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Working... Working... One of the most frequently overlooked components of the AR-15 is its buffer weight, a critical element in the AR-15s buffer assembly. Despite its importance, enthusiasts often overlook changing or upgrading their buffer when optimizing their rifle setups. Changing your buffer to a different weight can change the entire feel of your rifle when shooting. It can lower the felt recoil, improve reliability, and even improve your split times. Today, we will explore the various buffer weights available for the AR-15, when to use them, and the benefits they can bring to your rifle: The AR-15 buffer assembly is comprised of three main parts: the buffer, buffer/recoil spring, and buffer tube. Both the spring and buffer are housed inside of the buffer tube, which is attached to the rear portion of the lower receiver. This assembly plays a key part in the cycling of the AR-15. After a cartridge has been fired, the gas system propels the bolt carrier group (BCG) rearward, where the BCG strikes the buffer. The buffer and spring catch the BCG, allowing it to cycle back and return to battery, repeating the cycle with each shot. Because of how crucial this assembly is when it comes to your rifle functioning, its important to make sure you have the right buffer weight. If your rifle is having problems cycling, whether it be a failure to eject, failure to feed, or failure to cycle, the buffer assembly could likely be the issue. If your buffer is too light or too heavy, it could lead to a multitude of problems, as well as increasing the amount of wear and tear on the internal components of your rifle. You can really fine-tune the cycling rate, felt recoil, and ejection pattern by simply changing out the buffer weight in your AR-15. While it seems simple, it can get complicated fairly quickly, as there are many weights to choose from. Adjusting your buffer weight can get you some great results, but at the same time, it can also be detrimental to your shooting experience if you choose the wrong weight. Before you put another buffer into your rifle, its important to know what different buffer weights can do to your rifles cycling, and when to opt for a certain weight. One of the main factors that determines what buffer weight youll need is whether your rifle is overgassed or undergassed. Its fairly common for AR-15s to be slightly overgassed. This isnt necessarily a problem, since higher gas pressures can help the rifle operate when it gets dirty or when in rough conditions. That said, overgassing can lead to problems like increased recoil, higher amounts of carbon build up, and lower shot velocities. Undergassed rifles have their share of issues as well. Lower gas pressures can hinder the rifles ability to properly eject rounds or cause feeding issues or other cycling issues. Generally, in these situations, its better to be slightly overgassed than undergassed. Regardless, they can both be mitigated by using an adjustable gas block and a new buffer weight. Whether youre a seasoned AR-15 aficionado or a newer enthusiast, its a known fact that lighter recoiling rifles tend to be more fun to shoot and much more controllable when making quick shots in succession. Increasing your buffer weight can aid in reducing the amount of felt recoil your rifle has. A heavier buffer is more resistant to the forces put on from it the BCG after firing the rifle. More resistance means the BCG wont recoil as hard into the buffer and spring assembly, effectively reducing the felt recoil. Switching to a heavier weight isnt always the best option though. Keep in mind that since your buffer will resist the movement of the BCG more, the cyclic rate of your rifle will take longer. If you know that youre going to be making quick shots in rapid succession, like in a competition setting, a too slow or too quick cyclic rate can make your rifle unreliable. Ideally, youll want to find the right balance between your gas setting and the buffer weight. There are a lot of buffers to choose from, with some being better for other applications. It can be confusing to those who dont know the differences between the buffers available. Fortunately, its much simpler than it appears, and below, we have a breakdown of each of the most common buffer weights: Carbine buffer weights are the standard weight thats included in most AR-15s. This weight works best in mid-length gas systems but is commonly used in carbine gas-length ARs as well; just keep in mind that using this buffer with a carbine gas system will increase your felt recoil. This buffer weight is incredibly popular. It works with a wide array of calibers and ammo types including sub-sonic and high velocity ammunition. There are a lot of buffers to choose from and the H1 is the lightest of them. This buffer weight is great for many kinds of rifle setups. Using this buffer can reduce the amount of felt recoil your rifle has, but it can also keep the bolt from unlocking too soon after firing a round. Under perfect conditions, the H1 buffer works better in a mid-length or rifle-length gas system. Each of the H buffers have the same length as the standard Carbine buffer and will fit in your rifle without modification. This buffer weight has nearly an additional ounce of weight when compared to the H1. H2 buffers work exceptionally efficiently in carbine-length and mid-length gas systems, aiding with the rifles cycling ability while reducing felt recoil. Just about every rifle with a barrel between 13.7 and 16 inches can effectively run an H2 buffer when paired with the right spring. Its also a great choice to use in AR-15 pistols and SBRs (Short Barreled Rifles). The H3 is one of the heaviest of the H buffers, adding nearly 3 ounces to the standard Carbine buffer. H3 buffers are most commonly used in overgassed 5.56NATO AR-15s, as well as rifles chambered in other calibers. Generally, if the cartridge has a higher amount of muzzle energy, the H3 buffer is a great option to use. For instance, 300 Blackout and 7.6239 have considerably more powder and muzzle energy when compared to standard 5.56NATO cartridges. Though the extra weight of the H3 buffer can still be used to great effect in a 5.56NATO rifle, it works best when paired with larger calibers like 300 Blackout, 7.6239, and 6.5 Grendel. When used with these calibers, it has a better chance of increasing cycling efficiency while reducing felt recoil. Pistol buffers are used primarily on pistol caliber carbines (PCCs). Pistol caliber AR-15s dont use or need gas systems to cycle the action. Instead, they use a direct blowback system. Its one of the most basic firearm operating systems and works exceptionally well on pistol calibers since they dont require any lockup to properly chamber the cartridge. That said, direct blowback PCCs often have higher felt recoil than their intermediate caliber counterparts and a pistol buffer provides enough weight to dampen the recoil felt by PCCs. A rifle buffer is almost double the length of the standard carbine buffer and is exclusively used in rifles with rifle length buffer tubes. One such example is the A2 buffer tube. Its longer than carbine buffer tubes, and as such, it requires a longer spring and buffer. If youre running an A2 stock and buffer tube on your rifle, you CAN NOT use any of the of the aforementioned buffers without switching to a carbine buffer tube first. Doing so will cause your BCG to slam into the back of the buffer tube with greater force, potentially damaging your rifle. If youre wanting to change out your A2 stock to a carbine one, our guide on how to remove an A2 stock will walk you through the process. Below are some weight recommendations for AR-15s chambered in 5.56NATO: The A5 Buffer system from VLTOR, is certainly unique and incredibly versatile. It was initially designed and developed at the request of U.S. Marine Corps and was designed to mimic the smooth impulse of a rifle-length buffer assembly. As a result, it cannot be used with the standard carbine buffer tube. The A5 Buffer is slightly longer than the carbine buffer size, and as such, it requires a longer buffer tube and recoil spring, like an A2 length rifle spring, to use. Fortunately, A5 Buffer Tubes are relatively common, so you wont have any difficulty finding an A5 system to match your setup. You can find A5 buffers similar to the weights mentioned above, and, depending on the manufacturer, you can find specialty weights like 6.08-Ounce and 6.83-Ounce too. Its incredibly simple to change out your buffer with a new one. It does require some prep work though. Just like with any rifle modification, always make sure that your rifle is unloaded. Drop the magazine from the rifle, pull the charging handle back and lock it by pressing down on the bottom of the bolt catch. After ensuring that your rifle isnt loaded, both visually AND physically, you can close the bolt and remove the upper receiver from the lower receiver. Once the upper is removed from the lower, depress the buffer detent to release the buffer and buffer spring from the buffer tube. Now that the buffer and spring assembly is out of the buffer tube, you can pull the buffer out of the spring. It will take a slight amount of force to remove the buffer, but it shouldnt be too difficult. With your old buffer pulled from the spring, youre good to put your new buffer in its place. Install your buffer into the recoil spring by pressing it into the spring until its fully seated. With your new buffer installed into the recoil spring, you can reinstall it into the buffer tube. Once installed, reattach your upper receiver to your lower and perform a function check to make sure that everything is working properly. If they are, youre good to head to the range and try out your new buffer system. Though not necessary, its a good idea to clean your rifle while its disassembled. Cleaning off any carbon that has built up in the barrel, upper receiver, and on the BCG is much easier done when the rifle is disassembled. After cleaning, apply some oil or lubricant to your BCG to keep the action running smooth. If you plan on making more changes than just your buffer, its important to know how to disassemble and reassemble one if you plan on making upgrades to it. Follow our guide on assembling a lower receiver to see how its done, step-by-step. If youre building a new AR-15 or simply interested in swapping out your current buffer assembly with an upgraded one, there are a multitude of buffer tube kits available. These kits come with all of the parts necessary to build out a buffer assembly on your lower receiver, including the buffer tube, recoil spring, and buffer itself, depending on the kit. While most kits come with standard/mil-spec parts, others from specific manufacturers come with upgraded components and specialized buffer weights. A few examples would be Bravo Company Manufacturings MK2 Recoil Mitigation System and Geissele Automatics buffer assembly with their Super 42 braided recoil spring. The Recoil Mitigation System kit from Bravo Company Manufacturing comes with an A5buffer tube, their upgraded recoil spring, end plate, castle nut, and thebuffer weight of your choice. The Geissele kit also comes with some mil-spec components, but included in the kit is their Super 42 braided recoil spring. This spring has a longer lifespan than the mil-spec recoil spring, and the braided spring works to remove any excess vibrations that can occur with standard ones. Depending on what you want to use your AR-15 for, these kits and specialized components might be worth considering adding to your build. There are some options available that are designed for use with suppressors, while others are specialized for SBRs and pistol builds. If youre building a specialized AR-15 or are upgrading yours to be as such, specialized components can greatly enhance your shooting experience. Buffer assemblies are often overlooked when enthusiasts start making upgrades to their rifles. However, when theyre optimized for a specific rifle, they make a world of difference, enhancing the shooting experience with less felt recoil and increased cyclic reliability. We highly encourage you to take full ownership of your rifles by customizing them to fit your needs and changing out your buffer assembly is just the start when it comes to customizing your rifle. So now that you know what to do about your buffer, check out our guides on the quick and easy upgrades to your AR-15 and the best pistol grips to see what else is possible. Bottom line is no special buffer needed for 6.5 Grendel. From Alexander Arms FAQs:Question: Will my 6.5 Grendel upper receiver require me to replace the buffer or buffer spring with something heavier/stronger/different/better?Answer: No, replacement of the buffer or buffer spring components is not required as long as the lower receiver is made to standard specifications. Buffer components should not be replaced if they are already standard. . . . Both the .50 Beowulf and our 6.5 Grendel weapons are properly designed to work specifically with standard-specification lower receiver assemblies containing standard-specification components. It is a common misconception that weapons with higher-than-average recoil, such as the .50 Beowulf, automatically require a stronger buffer spring or heavier buffer to compensate for higher recoil in some way. This is not true of properly designed weapons. The AR-15 buffer and buffer spring are used only for the cycling of ammunition inside of the rifle. Recoil in an AR-15 rifle is almost entirely unrelated to the buffer components. . . . A direct gas impingement weapon that allows too much gas pressure through the system will cause the buffer to bottom out very hard in the receiver extension, thus slightly increasing felt recoil. Our AR-15 products do not have this flaw in design. Our products are specifically designed to use these particular, standard buffer components and no others just so that owners do not need to make specialized changes to their standard lower receivers. Replacement of these standard buffer components when using our products will not reduce recoil or help the weapon manage the higher recoil in any way. The only possible result is the failure to cycle ammunition properly. To reduce felt recoil, we strongly encourage any customer to order a muzzle brake or compensator. Rifle cartridge6.5mm Grendel6.5mm Grendel showing variety of bullets144gr (9.3g) to 90gr (5.8g)TypeRifle PlaceoforiginUnited StatesProduction historyDesignerBill Alexander and Janne PohjoispDesigned2003[1]SpecificationsParentcase.220 Russian (5.639mm)[2]CasetypeRimless, bottleneckBulletdiameter6.71mm (0.264in)Landdiameter6.50mm (0.256in)Neckdiameter7.44mm (0.293in)Shoulderdiameter10.87mm (0.428in)Basediameter11.15mm (0.439in)Rimdiameter11.2mm (0.44in)Rimthickness1.5mm (0.059in)Caselength38.7mm (1.52in)Overalllength57.5mm (2.26in)Case capacity2.3cm3 (35gr H2O)Riflingtwist1 in 200mm (8in) or 1 in 230mm (9in)PrimertypeSmall rifleMaximum pressure360MPa (52,000psi)Ballistic performanceBullet mass/typeVelocityEnergy90gr (6g) Speer TNT2,880ft/s (880m/s)1,658ftlbf (2,248J)108gr (7g) Scenar (moly)[3]2,790ft/s (850m/s)1,866ftlbf (2,530J)120gr (8g) Norma FMJBT2,700ft/s (820m/s)1,942ftlbf (2,633J)123gr (8g) Sierra Matchking2,650ft/s (810m/s)1,917ftlbf (2,599J)130gr (8g) Norma2,510ft/s (770m/s)1,818ftlbf (2,465J)Test barrel length: 24 inches (610mm)Source(s): Alexander Arms Pressure-safe Load DataThe 6.5mm Grendel (6.538mm) is an intermediate cartridge jointly designed by British-American armorer Bill Alexander, competitive shooter Arne Brennan (of Houston, Texas) and Lapua ballistician Janne Pohjoisp, as a low-recoil, high-precision rifle cartridge specifically for the AR-15 platform at medium/long range (200800 yard). It is an improved variation of the 6.5mm PPC.[4]The 6.5mm Grendel cartridge was first unveiled in May 2003 at the Blackwater Training Facility in North Carolina, where it remained supersonic at 1,200yd (1,100m) range and out-shot the 7.62mm NATO with only half the recoil.[5] Since its introduction, it has proven to be a versatile cartridge and is now expanding into other firearm design platforms including bolt-action rifles and the Kalashnikov system.[6]The name "Grendel" is inspired by the mythical monster antagonist from the Old English epic poem Beowulf.[7] It was a trademark owned by Alexander Arms (Bill Alexander's company in Radford, Virginia) and manufactured at Radford Arsenal,[8] until legally released in 2010 for SAAMI standardization with collaboration from Hornady.[7][9][10]The goal of the 6.5mm Grendel design was to create an effective STANAG magazine-length cartridge for the AR-15 platform that could reach 200800yd (180730m) and surpass the performance of the native 5.56mm NATO/.223 Remington cartridge. Constrained by the dimension of the STANAG magazines, the Grendel's designers decided to use a shorter, larger-diameter case for higher powder volume while allowing space for the long, streamlined, high ballistic coefficient 6.5mm (.264 cal.) bullets. Firing factory-loaded ammunition with bullets ranging from 90 to 129 grains (5.8 to 8.4g), its muzzle velocity varies from 2,500ft/s (760m/s) with 129- and 130-grain (8.4g) bullets to 2,900ft/s (880m/s) with 90gr (5.8g) bullets (similar in velocity to a 77-grain (5.0g) 5.56mm round). Depending on their case material and bullet weight, 6.5mm Grendel cartridges weigh 14.7 to 17.8 grams (227 to 275gr).The case head diameter of the Grendel is the same as that of the 5.639mm (.220 Russian), 7.6239mm and 6.5mm PPC cases. This diameter is larger than the 5.5645mm NATO, thereby necessitating the use of a non-standard AR-15 bolt. The increased case diameter results in a small reduction in the magazine ammo capacities. A 6.5mm Grendel magazine with the same dimensions as a 30-round STANAG magazine will hold 26 rounds of Grendel ammunition.C-Products 26-round Grendel MagazineProponents assert that the Grendel is a good "middle ground" between the 5.5645mm NATO and the 7.6251mm NATO. It retains greater terminal energy at extended ranges than either of these cartridges due to its higher ballistic coefficient (BC).[2] For example, the 123gr (8.0g) 6.5mm Grendel bullet has more kinetic energy and better body armor penetration at 1,000m (1,100yd) than the larger and heavier 147gr (9.5g) bullet of the M80 7.62mm NATO round.[11][12][13][14]In order to obtain ballistics that are superior to the 7.6251mm cartridge, a weapon with a longer barrel and firing a heavier bullet is necessary. To achieve the same results from shorter-length barrels, even heavier bullets are needed.[15] Muzzle Velocity Change with Bullet WeightBullet velocity: 24inch (609.6mm) barrelBullet massMuzzle velocity1,000 meter velocitygrgft/sm/sft/sm/sLapua Scenar1087.02,7008201,166355Lapua Scenar1238.02,6208001,222372Lapua FMJBT1449.32,4507501,213370As noted above, the Grendel case is very closely related to the .220 Russian case. In general, each additional grain of bullet weight will reduce muzzle velocity by 10.8ft/s (50.8m/s for each gram) and each additional inch of barrel length will increase muzzle velocity by 20ft/s (2.4m/s for each centimeter). Specific details are available as graphs derived from Alexander Arms' public domain load table linked below.Serbia is in process of adopting a rifle made by Zastava Arms[16][bettersourceneeded] in 6.5mm Grendel caliber as main armament for its armed forces. The rifle, designated Zastava M19, is a derivative of the previous-issue M70 rifle.[17] An American-manufactured rifle in 6.5mm Grendel caliber may also be adopted in armament for special forces units after it passes testing in Technical Testing Center.[citation needed] Three types of 6.5mm Grendel ammunition produced by Prvi Partizan of Uice, Serbia, will be tested for use with these rifles.[18][19][20][21]The French police tactical unit unit GIGN announced in 2025 that they are partnering with Swiss ammunition maker SwissP Defenc to produce 6.5 Grendel cartridges for the GIGN.[22][23].220 Russian (5.639mm).224 Valkyrie (5.641mm)6mm PPC6mm AR, a 6mm wildcat version which shares 6.5 Grendel's casing, but sends a (usually) lighter projectile up to 1,000 yards (900 m).6mm ARC, a factory cartridge with many similarities to the 6mm AR6.555mm Swedish6.5mm Creedmoor6.542mm, also known as 6.5 MPC (Multi Purpose Cartridge), based on a necked up .223 Remington case.[24]6.8mm Remington SPC7.6237mm Musang7.6239mmList of AR platform cartridgesList of rifle cartridgesTable of handgun and rifle cartridges^ "6.5mm Grendel (internet archive copy)". 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O. Ackley (links | edit)733mm Sako (links | edit)View (previous 50 | next 50) (20 | 50 | 100 | 250 | 500)Retrieved from " WhatLinksHere/6.5mm_Grendel" My 16" AA upper uses an H equivalent, and my 18" Lilja barreled upper uses and H2 equivalent. Both are mid length gas systems. I get 4:00 - 4:30 ejection with the 16" and 3:30ish ejection with the 18". Share copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Working... You've probably heard about the high power and accuracy of the 6.5 Grendel cartridge by now. And, you're probably interested in building one. Being able to ring steel at 800 yards using a short-action rifle like the AR sounds pretty epic. Let's review how to build aproperly configured Grendel AR-15 so you can maximize your accuracy and fun at the range.Frequent Questions Q: What is 6.5 Grendel? A:6.5 Grendel is a 6.5mm short-action cartridge based on the .220 Russian, which itself was designed as a combination of the AK-47's 7.62x39mm cartridge and the AR-15's 5.56 NATO.This guide compares Grendel to 5.56 NATO. If you're on the fence about building a 5.56-sized or .308-sized AR,this guide compares Grendel and 6.5 Creedmoor to help you decide. Q: Why should I bother with 6.5 Grendel at all? A:For decades, AR owners had to choose between the typical .22-caliber platform, and the .30-caliber AR platform. The 6.5 Grendel effectively bridges that gap: It fits in the .22-caliber AR, yet it provides performance that meets, and often exceeds, that of .308 Winchester. With a properly configured rifle, one can expect to hit targets with high accuracy at 800 yards. Q: What power and speed can I get out of Grendel? A: Grendel loads typically house 90-grain to 140-grain bullets. These loads produce between 2,400 and 2,800 feet per second of muzzle velocity with between 1,400 and 1,800 lb-.ft-. of muzzle energy. This truly is the "sweet spot" between 5.56 NATO, whose loads typically weigh 55 to 77 grains and .308, whose loads weigh between 125 and 185 grains. Q: What about 6.5 Creedmoor? Are these two similar? A: Yes, in fact: The 6.5 Creedmoor fires the same bullet as Grendel, a 0.264"-diameter round weighing about 90 to 140 grains. Yet Creedmoor utilizes a longer cartridge designed to fit in the .308 AR platform, producing more velocity and thus more performance. Creedmoor can achieve high accuracy beyond 1,000 yards, but the tradeoff is the need to investment in a longer, heavier, and more expensive rifle. Q: How do I build a 6.5 Grendel AR-15? A: Building a Grendel rifle (or simply converting an existing AR-15) is quite easy: 6.5 Grendel uses basically every .22-cal AR-15 part, including mil-spec upper and lower receivers and parts kits. You'll need to swap the bolt and extractor, and invest in a longer gas system and longer barrel. We'll go over the optimal configuration next. Q: So, can I just install a Grendel upper on my 5.56 or .223 lower? A: Yes! If you already own a .223/5.56 NATO AR-15, you can simply buy a Grendel barreled upper and slap it on your lower receiver. You may need to swap out the buffer in your buffer tube if it's a Carbine buffer. Grendel requires an "H" buffer to handle that extra powder and to reduce felt recoil.How to Build an AR-15 in 6.5 Grendel Before we get into the specifications and parts, we need to talk about "official" and "unofficial" 6.5 Grendel cartridges. Annoyingly, there is a cloned version of the official round that requires a different bolt and extractor.Type 1 vs. Type 2 GrendelThe official 6.5 Grendel is trademarked by its developer, Alexander Arms. That means any company that wants to produce ammunition or parts needs to pay a royalty to the company. Yet two companies, Les Baer Custom and Black Hole Weaponry, decided to skip the trademark and develop their own variants of 6.5 Grendel. Les Bear's cartridge is called the LBC .264, and Black Hole Weaponry's clone is called "Grendel Type 1", a naming convention the company developed to internally differentiate between their loads and parts, and official Alexander Arms-spec loads and parts. LBC and BWH loads are collectively lumped into this "Type 1" identifier. These cartridges utilizes a .125" headspace and 7.62x39mm bolt and extractor. To summarize: Trademarked 6.5 Grendel barrels, rifles, and bolts are called "Type 2".BHW 6.5 Grendel and .264 LBC rifles and parts are called "Type 1."Type 2 bolts use 0.136" headspacing.Type 1 bolts use 0.125" headspacing.When you're building an AR-15 chambered in 6.5 Grendel, it's probably best to stick with Alexander Arms' components and specifications. The official Grendel load is the only one submitted to SAAMI (Sporting Arms and Ammunition Manufacturers' Institute) for testing and certification.The Best 6.5 Grendel BarrelThe greatest advantages 6.5 Grendel has to offer are two-fold. You get hyper accuracy in a relatively compact rifle. But to get there, you need to get a barrel in the Goldilocks zone: One that's not too long, and not too short. Thankfully, Alexander Arms was pretty clear in their opinion on what works best for a Grendel barrel:Optimal Barrel Length: 20" There are always plenty of arguments to be made when it comes to optimal barrel lengths and AR-15s. That's especially true for a short-action cartridge capable of such long distance performance. So, here's a great comparison for 6.5 Grendel's ballistics in a 14.5", 16", 20", and 24" barrel, with velocity, energy, and bullet drop from the muzzle to 1,000 yards. The load being analyzed is a 129-grain Hornady SST: Data provided courtesy of Alexander Arms.Let's first analyze bullet drop between these four barrel lengths. At 1,000 yards, the 14.5" barrel sees quite a bit of drop: About 342 inches, or 28.5 feet. Increasing to a 16" barrel results in a 6.8% reduction in drop. Increasing again to a 20" barrel reduces drop by another 7.7%. And we if we continue on to a 24" barrel, we see yet another 7.6% reduction in bullet drop. Although the percentage reduction is consistent, the physical reduction is relatively small at this point: Going from 20" to 24" only reduces bullet drop by 1.75 feet.If we look at energy retained downrange, 20" yet again seems to be the sweet spot: Adding 4 more inches of barrel only increases energy by 19 lb.-ft. And most importantly, velocity only increases by 30 feet per second. And if we analyze these differences at Grendel's "official" 800-yard range of effectiveness, the differences get even smaller.So, can you go with a 24" barrel? Absolutely, and you'll still net some minor improvements in performance. But at this barrel length, you'll also need a rifle-length gas system, and your rifle will weigh quite a bit more than a mid-length gassed, 20"-barreled assembly. In this case, such a configuration would serve best as a dedicated bench rifle.Use a 1:8 (or 1:9) Twist RateSince Grendel is all about accuracy at distance, you'll want a relatively fast twist rate to help stabilize the heavier 130- to 140-grain loads. These are the loads that provide the best ballistic coefficient for hitting targets at 800 yards or more. This twist rate will also work well for lighter 90- to 120- grain loads without overstabilizing them. If you're building a shorter, lighter Grendel rifle and prefer to shoot those lighter loads, then a 1:9 twist rate will work best instead.You'll Need a Grendel Bolt and ExtractorWe touched on this when we compared Type 1 and Type 2 loads: You'll need the right Grendel bolt and extractor. Let's dive into this more, just to make sure we select the right components for our bolt carrier group."Type 2" (Official) 6.5 Grendel Bolt Specs To ensure reliability with your new rifle, we recommend sticking with Type 2 Grendel loads. That means you should only run a 6.5 Grendel bolt with these measurements:Measuring 2.810" in total lengthHaving 0.135" of headspacingHaving a 0.136" bolt face depthYou Get to Use a 5.56/.223 Bolt CarrierAn AR chambered in 6.5 Grendel can still use a standard M16 or AR-15 bolt carrier, because these rifles also use a typical AR-15 stripped upper receiver and a nearly identical barrel extension. The bolt itself is almost identical in its design and dimensions to a 5.56/.223 bolt, so it fits inside the typical carrier. Q: Can I use a 5.56 firing pin with my 6.5 Grendel bolt and carrier? A: Yes. A 5.56/.223 firing pin from an AR-15 or M16 can be used in your 6.5 Grendel when using a proper bolt. The 6.5 Grendel bolt should measure 2.810" in length. Some bolts have been found to measure 2.800", resulting in excessive firing pin protrusion. This can cause pierced primers and damage to the pin. Q: Can I use a 5.56 bolt with a replacement extractor for Grendel? A: No. The Grendel cartridge has a wide base diameter and wider lip, so it would not fit inside a 5.56 bolt face.Use a Regular AR-15 Stripped UpperSince the Grendel configuration only requires a different bolt and barrel, you get to use a regular AR-15 stripped upper receiver. The exterior dimensions of the Grendel barrel extension are identical to those of a 5.56/.223 extension, and the same barrel nut and threads are used to secure this barrel to the upper receiver. That also means your gas tube diameter will be identical to that of a 5.56 setup.Grendel Gas System LengthPretty simple, here: Any Grendel rifle with a barrel measuring up to 20" can use a mid-length gas system. Barrels longer than 20" should use a rifle-length gas system.Use a Regular AR-15 Lower, TooAgain, since the only parts that differ on a Grendel rifle involve the barrel and bolt, you get to use a regular AR-15 stripped lower receiver. That also meansyou can use a regular 80% lower if you want to build a custom rifle from scratch. You'll therefore also utilize a standard buffer tube and recoil spring. Speaking of buffer setups...6.5mm Buffer Weight Grendel builds are pretty easy: You get to use a standard Carbine or "H" buffer, depending on how much you want to reduce felt recoil. Either buffer should run reliably with generally any setup, though we recommend the heavier (3.8 ounces) buffer for 20"+ barrels, and the Carbine (3.0 ounces) buffer for barrels measuring 18" or less. Why does Grendel not need a heavier buffer?The Grendel cartridge produces gas port pressures that are similar to 5.56. Since the gas port pressure remains almost the same, it stands to reason that the same 5.56/.223-weighted buffers work with Grendel, too.6.5 Grendel MagazinesAlthough 6.5 Grendel can technically fit inside regular 5.56 and .223 magazines, it's not recommended. The followers and feed lips may interfere with this slightly larger cartridge, resulting in failures to feed or failures to chamber. We recommend using Grendel-specific AR-15 magazines. These magazines maintain the same external dimensions as 5.56/.223 magazines (they do have to fit in a regular AR lower) but the lips and followers are modified to handle the Grendel cartridge with better reliability and proper feeding.RecapWe covered a lot of technical info, so let's recap the most important things to remember when it comes to building an effective 6.5 Grendel-chambered AR-15:Type 2 Grendel is the "official" cartridge trademarked by Alexander ArmsType 1 Grendel comprises the "unofficial" cartridges from BHW and LBC.Type 2 Grendel uses a 0.135" headspace. Type 1 uses a 0.125" headspace.Grendel does best with a 20" barrel, without adding too much length or weight.A 1:8 or 1:9 twist rate should be used with 6.5 Grendel cartridges.The 1:8 rate is best for match loads, and 1:9 is best for lighter loads.Use a mid-length gas system for up to 20" barrel. Use rifle-length for longer barrels. 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What buffer for 6.5 grendel. What size buffer for 6.5 grendel. What buffer to use with 6.5 grendel.