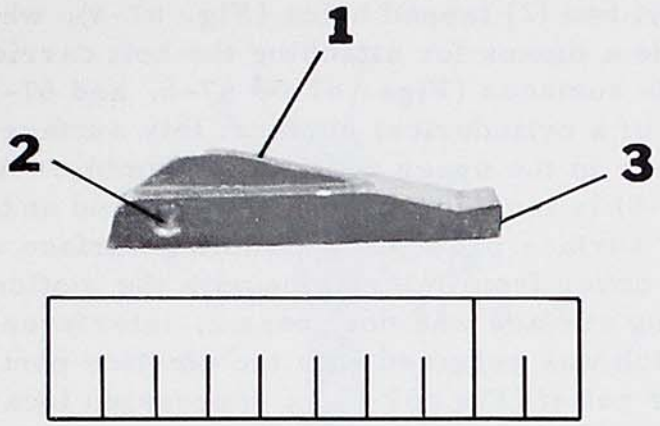
a. Description, Function, and Interrelationship. The forward assist pawl is located in the forward assist assembly (see Fig. 124). This component, a steel piece, is approximately one (1) inch in length. A flange (Fig. 66-1), located on one face, provides a guide for this component in the plunger. A transverse hole (Fig. 66-2), located approximately 1/4 of an inch from one end, provides a pivot for the forward assist pawl in the plunger; a nose (Fig. 66-3), located at the opposite end, is shaped so that it will engage serrations along the right side of the bolt carrier when the forward assist plunger is depressed. The purpose of the forward assist pawl, in conjunction with the plunger assembly, is to provide a means for manually closing the bolt when necessary.

b. Important Functioning Points and Areas. These are as follows:

(1) The width of the forward assist pawl and the perpendicularity of the transverse hole to the side face of the forward assist pawl must be maintained to insure smooth motion of this component in the plunger.

(2) The locating dimensions of the transverse hole and the contour dimensions of the end of the forward assist pawl which engages the bolt carrier must be within tolerance to avoid interference of the forward assist pawl with the bolt carrier during normal operation.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1662269. Routine gaging techniques and standard visual inspection methods are to be followed.



1. Guide flange
2. Transverse hole
3. Nose

Figure 66. Forward Assist Pawl

41. PAWL DETENT - 62270.

a. Description, Function, and Interrelationship. The pawl detent is located in the forward assist assembly (see Fig. 124). This component, a steel pin, is approximately 3/32 of an inch in diameter and 5/16 of an inch in length. The purpose of the pawl detent is to transmit bolt spring pressure to the forward assist pawl.

b. Important Functioning Points and Areas. The pawl detent must move freely in the forward assist assembly.

c. Inspection. Detailed inspection procedures and gages to be used in the final acceptance of this component are given in SQAP M1662270. Routine gaging techniques and standard visual inspection methods are to be followed.

42. BOLT CARRIER - 62274.

a. Description, Function, and Interrelationship. The bolt carrier is located in the bolt carrier assembly (see Fig. 127). This component, a cylindrically shaped steel piece, is approximately one (1) inch in diameter and 6 5/8 inches in length. The charging handle catch (Fig. 67-1), located on the top and at the front of the bolt carrier, provides a surface which is engaged by the charging handle when the weapon is manually charged. A cam slot (Fig. 67-2) is located on the top and near the front end of the bolt carrier; its purpose is to provide a track for rotating the cam pin and bolt so that the bolt can be locked in the battery position. The bolt carrier key seat (Fig. 67-3), located behind the cam slot at the top of the bolt carrier, provides a mounting surface