

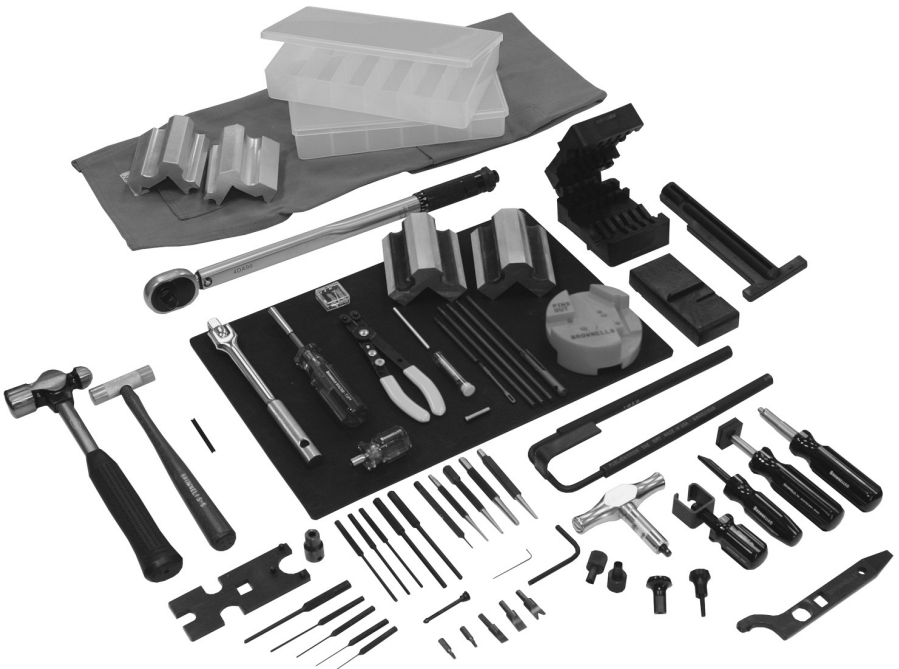


BROWNELLS®

Serious About Firearms Since 1939™

STANDARD AND PREMIUM AR-15/M16/M4 ARMORER'S KIT

#080-001-291/080-001-292



Congratulations! Your new Armorer's Kit contains the most comprehensive group of repair and maintenance tools ever offered to the Armorer and Gunsmith for working on the AR-15/M16/M4. This kit was designed with the assistance of key sales and service personnel at Colt Firearms as a part of their effort to put the correct tools in the hands of the people doing the work.

Each tool serves a specific function, and many are unique, one-of-a-kind tools - completely original. No other tool available anywhere will do the same job as well, as effectively, as quickly, or as correctly. All are of the finest quality, made to the most exact specifications.

We are confident you'll enjoy using these tools and making the most of your gunsmithing skills as you perform repairs and maintenance work on the AR-15/M16/M4.



WARNING



Never attempt to disassemble or reassemble a firearm unless you are absolutely certain that it is empty and unloaded. Visually inspect the chamber, the magazine and firing mechanism to be absolutely certain that no ammunition remains in the firearm. Disassembly and reassembly should follow the manufacturer's instructions. If such instructions are not immediately available, contact the manufacturer to see if they are available. If they are not available at all, then you should consult other reference sources such as reference books or persons with sufficient knowledge. If such alternative sources are not available and you have a need to disassemble or reassemble the firearm, you should proceed basing your procedures on common sense and experience with similarly constructed firearms.

With regard to the use of these tools, the advice of Brownells Incorporated is general. If there is any question as to a specific application it would be best to seek out specific advice from other sources and not solely rely on the general advice and warnings given.

STANDARD COLT AR-15/M16 ARMORER'S KIT

PREMIUM COLT AR-15/M16/M4 ARMORER'S KIT TOOL ADD-ON (Listed in BOLD)

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- 3 Cleaning Rod Small Arms Rod 2
- 4 Cleaning Rod Small Arms Rod 3
- 5 Barrel Nut Alignment Gauge
- 6 Starrett 5/32 Center Punch
- 7 Bolt Catch Pin Punch
- 8 Taper Pin Starter Punch
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- 16 Pivot Pin Detent Depressor (1)
- 17 Pivot Pin Detent Installation Tool
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- 19 Firing Pin Protrusion Gauge
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- 23 Magna-Tip 185-10 - 9/64 Allen
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- 26 AR-15 Combination Wrench
- 27 Broken Shell Extractor
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- 37 Bench Model Push Pin Tool**
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- 43 AR-15 Front Sight Bench Block
- 44 Socket Drive Adaptor
- 45 3/8" Square Drive T-Handle
Torque Wrench
- 46 AR-15 Magazine Feed Lip Tool**
- 47 1/2" Drive Handle
- 48 A1 AR-15 Sight Wrench
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- 50 AR-15 Armorer's Wrench
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- 52 AR-15 Bolt Ejector Tool**
- 53 Magcatch Tool**
- 54 #81 Solid Handle
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INSTRUCTIONS FOR TOOL USAGE

#1-4 – Cleaning Rod Small Arms

#084-116-100



HOW TO USE

Unlike the standard U.S. military rod that is threaded to accept only the military specification, 8-36 thread brushes, the Brownells version comes with a special adapter that permits the use of the more commonly available 8-32 threaded commercial brushes. Please note that while the various sections of the cleaning rod can be interchanged or assembled in virtually any order, the 33/8" long, 8-32 adapter can ONLY be used at the end of the rod. DO NOT attempt to thread any section or part of the cleaning rod into the adapter! To do so will ruin the threads in the adapter and/or on that section of the rod that was used.

When possible, always use the cleaning rod from the breech end of the rifle. Also, wipe the rod down frequently to remove dirt, grime and carbon. Occasionally, a drop of oil should be applied to the threads of each section of the rod. Never bend or apply side pressure to the rod.

#5 – Barrel Nut Alignment Gauge

#080-216-014



HOW TO USE

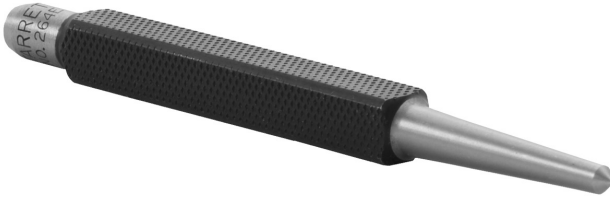
Begin by carefully checking the threads of the upper receiver and the barrel nut to ensure they are clean and free of burrs or imperfections. If both parts are in good condition, apply a small amount of a high quality, Molybdenum Disulfide Grease (#083-050-100) to the threads. This will make attachment easier and prevent galling. Prior to assembly, the barrel nut, handguard snap ring, handguard slip ring and spring must already be installed on the barrel if these parts are being used. Clamp the barrel securely in an AR-15/M16 Barrel Vise (#852-015-000 or #795-015-100), or alternately clamp the upper receiver in the Peace River Arms Receiver Action Block (#702-003-015). Slide the barrel shank into the upper receiver. Make sure the alignment pin on the barrel shank engages the alignment slot on the upper receiver. Use **EXTREME CARE** to avoid any damage to the receiver alignment slot. **DO NOT** allow the sides of the slot to be deformed or bent. Slide the upper receiver onto the barrel shank and thread the barrel nut assembly onto the upper receiver. These parts are threaded with a standard, right hand thread. Initially turn the nut on by hand.

When the nut begins to seat, it will be necessary to use a Combination Wrench (#080-216-015) along with an appropriate torque wrench. When using the combination wrench, hold it firmly in place against the barrel nut. **DO NOT ALLOW THE COMBINATION WRENCH TO SLIP FROM THE BARREL NUT. THIS CAN RESULT IN DAMAGE TO THE NUT OR INJURY TO THE USER!** The barrel nut should be torqued into position with 30 ft. pounds of pressure. Excessive Torque could damage the upper receiver or the barrel nut. Pressure of less than 30 ft. pounds may not secure the barrel properly. After the barrel nut assembly is in place, position the Barrel Nut Alignment Gauge in the open end of the bolt carrier key as far as possible. **DO NOT USE EXCESSIVE FORCE.** It should slide into position easily. If there is resistance, there may be a carbon deposit inside the carrier key that should be removed. Slowly insert the bolt carrier assembly into the upper receiver. Do not allow the Barrel Nut Alignment Gauge to fall from the carrier key. Slowly slide the bolt carrier forward into the receiver with minimal force. The alignment gauge should pass through the opening in the forward portion of the receiver. In most instances, the Alignment gauge will be stopped by contact with the handguard snap ring. Using a small punch or other suitable instrument, move the snap ring around the barrel nut until the opening between the ends of the snap ring is aligned with the alignment gauge and will permit it to pass through.

Repeat this procedure with the handguard slip ring and spring which may also need to be positioned to permit the passage of the alignment gauge. Note the barrel nut has a series of "U" notches along its circumference. The barrel nut must be positioned so the alignment gauge will pass through one of these "U" cuts. If necessary, additional torque should be applied to position the barrel nut to create clearance for free entry of the alignment gauge. When the Alignment Gauge can extend all the way through the barrel nut assembly without contacting any of the various components, the upper receiver, the barrel, the barrel nut assembly, and the carrier key are properly aligned. The Alignment Gauge can now be removed and reassembly of the rifle completed as per the manufacturer's instructions.

#6 – Starrett $\frac{5}{32}$ Center Punch

#827-512-820



HOW TO USE

Place the Bolt Carrier in a padded vise so that it is held securely and you have unrestricted access to the top of the Bolt Carrier. Position the Bolt Carrier Key on the Bolt Carrier as per the manufacturer's instructions and install the two socket head cap screws. Tighten these screws with a suitable torque wrench to 35 to 40 INCH pounds of pressure. Position the Starrett $\frac{5}{32}$ " Center Punch in those spots on the Carrier Key that were originally staked by the manufacturer and, using a suitable ballpeen hammer, strike the Punch with a single, sharp blow. This should move enough metal from the Carrier Key towards the side of the head of the socket head cap screws to provide additional friction and prevent loosening of the screws.

#7 – Bolt Catch Pin Punch

#080-216-012



HOW TO USE

Following the manufacturer's instructions, disassemble the rifle to the point that the lower receiver is detached from the upper receiver group. Secure the lower receiver in a vise with padded jaws in such a way that you have unrestricted access to the bolt catch pin on the left side of the receiver. One note of caution: **BE VERY CAREFUL WHEN USING THE VISE THAT YOU DO NOT SQUEEZE OR COLLAPSE THE LOWER RECEIVER HOUSING!** Position the Brownell AR-15/M16 Bolt Catch Pin Punch on the forward, or muzzle, end of the bolt catch pin, parallel to the surface of the magazine well housing. The punch should be placed so the relieved, or flat area of the punch clears, or extends over, the magazine well housing projection. Use a suitable, small hammer to drive the bolt catch pin to the rear and out.

Please note the bolt catch pin is a roll pin. Ideally, a roll pin punch would be used when removing this pin. However, because of the construction of the magazine well housing and the amount of material that must be removed from the punch body for clearance, a modified, flat-faced punch must be used to make the bolt catch pin punch. Be very careful to avoid damaging the roll pin during removal. Reinstall the bolt catch pin using a $\frac{3}{32}$ " roll pin punch. Since the pin will be driven in from the butt end of the receiver, there is ample clearance for the roll pin punch. Use the bolt catch pin punch **ONLY** when removing the bolt catch pin. Do not use it for installing the pin

#8 – Taper Pin Starter Punch

#827-530-320



HOW TO USE

Since the taper pins are installed from the right side of the rifle, they must be removed by driving from the left to the right. Please note the small end of the taper pin extends through to the left side of the front sight. Secure the rifle on a firm, non-marring surface with the left side of the rifle up so the small ends of the two taper pins are exposed. Make sure you have clearance below the heads of the taper pins so they can be driven from the front sight.

The Taper Pin Starter should be placed on the small end of the taper pin. Be absolutely sure its radiused face is firmly seated on the radiused end of the pin. Holding the Taper Pin Starter securely against the pin, and in line with the axis of the pin, strike the head of the Taper Pin Starter with a suitable machinist hammer. Most pins will move with moderate force. However, you may encounter some pins that require considerable effort to remove. Once a pin moves even a slight amount, the tapered design will quickly reduce the holding force that secures it.

Note that the Taper Pin Starter is designed to be used only as a starter punch when removing the taper pin. Its tapered shank prevents its use for complete removal of the taper pin. Once the taper pin has "broken loose", it can be easily removed with minimal pressure from a Starrett 1/8" punch. In most cases, the taper pin will virtually fall free once it has been started with the Taper Pin Starter.

Installing the taper pin should be done with the Taper Pin Starter to avoid damage to the radiused head of the pin. Remember, the taper pins are installed from the right side of the rifle! Never attempt to use a flat faced punch to start or remove a firmly seated taper pin. The head of the pin may be swaged outward, preventing removal and possible damage to the front sight.

The Taper Pin Starter should be used for removal or installation of the taper pins. Do not use it on flat end, solid pins or roll pins. Use such as this can damage both the pin and the Taper Pin Starter.

#9/#10 – Starrett Pin Punch

#827-525-830/ 827-525-800



HOW TO USE

It is critical that the correct size Pin Punch always be used. If the Pin Punch is larger than the pin, it will damage or mar the surface surrounding the pin.

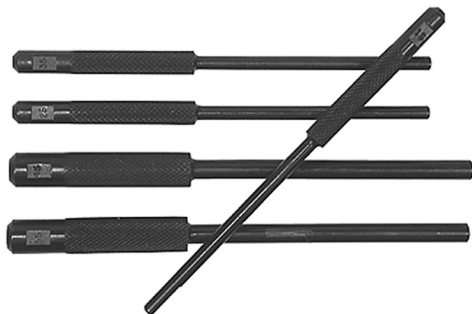
If the Pin Punch selected is too small, the end of the pin may be scarred, or the Pin Punch may bend or break. ALWAYS select a Pin Punch that is as close to the diameter of the pin to be moved as possible, but NEVER larger than the diameter of the pin. If the pin to be moved is quite tight or difficult to drive out, the use of a shorter starter punch is strongly recommended. Use of a standard length Pin Punch in a situation such as this will inevitably lead to a bent or broken punch.

Carefully examine the head of the pin to be moved before using any punch. The Starrett Pin Punches should be used only on FLAT, solid pins. DO NOT use these punches on roll pins. Some pins, as with some that are used on Smith and Wesson revolvers, have rounded heads. Use of a flat punch on this type of pin will mar or deform its head. Brownells Cup Tip Punches should be used for round headed pins.

Lastly, always make sure the axis of the shaft of the Pin Punch is in proper alignment with the axis of the shaft of the pin. Never allow the Pin Punch to tilt or lean to the side. If any punch is bent, it should be replaced or shortened. Bent punches, even those with a slight bend, are a liability and will eventually fail. They are best replaced before they fail at a critical point and damage a gun. From time-to-time, these Pin Punches should be wiped down with a good quality, non-gumming oil to prevent rust. We would also suggest that they be carefully stored when not in use to prevent loss or damage.

#11-15 – Roll Pin Holders

#080-685-062/0809685-078/080-685-093/080-685-130/080-685-125



HOW TO USE

The face of the Roll Pin Holder is drilled to accept and support the roll pin. To use, place the roll pin in the hole that is located in the end of the proper size Roll Pin Holder. Start the exposed end of the pin into its hole and gently tap the Roll Pin Holder with a hammer. Remove the Roll Pin Holder. Full seating of the roll pin should be done with a Roll Pin Punch.

WARNING: When striking any object with a hammer, suitable eye protection must always be worn. At a minimum, safety glasses with shatter proof lenses must be worn by the user. Please note that these Roll Pin Holders are NOT designed, nor intended, to fully seat a roll pin. They are designed only to set or start the roll pin into a hole. If you drive the Roll Pin Holder too far, you may mar or damage the surface of the metal around the roll pin hole. Be extremely careful and do not permit the Roll Pin Holder to strike the surface of the workpiece. Given proper use and care, your Roll Pin Holders will provide many years of use. After use, always wipe them with an oily cloth and store in a suitable container.

NOTES ON SPECIFIC GUNS Colt AR-15/M16: The smallest Roll Pin Holder, designed for 1/16" roll pins, has a flat milled on the end of the shaft. This provides clearance to the Windage Drum when seating the Windage Drum Roll Pin.

#16 – Pivot Pin Detent Depressor

#080-216-010



HOW TO USE

Following the manufacturer's recommended procedure, disassemble the rifle to the point required. Normally, removal of the Pivot Pin will be done after the Upper Receiver has been removed from the Lower Receiver. Secure the Lower Receiver in a padded vise so you have unrestricted access to the right side of the Lower Receiver. Using either finger pressure or a suitable punch, push the Pivot Pin to the right until approximately two thirds of its length is outside the receiver. The short arm of the Pivot Pin Detent Depressor is inserted into the milled slot of the Pivot Pin with the tapered point contacting the Detent. The tool is pressed to the left, into the Receiver, with moderate pressure. This short, tapered arm of the Tool will ride over and depress the Pivot Pin Detent. Rotate the Pivot Pin 90°, clearing the milled slot from the Detent. Remove the Pivot Pin Detent Depressor and place a finger over the opening of the Detent housing. Finish removing the Pivot Pin from the receiver, taking care NOT to lose the spring-loaded Detent.

Reassembling the Pivot Pin and the Pivot Pin Detent is extremely difficult unless you use another Brownell tool; the Brownells Pivot Pin Detent Installation Tool (#080-216-011).

#17 – Pivot Pin Detent Installation Tool

080-216-011



HOW TO USE

These instructions assume that the rifle has been disassembled according to the manufacturer's instructions and any needed repairs and/or maintenance work has been performed. It is further assumed that the rifle has been reassembled, following the manufacturer's instructions, to the point where the next step is installation of the Pivot Pin Detent.

Secure the Lower Receiver in a padded vise in a vertical position so the opening at the end of the Pivot Pin Detent hole is pointing "up". The LONG arm of the Installation Tool, which has a small through-hole near its end, is inserted from the LEFT side of the receiver into the holes for the Pivot Pin. Carefully position the Installation Tool so the through-hole is positioned directly over, and in line with, the Detent Spring hole in the right side of the receiver.

Pass the Detent Spring through the Installation Tool into its seating hole. Next, place the small metal Detent on top of the Detent Spring. Approximately half of the Detent will project out of the hole in the Installation Tool. A $\frac{3}{32}$ " diameter or smaller punch should be used to press the Detent down into the Detent Spring hole far enough to permit 90° rotation of the "short" arm of the Installation Tool. Rotating the Installation Tool will hold the Detent securely in place.

Position the small end of the Pivot Pin against, and in perfect alignment with, the end of the "long" arm of the Installation Tool. Using both hands and being EXTREMELY CAREFUL, push the Pivot Pin into its hole in the Lower Receiver. At the SAME TIME, you will push the Installation Tool to the left and out of the Lower Receiver. This MUST be done smoothly and quickly to prevent loss of the spring-loaded Pivot Pin Detent. When the Pivot Pin is pushed approximately halfway into the Lower Receiver, it may be necessary to rotate it so the Detent seats into the milled slot in the side of the Pin. The Pivot Pin can now be fully pressed into place in the Lower Receiver. Further reassembly can proceed as required.

IMPORTANT NOTE: ALWAYS wear safety glasses or other appropriate eye protection when working with spring-loaded parts to prevent injury to your eyes.

#18 – M16/M4 Buttstock Tool

#080-000-291



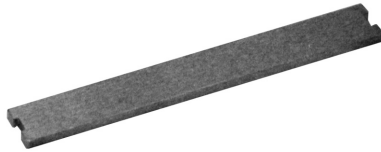
HOW TO USE

Secure the Lower Receiver in a vise with padded jaws in such a way that you have unrestricted access to the Receiver Extension and its lock nut (if applicable). Be VERY CAREFUL that you do not deform or damage the Lower Receiver when clamping it in the vise. Place the Buttstock Tool on the lock nut so that one of the holes on the nut is engaged by the tenon/stud on the Buttstock Tool's head. Depending on the shape of the Buttstock Tool holes on the lock ring it may be necessary to change out the tenon/stud on the Tool's head. The Buttstock Tool tenon is secured with a set screw. Use a 5/64" hex wrench to remove this set screw. Or, if disassembling a rifle, the tail end of this Buttstock Tool is a slotted driver used to remove and install the swivel and butt cap screws. The oval hole in the Tool body engages the rear end of the extension tube. If necessary, a 1/2" square drive handle (like the one in the Brownells Armorer's Kit) may be used in conjunction with the Buttstock Tool to increase leverage while removing the extension. Turning the Buttstock Tool counter-clockwise will loosen the extension tube; only moderate pressure should be required to break the lock nut loose. Use care when loosening the lock nut so as not to damage the Lower Receiver. Once the Lock Nut is loosened, follow the manufacturer's recommended procedure for further disassembly of the Receiver End Plate and Receiver Extension.

When reinstalling the Lock Nut, care must be taken to make sure the Receiver End Plate is properly positioned and the various detents are in place. The Buttstock Tool should be used with a 1/2" drive torque wrench, turn the Nut in a clockwise direction to install. Note: DO NOT EXCEED 42 FOOT POUNDS OF PRESSURE! Excessive torque may result in stripping the threads in the Lower Receiver. However, insufficient torque may not adequately secure the Receiver Extension.

#19 – Firing Pin Protrusion Gauge

080-216-013



HOW TO USE

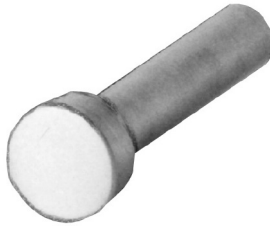
Begin by making absolutely sure the rifle is unloaded. Remove the magazine, lock the bolt carrier to the rear and check the chamber to ensure that it is clear. Following the manufacturer's instructions, disassemble the rifle and remove the bolt and firing pin from the bolt carrier.

The bolt and firing pin should be cleaned to remove carbon fouling or grease and grime that might interfere with protrusion measurement. Place the firing pin in the bolt and hold it in a forward position so its tip protrudes through the face of the bolt. Holding the firing pin firmly in the bolt, place the end of the Protrusion Gauge marked "max.", against the face of the bolt at exactly 90°. Move the notch in the end of the gauge slowly and carefully over the tip of the protruding firing pin. The bottom of the Protrusion Gauge notch should NOT touch the end of the firing pin. If it does not touch the firing pin, the firing pin does not exceed maximum acceptable length and you can proceed to the next step. If the firing pin DOES touch the bottom of the notch, it is too long and the tip must be carefully ground back to an acceptable length. When reshaping the tip of the firing pin, make SURE you contour the tip so you have an EVEN, SMOOTH, SPHERICAL SHAPE. There must be no flats or sharp edges which might lead to piercing or tearing of the primer.

Repeat the process using the end of the gauge marked "min." When this end of the gauge is used, it SHOULD contact the tip of the firing pin. This would indicate that the firing pin is of minimal acceptable length. If the firing pin DOES NOT touch the bottom of the "min." notch, it is too short and must be replaced with a new firing pin.

#25 - 0.250 Chamber Mirror

#084-174-250



HOW TO USE

In a typical bolt action rifle, first remove the bolt and clear the chamber of any oil, dirt or grease. Place the appropriate size Chamber Mirror in the chamber with the stem of the Chamber Mirror toward the muzzle. Lower the muzzle and allow the Chamber Mirror to slide forward until it is stopped by the rifling in the barrel throat. In most cases, normal room lighting will provide adequate illustration as the light is reflected from the highly polished head of the Chamber Mirror. Since the "light source" (in the form of the Chamber Mirror) is so close to the chamber, any significant imperfections should be easily seen.

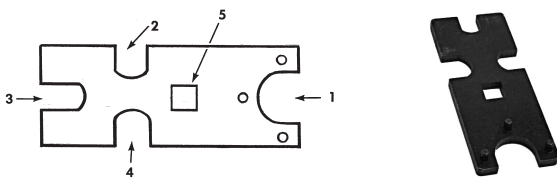
After the chamber inspection is completed, elevate the barrel and the Chamber Mirror will fall from the throat. If it does stick, due to grease or fouling, a light tap with a cleaning rod inserted from the muzzle will free the Chamber Mirror.

If the face of the Chamber Mirror becomes scratched or tarnished, it can be repolished on a muslin or felt wheel with Brownells 555 Polish-O-Ray™. When not in use, we suggest that the Chamber Mirrors be lightly coated with oil to prevent rusting and then stored in the compartmented carrying pouch.

CAUTION: Make sure the Chamber Mirror is REMOVED prior to chambering any type of ammunition. Not only will the Chamber Mirror act as a dangerous bore obstruction, the Chamber Mirror head can damage the rifling and the throat if it is driven forward into the rifling as a round is chambered. Again, ALWAYS CHECK the bore to ensure the Chamber Mirror is removed after the chamber examination is completed.

#26 – AR-15 Combination Wrench

#080-216-015



HOW TO USE

- 1) This radiused opening on the right side of the Wrench is used to tighten or loosen the Barrel Nut which secures the Barrel to the Upper Receiver. The three (3) pins that project from the surface of the Wrench are designed to fit notches cut into the circumference of the Barrel Nut. Before use, ALWAYS check these pins to make sure they are not bent or loose. When installing a barrel, the Combination Wrench is used with a 1/2" Square Drive Torque Wrench. EXACTLY 30 ft. pounds of pressure should be used to tighten the Barrel Nut. DO NOT apply pressure in excess of 30 ft. pounds as either the Barrel Nut or the Barrel may be damaged.
- 2) This approximately .630" wide slot provides a means of installing or removing the Lower Receiver Extension. A 1/2" Square Drive Torque Wrench is again used with the Combination Wrench to apply 35 to 39 ft. pounds to the Receiver Extension when fitting it to the Lower Receiver. DO NOT apply pressure in excess of 39 ft. pounds as either the Receiver Extension or the Lower Receiver may be damaged.
- 3) This .500" wide slot is included on the Combination Wrench to fit older, "narrow design" Receiver Extensions as used on the AR-15/M16 A1 models.
- 4) This approximately .760" wide slot is for removing and installing the Flash Suppressor. The Combination Wrench is used with a 1/2" Square Drive Torque Wrench when installing the Flash Suppressor. The recommended torque is 25 to 30 ft. pounds.
- 5) This 1/2" square hole in the body of the Combination Wrench is the attaching point for the 1/2" Square Drive Torque Wrench. In addition, this hole is used to attach a 1/2" Square Drive, 12" Handle that is used to give added leverage when removing the Receiver Extension, Barrel Nut, or Flash Suppressor. Please note that ONLY the 12" Handle should be used for disassembly; DO NOT USE A TORQUE WRENCH FOR DISASSEMBLY OF THESE COMPONENTS. THE 12" HANDLE SHOULD NOT BE USED FOR ASSEMBLY PURPOSES. Proper torque during assembly is of critical importance for proper functioning and to prevent damage to components. When installing any threaded part such as the Barrel Nut or Flash Suppressor, carefully inspect the threads for burrs, rust, grit, or other material that might interfere with proper fit. It is also advisable to apply a small amount of a high grade lubricant such as Brownells

#27 – Broken Shell Extractor

#080-000-441



HOW TO USE

(Portions of these Instructions are reprinted by permission from W. J. Riebe)

NEVER try to use the Broken Shell Extractor for any caliber other than the one it is marked for. Doing so can cause irretrievable damage to the barrel or chamber of your rifle. **NEVER** put the Broken Shell Extractor into the chamber of a rifle when there is no broken shell in the chamber.

NEVER try to feed the Broken Shell Extractor through the magazine of any rifle.

Make sure you have a broken shell in the chamber of the rifle. Usually, you can't feed another shell into the chamber. It will only go in a short way. If you are lucky, you will find the broken rim section of the previous round lying on the ground near your foot.

Drop the Broken Shell Extractor into the chamber of your rifle, work the action once (close the bolt, lever, or pump the slide, or do whatever you do to make a semi-automatic action function). Pull back on the bolt or otherwise open the action and both the Broken Shell Extractor and the broken shell that was stuck up in the chamber of your rifle should now be visible. If the action of your rifle is a Mauser 98 type, the procedure is somewhat different. Put the Broken Shell Extractor onto the face of the bolt by hooking it behind the cartridge extractor on the bolt; the same as if you were single loading the rifle without feeding the cartridge through the magazine. This procedure is necessary because the design of the action will not allow the extractor on the rifle's bolt to "skip" or "jump" over the rim on a cartridge case or over the "rim" of the Broken Shell Extractor.

To remove the remaining portion of the broken case off your Broken Shell Extractor so you can be ready to use it again: pinch the forward part of the extractor between your thumb and index finger, and push the broken portion of the shell off the extractor.

#28 – 5.56 Max Field Headspace Gauge

##319-418-033



HOW TO USE

Proper use of this gauge is **absolutely critical**. Improper use can lead to inaccurate measurements, causing an unsafe rifle to be fixed, with great potential for injury to the shooter.

Follow the manufacturer's recommended procedure and remove the Bolt Carrier Assembly from the Upper Receiver. Strip the Bolt after removing it from the Bolt Carrier. By removing the Extractor and Ejector, you prevent the possibility of a false reading, caused by pressure or tension from these components on the Headspace Gauge. In addition, the amount of force required to cam the Bolt into the locked position is greatly diminished. This is especially important in situations where the Bolt will barely close on a headspace gauge. If the Extractor and Ejector are present, they can prevent the bolt from closing on the headspace gauge.

After the Bolt is properly stripped, the Bolt face should be cleaned to remove any dirt, carbon or foreign material that can cause a false reading. The chamber should also be inspected and thoroughly cleaned. Finally, the Headspace Gauge itself should be checked and any oil or grease removed.

Reinstall the Bolt Carrier with the stripped Bolt in place and position the Bolt far enough to the rear to allow the insertion of the Headspace Gauge into the chamber. Place the Headspace Gauge in the chamber, then GENTLY, CAREFULLY, move the Bolt Assembly forward. DO NOT SLAM THE BOLT CARRIER FORWARD! EXCESSIVE FORCE WILL RUIN THE HEADSPACE GAUGE AND MAY DAMAGE THE CHAMBER! Use only your thumb and forefinger to move the Bolt Assembly forward. If headspace is excessive, the Bolt WILL cam into position and the Bolt Carrier will move forward so that its rear is flush with the rear of the Upper Receiver. If the bolt DOES NOT cam into the locked position, the rifle does not have excessive headspace. Remember, the Bolt should NOT close on a field gauge.

Please note that when checking headspace, the AR-15/M16 should ALWAYS be held in a normal horizontal position. DO NOT turn the rifle upside down as the Cam Pin may slide out of position and prevent retraction of the Bolt Carrier.

While not absolutely necessary, we suggest separating the Upper and Lower Receiver units. Doing so makes checking and cleaning the chamber and use of the Headspace Gauge easier.

After checking the Headspace, reinstall the Extractor and Ejector into the Bolt. Reassemble the firearm according to the manufacturer's instructions.

#30-34 – Roll Pin Punch Set

#230-112-105



HOW TO USE

As with any hardened punch, eye protection **MUST BE WORN** whenever a punch is struck with a hammer or any other metal object. We repeat, **EYE PROTECTION** in the form of safety glasses or a face shield must be worn when using hardened steel punches such as the Brownells Roll Pin Punches.

When choosing a Roll Pin Punch, select one that is no larger than the compressed diameter of the pin. If a punch is used that is larger than the pin, the surrounding metal in which the pin is seated can be damaged. Also, a Roll Pin Punch should not be used which is smaller than the compressed diameter of the pin. If this occurs, it may be possible to drive the punch through the hollow center of the roll pin.

Roll pin punches are designed with a small projection in the center of the pin tip to support the circumference of the roll pin. The tips of Roll Pin Punches are **NOT FLAT** and should **NEVER** be used on regular solid pins. If a roll pin punch is used on a solid pin, it will mar or mark the pin! **USE REGULAR SOLID PIN PUNCHES FOR SOLID PINS; USE ROLL PIN PUNCHES FOR ROLL PINS!**

If the end of a Roll Pin Punch is damaged or deformed, it should be discarded. It is virtually impossible to regrind the tip of the roll pin punch and properly shape the center projection.

When using a Roll Pin Punch, make sure the axis of the shank of the Roll Pin Punch is in line with the axis of the roll pin. **DO NOT** cant the Roll Pin Punch off to one side. When you strike the Roll Pin Punch, hit it directly on the top of its head. If you strike the head of the Roll Pin Punch at an angle you may bend the shank.

Notes On Specific Guns: Colt AR-15/M16: 1/16" Roll Pin Punch is used on the Charging Handle Latch Pivot Pin, the Ejector Retainer Pin, the Windage Drum Roll Pin and the Trigger Guard Roll Pin. 5/64" Roll Pin Punch is appropriate for removal of the Buttplate Door Plunger Retainer Pin and the Gas Tube Roll Pin. The 3/32" Roll Pin Punch should be used to remove the Forward Assist Assembly Roll Pin. The 1/8" Roll Pin Punch is the correct size for the roll pins used as a Trigger Guard Pivot Pin and as the Buffer Retainer Pin. The 3/16" Roll Pin Punch is not used to drive a roll pin, but is used instead to set, or stake, the rivet securing the upper Sling Swivel Loop.

#39 – AR-15 Barrel Vise Jaws

#795-015-100



HOW TO USE

In use, the Barrel of the AR-15/M16 is placed between the matching circular milled cuts in the Barrel Vise Jaws and is held securely as the two halves are clamped together in the machinist vise.

Note that the Barrel Vise Jaws have two sets of milled, circular grooves for the AR-15/M16 Barrels. The milled cut on the "short" arm of the Vise Jaw is for the larger diameter heavy barrel while the cut on the "long" arm of the jaw is for the smaller diameter, light-weight standard barrel.

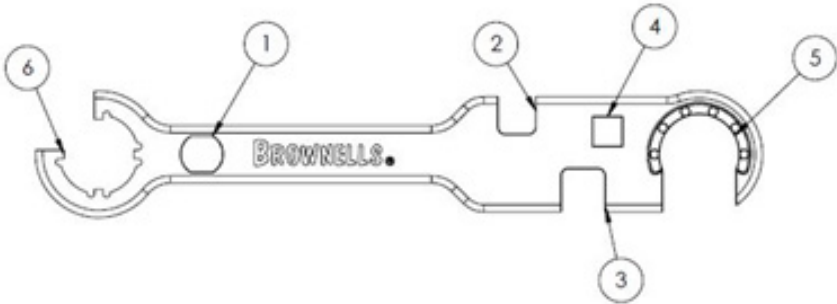
Prior to use, the portion of the barrel that will be clamped in the Vise Jaws, as well as the circular cuts in the Jaws, should be thoroughly cleaned with Brownells TCE Cleaner Degreaser (#083-060-032) to remove all traces of grease or oil. Even the slightest amount of oil will "lubricate" the barrel and allow it to twist or turn in the Vise Jaws. In addition, a light dusting of Brownells Rosin (#083-016-100) in the circular cuts in the Jaws will help prevent "turning".

Always make sure the machinist vise used is firmly attached to the workbench. The bench must also be sturdy and unable to tilt or overturn when pressure is applied.

These Barrel Vise Jaws should NEVER be used for any other purpose than that for which they were designed: holding AR-15/M16 Barrels! Given reasonable care and used appropriately, they will give many years of service.

#40 – AR-15 Armorer’s Wrench

#080-001-208



HOW TO USE

Secure the lower receiver in a vise with padded jaws in a way you will have unrestricted access to the receiver extension and lock nut. Take care not to overtighten the vise and deform the receiver.

1. This 5/8" opening is used for the installation or removal of a fixed butt-stock A2 lower receiver extension. Once installed, a 1/2" torque wrench is used to torque to 35-39 ft/lbs. on the extension (DO NOT exceed 39 ft/lbs. or damage may occur).
2. This opening is used to install the older style "narrow design" extensions used on AR-15/M16 A1 models. Once installed, a 1/2" torque wrench is used to torque to 35-39 ft/lbs. on the extension (DO NOT exceed 39 ft/lbs. or damage may occur).
3. This larger, 0.760" opening is used to install the Flash Suppressor. Once hand tight, use a 1/2" torque wrench to tighten the suppressor to 25-30 ft/lbs.
4. This 1/2" square hole is the attachment point for the torque wrench. In addition, this hole can be used to attach a 1/2" square driver, 12" handle that is used give added leverage for removal of extensions, barrel nuts, etc... Please not only a 12" handle should be used for disassembly; **DO NOT USE A TORQUE WRENCH FOR DISASSEMBLY OR DAMAGE TO FIREARM OR WRENCH MAY OCCUR.** Proper torque is critical to the proper functioning of the firearm and components. Inspect all threaded components for burrs or grit in the threads before assembly. It is advisable to apply a small amount of high grade lubricant such a Brownells Barrel Assembly Paste (083-000-444) to the threads to prevent galling.
5. This end of the wrench is used for barrel but installation which secures the barrel to the receiver. The (6) six pins protruding from the surface and the grooves on the opposite side are designed to fit into the necessary holes or grooves on the barrel nut. Before use, **ALWAYS CHECK** that the pins or grooves are properly engaging the nut and that the threads are properly engaging, or damage may occur. Apply torque according to barrel nut manufacturer's specs.
6. Use this opening for installation of the extension castle nut. Slide the wrench over the extension until the (4) four teeth engage the necessary notches on the castle nut. Using the torque wrench, install to 38-42 ft/lbs. of pressure. **DO NOT EXCEED 42 ft/lbs. AS DAMAGE MAY OCCUR.** Once installed, slide wrench back off the extension.

#41 – Lower Receive Vise Block

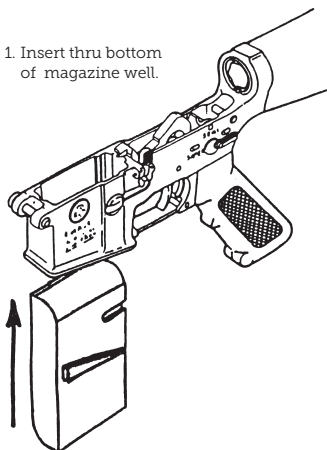
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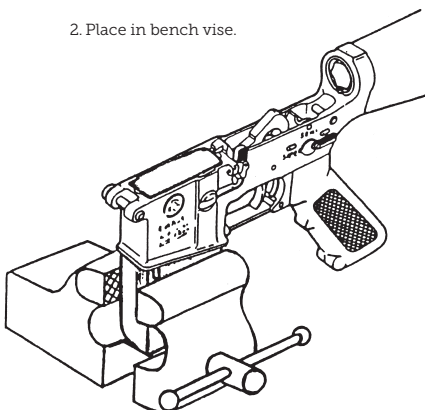
HOW TO USE

NORMAL MOUNTING PROCEDURE:

1. Insert thru bottom of magazine well.

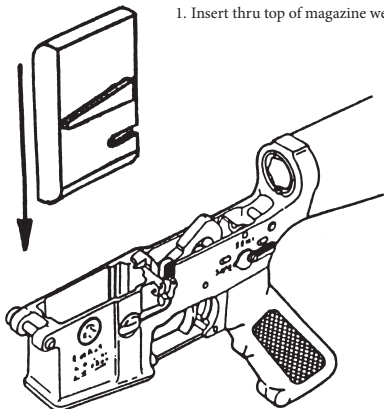


2. Place in bench vise.

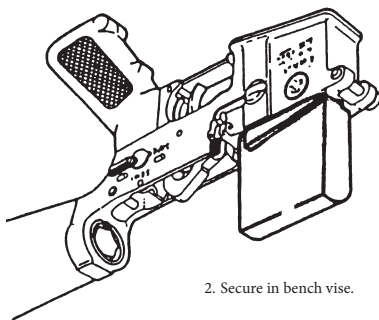


INVERTED MOUNTING PROCEDURE:

1. Insert thru top of magazine well.



2. Secure in bench vise.



#42 – Upper Receiver Action Block

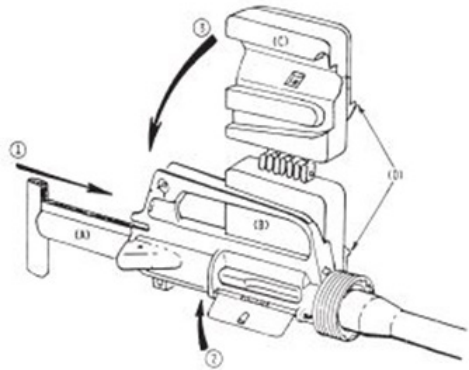
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HOW TO USE

Separate upper and lower receiver groups. Remove bolt, bolt carrier and charging handle from upper receiver. Note: Refer to Colt Manual No. CM102 (or similar publications) for specific procedures.

Insert the upper receiver internal support (A) into upper receiver, and close the dust cover. Be sure the upper receiver internal support is all the way forward and in contact with the barrel extension. Place the upper receiver into the left half of the Action Block (B), matching the outline of the molding to the upper receiver contours. Fold the right half of the Action Block (C) down onto the right side of the upper receiver, making sure the two, receiver action block halves mate properly.



Place the upper receiver and action block in a securely mounted bench vise with the barrel pointing to your right. We recommend a vise with a minimum of 3" or 4" jaws. The vise jaw ribs of the Action Block (D) must be above, and resting on, the vise jaws. The Action Block has to be positioned to give sufficient clearance for the action wrench to fully engage and turn the barrel nut.

Tighten vise to secure the Action Block. Do Not Crush!! Remove the barrel nut using an appropriate barrel nut wrench.

#47 – 12" Long 1/2" Square Drive Handle

#221-141-600



HOW TO USE

Please note that the rifle barrel should be firmly secured in a non-marring barrel vise. We recommend Brownells AR-15/M-16 Barrel Vise Jaws for this purpose. The AR-15/M-16 Combination Wrench should be attached to the 12" Handle. Note: the 1/2" square hole in the center of the AR-15/M-16 Combination Wrench will accept the hinged head of the 12" handle. The head should be inserted into the square hole in the AR-15/M-16 Combination Wrench far enough so that the spring loaded ball detent locks the 12" handle's head into the AR-15/M-16 Combination Wrench.

Important Note: to insure clearance for the 12" handle, insert the hinged head into the AR-15/M-16 Combination Wrench on the side OPPOSITE the three protruding Barrel Nut lugs.

When applying pressure to the 12" handle to remove the Barrel Nut use great care so that the three Barrel Nut lugs on the AR-15/M-16 Combination Wrench do not slip out of the Barrel Nut. Great pressure is generally not required to loosen the Barrel Nut as it is normally seated with only 30 foot pounds to torque. Do NOT attempt to retighten or install the Barrel Nut with just the 12" Handle as you will not have any way of measuring the amount of torque that is applied.

#51 – 12oz Ballpeen Hammer

#956-000-001



HOW TO USE

A ballpeen hammer is one of the most basic gunsmithing tools and has multiple functions on the bench. It is used for driving pins, peening, striking punches, riveting, stamping and other operations requiring a sharp blow. A gunsmith's ballpeen hammer should be used **ONLY** for gun work. **NEVER** allow it to be used for any other purpose. If the face or ball of the hammer is scratched, rusted, pitted or chipped, it should be reground and given a high polish. This is especially important as a smooth, even surface on the ball and face of the hammer will ensure a smooth, even surface on the workpiece when it is peened or struck.

The Gunsmith's Ballpeen Hammers are available in various weights from two to twelve ounces. The lighter weight heads are more suitable for delicate work while the heavier heads should only be used when extra force is required. Use of a too-heavy hammer can lead to damage to pins or other fragile parts. Always choose the lightest weight hammer that will be suitable for a particular application.

#52 – AR-15 Bolt Ejector Tool

#080-792-002



HOW TO USE

Bolt Action Rifles: Disassembly: Determine which handle assembly will be required for the bolt being worked on (small bolt face, such as the .223 Remington; or large, such as the .30-06 or .300 Win. Mag.). Install the appropriate handle assembly in the tool body. Remove the bolt from the receiver. With the striker either in the cocked position or removed from the bolt, slip the "ears" of the tool body over the rear surfaces of the bolt locking lugs. Position the handle assembly's tip over the ejector, and turn the handle down until its end is flush with the bolt face. Hold the bolt body in a padded bench vise, and use an appropriate pin punch to drive out the retaining pin. Carefully unscrew the handle assembly from the tool body, maintain control of the ejector plunger and spring. **CAUTION:** The ejector is under very heavy spring pressure. Care must be taken to control the parts to prevent injury or loss.

AR-15/M-16 Rifles: Disassembly: Following the manufacturer's instructions, remove the bolt and bolt carrier assembly from the upper receiver. It is not necessary to remove the bolt from the bolt carrier to remove the ejector from the bolt. Back off the small plunger handle assembly from the tool body, and slip the ears of the tool body over the bolt head, behind the locking lugs. Align the tool body so the ejector retaining pin will be accessible. Screw in the handle assembly to depress the ejector flush with the bolt face, and use an appropriate punch and hammer to remove the ejector retaining pin. Back off the handle from the tool body to allow the ejector to come free from the bolt. **CAUTION:** The ejector is under very heavy spring pressure. Care must be taken to control the parts to prevent injury or loss.

SPECIAL JOBS: Stuck ejectors - Plunger type ejectors will occasionally jam in the bolt head due to brass, bullet shavings, powder fouling, or rust accumulating in the hole along with the ejector and spring. Before the ejector can be removed from the bolt, it must be freed up. Clamp the bolt in a padded bench vise with the bolt head facing upward. Squirt a few drops of good penetrating oil, such as Brownells BPO, on the bolt head at the ejector. Allow the penetrating oil to soak the ejector for several minutes. If the ejector does not pop loose by itself, select a punch that matches or is just slightly smaller than the diameter of the ejector and a 2 oz. ballpeen hammer. Place the punch on the face of the ejector and use the hammer to lightly tap the end of the punch several times. You should get some "bounce back" from the ejector spring. Add more penetrating oil, and repeat the tapping until the ejector is freed up to its full extension against the retaining pin. At this point, use the Brownells Bolt Ejector Tool to help remove the ejector. Clean out the hole after the ejector is removed using appropriate solvents, swabs, pipe cleaners, etc. If the ejector is stuck so firmly that the above method does not work, you may want to try drilling the ejector plunger to accept a small screw extractor, normally used for removing broken or headless screws. Drilling will ruin the original ejector, so be sure to have a replacement ejector on hand. Ejectors are quite hard. In order to drill one, you will have to use a carbide drill bit. Select the size appropriate to the size of screw extractor you are using. First, center drill the ejector with a carbide center drill then drill the hole for the screw extractor. After drilling, try freeing up the ejector again with the punch and hammer. Sometimes, the

vibration from drilling will break loose the rust and crud jamming the ejector in the bolt. If the ejector does not free up from drilling, place the screw extractor in a tap handle, turn the screw extractor into the ejector by a couple of turns and then remove the retaining pin. Continue turning the tap handle while tapping the side of the bolt head with a 2 oz. ballpeen hammer to help break loose the rust and crud that has locked the ejector into the bolt head. You should be able to loosen the ejector to the point where the penetrating oil has some effect in helping to get the ejector free from the bolt. In the rare case, where the ejector is totally locked in place in the bolt, you will have to completely drill out the ejector. If drilling is required, be certain that the drill is centered on the ejector so you do not damage the bolt. If the ejector has to be drilled out to a slightly larger than standard size, you may have to make a new, slightly larger diameter ejector plunger to prevent brass cartridge particles or powder fouling from jamming the ejector in the future. Reassembly: Start the ejector plunger retaining pin into its hole in the bolt body, to the point where it does not protrude into the ejector's hole. Insert the ejector spring and ejector plunger into the hole, and turn the ejector until its retaining slot is roughly aligned with the retaining pin's axis. Slip the tool body over the bolt's locking lugs and screw in the handle assembly until the ejector is flush with the bolt face. Use an undersize pin punch to double check the alignment of the ejector's retaining slot, and carefully finish seating the ejector retaining pin in the bolt body. If required by the manufacturer's instructions, stake the retaining pin in place in the bolt. Remove the tool from the bolt, and make certain the ejector plunger is free to travel through its normal range of motion.

#55 – 4DA96 1/2" Torque Wrench

#018-150-050



HOW TO USE

Actual use of these torque wrenches on the AR-15/M16 begins with a careful and thorough check of the rifle to be absolutely sure that it is UNLOADED. Remove the magazine, lock the bolt to the rear and inspect the chamber to make sure that it is clear of ammunition. Depending upon the particular operation to be performed, the rifle should be disassembled as required following the manufacturer's instructions.

The 1/2" Square Drive Torque Wrench is used with the AR-15/M16 Combination Wrench to install the Flash Suppressor, the Barrel Nut and the Lower Receiver Extension. When installing the Flash Suppressor, 25 or 30 foot pounds of torque should be applied. When fitting the Barrel Nut to the Upper Receiver, a force of 30 foot pounds is applied to secure the barrel. The Lower Receiver Extension is fitted to the Lower Receiver and between 35 and 40 foot pounds should be applied to these screws.

#56 – Handguard Removal Tool

#100-000-438



HOW TO USE

HANDGUARD REMOVAL: (1) Remove the magazine from the firearm, and verify the chamber is empty. (2) Slip the hook at the closed end of the Handguard Removal Tool into the magazine well so the long bar ends of the tool are positioned over the angled surface of the delta ring. (3) Grasp the long bar ends and pull them toward the rear of the upper receiver to compress the delta ring against its spring (4) pull the upper and lower handguard halves from the rifle.

HANDGUARD INSTALLATION: (1) Remove the magazine from the firearm, and verify the chamber is empty (2) Slip the hook at the closed end of the Handguard Removal Tool into the magazine well so the long bar ends of the tool are positioned over the angled surface of the delta ring. (3) grasp the long bar ends and pull them toward the rear of the upper receiver to compress the delta ring against its spring. (4) Fit the front flanges on the upper and lower handguard halves into the handguard cap directly behind the front sight. (5) Hold the handguard halves together so the rear flanges are in position to be captured by the delta ring. Gradually release the tension on the delta ring. (6) Remove the tool, and verify the delta ring has properly engaged the handguard halves.

#58 – Snap Ring Pliers

#531-460-000



HOW TO USE

The Snap Ring Pliers are used as follows. First, select the appropriate set of nose tips for use in the Pliers (normally, the black .035" diameter tips). After loosening the slotted screws near the end of the pliers, place the shank of the appropriate tip in the groove under the clamping pad and retighten the screw. Make **ABSOLUTELY CERTAIN** that the tips are securely locked in place and will not slip or move during use.

Note that the Snap Ring Pliers can be set so the tips will move apart when the handles are closed, or so that the tips will come together as the handles are closed. The Pliers should be set up to function in the manner with which the user is most comfortable.

The tips of the Pliers are inserted in the holes located in the ends of the Snap Ring. Hold the Pliers securely so the tips do not slip from the holes in the Snap Ring, and spread the tips apart slowly and CAREFULLY. Do not over expand the Snap Ring. If the Snap Ring is spread too far, it may be damaged. Spread the ends of the Snap Ring only enough to permit its removal from the Barrel Nut.

The Snap Ring Pliers are also essential for proper, easy installation of the Snap Ring. Again, care must be taken to make sure the Snap Ring is not expanded any more than is absolutely necessary to slide onto the Barrel Nut. As always, when working with any type of spring, safety glasses or other suitable eye protection MUST be worn.



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