



# AT 500

## Instruction Manual

Version 3.3



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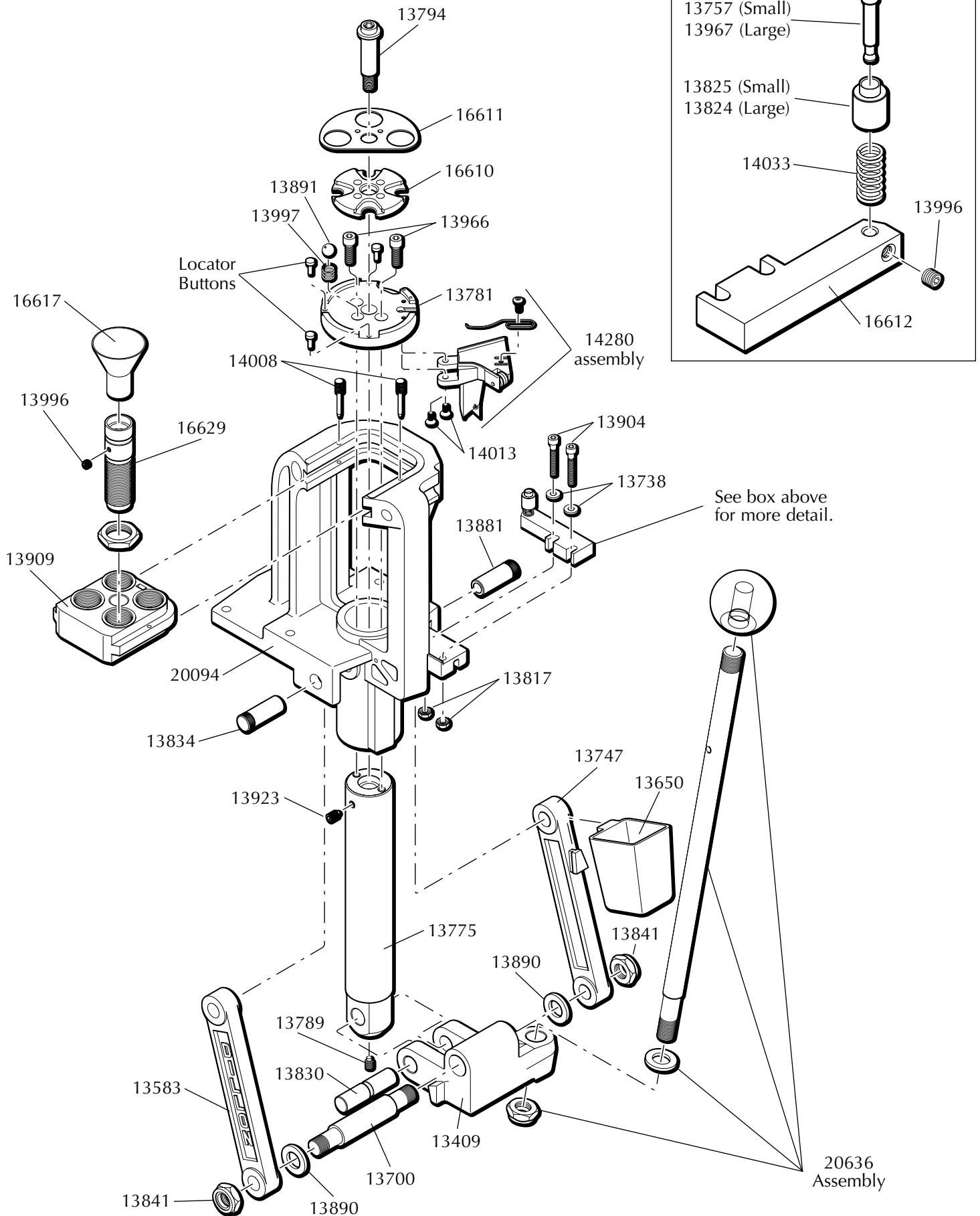
**For Technical Assistance**  
**or to place an order call: (800) 223-4570**  
**For an issue of the *Blue Press*: call:**  
**(800) 762-3844**  
**For additional product information,**  
**see our web site at:**  
***www.dillonprecision.com***

# AT 500 Parts List

Part #	Description
13409	Crank
13435	1/4" Hex Wrench
13583	Link Arm, Left
13593	5/32" Hex Wrench
13650	Spent Primer Cup
13700	Link Arm Pin
13728	1/8" Hex Wrench
13738	Rod Washer, #10
13747	Link Arm w/ Hook, Right
13757	Seating Punch, Small
13775	Main Shaft
13781	Platform
13789	Main Shaft Pin Set Screw
13794	Shellplate Bolt
13817	10-32 Kep Nut
13824	Primer Cup, Large
13825	Primer Cup, Small
13830	Main Shaft Pivot Pin
13834	Solid Link Arm Pin, Left
13841	Nylock Nut
13881	Hollow Link Arm Pin, Right
13886	3/32" Hex Wrench
13890	Spring Washer
13891	Index Ball
13904	Bellcrank Bolt
13909	Toolhead
13923	Brass Tip Set Screw
13966	Platform Mount Bolt
13967	Seating Punch, Large
13996	10-32 x 3/16 Set Screw
13997	Index Ball Spring
14008	Toolhead Pin
14013	Roller Bracket Screw
14033	Primer Cup Spring
14280	Roller Bracket Assembly
	13719 Cartridge Spring Screw
	13926 Cartridge Spring
16609	Conversion Kit
16610	Universal Shellplate
16611	Shellplate Cover
16612	Primer Punch Holder
16617	Plastic Funnel
16629	Powder Die
20094	Frame
20636	Handle, Knob & Nut Assembly

*Not all items are shown in schematic illustration.*

# AT 500 Schematic



## Suggested Minimum Equipment to Begin Reloading (Figure 1)

- 1) Powder scale
  - 2) Dies
  - 3) Loading manual
  - 4) Case lubricant (for bottlenecked cases)
  - 5) Safety glasses
  - 6) Primer flip tray\*
  - 7) Dial calipers\*
- (\*Not absolutely essential, but pretty handy.)



Figure 1– Minimum equipment needed to begin reloading.

## Reloading Safety

At this point you're anxious to finish your assembly and start cranking out rounds. But for your own safety, stop now and read the following:

Reloading small arms ammunition involves the use of highly explosive primers and powder. Handling these materials is inherently dangerous. You should recognize this danger and take certain minimum precautions to lessen your exposure to injury.

Never operate the machine without ear and eye protection on. Call our customer service department at (800) 223-4570 for information on the wide variety of shooting/safety glasses and hearing protection that Dillon has to offer.

- **PAY ATTENTION:** Load only when you can give your complete attention to the loading process. Don't watch television or try to carry on a conversation and load at the same time. Watch the automatic systems operate and make sure they are functioning properly. If you are interrupted or must leave and come back to your loading, always inspect the cases at every station to insure that the proper operations have been accomplished.
- **SMOKING:** Do not smoke while reloading or allow anyone else to smoke in your reloading area. Do not allow open flames in reloading area.
- **SAFETY DEVICES:** Do not remove any safety devices from your machine or modify your machine in any way.

- **LEAD WARNING:** Be sure to have proper ventilation while handling lead components or when shooting lead bullets. Lead is known to cause birth defects, other reproductive harm and cancer. Wash your hands thoroughly after handling anything made of lead.

- **LOADS AND LENGTHS:** Avoid maximum loads and pressures at all times. Use only recommended loads from manuals and information supplied by reliable component manufacturers and suppliers. Since Dillon Precision has no control over the components which may be used on their equipment, no responsibility is implied or assumed for results obtained through the use of any such components.

Seat bullets as close to maximum cartridge length as possible. Under some conditions, seating bullets excessively deep can raise pressures to unsafe levels. Refer to a reliable loading manual for overall length (OAL).

- **QUALITY CHECKS:** Every 50-100 rounds, perform periodic quality control checks on the ammunition being produced. Check the amount of powder being dropped and primer supply.

- **RELOADING AREA:** Keep your components safely stored. Clear your work area of loose powder, primers and other flammables before loading.

- **COMPONENTS:** Never have more than one type of powder in your reloading area at a time. The risk of a mix-up is too great. Keep powder containers closed.

Be sure to inspect brass prior to reloading for flaws, cracks, splits or defects. Throw these cases away.

Keep components and ammunition out of reach of children.

- **BLACK POWDER:** Do not use black powder or black powder substitutes in any Dillon powder measure. Loading black powder cartridges requires specialized loading equipment and techniques. Failure to do so can result in severe injury or death.

- **PRIMERS:** Never force primers. If they get stuck in the operation of the machine, disassemble it and gently remove the obstruction.

Never attempt to clear primers that are stuck in either the primer pickup tube or the primer magazine tube. Never, under any circumstances, insert any type of rod to attempt to force stuck primers out of these tubes. Trying to force primers out of the tube will cause the primers to explode causing serious injury or even death.

If primers get stuck in a primer magazine or pickup tube flood the tube with a penetrating oil (WD-40), throw the tube in the garbage and call us for a free replacement.

Never attempt to deprime live primers – eventually one will go off. When it does it will detonate the others in the spent primer cup. Depriming live primers is the single most dangerous thing you can do in reloading and can cause grave injury or death.

- **LOADED AMMUNITION:** Properly label all of your loaded ammunition (Date, Type of Bullet, Primer, Powder, Powder Charge, etc.).

- **BE PATIENT:** Our loading equipment is conservatively rated and you should have no trouble achieving the published rates with a smooth, steady hand. If something doesn't seem right, stop, look and listen. If the problem or the solution isn't obvious, call us. The reloading bench is no place to get into a hurry.

We have done everything we know how to make your machine as safe as possible. We cannot, however, guarantee your complete safety. To minimize your risk, use common sense when reloading and follow these basic rules.

- **REMEMBER:** If your machine does not perform to your expectations, or if you are having technical difficulties, give us a call. Technical Support (800) 223-4570

All electrical/electronic components in Dillon equipment are covered by a one-year warranty.

### Your AT 500 comes complete with:

- AT 500 Machine
- Operating Handle Assembly including:
  - Handle Shaft
  - Handle Knob
  - Nylock Nut and Washer
- Accessory Bag including: (Figure 2)
  - Small Primer Cup and Pin
  - Note: The Large Primer Assembly comes installed in the machine.*
  - Plastic Funnel
  - Spent Primer Cup
  - Hex Wrenches: 1/8", 1/4", 5/32" and 3/32"
  - Powder Die with Lock Ring
- Conversion Kit including: (Figure 2)
  - Powder Funnels: A, B and K for Rifle – W, E, D and F for Pistol calibers
  - Locator Pins: #1, #2 and #3

Double-check now to make sure all the parts needed are present. (Figure 2)

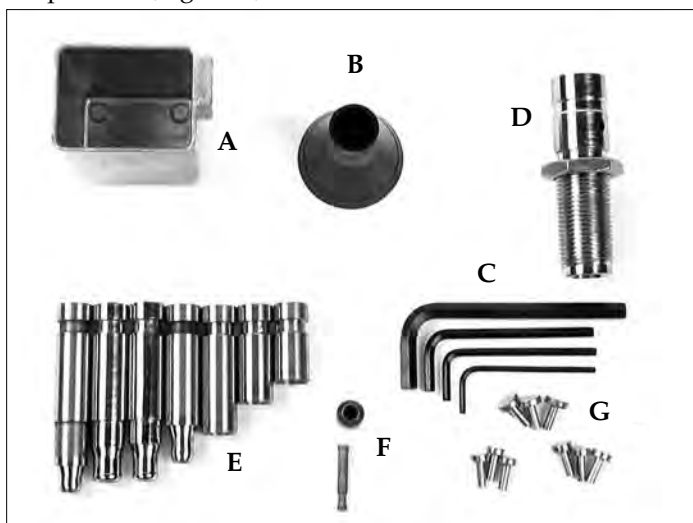


Figure 2– A) Spent Primer Cup B) Plastic Funnel C) Hex Wrenches D) Powder Die with Lock Ring E) Powder Funnels F) Small Primer Cup and Pin G) Locator Buttons

### MOUNTING THE AT 500 TO YOUR BENCH

Place your AT 500 on the edge of a sturdy bench or table where you plan to mount it. Give yourself about 12 inches of work space on each side of the machine to allow room for components.

Using the machine itself as a template, mark and drill four 1/4" holes in your bench and bolt your AT 500 securely to it. (Figure 3)



Figure 3 – Using the reloader as a template to mark your bench.

Avoid using wood or lag screws to mount your reloader to the bench. These types of screws can loosen over time.

### CONFIGURING THE AT 500

Install the handle and spent primer cup. (Figure 4)

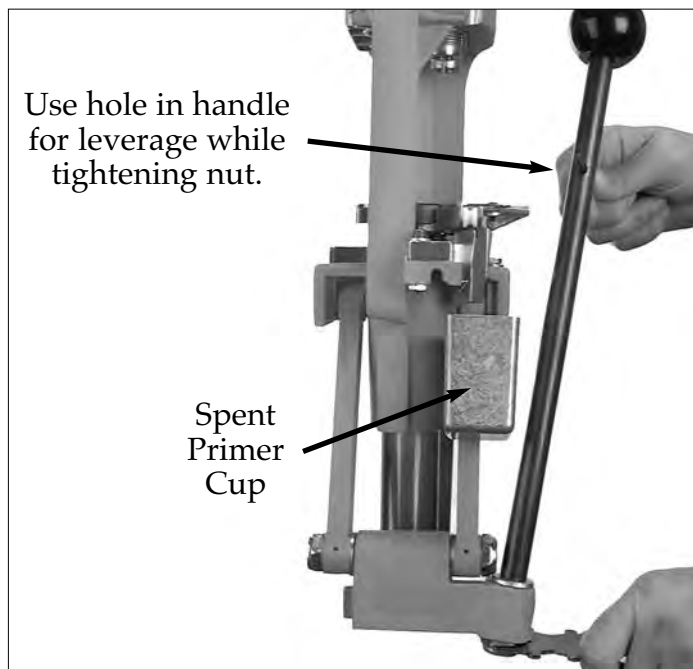


Figure 4 – Installation of the handle and spent primer cup.

## Changing Shellplate Position

Your AT 500 is shipped with the “universal” shellplate installed. The “universal” shellplate has four shellholder slots: #1, #2, #3 and #5. This allows you to reload a wide variety of calibers.

All AT 500 reloaders are shipped with the #1 slot visible. If the caliber you wish to load requires one of the other slots on the shellplate (see the caliber conversion chart on page 3 to be sure), you may change this by first loosening the brass-tipped set screw (Figure 5) at the top left side of the shaft, just below the shellplate platform, with the supplied 1/8” hex wrench.

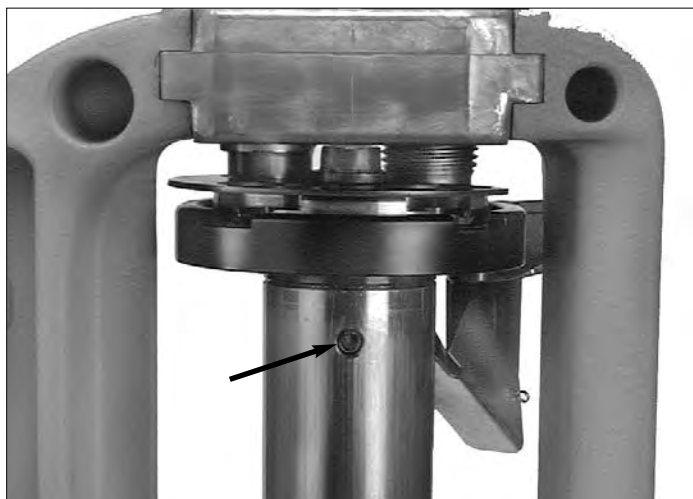


Figure 5 – Location of the shellplate bolt set screw.

Next, loosen the shellplate bolt with the 1/4” hex wrench. Then reposition the shellplate cover to display the slot you desire to use. The shellplate cover has two dimples (Figure 6) to help you align it with the shellplate.



Figure 6 – Locator “dimples” on the AT 500 shellplate cover.

Tighten the shellplate bolt with the hex wrench – then back the shellplate bolt out about 1/4 turn so that you can rotate the shellplate easily. There should be no looseness or “slop” at this point. When you rotate the shellplate, you should be able to feel and hear the shellplate “click” into place. Re-tighten the brass-tipped set screw under the shellplate platform to prevent the shellplate bolt from rotating as the shellplate is indexed.

## Caliber Conversion Chart

Caliber	Shellplate Slot	Powder Funnel	Locator Button
<b>Rifle Calibers</b>			
.222 Rem.	3	A	3
.22-250	1	A	1
.223 Rem.	3	A	3
.240 Wby. Mag.	1	K	1
.243 Win.	1	K	1
.250 Savage	1	K	1
.25-06	1	K	1
.257 Roberts	1	K	1
.257 Ackley Imp.	1	K	1
.270 Win.	1	K	1
.284 Win.	1	K	1
.30-06	1	B	1
.308	1	B	1
.358 Win.	1	B	1
.35 Whelen	1	B	1
6mm Rem.	1	K	1
6.5-06	1	K	1
6.5x55	1	K	1
7mm-08	1	K	1
7.65x53	1	B	1
7x57	1	K	1
7.7 Arisaka	1	B	1
7mm B.R.	1	K	1
7mm Exp./280 Rem.	1	K	1
7mm Int'l Rim	1	K	1
7.5x55 Swiss	1	B	1
8x57	1	B	1
<b>Handgun Calibers</b>			
.22 Rem. Jet	2	A	2
.221 Rem. Fireball	3	A	A
.380 ACP	3	F	3
.38 Super	5	F	3
.38/.357 Mag./Max.	2	D	2
.357 SIG	5	F	2
.45 ACP	1	E	1
7 TCU	3	K	3
9mm	5	F	3
9x25	5	F	2
9x21	5	F	3
10mm/.40 S&W	5	W	2

## Changing Primer Size

Your AT 500 has been shipped to you with the large primer bar installed and correctly adjusted to feed large primers. If the caliber you have selected requires small primers, you must change to the small primer cup and pin. Do this by loosening the set screw and removing the large primer cup and pin from the primer bar. Install the small primer cup and pin. (Figure 7) Do not tighten the set screw yet.

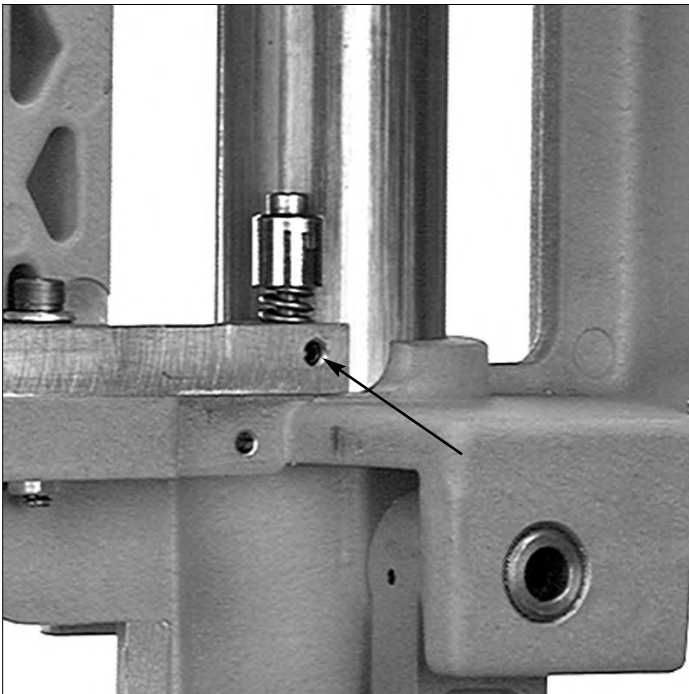


Figure 7 – To change the primer cup and pin, loosen this set screw. See arrow.

This set screw needs to be loose in order to align the primer cup with the platform. Lower the platform onto the primer cup (Figure 8), then tighten the set screw while the cup is in the platform. (Figure 9)

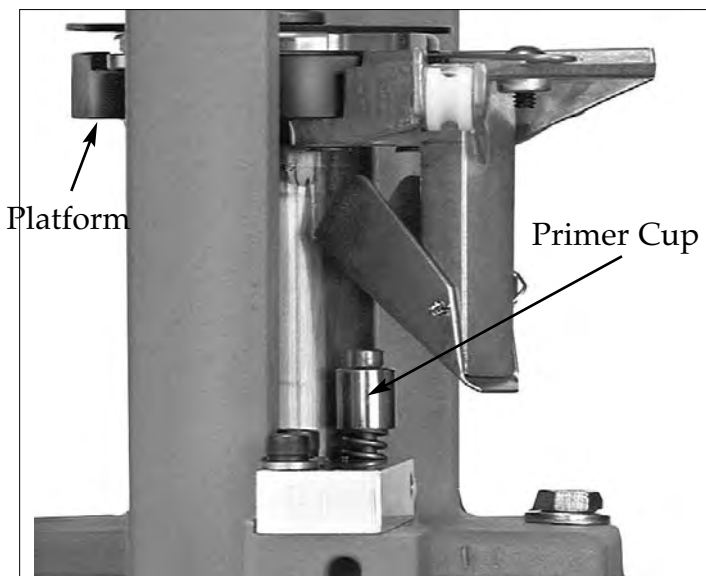


Figure 8 – Lowering the platform onto the primer cup.

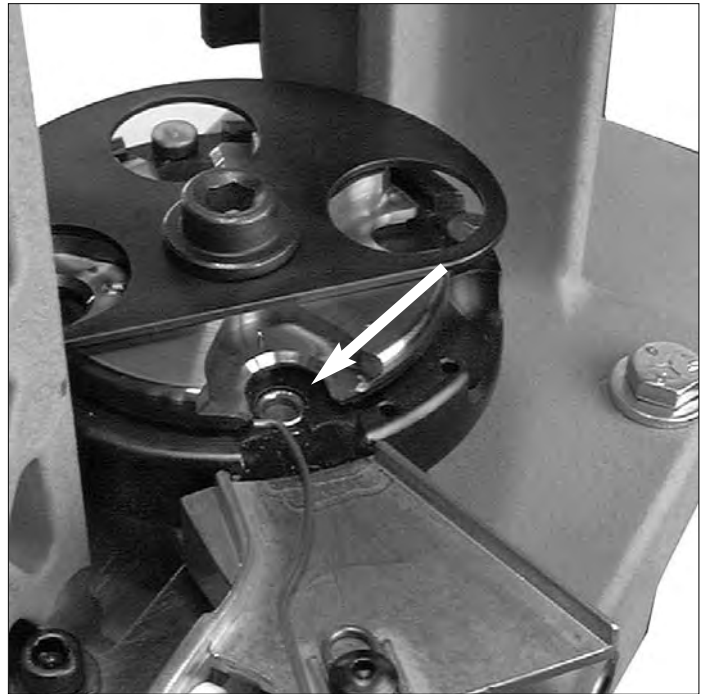


Figure 9 – The primer cup, showing through the platform.

## The Toolhead

Your new AT 500 is equipped with a removable toolhead. Additional toolheads are available from the factory or your local Dillon dealer.

The advantage of this system is simple. Once you have adjusted your dies just the way you want them, they can stay that way. Plus, changing to another caliber becomes a simple matter of pulling two pins and sliding the toolhead out. (Figure 10)



Figure 10 – Removing the toolhead.

Before you begin loading, make sure that the toolhead is secured by the toolhead pins.

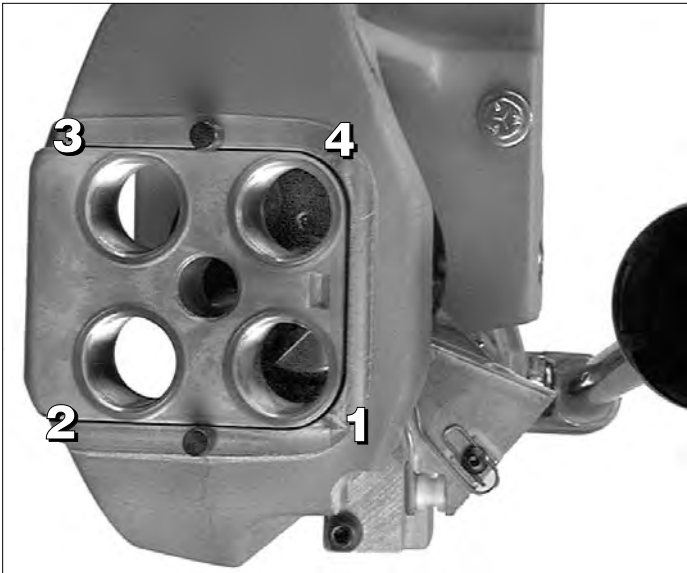


Figure 11 – Toolhead/die station orientation.

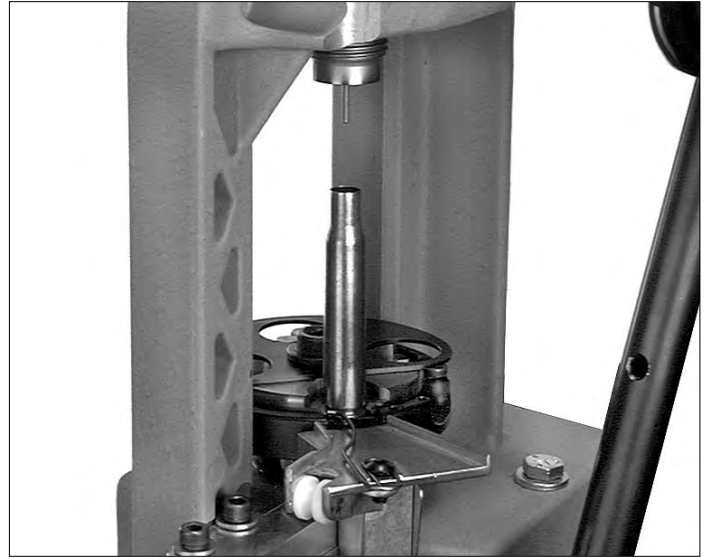


Figure 13 – Placing the cartridge case in the shellplate.

## SETTING UP THE AT 500 TO LOAD RIFLE AMMUNITION

We are using the .30-06 cartridge as an example in this section. The AT 500 machine comes to you with the shellplate (with the #1 slot ready for use) and large primer bar installed.

**Station #1 – Install the sizing/decapping die here.**

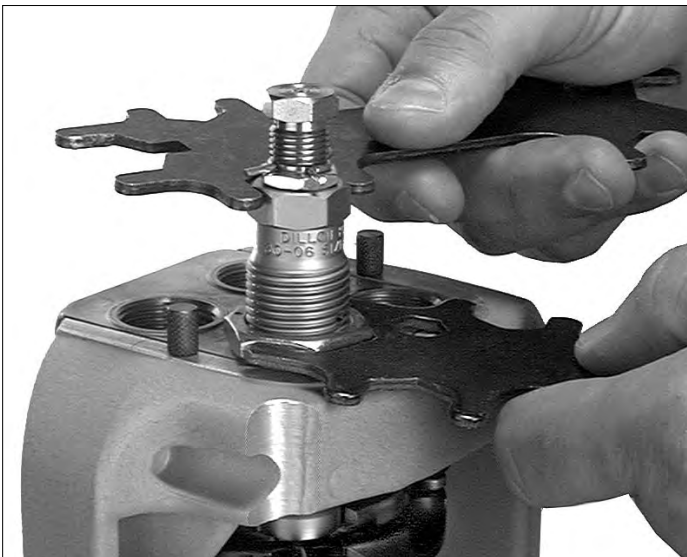


Figure 12 – Installing the sizing/decapping die in Station #1.

Move the handle down (which will raise the platform) and thread the sizing/decapping die completely into the toolhead until the die comes in contact with the shellplate. Return the handle to its rest position (up).

Wipe a small amount of case lube on the body and neck of an empty .30-06 cartridge case, then place the case into the #1 slot. (Figure 13)



Figure 14 – Inserting a case in a case gage.

Rotate the sizing/decapping die in or out as needed to reach the proper case-to-gage fit. After the die is adjusted, tighten the die lock ring to hold it in place. Advance the case to Station #2.

**Station #2 – Install the powder die and powder funnel here (We are using powder funnel “B” for the .30-06 cartridge – See Figure 15)**





**Figure 15 –Installing rifle powder funnel into the powder die.**

Slide the funnel into the powder die and tighten the set screw, assuring yourself that it has entered the groove in the funnel. (Figure 16)



**Figure 16 – The groove in the rifle powder funnel.**

With the resized case in Station #2, move the handle down and thread the powder die into the toolhead until the funnel comes in contact with the case. Tighten the die lock ring. Advance the case to Station #3.

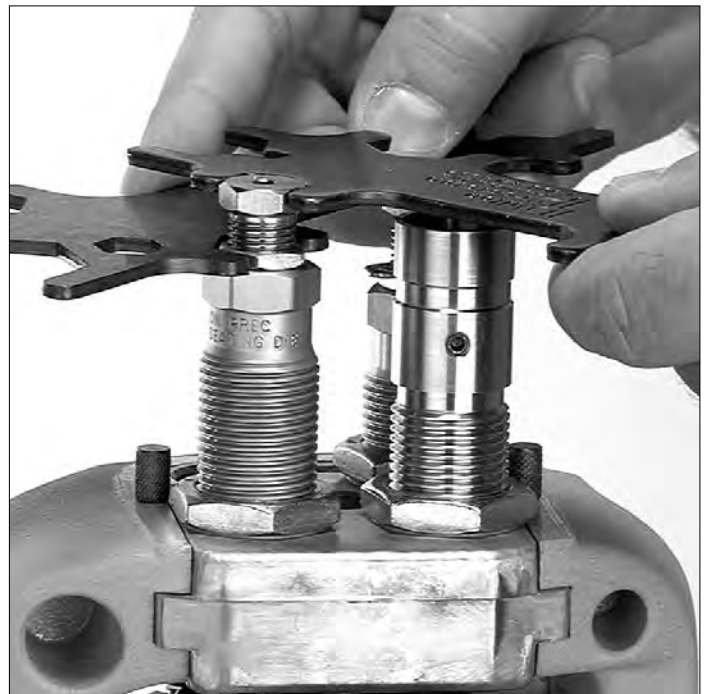
### **Station #3 – Install the bullet seating die here.**

Place a bullet on the empty case and move the handle down. Thread the bullet seating die into the toolhead until it comes in contact with the case/bullet. (Figure 17)



**Figure 17 – Installing the bullet seating die in Station #3.**

In 1/4 turn increments, thread the bullet seating die clockwise while you move the handle up and down, until the proper loaded length is reached. (Always use a loading manual for loaded length information.) Tighten the die lock ring and the lock ring on the seating stem. (Figure 18)



**Figure 18 – Tightening the lock ring on the seating stem.**

Examine the cartridge you've just assembled, checking the overall length. Advance the cartridge to Station #4.

**Station #4 – Install the taper crimp die (if you’re using a separate taper crimp die) here.**



**Figure 19 – Installing a taper crimp die in Station #4.**

Move the handle down. Thread the taper crimp die into the toolhead until it comes in contact with the cartridge. In 1/4 turn increments, thread the taper crimp die clockwise while you move the handle up and down, until a crimp appears on the mouth of the case. An average crimp should be approximately .002 smaller than the case diameter. (Figure 20) Tighten the die lock ring.



**Figure 20 – A properly crimped rifle cartridge.**

Once you’ve installed all the dies in the toolhead, place the black plastic funnel onto the powder die. Install the

three #1 (.30-06) brass locator buttons, included in the parts bag, on the platform. (For other calibers, see caliber conversion chart on page 3.) (Figure 21)



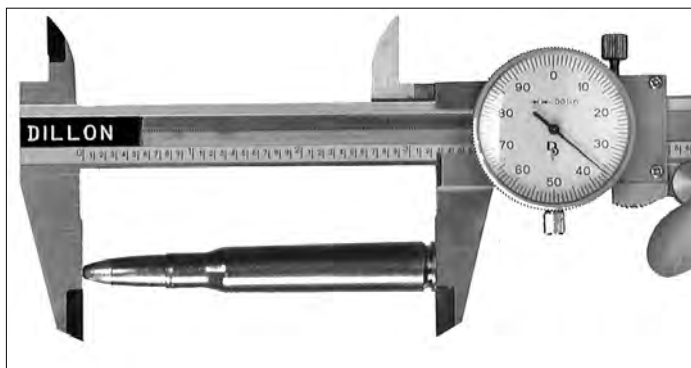
**Figure 21 – Installing a brass locator button at Station #2.**

The above example used a Dillon three-die set for reloading the .30-06 rifle cartridges. Some die companies offer two die-sets for some rifle calibers. With these sets, the bullet seating die must be adjusted as follows:

Place a resized rifle case in Station #3. Install your bullet seating die here. Remove the seating stem from the seating die. Move the handle down and thread the die into the toolhead until it comes in contact with the case. Tighten the die lock ring. Return the handle to its rest position.

Reinstall the seating stem approximately five turns. Place a bullet on the empty case and move the handle down. In 1/4 turn increments, thread the bullet seating stem clockwise while you move the handle up and down until the proper loaded length is reached. (Figure 22 – Always use a loading manual for loaded length information.)

Tighten the lock ring on the stem.



**Figure 22 – Using a dial caliper to check overall length.**

## SETTING UP THE AT 500 TO LOAD PISTOL AMMUNITION

We are using the .45 ACP cartridge as an example in this section. The AT 500 machine comes to you with the shellplate (with the #1 shellplate slot ready for use) and large primer bar installed.

**Station #1 – Install the sizing/decapping die here.**



**Figure 23 – Installing a sizing/decapping die in Station #1.**

Move the handle down (which will raise the platform) and thread the die completely into the toolhead until the die comes in contact with the shellplate. Tighten the die lock ring. Return the handle to its rest position and insert an empty cartridge case into the #1 slot. (Figure 24)



**Figure 24 – Inserting an empty cartridge case in Station #1.**

Move the handle down to resize and deprime the case. Return the handle to its rest position. Advance the case to Station #2.

**Station #2 – Install the powder die and powder funnel “E” for the .45 ACP cartridge here.**



**Figure 25 – Insert a pistol powder funnel into the powder die.**

Slide the funnel into the powder die and tighten the set screw, assuring yourself that it has entered the groove in the funnel. (Figure 26)



**Figure 26 – The groove in the pistol powder funnel.**

With the resized case in Station #2, move the handle down and thread the powder die into the toolhead until the funnel comes in contact with the case. In 1/4 turn increments, thread the powder die clockwise while you move the handle up and down until you begin to see a minor bell shape appear on the mouth of the case.

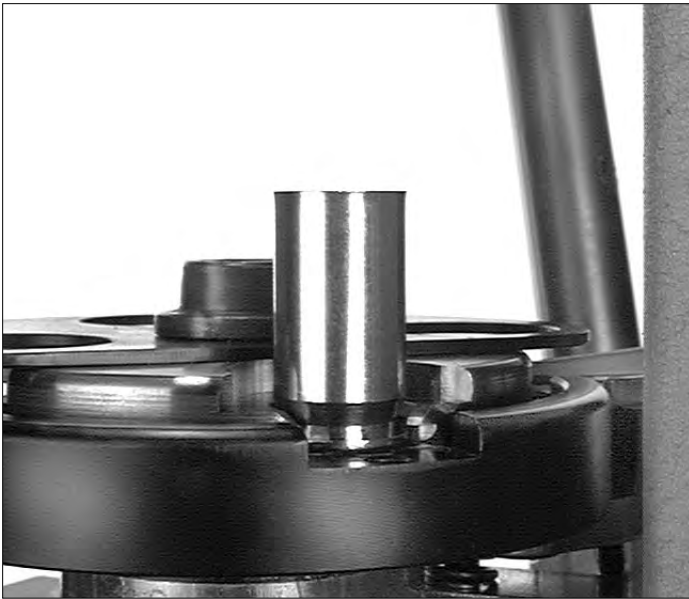


Figure 27 – A properly belled pistol case.

Tighten the die lock ring. Advance the case to Station #3.

**Station #3 – Install the bullet seating die here.**

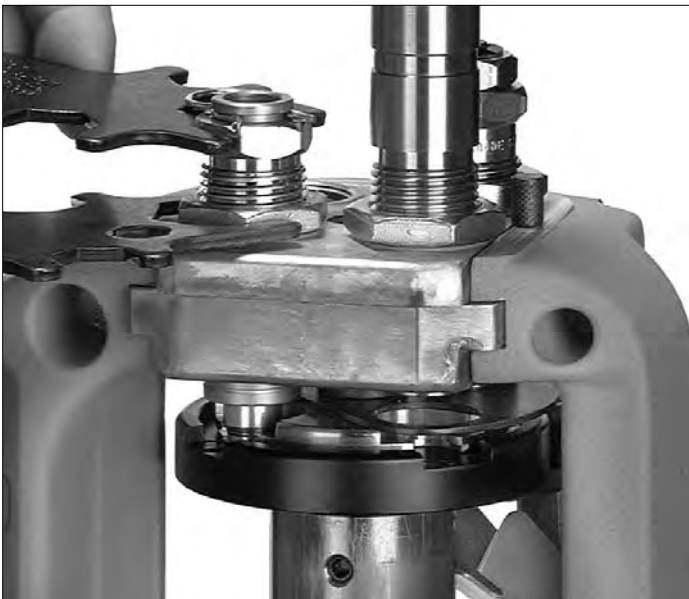


Figure 28 – Installing the bullet seating die in Station #3.

Inspect the inside seating stem. Assure yourself that the shape of the seating stem matches the bullets you will be loading (i.e. round-nose, semi-wadcutter, etc.).

Place a bullet on the empty case and move the handle down. Thread the bullet seating die into the toolhead until it comes in contact with the case/bullet. In 1/4 turn increments, thread the bullet seating die clockwise while you move the handle up and down, until the proper loaded length is reached.

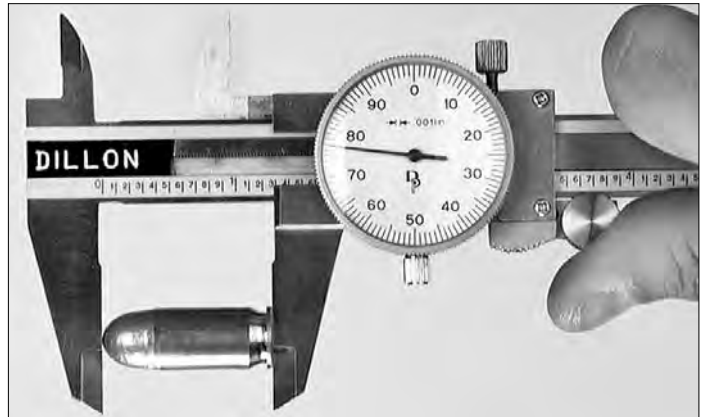


Figure 29 – Using a dial caliper to check overall length.

(Always use a loading manual for loaded length information.) Tighten the die lock ring. Examine the cartridge you've just assembled. Advance the case to Station #4.

**Station #4 – Install the taper crimp die here.**

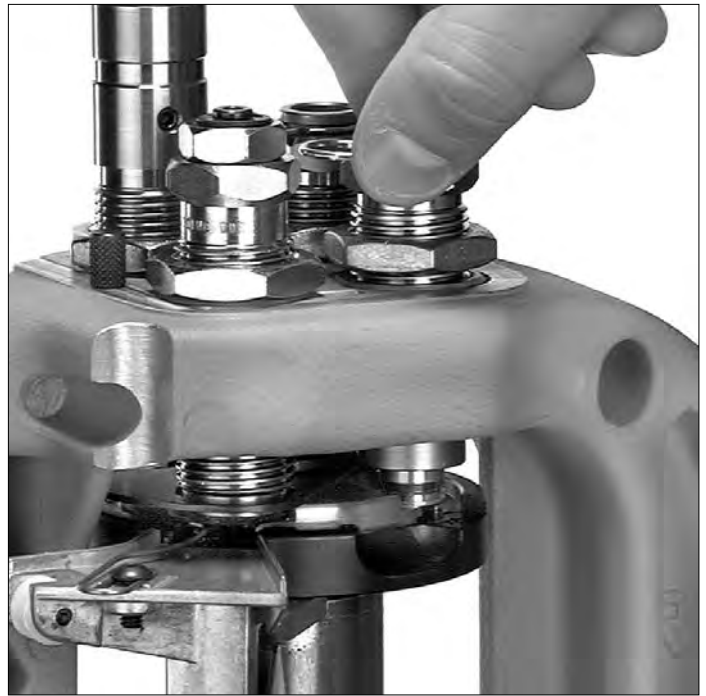


Figure 30 – Installing a taper crimp die in Station #4.

Move the handle down. Thread the taper crimp die into the toolhead until it comes in contact with case/bullet. In 1/4 turn increments, thread the taper crimp die clockwise while you move the handle up and down, until a crimp appears on the mouth of the case. An average crimp is approximately .002 smaller than the body diameter. (Figure 30) Tighten the die lock ring to hold it in place.

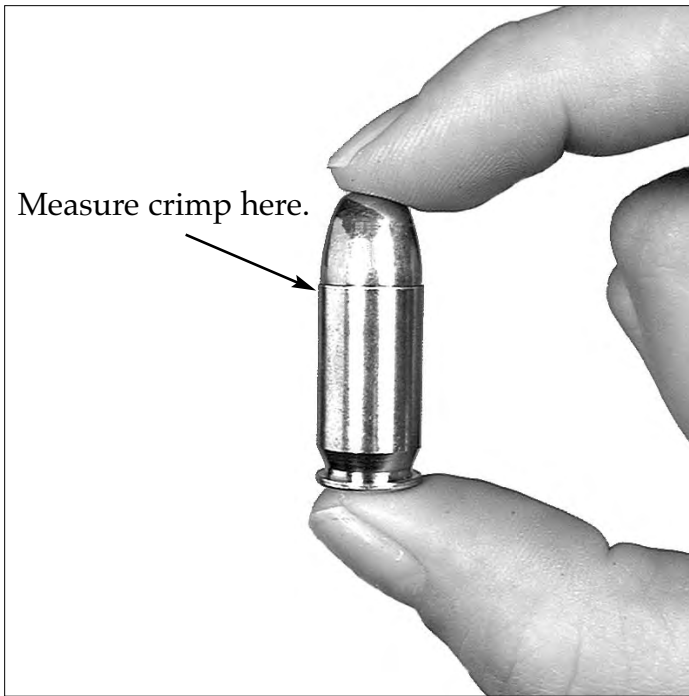


Figure 31 – A properly crimped pistol cartridge.

Once you've installed all the dies in the toolhead, place the black plastic funnel onto the powder die. Install the three #1 (for .45 ACP) brass locator buttons, included in the parts bag, on the platform. (Figure 32)



Figure 32 – Installing a brass locator button in Station #2.

## THE RELOADING PROCESS

The following is a list of items you will need before you begin. (Figure 33)

- 1) Empty brass casings
- 2) Primers
- 3) Powder scale
- 4) Loading manual
- 5) Powder (see manual)
- 6) Bullets (see manual)
- 7) Dial calipers
- 8) Safety glasses



Figure 33 – What you will need to start loading.

To begin, place an empty case in Station #1 and move the handle down. While the handle is in the down position, place a new primer in the primer cup. (Figure 34) Return the handle to its rest position and insert the new primer into the case by pushing the handle forward.



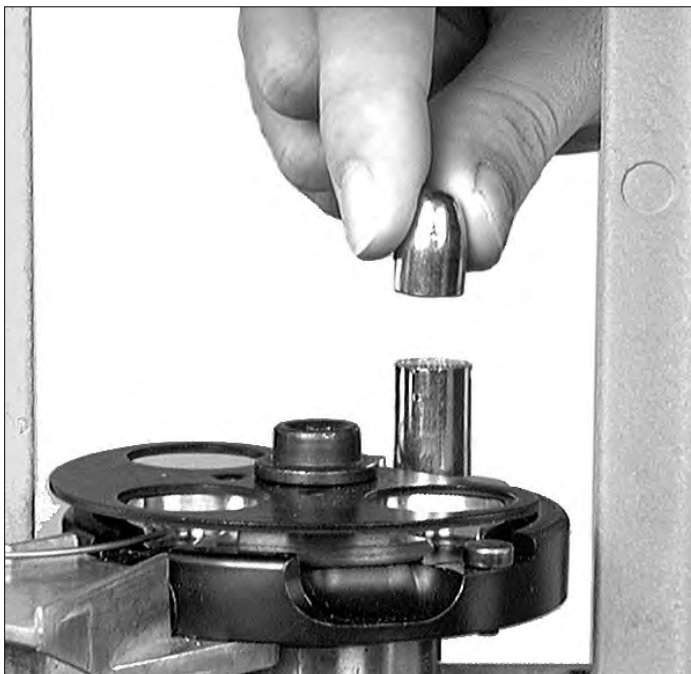
Figure 34 – Placing a primer in the primer cup at Station #1.

Place your left thumb on the shellplate cover and advance the shellplate to Station #2. Move the handle down. While the handle is in the down position, charge the cartridge case by dispensing a properly weighed amount of powder into the black plastic funnel. (Figure 35) Return the handle to its rest position.



**Figure 35 – Charging the case with powder at Station #2.**

Place your right index finger on the shellplate cover and advance the shellplate to Station #3. Place a bullet on the case (Figure 36) and move the handle down, this will seat the bullet into the case. Return the handle to its rest position.



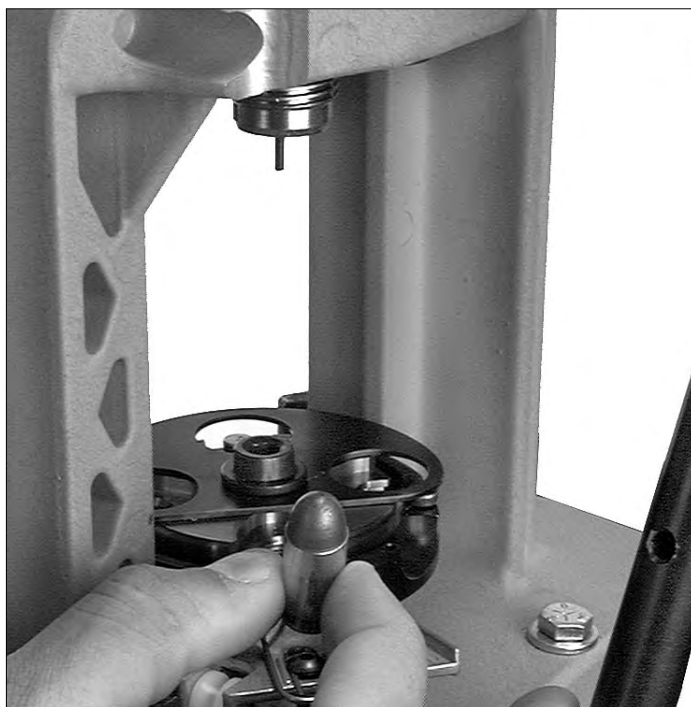
**Figure 36 – Placing a bullet on the cartridge case at Station #3.**

Place your right index finger on the shellplate cover and advance the shellplate to Station #4. (Figure 37) Move the handle down, this crimps the case around the bullet. Return the handle to its rest position.



**Figure 37 – Advancing the shellplate to Station #4.**

Finally, grasp the finished cartridge with your right hand while you advance the shellplate to Station #1 again. Remove the completed cartridge from the machine. (Figure 38) Place the finished cartridge into a Dillon ammo box and repeat the above steps.



**Figure 38 – Removing the completed cartridge.**

# AT 500 Upgrades & Accessories



## A. UPGRADE #1- AUTO PRIME SYSTEM

**Includes:**  
Primer Housing /Shield  
Primer Slides, Lg./Sm.  
Pickup Tubes, Lg./Sm.  
Pickup Tube Tips, Lg./Sm.  
Magazine Tubes, Lg./Sm.  
Mag. Orifices, Lg./Sm.  
Operating Rod  
Primer Track Bearing  
Housing Screws  
Ret. Spring Retaining Pin  
#16627

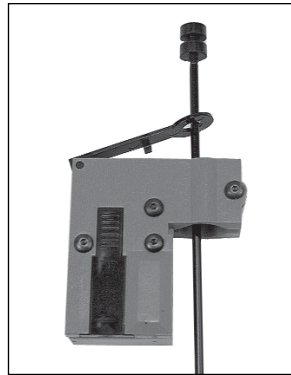


## C. UPGRADE #3- AUTO POWDER SYSTEM

Accurate to within 0.1 grain, our Automatic Powder Measure is world-renowned for its charge-to-charge consistency.  
#20251  
**OPTIONAL MAGNUM RIFLE POWDER BAR**  
#21353

## B. UPGRADE #2- PRIMER EARLY WARNING KIT

The device sounds when you have approximately three primers left in the primer magazine. Allows you to focus on loading instead of worrying about failing to seat a primer, and is an easy slip-on attachment to the auto prime system.  
#20302



## D. UPGRADE #4- AUTO EJECT SYSTEM

Greatly increases your ammo production capabilities and adds a Cartridge Chute/Bracket and a Cartridge Bin to your reloader.  
#22120



## E. POWDER DIES

Extra powder dies are a must, allowing you to move your powder measure from toolhead to toolhead without changing the critical "belling" adjustment.

Single, #20064  
3 pak, #20057

## I. BENCH WRENCH

The Dillon Universal Bench Wrench is like the old bicycle or skate wrench.

This handy device has all the correct sizes for Dillon dies, powder systems, Square Deal "B", RL 550B and RL 1050 adjustments, etc.

Single, #13770      2 pak, #20486



## E. TOOLHEADS

Don't adjust dies when switching calibers. These precision tool holders hold your dies in perfect alignment, making caliber changes a snap.

Single, #13909      3 pak, #20058



## G. TOOLHEAD STANDS

The ultimate in convenience for keeping your reloading bench clean and uncluttered.

Single, #22055  
3 pak, #22050

## J. 'ELIMINATOR' LOADING SCALE

This precision instrument eliminates the guesswork by a simple triple-poise balance beam. Easy to use for the novice; precision accuracy for the professional.



#13480

## H. PRIMER FLIP TRAY

Guns & Ammo magazine calls this "the Cadillac of flip trays." A heavy, high-quality tray large enough for the new Federal primer package.

#13606



