

A dark, textured background featuring a close-up of an airsoft helmet with a visor and a rifle, both in a muted blue-grey color. The helmet is on the left, and the rifle extends towards the right. The overall tone is professional and tactical.

We would like to thank you for joining the airsoft community, a community that has continuously been dedicated to safety and honor. Airsoft consists of responsible, respectful, and just plain awesome individuals like yourself that helped define the sport and hobby into what it is today; we would like to welcome you to this tight knit team.

Evike.com started building the industry in 2000 and we have taken pride in being one of the most iconic retailers in airsoft history. Today, Evike.com is the world's largest airsoft retailer and only continues to grow due to your endless support.

We know that we are here today because of you. Our team is hard at work to provide you with top-notch service. We will continue to perfect our system, and to perfect every aspect of your hobby. Our success came from your voice, input, and suggestions.

We hope this guide will further assist you on the battlefield. On behalf of Evike.com: Happy Airsofting.

EVIKE.COM TEAM WWW.EVIKE.COM

AIRSOFT

FIELD GUIDE

AIRSOFT FUNDAMENTAL PRINCIPLES



SAFETY TIP:

If you are ever approached by the police while you have an airsoft gun, immediately drop the gun and comply with the officer's commands.



Airsoft is a sport that must be played with common sense. Wearing appropriate eye protection, using safe gun handling techniques, and understanding how to operate your gun are fundamental to safe play.

- All guns, including airsoft guns, must be treated as if they are loaded at all times.
- Do not point an airsoft gun at an animal or an unprotected person.
- Never look down the muzzle or barrel of an airsoft gun.
- Only discharge the gun at something you are willing to damage or destroy.
- Store an airsoft gun unloaded.
- Disconnect any batteries and discharge any gas when storing a gun.
- Never brandish your airsoft gun in public.
- Never take your airsoft gun to school or any other public place.
- Everyone must wear eye protection at all times, including spectators and bystanders.

The minimal eye protection recommended for play is a set of full seal ANSI Z87.1 goggles or 20-gauge mesh. The goggles must have a complete seal around the eyes so as not to allow a BB to enter from a side impact. Some fields or facilities may require a full-face mask, or multi-piece face protection, as well as a barrel condom or cover on your airsoft gun. Remember to always keep your finger off of the trigger when not in use.

Regardless of the country or state, it is your responsibility to avoid the confusion of your airsoft gun with a real gun. Although your airsoft gun may be brightly colored to discern it from the real thing, do not bring your gun out into public view. In most countries, brandishing is illegal, regardless of the coloration of the replica. In many states, it is illegal to modify the orange tips or safety colors at any time. Remember to always keep your gun on safety when it is being transported. Always treat your airsoft gun as you would treat a real gun.



AIRSOFT

FIELD GUIDE



AIRSOFT GUN TYPES, BASICS & EXTERNAL ANATOMY

SPRING OPERATED GUNS

The most basic gun type is the spring powered airsoft gun. Nicknamed a 'springer,' the player pulls back a slide or bolt to manually cock a spring. When the trigger is pulled, the spring pushes air to the BB and fires it. Most low-end pistols and rifles use this type of operation, as well as high quality replicas. The general advantage is no gas or battery is required. These types of guns are recommended for recreation and target shooting.



GAS OPERATED GUNS

Gas guns are the most realistic airsoft gun and are widely used for Military and Law Enforcement simulation and training. There are two types of gas guns: Gas Blowbacks (GBB) and Non-Blowback (NBB). In a gas gun, compressed gas is released in small bursts to fire the BB. On a GBB, some of the gas is used to force back a bolt or slide, much like a real gun. Non-blowback guns are generally more efficient since all of the gas goes to firing the BB in the chamber.



AUTOMATIC ELECTRIC GUNS (AEGs)

Airsoft Electric Guns (AEGs) are the most common platform for standard gaming. AEGs use an electric motor to pull back a piston that forces air to the BB. On full auto, this happens rapidly, with some guns reaching fire rates far over 30 rounds per second.



AIRSOFT FACT:

Did you know that the M4 is most common airsoft rifle?

MAGAZINES

All types of magazines are available to suit your play style. High capacity magazines use a winding spring that is done manually or electronically. The most common type of magazine is the standard magazine, which has a spring that is compressed as each round is loaded.

Most box magazines have an electric motor that feeds the BBs into the gun. These magazines usually carry 3,000 to 5,000 rounds depending on the type.

Typical high capacity magazines, nicknamed 'Hi-caps', can hold 200-600 rounds, but must be thoroughly wound-up before each use. These provide the most efficient payload relative to their size, but can rattle during play.

Standard type magazines have varied capacities ranging from 'Mid-caps' (70-200 rounds), Standards (40-80 rounds), and 'Real' or 'Low-caps' (5-30 rounds). These are the most common with Military Simulation players since they do not rattle and do not require winding like Hi-Caps.

Certain airsoft shotguns use ejecting shells. Shotgun shells can hold up to around 30 rounds and are widely available.

Loading Port

Feed Lip



BB Reservoir

Winding Wheel

SAFETY TIP:

Always transport your airsoft guns in a gun bag or gun case.



SAFETY TIP:

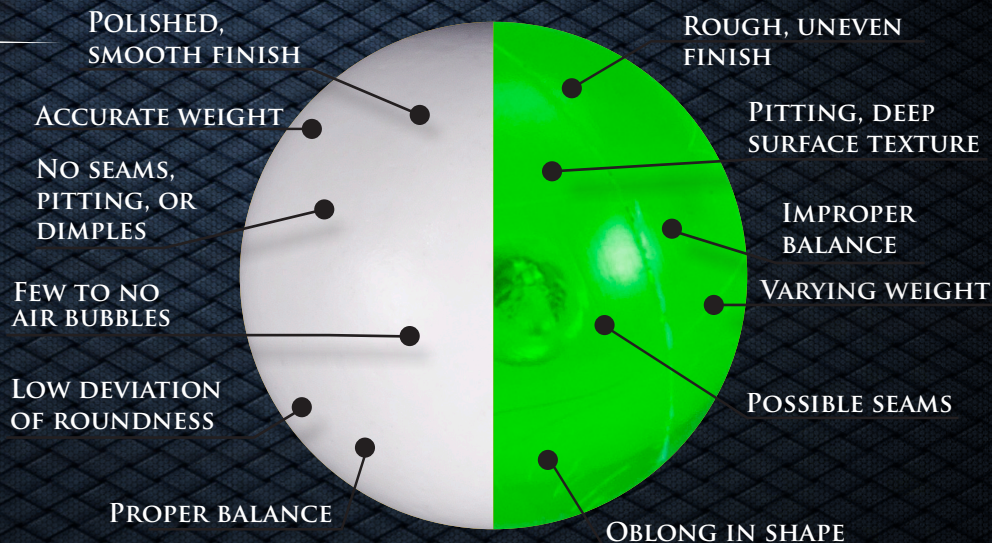
Never brandish an airsoft gun in public. It is irresponsible and, in most cases, illegal.

AIRSOFT

FIELD GUIDE

YOU'RE ONLY AS GOOD AS YOUR BBs

GOOD VS BAD



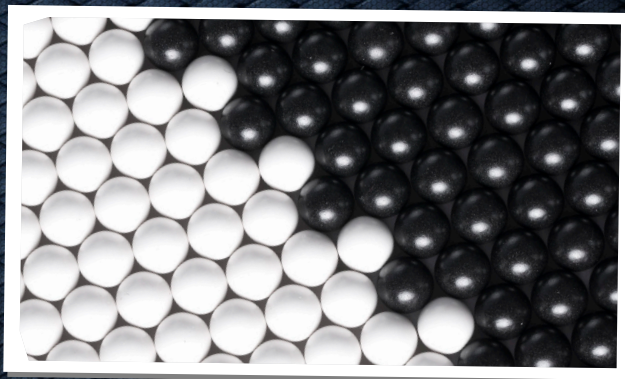
PRECISION MATTERS

Precision is the most important factor to high quality BBs. This is true not only for the manufacturing process, but for pairing the proper size BB with your inner barrel. High quality BBs come in sizes ranging from 5.90mm to 5.98mm ($\pm 0.01\text{mm}$) so it is important to keep your inner barrel diameter in mind. The closer the diameter of the BB to the diameter of your inner barrel, the better the air seal. It is very important to keep your inner barrel clean as tight tolerances of high quality BBs and barrels allow little to no room for dust and debris. There is no specific size that is best for all applications. It all comes down to your inner barrel specifications.

When comparing two types of BBs, you want to be sure you choose a high quality, polished BB, as opposed to an uneven, rough, or odd-sized brand. High quality BBs are 5.90-5.98mm ($\pm 0.01\text{mm}$) in size and have an even consistency with little to no air bubbles inside. The less air inside each BB, the better the grouping.

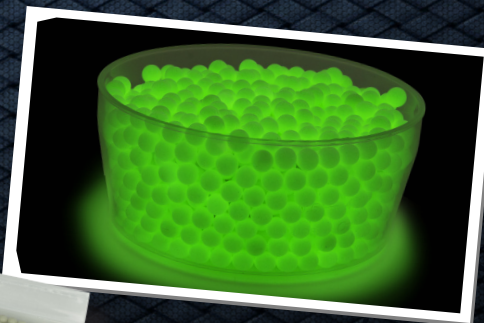
BLACK AND WHITE

The most popular BB color is white, as they reflect the most light and are easily seen as they fly through the air. Other colors exist, however white is typically the color of most high quality BBs. The darker the BB, the less visible it is in flight. Black BBs are nearly invisible when in flight, and can be used for an extra element of stealth.



NIGHT GLOW BBs

Night glow or “tracer rounds” are BBs made of light-absorbing materials. They will not glow on their own, as they must first be exposed to light. Tracer magazines, hopups, and barrel attachments flash or emit light, creating a streak of color as the BB flies through the air.



PLAYER TIP:

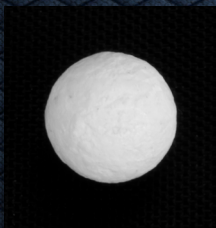
Never re-use BBs, as they deform once they are fired at a target and will cause jamming and feeding issues. Only use clean, new BBs inside your airsoft guns.

AIRSOFT
FIELD GUIDE

YOU'RE
ONLY AS
GOOD AS
YOUR BBs

BIODEGRADABLE BBs

Biodegradable BBs are made of decomposing materials that are coated and polished. Only use high quality polished Bio BBs in your gun. Always keep them cool, dry and in an airtight container.



CONSEQUENCES OF BAD BBs

Using low quality or lightweight BBs in a quality airsoft gun will cause you to strip your piston or gear set. Low quality BBs do not seal properly in the barrel and add wear to a gun's internal parts. Because of their low quality control, many are oddly shaped and have high deviations in size. Along with all this, low quality BBs can break apart in your hopup unit, causing jams.



PLAYER TIP:

Remember to empty as much air as possible and to fully seal your bag of Bio BBs to prevent premature decomposition and breakdown.

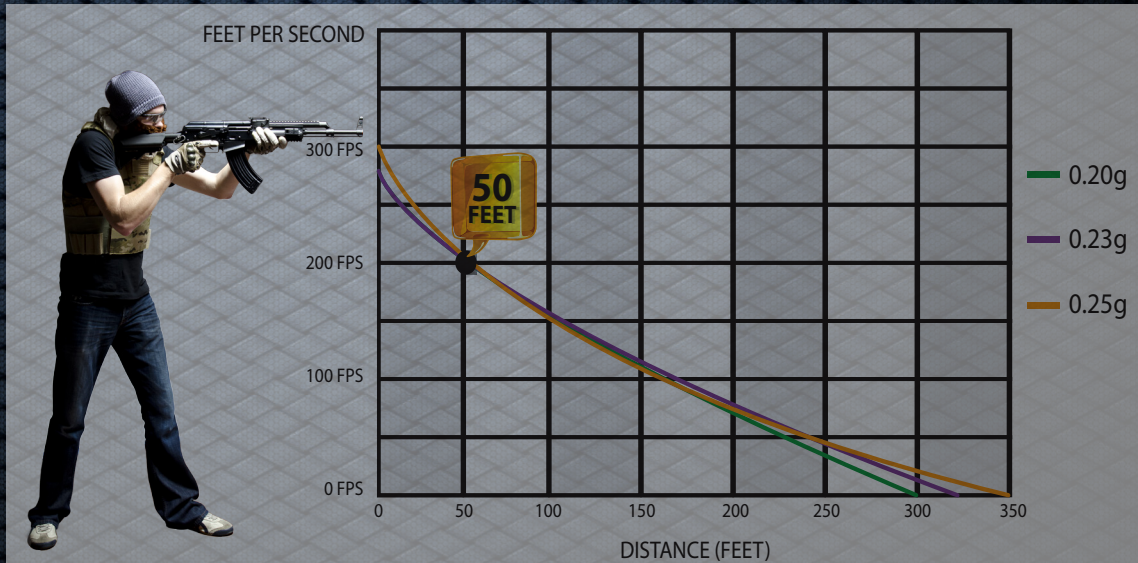
THE BIO BREAKDOWN

Bio BBs will typically start to break down when wet or exposed to sunlight for long durations. Most Bio BBs will decompose in the environment within several months, but it will take longer in dry terrain.



WEIGHT VS MUZZLE VELOCITY

The most common weights used in airsoft today are 0.20, 0.23, and 0.25 grams. The heavier the weight of a BB is, the lower the muzzle velocity, and vice-versa. Heavier BBs are less susceptible to wind forces that can affect flight. Heavier BBs can also add range and are generally more accurate. Commonly, airsofters use heavier weight BBs to optimize their range. It is a good rule of thumb to increase the weight of the BB being used as the muzzle velocity increases. This will ensure that your BBs perform well in your gun in regards to range and accuracy. Using a heavier BB does not change the Joules, or energy, that a BB carries when fired.



**RECOMMENDED
BB WEIGHT** | 0.20g = 280-330 FPS
0.23g = 330-380 FPS
0.25g = 350-450 FPS

The Above graph represents a standard AEG shooting 300 FPS with 0.20g BB's over a two second time span.

AIRSOFT
FIELD GUIDE

AIRSOFT BATTERIES



PLAYER TIP:

If your gun does not fire - check your fuse.

BATTERY FORMATS

Selecting the right battery will make a world of difference in your airsoft gaming experience. Here are the most common configurations of battery packs:

THE #1 UPGRADE

One of the most common questions asked is "What should I upgrade on my gun?" Before going into high speed or high power setups the first thing you should upgrade is your battery. A 9.6 Volt battery with high amperage is the #1 recommended upgrade for most of today's guns. You will experience a higher rate of fire and greater overall efficiency. Another great upgrade for the more seasoned and experienced player is the Lithium Polymer battery (LiPo).



VOLTAGE (SPEED) AND MAH (CAPACITY) = POWER

The more power there is, the faster your motor will cycle, and the higher the rate of fire will be. Most airsoft AEG motors are designed to use 8.4V and 9.6V battery packs, although they can handle up to 12V depending on user preference and your gun's internals. Don't use a battery over 9.6v on a stock gun unless recommended by the manufacturer. LiPo batteries generally have a higher constant output than NiMH batteries.

BATTERY VOLTAGE VS RPS	8.4v 1600 mAh	10
	9.6v 4000 mAh	13.5
	12v 4500 mAh	19
	11.1v 2300 mAh	19

CELL TYPES

NiMH: The most common battery cell in airsoft is the Nickel-metal Hydride cell (NiMH); they are the most stable and reliable cell type.

NiCD: Nickel-Cadmium batteries (NiCD) are less common in today's Airsoft industry. NiCD batteries generally produce less voltage per cell and require a complete discharge before recharging.

LiPo: Lithium Polymer batteries (LiPo) are the newest addition to Airsoft batteries. Use of LiPo batteries in an Airsoft gun requires high-end internal parts and advanced knowledge to be properly used.

NiMH and NiCD cells are generally 1.2 Volts each. The most common battery voltages are 8.4 and 9.6 volts (7 and 8 cell type batteries). LiPo battery cells are generally 3.7 Volts per cell.



WHY 'SMART' CHARGERS?

Smart chargers automatically shut off when a battery is detected as full. This prevents damaging your battery cells. Regular wall chargers are not recommended for extended use, as you can never tell when the battery is full or over-charged. Overcharging a battery can cause damage to battery cells and lead to a potential fire hazard. Be smart, be safe, use a Smart Charger.



BATTERY CHARGING COMMON SENSE:

Always charge your battery on non-flammable surface and monitor it as it charges. Never leave a battery charging unattended.

AIRSOFT
FIELD GUIDE

AIRSOFT BATTERIES



LITHIUM POLYMER (LIPO)

The advantage of LiPo batteries is that they feature higher power output, faster response time, and compact size. LiPo batteries allow guns to push their rate of fire (RoF) to the limit. They provide a significant advantage when properly used. Most LiPo batteries are custom made to a very specific form factor, greatly increasing the compatibility with the majority of airsoft guns on the market. Remember though that great power means great responsibility. LiPo batteries require a special charger and should never be fully discharged. LiPo batteries must also be treated with more care than regular NiMH cell batteries. If abused, they can rupture and create a fire hazard. Generally LiPo batteries are recommended for the most experienced players.



CONNECTORS

TAMIYA PLUG
SMALL 7/8" x 3/8"
SOLID WHITE AND
TRANSLUCENT
GREENISH PLASTIC

TAMIYA PLUG
LARGE 1 1/8" x 1/2"
TRANSLUCENT WHITE
PLASTIC

SMALL DEANS
BLACK, BOX-LIKE 1/4"

LARGE DEANS
RED, BOX-LIKE 1/2"

TAMIYA:

The most common types of connectors on the market today are Tamiya Connectors. These have been used as the industry standard due to their wide availability and huge popularity with other hobby industries such as Radio Controlled Cars. There are two sizes; large and small. The advantage of a small-type connector is its smaller form factor, allowing it to be used in tighter spaces such as hand guards and stock tubes. The advantage of a large-type is the larger internal connector posts, providing lower resistance and a little bit better output potential. Tamiya connectors do not come undone easily due to their interlocking design.

DEANS:

Deans connectors are popular with high-end airsoft applications. They provide better conductivity and lower resistance providing the best in efficiency and output. Like Tamiya connectors, Deans connectors come in large and small types with the same benefits. Deans connectors are regarded as a high-end upgrade and are highly recommended due to their wide availability and low cost.



DID YOU KNOW

The higher the voltage, the higher the rate of fire. The higher mAh, the longer the duration of use is per battery.

Most AEG motors are powered by 8.4V and 9.6V batteries, although they can handle up to 12V. The stronger the battery, the faster the trigger response and rate of fire, but this increases the wear and tear on your gun's internals.

Battery voltage and mAh levels do not affect FPS.

SOFT
GUIDE

AIRSOFT MECHANICS: BARRELS, HOP-UP, AND ACCURACY

Airsoft guns operate from a spring or gas source compressing air to propel a BB through an internal barrel. An internal barrel and backspin, or “Hop-up”, system extends the range and enhances round grouping. Since airsoft guns are low power compared to real firearms a Hop-up system is necessary to achieve long projectile range while maintaining a safe muzzle velocity. All internal parts work together to provide speed, accuracy, and consistency. Proper adjustment of your Hop-up can provide optimum range and accuracy.

AIRSOFT FACT:

Did you know that cleaning and lubricating your barrel frequently could improve your accuracy and reduce jamming?

BARRELS

Airsoft guns typically have a smooth, polished “inner” barrel, which provides the physical bore that the BB travels through. The inner barrel is inside of an “outer” barrel that is an external component of the airsoft gun. The outer barrel does not contact the BB, but is used for guiding the inner barrel.

The bore, or tightness, of the inner barrel is a major factor that determines accuracy and round consistency. Standard barrel inner diameter ranges from 6.06mm to 6.10mm. A “tight-bore” barrel is an inner barrel that provides a tighter bore than stock, typically 6.05mm to 6.01mm.

The following chart shows the common lengths of barrels for most airsoft guns; choose a barrel for your gun that is the right size, or choose one slightly shorter. Size does not have to be exact; this chart is approximate. Gas guns, sniper rifles, and AEGs all use different styles of barrels so be sure to purchase the correct type for your gun.

Length	Gun Type
110	MP5K
229	MP5 A Series, MP5 SD Series, AK47 Beta
247	G36C, P90, SIG 552
363	M4 Series, M249 PARA
420	SOCOM-16
455	AK-47, AK-74
469	G3 SG1
509	M16 Series, AUG, M249 MKII
510	M14
590	PSG-1
650	Dragunov SVD

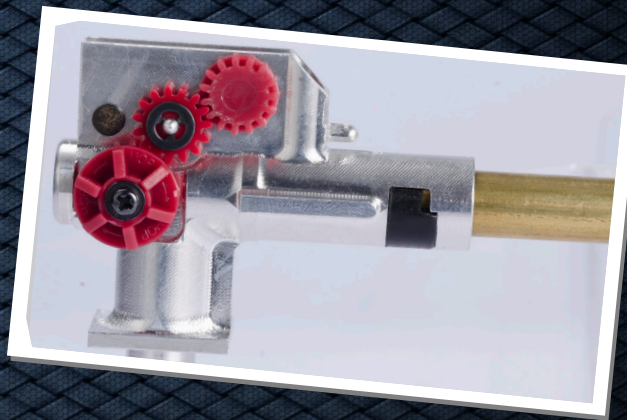
BRASS

STEEL

ALUMINUM

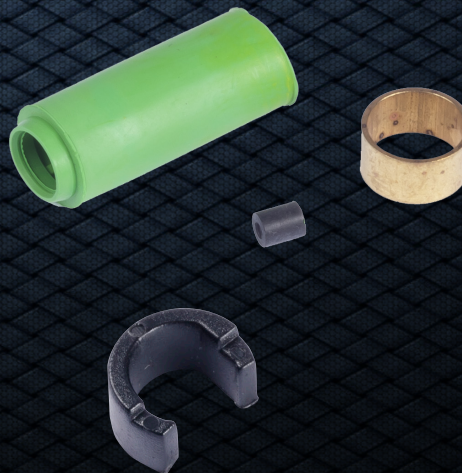
HOP-UP SYSTEM

A “Hop-up” system is an adjustable backspin device that adjusts an airsoft gun’s trajectory. The hop-up works using mechanically induced rotation, causing BBs to fall less over a given distance, increasing range. Most guns use their own hop-up system design, however most parts within the device are interchangeable or upgradeable.



BUCKING

A hop-up bucking is a rubber-type insert that makes physical contact with the BB in the hop-up unit. Buckings are interchangeable with ones made of different material densities that affect BB flight. Termed as ‘hard’ or ‘soft’ buckings, the FPS of the airsoft gun determines what type to use. Typically, soft buckings should be used with guns under 400 FPS and hard types for guns over that. The inner piece that links the internal workings of the hop-up and the bucking is called the “nub”. The hop-up nub is a small circular piece of hard rubber that fits onto the internal adjustment arm and pushes into the bucking, producing an extrusion on the exterior. This small extrusion fits through a carefully designed cutout at the hop-up end of the inner barrel.



BARREL LOCK

The hop-up barrel lock is an essential part to ensure that the bucking and barrel stay in place when in use.



ADJUSTING HOP-UP

Your hop-up test should be performed using the same weight and brand of BB as a constant; using a mix of weights and/or brands during a single test may affect your results. The goal of adjusting your hop-up is attaining the farthest, straightest flight path as possible. Aim at a target and pay attention to the flight of the BB. Experiment by performing separate tests with different weights of BBs to find the best type for you.

AIRSOFT
FIELD GUIDE

AIRSOFT MECHANICS: AEG GEARBOXES & INTERNALS

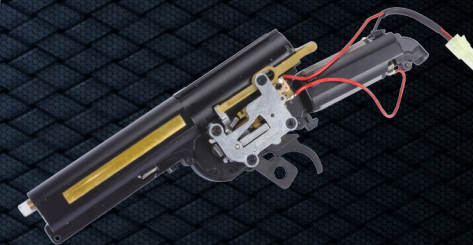


AIRSOFT FACT:

Did you know that the Tokyo Marui FAMAS was the first ever AEG? It was released in 1991.

AEG GEARBOXES

AEGs are airsoft guns that use a mechanical gearbox to turn energy from an electric motor into rapid air pressure to fire BBs. Several springs, gears, and other various parts are involved in this process.

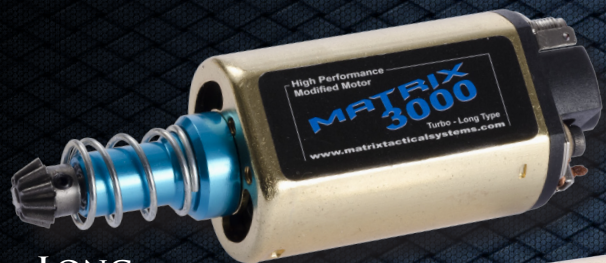


COMMON GEARBOX TYPES

Tokyo Marui released the first AEG in 1991. Since then, they and other companies have designed many new gearbox designs and types for different guns. The following table shows the different gearbox versions that the most popular guns use.



Motor Type	Short	Medium	Long
Gearbox Version	3, 6 and 7 AK Series, AUG, G36 Series,	3 and 4	2
Gun Type	MP5K, MP5PDW, P90, Thompson, M14	Sig Commando, PSG-1	M4 Series, MP5 A and SD Series, G3 Series



LONG



MEDIUM

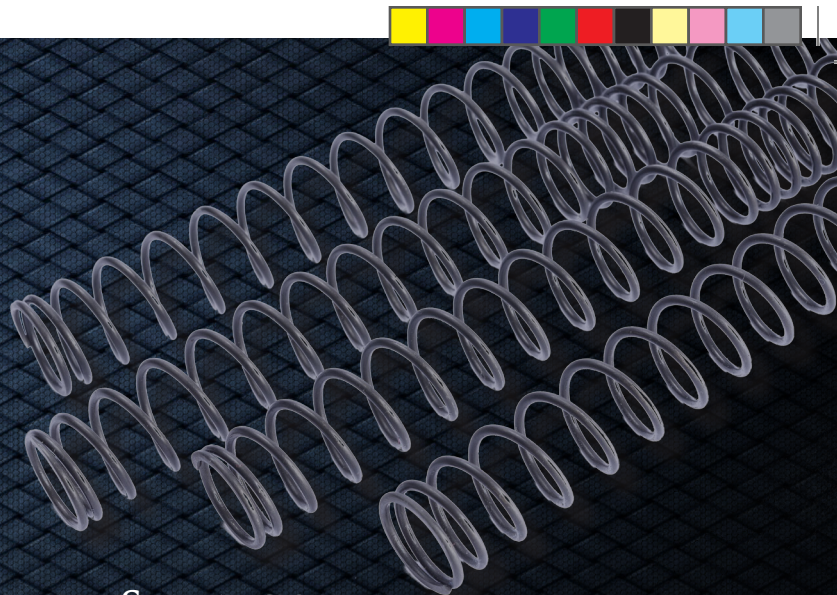


SHORT

MOTORS

Motors are rated by type, torque, and speed. High-speed motors generally are for softer rated springs, where as torque rated motors can be used for almost any setup. A quality motor can withstand years of use without being replaced. In some cases a qualified technician can repair motors if needed.

Motors come in different sizes, or "Types," for various guns and gearboxes.



SPRINGS

Gearbox springs are the primary source of air power for the AEG. They come in different ratings to alter the FPS that the gun will shoot. Spring rating scales vary by manufacturer. Because other factors can affect the FPS of a gun, spring ratings are only approximate and do not guarantee the final velocity.

SPRING PITCH

Springs are made with regular or irregular pitch. Irregular springs help reduce the stress on the piston and other parts as the gearbox cycles. Spring pitch does not affect FPS ratings. When installing an irregular spring, the compressed coils should be installed toward the spring guide.

AIRSOFT

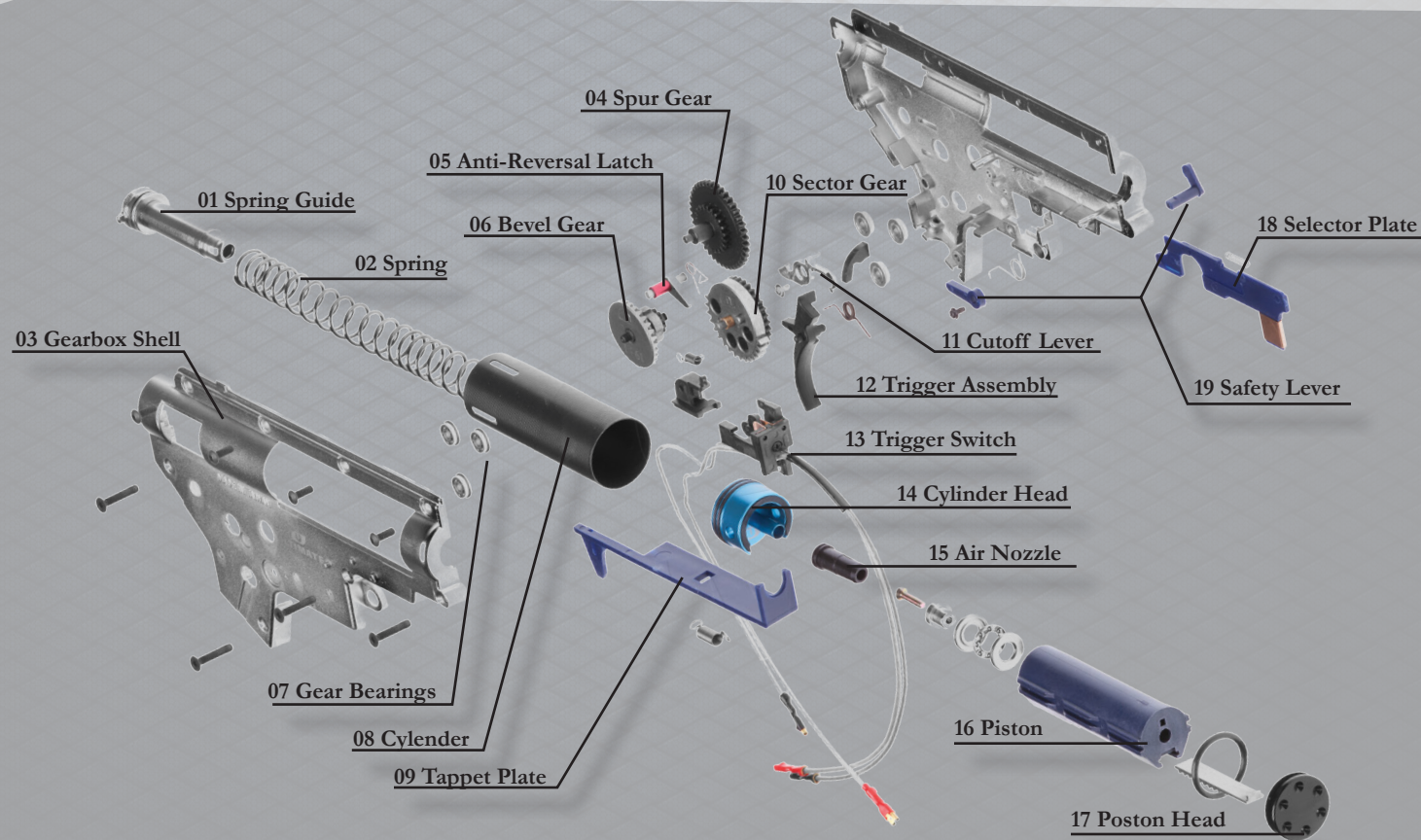
FIELD GUIDE

AIRSOFT MECHANICS: AEG GEARBOXES & INTERNALS

- | | |
|------------------------|---------------------|
| 01 Spring Guide | 11 Cutoff Lever |
| 02 Spring | 12 Trigger Assembly |
| 03 Gearbox Shell | 13 Trigger Switch |
| 04 Spur Gear | 14 Cylinder Head |
| 05 Anti-Reversal Latch | 15 Air Nozzle |
| 06 Bevel Gear | 16 Piston |
| 07 Gear Bearings | 17 Poston Head |
| 08 Cylender | 18 Selector Plate |
| 09 Tappet Plate | 19 Safety Lever |
| 10 Sector Gear | |

AIRSOFT FACT:

Did you know that properly
shimming your gearbox can
not only increase efficiency
improve longevity?



AIRSOFT

FIELD GUIDE

AIRSOFT MECHANICS: AEG GEARBOXES & INTERNALS

OPERATION

The gearbox begins operation with a pull of the trigger. A circuit is made and the motor turns. The motor turns several gears to a half-tooth gear called a sector gear, which pulls back a spring-loaded piston. The piston releases and forces air to the hop-up chamber. On average, this process happens around 15 times per second.



AIRSOFT FACT:

Did you know airsoft began in Japan in the late 1970's? Most guns, at the time (now called Classic Airsoft guns), were gas operated from an external gas rig that each player carried on them.



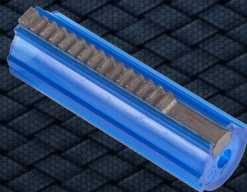
GEARS

The most common gearboxes use 3 different gears: Bevel, Spur, and Sector gears. The motor also features a built in gear known as a Pinion gear. Several types of gear sets exist for almost any application. High-torque sets offer a slower rate of fire, but more overall durability for guns with stronger springs and higher muzzle velocity. High-speed setups offer a steeper gear ratio for a higher rate of fire, ideal for guns with 350 FPS or lower.



PISTON

The piston is driven back by the sector gear, pressing against the main spring until it is released, where it slams forward into the cylinder head. The piston's main functions are to compress the spring and guide the piston head through the cylinder throughout the gear cycle. Pistons are a part that must be replaced as part of a gun's tune-up, as they wear out with use.



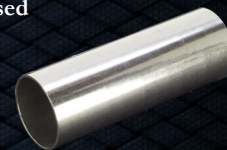
PISTON HEAD

The piston head seals the air inside the cylinder as the piston drives it forward. There are many different types of piston heads but the most common are aluminum and polycarbonate. Aluminum piston heads are generally more durable while polycarbonate versions are quieter and cause less internal wear. Some piston heads have ball bearings on the backsides of them to allow the spring to spin freely, reducing friction.



CYLINDER

The cylinder holds all the air that is compressed by the piston head. Most gearboxes use a standard length cylinder although longer cylinders are necessary for extremely long barrels, as is the case with the Tokyo Marui PSG-1. Cylinders may also have ports on them—this increases fire rate by reducing drag from the intake cycle of the piston pulling back, but may reduce muzzle velocity. Ported cylinders are ideal for high-speed setups.



CYLINDER HEAD

The cylinder head helps to seal the air compressed in the cylinder and also provides a pathway for air to escape. The cylinder head directs the air to and provides the point of travel for the air nozzle.



TAPPET PLATE

The tappet plate is attached to the air nozzle. When the gun is fired, the sector gear pulls back the tappet plate, which moves the air nozzle and allows a BB to feed into the hop-up. The plate is plastic and is designed to break in a severe jam. This breaking point feature is meant as a failsafe to prevent more expensive parts from being destroyed.

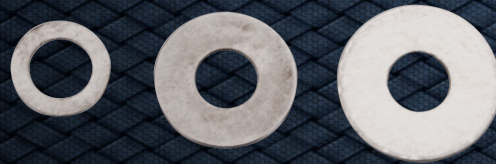


AIRSOFT
FIELD GUIDE

AIRSOFT MECHANICS: AEG GEARBOXES & INTERNALS

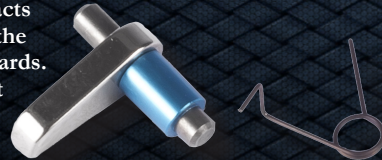
SHIMS

Shims are small, precision metal washers that adjust the spacing between the gears. Shimming is one of the most important factors of gearbox operation, because they can cause extensive damage or bind within the gearbox if done improperly. Only qualified technicians should attempt to shim a gearbox.



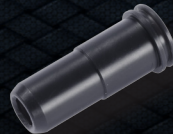
ANTI-REVERSAL LATCH

The anti-reversal latch contacts the bevel gear and prevents the gearbox from cycling backwards. This is a vital part to prevent motor damage.



AIR NOZZLE

The air nozzle is the point at which the air escapes from the cylinder. Air nozzles work in conjunction with the tappet plate to chamber BBs and travel along the output shaft of the cylinder head. Air nozzles can control the amount of air released from the cylinder and have the potential to control the overall muzzle velocity of the gun. It is a good idea to use a sealed air nozzle with an o-ring to prevent air from leaking.



GEARBOX SHELL

The majority of modern airsoft guns use gearbox shells made from solid metal. Standard metal gearbox shells are able to withstand springs around the M120 range. Upgraded reinforced gearbox shells exist to withstand higher spring ratings and fire rates. The materials used range from zinc-alloy to CNC machined solid aluminum and can greatly affect the capability of the gearbox shell.



SELECTOR PLATE

The selector plate is the linking point from the external selector switch on the gun, and the internal parts controlling semi and full auto fire modes. When set to safe the selector plate engages the safety lever. When set to semi-auto the selector plate engages the cutoff lever. When the selector plate is set to full-auto the plate disengages all forms of cutoffs, allowing continuous gear cycling. Some selector plates feature metal tabs that act as a secondary safety.

SPRING GUIDE

The spring guide prevents the spring from bunching up when being compressed. Bearing spring guides allow the spring to turn on its own when the piston pulls back, further reducing issues caused by spring compression.



CUTOFF LEVER

The sector gear contacts the cutoff lever, which dictates when to stop the gear cycle for the semi-auto firing mode. Cutoff levers are metal, but may need to be replaced on the gun's tune-up depending on how the gun is used.



SAFETY LEVER

The safety lever interrupts the pathway of the trigger preventing the wiring circuit from being connected. They are generally made from plastic to avoid conducting current.



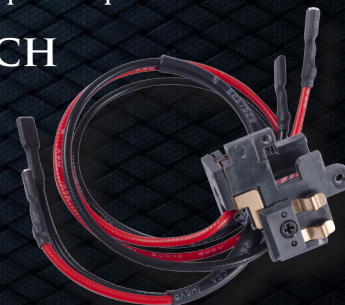
BUSHINGS

Bushings and bearings hold the gears in alignment within the gearbox. Standard bushings are 6mm, with reinforced and upgraded gearboxes housing bushings up to 9mm in size. Solid bushings are sought after for their rigidity. Alternatives to solid bushings are bearings. Bearings provide the same support as solid bushings but provide even smoother action to further reduce friction. Generally either can be used for most applications while bushings tend to have more popularity with extremely powerful builds, and bearings with high-speed setups.



TRIGGER SWITCH

When the trigger is pulled, a switch is engaged and completes the circuit between the battery and the motor. This combined with the cut-off lever and the selector plate control whether the gun will fire semi or full auto.



ADVANCED PARTS | HELICAL GEARS

Helical gear sets are gears with an angular cut. This increases the surface area of the gear teeth, allowing you to use higher-powered springs. Many times, you will have to use a special half-toothed piston. Helical gear sets are generally quieter when cycling. Helical sets are not recommended for high-speed setups.



BORE-UP SET

Bore-up sets are comprised of a larger-than-standard inner diameter cylinder, a larger outer diameter cylinder head, larger diameter piston head, and special air nozzle. The idea behind Bore-up is to bring in more air to accommodate longer inner barrels with the end goal being a higher muzzle velocity. Generally it is best to use with a minimum inner barrel length of 500mm or longer.

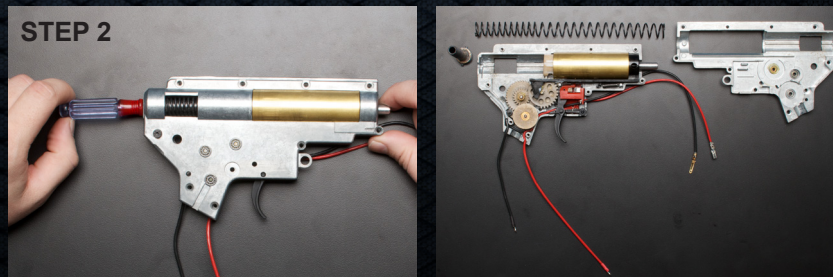
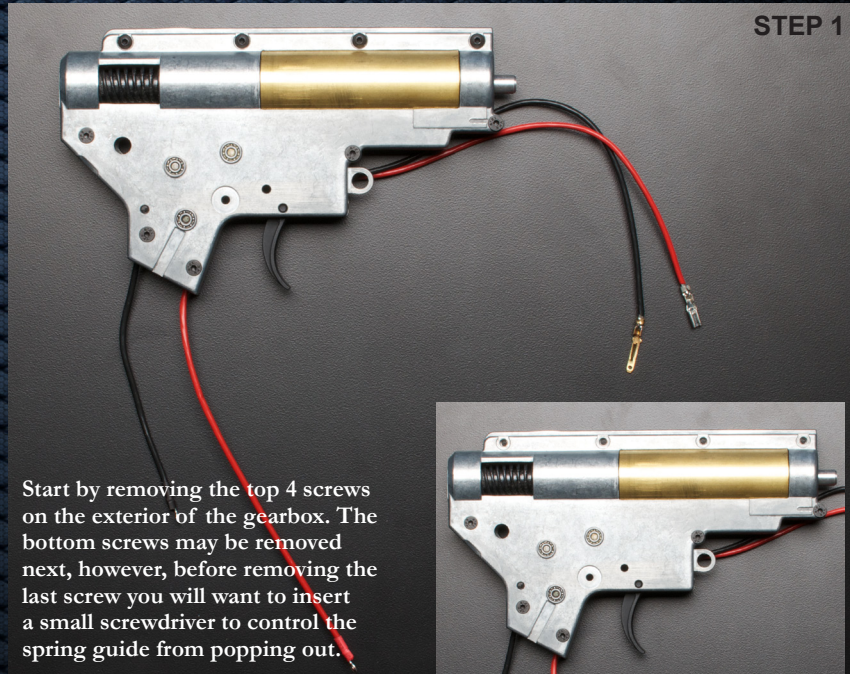


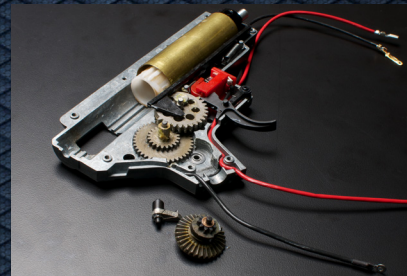
AIRSOFT FIELD GUIDE

AIRSOFT VERSION 2 GEAR BOX BREAKDOWN

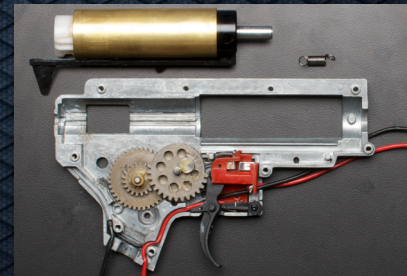
The following is a guide for the disassembly of a standard Version 2 gearbox. This guide assumes that you are using a standard, non-blowback Version 2 AEG Gearbox. Please refer to our AEG internal parts section for part identification and information.

While keeping tension on the spring guide, carefully break the two halves of the gearbox apart. This can be done by lightly moving the screwdriver up and down to break the seal. Use caution during this step as the spring tension will want to force the screwdriver out of your hands.

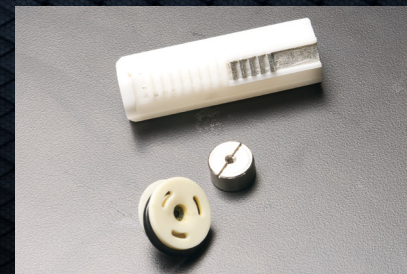




With the 2 halves of the gearbox separated, remove the bevel gear and anti-reversal latch.



With the bevel gear and anti-reversal latch out of the way, you can now remove the tappet plate and cylinder unit. To do this start by carefully removing the tappet plate spring, as illustrated in the picture. When the spring has been removed you can now simply lift and remove the cylinder unit.



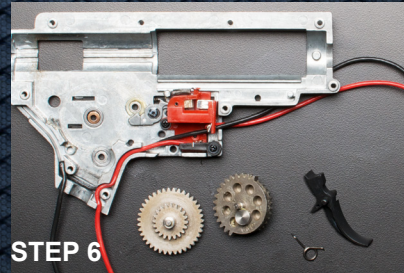
To fully disassemble the cylinder unit, simply remove the tappet plate and air nozzle, push out the cylinder head, and pull out the piston. The piston head may be removed by loosening the locating screw and internal piston head nut. Piston and piston head assembly may vary slightly depending on the manufacturer.

AIRSOFT

FIELD GUIDE

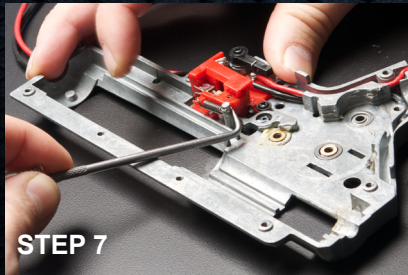


AIRSOFT VERSION 2 GEAR BOX BREAKDOWN



STEP 6

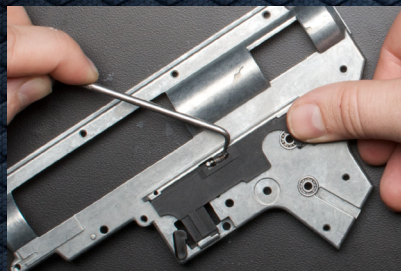
Now that the cylinder unit is out of the way, the remaining sector gear, spur gear, and trigger can be lifted out for removal. Be careful of any shims that may be removed when lifting out the gears. Shims are an essential part for a smooth functioning gearbox.



STEP 7

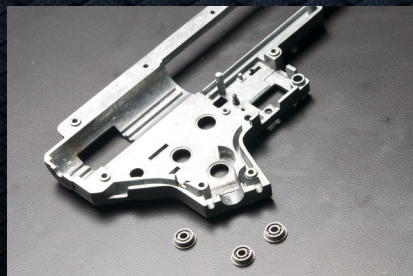
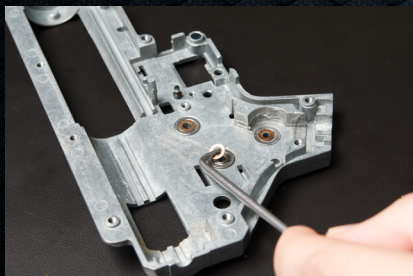
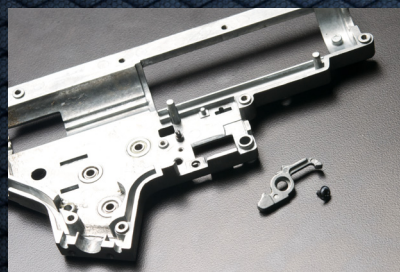
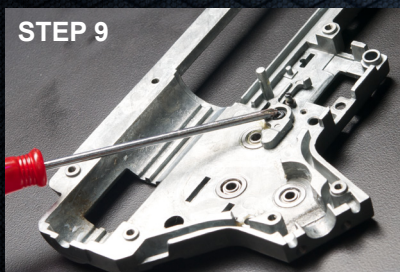
The next step is to remove the trigger contact spring. A good method is to carefully pull up on the spring loop with a small, angled pick as illustrated in the picture. After removing the spring, loosen the small Phillips head screw that secures the trigger contact to the gearbox housing. Once this small screw has been removed, the entire trigger contact and wiring may be removed.

STEP 8



From here you will have full access to the selector plate and associated parts. Remove the yaw control arm by loosening the attachment screw. Carefully remove the selector plate spring. Once the spring has been removed, all parts can be pulled away from the gearbox and the selector plate can be removed by sliding it out of the gearbox shell.

STEP 9



The last step is to remove the cutoff lever by loosening the attachment screw. This leaves only the bushings/bearings. Once again, be sure to keep track of any shims that may still be in place. Bushings/bearings simply pop out of the gearbox shell though you may need to give them a light tap.

This concludes the complete disassembly of the standard Version 2 AEG Gearbox. Assembly is the exact reverse of disassembly.

AIRSOFT SPRING AND GAS GUN INTERNALS



AIRSOFT FACT:

Did you know that proper lubricating can resolve 90% of issues experienced with your gas gun?

SPRING GUN INTERNALS

Spring guns use a piston and sear system. When cocked, the piston will compress the gun's main spring. While compressed, a sear (catch) will hold the piston in place until the trigger is pulled. Once pulled, the piston releases and pushes air toward the BB to fire it from the gun.



GAS GUN INTERNALS

Gas guns use a network of valves and springs to fire. The gun will load a BB into its chamber when the slide, bolt, or trigger is pulled back. Simultaneously, the hammer will cock back and the gun is ready to fire.

When the trigger is pulled, the hammer releases a set amount of gas from the magazine. From here, gas will travel through the air nozzle and into the chamber to fire the round.

On a common gas blowback gun, the excess gas will force the slide or bolt back and load the next round into the chamber. This is what creates the blowback action of the gun and simulates recoil.

PLAYER TIP:

Store all gas magazines and grenades with a small amount of gas to ensure the seals stay properly lubricated. Make sure to keep them completely unloaded for safety purposes.



ADVANCED PARTS

HIGH-FLOW VALVES

High flow valves are aftermarket magazine valves that allow more gas to flow to the chamber on each shot. High flow valves can increase your FPS and recoil (on a blowback gun), but they will make your gun less efficient and consume more gas.

ENHANCED HAMMER SPRINGS

Enhanced hammer springs depress the magazine valve further and for a longer duration, allowing more gas to release per shot. This can improve shot consistency on an upgraded gun, as gas is released for a longer period throughout the blowback cycle. Stiffer hammer springs also increase gas consumption.

ENHANCED RECOIL SPRINGS

Upgraded recoil springs stiffen up a gas blowback's bolt or slide, creating harder recoil felt per shot. They do not increase gun performance and are primarily used for simulated realism. Stiffer recoil springs increase gas consumption.

AIRSOFT
FIELD GUIDE

AIRSOFT GAS

While popular airsoft rifles are typically electric or spring operated, most high-end handguns operate with gas or CO2 due to the limited amount of frame space available for a full size gearbox or spring bolt.

GAS TYPES

Original airsoft guns ran off of CFC11 gas, which had a relatively low pressure. This was replaced with 134A gas, which is the lowest power gas on the airsoft market. The most common gas type found in today's airsoft gas guns is Green Gas (LPG), or compressed propane. With the same properties as Green Gas, Red Gas (HCFC22) is a higher-pressure version. The highest-pressure gas available for airsoft guns today is compressed CO2.



PROPANE ADAPTERS

Commercial Green Gas is liquid propane with a silicone oil additive. The oil lubricates the gun during use—this is vital to proper operation. Propane adapters screw onto commercial camping propane containers and can be used to fill your airsoft gun. Included with the adapter are lubrication instructions, as you need to add your own oil.



FILL UPSIDE-DOWN

When you charge an airsoft gun's magazine with gas, always hold the container upside down and fill the magazine when it is out of the gun. Charge until you no longer hear the pressure equalizing, or hold for 5 seconds. The compressed gas is in liquid form and works best when you fill it upside-down.



AIRSOFT
FIELD GUIDE



WARM UP YOUR MAGAZINE: THE COOL DOWN EFFECT

Gas expansion and compression is related to temperature. During cold weather or after the rapid firing of a gas gun, the magazine will feel cold. It is recommended that you have spare magazines when you need to quickly fire your gas pistol or rifle. O-rings and seals will become brittle when cold leading to gas decompression slowing in low temperatures, resulting in lower FPS.

AIRSOFT TIP:

Most Japanese pistols appear to 'spill' gas around the fill nozzle while filling. This is actually deliberate, as the gun allows only the right amount of gas inside, to avoid overfilling and breaking any seals. Japanese guns are less likely to leak because of this. There are kits to replace the override valve.

AIRSOFT GRENADES, MINES & ROCKETS

Various types of grenades, rockets, and mines amplify game play; airsoft is the only simulation that keeps it as realistic as possible.



AIRSOFT FACT:

Never point a grenade shell toward your face or toward any people when filling with gas or when loaded. They can accidentally discharge at anytime.

TYPES OF GRENADES

In airsoft, hand grenades, launched grenades, and anti-personnel devices enhance game play and provide a unique experience on the battlefield. All airsoft grenades and devices are designed with safety in mind and do not emit harmful shrapnel or concussion, however some do explode to make noise. Most grenades use Green Gas or CO2 for power.

BB hand grenades either swirl and spray, or pop open, to emit a shower of BBs. Most grenades of this type can be reused.

40mm shell grenades fit into a grenade launcher and either spray a shower of up to 200 BBs or emit gas to shoot a foam or rubber projectile out of the launcher. Airsoft grenade shells do not physically shoot out of the launcher.

Sound grenades do not shoot any BBs, but emit a loud noise. Typical game rules state that if you're in the same room or within 15 feet of a grenade, you're 'hit'. They do not emit any shrapnel, but the outer shell must be replaced with a new one after each use.



GRENADE SHELLS

40mm airsoft grenade shells come in a wide variety of shapes and size. They are designed to either fire a shower of up to 200 BBs, or expel gas to fire a rubber or foam projectile such as a foam rocket, or rubber cap. High-end 40mm shells can handle high-pressure red gas and CO2.



MAINTENANCE

Shell grenades must be 'reset' by pressing the pin fully and firmly into the grenade.

Grenades and mines require very little maintenance. Proper lubrication will keep them working for a lifetime. Never open a grenade as they contain many little parts that are easily lost. Always store grenades and mines empty of gas and BBs.



GRENADE LAUNCHERS

Below are just a few of the many Airsoft 40mm Grenade Launchers available today.



AIRSOFT
FIELD GUIDE

AIRSOFT GRENADES, MINES & ROCKETS

ANTI-PERSONNEL MINES

Anti-personnel mines emit either a cloud of powder that marks the player's leg or a shower of BBs when triggered. Some mines can be stepped on, tripped with a wire, or remotely triggered. Some mines use gas to propel BBs or powder and others use a spring-loaded bay.



PLAYER TIP:

There may be a photographer or videographer at your event. If you see someone dressed in bright orange with a camera, chances are you shouldn't shoot them.

HAND GRENADES

Hand grenades come in three varieties: BB emitting, and sound emitting, and dummy grenades. Depending on the design BB hand grenades can spray, swirl, or pop open and emit a shower of BBs on surrounding players. These types of hand grenades are generally reusable and run off of Green Gas as a power source. These provide a great effect in close quarter situations.

Sound emitting hand grenades can be either CO2 powered or electronic. CO2 powered hand grenades feature a one-time use outer shell and an inner core. The CO2 is expelled into the airtight plastic outer shell, causing the shell to expand until it explodes. This explosion creates a loud, sharp burst of sound. The shells are made from very thin walled plastic and pose no threat of injury when properly used with eye protection.

Electronic sound emitting grenades give out a loud siren or burst of sound. These are less common than CO2 powered hand grenades and may or may not be legal in gameplay. Always check with the game authority to ensure you are using the right equipment.

The last variety, dummy grenades, are the most basic version of Airsoft hand grenades. These can be a rubber grenade made to look like the real counterpart, or even a tennis ball, depending on the rules of the game. Dummy grenades emit no sound, no explosion, and no BBs. They have zero upkeep but are also less effective, as it is hard to identify where and when they fall into your area of play. Generally these types of grenades are best for decoration use.

ROCKET LAUNCHERS

Most rocket launchers shoot a cloud of BBs or propel a foam rocket. Launchers do not emit any recoil and are typically powered by CO2.



AIRSOFT
FIELD GUIDE

AIRSOFT

GAME SCENARIOS

Last Man Standing

All against all in a game often with limited time and area.

Team Deathmatch

Two teams that fight against each other until time has run out or one team has been eliminated.



Capture the Flag

Two teams play against each other and try to take the other team's flag back to their on base. The flag has to be carried clearly visible. This game can be played in two variants, "Live Flag" or "Dead Flag". In "Live Flag" the flag is dropped if the Flag carrier is shot, and another player can pick the flag up. In "Dead Flag" the flag carrier has to return the flag to the enemy's base if the flag carrier gets eliminated, before the flag can be taken again.

Claim the Flag

This is similar to "Capture the Flag", but involves more than two teams. In this game there are two or more bases, but only one flag and that flag is placed in the middle of the field between them. A team begins in each base. The goal of this game is to take the flag to your own base. When the flag reaches your base, the other teams lose. If the flag carrier is eliminated, anyone can pick up the flag where it drops.



Demolition

Teams have their own bases. In the middle of the field is a bomb. The bomb must be escorted to the enemy base where it is planted and detonates within a certain amount of time. The bomb is dropped if the carrier is killed. Depending on the scenario, the carrier may not be able to shoot while carrying the bomb.

Grab the Flag

Two or more teams try to be the first to reach the flag. The team that has the first player to reach the flag alive wins. This game should be played in fairly open terrain.

Traitors

Game control discreetly chooses one player from each team that is a "traitor". The game is played like Capture the Flag, but after the game has lasted for 5 minutes (or another set amount of time) the traitors can change teams anytime they choose. Don't trust your teammates.

Manhunt (Downed Pilot)

A volunteer player is the target and the rest of the players are the hunters. The target is given a pistol and the hunters can use any weapons they'd like. The hunters should be between 4 and 10. The target wins if he can reach a specific place within the time limit. The hunters win if the target is eliminated. The hunters can't shoot each other.

AIRSOFT

FIELD GUIDE

AIRSOFT GAME SCENARIOS



Bounty Hunters

The game begins as a free-for-all—all players engage each other. When a player eliminates another, the shooter must go to the eliminated player and make physical contact (such as a shoulder grab). The eliminated player is back in the game but is now fighting for the person who tagged them. Last standing team wins.

Prison Break

A small team, about 20% or so of the total amount of players, are prisoners and must travel through an area that is guarded by the remaining players. The prisoners can't have any heavy or support weapons. The guards can use any weapons they choose. Each prisoner that reaches the goal is considered a winner. Time limit is between 30 minutes to several hours.





Commando (Paratroopers)

A small group is chosen as the commandos. The rest of the players are evenly divided to guard objectives. The defenders begin at their objectives; the commandos are taken to a small zone outside the game area, which is their insertion and extraction point. The commandos must attack the guards and retrieve the objectives, bringing them back to their extraction zone. The guards can barricade themselves and send out patrols, but the objectives can never be unguarded.

Hostage Rescue

There are three total teams. The smallest team is “Hostages”, the next largest team is “Rescue”, and the largest team is “Guards”. The hostages are unarmed and separated into different locations. The rescue team may arm the hostages. The guards cannot kill the hostages unless they attempt to flee. To win, the rescue team must rescue at least half the hostages within the time limit.

SWAT Terrorist Elimination

Classic. A well-armed SWAT Team, which is about a quarter of the players, must clear an area of terrorists, which are not as well armed. Buildings are preferred for this type of game.

Kill House

A player or a small team shall clear a house that has been rigged by the organizers in the shortest time possible. Each room must be clear of targets but no friendly targets can be hit. The goal is to clear the house in the least amount of time.



AIRSOFT

FIELD GUIDE



AIRSOFT GAME SCENARIOS

VIP Escort (Assassins)

There is an assassin, or a very small team of them, that must kill a target, or VIP. The VIP must be extracted to a certain point within the time limit. A team must protect the VIP, but cannot stray too far away from him. If the VIP is eliminated, the assassins win.



Commander Elimination

There are two teams, each team has a commander. Each team must try and kill the opposing team's commander. Alternatives



for this game include making the commanders immobile, or restricting ammo for the game.



King of the Hill

About a third of the players must barricade themselves on a hill or relatively open area. The rest of the players must attack the team on the hill. On the top of the hill is a flag, and the team that is closest to the flag when the time is out wins. The game is best played when the “hill” offers quite a bit of cover on its slopes.

Zombies

A team deathmatch game, but all eliminated players go to a third start point. When three eliminated players have reached that point, they form a zombie team and can play again. They must wear something on them to indicate they are a zombie team. The zombie teams fight against all other teams, including other zombie teams. The game ends when there is only one player left from anyone of the original teams.

Drag the Doll

A doll (stuffed and man-sized, weighing a considerable amount) is in the middle of a battlefield. The field should be open and flat, but with lots of small cover. Two teams fight to grab the doll and drag it to their side. This game is intensive and fast—basically a Capture the Flag game in a smaller arena with a heavy target.

CQB (Close Quarters Battle)

Indoors version of many scenarios, often played in a big house, warehouse, or in several close buildings.

Pistols Only

A game where only pistols are allowed. Ammo can be limited. This can be applied to almost any scenario.

AIRSOFT

FIELD GUIDE

