VK-1

PISTON-DRIVEN RIFLE

VKTR INDUSTRIES

OPERATOR'S MANUAL

HANDLING AND SAFETY INSTRUCTIONS

VKTRIND.COM

VK-1

The VK-1 uses a revolutionary patented low-profile piston system design. It has optimum gas port sizing and a piston assembly featuring a unique cup and spigot design that improves the gas seal and overall efficiency of the gas system. The VK-1 also includes a staged gas bleed system with two sets of exhaust ports at precisely determined distances to reduce the inertia of the operating rod once it nears the end of its stroke. The reimagined VK-1 Short Stroke Piston System includes a fully-supported one-piece op rod, removable gas block, and matches the footprint and weight of a standard DI AR-15 while providing the benefits of a piston-driven system.

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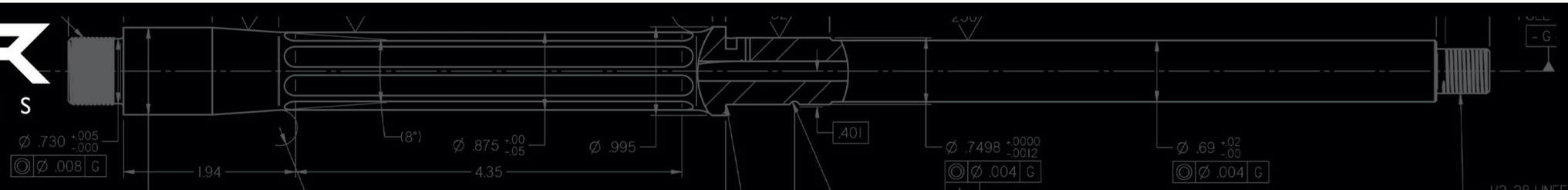


WARNING

CAUTION: VK-1 IS A FIREARM. WHEN HANDLED CARELESSLY OR IMPROPERLY, NEGLIGENT DISCHARGES CAN OCCUR, CAUSING INJURY, DEATH, OR DAMAGE TO PROPERTY.

NOTICE: VKTR Industries, LLC shall not be responsible for injury, death, or damage from either intentional or negligent discharge of this firearm or from its function when used in a manner other than designed.

IMPORTANT: Careless or improper handling, unauthorized adjustment or parts replacement, neglect, poor storage and the use of the wrong caliber or any ammunition other than recommended will void any warranties extended by VKTR Industries on this Firearm.

NOTICE: Due to our policy of continual development, VKTR Industries reserves the right to update these specifications from time to time.

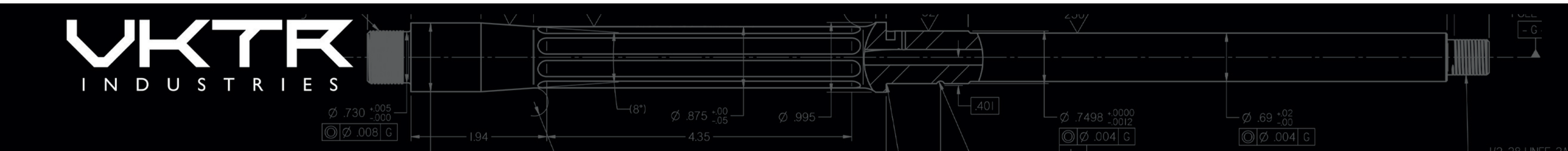
GENERAL SAFETY PROCEDURES

An important part of safe handling, especially around other people, is to frequently ensure that the weapon is clear when it is not being actively shot. ALWAYS TREAT THE WEAPON AS LOADED UNTIL YOU HAVE PERSONALLY VERIFIED IT IS NOT. For example, when handing your weapon to another person, first safely aim the muzzle down range / in a safe direction, properly clear the weapon, verify visually and physically that the firearm is cleared, and lock the bolt carrier to the rear using the bolt catch. When the receiving person accepts the weapon, the new holder should follow the clearing procedure (including visual/physical inspection of the chamber). Please consult page 13 of this manual for instructions on how to safely and properly clear your VK-1 rifle.

Always Follow the Four Rules of Firearms Safety:

1. **Always keep the firearm pointed in a safe direction. Never point your firearm at anything you do not intend to shoot.**
2. **Treat all firearms as though they are loaded.**
3. **Keep your finger off the trigger until you are ready to shoot.**
4. **Always be sure of your target and what is beyond it.**

Always ensure that you are using the correct caliber ammunition in your weapon. To ensure proper function and safety, VKTR Industries recommends using factory-loaded ammunition that complies with SAAMI, NATO, or CIP published standards. VKTR Industries does not guarantee your weapon's safety or performance when using reloaded, hand-loaded, or surplus ammunition.



GENERAL SAFETY PROCEDURES CONTINUED

Prior to firing, know your intended target and what lies beyond it. Be sure that there is an adequate backstop or open space free of persons and other unintended targets. Keep in mind that hard objects behind your target can cause ricochets, posing a safety hazard to property, persons in the vicinity, and the shooter.

Check your weapon's bore to ensure that it is free from any obstructions before loading and firing the weapon, especially for the initial firing after a period of inactivity (storage, cleaning, etc.). If the weapon is dropped, or the muzzle touches the ground, clear the weapon before checking for possible bore obstructions.

At all times you must be aware of where your muzzle points and, regardless of the status of the weapon, never point the weapon's muzzle at any person or unintended target. When not being carried by a user, the weapon should be placed in a 'Range Safe' condition: the magazine is removed, the muzzle faces downrange, the ejection port is open and faces up, the bolt carrier is locked to the rear, and the selector is set to SAFE.

Weapons should be stored unloaded, either in a locked case or in a secure area. Always remember to return the chamber safety flag supplied to the empty chamber to give yourself and others around a visual indicator that your weapon is in a safe condition.

Always use eye and ear protection when shooting any firearm. Fully familiarize yourself with the weapon, its controls, features, and operating procedures prior to shooting.

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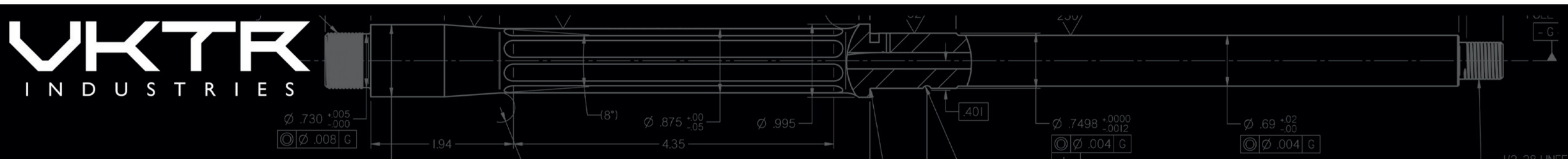


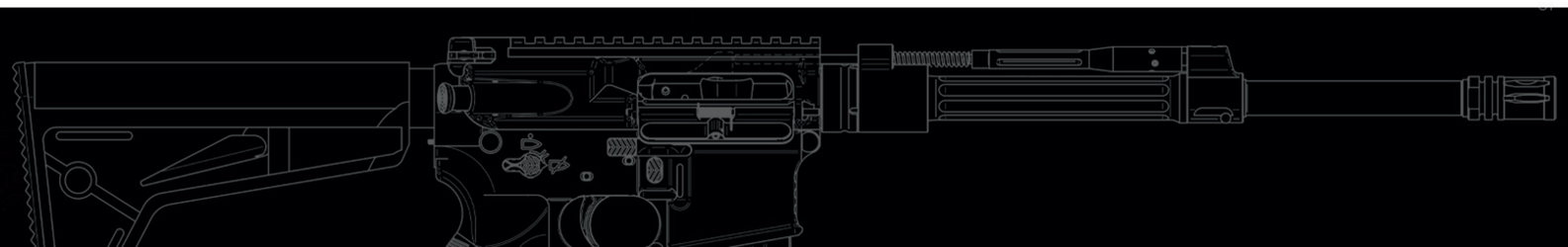
VK1- SPECIFICATIONS

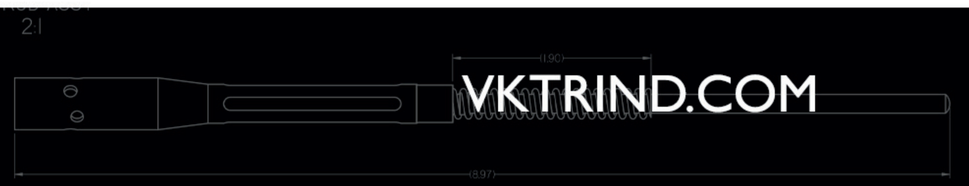
SPECS:	VK-1 (All Models)
CALIBER:	5.56mm NATO
MUZZLE THREADS:	1/2 X 28 TPI
RIFLING:	1/7" RH
MAGAZINE CAPACITY:	10/30
TRIGGER PULL:	5.5 - 8.5 lbs.
CYCLIC RATE:	750-900
SUSTAINABLE RATE OF FIRE:	70 RPM

TECHNICAL DATA:	VK-1 16.1"	VK-1 13.7"	VK-1 10.5"
OVERALL LENGTH:	31.9" - 34.5"	30.5" - 33.1"	27.3" - 29.9"
WEIGHT:	6.8 lbs	6.6 lbs	6.0 lbs
MAX EFFECTIVE RANGE:	500 yards	500 yards	300 yards

BARREL

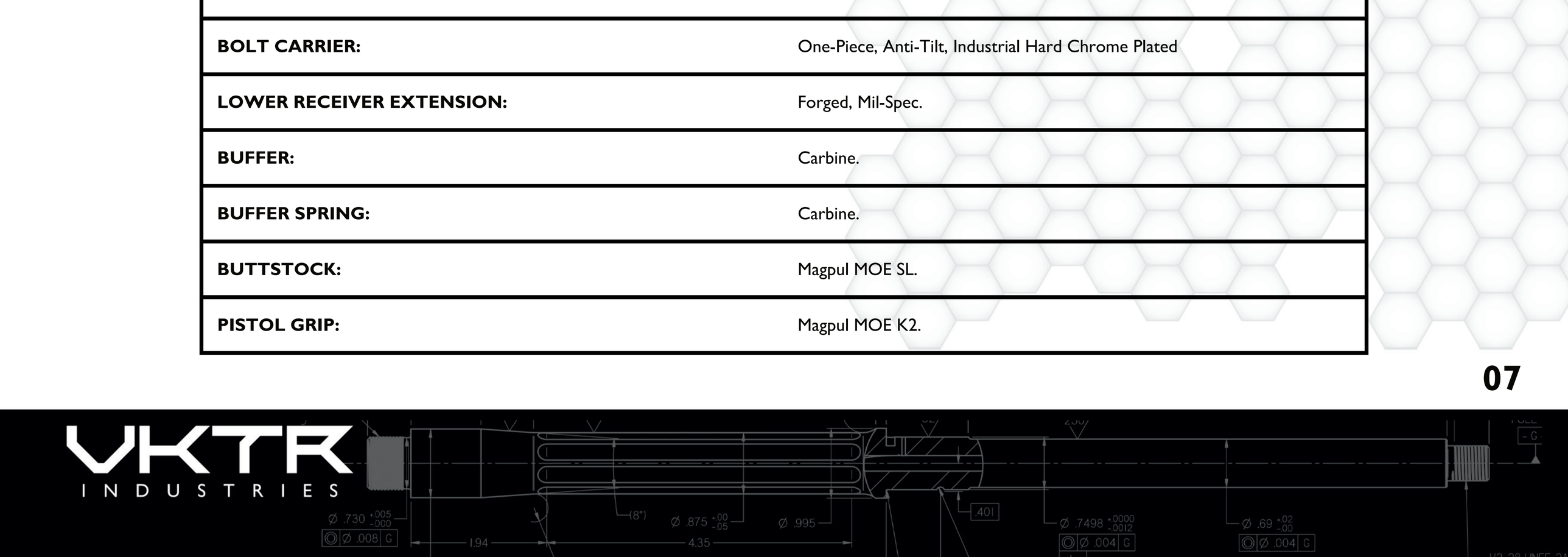
6-groove rifling, 1-in-7 RH twist, 41v45 CMV steel, nitrided, cold hammer-forged, including rifling and chamber, M4 barrel extension with extended feed ramps.





VK1- SPECIFICATIONS CONTINUED

TECHNICAL DATA:	VK-1 (All Models)
PISTON OPERATING SYSTEM:	One-Piece
UPPER RECEIVER:	Forged 7076 Aluminum, Cerakoted
AMBIDEXTROUS LOWER RECEIVER:	Forged 7076 Aluminum, Cerakoted
RAIL SYSTEM:	Extruded Aluminum, MLOK, Cerakoted, 9.5" - 15"
CHARGING HANDLE:	Ambidextrous
BOLT CARRIER:	One-Piece, Anti-Tilt, Industrial Hard Chrome Plated
LOWER RECEIVER EXTENSION:	Forged, Mil-Spec.
BUFFER:	Carbine.
BUFFER SPRING:	Carbine.
BUTTSTOCK:	Magpul MOE SL.
PISTOL GRIP:	Magpul MOE K2.

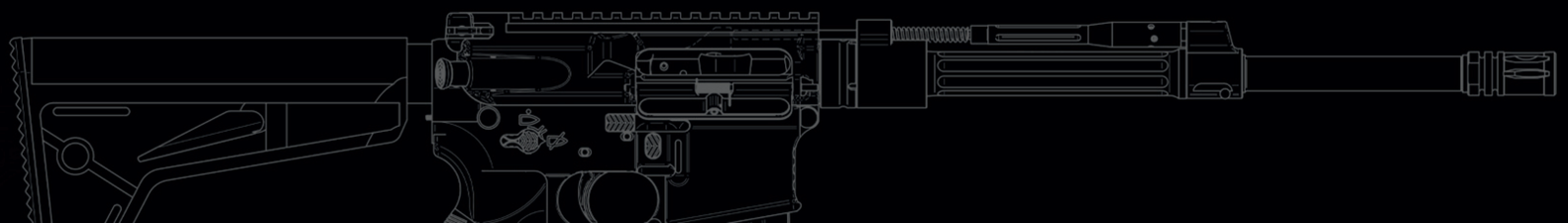


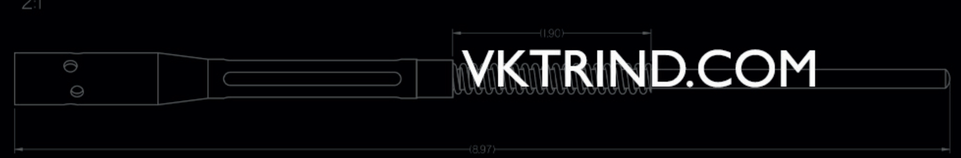
VK-1 NOMENCLATURE

Bolt Carrier Group

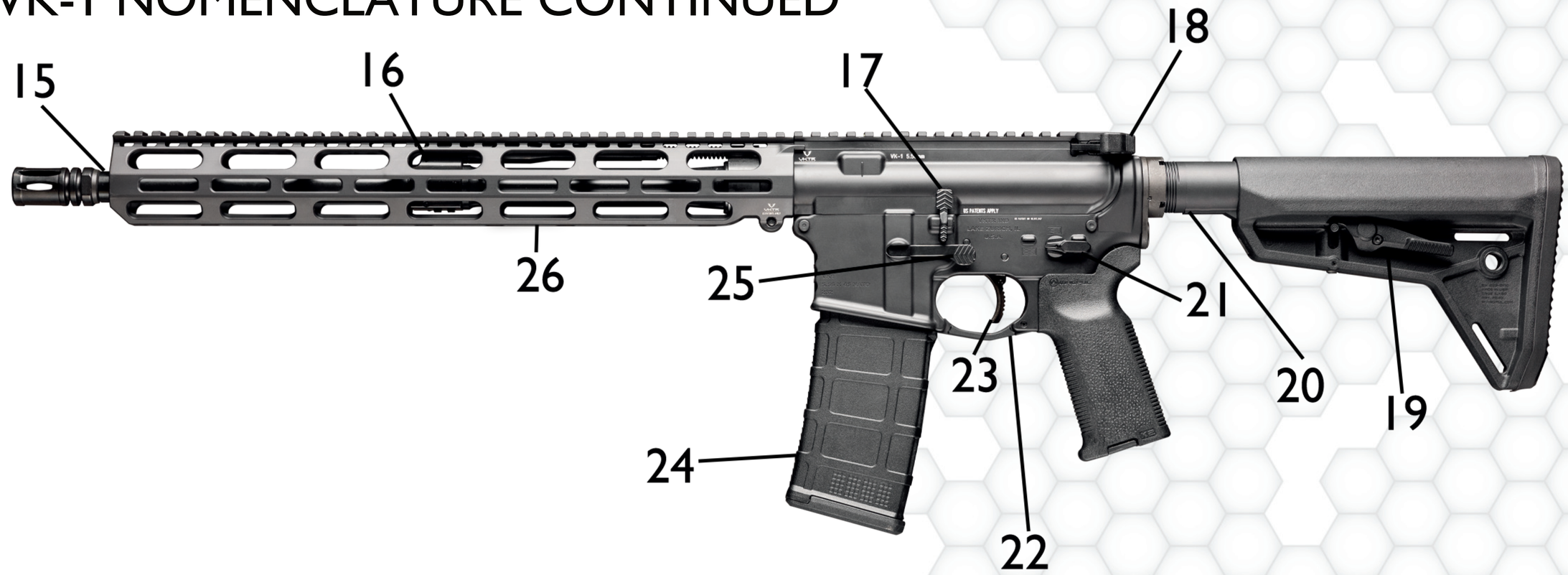
Charging Handle

1. Buttstock
2. Forward Assist
3. Ejection Port Dust Cover
4. Mil-Std 1913 Rail
5. MLOK Mounting Point
6. A2 Flash Hider
7. Handguard Retaining Bolt
8. Pivot Pin
9. Ambidextrous Magazine Release
10. Right Side Bolt Carrier Catch/Release Lever
11. Pistol Grip
12. Takedown Pin
13. QD End Plate Sling Mount
14. Lower Receiver Extension Castle Nut





VK-1 NOMENCLATURE CONTINUED



15. Barrel
16. Gas Block
17. Ambidextrous Bolt Catch/Release
18. Ambidextrous Charging Handle
19. Stock Latch
20. Lower Receiver Extension
21. Ambidextrous Fire Control Selector
22. Trigger Guard
23. Trigger
24. Magazine
25. Ambidextrous Magazine Release
26. Handguard

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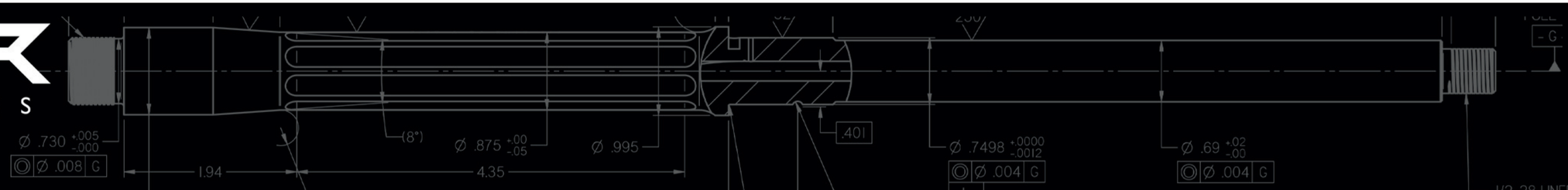


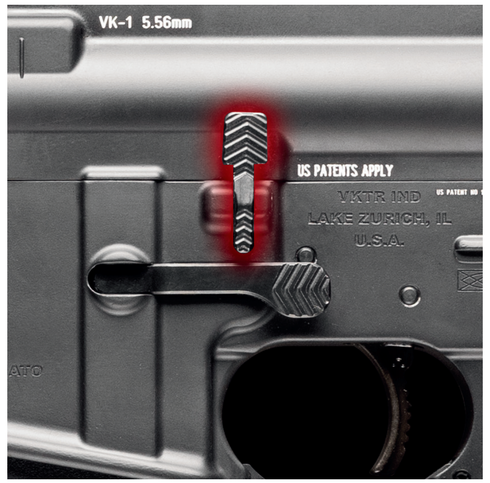
CONTROLS

AMBIDEXTROUS BOLT CATCH AND RELEASE (10) (17)

The VK-1 has controls for the bolt catch and release on either side of the lower receiver.

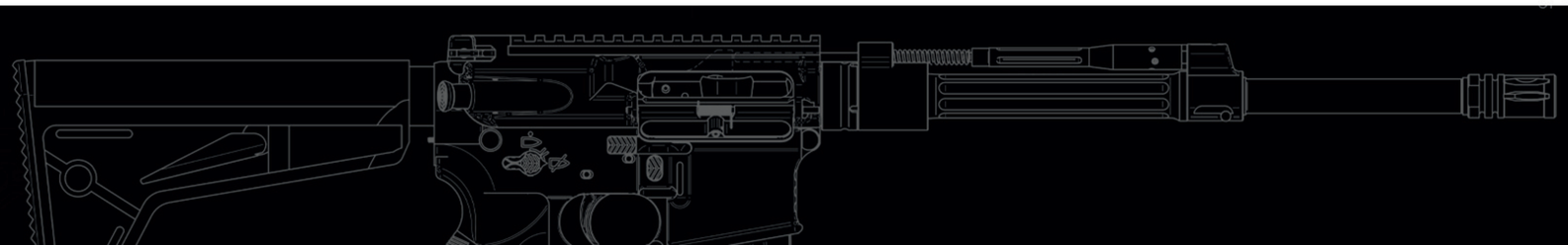
To lock the bolt carrier back, use the charging handle to pull the bolt carrier group back until the leading face of the bolt passes the bolt catch. Once the bolt face has cleared the bolt catch, press the lower section of the left bolt catch paddle or the bolt catch lever on the right. Ensure the bolt carrier remains locked back after removing pressure from the bolt catch. If the bolt remains locked back, the charging handle can now be returned to the home position manually.

To release the bolt carrier group from its locked back position, press the top half of the left bolt catch paddle or the lever on the right. The carrier will be released and return to its home position.



BOLT CATCH (LEFT SIDE)

BOLT CATCH (RIGHT SIDE)



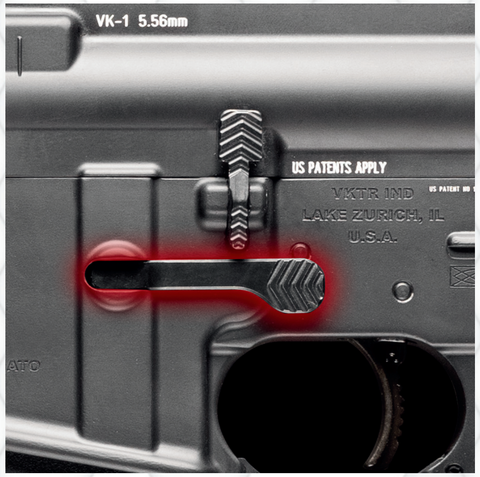
CONTROLS CONTINUED

AMBIDEXTROUS MAGAZINE RELEASE (9) (25)
Magazines that are properly inserted into the VK-1 magazine well will automatically be caught and locked in place. Usually, an audible click can be heard when the magazine is fully seated but tugging on the magazine will verify that it is locked in place.

The magazine is released by depressing the magazine releases located on either side of the lower. On the left side of the receiver, the magazine release is in the form of a lever; the right side release is the more traditional button. Magazines may or may not drop free. A tug on the magazine while depressing the mag release will ensure removal.

CAUTION: Remember that removing the magazine does not mean that the weapon is unloaded; there may still be a round in the chamber. The chamber can be checked by clearing the weapon (several pulls of the charging handle is standard) before visually inspecting the chamber. Devices such as chamber flags can be used to further ensure that the chamber is clear in a low-visibility scenario.

MAGAZINE RELEASE (RIGHT SIDE)



MAGAZINE RELEASE (LEFT SIDE)

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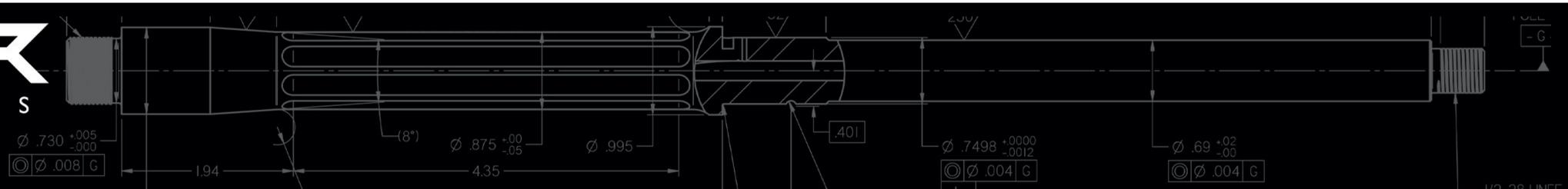


FORWARD ASSIST (2)

The forward assist is used to ensure that a cartridge is fully seated into the chamber. Repeatedly tapping on the forward assist button forces a non-fully seated carrier to move forward in small increments. DO NOT force a round into the chamber. If several firm taps do not fully seat the round, follow the clearing procedure, and inspect the round, the magazine, the chamber, and the bore of the weapon. The forward assist is designed to be used in situations where regular cleaning is not possible, or when debris is introduced into the action of the rifle. Normal use will rarely, if ever, require the use of the forward assist.

EJECTION PORT DUST COVER (3)

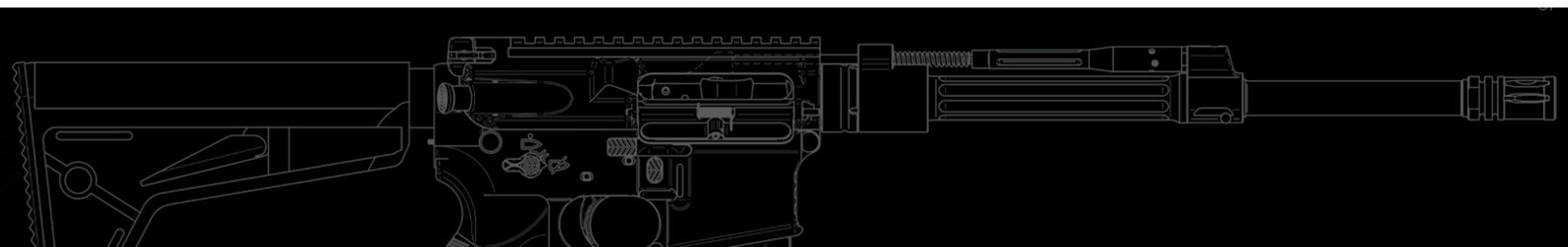
The spring-loaded ejection port dust cover is used to keep debris and foreign matter from entering the upper receiver through the ejection port. It opens automatically when the weapon is cycled, either by hand or by firing.

EJECTION PORT DUST COVER (Cont.)

The ejection port cover should always be closed when the weapon is no longer firing except for the ‘Range Safe’ condition. To close it, simply push the cover up until it engages the upper receiver.

FORWARD ASSIST

DUST COVER



PRE-OPERATING PROCEDURES

Several measures should be taken before firing your VK-1. These pre-operating procedures can be taken as often as the user requires, but they should at the least be completed before every firing session to ensure proper function of the firearm.

CLEARING THE WEAPON

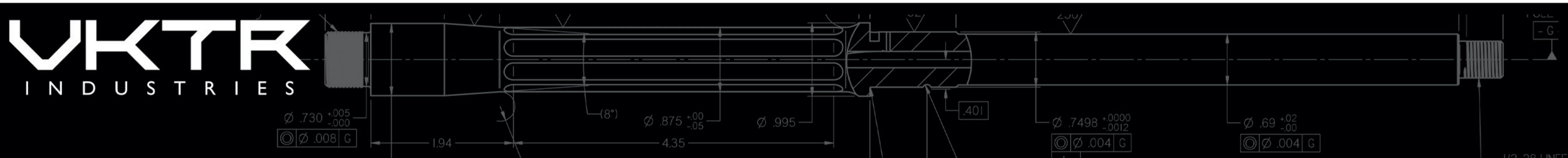
Clearing your weapon is an important starting and stopping point for many weapon operations. Clear the weapon upon receiving it from someone, when you pass it along to someone, and when it is being set down on the range or for storage. Clearing is also the easiest way to put the weapon into conditions 3-4.

The process for clearing your rifle is as follows:

1. While pointing the muzzle in a safe direction, remove the magazine (if present) by depressing the magazine release and pulling the magazine out.

2. Press and hold the bottom half of the left bolt catch paddle or the right lever. The usual method is to turn the rifle onto its side and hold the bolt catch with the support hand, but the ambidextrous controls of the VK-1 allow for the firing hand to engage the bolt catch as well.

3. Using the hand that is not depressing the bolt catch paddle/lever, grasp the charging handle and firmly pull the charging handle and carrier group all the way to the rear. If a round was chambered, it should have been ejected as the bolt carrier moved to the rear. As the bolt carrier group passes the bolt catch, the bolt catch will engage, and the bolt carrier group will not be able to return to the home position. Note that if the bolt carrier group is not pulled completely to the rear, the bolt catch can catch on the front face of the carrier instead of the bolt.



4. Return the charging handle to the closed and latched position.

5. Roll the weapon counterclockwise until you have a clear view of the bolt and chamber through the ejection port. Visually check to make sure that the chamber is clear and that the bolt is locked to the rear. In low-light conditions, perform a tactile check.

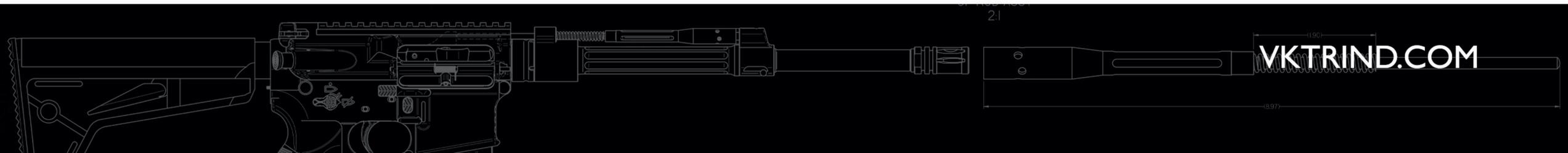
CAUTION: Step 5 is a crucial part of the clearing process. Do not depend on the fact that no casing was ejected on clearing. There could still be a live round in the chamber for any number of reasons. Make certain that you inspect the chamber to ensure that it is clear.

PRE-FIRE INSPECTION (PFI)
A pre-fire inspection should be performed before each firing session.

1. Clear the weapon before placing it into Condition 4.

2. Break the weapon down ‘shotgun style’ by pulling out the rear takedown pin and pivoting the upper and lower receivers apart. The rear takedown pin is captured and cannot be fully removed from the lower receiver.

3. Inspect the bolt carrier group. Remove the bolt carrier group by pulling the charging handle back halfway and sliding the bolt carrier group free of the upper receiver. Check to make sure that the bolt is fully captive in the carrier. Make sure that the cam pin is captive, the directional arrow is pointing forward, and that it rides in its track smoothly when the bolt is moved in or out. (Continued)



PRE-OPERATING PROCEDURES CONTINUED

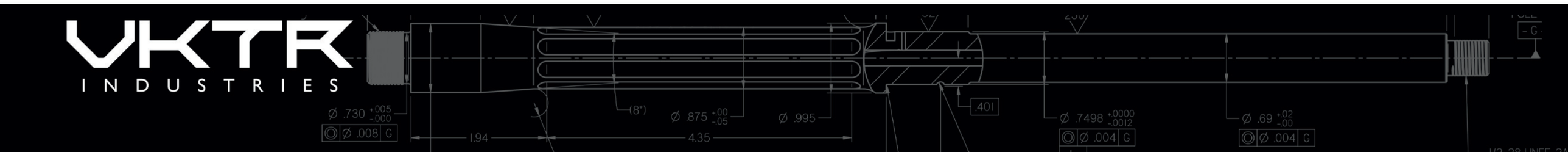
3. (Cont.) Check for damage on the bolt face and the bolt lugs. Ensure that the firing pin retainer is fully seated in its hole. Ensure that the firing pin hole in the bolt face is not obstructed. Tap the bottom of the bolt carrier firmly against the palm of your hand to ensure that the firing pin is fully captured. A light coating of lubricant is recommended for the body of the carrier and/or the inside of the upper receiver; ensure that the lubricant has not dissipated.

4. Visually inspect the bore for obstructions. In low light conditions, physically inspect the bore by passing a cleaning rod through it. Do not check for bore obstructions using a flexible barrel cleaner. Flexible cleaners, especially worn or used ones, can snag on small obstructions and break, leading to even larger obstructions.

5. Reassemble the weapon by inserting the bolt carrier group into the upper receiver, close the upper and lower receivers, and push the rear takedown pin into the lower receiver all the way.

6. Inspect your magazines. Ensure that they are clean and not dented or cracked. Pay special attention to the shape of the feed lips on metal magazines. Check that the magazine follower moves freely within the magazine body and returns home under its own spring tension. Do not oil or otherwise lubricate magazines.

7. Inspect the ammunition. Ensure that the ammunition is the correct caliber for the weapon and is not damaged. Do not oil or otherwise lubricate ammunition. Once the inspection is completed, clear the weapon, and return it to either Condition 4 or make it ‘Range Safe’.



OPERATING THE VK-1

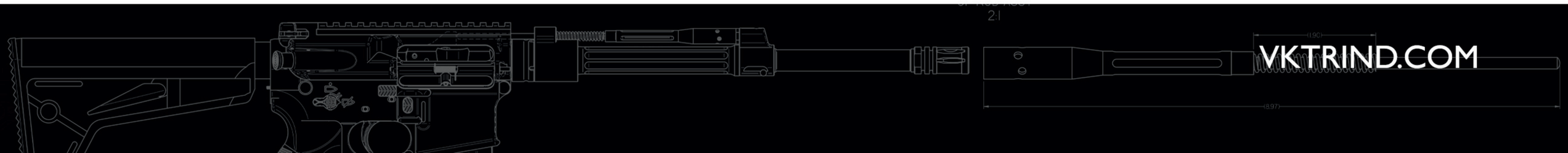
Your VK-1 rifle is designed to perform right out of the box with no user adjustment necessary. Each rifle is quality-checked and test-fired to meet our exact tolerances for optimal performance. This section outlines manufacturer recommendations required to ensure safe and desired levels of performance.

CHOICE OF AMMUNITION

To reiterate, always ensure that you are firing the correct caliber ammunition through your weapon. To ensure proper function and safety, VKTR Industries recommends using factory-loaded ammunition that complies with SAAMI, NATO, or CIP published standards. VKTR Industries will not guarantee your weapon's safety or performance when using reloaded, hand loaded, or surplus ammunition.

VKTR Industries does not recommend the use of steel-cased ammunition. While the VK-1 will function with this ammunition, prolonged use can cause lacquer build-up in the chamber and difficulty chambering ammunition. Always clean the chamber and barrel after using steel-cased ammunition.

Subsonic ammunition will not reliably cycle the VK-1, the use of a suppressor can help but generally, a spring and buffer change is required for fully reliable operation with this type of ammunition. The VK-1 is designed to cycle with a broad range of 5.56x45mm NATO and .223 Rem ammunition. The 1:7 twist rate of the rifling (one revolution of the bullet takes place every 7") will generally give the best accuracy results with heavier bullets, such as 62-77gr.



OPERATING THE VK-1 CONTINUED

CHOICE OF MAGAZINES

The VK-1 is designed to use all STANAG AR-15/M-16 pattern magazines. VKTR Industries recommends the supplied Magpul PMag Gen 3 series magazines for use in its rifles.

INITIAL LOADING OF THE WEAPON

1. Clear the weapon before placing it into Condition 4.

2. Insert a loaded magazine firmly into the magazine well. Ensure that it is properly seated by tugging on it.

3. Charge the weapon by firmly pulling the charging handle to the rear and releasing it. The bolt carrier group will move forward, picking up the top round in the magazine and loading that round into the chamber.

4. Rotate the selector to SAFE. If you do not intend on firing immediately, close the ejection port cover. The weapon is now in Condition 1.

FIRING IN SEMI-AUTOMATIC MODE

Starting with the weapon in Condition 1:

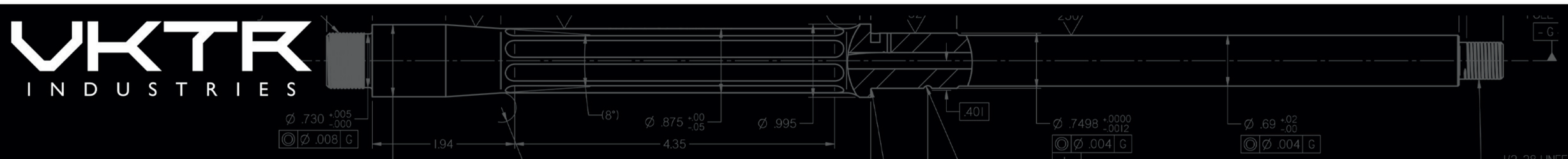
1. Bring the weapon to the “Ready” position.

2. Acquire and aim at the intended target.

3. Move the selector to “SEMI”. The weapon is now in Condition 0.

4. Squeeze the trigger with a strong, smooth pull to fire individual shots.

5. When you are finished firing, move the selector to SAFE to return the weapon to Condition 1. If you have fired all the rounds in the magazine, turn the weapon counterclockwise and visually inspect the chamber to make sure that it is empty, and the bolt carrier is locked back.



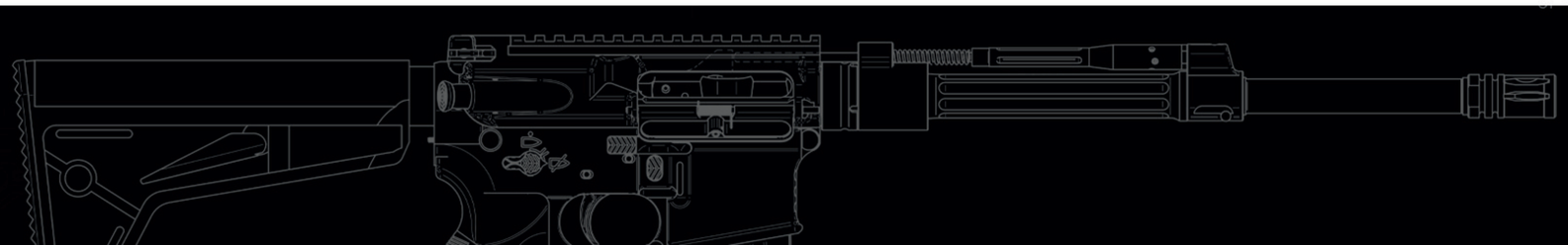
RELOADING FROM AN OPEN BOLT CARRIER GROUP
When the magazine is out of ammunition, the bolt catch is automatically engaged, and the bolt carrier group is locked open.

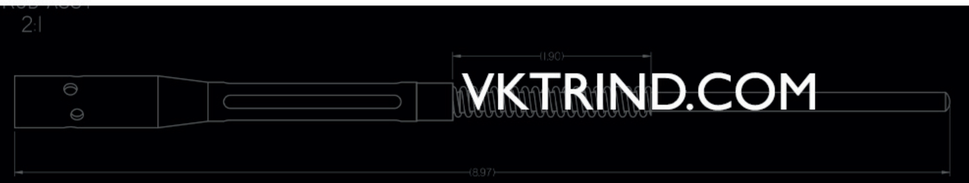
1. Release and remove the magazine by pressing either of the magazine releases.

2. Insert a loaded magazine into the magazine well. Ensure that the magazine is properly seated by tugging on it.

3. Press the large paddle of the left bolt catch OR the lever of the right bolt catch, releasing the bolt carrier and chambering a round from the new magazine.

The weapon is now in Condition 1 if the selector was set to SAFE or Condition 0 if the selector was set to SEMI or AUTO.





CYCLE OF OPERATION

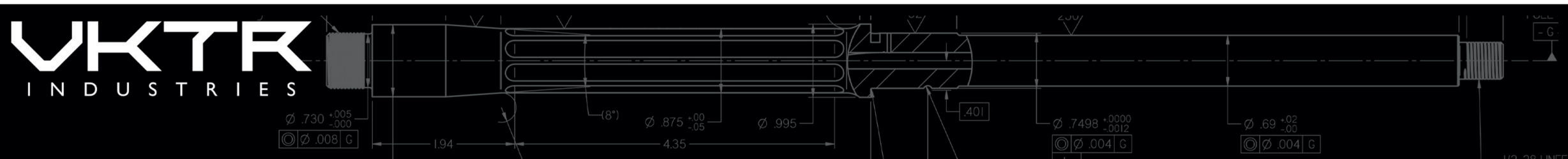
There are eight steps in the cycle of operation of the VK-1, which begins after a loaded magazine is inserted into the firearm.

FEEDING
As the bolt carrier is released from its rearward position, the carrier group moves forward allowing the lower lugs of the bolt to contact the rear of the cartridge as it sits in the magazine. The cartridge is stripped from the magazine and begins its forward movement toward the chamber.

CHAMBERING
As the bolt moves forward the bolt locking lugs move forward into the barrel extension. The ejector is then compressed against the left side of the cartridge head. The last action that occurs is the extractor snapping over the rim of the cartridge case.

LOCKING
The cartridge passes through the locking lugs of the barrel extension and the movement of the bolt and the cartridge is stopped by the chamber. The bolt carrier continues to move forward until it is stopped by contact with the rear face of the barrel extension. As the carrier goes through the last portion of movement, the bolt is rotated to the left, through the action of the cam slot in the top of the carrier and the cam pin that passes through the bolt. This rotates the bolt lugs behind the barrel extension lugs to lock the bolt into the barrel extension.

FIRING
The selector is rotated to the SEMI position. The trigger is squeezed, and the hammer is released. The hammer spring drives the hammer forward onto the firing pin. The firing pin moves forward and strikes the cartridge primer, causing detonation.



UNLOCKING

As the bullet passes the gas port in the barrel, a small amount of gas is bled off, traveling up through the gas port, into the gas block and into a chamber in the gas nozzle. Once the gas pressure overcomes the mass of the bolt carrier group, buffer, and buffer spring, the operating rod moves and engages with the bolt carrier moving it rearward. The rearward movement of the carrier causes the bolt cam pin to rotate the bolt to the unlocked position.

EXTRACTION

As the bolt carrier assembly moves rearward the spent case is pulled free from the chamber by the extractor. The rotation of the bolt aids in the extraction from the chamber.

EJECTION

The extractor continues to grip the rim of the spent case on the right side. The ejector is applying forward pressure to the left side of the case. As the expended case clears the chamber, then the barrel extension, it is flipped out through the ejector port on the right side of the receiver.

COCKING

The rearward movement of the bolt carrier overrides the hammer, forcing it down into the receiver and compressing the hammer spring, cocking the hammer into the firing position.

BASIC MAINTENANCE

Proper maintenance of a weapon requires not only post-fire cleaning but also the timely replacement of worn parts to ensure full reliability and performance. An accurate log of rounds fired is ideal, but a rough daily round count is immensely useful for scheduled maintenance.

LUBRICANTS AND CLEANERS

The VK-1 is compatible with all standard U.S. Military and NATO specified small arms lubricants and cleaners, as well as all widely available commercial products.

Note that the use of water-based lubricants, such as WD-40, is not advised as the water content of the lubricant can aid corrosion.

When applying lubricant, use a moderate coat of lubricant on moving parts. A moderate coat should be just visible. Apply lubricant directly to the part and spread it with a brush, cloth, or finger.

AREAS TO LUBRICATE INCLUDE:

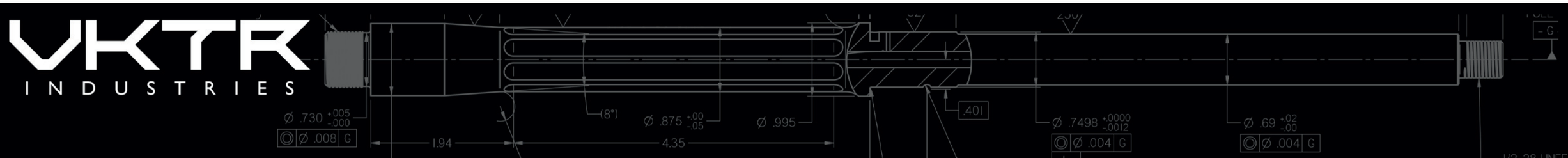
1. Bolt carrier body and cam pin, especially along the runners on the bottom of the carrier. Place two drops of lubrication into the cam pin slot.

2. Inside of the upper receiver.

3. Outside of the long, thin section of the charging handle.

4. Takedown pins.

NOTE: Do not lubricate the piston system. These parts are designed to run dry.



FIELD STRIP

Field Stripping, or Basic Disassembly, is breaking the rifle down to its core components for the purpose of field-expedient maintenance (mainly cleaning and lubrication). Field Stripping can also shed light on the cause of common failures, such as a blocked bore or broken parts. The Field Stripping process requires no special tools. Caution should be taken to ensure that parts are not lost during this process.

Please note that rifles should not be broken down beyond the field strip unless in a controlled environment, such as a home workbench, interior room, or in a gunsmith's shop. To start the field strip, separate the upper and lower receiver groups:

1. Clear the rifle several times. Most negligent discharges occur during disassembly and cleaning operations.

2. From the left-hand side, press in the rear takedown pin. From the right-hand side, pull the rear takedown pin to the right until it stops.

3. Repeat step 2 for the front pivot pin. Separate the upper and lower receiver groups.

To complete the field strip of the lower receiver assembly, remove the buffer and spring from the lower receiver extension:

1. With the hammer cocked, depress the buffer retainer using a screwdriver, punch, or other suitable tool. The buffer should spring free.

2. Pull on the buffer to remove the buffer and buffer spring from the lower receiver.

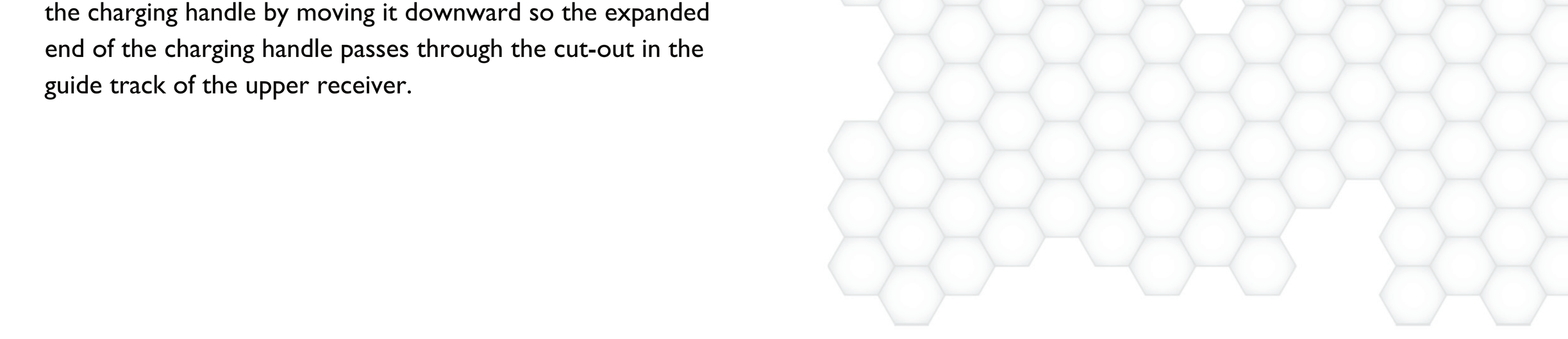
FIELD STRIP CONTINUED

To complete the field strip of the upper receiver assembly, remove the bolt carrier group and charging handle from the upper:

1. Pull the charging handle to the rear about three-quarters of the way.

2. Remove the bolt carrier group from the upper receiver.

3. Pull the charging handle fully towards the rear. Remove the charging handle by moving it downward so the expanded end of the charging handle passes through the cut-out in the guide track of the upper receiver.



DETAILED DISASSEMBLY

Detailed disassembly is simply breaking down the rifle as much as possible without specialized tools. This type of disassembly should be done routinely. For example, the detailed disassembly might be done after several thousand rounds of use or before the rifle is put away for extended storage. To complete the detailed disassembly of the lower receiver, simply remove the stock:

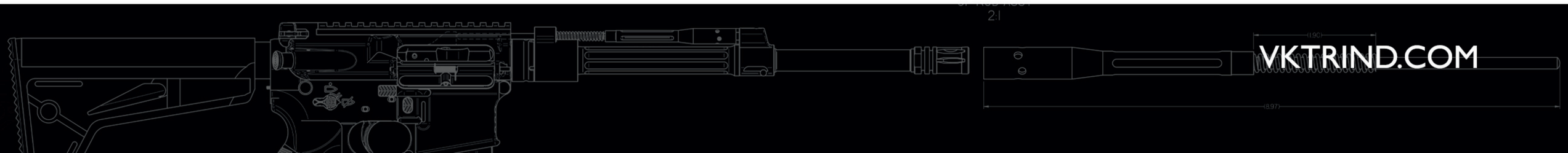
1. Grasp the adjustment lever on the underside of the buttstock. Pull the adjustment lever straight down to disengage the stock pin, and then slide the stock from the end of the lower receiver extension.

To fully disassemble the bolt carrier group:
1. With a suitable punch or the tip of a cartridge, pull out the firing pin retaining pin from the left side of the bolt carrier. Do not twist the retainer during removal.

2. Tip the carrier upright to slide the firing pin out of the rear of the carrier.

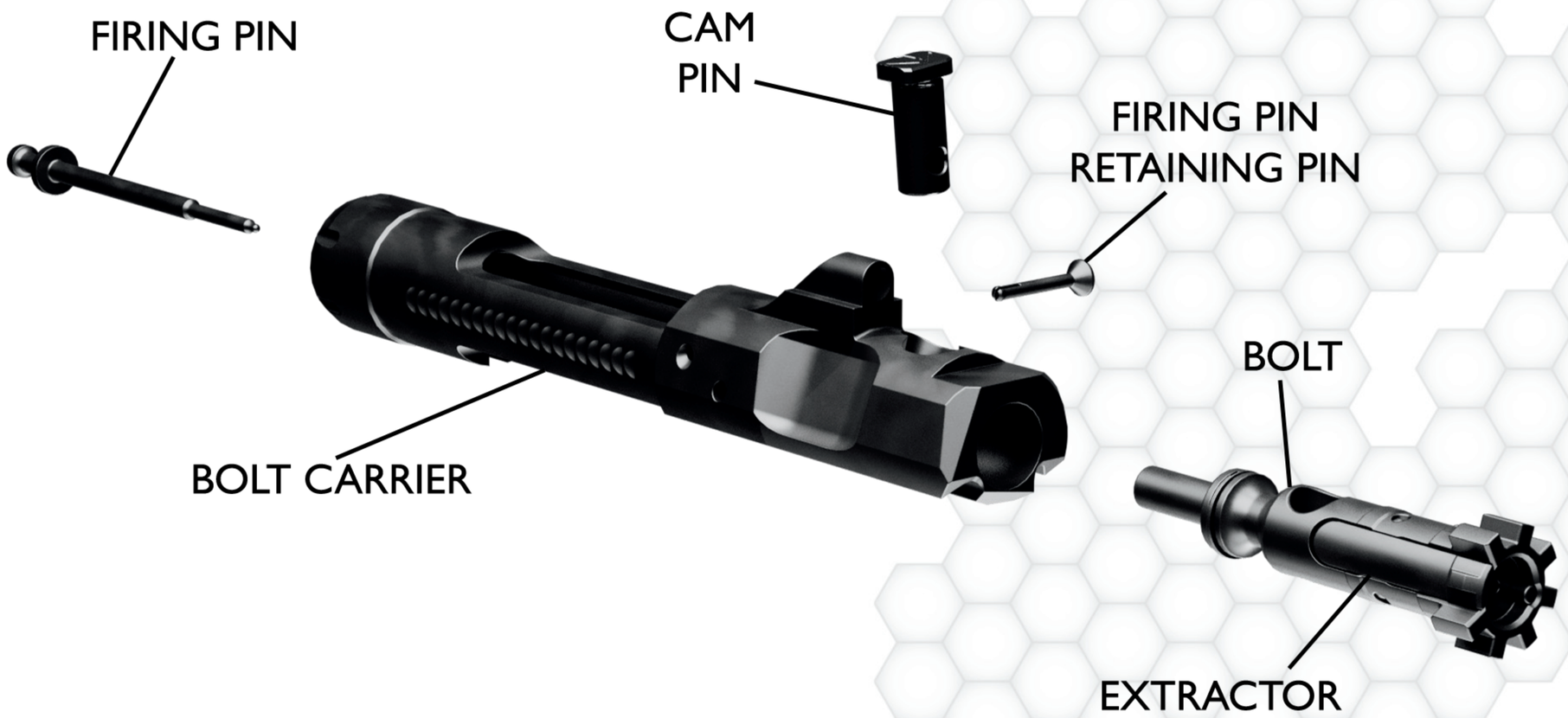
3. Lift the cam pin out of the bolt carrier group.

4. Remove the bolt from the front of the bolt carrier.

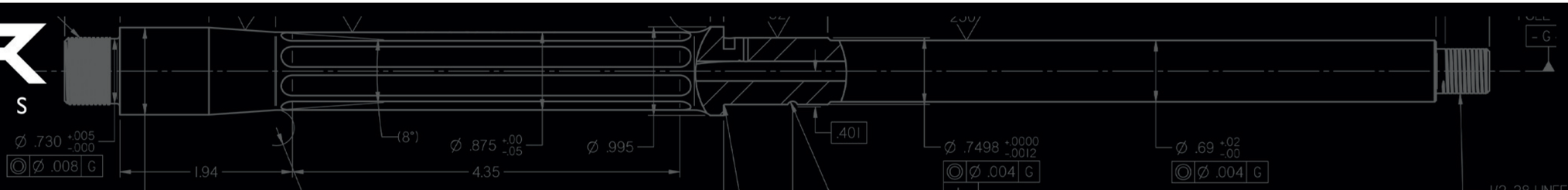


DETAILED DISASSEMBLY DIAGRAMS

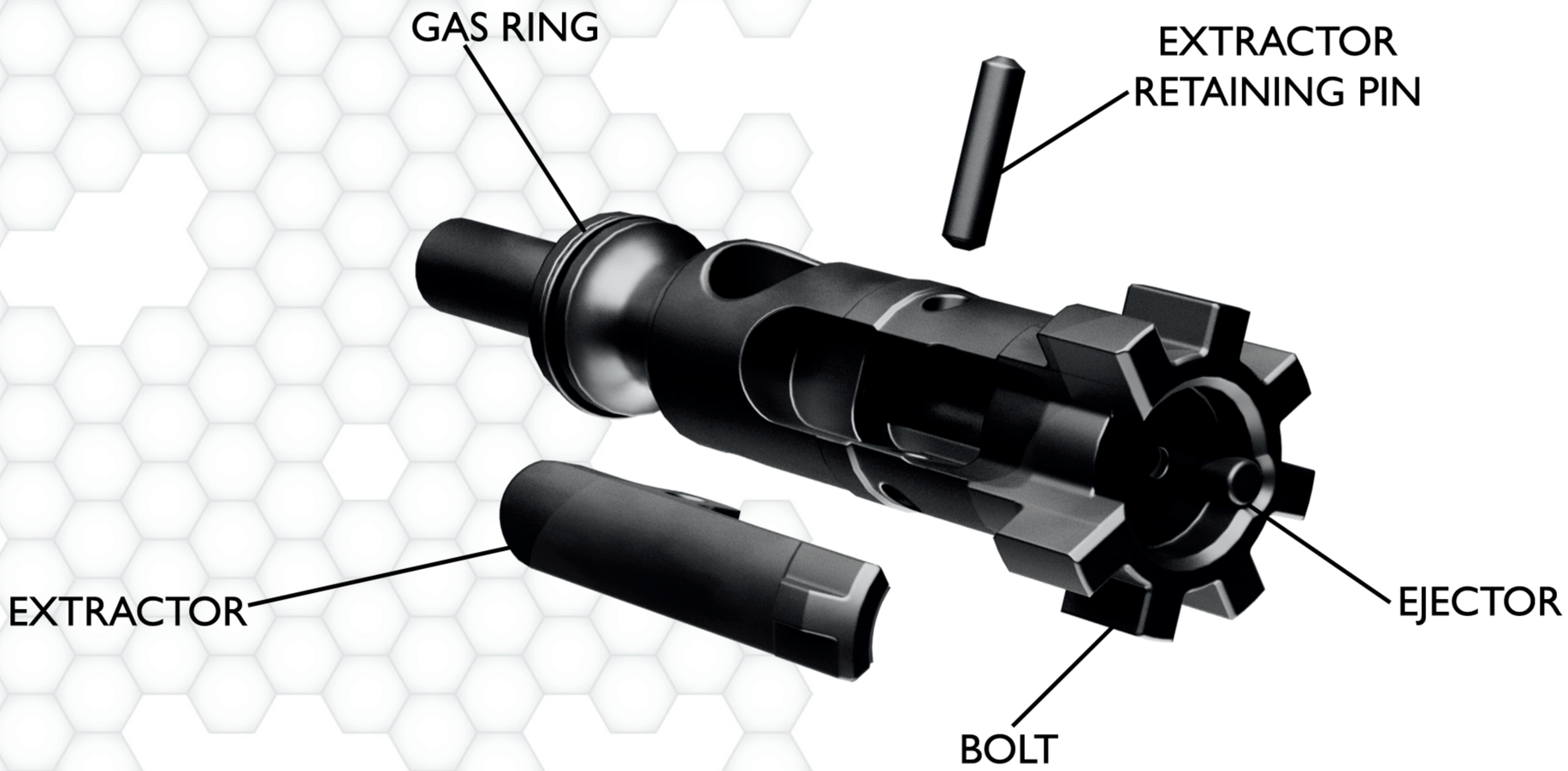
BOLT CARRIER GROUP

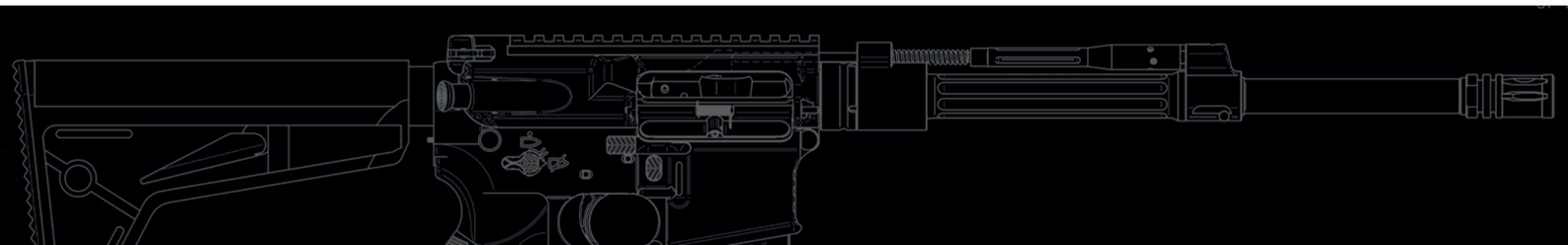


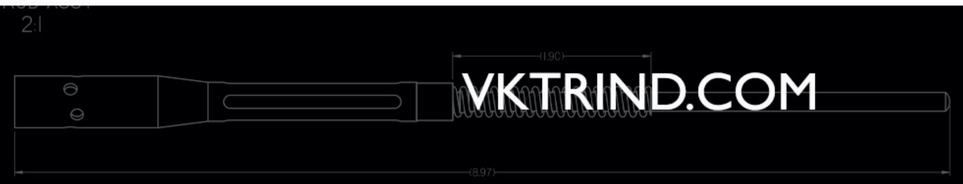
VKTR INDUSTRIES



BOLT







PISTON OPERATING SYSTEM DISASSEMBLY

Please note that it is not necessary to disassemble the piston operating system for routine maintenance. The operating system is designed to be maintenance-free and requires no servicing. If you wish to remove the piston system for cleaning and inspection after use in adverse conditions such as extreme rainfall, wet environments, or dry and dusty environments. Follow these instructions to complete the detailed disassembly of the upper receiver assembly and remove the piston operating system:

1. Undo the Handguard Retaining Bolt (7) at the rear of the handguard and remove it.

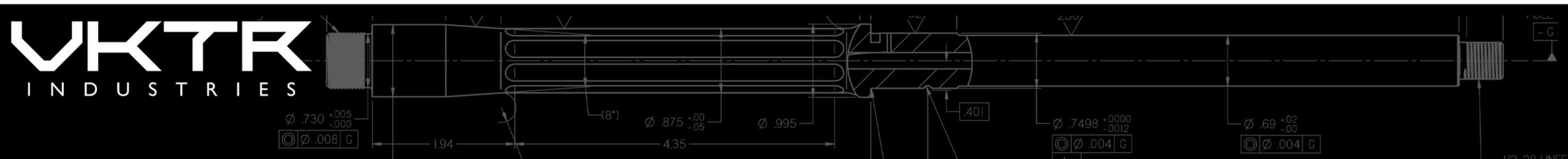
2. Slide the handguard forward and remove from the barrel.

3. Undo the two screws on the underside of the gas block and remove.

4. With a suitable punch or bullet tip, either push the gas block takedown pin from the left side or pull it from the right. The takedown pin is captured and cannot be fully removed from the gas block.

5. Slide the gas block forward off the gas journal and onto the barrel. In certain instances, you may need a wooden dowel or plastic gunsmithing mallet to start the gas block moving. The gas block cannot be fully removed from the barrel if a muzzle device is mounted.

6. The gas block and gas nozzle are one assembly, once the gas nozzle clears the operating rod, rotate it out of the way and remove the operating rod. No further disassembly is required.



REASSEMBLY

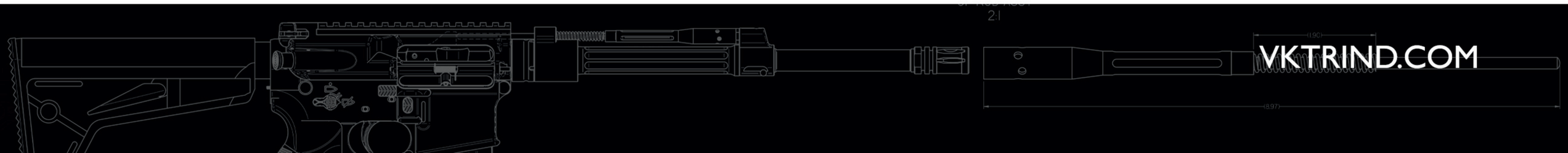
Reassembly of the VK-1 is achieved by reversing the order of the disassembly steps. Some items to keep in mind during the reassembly are:

1. When reassembling the piston operating system, insert the operating rod first. Next, slide the gas block assembly onto the barrel gas journal. There is an index pin at the barrel shoulder that inserts into a corresponding notch in the gas block to ensure correct alignment of the gas block assembly. The gas block assembly should be firmly pushed against the barrel shoulder with the gas nozzle inside the operating rod. Only when it is in this position will you be able to push the takedown pin into place. Next, inspect and tighten the two locking screws to a torque setting of 33-35 in/lbs. Once this is completed, rotate the operating rod around the nozzle using your fingers to ensure everything is seated correctly; there should not be any binding of the operating rod.

2. Slide the handguard over the barrel and onto the barrel nut assembly. The two anti-rotation tabs at the top rear of the handguard should slide over each side of the upper receiver, push the handguard firmly against the front of the upper receiver to seat correctly. Insert the handguard retaining bolt and torque to 42-45 in/lbs.

3. When reinstalling the buffer and buffer spring, push the buffer fully into the lower receiver extension, passing the buffer detent to ensure that it is FULLY CAPTURED by the detent.

4. DO NOT forget to install the cam pin. There is an arrow indicating which way the pin is to be inserted into the bolt carrier, the arrow should always point towards the bolt. The rifle can potentially chamber a round and fire without the cam pin, which would result in an unlocked breach and could lead to catastrophic failure of the weapon.



ROUTINE MAINTENANCE

Routine maintenance is generally performed after each firing session or once daily while operating in normal field conditions. As always, clear the weapon before performing any maintenance.

1. Clear the weapon

2. Field strip the weapon as detailed on page 22.

3. Clean the bore of the barrel. Using a cleaning rod, push a bore patch soaked with solvent from the chamber end of the barrel to the muzzle end. Remove the bore patch and cleaning rod, then let the barrel sit for several minutes.

4. Using a cleaning rod with a bore brush, punch the bore several times to break buildup free.

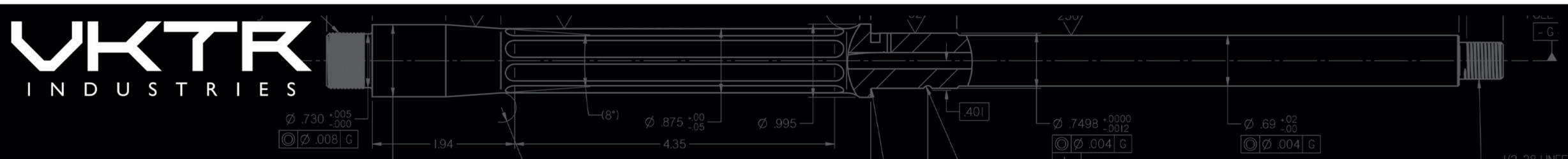
5. Punch the bore with a dry patch to remove the residue and solvent. Repeat this step until the patches come through the bore clean.

6. Wipe the bolt carrier, charging handle, interior of upper receiver, buffer and buffer spring with a cloth slightly dampened with cleaning solvent if available.

7. Wipe the face of the bolt with a nylon brush dipped in cleaning solvent if dirty.

8. Remove the solvent from the parts with a cloth or rag.

9. Apply a few drops of point lubricant to the interior of the upper receiver, buffer spring, charging handle, and bolt carrier. DO NOT lubricate the face of the bolt.



DETAILED MAINTENANCE

Detailed maintenance should be performed every 2,500 to 3,000 rounds or once weekly while operating in normal field conditions.

1. Clear the weapon.

2. Complete the detailed disassembly as described on page 24.

3. Complete all the routine maintenance detailed on page 29.

4. Scrub the bolt (including the extractor) with a nylon brush dipped in solvent. Pay particular attention to removing buildup of any type in the extractor groove. Wipe away any remaining solvent with a rag or cloth.

5. Scrub the bolt carrier, firing pin, and the interior of the upper receiver with a nylon brush dipped in cleaning solvent.

6. Clean the firing pin hole and firing pin cavity of the bolt with a pipe cleaner.

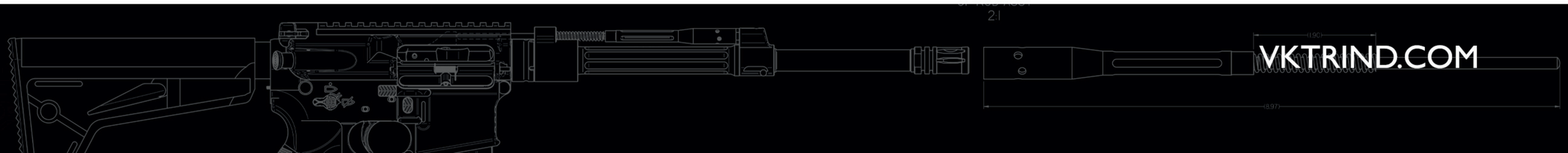
7. Wipe away any remaining solvent thoroughly with a rag.

8. Apply a few drops of lubricant to the cavity on the carrier into which the bolt is installed.

9. NOTE: The piston operating system is designed to be maintenance-free. Only perform the following procedures if the weapon has been used in adverse conditions as detailed on page 31. Follow the instructions on page 27. Brush the gas nozzle, both inside and out. Wipe away any remaining carbon residue with a rag and cleaning solvent. You may have to repeat this process if the nozzle has been heavily fouled in a moist environment as carbon is hygroscopic and can form very hard deposits.

10. Fully dry the piston components. No lubrication should be used on these parts.

11. Reassemble the weapon and check to make sure that all moving parts are functioning correctly as shown on page 28.



MAINTENANCE PROCEDURES FOR ADVERSE CLIMATES

In adverse sandy, muddy, and snowy conditions, conduct frequent function checks of your weapon and take every opportunity to remove sand, mud, and snow from the weapon. Carrying the weapon in a soft case when not in use is highly recommended. A small paintbrush can also be used to remove sand from the weapon.

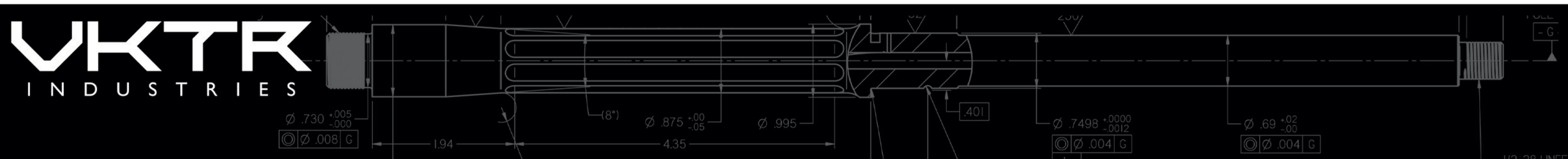
Do not lubricate the interior of the upper receiver or any exterior parts of the rifle when operating in extremely sandy or snowy environments. In line with the maintenance procedures detailed on pages 29 and 30, apply point lubrication as sparingly as possible.

The design of the handguard allows for quick cleaning of mud, sand, or snow from the piston components without having to first remove the handguard.

FOR EXTREME COLD ENVIRONMENTS

Always use a cold weather-rated lubricant. If the weapon is brought inside from a cold, dry area, allow the weapon to warm to ambient temperature before performing any maintenance. Wipe down and remove any condensation before returning the weapon back into cold temperatures. If snow gets inside the weapon, pull out the rear takedown pin and open the weapon. Remove snow from inside the lower receiver, upper receiver, and bolt carrier. Check the bore for snow and remove the snow if necessary.

In the unlikely event the weapon freezes shut, do not attempt to thaw it by firing it. Warm the weapon using body heat or other source of heat until it is unfrozen. If using indirect or radiated heat, hold the weapon at least eight inches above the heat source with the muzzle pointing in a safe direction and with the magazine removed prior to warming until thawed.



TROUBLESHOOTING

The following sections describe the various failures that could occur during the operation of the VK-1. It is important to note that the cause of many failures lies with the magazine. The magazine is a disposable part of the weapon system and one that can wear out over time, unlike the VK-1. It is good practice to mark and number magazines to allow for easy identification of old/worn/defective ones.

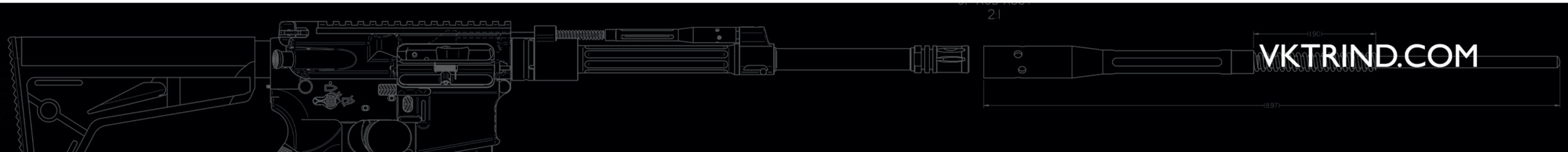
SUPPRESSOR USE

Older style suppressors can cause a weapon to exhibit over-gassed symptoms. The VK-1 is gassed and timed correctly, so even when using these earlier suppressor designs, they are unlikely to cause these problems. If you do notice examples of this, contact VKTR Industries detailing the exact symptoms and make and model of suppressor.

FAILURE TO SEAT THE MAGAZINE

Magazine will not lock into rifle.

CAUSE	CORRECTIVE ACTION
Too many rounds in magazine.	Remove rounds from magazine.
Bent/damaged feed lips or locking cutout.	Inspect magazine and replace as necessary.
Bent/broken magazine catch.	Inspect magazine catch assembly and replace as necessary.



TROUBLESHOOTING CONTINUED

FAILURE TO LOAD

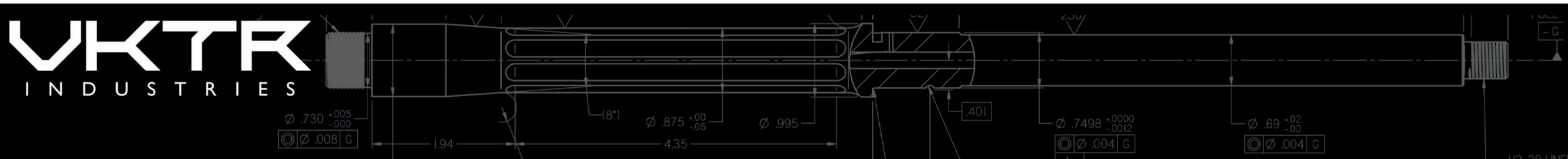
No round present in chamber after charging, releasing bolt.

CAUSE	CORRECTIVE ACTION
Magazine not seated properly.	Reinsert magazine, tap/tug to ensure locked in place, charge rifle or release bolt catch.
Rifle not fully charged.	Ensure charging handle is pulled all the way to the rear before release.
Unable to fully charge rifle.	Ensure correct buffer and spring are installed, check buffer roll pin is flush with outside of buffer body, inspect lower receiver extension for foreign object.
Bent/damaged magazine feed lips.	Inspect magazine and replace as necessary.
Worn/damaged bolt lugs.	Replace bolt.
Object detected in magazine.	Remove object, replace magazine spring and/or follower if required, clean magazine.

FAILURE TO FEED

Bolt lugs pushing on back of cartridge case, nose of round jammed into receiver ramps, barrel extension feed ramps or lugs.

CAUSE	CORRECTIVE ACTION
Worn or incorrect buffer spring.	Replace buffer spring. Repair is not possible.
Too many rounds in magazine.	Remove rounds from magazine.
Magazine not seated correctly.	Reinsert magazine, tap/tug to ensure locked in place, charge rifle or release bolt catch.
Bent/damaged magazine feed lips.	Inspect magazine and replace as necessary.
Worn or weak magazine spring.	Replace magazine spring.



FAILURE TO CHAMBER

Round has pushed past feed ramps and failed to enter chamber at correct angle. *Do not attempt to reuse failed round if damage is apparent.

CAUSE	CORRECTIVE ACTION
Magazine not seated properly.	Remove magazine, lock bolt carrier to the rear, clear round, reinsert magazine.
Foreign object detected.	Clear, field strip rifle, inspect and clean receiver, barrel extension, chamber.
Short stroke.	See the Short Stroke Section of Troubleshooting.

DOUBLE FEED

Two LIVE rounds being simultaneously fed into chamber. This is always a magazine or operator induced failure.

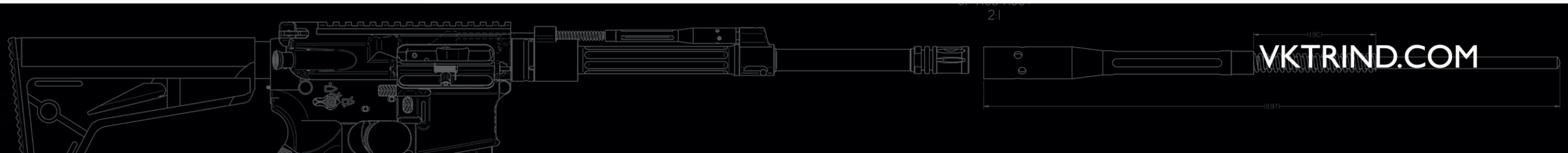
DOUBLE FEED (Cont.)

CAUSE	CORRECTIVE ACTION
Bent or damaged magazine feed lips.	Inspect magazine and replace as necessary.

FAILURE TO LOCK

Round has entered chamber correctly, but bolt has not fully locked into barrel extension or seated cartridge base properly onto bolt face. *Do not attempt to reuse failed round if damage is apparent.

CAUSE	CORRECTIVE ACTION
Magazine not seated properly.	Remove magazine, lock bolt carrier to the rear, clear round, reinsert magazine.
Foreign object detected.	Clear, field strip rifle, inspect and clean receiver, barrel extension, chamber.
Short stroke.	See the Short Stroke Section of Troubleshooting.



TROUBLESHOOTING CONTINUED

FAILURE TO FIRE

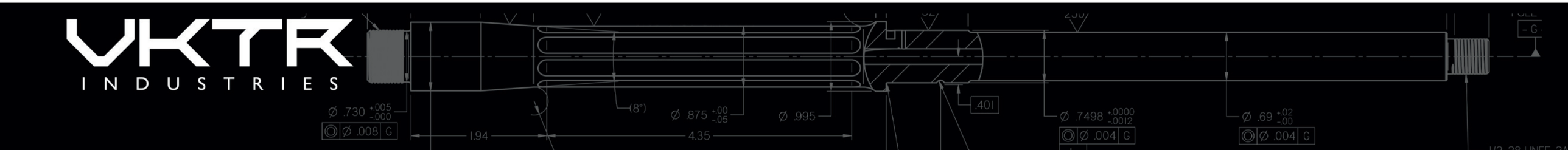
LIVE round in chamber, trigger is pulled, round fails to discharge.

CAUSE	CORRECTIVE ACTION
Defective ammunition.	Inspect ammunition, look for indentation on cartridge primer.
Broken or weak hammer spring.	Replace hammer spring.
Broken or worn firing pin tip.	Replace firing pin.
Foreign object.	Clear, field strip weapon, inspect receiver, barrel extension, bolt face and extractor, inside chamber, and barrel extension.
Carrier/bolt bounce (select fire only.)	See Carrier/Bolt Bounce Section of Troubleshooting.

FAILURE TO EXTRACT

Spent case remains in chamber after firing and carrier group has either short-stroked and returned forward or fully cycled and attempted to load a new round into a now blocked chamber.

CAUSE	CORRECTIVE ACTION
Worn or broken extractor.	Inspect extractor and extractor spring, replace extractor or spring as necessary.
Corroded or damaged ammunition.	Remove fired case from chamber and inspect. Inspect all ammunition and replace as necessary.
Torn cartridge case rim.	Remove fired case from chamber and inspect case and chamber. Clean chamber and replace ammunition as necessary.
Foreign object.	Clear, field strip weapon, inspect receiver, barrel extension, bolt face and extractor, inside chamber, and barrel extension.

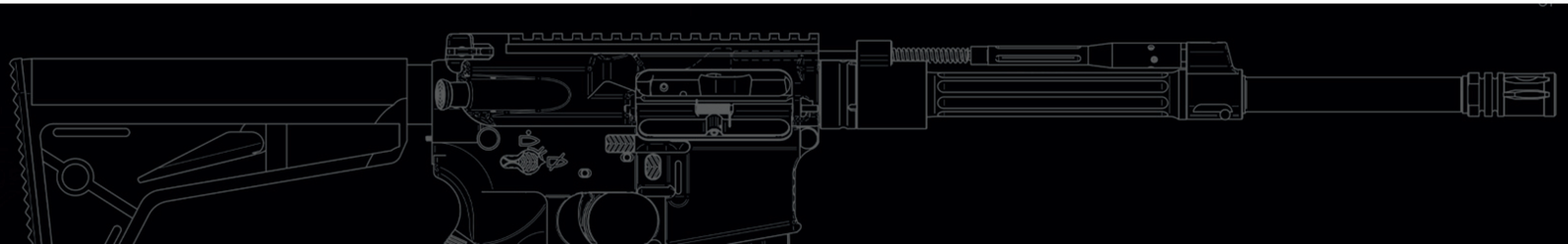


FAILURE TO EXTRACT (Cont.)

CAUSE	CORRECTIVE ACTION
Defective ammunition.	Inspect ammunition, and ensure it is the correct caliber as indicated on the weapon and that it is SAAMI/CIP/NATO compliant.
Weak or worn buffer spring.	Replace buffer spring.
Worn, stuck, or broken ejector spring.	Replace ejector spring.
Foreign object, extractor.	Inspect, remove, and clean extractor. under extractor not allowing spent case to be released.
Foreign object, barrel.	Clear, field strip rifle, inspect and clean bolt face, under extractor, inside chamber and barrel extension.
Stuck or broken ejector.	Remove ejector, inspect. Replace or clean as necessary.
Short stroke.	See the Short Stroke Section of Troubleshooting.

FAILURE TO EJECT

Spent case has been pulled partially or completely from the chamber into the receiver but has failed to clear the ejection port. This is commonly confused with a double feed because the following round is usually jammed in with a spent case, resembling two LIVE rounds in the receiver. See Double Feed Section of Troubleshooting for more details.



TROUBLESHOOTING CONTINUED

CARRIER BOUNCE/BOLT BOUNCE - NOTE: SELECT FIRE VARIANTS ONLY

During automatic fire, the bolt carrier group can rebound off the barrel extension as it moves into battery. As the firing pin will not protrude through the bolt face unless the bolt carrier group is fully in battery, bolt bounce causes the hammer to strike the firing pin while the pin is still recessed in the bolt, leading to a LIVE ROUND chambered and un-fired even though the trigger is still being pulled. The action of the hammer striking the pin can move the bolt carrier group forward enough to partially lock the chamber.

CAUSE	CORRECTIVE ACTION
Worn, broken, or incorrect buffer spring.	Replace buffer spring. Use only VKTR Industries recommended springs.
Incorrect buffer.	Replace with VKTR Industries recommended buffer.
Worn or broken operating rod spring.	Replace spring.

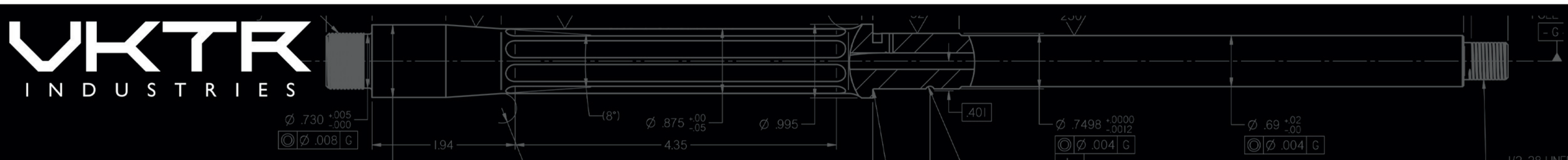
CARRIER BOUNCE/BOLT BOUNCE (Cont.)

CAUSE	CORRECTIVE ACTION
Suppressor causing excessive back pressure.	Contact VKTR Industries detailing the exact symptoms and make and model of suppressor.

SHORT STROKE

Insufficient amount of force or excessive drag in the operating system, not allowing the weapon to fully complete its operational cycle.

CAUSE	CORRECTIVE ACTION
Underpowered or subsonic ammunition.	Inspect ammunition and replace as necessary.
Dirty, fouled, or excessively dry bolt carrier group.	Clean bolt carrier group, upper receiver, and chamber, apply point lubrication as detailed on pages 29 and 30.
Lower receiver extension misaligned.	Reinstall and realign lower receiver extension.



SHORT STROKE (Cont.)

CAUSE	CORRECTIVE ACTION
Incorrect buffer (too heavy).	Replace with VKTR Industries recommended buffer.
Incorrect spring (too heavy).	Replace buffer spring. Use only VKTR Industries recommended springs.

STOVE PIPE

Spent casings are jammed sideways between bolt and ejection port, typically a result of the rifle operating system cycling too fast. More common with full automatic variants or when equipped with older style suppressors.

CAUSE	CORRECTIVE ACTION
Worn or broken operating rod spring.	Replace spring.
Worn or incorrect buffer spring.	Replace buffer spring. Repair is not possible.

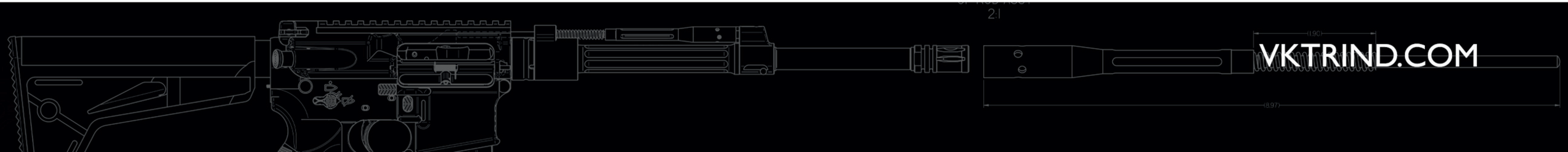
STOVE PIPE (Cont.)

CAUSE	CORRECTIVE ACTION
Suppressor causing excessive back pressure.	Contact VKTR Industries detailing the exact symptoms and make and model of suppressor.
Incorrect buffer.	Replace with VKTR Industries recommended buffer.

ACCURACY ISSUES

Shots failing to group consistently.

CAUSE	CORRECTIVE ACTION
Defective ammunition.	Inspect all ammunition and ensure it is the correct caliber as indicated on the weapon and that it is SAAMI/CIP/NATO compliant. Use match grade ammunition for best results.
Sights or optic mounts not installed properly.	Ensure sights and or mounts are torqued correctly to their manufacturer's specifications.



TROUBLESHOOTING CONTINUED

ACCURACY ISSUES (Cont.)

CAUSE	CORRECTIVE ACTION
Excessive bore fouling.	Clean bore as detailed on page 29.

TUMBLING ROUNDS (KEYHOLING)

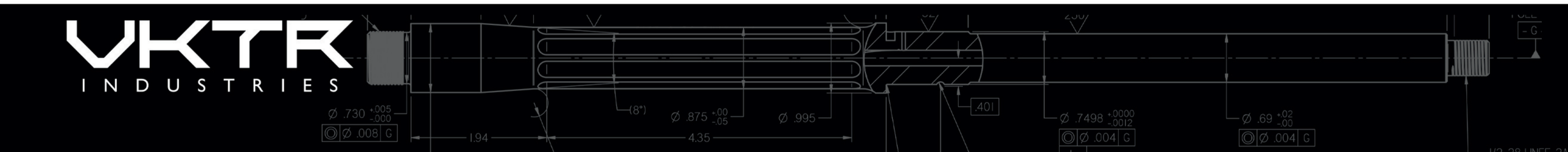
Rounds are failing to stabilize in bore, striking the target sideways, resembling a “keyhole” shape.

CAUSE	CORRECTIVE ACTION
Defective ammunition.	Inspect all ammunition and ensure it is the correct caliber as indicated on the weapon and that it is SAAMI/CIP/NATO compliant. Use match grade ammunition for best results.
Excessive bore fouling.	Clean bore as detailed on page 29.
Barrel has reached end of service life.	Replace barrel assembly.

NOTE: Barrel life can be significantly shortened by excessive rates of fire which heats the barrel to a point where the metallurgical properties of the barrel change.

Excessive heat also causes the bore diameter to expand and allows the propellant gasses to overtake the bullet traveling up the bore. These compressed high-pressure jets can act as a plasma and can cut and erode the bore.

The use of projectiles that do not readily compress like sintered powdered metal frangible projectiles, solid metal (copper/ brass) projectiles, and jacketed projectiles with non-lead cores may result in shortened barrel life.



WARRANTY

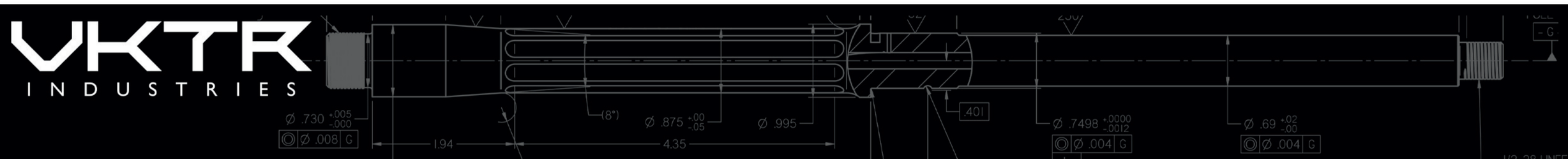
VKTR Industries products are warranted to be free from defective materials and workmanship for the life of the original purchaser. VKTR Industries' obligation under this warranty shall be limited to (1) repairing or (2) replacing any product that, upon inspection at VKTR Industries and based on its discretion, is found to be defective in material or in workmanship.

This warranty is limited and does not extend to: careless handling, abuse and misuse, unauthorized adjustments or modifications, use of improper or remanufactured ammunition, excessive or unreasonable use, ordinary wear and tear, rust or corrosion, and damages due to non-factory barrel obstructions. Repairs and replacements are warranted for the duration of the original warranty. This warranty applies only to factory-built products that have been purchased through an authorized VKTR Industries distributor or direct dealer. The warranty is only good for the original purchaser of the product. To register your VK-1, please email warranty@vktrind.com for more information.

WARRANTY CONTINUED

Exclusive Remedy: The remedies in this section and in the warranty agreement constitute the sole and exclusive remedies of any authorized customer, as well as its successors and assigns, for any defect in the product.
Disclaimer: The warranty stated in this agreement is the sole and exclusive warranty pertaining to the product. VKTR Industries disclaims any warranty, express or implied, including, without limitation, any warranty of merchantability or fitness for a particular purpose. In no event shall VKTR Industries be responsible for any indirect, incidental, or consequential damages including, without limitations, lost profits, or costs of delay, with respect to economic loss or injury to property or to third parties, whether as a result of breach of express or implied warranty, negligence or otherwise.

Prior to returning any VKTR Industries product for warranty work, you must receive return material authorization (RMA) from our customer service department. The contact information is available in this document. Items are returned using prepaid shipping. VKTR Industries accepts no responsibility for items lost or damaged in shipping. Items that are returned and found to be Out-of-Warranty will be repaired at the customer's expense; however, no work will be performed without the customer's written authorization.

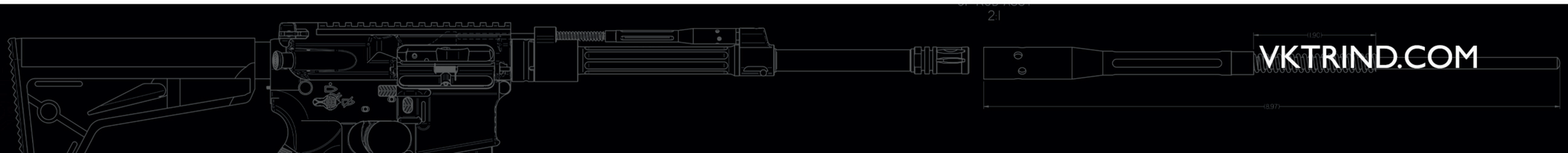


VKTR

INDUSTRIES

VKTR Industries LLC
7258 Burgan Grove Rd
House Springs, MO 63051

info@vktrind.com
(847) 989-8288



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7258 BURGAN GROVE RD
HOUSE SPRINGS, MO 63051
VKTRIND.COM