PYRO SHOT

Model FBS-1

Delayed Ground Ignition Device Launcher

Operator's Manual

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Rev. 0

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Introduction

How it works: The Pyro Shot is a simple spring powered dispenser. It is hand held and the butt is placed against the hip to operate. A rearward stroke of the slide cocks the spring and feeds one sphere into the barrel. On the forward (return) stroke a needle pierces the ball and a pump injects .5 cc of glycol, charging the ball. The spring is released automatically at the end of the forward stroke and the charged ball is launched to the desired location. No operator action is required other than to pull the slide back and move it forward to dispense charged balls. A delay of 20 to 60 seconds, depending on ambient temperature, occurs before ignition.

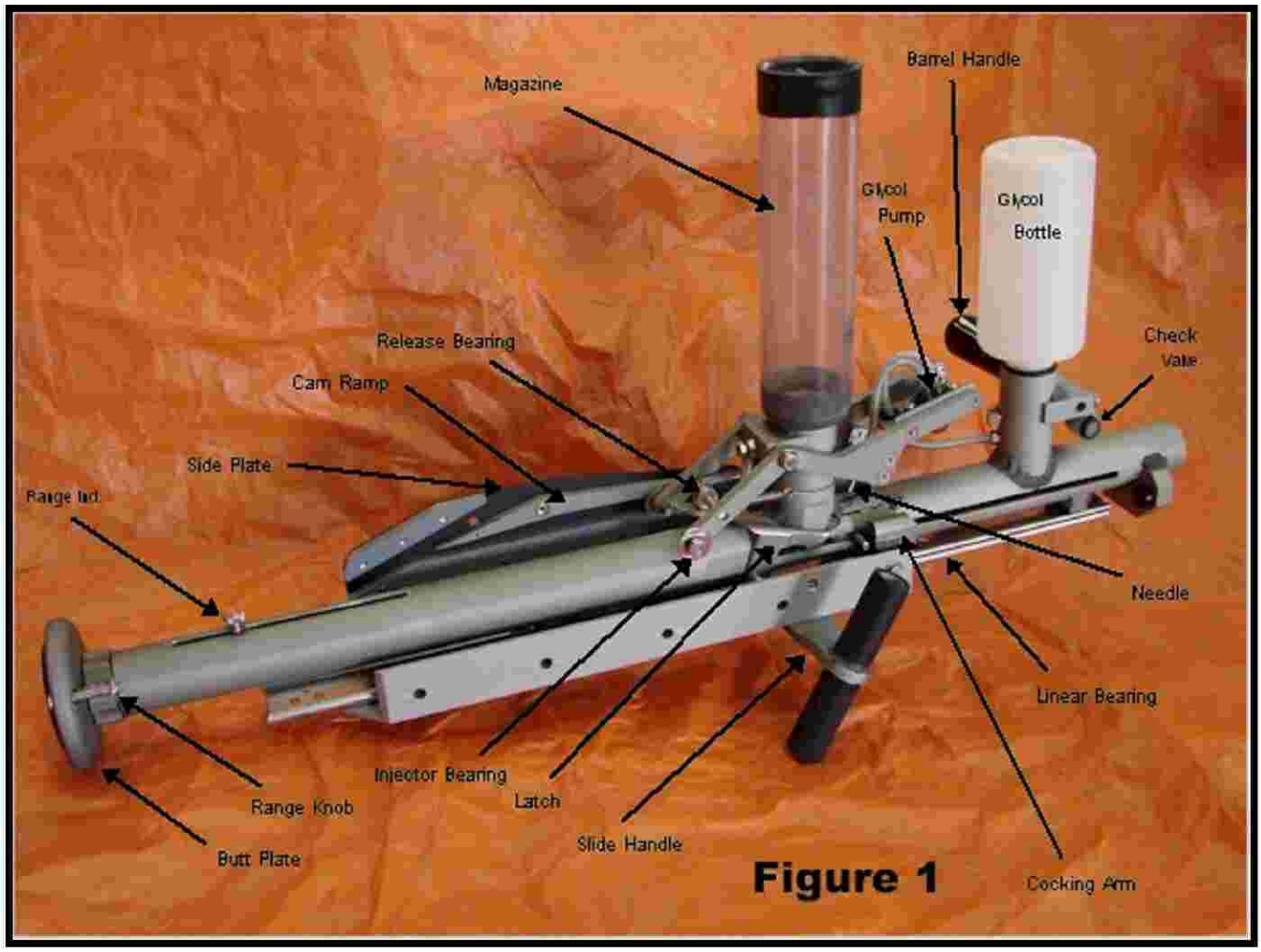
Rotating the butt plate moves the main spring base forward or aft to preset tension for existing conditions. This allows control over both range and cocking effort. The mechanically operated displacement pump ensures very consistent glycol delivery for super reliable ignition. The 250 cc glycol bottle will charge about 500 spheres. All aluminum parts are Hard Coat Anodized and all hardware is Stainless Steel to reduce maintenance and increase durability. Simple soap and water clean-up and light lubrication will provide years of trouble-free service.

The Ammo: SEI Industries, Ltd. of Canada has produced a new delayed aerial ignition device (D.A.I.D.) called the Dragon Egg. The Dragon Egg is 1" in diameter as opposed to the older 1.25" D.A.I.D. Both use 3 grams of potassium permanganate crystals enclosed in a polystyrene plastic sphere. This smaller sphere has much-improved aerodynamic characteristics allowing better ballistics from the Pyro Shot and better drop patterns and more reliability when used in aerial ignition dispensers. For more info about Dragon Eggs and the new aerial ignition machines to dispense them go to http://www.sei-ind.com/ and check out the Dragon Division.

Specifications:

Empty Weight	6.5 lb.
L.O.A.	26 in.
Magazine Capacity	10 balls (150 ball. mag. optional)
Glycol Capacity	250 ml
Glycol per Cycle	0.50 ml
Balls per 250 ml	500 Approx.
Range at best Trajectory	45 to 75 ft.
Regular US Patent #	7275529

Nomenclature:



Note: Right side plate removed for clarity. Refer to Illustrated Parts List for more detailed information.

Pre-Use Inspection (See Figure 2):

1. Unload any dragon eggs inadvertently left in the magazine and barrel. Look over PyroShot for cleanliness and general condition, and security of handles, butt assembly and range indicator.

2. Place PyroShot in firing position with butt plate against hip and pull slide assembly full aft, past the cocked position. Hold slide fully against back stop and lift and release the front end of each cam ramp to ensure that there is no binding and that each one snaps smartly back into its relaxed position against the plastic guide.

3. Relax the slide handle and the piston pin will engage the latch in the cocked position. Move the slide forward enough to inspect the piston pin bumpers on the cocking arms for any evidence of cracking or splitting. Also have a look at the slide stop bumpers at this time. Any cracking or splitting requires immediate replacement of the rubber bumper. Do not operate the PyroShot with deteriorated bumpers! See page 9 for replacement procedure.

4. Adjust the slide so that the drilled holes near the slide handles line up with the latch pivot screws. Using the 3/32" socket head wrench supplied, check both of the latch pivot screws to determine that they have not come loose. IMPORTANT: This is meant only to check the security of the locking system for these screws, not to tighten or loosen them. Apply only moderate turning pressure to ensure that all is well.

5. Check injector (rocker) assembly for security of hardware, track roller bearings, needle, etc. and for freedom of movement.

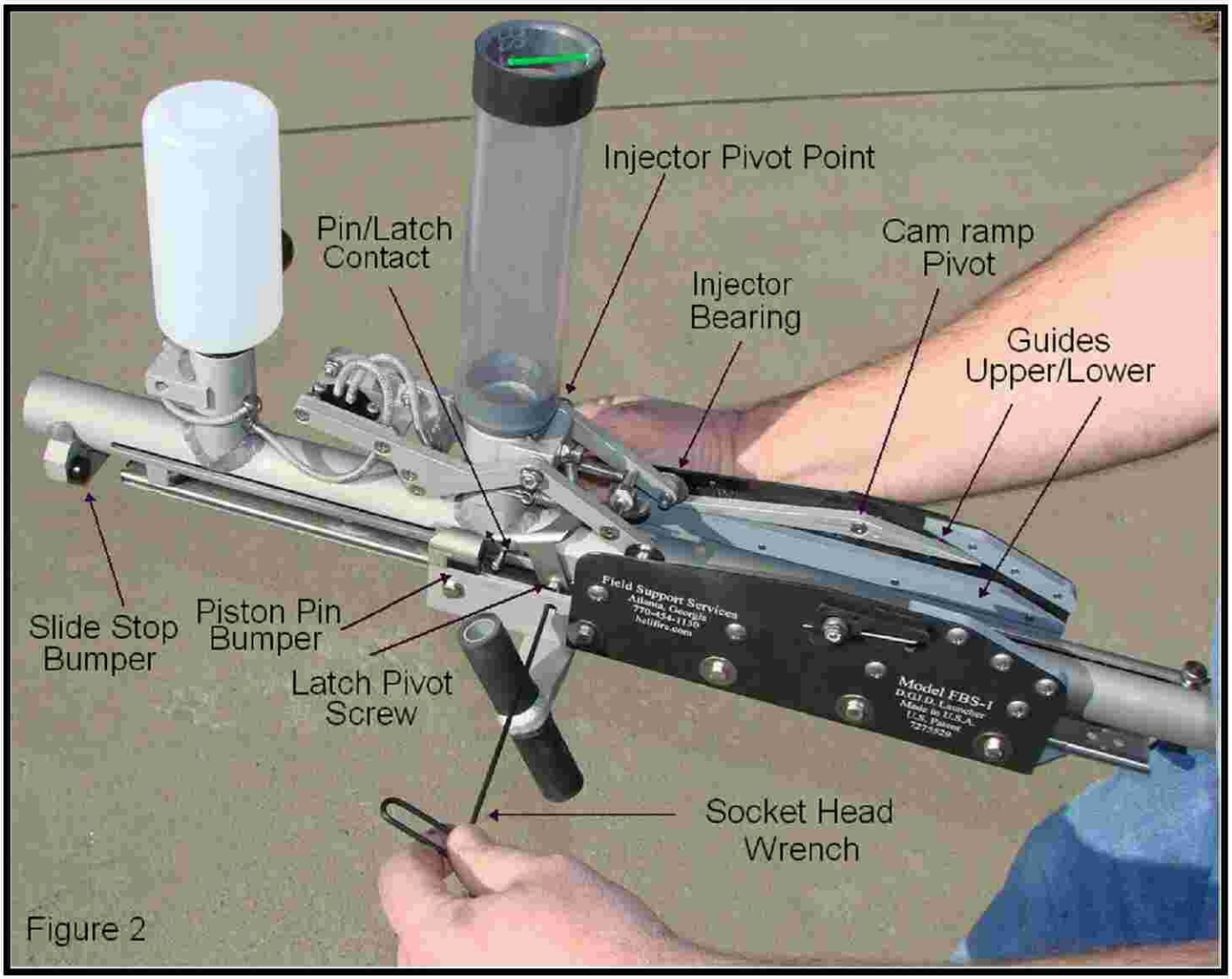


Figure 2

6. Lubricate as required.... One drop of light machine oil on each latch pivot point, injector pivot point, injector bearing (including the large area washer) and cam ramp pivot point. Spread a small amount of

grease on the four bumper contact surfaces, and on the piston pin and latch contact points. Also, lightly coat the inside faces of the upper and lower plastic side plate guides with grease. A small amount of light machine oil on the cam ramp itself will help maintain smooth operation as well. This should be applied where the cam ramp makes contact as it slides across the side plate.

7. To return the PyroShot to the relaxed, uncocked position without injecting glycol into the barrel, pull the slide assembly full aft, simultaneously lift the forward ends of both cam ramps so that the track roller bearings pass beneath them as the slide is gently moved forward. Continue moving the slide assembly forward until the unit dry-fires. The PyroShot is now ready to be loaded and operated.

8. If the PyroShot jams or fails to operate normally at any time, suspend operation immediately until the problem is identified and resolved. .

Note: The launcher may be "dry fired" at the lowest range setting with no ill effect. It is recommended that an operator that is unfamiliar with the launcher "dry fire" several cycles to acquaint him or herself with its operation prior to loading. Avoid "dry firing" at higher range settings. Do not "dry fire" with glycol loaded.

Loading:

To charge the glycol delivery system, turn the launcher upside down and screw the glycol bottle directly into the glycol tube until the O-ring is slightly compressed. Turn the unit right side up; point the muzzle down about 30 degrees so that the base of the pump is horizontal and using your finger compress the pump several times until you have purged the air all the way to the needle. You can observe the movement of the air and glycol through the clear tubing. Avoid pumping glycol directly into the barrel. A check valve is fitted to the front of the glycol tube to allow air to replace lost glycol volume. Bubbles may be observed rising in the glycol bottle; this is normal.

To load the magazine, simply push the balls into the top of the clear magazine tube until they drop below the retainer string at the top. This is easy to do with a handful of 4 to 6 balls.

Launching Balls:

Handling:

The launcher is designed to be operated by either right or left-handed personnel and is fired from the hip. (The following instructions apply to right-handers and should be reversed for left-handers, as well as relocating the barrel handle to the right side of the glycol tube.)

With the left hand grasp the barrel handle, which is attached to the front side of the glycol tube. With the right hand grasp the right hand slide handle attached to the front of the slide. Place the butt plate, located on the rear end of the barrel tube, against your right hip.

Cocking:

Using the barrel handle elevate the barrel about 30 degrees and point the launcher at the target area. Using the slide handle, pull the slide to the rear (resisting the cocking force with your hip).
The slide must be pulled all to the way to the end of its rearward travel to insure proper functioning.

Note: Three separate functions of the device must occur at the end of each cocking stroke to insure the success of each launch cycle. They are:

1…One ball from the magazine tube must feed downward into the barrel.
2…Both of the cam ramps, located on the inside of each slide side plate, must drop down from the top of the injector bearings to the flat plastic surface below.
3…The piston pin catch must capture and retain the piston pin and thus hold the piston and mainspring in the cocked position. This action actually occurs about an inch into the forward stroke and since the spring load is taken by the catch, the operator can feel the latch take the spring load before starting the forward stroke.

The ball drop and ramp drop will be clearly heard by the operator and with experience the operator can verify proper operation by feel and sound.

Injection and Launching:

After the catch has captured the piston pin, it becomes necessary for the slide to be pushed smoothly forward to insert the needle into the ball and compress the pump to inject the glycol. Continued forward motion extracts the needle from the ball and in the last inch of the forward stroke, the release bearing depresses the back of the piston pin catch and launches the ball.

Caution: There is no "trigger". This device fires automatically at the end of the forward stroke!

Note: Injection will occur whether or not a ball is present under the needle thus pumping glycol into the barrel. Insure that the launcher does not run out of balls when glycol is loaded.

Adjusting the Range:

The base of the mainspring is adjustable to allow the operator some control over range and required cocking effort. At the top rear of the barrel tube, there is a 4 in. slot with a thumbscrew fitted through the slot and into the spring base. A threaded rod attached to the butt plate determines the spring base position. The range is shortest and the cocking effort the least when the thumbscrew is at the rear of the slot. Greatest range is obtained with the spring base fully forward.

To adjust the spring base, loosen the thumbscrew about one turn and rotate the butt plate to move the spring base. Counter clockwise moves the base forward. Clockwise moves the base aft. Tighten the thumbscrew after adjustment.

Unloading:

To unload the magazine simply pull the retainer string back out of the top with your finger and pour the balls from the magazine.

To remove the glycol, turn the launcher up side down, allow some time for most of the glycol to drip back into the bottle, then unscrew the bottle from the tube.

Cleaning, Lubrication and Storage:

Cleaning of the barrel bore can be accomplished by removing the mainspring and butt plate assembly:

Position the thumbscrew about an inch forward of the rear of the slot. Remove the thumbscrew and unscrew the rear barrel cap located just in front of the butt plate. Remove the butt plate assembly and mainspring. The barrel can now be cleaned from both ends.

Note: Do not remove the piston pin and piston except to replace them. They are a "one time" press fit assembly. The piston can be moved along its normal travel to allow thorough bore cleaning. Similarly, the piston pin catch screws are installed with thread lock and should not be removed. Clean and lubricate the catch in place.

The slide, slide bearing, side plates, pin catch and needle/injector assembly are most easily cleaned by removing the slide from the barrel. To remove the slide:

Remove the butt plate assembly and mainspring as noted above. Remove the 4 screws that retain the two cocking arms. These are the 4 forward most screws on the front end of the slide. Remove the cocking arms. The slide can now be removed by pulling it completely to the rear to separate it from the barrel. Some resistance will be felt as the linear bearing halves disengage. This is normal.

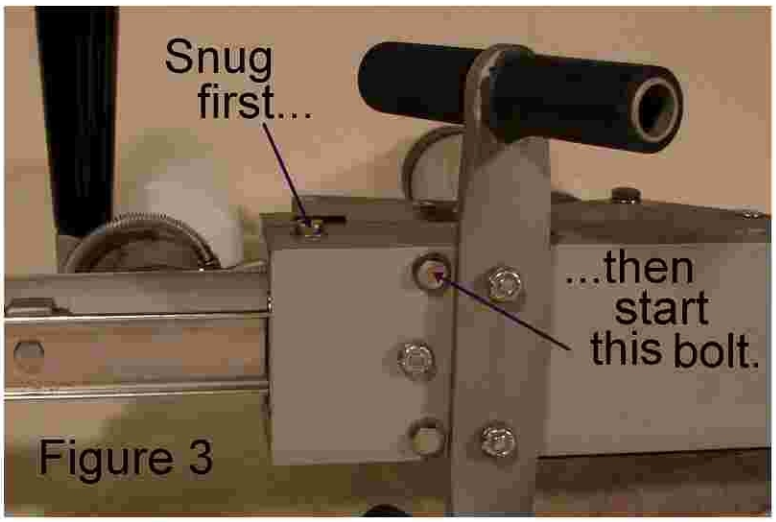
Rinse all traces of glycol from the glycol tube and use your finger to pump water through the pump, tubing and needle until all glycol is purged. Dump the water from the glycol tube and compress the pump until most of the water is expelled from the glycol system.

Detergent and water are all that's needed to clean the various parts. Rinse and dry completely. Compressed air works well to remove water. Paper towels are useful as well.

Light or medium machine oil should be applied to the barrel bore, piston, side plates and all upper bearings. Be sure to lubricate all pivot points and bearings directly. Also insure that the interior surfaces of the 4 plastic guides are well lubricated since the flat washers under the injector bearings slide along these parts during operation. Bearing grease should be used on the linear slide bearing attached to the inside bottom of the slide and barrel.

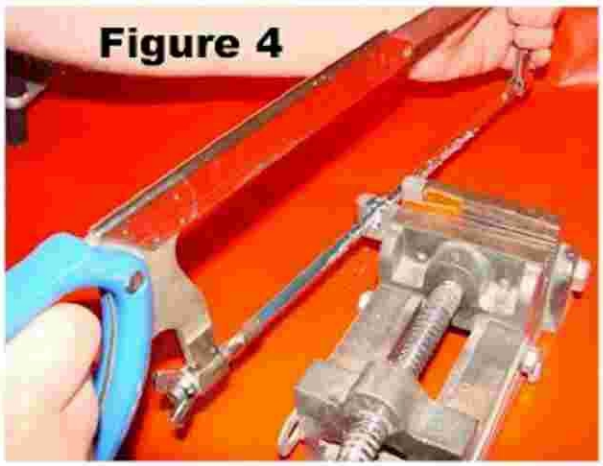
To reinstall the slide: Place the barrel in a vertical position with the muzzle end down and pivot the injector assembly until the pump contacts the barrel. This action raises the injector bearings high enough to clear the cam ramps on the side plates.

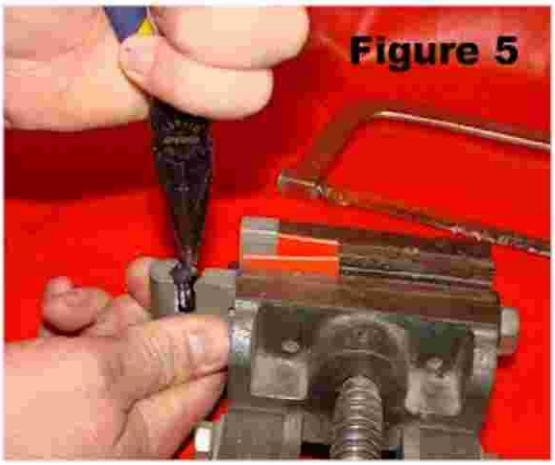
Holding the slide by its aft end, place the slide back on track by starting the rear end of the barrel track into the black plastic guide on the front of the slide track. IMPORTANT: Ensure that the linear bearing halves are aligned correctly as they engage. Failure to engage the halves properly will result in a jammed slide assembly and damage to the linear bearing. Move the slide to the full forward position. Reinstall the cocking arms insuring that the piston pin is to the rear of the arms. To align the cocking arms correctly, install the shorter side bolts first, snug them up, then start the longer bottom ones. See Figure 3. Reinstall the mainspring, butt plate assembly and thumbscrew.



Piston Pin Bumper Replacement:

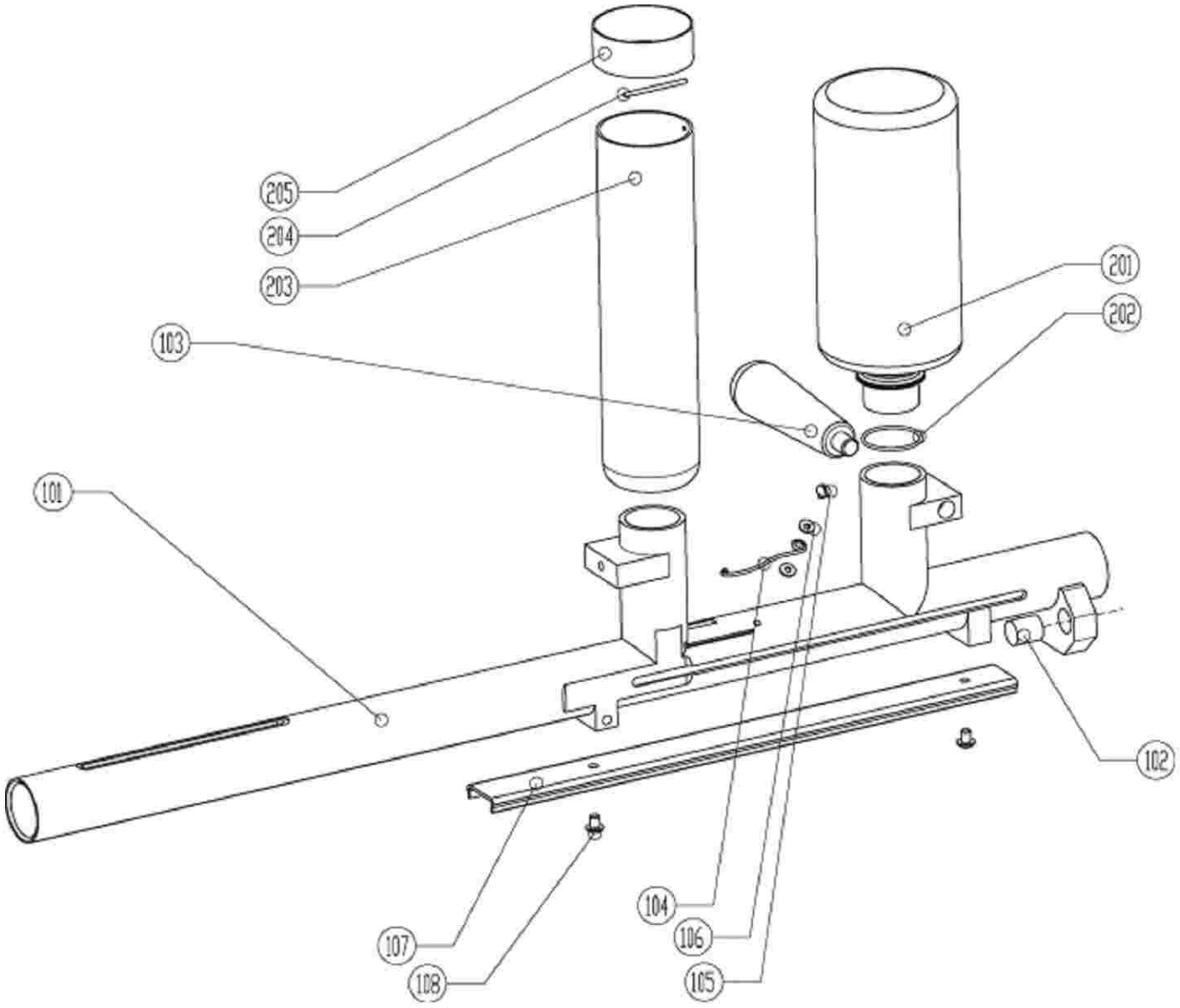
The piston pin bumpers mounted in the cocking arms firmly set themselves in place with use and require the removal of some of the bumper material in order to extract the bumpers. After removing the cocking arm from the slide assembly, and using a suitable saw, such as a crosscut saw, hacksaw or bandsaw, carefully cut through the bumper in several places ALMOST to the bottom of the slot, being careful not to damage the cocking arm. After sufficient bumper material has been removed, the remaining pieces can be extracted using a pair of pliers. After cleaning the slot in the cocking arm, coat lightly with grease before carefully pressing the new bumper into place using a suitable clamp. See Figures 4, 5 & 6.





Optional 150 Round Magazine:

Figure 7 illustrates the optional 150 round magazine. This is a simple screw-on replacement for the standard ten-round magazine, and allows the operator the convenience of less frequent reloads. This configuration requires that the balls move about freely in the bottom half of the globe magazine. For this reason, the magazine should not be loaded more than half full (about 150 balls). The normal movement of the launcher as it is cycled during operation will usually allow spheres to drop into the clear plastic feed tube. To insure proper feeding, every three or four shots the operator should visually check that there are spheres in the clear plastic feed tube. If not, a quick lateral shake of the unit will allow the spheres to drop into the tube. With experience the operator will be able to incorporate some lateral movement into the operating cycle, ensuring a steady flow of spheres.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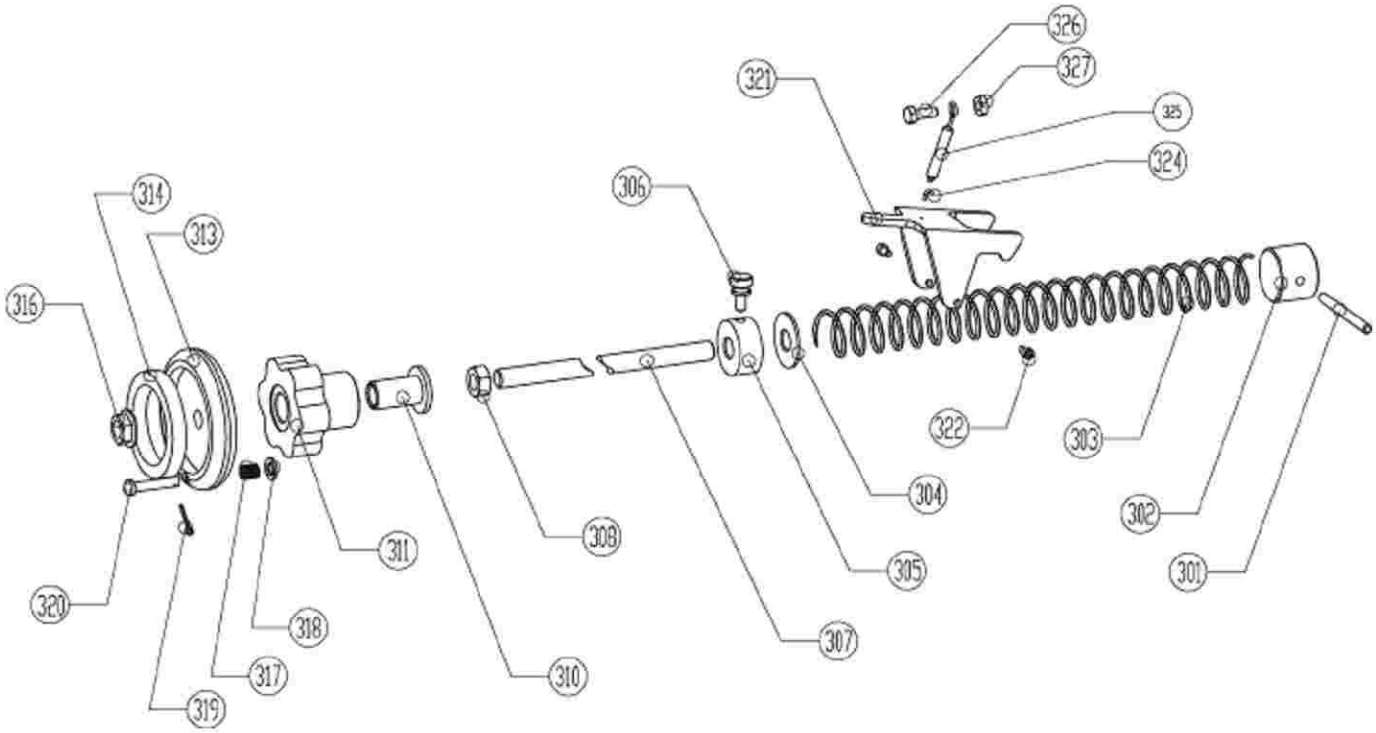
Barrel Group

Part Number	Description	Units per Assembly
101	Barrel assembly	1
102	Slide stop bumper	2
103	Fixed handle	1
104	Anti-gravity spring	1
105	Screw with washer	1
106	Flat washer	2
107	Linear bearing, inner half	1
108	Hex screw	2

Feed Group

Part Number	Description	Units per Assembly
201	Glycol reservoir	1
202	O-ring	1
203	Sphere magazine assembly	1
204	Anti-gravity guard	1
205	Guard retainer	1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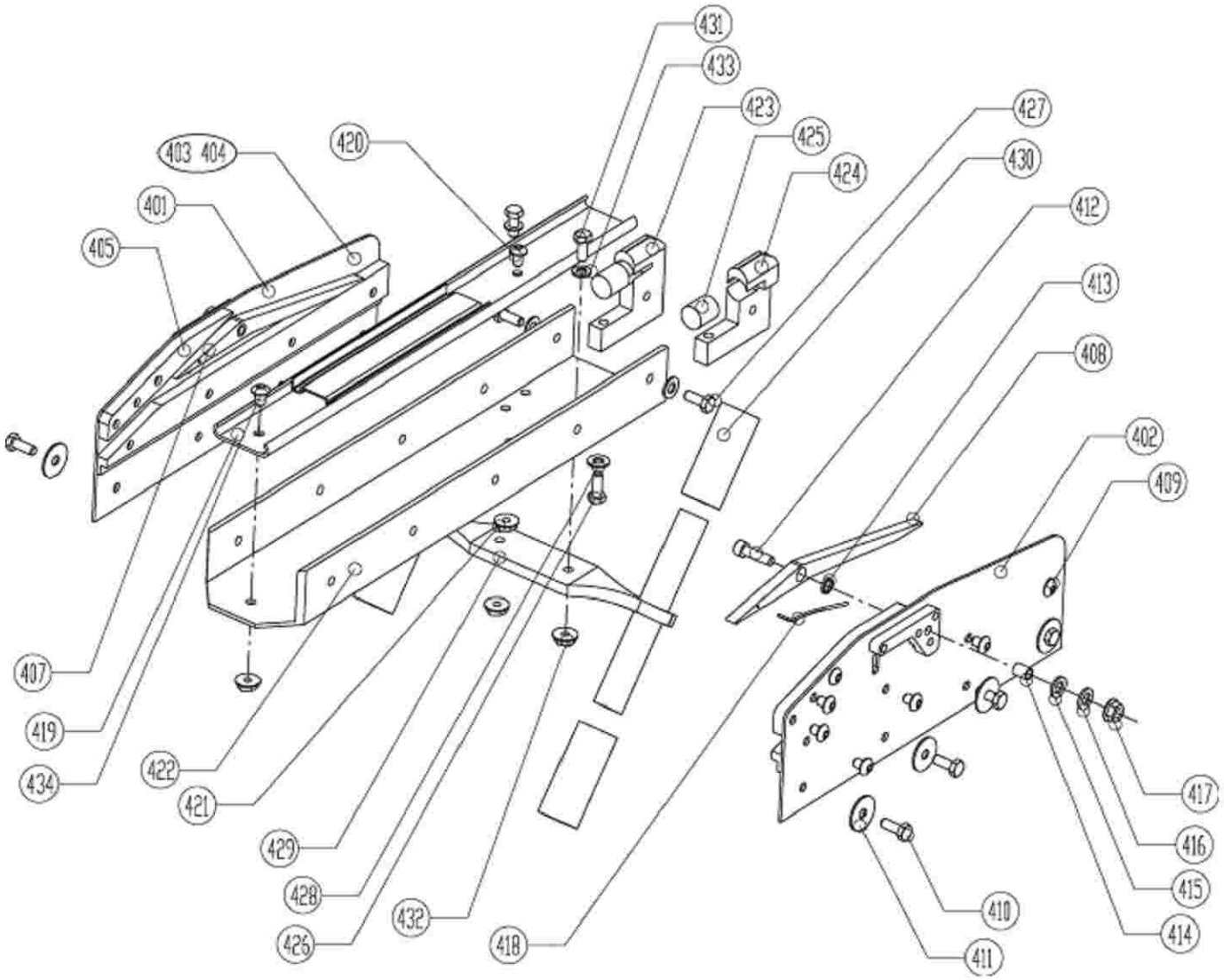
Propulsion Group

Part Number	Description	Units per Assembly
301	Piston pin	1
302	Piston	1
303	Main spring	1
304	Buffer	1
305	Spring base	1
306	Range indicator	1
307	Range rod	1
308	Nut	2
310	Bushing	1
311	Butt plug	1
313	Butt plate	1
314	Non-slip pad	1
316	Nut	1
317	Spring	1
318	Washer	1
319	Cotter pin	1
320	Knob	1
321	Latch	1
322	Shoulder screw	2
324	Escutcheon pin	1
325	Spring	1
326	Hex screw	1
327	Nut	1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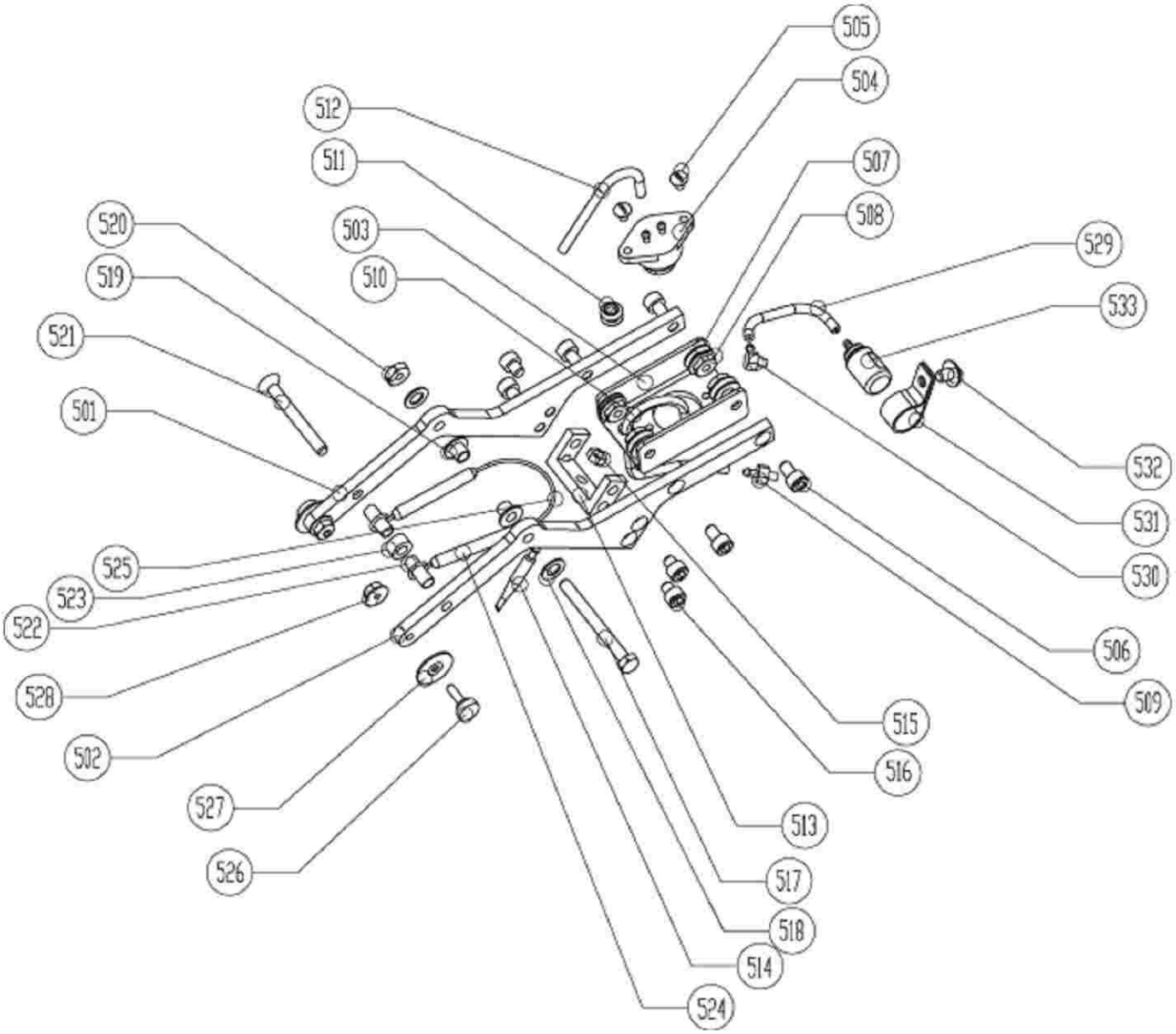
Slide Group

Part Number	Description	Units per Assembly
401	Side plate assembly, left	1
402	Side plate assembly, right	1
403	Lower guide, left	1
404	Lower guide, right	1
405	Upper guides, left and right	2
407	Cam ramp, left	1
408	Cam ramp, right	1
409	Screw	14
410	Screw	8
411	Washer	8
412	Screw	2
413	Washer	2
414	Bushing	2
415	Washer	2
416	Washer	2
417	Nut	2
418	Cam ramp spring	2
419	Linear bearing, outer half	1
420	Hex screw	2
421	Nut	2
422	Slide base assembly	1
423	Cocking arm, left	1
424	Cocking arm, right	1
425	Piston pin bumper	2
426	Hex screw	2
427	Hex screw	2
428	Washer	4
429	Slide handle assembly	1
430	Slide handle cushion	4
431	Hex screw	2
432	Nut	2
433	Washer	2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Injector Group

Part Number	Description	Units per Assembly
501	Injector lever, left	1
502	Injector lever, right	1
503	Pump mount	1
504	Pump	1
505	Screw	2
506	Screw	4
507	Washer	4
508	Nut	4
509	Straight barb fitting	1
510	Pump inlet tubing	1
511	Grommet	1
512	Injection tubing	1
513	Needle holder	1
514	Needle	1
515	Nut	1
516	Screw	4
517	Bolt	1
518	Washer	2
519	Bushing	2
520	Nut	1
521	Screw	1
522	Spacer	2
523	Release bearing	1
524	Spring	2
525	Spring retainer	1
526	Track roller bearing	2
527	Washer	2
528	Nut	2
529	Vent tubing	1
530	Ninety-degree barb fitting	1
531	Clamp	1
532	Screw	1
533	Check valve assembly	1
534	Washer	2