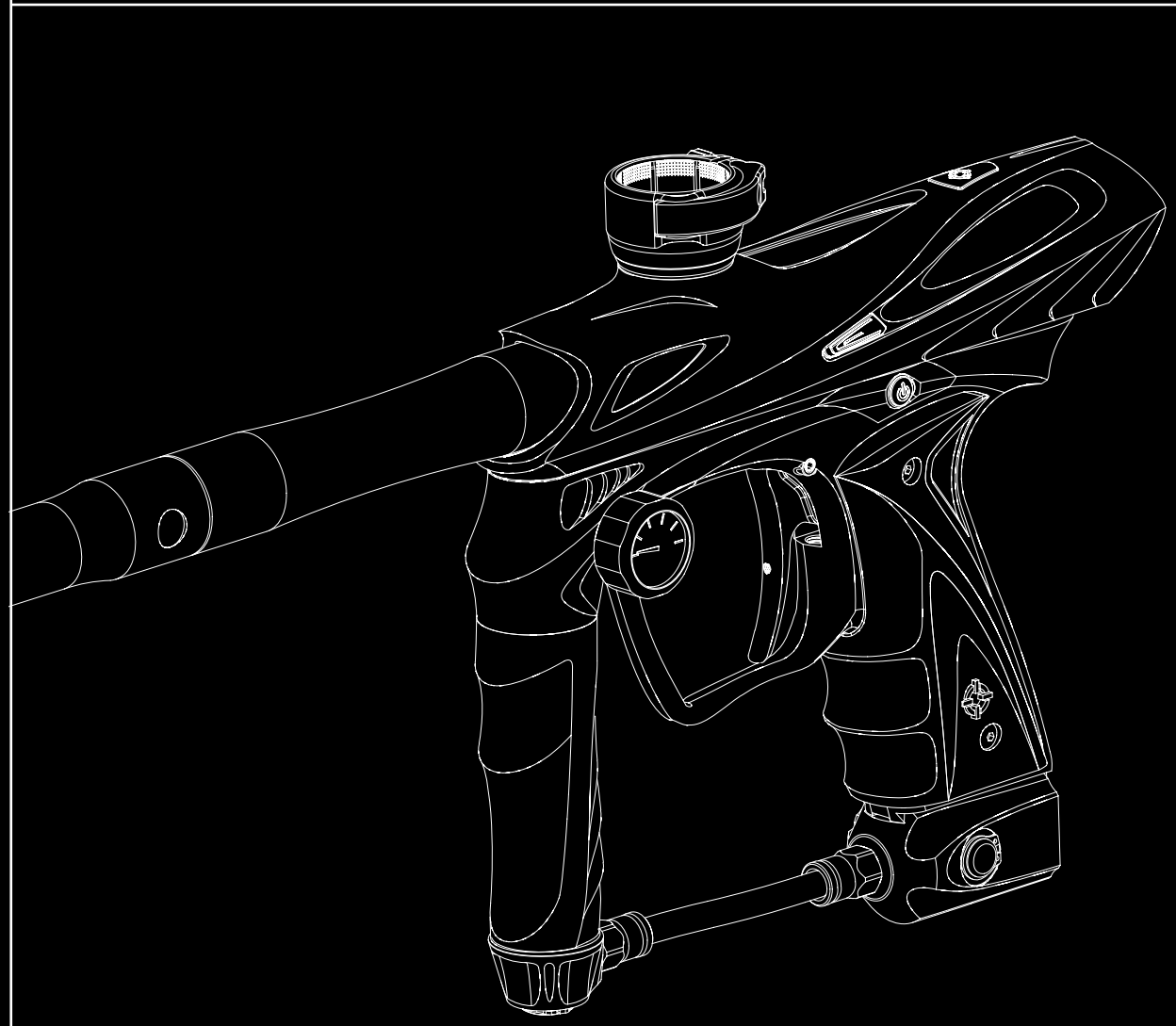
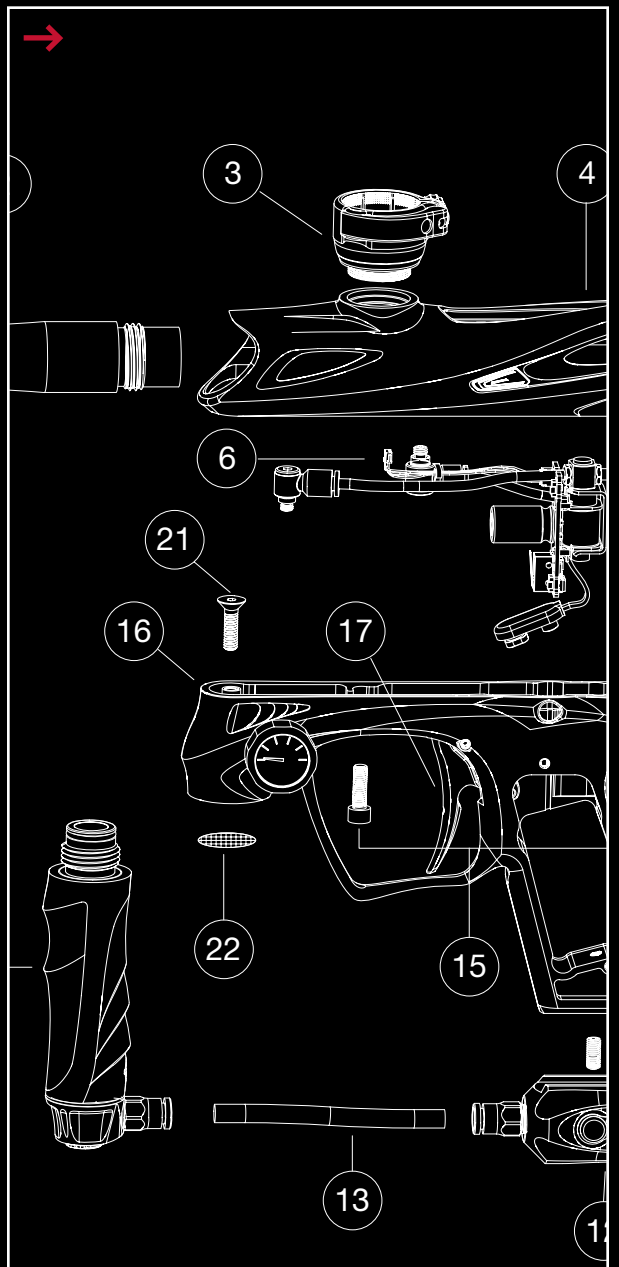
EOS

SMART PARTS

Operation and adjustment instructions

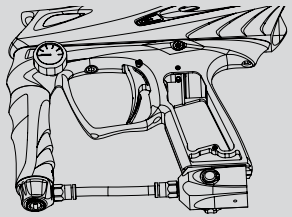




QUICK START

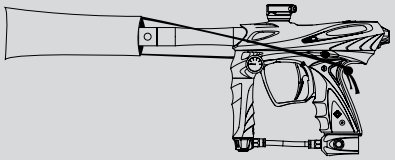
PLEASE READ CAREFULLY

01 BATTERY



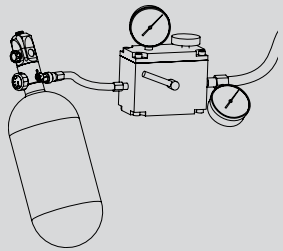
The EOS is powered by a standard 9-volt battery. To verify that a battery is installed, or to install a new one, use a 5/64-inch Allen wrench to remove the two screws from the left side of the rubber grip and lift the panel open. The battery should be attached to the battery clip, and placed in the grip frame with the battery wires tucked in above it. When changing batteries, pull the battery clip from the battery directly, do not pull on the wires. With the battery secure, close the grip and reinstall the screws.

02 BARREL BLOCKER



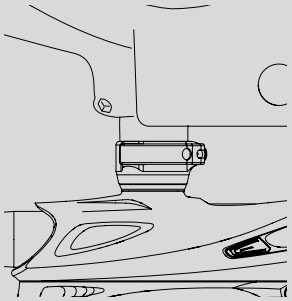
Screw the included barrel into the EOS. Slide the included barrel blocker over the barrel and secure its cord as far back on the EOS body as possible, cinching it tight. The barrel blocker is a critical piece of paintball safety equipment – nearly as important as paintball goggles. The barrel blocker must be fully seated on the marker's muzzle and secured in place with its strap any time the marker is stored or handled in an area where people or property are not properly protected by paintball goggles of paintball field netting.

03 FILL TANK



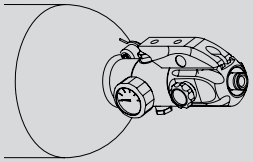
Have your compressed air (HPA) or CO_2 tank filled by a person who is properly trained to do so. If using an HPA system with an on/off valve, such as the Max-Flo or Max-Flo Micro, make sure it is in the OFF position.

04 LOADER



The EOS is a high-performance tournament grade marker. The break-beam Vision system will allow it to use a low-end hopper without chopping paintballs. A high-performance, preferably force-feeding loader must be used to achieve maximum rates of fire. Open the marker's Q-Lock feedneck by pulling the locking lever away from the feedneck, then insert the loader and secure it in place by folding the lever back to its locked position.

05 TURN ON AIR

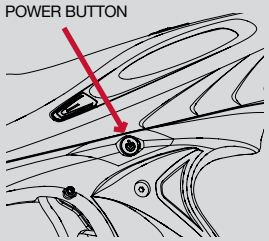


Gently gas up the marker by slowly turning on the air system or ASA's on/off valve, or slowly screwing the CO_2 or compressed air system into the ASA.

WARNING

A gentle rise in pressure is important, as a sudden blast may reduce the service life of the EOS's internals.

06 TURN ON EOS

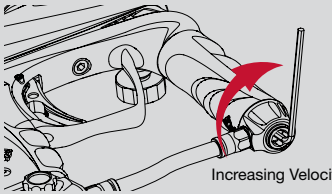


Turn the marker on by pressing the power button, and holding it in for a full second. When the EOS turns on, the power button will glow red. The EOS is turned off by pressing and holding the power button for one second. To conserve battery power, the EOS will turn itself off if it is not fired for more than 15 minutes. Pressing the power button momentarily while the EOS is on, will de-activate the Vision anti-chop system, which is indicated by the power button blinking.

WARNING

Although the power button serves as the EOS's safety switch to prevent accidental firing, it should never be relied upon in place of a barrel blocker and proper paintball eye protection.

07 ADJUST VELOCITY



Increasing Velocity.

Fill the hopper with paintballs and turn it on. While wearing ASTM compliant paintball goggles, in an area where all bystanders are protected, remove the barrel blocker and fire over a chronograph to measure the velocity. Using a 5/32-inch allen wrench on the adjuster in the bottom of the vertical regulator, turn clockwise to increase velocity/pressure, and counter-clockwise to decrease. Take three or four shots after every adjustment to allow the gas pressure inside the EOS to stabilize. Adjust until the marker is firing consistently within the limits for the field where you are playing (for safety reasons, never adjust the EOS to fire at greater than 300 feet per second.) As you adjust, check the EOS' pressure gauge to be certain you stay below the EOS' operating limit of 280 psi. Depending on what modes of fire are allowed at the field where you are playing (semi-automatic, rebound, etc.) you may need to adjust the EOS' firing mode. See the Electronic Adjustment section for more information. Shoot out the competition, hang the flag and win the game.

TABLE OF CONTENTS

WARNING

- THE EOS IS NOT A TOY.
- MISUSE OF THE EOS MAY RESULT IN SERIOUS INJURY OR DEATH.
- EYE PROTECTION SPECIFICALLY DESIGNED FOR PAINTBALL USE MUST BE IN COMPLIANCE WITH ASTM SPECIFICATION F1776 AND MUST BE USED BY THE USER AND ANYONE WITHIN RANGE OF THE EOS.
- WEAR EYE PROTECTON DURING DISASSEMBLY OR MAINTENANCE.
- SMART PARTS RECOMMENDS THAT THE EOS ONLY BE SOLD TO PERSONS 18 AND OLDER.
- THOROUGHLY READ THE EOS MANUAL BEFORE OPERATING.
- TREAT EVERY PAINTBALL MARKER AS IF IT WERE LOADED.
- NEVER LOOK DOWN THE BARREL OF A PAINTBALL MARKER.
- KEEP YOUR FINGER OFF THE TRIGGER UNTIL READY TO SHOOT.
- NEVER POINT THE EOS AT ANYTHING YOU DON'T WISH TO SHOOT.
- KEEP THE EOS ON SAFE (POWER OFF) UNTIL READY TO SHOOT.
- KEEP THE BARREL BLOCKING DEVICE ON THE EOS'S MUZZLE WHEN NOT SHOOTING.
- ALWAYS REMOVE PAINTBALLS AND DEGAS THE EOS BEFORE DISASSEMBLY.
- STORE AND TRANSPORT THE EOS UNLOADED AND DEGASSED IN A SECURE PLACE.
- FOLLOW ALL MANUFACTURER'S WARNINGS AND INSTRUCTIONS FOR PROPELLANT SOURCE HANDLING, STORAGE, AND FILLING.
- DO NOT SHOOT FRAGILE OBJECTS SUCH AS WINDOWS.
- ALWAYS MEASURE THE VELOCITY OF PAINTBALLS FIRED BY THE EOS BEFORE USE, AND NEVER ADJUST TO FIRE ABOVE 300FPS (91.44 M/S.)

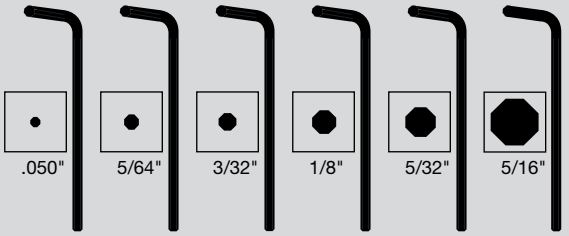
GETTING FAMILIAR

PLEASE READ CAREFULLY

STATISTICS

LENGTH/HEIGHT/WEIGHT:	20 Inches (with stock 14” barrel) / 8.25 Inches (with on/off ASA) / 2lbs, 3oz (marker only)
OPERATING PRESSURE:	Approx. 260 psi, 280 psi max
PAINTBALLS:	.68 caliber –Compliant to ASTM F1979 Specification
POWER SOURCE:	9-volt alkaline battery
PROPELLANT:	CO_2 or Nitrogen/Compressed air
RATE OF FIRE:	17 bps maximum – 20 bps max with optional Blackheart board
OPERATION:	Low pressure electropneumatic
MODES OF FIRE:	Full Auto, 3-shot burst, Semi automatic and Rebound
ANTI CHOP SYSTEM:	Break Beam Vision
BARREL THREAD:	Smart Parts
GAS EFFICIENCY:	1200 shots (68ci, 4500psi tank), 800 shots (20oz. ANTI-SIPHON tank) – Efficiency will vary with paint, barrel and setting combinations.
LUBRICANT:	For proper and consistent operation, the EOS should only be lubricated with SL33K lubricating grease.

REQUIRED ALLEN WRENCHES



MAINTENANCE

The EOS has been designed with simplicity in mind so that you can concentrate on your game instead of your marker. It has a minimal number of moving parts and seals so that you can maintain the marker with little effort. This DOES NOT mean that you should neglect your marker. If you take care of it off the field, your EOS will take care of you on the field. For best performance, clean and grease your EOS frequently. Many players clean their marker after every use. While this may seem a bit extreme, being vigilant in the upkeep of your marker will extend its useful life considerably. Playing in the rain will not damage your EOS, but you should NEVER immerse it in water. If your marker should become waterlogged, remove the barrel, body cover and rubber grips and allow them to dry out, then follow the disassembly instructions for full cleaning. Clean out mud and paint with a damp cloth and alcohol. Grease the EOS ONLY with SL33K pneumatic grease. For best performance, use high quality paintballs.

BARREL BLOCKER/HOPPER

PLEASE READ CAREFULLY

BARREL BLOCKER

The Barrel Blocking Device is a critical piece of paintball safety equipment - nearly as important as paintball goggles. The Barrel Blocker serves to protect against accidental discharge of a paintball by catching it before it can cause harm. A Barrel Blocker is included with the EOS, and must be used every time the marker is handled in an area where people or property are not properly protected by paintball goggles or paintball field netting. To use the Barrel Blocker simply slip it over the end of the barrel and stretch its cord back over the back of the marker or the rearmost part over which it can be securely looped. Use the strap's adjuster to cinch the strap tight, so that the Barrel Blocker can provide protection against accidental discharge of a paintball.

⚠WARNING

The Barrel Blocker should only be removed when the marker is on a "live" paintball field and all persons involved are wearing proper paintball protection.

HOPPER

The EOS is a high performance tournament grade paintball marker. The break-beam Vision system means that you won't need to worry about chopping paint because your trigger finger is faster than your hopper. However, if you want to realize the marker's maximum firepower potential, you will need to use a high performance loader. High performance loaders, especially those which provide force-feeding, will yield the best results with the EOS.

Open the marker's Q-Lock feedneck by pulling the locking lever away from the feedneck, then insert the loader and secure it in place by folding the lever back to its locked position. The adjuster nut can be used when the lever is unlocked, to compensate for a larger or smaller hopper neck.

FIG. 1 → BARREL BLOCKER IN USE

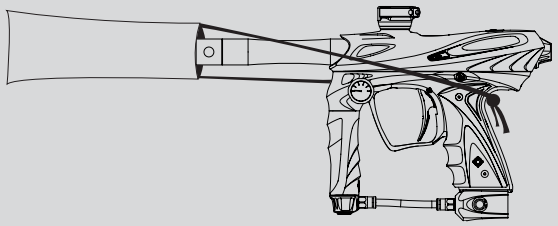
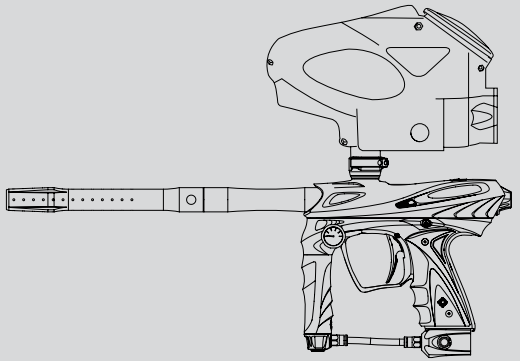


FIG. 2 → USE HIGH PERFORMANCE LOADER



GASES

WARNING
Never put oil in a compressed air regulator or tank—only apply manufacturer specified lubricants.

TThe EOS is a low-pressure paintgun. It is normally set to approximately 260 psi, and will operate properly anywhere between 250 and 280 psi. It may utilize either compressed air or CO_2 as a power source. This pressure level allows the EOS to operate with a small valve chamber which recharges fast, delivering velocity consistency at 15 balls per second and higher rates of fire. Proper set up of your gas system will help you obtain the best possible performance.

High Pressure Air systems (HPA) are the most common power source used with the EOS, as they are unaffected by temperature fluctuations and do not have the potential for liquid problems. HPA systems consist of a tank and a regulator, and are typically rated to store air or nitrogen (while nitrogen is almost never used in paintball, many players call compressed air “nitro” as air is made of more than 70% nitrogen) at pressures of 3,000 or 4,500 psi.

There are two main types of HPA systems, those on which the output pressure is adjustable, and those for which their regulator is pre-set to a fixed output pressure. HPA systems designed to screw into an ASA are usually pre-set to deliver either 400 psi (low pressure output) or 800 psi (high pressure output.)

WARNING
Never use oil or any petroleum based cleaner or lubricant in a compressed air regulator or tank. Exposure to pressurized air increases oil’s flammability and can cause a serious safety hazard. Only use manufacturer recommended lubricants with compressed air systems, and follow the manufacturer’s maintenance and operation instructions explicitly.

If you are using your EOS with an adjustable output compressed air system, it should be adjusted to deliver about 650 psi to the marker’s vertical regulator. The EOS’ regulator can accommodate a wide range of input pressures, so exact adjustment of the air system is not critical, and either low output, or high output pre-set HPA systems may be used as well.

While CO_2 can also be used, it is less popular, since its pressure fluctuates with temperature and use. For reliable operation, liquid CO_2 must not be delivered to the marker. Although the relief valve in the Max-Flo R regulator will protect the internal components of the EOS from damage caused by liquid related pressure spikes, liquid CO_2 will still hamper consistent operation. Because liquid CO_2 is heavier than CO_2 gas, it is easily blocked through the use of gravity.

WARNING
The relief valve in the Max-Flow R regulator protects the EOS from liquid CO_2 related overpressure. Do not use CO_2 with any other regulator, or internal damage may result.

FIG. 3 → HPA TANK BEING FILLED

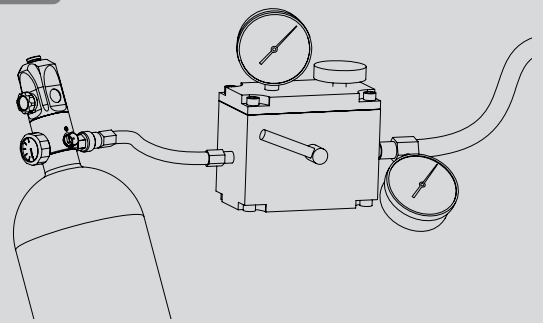


FIG. 4 → COMPRESSED AIR

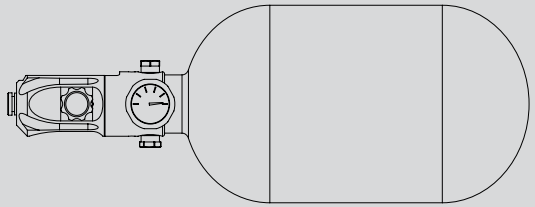
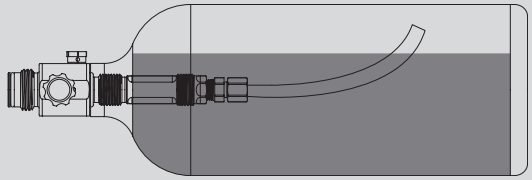


FIG. 5 → CO_2 WITH ANTI-SIPHON [CUTAWAY VIEW]



GASES

PLEASE READ CAREFULLY

Two easy ways to properly use CO_2 with the EOS are an anti-siphon tank or a remote line.

Anti-siphon tanks have a J shaped tube professionally installed inside. When the tank is screwed into a bottom line ASA, such as the one that is standard on the EOS, the tube delivers gas only. The anti-siphon tube works like a diver's snorkel, repositioning the gas intake from the valve, to the top side of the tank. When an anti-siphon tube is installed in a tank, the airsmith will usually mark the valve, to indicate the position of the tube. When the tank is screwed into a marker, this mark must be oriented to the top.

A remote hose allows a standard (non-siphoned) CO_2 tank to be carried in a player's pack. Not only does this reduce the total weight of the marker, but it also allows the tank to be placed vertically, so that its valve is at the top while gravity holds the liquid CO_2 at the bottom. It is important to note that lying down on the field or crawling while using a remote can cause liquid CO_2 to be fed to the paintgun as the tank is turned on its side.

Whether using compressed air or CO_2 it is important that the marker is not exposed to sudden "pops" of pressure. If using a standard ASA with a screw in HPA system or CO_2 tank, screw the tank in slowly, so that the valve opens slowly and the pressure rises gently. If using an ASA with a built in on/off valve, screw in the tank fully, then open the valve slowly. If using an HPA system or CO_2 tank with its own on/off valve, open that valve slowly. Be gentle to the internals of your marker and they will reward you with a long service life.

IMPORTANT

CO_2 can also be used with remote hose with-out Anti-Siphon. [Not Shown]

GAS SYSTEM MOUNTING

PLEASE READ CAREFULLY

The EOS offers multiple gas system mounting options. While it has a pair of 10-32 screw holes, it also features an integrated air system rail which can be used for low profile air system attachment.

The EOS is preconfigured with a dovetail mount on/off ASA mounted on the rail. To remove this ASA, degas and unload the EOS. Take off the EOS' flexible wraparound grips, then unplug and remove the 9-volt battery from the grip frame. Using a 3/32 allen wrench through the hole inside the grip frame, loosen the set screw in the forward grip frame screw hole. The ASA will now be free to slide off the rail.

To use 10-32 screw mounted accessories instead of rail mounted accessories, completely remove the set screw from the grip frame. If reinstalling it, be sure to thread it in from the bottom of the frame, hex side up.

FIG. 6 → BOTTOM OF GRIP FRAME

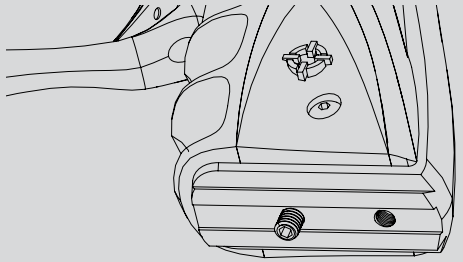


FIG. 7 → INSTALLING SET SCREW

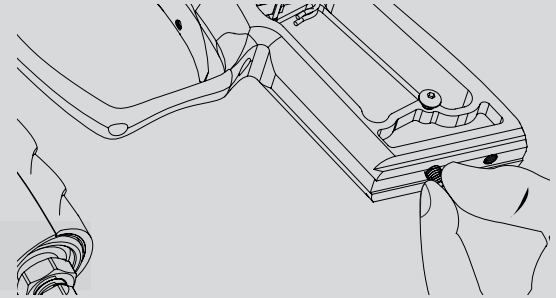
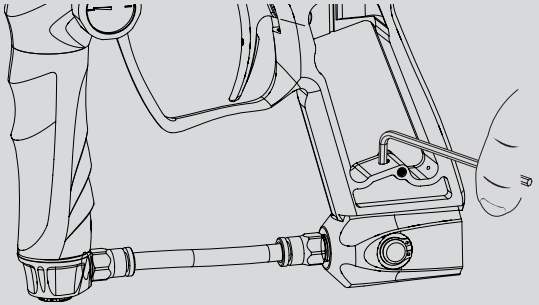


FIG. 8 → TIGHTENING SET SCREW

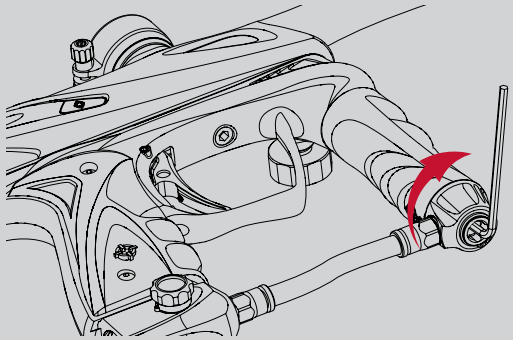


PAINT

Even the best quality paintballs will vary in size from one batch to the next and as weather conditions change. While your marker will work well even with a poor paint to barrel fit, optimal performance will be achieved with a proper fit. Paintgun barrels are available in a variety of bore sizes to allow the user to select the best possible fit, and barrel kits like The Freak allow for easy adjustment to paint of different diameters.

The ideal fit between the paintball and the barrel is when the ball is inserted in the bore (the end that screws into the marker) and does not slip or roll through to the muzzle (the business end) on its own. The ball should sit in place, even when the barrel is pointed straight down. If the paintball can roll out on its own, the fit is too loose. The ball should be able to be expelled from the barrel by blowing it out like a blowgun, using a minimal amount of breath. If the ball is difficult to blow through, the fit is too tight, which can lead to ball breakage.

FIG. 9 → INCREASING VELOCITY



VELOCITY

The velocity, or speed at which the EOS fires a paintball, must be measured and adjusted to below the paintball field's velocity limit immediately before each day of play. This is required for player safety. If CO_2 is used, velocity should be checked and adjusted multiple times during the day. While wearing proper paintball speficic goggles and protective equipment, and in an area in which all persons and property are properly protected, fire three or four shots over a chronograph and if necessary change the velocity by adjusting the vertical regulator with a 5/32-inch allen wrench. Turn clockwise to increase velocity/pressure, and counter-clockwise to decrease. Take three or four shots after every adjustment to allow the gas pressure inside the marker to stabilize. Adjust until the marker is firing consistently within the limits for the field where you are playing. For safety reasons, never adjust the marker to fire at greater than 300 feet per second. As you adjust, check the pressure gauge to be certain you stay within the EOS' operating pressure range of 250 to 280 psi. If the desired velocity can not be set within that pressure range, adjustment of the fire chamber volume may be necessary. See the EOS volume control inserts section of this manual for more information.

VISION/DEGASSING

PLEASE READ CAREFULLY

VISION INSTRUCTIONS

When the EOS is turned on it will be in Vision mode. The internal infra-red eye will be used to detect whether or not a paintball is in the breech. This feature practically eliminates the possibility of a chopped paintball. Vision mode is indicated by a rapid blinking of the light in the power button when there is a paintball in the breech, or a slow blinking when it is empty. Vision mode can be de-activated by pressing the power button quickly while the marker is on. Vision mode off is indicated by a double-tap blinking pattern on the power button light. Vision mode may be turned back on by once again pressing the power button briefly.

DEGASSING

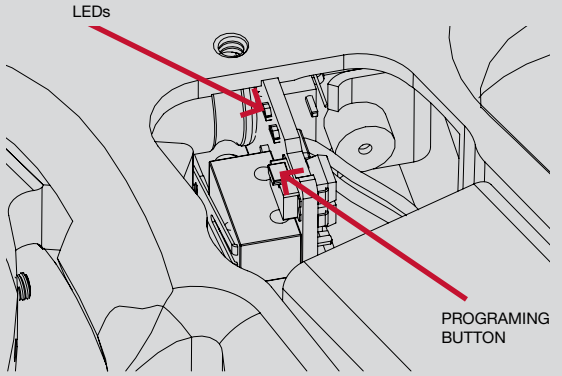
At the end of each day's use and before performing maintenance work on your marker, it will need to be degassed, and all paintballs must be removed. In an area where it is safe to shoot (such as the chronograph area at a paintball field) and while wearing paintball goggles, remove the hopper from the feedneck. By turning the marker upside down, you can empty any extra paintballs from the feedneck into your hand. Turn the marker on, then deactivate Vision mode by pressing the power button momentarily. Dry-fire 2 or 3 shots in a safe direction to ensure that no paintballs remain in the marker. Turn off the compressed air system or on/off ASA, or unscrew the compressed air system or CO_2 tank far enough to close its pin valve.

Continue to dry fire the marker in a safe direction until all of the gas pressure inside has been released. At this point the only sound you should hear when you pull the trigger is the click of the solenoid valve. Turn off the EOS by pressing and holding the power button for two or more seconds.

If using a CO_2 tank or screw in HPA system, unscrew it the rest of the way.

If the marker is to be stored for an extended period of time, remove the 9-volt battery from the grip frame.

FIG. 10 → PROGRAMMING BUTTON/LED



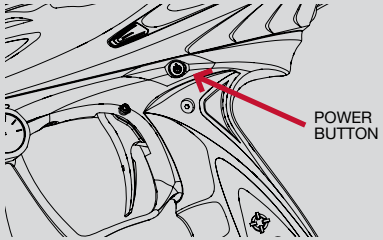
WARNING

Even with no CO_2 tank or compressed air system attached, the marker may still have enough gas pressure stored in the regulator and fire chamber to fire 2 or more shots. You must degas your EOS before storage or maintenance.

ELECTRONIC ADJUSTMENT

SETTING	LIGHT INDICATION	MODE FUNCTION
ONE		Dwell Up [solid yellow]
TWO		Dwell Down [solid red]
THREE		ROF Delay Up [shoot slower/blink yellow]
FOUR		ROF Delay Down [shoot faster/blink red]
FIVE		Firing Modes Up [double blink yellow]
SIX		Firing Modes Down [double blink red]

FIG. 11 → TURNING ON EOS



ELECTRONIC ADJUSTMENT

Dwell, Rate of Fire Delay and Mode adjustments are made using the marker's programming button and power button. Removing the two grip screws on the left side of the EOS grip frame and folding the grip back provides access to the programming button. The button is small, gray and rectangular in shape. It is mounted on the circuit board facing the left edge for easy access. A notch in the board helps to identify the button and make it easier to press.

Yellow and red light emitting diodes (LEDs) are located on the circuit board just above the programming button. The patterns which flash on these buttons indicate the function the power button will perform when pressed.

To enter the programming modes, make sure the EOS is completely degassed and unloaded, with a barrel blocker properly in place. Turn the marker on and note that the programming LEDs are not lit or flashing. This indicates that the EOS is in operational mode rather than a programming mode. To select one of the programming modes, press the programming button and note the sequence of blinking LEDs to determine which mode you have selected. The yellow LED indicates that you have selected to increase a setting, and the red LED indicates that you have chosen to decrease a setting. The LED will be lit solidly for adjustment of the dwell, single blink for adjustment of the ROFDelay and double blink for adjustment of the firing mode.

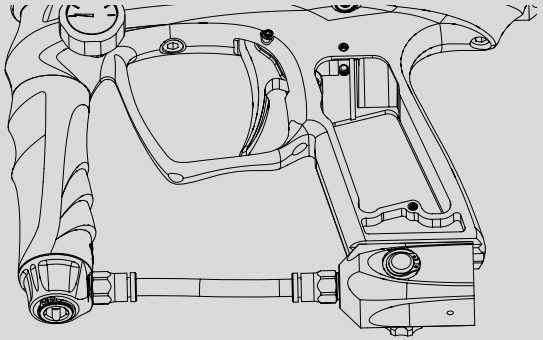
To change a particular setting, choose the appropriate mode, then press the power button. Both LEDs will blink to acknowledge that the adjustment has been made. When only the red LED blinks after pressing the power button, this indicates that you have reached the lower limit of adjustment. Similarly only the yellow LED will blink to indicate that the upper adjustment limit has been reached. Pull the trigger to exit the programming mode and save your new settings.

IMPORTANT

PROGRAMMING EXAMPLE

To set a dwell value of 18ms, first press the programming button as many times as needed to light the red programming LED solidly. Then press and hold the power button until the red LED blinks alone, indicating that the bottom of the adjustment range (8ms) has been reached. Press the programming button again to cycle through the programming modes until the yellow LED is lit solidly indicating Dwell Up function. Then, press the upper power button 20 times (20 button presses x 0.5ms = 10ms increase or 18ms total.) Pull the trigger to exit the programming mode and save the setting.

FIG. 12 → REMOVE RUBBER GRIP



DWELL

The dwell setting determines how long the EOS holds open its solenoid valve, which ultimately affects how much gas is released to fire each shot. It is important to balance the dwell and the operating pressure (the setting of the vertical regulator). Too high of a dwell with a low operating pressure will cause poor gas efficiency and velocity drop-off. Too low of a dwell will leave the marker unable to properly cycle through a full firing sequence. Dwell setting changes should not be used to adjust velocity.

The dwell value can be adjusted between 8 milliseconds (1ms = 0.001 seconds) and 52ms in 0.5ms increments. To adjust the dwell, make sure the marker is already turned on, select the proper adjustment mode for Dwell Up or Dwell Down and press the power button once for every .5ms change desired.

To optimize your dwell setting, wear proper paintball protective goggles and gas up your EOS with a barrel blocker in place, with no paint or hopper. Turn on the EOS and press the power button once to deactivate Vision mode. Decrease the dwell time (solid red adjustment mode) until the EOS can no longer complete a full firing cycle (bolt does not close all the way) each time you pull the trigger. Increase the dwell value (solid yellow adjustment mode) one button press at a time, test firing after each change until you hear the EOS fire a full volume shot. Increase the dwell by an additional 15 to 20 button presses to reach the setting for best gas efficiency.

If your new setting causes an increase in first shot drop off, where the marker is at rest for an extended period of time and has reduced velocity or will not fire on the first shot but fires fine after that, first disassemble, clean and lubricate the EOS bolt assembly and repeat the dwell setting procedure. If this does not eliminate the problem, further increase the dwell setting until there is no longer a sluggish first shot.

ROF DELAY/FIRING MODES

ROF DELAY

The Rate of Fire Delay (ROFDelay) adjustment determines how long the EOS must wait after it shoots, before the next shot can be fired. This delay allows time for the bolt to return to its rear position, gas pressure in the fire chamber to be recharged, and for a new paintball to fall into the breech. Increasing the Rate Of Fire Delay setting will decrease the maximum rate of fire the marker is capable of achieving. Many players will set the ROFDelay to its minimum, relying on the Vision system to determine when the marker is ready to fire. Setting a higher ROFDelay can be useful if there is a Vision problem, or when playing at tournaments or fields which limit players to shooting 15 balls per second or slower.

The Rate of Fire Delay setting is adjustable from 25ms to 70ms in 0.5ms intervals. To change the rate of fire setting, while the EOS is turned on, press the programming button to select the ROFDelay Up mode (single blink yellow – SLOWER) or ROFDelay Down mode (single blink red - FASTER.)

As with the dwell settings blink of only the red or yellow light only when the power button is pressed indicates you have reached the limit of adjustment.

FIRING MODES

The EOS features four distinct firing modes which can all be selected by increasing (double blink yellow) or decreasing (double blink red) the firing mode setting. Mode 0 is Semi-Automatic and fires one shot per trigger pull. Mode 1 is Rebound and fires more than one shot per trigger pull when the trigger is pulled at a constant, rapid pace. Mode 2 is 3-Shot Burst which fires up to three consecutive shots when the trigger is pulled and held. If the trigger is released before the 3 shots have been fired, the EOS will stop firing. Mode 3 is Full-Automatic, which will fire repeatedly while the trigger is held back. The maximum rates of fire that can be achieved in semi-automatic and Rebound modes will depend on the marker's Dwell and Rate of Fire Delay settings. Both 3-shot burst and full-automatic fire at a rate of 10 shots per second. EOS manufactured for the United Kingdom can be identified by a green (instead of red) power button LED and do not include 3-shot burst or full auto modes.

To select Semi-Auto mode, degas and unload the marker as with other mode adjustments. Turn the power on, and press the programming button as many times as needed to cycle the programming LEDs to a red double-blink pattern (Firing Modes Down.) Press and hold the power button until the LEDs blink red, indicating that the lowest mode (0- Semi-Automatic) is reached. Tap the trigger to exit programming mode. To select other modes, first set the EOS to semi-automatic mode, but do not press the trigger. Then press the programming button 5 times to choose Firing Modes Up (double blink yellow) and press the power button the number of times needed to select the desired mode – once for Rebound, twice for 3-Shot Burst, and three times for Full Auto.

⚠WARNING

RATE OF FIRE

It is important to remember that the ROF setting is not the same as a rate of fire cap, or the maximum rate of fire the EOS can achieve. The maximum rate of fire or Cycles Per Second (CPS) is calculated from a combination of the Dwell setting and the ROF setting.

➞ **Cycle Time (milliseconds) = Dwell + ROF**

The length of time needed for one complete cycle equals the Dwell time plus the ROF time (time in milliseconds, not number of chirps.)

➞ **Cycle Time (Seconds) = Cycle Time (milliseconds) / 1,000**

To calculate the maximum CPS, the cycle time will need to be converted from milliseconds to seconds. This is done by dividing it by 1,000.

➞ **CPS = 1 Second / Cycle Time (seconds)**

The maximum cycle rate of an EOS, for any given Dwell and ROF settings can be easily calculated. Divide one second by the cycle time to arrive at the number of shots per second.

For fields or tournaments which require paintguns be limited to a maximum rate of fire, you will need to make sure the Dwell of your marker is properly adjusted and then calculate the proper ROF value to create the desired CPS limit. See the CPS table for examples.

TRIGGER

The EOS features three trigger adjustment points to best suit your style of play. It may be tempting to set your EOS to the shortest trigger pull possible. Many players however, opt for a slightly longer pull. This allows them to walk the trigger to higher rates of fire. Use of Blue Loctite 242 or equivalent thread locker on the adjustment screws will ensure that trigger adjustments do not vibrate out of place.

PRE-TRAVEL
This adjustment is located in the trigger guard where it meets the grip frame and is adjusted with a 1/8-inch allen wrench. Turning this adjustment clockwise shortens the distance the trigger travels before it activates the trigger switch. Counterclockwise adjustment has the reverse effect. Care must be taken not to adjust this screw in too far or the trigger will not reliably reset after each shot.

POST-TRAVEL
How far the trigger can travel after it activates the trigger switch is determined by the post-travel adjustment screw. This screw is located in the center of the EOS trigger and is adjusted with a 0.050-inch allen-wrench. To avoid trigger switch damage, it is critical that the Post-Travel and Activation point adjustments are set so that the trigger stops with the post-travel adjustment screw solidly against the EOS Grip frame.

ACTIVATION POINT
This setting determines the point in the trigger pull at which the EOS' trigger switch is activated, firing the marker. Adjusting the trigger activation point requires disassembly. First degas and disassemble the EOS, removing the receiver, circuit board, rubber grips and battery from the grip frame (see Disassembly Section.) The trigger activation screw is visible on the rear of the EOS trigger, and can be adjusted with a 0.050-inch allen-wrench. Like the other trigger adjustments, final setting of the activation point screw should be secured with a thread locking compound. Access to this screw will usually require removal of the EOS Circuit Board – see Advanced Disassembly.

INSTALLATION
The EOS trigger is held in place by a pair of centering screws which lock into its roller bearing. With the grips, grip frame and circuit board disassembled (see Disassembly Section,) use a 5/64-inch allen wrench to back out these screws, located on either side of the grip frame, then lift the trigger out through the top of the grip frame. When reinstalling the trigger, be sure to screw in the trigger bearing lock screws evenly, so that the trigger is centered in the grip frame. Uneven tightening of these screws can press the trigger against one side of the grip frame causing it to bind or drag. Be sure to secure the trigger bearing lock screws with a temporary thread locking compound such as Blue Loctite 242.

FIG. 13 → PRE–TRAVEL ADJUSTMENT

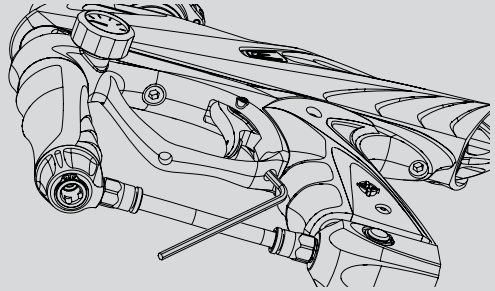


FIG. 14 → POST–TRAVEL ADJUSTMENT

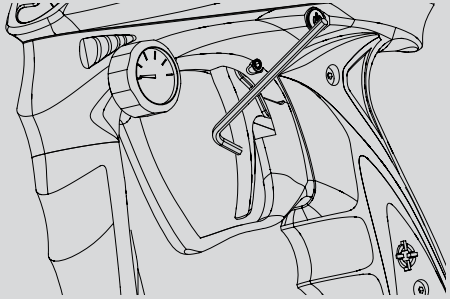
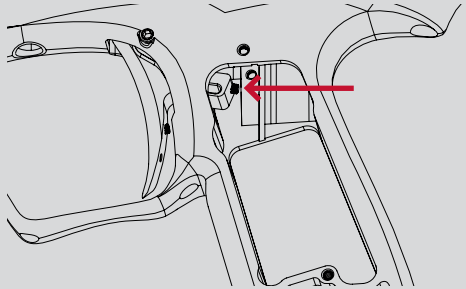


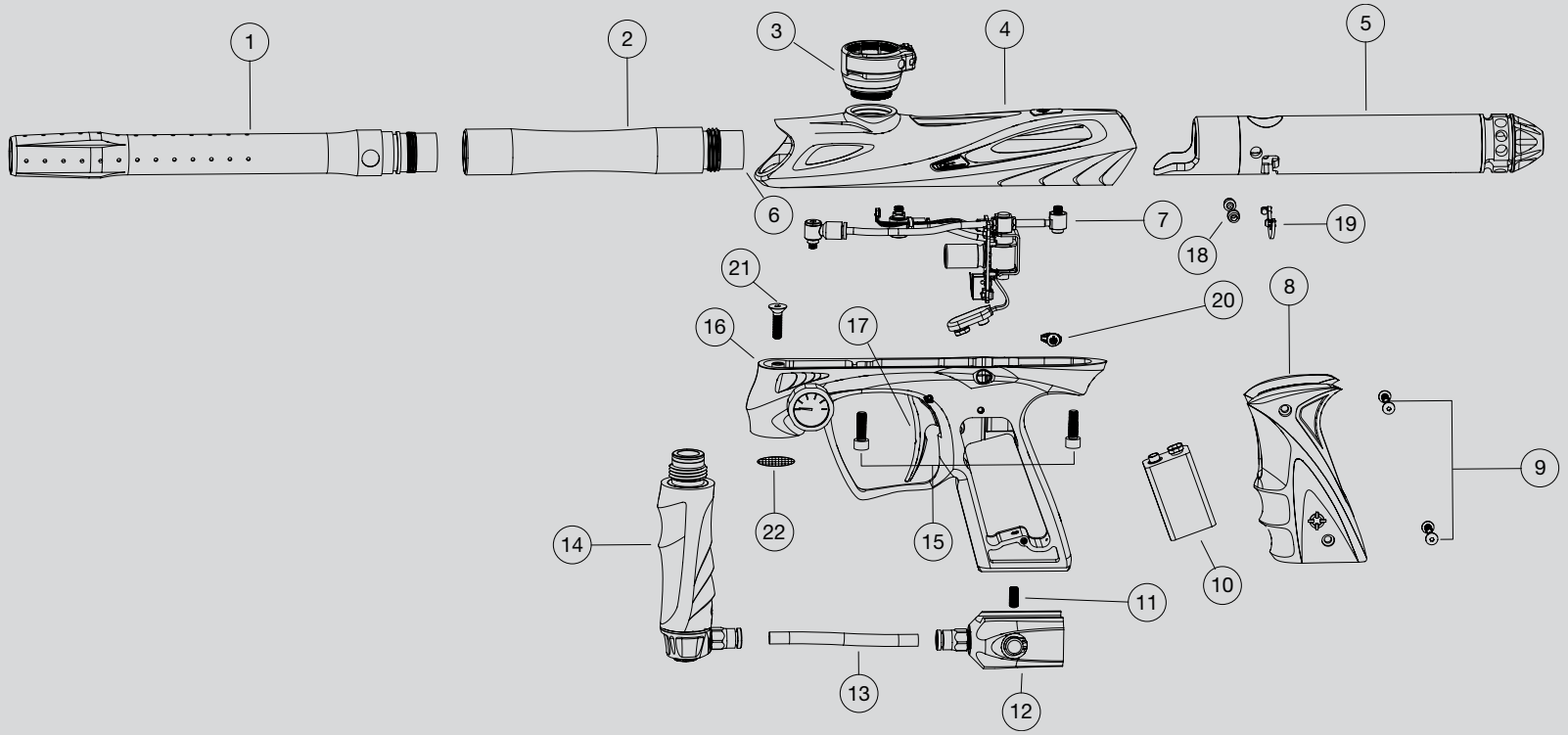
FIG. 15 → ADJUSTING ACTIVATION POINT



EOS PARTS

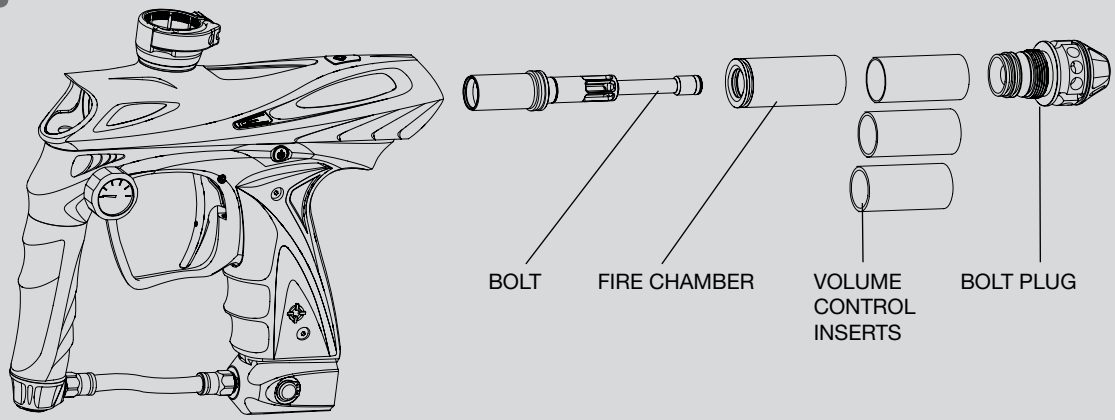
IMPORTANT

FIG. 16 → MAJOR EOS COMPONENTS



1 FRKJFBLK – Freak Jr. Front (Black)
2 FRKJB30BL – Freak Jr. Back
3 QLK200NXTD – Q-Lock Feedneck
4 EPY101PLT – EOS Body Shell
5 Inner Body Assembly
6 FRKI693AL - Freak .693 Insert
7 EOS Circuit Board Assembly
8 GRPEPY – Pro Touch Grips
9 SCRN063632X0188BS – Grip Screws
10 9-Volt Alkaline Battery
11 SCRN0632X0188BS – Air Rail Lock Screw
12 VLVDTAD – On/Off ASA
13 HOS14BLK – 1/4" Macro-Line (Black)
14 Max-Flo R Vertical Regulator with EOS Reg Cover
15 SCRN1032X06870CS – Grip Frame Screws (2x)
16 EOS Grip Frame Assembly
17 EPY107ASM– EOS Trigger
18 ION108 – Ball Detents (2x)
19 ION117UPPRVSN – Breakbeam Vision Board
20 EPY108 – Power Button
21 SCRN1032X0375VO – Body Flat Cap Screw
22 ION120 – Filter Screen

FIG. 17 → EOS BOLT DISSASSEMBLY



The EOS valve system has only one major moving part, making it simple to maintain, but this does not mean maintenance can be ignored. The EOS should be disassembled and cleaned any time it shows erratic performance, becomes contaminated with paint, dirt or other debris, or for general maintenance after 3 or 4 days of use.

01 Unload and degas the EOS. Use a 5/16-inch allen wrench to unscrew and remove the bolt plug from the back of the EOS.

02 Using a soft tool, like a wooden chopstick or plastic toothbrush, push the bolt, bolt stop and volume control insert, if present, out the back of the EOS.

03 Clean the interior of the body, the fire chamber, bolt and bolt stop with a clean cloth or paper towel. Inspect their o-rings for signs of damage such as rips or cuts and replace if necessary.

04 Lubricate o-rings with SL33K marker lubricant. Slide the volume control insert into the fire chamber. Slide the bolt stop onto the bolt from the rear. Slide this assembly into the rear of the EOS. Screw the bolt plug into place with a 5/16-inch allen wrench – do not overtighten.

This is all that is required for routine maintenance of the EOS. Further disassembly to inspect or replace ball detents and Vision or circuit board components may be done by following the advanced Disassembly instructions in this manual.

EOS VOLUME CONTROL INSERTS

IMPORTANT

In order to provide more consistent velocity at higher rates of fire (above 10 bps) the EOS utilizes a smaller fire chamber volume than an Ion. To deliver full velocity, it operates at a slightly higher pressure range (250 to 280 psi.) The smaller volume fire chamber can be recharged more quickly by the regulator, while the Ion bolt structure ensures that only a gentle low pressure burst of gas impacts against the paintball.

In order to tune the EOS for optimal performance, three inserts are available, allowing four levels of adjustment to the volume of the fire chamber. These range from the largest volume (no insert,) to the green insert (second largest volume) to the blue insert (second smallest volume,) and finally to the silver insert (smallest volume.) An increase in operating pressure can be balanced with a decrease in fire chamber volume to maintain desired velocity.

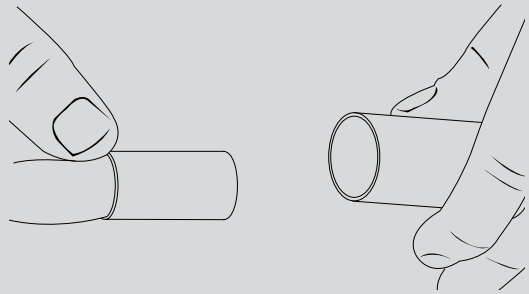
COMMON EOS CONFIGURATIONS:

The Key to EOS performance is its reduced volume valve chamber. The smaller airspace in the EOS fire chamber fills with gas faster, recharging the marker to deliver a full power shot sooner. This eliminates shoot-down and allows the EOS to maintain consistent velocity even at high rates of fire. To optimize performance, the EOS includes three volume control inserts which allow you to fine-tune the amount of airspace in its valve. Choosing the ideal insert and operating pressure level is a balancing act between lower pressures which allow for gentler, quieter operation, and higher pressures which allow for better velocity consistency at high rates of fire (10 bps and above.) It should be noted, that even at the high end of its pressure range, the EOS still operates at a lower pressure than many other “low-pressure” paintball markers. While some experimentation will be necessary to find the best setting for any given marker configuration and playing condition, the following guidelines will help select the proper volume insert.

Firebolt without QEV (Standard Configuration) – Green (thinnest wall) – This is the standard EOS configuration, which will deliver a velocity of 285 fps at approximately 260 psi.

Firebolt and a Quick Exhaust Valve (QEV) – Blue (middle size) Volume Insert – The volume of the blue insert will compensate for the effects of the QEV by slightly reducing the volume of gas in the fire chamber to provide 285 fps operation at approximately 260 psi.

FIG. 18 → REMOVING VOLUME INSERT



CHANGING VOLUME INSERTS

Changing the volume inserts is simple. Degas and disassemble the EOS, following the Disassembly section of this manual. The selected insert (or no insert) can be slid freely into the EOS fire chamber, and installed inserts can be removed by reaching a finger into the insert and pulling it out. After installing the proper insert, the EOS can be reassembled by following the Reassembly section of this manual. The marker will then need to have its velocity measured and set (see the Velocity section of this manual.)

VOLUME CONTROL INSERTS

IMPORTANT

COMMON EOS CONFIGURATIONS (CON'T.):

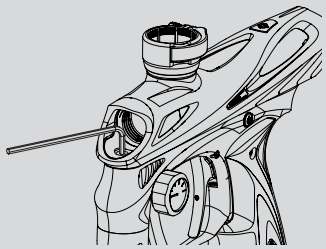
Reducing Pressure – No Insert – If the pressure at the desired velocity is above the EOS's maximum of 280 psi, or temperatures are extremely high (which can soften pneumatics hoses) an increase in fire chamber volume to reduce operating pressure can be desirable. Setting up the EOS with no inserts gives the maximum possible fire chamber volume.

Indoor Operation – Silver Insert (thickest wall – smallest gas volume) – Many indoor paintball fields restrict marker velocity to a maximum of 250 fps. By reducing the fire chamber volume even further, the silver insert allows this velocity to be reached while keeping the fire chamber pressure up in the range of 250-280 psi, protecting against velocity drop-off under rapid fire conditions.

Some aftermarket Ion bolts, while compatible with the EOS, may increase the marker's fire chamber volume to that point that even with the silver insert, there is too much airspace to operate within field velocity limits without reducing air pressure below 250 psi. While the marker will operate at this lower pressure, such a configuration will lose the high rate of fire velocity consistency benefits of the EOS low-volume valve system.

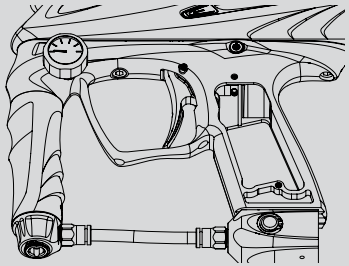
ADVANCED DISASSEMBLY

01



Remove the bolt plug, bolt, fire chamber and volume control insert from the EOS following the directions in the maintenance/disassembly section of this manual. Use a 1/8-inch allen wrench to remove the body flat cap screw, which is normally concealed by the barrel.

02

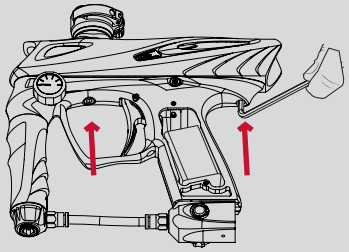


Remove both left side (gauge side) grip screws with a a 5/64-inch allen wrench and open the flexible wraparound grip. It is important to note that the EOS' grip screws are shorter than those of an Ion, and use of screws that are too long may damage the marker's circuit board. Remove the battery from the grip frame. Grasp the battery in one hand and with the other hand grasp the battery clip by the sides and unplug it from the battery. Remove the right side grip frame screws and the flexible grip, as the upper right grip screw may catch on the circuit board, making its removal difficult.

WARNING

Do not pull on the battery wires or circuit board to unplug the battery as this may cause significant damage.

03



Remove the front and rear grip frame screws using a 5/32-inch allen wrench.

WARNING

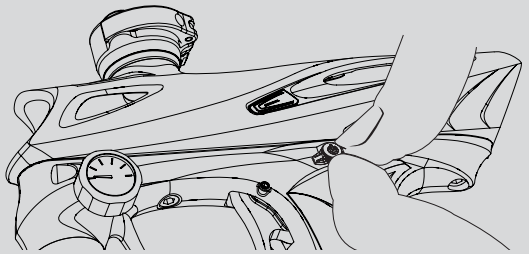
The EOS does not use the same length grip frame screws as previous Smart Parts Markers. Use of an incorrect length screw may cause internal damage, and void the EOS' warranty.

[CONTINUED ON PAGE 18]

WARNING

Before beginning any maintenance or repair procedures, completely unload and degas the marker following the instructions in the Degassing section of this manual. Choose a clean, stable and protected work area where small parts will not be lost, such as a table covered with a towel to prevent parts from rolling. Remove the barrel.

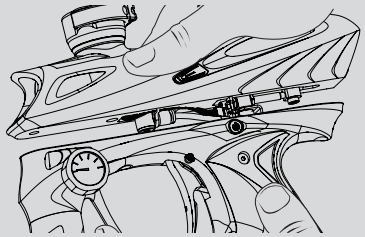
FIG. 19 → POWER BUTTON REMOVAL



During normal maintenance the power button does not need to be and should not be removed. If it is damaged or requires replacement, grip it between a fingernail and thumbnail, and wiggle out, rear side first.

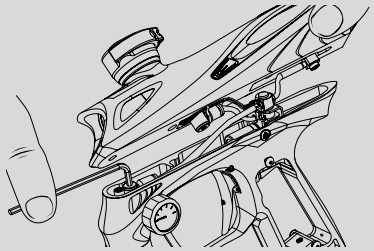
ADVANCED DISASSEMBLY (CONT.)

04



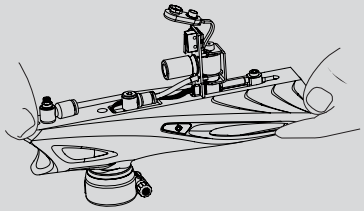
Grasp the body with one hand and the grip frame with the other. Slowly pull the body away from the grip frame, rolling it slightly to the side, exposing the top of the grip frame and banjo fitting. It can be helpful to gently push on the bottom of the circuit board with a thumb, helping it to slide upward.

05



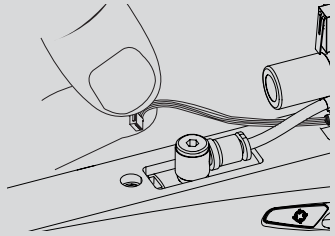
Remove the front banjo fitting from over the vertical adapter with a 1/8-inch allen wrench. The center of the banjo fitting will turn with the wrench, pivoting inside the rest of the fitting.

06



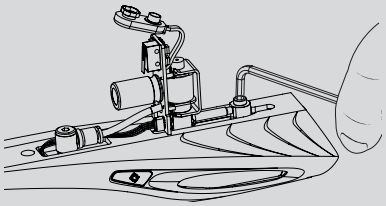
Gently complete the process of separating the body from the grip frame. Take care to make sure that the circuit board slides out of the grip frame without being strained, and that the battery wires and battery clip follow without catching on the grip frame. Set the grip frame aside, and hold the body upside down (with the feedneck facing down.)

07



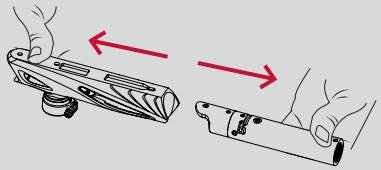
Locate the Vision wiring harness. This group of four black wires runs from the lower circuit board to the Vision circuit board in the body breech. Unplug the Vision wiring harness from the body end, being careful not to strain the wires by tugging on them. As much as possible, pull on the connector directly.

08



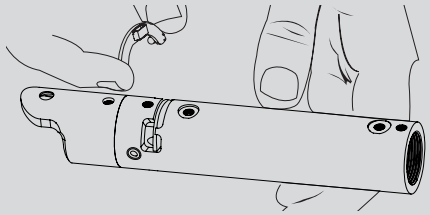
Remove the remaining two banjo fittings from the body with a 1/8-inch allen wrench.

09



Keeping the body upside down, slide the inner receiver components out of the body cover.

10



Remove the Vision circuit board from the body breech and set aside carefully. This circuit board is shaped like the letter C, and should come easily out of place. Take care to make sure that the infra-red emitter and detector (these look like clear LEDs) are not set on anything that can scratch them.

MAX-FLO R

For advanced maintenance of the EOS' Max-Flo R vertical regulator, please download the Max-Flo R maintenance manual from the Support section of SmartParts.com.

REASSEMBLY

01

Use a soft cloth to clean all parts of paint and dirt as well as old oil or grease.

02

Make sure the Vision circuit board and its components are clean and undamaged. Make sure no dirt or debris is blocking the Vision holes in the body breech – use a cotton swab to clean these openings if necessary.

03

Screw the fire chamber into the body breech. Place the Vision circuit board into its slot in the body breech. Its plug should be on the side of the board facing the rear of the marker. The clear emitter and detector should be on the side facing the front of the body breech.

04

Slide the inner receiver assembly into the body cover while holding both upside down to prevent the Vision circuit board from falling out, then plug the Vision wire harness back into the Vision circuit board, and reconnect the center and rear banjo fittings to the receiver, being careful not to cross thread them.

05

Carefully pass the battery clip down into the grip frame and slide the circuit board into place before reinstalling the forward banjo fitting to its position in the grip frame, again taking care not to cross-thread.

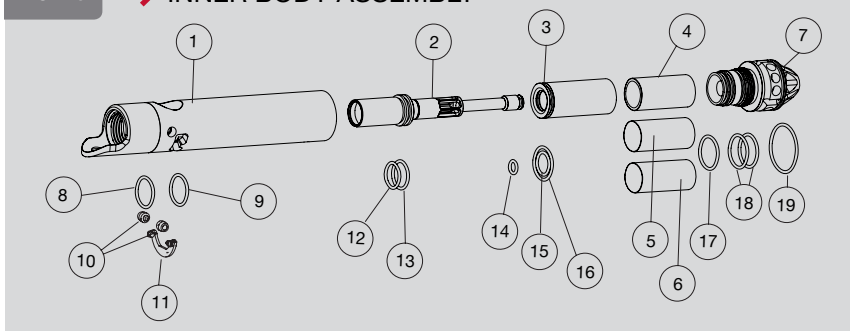
06

Reposition the body and grip frame together being careful not to pinch any wires or hoses. Reinstall the grip frame screws, and flat cap body screw, then tighten all three with an 1/8-inch allen wrench. Reinstall the battery, taking care not to pinch the battery wires, and flexible the rubber grip and its screws

07

Use SL33K to grease the o-rings on the bolt, fire chamber and bolt plug, then reinstall these components.

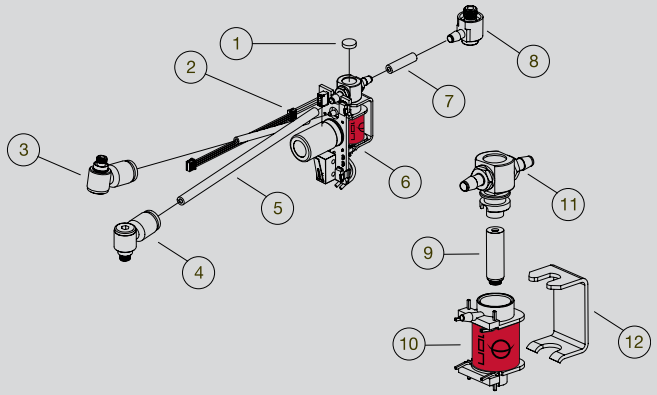
FIG. 20 → INNER BODY ASSEMBLY



1 MRK100 – Inner Body
2 ION209 – Firebolt
3 EPY111 – EOS fire Chamber
4 EPYINTLG – Green Volume Control Insert
5 EPYINTLM – Blue Volume Control Insert
6 EPYINTLS – Silver Volume Control Insert
7 EPY104 – Back Plug
8 ORN01790UR – SFT O-Ring
9 ORN01770HN – Rear Breech O-Ring
10 ION108 – Ball Detent (2x)
11 ION117UPRVSN – Break-Beam Vision Board
12 ORN01590CUR – Firebolt Bumper
13 ORN0162070HN – Firebolt Middle O-Ring
14 ORB01070UR – Firebolt Rear O-RIng
15 ORN01470UR – Fire Chamber Inner O-Ring
16 ORN01870BU – Fire Chamber Outer O-Ring
17 ORN01770BU – Plug/Chamber O-Ring
18 ORN01870BU – Supply Seal O-Rings (2x)
19 ORN02270BU – Rear O-Ring

SOLENOID VALVE

FIG. 21 → SOLENOID EXPLODED VIEW



1 BUM006 – Foam Disk
2 ION118 – Vision Wiring Harness
3 ELB1032X18PTCBNJ – Banjo Fitting
4 ELB1032X532PTCBNJ – Banjo Fitting
5 HOS4MMBLK4025 – Black EOS Hose
6 EPY117LOVUSASM – EOS Circuit Board
7 HOS4MMBLK875 – Black EOS Hose
8 ION131 & ION132 – Barbed Banjo Fitting
9 Armature
10 SOL3UPG – EOS Solenoid Coil
11 Solenoid Head
12 Solenoid Bracket

The solenoid valve is the heart of the EOS. When the circuit board supplies it with power, it redirects gas flow to allow the bolt to close and fire the marker. During normal maintenance the solenoid valve should not need to be disassembled. However, if it becomes clogged or develops a leak it is simple to disassemble for cleaning or repair. When replacing hoses or solenoid valve components, EOS or Epiphany rated models must be used. The EOS solenoid valve can be identified by its red protective coil wrap with black Ion logo.

01

Follow the advanced disassembly instructions to remove the circuit board from the EOS. Using a 3/32-inch allen wrench, hold the circuit board and solenoid body then pry the bracket from the back of the solenoid valve. Place the wrench between the bracket and the upper, black section of the solenoid valve body.

⚠WARNING

Do not pry against the red solenoid coil or the EOS heat shrink coil protector, as this will cause damage.

02

After the solenoid bracket is removed, lift the solenoid head straight out, wiggling if necessary to loosen it.

03

Tip the circuit board over and allow the armature to fall into your hand. The armature fits loosely in the center of the coil, and should fall out easily.

04

Clean the inside of the solenoid with a cotton swab, and clean the armature with a soft cloth, removing any debris, oil or grease.

05

Reassemble the solenoid valve. Place the armature back in the coil with the armature facing down.

06

Push the solenoid head back into the solenoid valve body, making sure that the long hoses and Vision wiring harness are aligned on the same side of the circuit board as the trigger switch.

07

Replace the solenoid bracket, pressing it back into place. The bent bracket section goes over the bottom side of the solenoid.

⚠WARNING

A very light layer of SL33K lubricating the hose barb will make the installation of new hoses easier, but extreme care must be taken that no excess grease is able to enter the solenoid valve. Holding the solenoid head with a box end or small adjustable wrench over the hose barb will allow the hose to be pulled away from the wrench which will hold back the solenoid head.

BALL DETENTS

01

Degas and disassemble the marker (see the Advanced Disassembly section.)

02

Look into the body. The tip of each ball detent should extend approximately 1/16 of an inch into the breech area. If either detent does not reach this far into the breech, it should be replaced.

WARNING

To avoid risk of eye injury, even while wearing goggles, do not look into the barrel or breech of an assembled marker.

03

Reach a finger into the body and press out against the detent. It may then be removed by prying or gripping with fingernails, needle-nosed pliers, an o-ring pick or even a 0.050-inch allen wrench. Inspect the ball detents for tears or damage. If they are damaged, replace them. If not, clean them with a soft cloth, and clean the detent openings in the body breech with a cotton swab.

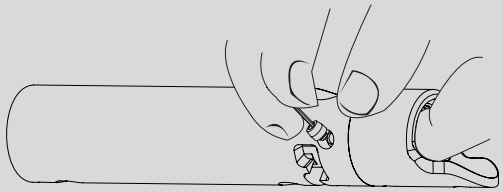
04

Reinstall the detents by pressing them into place with a thumb.

05

Reassemble the marker.

FIG. 22 → PRYING OUT DETENT



IMPORTANT

EOS IS LEAKING INTERNALLY.

— Pneumatic hoses may be loose, damaged or not fully connected. Replace hoses with Smart Parts EOS hoses only.
— One or more of the banjo fittings may be loose or have a damaged seal. Inspect and tighten fittings. Replace if necessary with Smart Parts Ion/EOS banjo fittings only.
— Solenoid armature is damaged or over-pressurized. Make sure operating pressure is under 280psi. Inspect solenoid valve and replace armature if necessary.

EOS IS LEAKING DOWN THE BARREL.

— One or more of the bolt o-rings and/or the fire chamber o-rings are damaged. Inspect and replace, making sure to clean and lubricate these parts following the Disassembly section of this manual.

EOS IS LEAKING FROM THE MACROLINE AIR FITTINGS.

— Macroline may not be fitted properly. Degas the marker and make sure the macroline is properly locked into its fittings. If the macroline shows signs of damage, replace it with a new piece. Be sure to cut clean ends, and if using diagonal cutters, dress the end with a small needle file to be certain it is not crimped partially closed.

EOS IS LEAKING FROM IN OR AROUND THE REGULATOR.

— Gas may occasionally vent near the bottom of the Max-Flo R vertical regulator, especially when using CO_2. This is a normal function as the regulator protects your marker and does not indicate a problem.
— The ASA o-ring at the top of the regulator may be damaged. Remove the regulator to inspect. If this o-ring is damaged it may be replaced with a standard CO_2 bottle o-ring available at most paintball shops.
— The regulator seat may be contaminated and/or damaged. Download the Max-Flo R manual from the support section of SmartParts.com.

EOS EXHIBITS FIRST SHOT DROP-OFF (FSDO).

— FSDO is a low velocity, or non-firing first shot followed by normal shooting, and is often caused by debris in the bolt or a poorly lubricated bolt. Clean the bolt, body breech, fire chamber and bolt stop, and lubricate them with SL33K (See the Disassembly section of this manual.)
— FSDO can also be caused by too low of a dwell setting. Follow the procedure for optimal dwell adjustment and or increase the dwell setting (see the Electronic Adjustment section of this manual.)

TROUBLESHOOTING

IMPORTANT

EOS HAS INCONSISTENT VELOCITY OR DROPS SIGNIFICANTLY DURING RAPID FIRING.

- Barrel to paint match may not be correct. Check the fit of the paintballs to the barrel (see Paint section of this manual.) If it is a poor fit, switch paintballs, barrel, or barrel insert for a better fit.
- Gas source could be low. Fill gas source and make sure valve is turned on.
- Battery may be low. This will be most noticeable with velocity dropping, and then entire shots not firing during rapid fire. Replace with a name brand alkaline 9-volt battery.
- Regulator seat may be contaminated and/or damaged. Inspect and clean the regulator seat (download the Max-Flo R manual at smartparts.com.) If the regulator seat is damaged, it may be flipped over to use the back side. If both sides are damaged, it must be replaced.
- Pressure may be low. Switch to a smaller volume fire chamber insert and increase operating pressure.
- SFT o-ring may be damaged, swollen or missing. Inspect and if necessary replace the SFT o-ring (see Assembly diagram.)
- Liquid CO_2 may be entering the regulator. Only use CO_2 with an anti-siphon tank in the ASA, or a standard tank placed vertically in a pack with a remote. Alternatively, switch to compressed air.

EOS WILL TURN ON BUT WILL NOT FIRE.

- Battery may be low or dead. Replace with a name brand alkaline 9-volt battery.
- Solenoid valve may be blocked with debris. Disassemble solenoid, clean armature, and inside solenoid body, then reassemble without lubricant (see Solenoid Disassembly/Maintenance section of this manual.)
- One or more of the trigger set screws may be mis-adjusted. The trigger switch should be heard clicking when the trigger is pulled with the EOS turned off. Back pre and post-travel screws out until trigger will activate the marker then set properly (see the Trigger section of this manual.)
- Trigger switch may be damaged. - Visit your nearest Smart Parts Authorized Dealer or contact Smart Parts for circuit board repair or replacement.
- Regulator output pressure may be too high (above 280 psi.) Decrease the pressure (see Velocity Adjustment section of this manual.) If pressure slowly rises after being set, inspect, clean and if necessary replace the regulator seat (see Regulator section of this manual.)
- Liquid CO_2 may be entering the regulator. Only use CO_2 with an anti-siphon tank in the ASA, or a standard tank placed vertically in a pack with a remote. Alternatively, switch to compressed air.

TRIGGER WILL NOT RESET TO THE FORWARD POSITION

- The trigger activation point screw may be adjusted too far toward the rear of the marker. Follow the trigger adjustment instructions and adjust this screw further in to the trigger.

TROUBLESHOOTING

IMPORTANT

THE EOS IS BREAKING PAINT.

- Battery may be low or dead. Replace with a name brand 9-volt alkaline battery.
- Ball detents may be worn or damaged. Inspect and if necessary replace (see Ball Detent section of this manual.)
- Barrel to paint match may not be correct. Check the fit of the paintballs to the barrel (see Paint section of this manual.) If it is a poor fit, switch paintballs, barrel, or barrel insert for a better fit.
- Vision mode may be turned off. This will be indicated by a double-blink pattern on the power button. Turn Vision on by pressing the power button.
- Paint or debris may be partially blocking the Vision eye from properly "seeing" the breech. Remove the Vision circuit board. Carefully clean the infrared emitter and detector with a damp, soft cloth and clean the Vision ports in the body breech with a cotton swab (see Disassembly section of this manual.)
- Wiring harness may be damaged. Check to make sure that the wiring harness running from the solenoid circuit board in the grip frame to the Vision circuit board in the body is plugged in at both ends, and is not bent, crimped, broken or frayed (see Disassembly section of this manual.)
- Vision board may be damaged from improper installation. Replace Vision board (see Disassembly section of this manual.)
- Liquid CO_2 may be entering the regulator. Only use CO_2 with an anti-siphon tank in the ASA, or a standard tank placed vertically in a pack with a remote. Alternatively, switch to compressed air.

ROF IS TURNED UP ALL THE WAY AND EOS WILL NOT FIRE RAPIDLY.

- The ROFDelay setting of the EOS circuit board controls how long the marker must wait between shots. Increasing the delay (yellow blinking) will slow the EOS down. Decreasing the delay (red blinking) will allow it to shoot faster (see Electronic Adjustment section of manual.)
- The EOS's break-beam Vision system prevents it from firing until a paintball has been properly loaded. Non-motorized or agitating hoppers will not feed paintballs as quickly as a modern force-feed loader, resulting in a restricted rate of fire.

TROUBLESHOOTING

IMPORTANT

A REFEREE SAYS THE EOS IS SHOOTING TOO FAST (BALLS PER SECOND)

— Some tournaments and paintball fields limit the rate of fire allowed. Many tournaments, for example, limit players to a maximum of 15 balls per second. The marker's rate of fire can be limited by increasing the ROFDelay setting (see Electronic Adjustment section of manual and the CPS Table.)

REFEREE SAYS THE EOS IS SHOOTING TOO FAST (MORE THAN 1 SHOT PER TRIGGER PULL)

— Many tournaments, scenario games and paintball fields limit players to shooting in true semi-automatic mode. Set the marker's firing mode to 0-Semi-Automatic (see Electronic Adjustment section of manual.)

WARRANTY

Smart Parts warrants for one (1) year to initial retail purchaser that the paintball marker and regulator are free from defects in materials and workmanship. Disposable parts (batteries, o-rings, seals, springs, etc.) are not warranted. The valve assembly is warranted for six (6) months. The solenoid and electronics on the marker are warranted for six (6) months, plus an additional warranty of six months for electronic parts only (installation and labor are not included.) This warranty does not cover surface damages (scratches and nicks), misuse, improper disassembly and re-assembly, attempts made to drill holes or remove metal from the external surfaces which could degrade performance and reduce pressure safety factors of the marker. Do not make changes to the basic marker parts without written approval. The only authorized lubricant for the marker is SL33K Lubricant. Use of any other lubricant could result in voiding your warranty. Paintball markers are non-refundable. This warranty is limited to repair or replacement of defective parts with the customer to pay shipping costs. This warranty is effective only if the customer returns the warranty registration card enclosed with the marker. The warranty is non-transferrable. Do not attempt to alter the trigger assembly in any way, as this will void your Smart Parts Inc. warranty. Trigger alteration of any kind may result in serious injury. **Replacement or alteration of the Max-Flo R Vertical regulator will void warranty and may result in serious damage and or injury.**

TECH SUPPORT

U.S. EAST COAST
Smart Parts, Inc.
100 Station Street
Loyalhanna, PA 15661
800.992.2147

U.S. WEST COAST
West Coast Repair Center
27326 Jefferson Ave #2
Temecula, CA 92590
951.296.1000

U.K.
Unit A6
Larkfield Trading Estate
New Hythe Lane
Aylesford,Kent
ME20 65W
++40 (0) 1622.719.995

Additional support and downloadable product manuals are available through our web site, www.smartparts.com.

CPS TABLE

This table provides a cross reference between EOS settings and the resulting maximum possible cycles per second. To limit an EOS to shoot at or below 15 balls per second, look up its dwell setting in the dwell column, then look across to find a CPS value that is comfortably below 15, and up to find the appropriate ROFDelay value needed.

Stock Dwell Value: 52 clicks from bottom
Stock ROFDelay Value: 50 clicks from bottom

NOTE: THE EOS CIRCUIT BOARD WILL FIRE AT A MAXIMUM OF 17 CYCLES PER SECOND.

ROFDELAY	DWELL																				
	Clicks	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	88
Clicks	Ms	8	10.5	13	15.5	18	20.5	23	25.5	28	30.5	33	35.5	38	40.5	43	45.5	48	50.5	52
0	25.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.5	15.9	15.3	14.7	14.2	13.7	13.2	13.0
3	26.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.1	15.5	14.9	14.4	13.9	13.4	13.0	12.7
6	28.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.7	15.2	14.6	14.1	13.6	13.2	12.7	12.5
9	29.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.7	16.0	15.4	14.8	14.3	13.8	13.3	12.9	12.5	12.3
12	31.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.9	16.3	15.6	15.0	14.5	14.0	13.5	13.1	12.7	12.3	12.0
15	32.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.5	15.9	15.3	14.7	14.2	13.7	13.2	12.8	12.4	12.0	11.8
18	34.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.8	16.1	15.5	14.9	14.4	13.9	13.4	13.0	12.6	12.2	11.8	11.6
21	35.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.4	15.7	15.2	14.6	14.1	13.6	13.2	12.7	12.3	12.0	11.6	11.4
24	37.0	17.0	17.0	17.0	17.0	17.0	17.0	16.7	16.0	15.4	14.8	14.3	13.8	13.3	12.9	12.5	12.1	11.8	11.4	11.2
27	38.5	17.0	17.0	17.0	17.0	17.0	16.9	16.3	15.6	15.0	14.5	14.0	13.5	13.1	12.7	12.3	11.9	11.6	11.2	11.0
30	40.0	17.0	17.0	17.0	17.0	17.0	16.5	15.9	15.3	14.7	14.2	13.7	13.2	12.8	12.4	12.0	11.7	11.4	11.0	10.9
33	41.5	17.0	17.0	17.0	17.0	16.8	16.1	15.5	14.9	14.4	13.9	13.4	13.0	12.6	12.2	11.8	11.5	11.2	10.9	10.7
36	43.0	17.0	17.0	17.0	17.0	16.4	15.7	15.2	14.6	14.1	13.6	13.2	12.7	12.3	12.0	11.6	11.3	11.0	10.7	10.5
39	44.5	17.0	17.0	17.0	16.7	16.0	15.4	14.8	14.3	13.8	13.3	12.9	12.5	12.1	11.8	11.4	11.1	10.8	10.5	10.4
42	46.0	17.0	17.0	16.9	16.3	15.6	15.0	14.5	14.0	13.5	13.1	12.7	12.3	11.9	11.6	11.2	10.9	10.6	10.4	10.2
45	47.5	17.0	17.0	16.5	15.9	15.3	14.7	14.2	13.7	13.2	12.8	12.4	12.0	11.7	11.4	11.0	10.8	10.5	10.2	10.1
48	49.0	17.0	16.8	16.1	15.5	14.9	14.4	13.9	13.4	13.0	12.6	12.2	11.8	11.5	11.2	10.9	10.6	10.3	10.1	9.9
51	50.5	17.0	16.4	15.7	15.2	14.6	14.1	13.6	13.2	12.7	12.3	12.0	11.6	11.3	11.0	10.7	10.4	10.2	9.9	9.8
54	52.0	16.7	16.0	15.4	14.8	14.3	13.8	13.3	12.9	12.5	12.1	11.8	11.4	11.1	10.8	10.5	10.3	10.0	9.8	9.6
57	53.5	16.3	15.6	15.0	14.5	14.0	13.5	13.1	12.7	12.3	11.9	11.6	11.2	10.9	10.6	10.4	10.1	9.9	9.6	9.5
60	55.0	15.9	15.3	14.7	14.2	13.7	13.2	12.8	12.4	12.0	11.7	11.4	11.0	10.8	10.5	10.2	10.0	9.7	9.5	9.3
63	56.5	15.5	14.9	14.4	13.9	13.4	13.0	12.6	12.2	11.8	11.5	11.2	10.9	10.6	10.3	10.1	9.8	9.6	9.3	9.2
66	58.0	15.2	14.6	14.1	13.6	13.2	12.7	12.3	12.0	11.6	11.3	11.0	10.7	10.4	10.2	9.9	9.7	9.4	9.2	9.1
69	59.5	14.8	14.3	13.8	13.3	12.9	12.5	12.1	11.8	11.4	11.1	10.8	10.5	10.3	10.0	9.8	9.5	9.3	9.1	9.0
72	61.0	14.5	14.0	13.5	13.1	12.7	12.3	11.9	11.6	11.2	10.9	10.6	10.4	10.1	9.9	9.6	9.4	9.2	9.0	8.8
75	62.5	14.2	13.7	13.2	12.8	12.4	12.0	11.7	11.4	11.0	10.8	10.5	10.2	10.0	9.7	9.5	9.3	9.0	8.8	8.7
78	64.0	13.9	13.4	13.0	12.6	12.2	11.8	11.5	11.2	10.9	10.6	10.3	10.1	9.8	9.6	9.3	9.1	8.9	8.7	8.6
81	65.5	13.6	13.2	12.7	12.3	12.0	11.6	11.3	11.0	10.7	10.4	10.2	9.9	9.7	9.4	9.2	9.0	8.8	8.6	8.5
84	67.0	13.3	12.9	12.5	12.1	11.8	11.4	11.1	10.8	10.5	10.3	10.0	9.8	9.5	9.3	9.1	8.9	8.7	8.5	8.4
87	68.5	13.1	12.7	12.3	11.9	11.6	11.2	10.9	10.6	10.4	10.1	9.9	9.6	9.4	9.2	9.0	8.8	8.6	8.4	8.3
90	70.0	12.8	12.4	12.0	11.7	11.4	11.0	10.8	10.5	10.2	10.0	9.7	9.5	9.3	9.0	8.8	8.7	8.5	8.3	8.2