BAR FIELD SERVICE MANUAL

BROWNING®

BROWNING BAR C.F. FIELD SERVICE MANUAL

This manual is written to assist trained gunsmiths in the repair and servicing of Browning products. It should never be used by an untrained person to repair any firearm. Read the entire manual carefully and pay special attention to the portions dealing with safety.

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BROWNING FIELD SERVICE MANUAL

IMPORTANT SAFETY WARNINGS

Before carrying out any instructions given throughout this manual, be certain to read the **NOTES** and **CAUTION** notes given in regard to those instructions. Generally, these precautionary notes follow the related instructions. In any case, read all of the instructions and cautions on any step involving assembly or reassembly before proceeding with that step.

Failure to obey a Safety Warning—**CAUTION**—may result in injuries to you or to others.

Failure to obey a **NOTE** regarding the repair process may result in incorrect procedure which could cause malfunctions and/or damage to the firearm.

CAUTIONS:

1. Be certain the firearm is unloaded before proceeding with any service work.
2. Appropriate safety glasses should be worn by service personnel and bystanders when removing or re-installing any springs or spring-loaded components.
3. As noted in the attached parts list on Page 3 , some of the Browning supplied spare parts must be fitted by Browning Service Dept. in Arnold, Missouri, or qualified gunsmiths. No other persons should attempt to fit these specific parts.
4. If for any reason it becomes necessary to load and discharge this firearm, it is recommended that reference be made to the Owners Manual for proper loading, handling and safety procedures. These Owners Manuals are supplied with each new rifle and extra copies may be obtained by contacting Browning, Route # 1, Morgan, Utah 84050.
5. Section VI provides lists of special tools which may be required and the recommended points of lubrication.

SECTION I

DESCRIPTION AND FUNCTIONAL OPERATION

The BAR is a centerfire, gas operated semi-automatic rifle. Magazine capacity is four rounds (three in Magnum calibers).

The Safety is a crossbolt-type blocking Trigger movement when in the "ON SAFE" position. When the Trigger is pulled, with the Safety in the "OFF SAFE" position, it rotates about its pin causing the Disconnector to move forward against the Sear. This causes the Sear to disengage from the Hammer which is driven forward by two compressed Mainsprings to strike the Firing Pin. The Firing Pin moves forward compressing the Firing Pin Spring, strikes and ignites the primer of the chambered cartridge.

As the bullet travels down the barrel and passes the gas port, gas pressure is bled into the Gas Cylinder driving the Gas Piston rearward. Excess pressure is bled off through the Gas Regulator. The Gas Piston travels rearward approximately ⅝" and imparts its momentum to the Inertia Piece which is connected to the Bolt Sleeve through the Action Rods.

As the Bolt Sleeve is driven rearward by the Inertia Piece, the Action Spring is compressed and the Cam Pin rotates the Bolt unlocking it from the locking lugs in the Barrel. During this unlocking process, the Timing Latch, attached to the Bolt Sleeve, is engaged in a short slot in the left side of the Receiver.

After the Bolt has been fully unlocked and starts moving rearward, the Timing Latch is cammed into the sleeve. This keeps the Bolt in proper orientation with the locking lugs of the Barrel until the Bolt and Bolt Sleeve are returned forward.

In moving rearward, the empty case is extracted from the chamber. Ejection occurs by action of the compressed Ejector Spring and Ejector when the forward end of the empty case clears the Receiver ejection port.

Additionally, in moving rearward, the tail of the Bolt Sleeve overrides the Hammer depressing it past the cocked position disengaging the Disconnector from the Sear and compresses the Mainsprings. Rearward motion of the action is stopped by the Inertia Piece striking the Buffer and Buffer Plates at the forward end of the Receiver. The compressed Action Spring then starts the action moving forward.

In moving forward, the Bolt picks up a fresh round from the Magazine and starts it toward the chamber. When the Bolt is approximately ¾ closed, the Hammer is allowed to raise and engage the Sear. The Disconnector cannot re-engage the Sear unless the Trigger has been fully released. Thus, the rifle cannot fire fully automatic if the Trigger is held to the rear. Additionally, if for some reason the Hammer follows the Bolt forward, the tail of the Bolt Slide keeps the Hammer from contacting the Firing Pin until the Bolt is locked. Even then the Firing Pin has insufficient inertia for primer ignition.

When the Bolt has traveled forward and is in proper orientation, the Timing Latch is cammed into its slot in the Receiver and the Cam Pin rotates the Bolt into the locking lugs of the Barrel.

As the Bolt is rotating into the full locked position, the Extractor is forced over the rim of the newly chambered cartridge.

Full forward movement of the Inertia Piece returns the Gas Piston to the unfired, or forward position.

SECTION II

CONFIGURATIONS, PARTS SCHEMATIC & PARTS INFORMATION

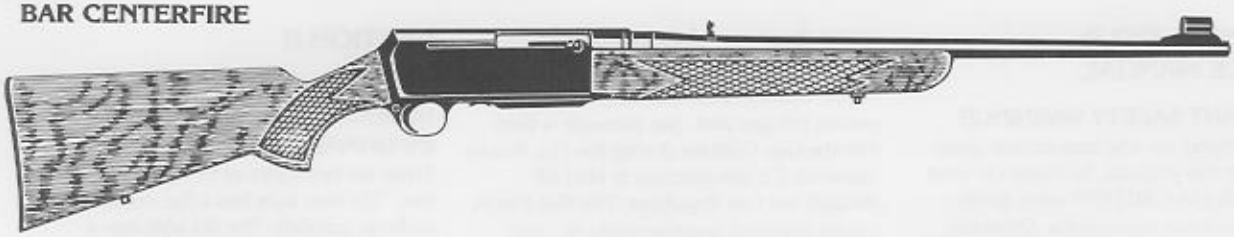
There are two styles of BAR's, old and new. The new style has a flat Receiver (side surfaces parallel). The old style has a flared Receiver, i.e., a section of the Receiver at the rear end is thicker than the center part of the Receiver. The new style is manufactured only in Grade I. Higher grades in current manufacture are of the old style.

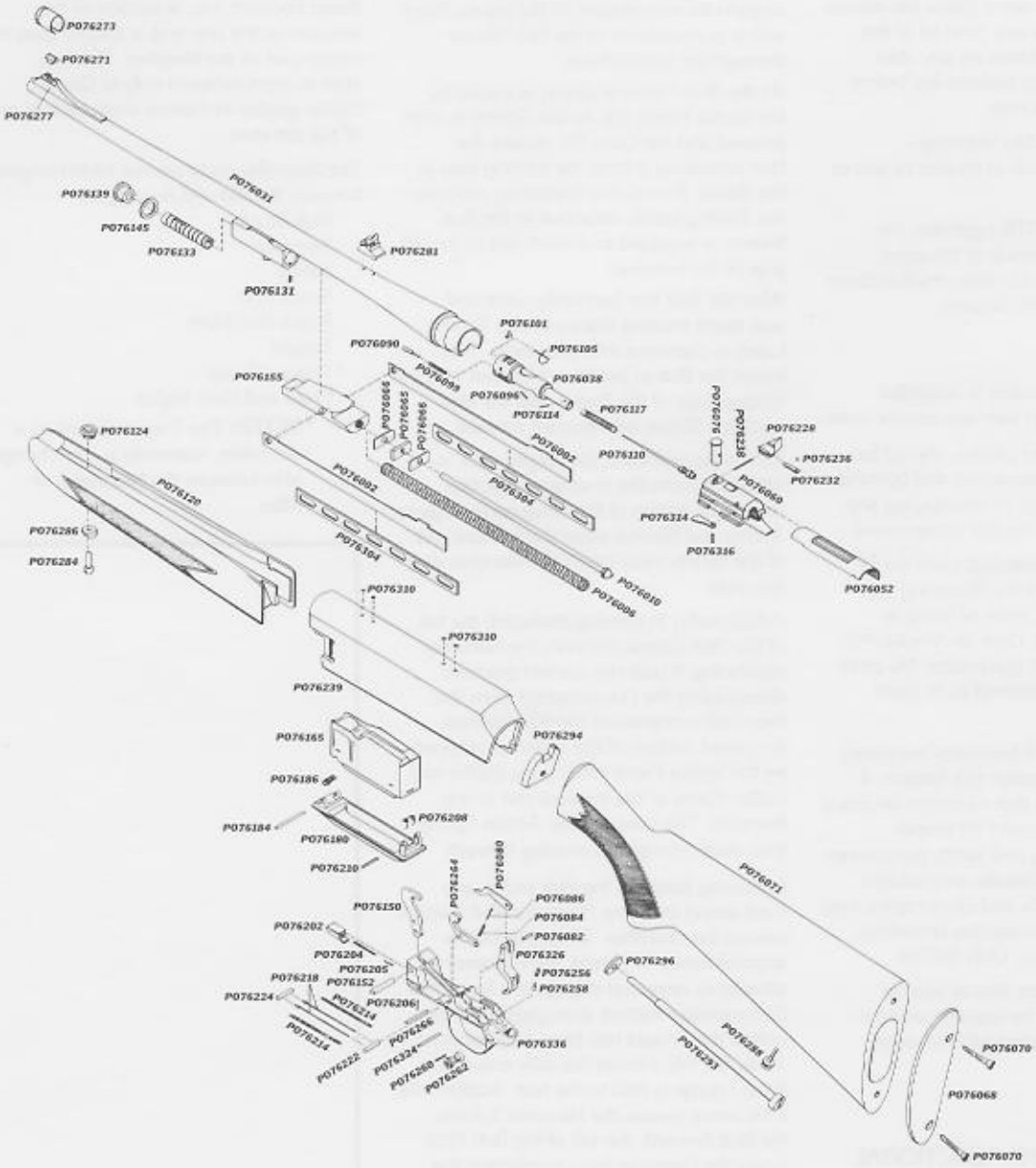
The following parts are not interchangeable between the old and new styles:

- Butt Stock
- Receiver
- Safety
- Stock Bolt
- Stock Bolt Plate
- Trigger
- *Trigger Guard
- Front and Rear Sights

*NOTE: The Trigger Guard as a complete Assembly is interchangeable between the two styles of rifles.

BAR CENTERFIRE





Schematic is provided for parts identification only and should not be used as a guide to assemble guns.

BAR CENTERFIRE

BAR—Browning Automatic Rifle Standard and Magnum Models Six Popular Calibers

PART NO.	PART NAME
PO76002	Action Rod—Right or Left
PO76006	Action Spring
PO76010	Action Spring Guide
*PO76015	Barrel w/o Sights, 243 Win.
*PO76016	Barrel 243 Win. Type II
*PO76020	Barrel w/o Sights, 270 Win.
*PO76021	Barrel 270 Win. Type II
*PO76025	Barrel w/o Sights, 308 Win.
*PO76026	Barrel 308 Win. Type II
*PO76030	Barrel w/o Sights, 30/06 Sprg.
*PO76031	Barrel 30/06 Sprg. Type II
*PO76032	Barrel w/o Sights, 7mm Rem. Mag.
*PO76033	Barrel 7mm Rem. Mag. Type II
*PO76034	Barrel w/o Sights, 300 Win. Mag.
*PO76035	Barrel 300 Win. Mag. Type II
*PO76036	Barrel 338 Win. Mag.
*PO76038	Bolt—243 Win., 308 Win., 270 Win., 30/06 Sprg.
*PO76040	Bolt—7mm Rem. Mag. 300 Win. Mag., 338 Win. Mag.
*PO76045	Bolt Assembly—243 Win., 308 Win., 270 Win., 30/06 Sprg.
*PO76048	Bolt Assembly—7mm Rem. Mag., 300 Win. Mag., 338 Win. Mag.
PO76052	Bolt Cover
PO76060	Bolt Sleeve—243 Win., 308 Win., 270 Win., 30/06 Sprg.
PO76062	Bolt Sleeve—7mm Rem. Mag., 300 Win. Mag., 338 Win. Mag.
PO76065	Buffer
PO76066	Buffer Plate
PO76068	Butt Plate
PO76070	Butt Plate Screws
PO76072	Butt Stock, Standard Calibers
*PO76071	Butt Stock—Standard Calibers Type II
PO76074	Butt Stock, Magnum Calibers
*PO76077	Butt Stock—Magnum Calibers Type II
PO76076	Cam Pin
*PO76080	Disconnector
PO76082	Disconnector Pin
PO76084	Disconnector Spring
PO76086	Disconnector Spring Plunger
PO76090	Ejector
PO76096	Ejector Retaining Pin
PO76099	Ejector Spring
PO76101	Extractor
PO76105	Extractor Spring
PO76110	Firing Pin
PO76114	Firing Pin Retaining Pin
PO76117	Firing Pin Spring
*PO76120	Forearm—Standard Calibers
*PO76122	Forearm—Magnum Calibers
PO76124	Forearm Escutcheon
PO76130	Gas Cylinder
*PO76131	Gas Cylinder Type II
PO76133	Gas Piston Type II
PO76134	Gas Piston
PO76138	Gas Piston Stop Pin
PO76135	Gas Regulator 243 Win. Type II
PO76136	Gas Regulator 270 Win. Type II
PO76137	Gas Regulator 308 Win. Type II
PO76139	Gas Regulator 30/06 Sprg. Type II
PO76141	Gas Regulator 308 Win.
PO76142	Gas Regulator 270 Win.
PO76143	Gas Regulator 30/06 Sprg.
PO76144	Gas Regulator 7mm Rem. Mag. Type II
PO76146	Gas Regulator 300 Win. Mag. Type II
PO76145	Gas Regulator Gasket
PO76147	Gas Regulator 7mm Rem. Mag.
PO76149	Gas Regulator 338 Win. Mag.
PO76148	Gas Regulator 300 Win. Mag.
*PO76150	Hammer
PO76152	Hammer Pin
PO76155	Inertia Piece
PO76170	Magazine Body 243 Win., 308 Win.
PO76175	Magazine Body 270 Win., 30/06 Sprg.
PO76177	Magazine Body 7mm Rem. Mag.
PO76178	Magazine Body 300 Win. Mag.
PO76179	Magazine Body 338 Win. Mag.
PO76180	Magazine Floor Plate—Standard Calibers
PO76182	Magazine Floor Plate—Magnum Calibers
PO76184	Magazine Floor Plate Pivot Pin
PO76186	Magazine Floor Plate Spring
PO76188	Magazine Follower 243 Win., 308 Win.
PO76192	Magazine Follower 270 Win., 30/06 Sprg.
PO76193	Magazine Follower—Magnum Calibers
PO76194	Magazine Follower Spring 243 Win., 308 Win.
PO76196	Magazine Follower Spring 270 Win., 30/06 Sprg.
PO76197	Magazine Follower Spring—Magnum Calibers

**Indicates part must be fitted by Browning Service Department or qualified gunsmith.*

*†*Part may be purchased only by holders of current valid Federal Firearms Licenses.*

NOTE: Unless otherwise indicated part is interchangeable between gauges/calibers.

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NOTE: Unless otherwise indicated part is interchangeable between gauges/calibers.

PART NO.	PART NAME
PO76198	Magazine Follower Spring Rivet
PO76202	Magazine Latch
PO76204	Magazine Latch Spring
PO76205	Magazine Latch Spring Plunger
PO76206	Magazine Latch Stop Pin
PO76208	Magazine Retaining Spring
PO76210	Magazine Retaining Spring Pin
PO76214	Mainspring—Right or Left
PO76218	Mainspring Guide—Right or Left
PO76222	Mainspring Pin—Hammer
PO76224	Mainspring Pin—Trigger Guard
PO76228	Operating Handle
PO76232	Operating Handle Lock
PO76236	Operating Handle Lock Pin
PO76238	Operating Handle Lock Spring
†*PO76239	Receiver, Standard Calibers Type II
†*PO76240	Receiver, Standard Calibers
†*PO76246	Receiver, Magnum Calibers Type II
*PO76254	Safety, Cross Bolt
*PO76255	Safety, Cross Bolt Left Hand
*PO76262	Safety, Cross Bolt Type II
PO76256	Safety Spring
PO76258	Safety Spring Plunger
PO76260	Safety Spring Retaining Pin
*PO76264	Sear
PO76266	Sear Pin
PO76270	Sight Bead, Front
PO76272	Sight Hood, Front
PO76271	Sight Bead, Front—Williams Type
PO76273	Sight Hood, Front—Williams Type
*PO76274	Sight Ramp Front—Standard Calibers
*PO76276	Sight Ramp Front—Magnum Calibers
PO76277	Sight Ramp Front—Williams Type
*PO76280	Sight Assembly Folding Leaf Rear
PO76281	Sight Assembly Rear—Std.—Williams Type
PO76282	Sight Assembly Rear—Mag.—Williams Type
PO76284	Sling Eyelet, Front
PO76286	Sling Eyelet Washer
PO76288	Sling Eyelet, Rear
PO76292	Stock Bolt
PO76293	Stock Bolt Type II
PO76295	Stock Bolt Washer
PO76296	Stock Bolt Washer Type II
PO76294	Stock Bolt Plate Type II
PO76298	Stock Screw Plate

**Indicates part must be fitted by Browning Service Department or qualified gunsmith.*

*†*Part may be purchased only by holders of current valid Federal Firearms Licenses.*

NOTE: Unless otherwise indicated part is interchangeable between gauges/calibers.

PART NO.	PART NAME
PO76304	Support Rail—Right or Left
PO76310	Telescope Mount Filler Screws (4 each)
PO76314	Timing Latch
PO76316	Timing Latch Retaining Pin
*PO76322	Trigger
*PO76323	Trigger, Gold Plated
*PO76325	Trigger Type II
PO76324	Trigger Pin
*PO76326	Trigger, Gold Plated, Type II
PO76330	Trigger Guard
PO76336	Trigger Guard Type II

**Indicates part must be fitted by Browning Service Department or qualified gunsmith.*

*†*Part may be purchased only by holders of current valid Federal Firearms Licenses.*

NOTE: Unless otherwise indicated part is interchangeable between gauges/calibers.

SECTION III

DISASSEMBLY INTO SUB-ASSEMBLIES

CAUTION: Make certain the pistol is unloaded before any inspection or disassembly operations are performed.

1. FOREARM

Remove the Front Sling Eyelet and Sling Eyelet Washer with a 9mm wrench.

Pull the Bolt Assembly to the rear to the locked open position.

Pull outward on the front end of the Forearm slightly to clear the stud on the bottom of the Gas Cylinder and pull the Forearm forward and off the Barrel.

2. GAS REGULATOR AND GAS REGULATOR GASKET

With a ⅝" open end wrench remove the Gas Regulator and gasket as shown in Figure #1A. (Older rifles may have regulators with screwdriver slots.)

FIGURE #1A

FIGURE #1B

NOTE: The Gas Regulator has right hand thread and must be installed tightly. The use of a padded vise may be required for removal.

3. SUPPORT RAILS

Release and drop the Magazine Floorplate, close the action and then close the Floorplate.

Pull forward on the Support Rails and remove from the Receiver as shown in Figure #2.

FIGURE #2

4. ACTION RODS

Lift upwards on the forward ends of the Inertia Block and withdraw them from the Receiver as shown in Figure #3.

FIGURE #3

5. GAS PISTON

Grasp the Action Spring around the Action Spring Guide and push forward to eject the Gas Piston from the Gas Cylinder as shown in Figure #4.

FIGURE #4

6. INERTIA PIECE ACTION SPRING AND ACTION SPRING GUIDE

Grasp the Action Spring around the Action Spring Guide and push forward to allow for their removal along with the Inertia Piece as shown in Figure #5.

CAUTION: In compressing and removing the Action Spring and guide, do not let them escape your grasp and cause injury.

FIGURE #5

7. STOCK

Remove the Butt Plate or Recoil Pad with a blade screwdriver and remove the Stock Bolt and washer with a special screwdriver such as shown in Figure #29, Section VI.

NOTE: A regular blade screwdriver is easily positioned along side the Stock Bolt and when turned could bust out the side of the Stock.

8. STOCK BOLT PLATE

A. OLD STYLE (FLARED RECEIVER)

Screw the Stock Bolt into the Stock Bolt Plate 2 or 3 turns. Lift the plate to the top of the Receiver and pivot out at the bottom as shown in Figure #6.

FIGURE #6

B. NEW STYLE (FLAT RECEIVER)

Screw the Stock Bolt into the Stock Bolt Plate 2 or 3 turns. Lift the plate to the top of the Receiver and turn sideways and remove as shown in Figure #7.

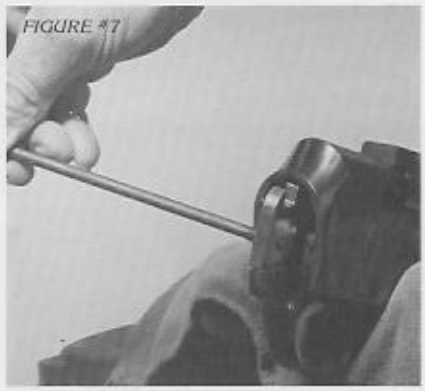


FIGURE #7

9. TRIGGER ASSEMBLY

Making sure the Hammer is cocked and the safety is in the "ON SAFE" position, pull the Trigger Assembly to the rear and out of the Receiver.

10. MAGAZINE

Disengage the Magazine from the Magazine Floorplate by pulling the rear end away from the floorplate and lifting it out as shown in Figure #8.

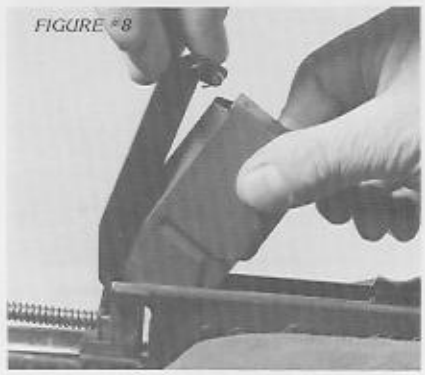


FIGURE #8

11. MAGAZINE FLOORPLATE

Remove the Magazine Floorplate and the Magazine Floorplate Spring by removing the Magazine Floorplate Pivot Pin with a 3/32" punch.

NOTE: It is recommended the Floorplate not be removed unless necessary for service.

12. OPERATING HANDLE

Pull the Operating Handle fully to the rear and then bring the Bolt forward against the index finger as shown in Figure #9.

FIGURE #9

With the index finger still in the Receiver, apply slight pressure to the Operating Handle with the thumb as shown in Figure #10.

FIGURE #10

With a small blade screwdriver lift up on the Operating Handle Lock as shown in Figure #11 disengaging it from the Bolt Slide.

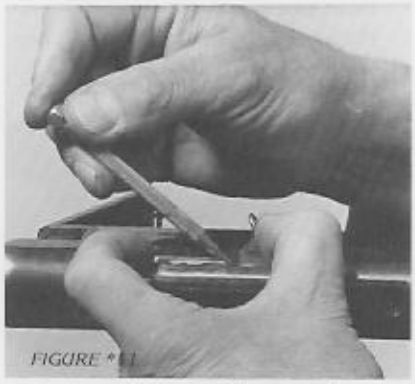
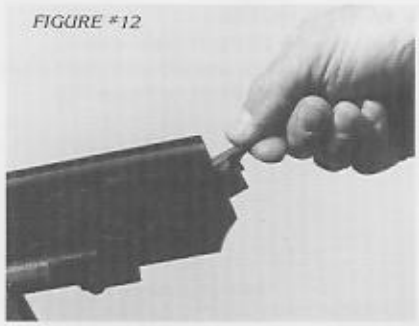


FIGURE #11

Maintain the blade of the screwdriver under the Operating Handle Lock and slide the Operating Handle forward and out of the Receiver.

FIGURE #12



13. BOLT ASSEMBLY

A. OLD STYLE (FLARED RECEIVER)

Slide the Bolt Assembly to the rear of the Receiver. Grasp the tail of the Bolt Slide and lift out of the Receiver as shown in Figure #12.

B. NEW STYLE (FLAT RECEIVER)

Position the Bolt Assembly approximately in the center of the Receiver. Elevate the assembly midway, rotate 90° and remove as shown in Figure #13.

FIGURE #13

SECTION IV

DISASSEMBLY OF SUB-ASSEMBLIES INTO COMPONENT PARTS, INSPECTION AND REASSEMBLY OF SUB-ASSEMBLIES

1. DISASSEMBLY OF THE BOLT ASSEMBLY (Figure #14)

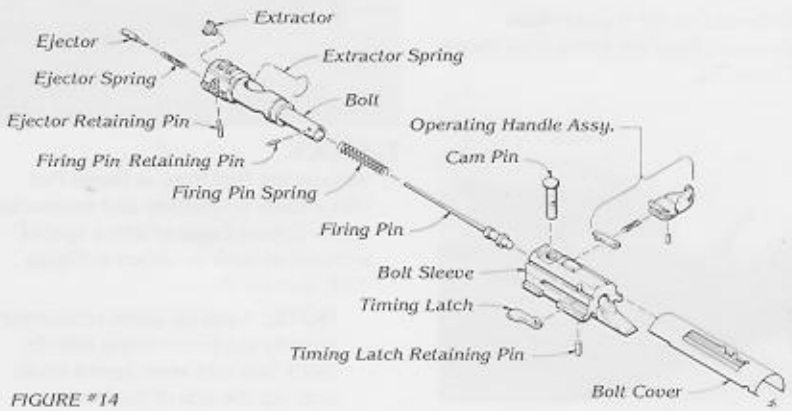


FIGURE #14

A. BOLT COVER

Slide the Bolt Cover to the rear and while holding the assembly in one hand, lift up on the right rear corner as shown in Figure #15 and remove the Bolt Cover.

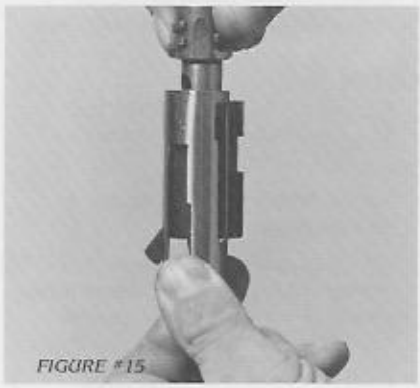


FIGURE #15

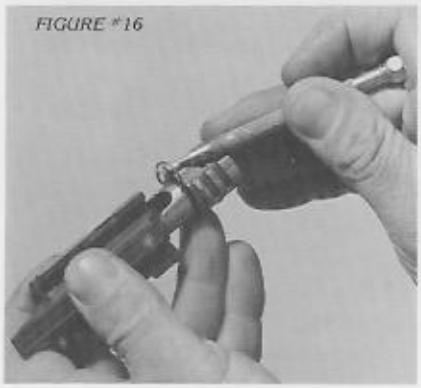
B. TIMING LATCH

Using a 3/32" punch, drive out the Timing Latch Pin from the bottom of the Bolt Sleeve to the top and remove the Timing Latch.

C. EXTRACTOR AND EXTRACTOR SPRING

With the aid of a small blade screwdriver, lift the free end of the Extractor Spring from the Bolt as shown in Figure #16.

FIGURE #16



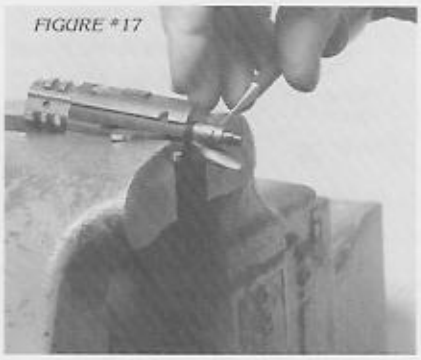
Pull the spring to the rear and remove the Extractor from the Bolt face.

D. FIRING PIN AND FIRING PIN SPRING

Grip the Bolt Assembly in a smooth jawed vise by the rails of the Bolt Sleeve as shown in Figure #17. Using a 1/16" punch, drive out the Firing Pin Retaining Pin from *right* to *left* and remove the Firing Pin and Firing Pin Spring.

CAUTION: Do not let the Firing Pin and spring fly out of the assembly on withdrawal of the punch.

FIGURE #17



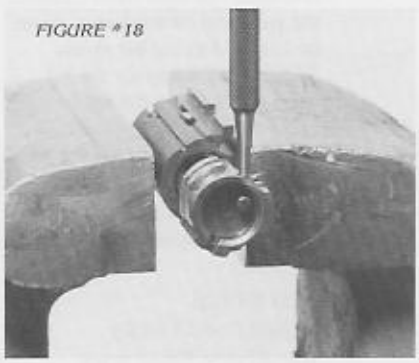
E. EJECTOR AND EJECTOR SPRING

Grip the Bolt Assembly in a smooth jawed vise as shown in Figure #18. (90° from orientation as shown in Figure #17.)

Using a 1/16" starter punch, partially drive out the Ejector Retaining Pin from left to right only far enough to remove the Ejector and Ejector Spring.

CAUTION: Do not let the Ejector and Ejector Spring fly out of the Bolt upon removal of the punch.

FIGURE #18



F. BOLT AND CAM PIN

Remove the Bolt Assembly from the vise and remove the Cam Pin from the top of the Bolt Sleeve. Withdraw the Bolt from the Bolt Sleeve.

2. INSPECTION OF COMPONENTS & RE-ASSEMBLY OF THE BOLT ASSEMBLY

A. BOLT SLEEVE

Inspect the Bolt Sleeve for cracks and chipped out areas.

Chamfer the lower forward edges of the Bolt Sleeve guide rails and break the edges of the guide rails.

Insert the Bolt into the Bolt Sleeve and see that it works freely. If burred, polish the inside of the sleeve.

B. BOLT

Inspect the Bolt's Timing Latch camming shoulder for burrs. File smooth and polish.

Inspect the Ejector Spring hole for burrs and accumulated dirt. Clean and polish as necessary.

Chamfer the end edges of the locking surfaces of the Bolt and polish the head of the Bolt (locking surfaces) on a cloth wheel.

C. CAM PIN, FIRING PIN AND SPRING

Install the Bolt in the Bolt Sleeve with the Extractor slot on the right side.

Place the Cam Pin in the assembly as shown in Figure #19 with the Firing Pin hole aligned with the longitudinal axis of the Bolt.

FIGURE #19

Insert the Firing Pin and Firing Pin Spring in the Bolt and install the Firing Pin Retaining Pin.

NOTE: To preserve factory installation orientation, a new Firing Pin Retaining Pin should be installed from *left* to *right*.

After installation of the new Firing Pin Retaining Pin, file both ends flush with the Bolt neck.

Check to see the Firing Pin works freely in the Bolt and the Bolt works freely in the Bolt Sleeve past the Firing Pin Retaining Pin.

D. EJECTOR AND EJECTOR SPRING

To assure good ejection, polish the Ejector and Ejector Spring.

Grip the Bolt Assembly in a smooth jawed vise and install the Ejector, Spring and Retaining Pin.

NOTE: Make sure to install the Retaining Pin from right to left with the splined end of the pin away from the Ejector to ensure proper function.

After installation of the Ejector, depress and release it and see that it works freely.

E. EXTRACTOR SPRING AND EXTRACTOR

Inspect the straight end of the Extractor Spring for burrs and polish on a cloth wheel.

Position the Extractor on the face of the Bolt. Extend the Bolt from the Bolt, Slide and insert the Extractor Spring up through the Bolt head engaging the hole in the Extractor.

Rotate the Extractor Spring snapping it into its groove at the rear of the Bolt head.

NOTE: Make sure the Extractor is captivated by the spring and the spring is bottomed out in its groove.

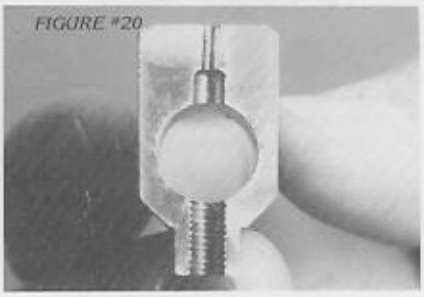
F. TIMING LATCH

Inspect the Timing Latch and remove any burrs with a fine cut file and polish.

NOTE: If badly burred, replace the Timing Latch.

Install the Timing Latch with orientation as shown in Figure #20 and install the Timing Latch Retaining Pin.

FIGURE #20



G. BOLT COVER

Position the Bolt Cover on the Bolt Sleeve hooking the left side of the cover in its slot as shown in Figure #21 and tap into place with a plastic or rawhide mallet.

FIGURE #21

Check to see the Bolt Cover moves with enough restriction to prevent it from moving on its own and causing a rattle in the rifle. Too much restrictive force, however, may cause malfunctions. Please refer to Section VI for adjustment procedure.

3. PRE-DISASSEMBLY INSPECTION OF THE TRIGGER GUARD ASSEMBLY

CAUTION: The searing surfaces of the Sear and Hammer must never be altered or show signs of being altered. If they have been altered, they must be replaced. Inspections procedures follow:

NOTE: If the Trigger Guard Assembly fails to meet the following inspection criteria, refer to Section VI, Para. 4 for adjustment procedure after disassembly.

A. Check the Trigger pull for a pull of 3.5 to 4.5 lbs.

B. With the Hammer in the cocked position, observe positive engagement with the Sear.

C. With the Hammer cocked and the Safety in the "OFF SAFE" position, slightly pull the Trigger and observe slight Trigger pre-travel before the Disconnector contacts the Sear.

D. With the Hammer cocked, place the Safety to the "ON SAFE" position. See that it does not bind in moving and detents positively in the "ON" and "OFF" positions.

E. Pull the Trigger with the Safety in the "ON SAFE" position and observe the Disconnector *does not* contact the Sear by holding the Trigger to the rear and depressing the Disconnector with a finger.

CAUTION: If the Disconnector contacts the Sear with the Safety in the "ON SAFE" position, the Trigger must be replaced or the Disconnector adjusted at the point of contact with the Sear. Please refer to Section VI, Para. 4 for Trigger replacement and adjustment procedures.

F. With the Hammer cocked, pull the Trigger and ease the Hammer forward. Hold the Trigger to the rear firmly, not permitting it to go forward. Holding the Trigger to the rear, retract the Hammer and see that the Sear engages the Hammer. If it does not, the bottom end coil of the Disconnector Spring may be binding the Disconnector Spring Plunger in its hole in the Sear. To make necessary correction, spread the bottom end coil of the Disconnector Spring after disassembly.

G. With the Hammer cocked and the Safety in the "OFF SAFE" position, pull the Trigger slightly and only partially disengage the Hammer and Sear. Release the Trigger and observe the Hammer and Sear regain to full engagement. If they do not, replacement of the Hammer and/or Sear will be necessary.

4. DISASSEMBLY OF THE TRIGGER GUARD ASSEMBLY

A. MAINSPRINGS AND HAMMER

(Figure #22)

1. NEW STYLE (FLAT RECEIVER)

Place the Safety to the "OFF SAFE" position and lower the Hammer to the fired position.

Disengage the Mainspring Guides from the Mainspring Pin and remove the Mainsprings, guides and pin.

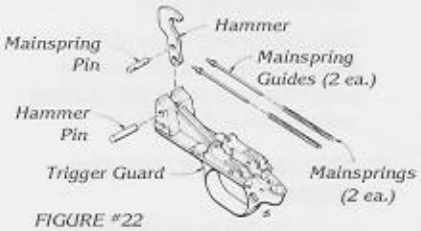


FIGURE #22

2. OLD STYLE

(FLARED RECEIVER)

The old style Trigger Guard Assembly contains two Mainspring Pins. Disassembly procedure is identical to the new style with that exception.

CAUTION: Use care not to let the Mainsprings and guides fly out of the Assembly.

Next remove the Hammer Pin with a 1/8" punch and remove the Hammer.

B. TRIGGER & DISCONNECTOR, SPRING & PLUNGER (Figure #23)

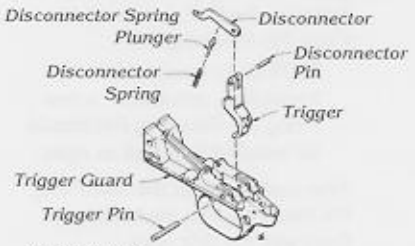


FIGURE #23

Remove the Trigger Pin with a 3/32" punch and remove the Trigger with the Disconnector attached, Disconnector Spring and Disconnector Spring Plunger.

CAUTION: Do not let the Disconnector Spring and plunger fly out of the Assembly.

C. SEAR AND MAGAZINE LATCH

(Figure #24)

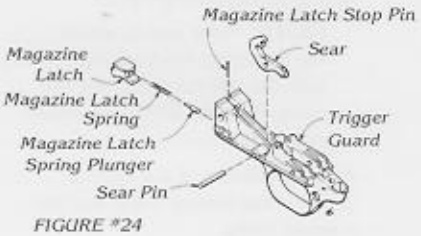


FIGURE #24

Remove the Sear Pin with a 3/32" punch and remove the Sear.

Lay the Trigger Guard inverted on a work surface. Using a 1/8" punch, drive the Magazine Latch Stop Pin flush while keeping the Magazine Latch held to the rear. Remove the latch, spring and plunger.

CAUTION: Do not let the spring-loaded components fly out of the Trigger Guard.

D. SAFETY (Figure #25)

FIGURE #25

Remove the Safety Spring Retaining Pin with a 1/16" punch.

CAUTION: Do not let the spring-loaded components fly out of the Trigger Guard upon withdrawal of the punch.

Remove the Safety Spring, plunger and Safety.

5. INSPECTION OF COMPONENTS AND REASSEMBLY OF THE TRIGGER GUARD ASSEMBLY

A. TRIGGER GUARD

Inspect the Trigger Guard housing for cracks and replace if necessary.

B. SAFETY ASSEMBLY (Figure #25)

1. NEW STYLE (FLAT RECEIVER)

The new style Safety can be installed for right or left hand shooters. For right hand shooters, the red band on the Safety must be installed to the left of the Trigger Guard and for the left hand shooters, to the right of the Trigger Guard. When Safety is "ON SAFE" the red band is not visible.

NOTE: This Safety is interchangeable with the B-2000 Safety.

2. OLD STYLE

(BOSSED RECEIVER)

The old style Safety is not reversible. However, left and right hand Safeties are available. Refer to Section VI for installation of left hand Safety.

Position the Safety in its hole in the Receiver with the detent notches aligned with the Safety Spring hole.

Insert the Safety Spring Plunger and spring in its hole, compress the spring with a 1/8" punch and install the Retaining Pin.

CAUTION: Do not let the spring and plunger fly out of the Trigger Guard.

Operate the Safety and see that it detents positively into the "ON SAFE" and "OFF SAFE" position.

Minimum operating force should be 4 to 5 lbs. If lighter, replace parts as necessary to correct.

C. MAGAZINE LATCH ASSEMBLY
(Figure #24)

Position the Magazine Latch Spring Plunger, spring and Magazine Latch in the Trigger Guard with the plunger to the rear.

Compress the spring with the latch and drive the Magazine Latch Stop Pin down in the Trigger Guard to protrude approximately 1/32" at the bottom.

D. SEAR (Figure #24)

Inspect the Sear for signs of alteration and replace if altered.

Install the Sear and Sear Pin.

E. TRIGGER AND DISCONNECTOR ASSEMBLY
(Figure #24)

Inspect the safety contacting surface of the Trigger for burrs and remove with a small, fine cut rat-tail file the size of the Safety.

CAUTION: Do not remove any more than .001" to .002" from the safety contacting surface. If badly burred, replace the Trigger. (See Section VI)

Install the Trigger and Disconnector Assembly and the Trigger Pin.

F. DISCONNECTOR SPRING PLUNGER AND SPRING
(Figure #23)

With the thumb and index finger, hold the Disconnector Spring Plunger and spring in position with the Disconnector as shown in Figure #26.

FIGURE #26

Rotate the Disconnector downward guiding the lower end of the plunger into its hole in the Sear.

Compress the spring and engage the Disconnector on the lower corner of the Sear.

G. HAMMER AND MAINSPRINGS
(Figure #22)

Inspect the Sear notch of the Hammer for signs of alteration and replace if found altered.

Install the Hammer, Hammer Pin and Mainspring Pin (two pins on old style).

Install both Mainsprings and Mainspring Guides by initially seating the non-flanged end of the guides in the holes of the Mainspring Pin and then compressing the Mainsprings until the flanged end of the guides fit into the holes of the Hammer Pin.

CAUTION: Use care not to let the spring and guides fly out of the Trigger Guard.

H. FINAL INSPECTION OF THE TRIGGER GUARD ASSEMBLY
Refer to Para. 3 of this Section, PRE-DISASSEMBLY INSPECTION OF THE TRIGGER GUARD ASSEMBLY and inspect to the criteria given in that paragraph in its entirety.

6. INSPECTION OF THE BARREL ASSEMBLY AND GAS SYSTEM

NOTE: Rifles containing a flat Receiver (new style) have a different gas system than the old style with a flanged Receiver. The Gas Piston for the new style has 10 milled rings whereas the old style has 3 milled rings. Some of the gas orifice specifications are also different.

A. GAS PISTON
Clean the Gas Piston if found dirty by soaking in powder solvent and brushing.

B. GAS CYLINDER
Visually inspect the Gas Cylinder for leaks around the Barrel solder joint. If any evidence of leaks are found, it is recommended the rifle be returned to the Arnold Service Center for re-soldering. Refer to Section VI for cleaning and polishing procedures.

C. BARREL GAS ORIFICE
Check the Barrel gas orifice for proper size according to the following criteria:

CALIBER	OLD STYLE		
	MAX	NOMINAL	MIN
7mm Rem. Mag.	.047	.046	.045
300 Win. Mag.	.047	.046	.045
338 Win. Mag.	.047	.046	.045
243	.053	.051	.049
270	.053	.051	.049
30/06	.053	.051	.049
308	.053	.051	.049

CALIBER	NEW STYLE		
	MAX	NOMINAL	MIN
7mm Rem. Mag.	.047	.046	.045
300 Win. Mag.	.047	.046	.045
338 Win. Mag.	—	—	—
243	.052	.051	.050
270	.052	.051	.050
30/06	.052	.051	.050
308	.054	.053	.052

If found oversized, please refer to Section VI for plugging and re-drilling procedures.

D. GAS REGULATOR
Check the Gas Regulator for proper orifice size according to the following specification:

CALIBER	OLD STYLE		
	MAX	NOMINAL	MIN
7mm Rem. Mag.	.088	.086	.085
300 Win. Mag.	.076	.074	.073
338 Win. Mag.	.060	.059	.057
243	.073	.071	.069
270	.069	.067	.065
30/06	.054	.053	.051
308	.037	.035	.034

CALIBER	NEW STYLE		
	MAX	NOMINAL	MIN
7mm Rem. Mag.	.088	.087	.085
300 Win. Mag.	.084	.083	.081
338 Win. Mag.	—	—	—
243	.061	.063	.064
270	.060	.059	.058
30/06	.048	.047	.046
308	.053	.051	.050

E. BUFFER
Inspect the Buffer and replace if found cracked or mashed out of shape.

F. ACTION SPRING
New free length of the Action Spring is approximately 11". If found to be less than 10" it is recommended the spring be replaced.

7. FINAL ASSEMBLY AND INSPECTION

A. BARREL ASSEMBLY
Place the Barrel Assembly inverted in a padded vise and grip by the Barrel.

B. BOLT ASSEMBLY

NOTE: On both the old and new style rifles, the Bolt must be extended from the Slide and the Timing Latch retracted into

the Slide in order to install the Bolt Assembly into the Receiver.

1. **OLD STYLE**
   Install the Bolt Assembly into the Receiver as shown in Figure #12 during disassembly. Push the Bolt Assembly forward and lock the Bolt to the Barrel lugs.

2. **NEW STYLE**
   Lower the Bolt Assembly into the bottom of the Receiver with its left side positioned upward and the Timing Latch retracted into the Slide.

   Rotate the Bolt Assembly and lower it so that the side rails of the Slide rest on the rails inside the Receiver.

   Push the Bolt Assembly forward locking the Bolt to the Barrel lugs.

C. OPERATING HANDLE ASSEMBLY

Rotate the Barrel Assembly in the vise positioning the right side of the Receiver upward.

Retract the Bolt Assembly about midway and position the forward edge of the Bolt Cover cutout even with the rear edge of the head of the Bolt.

Grip the Bolt Assembly to the Receiver as shown in Figure #27. Install the Operating Handle in the Bolt Assembly pulling the Operating Handle fully to the rear until it locks into position.

Push the Bolt Assembly fully forward locking it into the Barrel lugs.

FIGURE #27

D. INERTIA PIECE, ACTION SPRING & GUIDE

Re-position the Barrel Assembly in the vise in the inverted position.

Position the Inertia Piece, Action Spring and Action Spring Guide with the Buffer Assembly back on the Barrel Assembly in the reverse order of disassembly.

E. GAS PISTON

Install the Gas Piston in the Gas Cylinder making sure the Gas Piston Stop Pin (located at the bottom rear end of the Gas Cylinder) aligns with the slot in the Gas Piston, and over the Action Spring Guide.

F. GAS REGULATOR AND GAS REGULATOR GASKET

Install the Gas Regulator and gasket torquing the Regulator down securely.

G. TRIGGER GUARD ASSEMBLY

Cock the Hammer and place the Safety to the "ON SAFE" position.

Making sure all cross pins are centered, install the Trigger Guard Assembly by sliding it into the Receiver from the rear end.

H. STOCK BOLT PLATE

Re-position the Barrel Assembly in the vise to the upright position.

Install the Stock Bolt Plate with the aid of the Stock Bolt as in disassembly. (See Figure #6)

Position the Trigger Guard Assembly so the Stock Bolt Plate drops into its recess in the rear of the Trigger Guard.

Remove the Stock Bolt.

I. STOCK

Visually inspect the Stock to see if it is properly fitted to the Receiver. The Stock should not bear on the top radius of the Receiver and should be relieved at the lower corners. The Stock should bear against the Receiver on both sides. The Stock does not bear on the Stock Bolt Plate.

Install the Stock and Stock Bolt using the special screwdriver recommended during disassembly.

NOTE: It is advisable to lubricate the threads of the Stock Bolt with grease to prevent seizing, especially if it or the Stock Bolt Plate is aluminum.

Install the Butt Plate or Recoil Pad.

J. MAGAZINE FLOORPLATE

If the Magazine Floorplate was removed, to re-install, grip the Barrel Assembly in the padded vise in the inverted position.

Position the Magazine Floorplate on the Receiver for assembly.

Position the Magazine Floorplate Spring with the short end of the spring to the Floorplate.

NOTE: Some Magazine Floorplate Springs are wound left and others right hand.

Install the Magazine Floorplate Pivot Pin from the short end of the Spring.

NOTE: It is helpful to use a slave pin in alignment of the spring, Magazine and Receiver holes.

Install the Pivot Pin approximately midway. Using a punch in the other hand, push down and forward on the long end of the spring compressing it and tap the Pivot Pin into final position as shown in Figure #28.

FIGURE #28

After the Pivot Pin has been installed, using a small blade screwdriver, pry the long end of the spring toward the center of the Receiver slightly to remove any binding.

Operate the Floorplate and see that it does not bind. If it does, tap on both insides of the Receiver using a wooden dowel at the location of the Pivot Pin.

K. ACTION RODS

Before installation break all sharp edges and de-burr. Pay special attention to the edges next to the Support Rails.

With the Bolt Assembly forward and locked, install the Action Rods. Engage the forward ends of the Action Rods with the studs on the Inertia Piece.

Retract the Inertia Piece and Action Rods slightly to engage the tabs on the rear end of the Action Rods in their seats in the Bolt Sleeve.

L. SUPPORT RAILS

Before installation break all sharp edges and de-burr. Pay special attention to the edges next to the Action Rods.

Install both Support Rails with their smooth sides positioned toward the inside of the Receiver.

M. FOREARM

Inspect the inside of the Forearm for signs of interference with the Action Rods. Relieve as necessary with a rounded scraper.

Clearance of .003" to .004" should exist between the Barrel and Forearm all along the Forearm Barrel Channel. If necessary relieve with a fine cut bastard file.

Inspect for excessive pressure at

the points of contact with the Receiver. Too much pressure here may result in a split Forearm. Relieve as necessary.

Install the Magazine and close the Magazine Floorplate.

Pull the Bolt Assembly back to the locked open position.

Slide the Forearm over the Gas Cylinder onto the Receiver. Lift the forward end of the Forearm to clear the Gas Cylinder and then press down on the forward end of the Forearm into final position.

Install the Sling Eyelet and washer with proper orientation by holding a punch through the eyelet perpendicular to the Barrel and tightening the washer.

Cycle all systems to ascertain proper assembly and function.

SECTION V

TROUBLE SHOOTING / POSSIBLE CAUSES

1. FAILS TO EJECT

- **A.** Frozen or sticky Gas Piston.
- **B.** Clogged or undersized Barrel gas orifice.
- **C.** Weaver-type scope mounts improperly installed on the rifle and interfering with ejection. Ring clamp must be used on left side of the rifle.
- **D.** Scope base screws too long and rubbing on the top of Bolt Cover.
- **E.** Damaged or missing Ejector.
- **F.** Ejector binding due to debris build-up in Ejector hole.
- **G.** Interference between the Action Rods and the Forearm.
- **H.** Sling eyelet too long interfering with the Gas Piston.
- **I.** Weak Ejector Spring.
- **J.** Oversized Gas Regulator orifice.
- **K.** Weak cartridge i.e. low pressure.

2. FAILS TO FEED

- **A.** Rough or bent Magazine lips.
- **B.** Broken Magazine Spring.
- **C.** Sharp edge at chamber rim.
- **D.** Bolt cover too tight or loose causing binding or jamming. Refer to Section VI.
- **E.** Gas Regulator orifice too small resulting in the action cycling too rapidly.
- **F.** Gas Port too large resulting in the action cycling too rapidly.
- **G.** Weak cartridge i.e. low pressure.

3. FAILS TO FIRE

- **A.** Sticking Gas Piston not letting the Bolt close completely. (May have to be noticed before pulling Trigger because the Hammer falling may drive the Bolt closed.)
- **B.** Bolt Cover too tight preventing the Bolt from completely closing. Refer to Section VI for adjustment procedures.
- **C.** Burred Timing Latch not letting the the Bolt close completely.
- **D.** Build-up of debris between the Trigger and Trigger Guard.

4. HAMMER FAILS TO COCK

- **A.** Debris build-up between the Sear and Trigger Guard.
- **B.** Last coil of the lower end of the Disconnector Spring binding the Disconnector Spring Plunger in its hole in the Sear. Spread the last coil of the Spring.
- **C.** Inspect the Trigger Guard Assembly for broken parts.

  NOTE: As previously explained in Section I, "Description and Functional Operation", if for some reason the Hammer fails to cock and follows the Bolt forward, the rifle will not fire because the tail of the Bolt Slide keeps the Hammer from contacting the Firing Pin with sufficient energy to fire the cartridge until the Bolt is locked.

5. SAFETY DIFFICULT TO WORK

- **A.** Debris between the Trigger and Trigger Guard.
- **B.** Burred surface of the Trigger that contacts the Safety.

6. BRASS MARKS ON THE RECEIVER

Normal condition. Mouths of ejected brass may flatten slightly when they strike the Receiver during ejection.

7. CUTS IN BRASS

- **A.** Sharp edges on Bolt Lugs, Barrel Lugs, Ejection Port. (Sharp Cam Pin hole edge will cut the bolt on Magnum brass.)

8. SHORT CYCLING

- **A.** Gas leaks around the Gas Cylinder.
- **B.** Dirty Gas Piston and Cylinder.
- **C.** Improper Barrel or Gas Regulator orifices.

9. BOLT HARD TO OPERATE

- **A.** Action Rods or Support Rails binding in the Receiver.
- **B.** Action Rods interfering inside the Forearm.
- **C.** Cracked Bolt Sleeve.
- **D.** Burred Bolt at the point of Timing Latch contact.
- **E.** Burred Timing Latch. Replace.

10. POOR ACCURACY

- **A.** Damage crowning.
- **B.** Loose Stock or Forearm.
- **C.** Interference between the Barrel and Forearm.
- **D.** Barrel fouling—Polish bore with a good lapping compound.

  NOTE: Browning's accuracy specification for centerfire rifles follows:

CARTRIDGE	BOLT & SINGLE SHOT 100 yards-inches	LEVER & BREAK OPEN 100 yards-inches	AUTOLOADING 100 yards-inches
6mm Rem.	1½		
7mm-08 Rem.	1½	1¾	
7mm Rem. Mag.	1½		3½
22-250 Rem.	1½	1¾	
243 Win.	1½	1¾	2.0
25-06	1½		
257 Roberts	1½	1¾	
270 Win.	1½		2.0
300 Win. Mag.	2		2½
30/06	1½		2.0
308 Win.	1½	1¾	2.0
357 Mag.		3	
358 Win.	2	2	
44 Rem. Mag.		3	
45-70 Govt.	2		

SECTION VI

SPECIAL INSTRUCTIONS, REPAIRS AND ADJUSTMENTS

SECTION VI

SPECIAL INSTRUCTIONS, REPAIRS AND ADJUSTMENTS

1. RECOMMENDED POINTS OF LUBRICATION DURING REASSEMBLY

The use of Browning Gun Oil is recommended in the following areas: Use oil sparingly.

A. Extractor Spring

B. Bolt

C. Bolt Sleeve (inside and on rails)

D. Action Guide Spring

E. Exterior surfaces

2. SPECIAL TOOLS

The following special tools shown in Figure #29 are recommended in servicing the BAR.

FIGURE #29

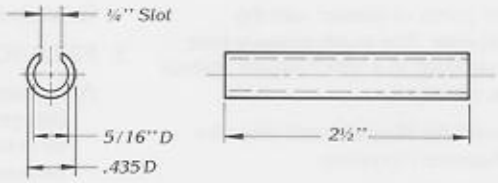
From left to right:

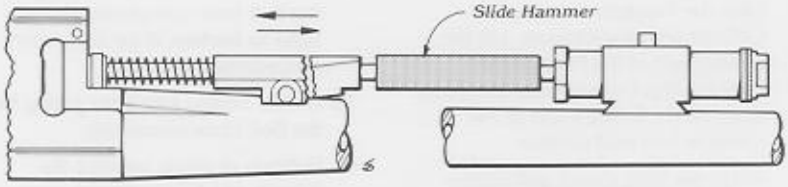
A. Stock Bolt removal screwdriver.

B. Scraper for relieving interference in the Forearm.

C. Slide Hammer. This device is used to hammer out a frozen Gas Piston. In use it is slipped around the Action Spring Guide and then the Inertia Piece is used to hammer the piston out of the Gas Cylinder by retracting the Inertia Piece and letting it fly forward. This may have to be repeated several times.

FIGURE #30





Dimensions and diagram of use are given in Figure #30.

NOTE: A piece of a scrap .30 caliber Barrel may be used as stock for the slide hammer.

3. ADJUSTMENTS TO THE BOLT COVER

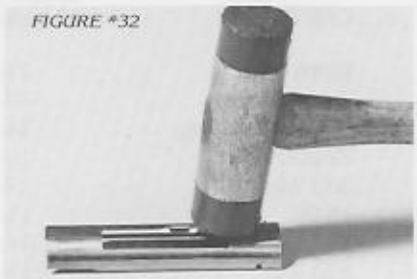
The Bolt Cover should fit the Bolt Sleeve tight enough to prevent it from moving by itself creating a rattle in the rifle. However, too tight of a fit may result in malfunctions.

To tighten the fit, lightly strike the side of the Bolt Cover as shown in Figure #31.

FIGURE #31

To loosen the fit, lightly strike the top of the Bolt Cover as shown in Figure #32.

FIGURE #32



4. TRIGGER ADJUSTMENT

Sear engagement may be increased (also increasing Trigger pull) by relieving the bottom surface of the Sear contacting the floor of the Trigger Guard.

CAUTION If Sear engagement is increased by relieving the bottom of the Sear, the following inspection procedure is mandatory:

A. Check the Trigger pull for a Trigger pull of 3.5 to 4.5 lbs.

B. With the proper Sear engagement and the Safety in the "OFF SAFE" position, slightly pull the Trigger and observe slight pre-travel before the Disconnector contacts the Sear.

C. With the Hammer cocked, place the Safety to the "ON SAFE" position. Pull the Trigger and observe the Disconnector *does not* contact the Sear by holding the Trigger to the rear and depressing the Disconnector with a finger.

CAUTION: If the Disconnector contacts the Sear with the Safety in the "ON SAFE" position, the Trigger must be replaced or the Disconnector adjusted at the point of contact with the Sear. Please refer to the next paragraph for Trigger replacement procedures.

5. TRIGGER REPLACEMENT PROCEDURE

A. Remove the Trigger Guard Assembly from the rifle.

B. Remove the Mainsprings and Guides, Trigger Pin, Trigger, Disconnector Spring and plunger.

C. Place the Safety to the "OFF SAFE" position.

D. Install the Trigger and Trigger Pin.

E. Hold the Trigger forward and tap the Safety toward the "ON SAFE" position to mark the contacting tab of the Trigger.

F. Remove the Trigger and in small progressive steps, remove material to the impression of the Safety being tapped toward the "ON SAFE" position.

NOTE: Each time the Trigger is re-installed, remember to first place the Safety to the "OFF SAFE" position and hold the Trigger forward when tapping the

Safety toward the "ON SAFE" position.

CAUTION: The cut on the Trigger must be parallel to the Trigger Pin hole and match the radius of the Safety. Use a fine cut rat-tail file.

G. Smooth the cut surface of the Trigger so as to prevent burring from contact with the Safety.

CAUTION: The Trigger should have no travel with the Safety in the "ON SAFE" position. However, there should be no interference of fit between the Trigger and Safety or else a burr will develop on the Trigger preventing Safety engagement.

After the Trigger has been fit and the Trigger Assembly reassembled, inspect to Para. 4.C of this Section.

6. PROCEDURE FOR INSTALLATION OF LEFT HAND SAFETY IN OLD STYLE BAR

Remove the Trigger Guard Assembly from the rifle.

Refer to Figure #25 and remove the Safety Spring Retaining Pin, the Safety Spring and Safety Spring Plunger.

CAUTION: Do not let the spring-loaded components fly out of the Trigger Guard.

Remove the right hand Safety from the left of the Trigger Guard.

Install the left hand Safety from the left side of the Trigger Guard. Red line of the Safety will be on the right.

NOTE: Make sure to position the detent notches so they will mate with the Safety Spring Plunger.

NOTE: If the Safety interferes with the Trigger, refer to Para. 5.E through 5.G and **CAUTION** notes of this Section, "Trigger Replacement Procedure", for adjustment procedure.

Install the Safety Spring Plunger, spring and Retaining Pin.

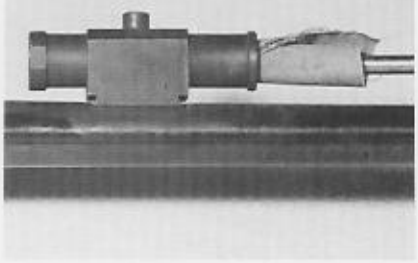
CAUTION: Use care not to let the spring-loaded components fly out of the Trigger Guard.

Work the Safety back and forth to see that it detents positively into the "ON SAFE" and "OFF SAFE" positions. Operating force should be from 4 to 5 pounds.

7. GAS CYLINDER POLISHING PROCEDURE

The Gas Cylinder may be relieved of light pitting and carbon accumulation by the use of a split shaft and drill motor as shown in Figure #33. If badly carboned,

FIGURE #33



first soak in a good powder solvent. Before polishing, remove the Gas Piston Stop Pin with a 1/16" punch.

Use 240 grit paper and finish with 400 grit.

NOTE: Make sure to flush out all loose carbon and grit before reassembly and reassemble the Gas Cylinder Stop Pin.

8. BARREL GAS ORIFICE PLUGGING & RE-DRILLING PROCEDURE

If the Barrel Gas Orifice has been found oversize due to someone's drilling, it may be plugged and re-sized using the following procedure:

Drill perpendicular to the Barrel through the Gas Cylinder stud hole ¼" into the base as shown in the cross-sectioned Gas Cylinder shown in Figure #34.

CAUTION: Use care not to drill through the Gas Cylinder into the bore of the Barrel.

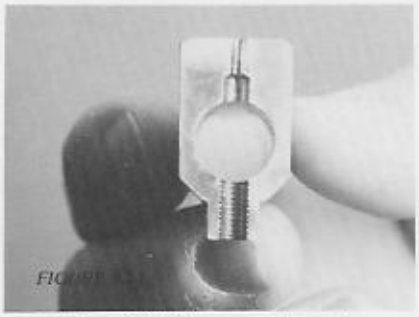


FIGURE #34

Drill for a #6-48 screw and tap the hole.

File a screwdriver slot in a 5/16" long portion of a #6-48 screw, apply Loctite and tighten in the hole.

With a #21 bit, using the stud hole as a guide, drill away the protruding portion of the plug screw.

NOTE: Make sure the #21 bit drills slightly past the screwdriver slot in the plug screw in order to effect a center start for the next drilling operation.

Next, using the proper size bit according to the orifice sizes given in Section IV, Para. 6.C, drill through the center of the plug screw into the bore.

Polish the inside of the cylinder to clean away burrs.