

BKO



Indian Creek Design Bushmaster Series

1019 First St. North Nampa ID 83687

www.icdpaintball.com

WARNING: This is not a toy. Misuse may cause serious injury or death. Eye protection designed specifically for paintball must be worn by the user and persons within range. Recommend 18 years of age or older to purchase. Persons under 18 years of age must have adult supervision. READ OWNER'S MANUAL BEFORE USING.

US Pat. Nos: U.S. Patent No. 5,881,707; 5,967,133; 6,035,843;6,474,326,B1 & 6,637,421 B2 and Pat. Pend.



INSTRUCTION MANUAL
Version 1.5
BushMaster Series
Model BKO

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BKO OVERVIEW

The BKO is a high quality paintball marker specially designed to meet the needs of the professional style tournament player. The BKO is an electronic solenoid actuated computer controlled marker. The major components of the BKO are machined from solid, aircraft-grade aluminum, and then hard anodized per military specifications. Only the highest quality materials are used in the construction of the BKO, thereby providing the end user with a high-quality, precision-engineered marker.

Paintball markers get a lot of abuse. The BKO is built with this in mind. All internal parts, wear and contact surfaces have been heat treated or hard anodized. The toughest and most resilient materials and components have been used in the design of this marker.

The BKO uses a single standard 9-volt battery for operation. The circuitry is a microprocessor based digital controller.

The BKO does not require tools to field-strip. Removing the field-strip link-pin of the bolt enables the removal of the entire bolt assembly.

The BKO offers low-pressure operation. The main operating pressure is 200-300 PSI which is set by watching the gauge on the primary (input) regulator while making adjustments. The secondary pressure is factory pre-set and regulated to 85-95 PSI. Gas usage is controlled through these 2 internal regulators. One unique feature of this marker is the regulator adjustment. This allows precise adjustment for the velocity control of the marker and for gas efficiency.

The BKO comes with a removable barrel. This feature allows the user to select a barrel that is most suitable for the playing conditions. All barrels are mirror-honed with a step-bore and porting and stock length is 11".



OPERATION

Read the entire manual before you prepare your BKO for firing. Safety and safe marker handling are the most important aspects of paintball sports. Please practice each of the following steps with an unloaded marker before attempting to charge your marker with compressed air and paintballs. **Do not load compressed air and paintballs into your BKO until you feel completely confident with your ability to handle your BKO safely.**

Keep your finger out of the trigger guard and away from the trigger; point the muzzle of the marker in a safe direction at all times. Keep the marker turned off until ready to operate. The BKO has an electronic disabling device instead of a mechanical safety. **Always keep your BKO pointed in a safe direction. Always use a barrel blocking device.**

Installing the 9-volt Power Source

The BKO requires a single 9-volt battery as the electronic power source. The use of alkaline batteries is recommended.

The 9-volt battery is located inside the 45 grip frame beneath the left side panel. The battery is accessed through the two screws that hold the left side panel in place.

Remove the 2 screws that hold left side panel in place. Connect the battery to the terminal and place the battery inside the grip frame carefully, being sure that the black and red wires to the terminal are not stressed. Make sure that there are no abrupt kinks and the wires are comfortably placed, do not force them into place. Replace the side panel and 2 screws.



CO2, Nitrogen or Compressed Air Usage

The BKO comes with a macroline male quick-disconnect adapter on the bottom of the regulator. The BKO can be set up to use a nitrogen or compressed air system. Although it may be used, CO2 is not recommended for use as the propellant.

Adjustable regulator compressed air systems:

The input pressure from your compressed air system should be regulated down to 350-500 PSI output pressure. Note: on MOST systems, there is a large difference between the setting pressure and the actual output operating pressure. If your compressed air system does not have an output pressure gauge on its regulator, we do not recommend its use.

Fixed output regulated compressed air systems:

Fixed output regulated tanks (preset) will work just fine with the BKO, however it will not perform as well as an adjustable regulated tank. VERIFY the output pressure from the regulator. If your compressed air system does not have an output pressure gauge on its regulator, we do not recommend its use.

CO2 usage:

Although it may be used, CO2 is not recommended for use as the propellant. Generally the CO2 that is most commonly used in the paintball industry is industrial grade. It is dirty, pumped from large tanks full of contaminants including rust, metal flakes and dirt. CO2 can be used successfully if used with anti-siphon systems and filters. Be aware that the use of CO2 may result in less than optimal performance.

REMEMBER: CO2, compressed air or nitrogen systems can be dangerous if misused or improperly handled. Use only properly certified cylinders.

Before pressurizing your BKO, check to make sure that you have a barrel blocking device in place and there are no paintballs in the marker. The on-off switch should be OFF. Air can now be applied, the marker will become pressurized and the gauge on the regulator system adapter will show the air pressure regulated thru the input regulator.



Paintball and Loader Usage

The BKO comes equipped to accept 1.03" OD standard-gravity feed loaders. Fit the loader directly into the vertical feed tube. Always twist it down in a CLOCKWISE direction. Always twist it off in a CLOCKWISE direction as well. The BKO uses .68 caliber, water-soluble paintballs. The paintballs are gravity fed from the loader through the direct vertical feed nipple and into the breech of the marker.

Firing the BKO

Keep your finger out of the trigger guard and away from the trigger; point the muzzle of your marker in a safe direction at all times during this process. Be sure your goggles are securely in place. Push the on-off switch into the off position.

Always keep your BKO pointed in a safe direction!

1. Place the empty loader onto the marker. Be sure that it is securely mounted in place.
2. Apply the compressed gas, pressurizing the marker.
3. Put the paintballs into the loader.
4. Remove the barrel blocking device.
5. Aim the marker at the target.
6. Push the on-off switch to the ON position, the LED will light up.
7. Place your finger on the trigger.
8. Pull the trigger with a smooth squeezing motion. **BANG. . . .**



Unloading the BKO

Keep your finger out of the trigger guard and away from the trigger; point the muzzle of your marker in a safe direction during this entire process. **Always keep your BKO pointed in a safe direction!**

1. Install the barrel blocking device
2. Push the on-off switch to the off position. The LED will be off.
3. Remove the pressurized gas from the marker carefully.
4. Tilt the marker so that the loader is upside down and beneath the body of the marker.
5. Remove the paintball loader from the direct vertical-feed tube, turning the loader in a clockwise direction.
6. Inspect the inside of the direct vertical-feed tube to be sure that a ball does not remain inside the breech.

Maintenance

CAUTION: Before attempting to perform any maintenance operations or any marker disassembly, make sure that all paintballs and the propellant source have been removed from the marker. Install the barrel blocking device, push the on-off switch to the OFF position and keep the marker in its "SAFE" mode.



Simple Maintenance

Keep your BKO clean and lubricated to eliminate the friction that would prevent reliable operation. Clean and lube the marker before each use, and do not put it away dirty. **USE NO OILS!** Do **not** use petroleum-based lubricants in the lubrication of this marker. Do not use oils “made for paintball markers”. Do **not** use oils “made for pneumatic tools”. Teflon or silicone spray lubricants are the recommended types of lubrication for the bolt area of the main housing. **Lithium grease** is recommended for lubricating the regulator pistons and the cylinder assembly. Be sure it is **Lithium Grease**, not axle grease.

Cleaning Paint from the Barrel

Unscrew the barrel with approximately to remove the barrel for swabbing/cleaning. Keep the barrel clean to insure the continued accuracy of the **BKO**. Gelatin from the paintballs has a tendency to build up in the barrel. As part of your cleaning routine, wash out the barrel with hot soapy water and rinse it well.



Removing the Bolt Assembly (Field Stripping)

The marker can be field stripped while it is pressurized but this is not recommended.

1. Install the barrel blocking device.
2. Push the on-off switch to the off position. The LED will be off.
3. Remove the pressurized gas from the marker carefully.
4. Remove (pull) the knurled pin from the top of the marker. Pull the bolt body out the back of the main body.

Once the bolt assembly is removed, it is possible to clean the entire upper receiver of the marker, including the breech and feed tube area. You may slightly lubricate the rear section of the bolt and bolt chamber with a light synthetic spray lubricant before re-installing the bolt. Do not use petroleum/oil-based lubricants; do use Teflon or silicone-based lubricants. The bolt is **NOT** a simple plastic; it is a natural Delrin acetate material, which is a Dupont 3M material, developed specifically for this type of application. The use of a metal type of bolt will void all warranties.

1. Point the barrel downward and slide the bolt in until the link pin hole lines up with the slot in the hammer
2. Carefully install the link pin.

Note: You must be sure that the link pin is engaged **PROPERLY** with the hammer, if the link pin **IS NOT PROPERLY** replaced, you may damage the hammer/cylinder assembly.

Remember damage caused by operator error is not covered by warranty!



STORAGE AND TRANSPORTATION

- Your BKO must be clear of all paintballs and propellant when not being used.
- Be sure the on-off switch is off and the LED is not lighted.
- Put the barrel blocking device in place.
- Make sure the marker is clean.
- Store your BKO in a secure, clean, cool and dry place.
- Keep your BKO away from any unauthorized users.

Your BKO must be clear of all paint and any source of propellant during transportation to and from the playing field. Keep your barrel blocking device in place. Keep the on-off switch in the off position. Protect your BKO from excessive heat during transportation. Observe and obey all local, state and federal laws concerning the transportation of paintball markers. For information concerning any of the laws in your area, contact your nearby friendly law enforcement agency.

IMPORTANT: Never carry your BKO uncased when not on a playing field. The non-playing public and law enforcement personnel may not be able to distinguish between a paintball marker and a firearm. For your own safety and to protect the image of the sport, always carry your BKO in a suitable marker case or in the box in which it was shipped.

If you must ship your BKO for any reason, the box in which you purchased the marker is acceptable to all major carriers. Never ship charged CO2 or pressurized gas containers.



ADJUSTING THE TRIGGER PULL

You will notice two screws in your trigger. These screws adjust the length of pull and actuation point of the trigger. The bottom screw adjusts your trigger stop point (length of pull). The top screw is the contact point for your micro switch.

1. Use *blue loctite* while adjusting the screws. Normal activity can cause the screws to back out of adjustment. **DO NOT** glob the loctite on, it can cause damage to the micro switch if you use too much.
2. Begin by adjusting the bottom screw to your desired pull. Screw it in to lessen the distance the trigger must travel.
3. **Very Carefully** screw in the top screw. Making large adjustments can force the screw into the micro switch and damage it. You will want to screw it in to the point where it makes contact with the micro switch but does not permanently rest on it. Continually check to verify that the LED flashes off and then back on when you pull the trigger. If you pull the trigger and the **LED** goes off and stays *off*, you have adjusted the screw in too far. Back it out.
4. Clean up any excess loctite and let it dry for at least an hour before using your BKO. This ensures the screws will remain in place.



BKO TUNING GUIDE

Main Input pressure regulator adjustment:

The *BKO* operates on a proven and innovative system. Take the time to understand this section. The pressurized gas is regulated internally. The pressure regulator is externally adjustable via the screw in the side of the high-pressure regulator. A 3/32 allen key for this screw has been provided to access to this screw. To increase the pressure apply the wrench into the screw and turn clockwise.

NOTE: Only slight turns are needed to accomplish changes in the pressure used to shoot the paintball, thus changes in the velocity at which it is propelled.

To decrease the pressure registered on the gauge, turn the screw counter-clockwise. You must take a clearing shot before the change in the decreasing direction can be registered.

A pressure gauge has been installed into the regulator body to indicate the exact operating pressure of the marker. This gauge is extremely useful. **At the factory**, we set the regulator gauge to 200-250 PSI with an input pressure of 400 PSI using Compressed air as the base propellant. Under normal circumstances these settings will produce paintball velocities at approximately 280-300 fps. If you have an adjustable tank regulator, the input pressure from your tank should be set at 350-500 PSI. Higher input pressures will not provide increased performance. If you have a fixed output regulator on your tank (pre-set) then you may have to re-adjust the pressure shown on the gauge using the method discussed previously. If you plan to use CO₂, then please use an anti-siphon tank and a filter.



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Low pressure regulator adjustment:

The low pressure regulator is your main source for paintball velocity adjustments. The low pressure regulator is the small cylindrical body that located directly in front of the marker and directly below the barrel. The low pressure regulator is externally adjustable via the adjustment screw in the front of the regulator using a quarter, or broad head screw driver. The low pressure regulator is pre-set at the factory to 85-95 PSI to operate the single 3-way solenoid actuated valve. It may be necessary to re-adjust the low pressure regulator from time to time to accomplish the velocities that you require. Bench adjusting the regulator can be done by pressurizing the marker, be sure the input regulator is set properly, and then turning the adjustment screw inward (clock-wise) until you hear a leak coming from the 3-way valve in the grip area. The 3-way valve has an over-pressurization relief valve that will start to bleed off at approximately 125 PSI, once you hear the leak start then back off the adjustment screw one half turn and the leak will stop. That will approximate the pressure to about 90 PSI. The low pressure regulator is designed to shut down and preserve the integrity of the low pressure system if it sees an input pressure over approximately 400 PSI coming from the main input regulator.

This marker was designed with safety and safety standards in mind. If you attempt to shoot paintballs higher than established safety standards, the marker will not function properly.

NOTE 1. You may notice that if you attempt to operate the marker at extremely high velocities, the internals will not function properly!

NOTE 2. This marker is not designed to shoot above the safety limits established by industry standards.

Just a side note:

Higher pressures do not equate into better performance and higher velocities. High pressures in this marker can cause problems, showing up in erratic velocity, extreme gas consumption and in general a poor day of play. This marker was designed to perform at lower pressures. If you keep the gauge on the side of the marker set at 250-300 and do the rest of your adjustments with the low pressure regulator, you will be operating the marker within the range in which it was designed.



Troubleshooting Guide

Leak Related Problems

1. The BKO has a leak down the barrel.

Reason: gas is leaking through or around the valve pin seal or O-ring area.

- a. Can you hear the leak when the gas is removed? Yes? There is no leak. You hear the ocean.
- b. The valve seal is marred, scratched, worn out or dirty. Replace it.

2. The BKO has a leak around the high pressure regulator seam.

Reason: the seal between the regulator body and the main body or the regulator adapter is bad.

- a. Tighten the regulator to the body.
- b. Check and/or replace the O-RING.

3. The BKO has a leak around the low pressure regulator seam.

Reason: the seal between the regulator body and regulator adapter body is bad or the regulator has loosened up.

- a. Tighten the regulator into the body.
- b. Check and/or replace the O-RING gasket. Size -019.

4. The BKO has a leak inside the grip/battery area.

Reason: the 3-way valve is leaking.

- a. Check for over-pressurization from the low pressure regulator. Re-adjust the low pressure regulator per instructions on the previous pages.
- b. Tighten the 3-way valve to the manifold. Take care not to over-tighten.
- c. Replace the solenoid/valve assembly.



Ball Breakage Problems

1. The ball breaks in the breech.
 - a. The balls in your loader can bind, messing up your trigger timing.
Note: Always use an agitated loader.
 - b. As you run and shoot, you actually unweigh the gravity-fed balls in your loader. This can cause a ball to hesitate in its drop. This affects your trigger timing.
 - c. If the ball retention ball does not move freely, the paintballs will crush against it or it may have stuck in the depressed position allowing double feeding. Check its tension regularly and keep this area as clean as possible.
 - d. If the ball retention ball is too sloppy, the ball will not be held in the proper position. This may allow the next ball to enter the path of the bolt, subjecting it to impact cracking or shearing. Verify the tension.

Regulator Related Problems

1. The gauge reads correctly when charged, but climbs in pressure after a few moments.

- a. The regulator seal has been contaminated. Disassemble the regulator, and clean the seal with a Q-tip and alcohol. If you need assistance in the Disassembly of the regulator, please call (208) 468-0446.

2. The gauge reads correctly when charged, but drops in pressure after a few shots.

- a. The regulator may not be adjusted correctly. Remove all pressurized gas, and back off the regulator adjustment screw 3 turns. Pressurize the system and adjust the pressure back up to the desired pressure.



3. The gauge reads correctly when charged, but drops in pressure after a few shots, and is slow to climb back to normal pressure.

- a. The recovery side of the regulator is sluggish and may need cleaning and lubrication.
If you need assistance in the disassembly of the regulator, please call (208) 468-0446.
- b. The regulator seal needs to be replaced if it has a deep groove in it from the regulator cup.

Replacing or removing the original regulators voids all warranties.

Battery Related Problems

1. LED functions but the marker does not fire.
 2. Alternately missed shots.
 3. Velocity drops while firing several shots.
 4. Erratic Velocities. Jumps of 20 fps or more.
 5. Unexplainable paint breakage.
 6. Slight leak from the solenoid in the back of the grip.
- a. Change the battery. The LED only requires 1.5 volts to function. The solenoid requires a minimum of 5 volts to operate. This means the marker may appear to be getting enough power when it is not. All batteries are **NOT** created equal. Performance will vary. **Therefore, if you experience any erratic behavior, always change the battery first.**



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LIMITED WARRANTY

The manufacturer warrants the replacement of any original part due to defect in materials and/or workmanship of this air marker. This warranty will be in effect for twelve (12) months for parts and twelve (12) months for labor following the original date of purchase for the original purchaser. Such warranty service will be provided only if the warranty registration card included with this manual is filled in completely and on file with the manufacturer. All other service will be duly charged for and returned via UPS C.O.D.

The manufacturer will replace without charge any original part that is determined by Indian Creek Design, Inc., to be defective under the terms of this warranty. However, shipping charges are not covered hereunder. Failure due to an accident, abuse, neglect, modification, normal wear, operator error, maintenance by other than an authorized the manufacturer, dealer, or use of parts inconsistent with the use originally intended for the air marker as sold, is not covered by this warranty.

There are no other warranties or guarantees, expressed or implied, made by the manufacturer, on this air marker. The sole and exclusive liability of the manufacturer, and/or its authorized dealers, affiliates, or agents pursuant to this warranty will be for repair or replacement of the defective part; incidental or consequential damages are expressly excluded hereunder.

The manufacturer, its authorized dealers, affiliates, or agents, will not be liable under this warranty, nor under any state or federal law, or the common law or otherwise for any damage or failure, including personal injury, resulting from such use and/or alteration. This warranty gives you specific legal rights, and you may also have other rights that may vary from state to state.

For warranty parts, service or information contact:

Indian Creek Design, Inc.
1019 First Street North
Nampa, Idaho 83687
(208) 468-0446

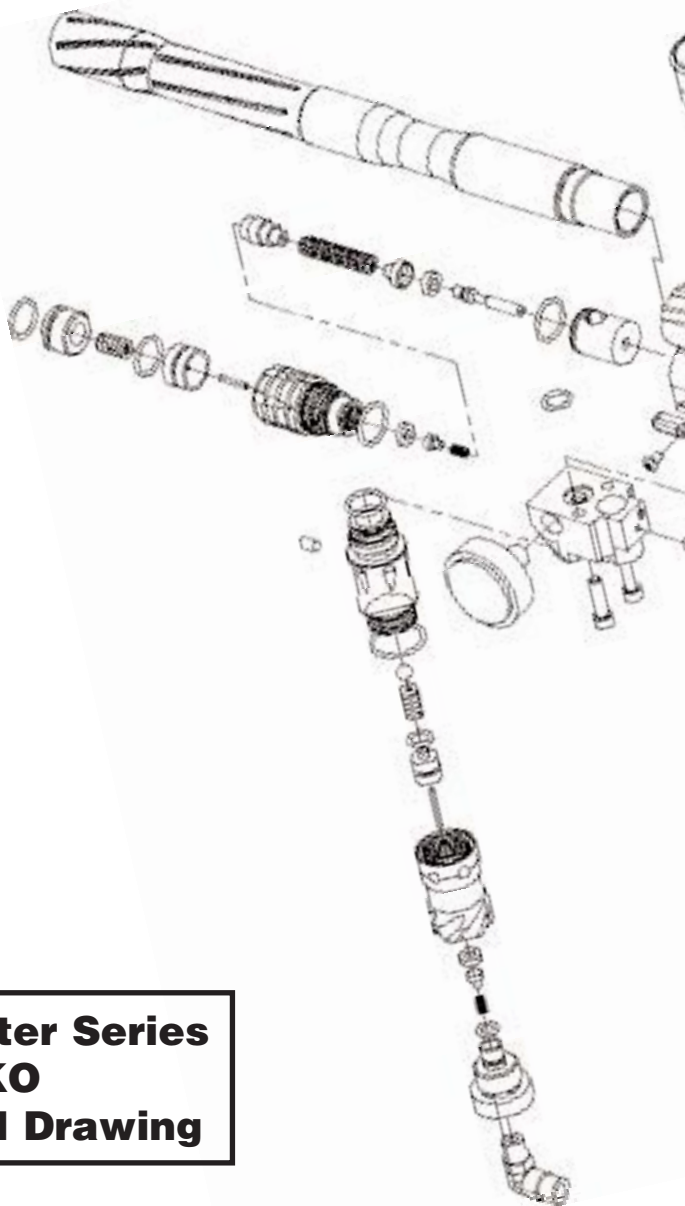


Paintball Marker Safety Rules

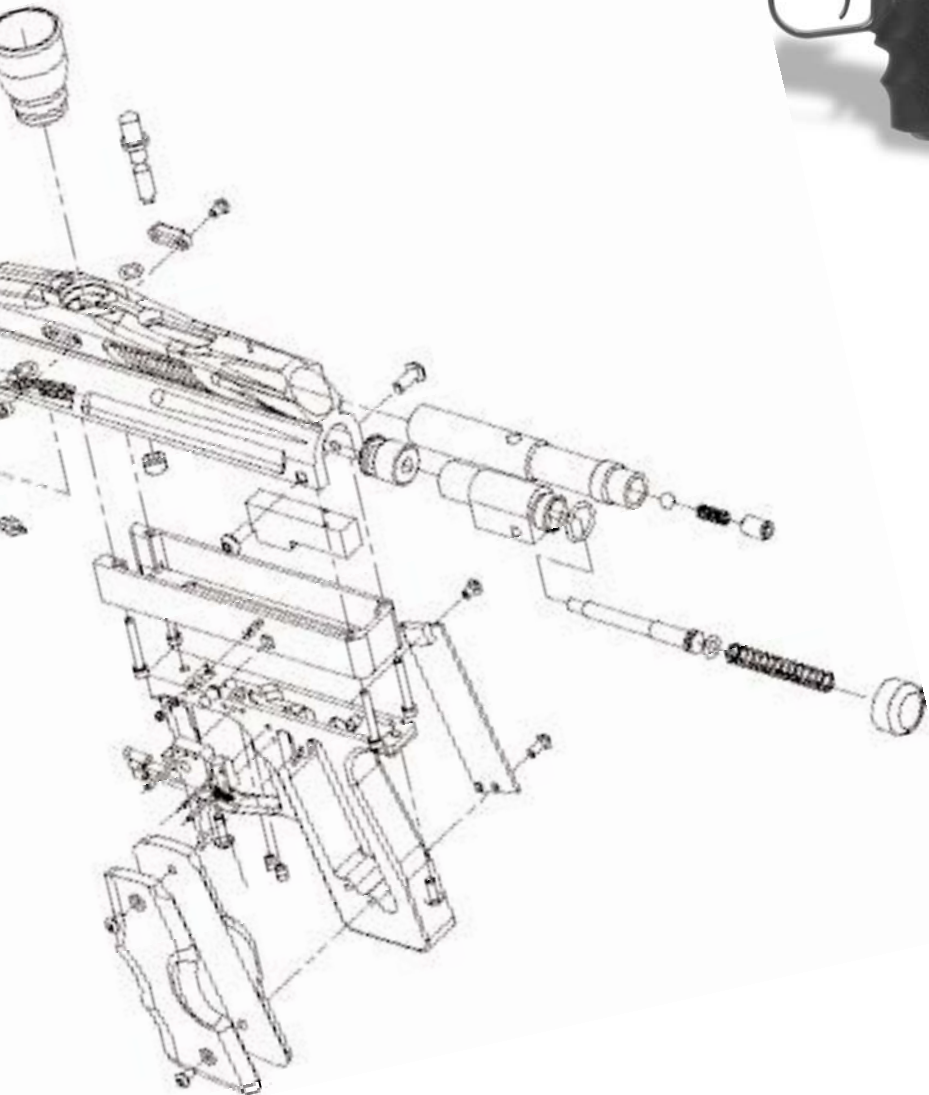
1. Treat every marker as if it were loaded.
2. Never look down the barrel of a paintball marker.
3. Keep your finger off the trigger until ready to shoot.
4. Never point the marker at anything you don't wish to shoot.
5. Keep the marker on SAFE until ready to shoot.
6. Keep the barrel blocking device in/on the marker's muzzle when not shooting.
7. Always remove paintballs and propellant source before disassembly.
8. After removing propellant source, point marker in safe direction and discharge until marker is degassed.
9. Store the marker unloaded and de-gassed in a secure place.
10. Follow warnings listed on propellant source for handling and storage.
11. Do not shoot at fragile objects such as windows.
12. Every person within range must wear eye, face and ear protection designed specifically to stop paintballs and meeting ASTM standard F1776.
13. Always measure your marker's velocity before playing paintball and never shoot at velocities in excess of 300 feet (91.44 meter) per second.



Indian Creek



**BushMaster Series
Model BKO
Technical Drawing**



BKO



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