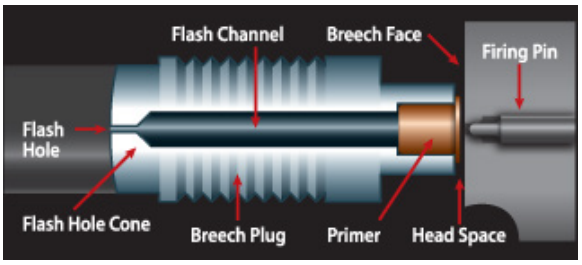
Blackhorn 209 Ignition Guidelines

We have received reports of ignition issues and hangfires with Blackhorn 209. To better address this subject, it is important to understand what can cause ignition problems with Blackhorn 209 and the appropriate steps that may be taken to resolve these issues.

Blackhorn 209 is a very consistent and effective muzzleloading propellant that is unmatched in its quality and accuracy. Because of its unique formulation, Blackhorn 209 requires a properly functioning ignition chamber more so than black powder and lower quality substitutes – thus poor ignition is not a result of the powder failing or going bad. Ignition difficulties can occur, however, if one or more of the following factors exists:



1. Breech Plug is Dirty or Fouled

Breech plug cleaning is often inadequate. Most muzzleloading shooters do not realize the amount of primer residue that builds up in a breech plug flash channel. This residue is extremely hard and does not dissolve with water or solvents. It must be removed mechanically. Soaking a breech plug in Thompson Centers T-17 will soften the primer residue and ease the removal process, but it will still take mechanical means to remove the primer residue.

Note the amount of fouling in this breech plug flash channel. The flash channel has effectively been reduced by 50% and as such the flame and gas volume going through the flash hole to the powder is also significantly reduced. In addition, the erratic and rough structure of the walls of the hole is not favorable to efficient gas flow. This buildup occurred after 20 rounds with a Winchester 209 primer and Triple 7. Some of the buildup can be attributed to powder.

2. Incorrect primer

We do not recommend any of the 209 primers designated for muzzleloaders (Winchester Triple 7, CCI MZL, Federal Fusion, or Remington Kleanbore). These primers are all weaker than standard shotshell 209 primers and do not provide adequate ignition for Blackhorn 209 – especially when used in a poorly designed breech plug system.

3. Non-compatible or poorly designed breech plug

There have been many different styles of breech plugs from all the gun manufacturers over the years. It is impossible for us to evaluate every breech plug that has been manufactured and the problem goes deeper than just the breech plug, it also depends on the fit of the primer in the breech plug and the head space between the breech face and the breech plug.

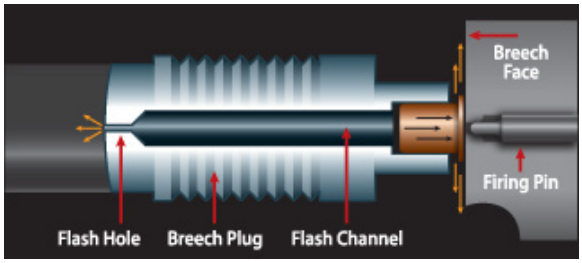
A properly designed breech plug should seal the primer, have minimal head space (less than 0.004") and should effectively facilitate efficient flow of the flame and gas through the flash hole including a proper face angle on the flash hole cone. Failure of any or all of these requirements may cause hangfires and poor accuracy due to inconsistent ignition.

We have pin gauged a number of flash holes from all manufacturers and found there can be a wide variation of the flash hole size. Even within the same model breech plug we have measured variances of 0.005". This lack of tolerance control can certainly contribute to poor ignition and also poor accuracy. Is there an optimum size flash hole that will ignite Blackhorn 209? Generally, IF all other factors mentioned above (minimal head space, good flash cone angle, good primer seal and minimal distance from primer to flash hole [see below]) are correct, a flash hole of 0.030" – 0.035" is sufficient to ignite Blackhorn 209.

The flash channel should be adequate to transfer the flame and hot gasses to the flash hole. The angle at the point of the hole reduction should be conducive to funneling the gasses through the flash hole efficiently, say 60°. Many breech plugs have a very shallow and in some cases, no angle. A shallow angle or a flat bottom hole causes the gasses to reflect back and disrupt the necessary smooth flow of gasses through the flash hole and into the powder column.

a. Too Much Head Space

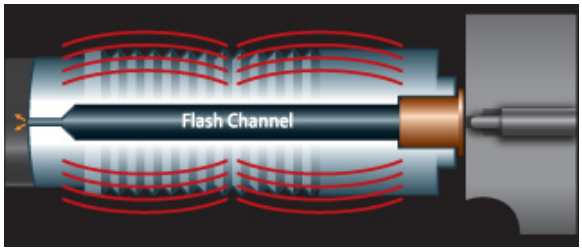
Head space is the distance between the face of the gun breech to the back of the breech plug in the locked position. Too much head space allows the primer to back out during firing. If your primer has a tight fit in the breech plug, but you are still getting dirty primers, you have a head space problem.



Pressure is reduced in the flash channel as the primer backs out and reduces the flow of gas and flame to the flash hole.

b. Excessively Long Flash Channel

With the advent of quick release breech plugs gun manufacturers have increased breech plug length and subsequently the distance from the primer to the flash hole. Lengthening this distance can only allow the side walls of the flash channel to rob heat and energy from the primer and the increase in volume of the flash channel reduces pressure through the flash hole.



Heat is robbed by excessively long breech plug and increased volume of flash channel reduces chances for good ignition

An excessively long breech plug can also contribute to ignition problems especially in cold weather. A longer breech plug absorbs more energy from the primer by acting as a heat sink for the flame and hot gasses. It doesn't make sense to move the powder farther from the ignition source.

Some manufactures have lengthened breech plugs to facilitate easier removal. However, easy breech plug removal has never been a problem with Blackhorn 209.

4. Poor fitting primer

The looser the primer fit the more blow back you can expect and the less likely you are to transmit sufficient gas and flame to the powder. Observe the condition of your primers after firing. If they are largely black, you are getting excessive blow back. Below is an example of same brand primer fired in two different muzzleloaders.

If your primer looks like the one on the right, call your gun manufacturer.

Not only does this result in a large loss of energy in the wrong direction, the escaping gasses leave excessive fouling in the breech area. These gasses can also exit the gun, cause damage your scope and is not considered safe. Safety glasses should always be worn when shooting a firearm.

5. Loose bullet with inadequate seal or compression

A muzzleloader is different than a cartridge gun, but many of the principles relative to the propellant are the same. The bullet is seated in the cartridge to create the pressure necessary to propel the bullet. A bullet in a muzzleloader needs to be compressed against the powder. The base of the bullet, or sabot needs to expand to hold the building pressure which propels the bullet. Imagine you placed a bullet 1 inch ahead of the case in a cartridge gun. The bullet most likely would not exit the barrel. This same principle works in a muzzleloader. Loose fitting bullets, like the typical Powerbelts, may be convenient to load, but lack sufficient compression to assure consistent ignition or accuracy.

Because there are no standards in muzzleloading barrels, the diameters vary between all manufacturers and at times within the same manufacturer. A Powerbelt may fit nicely in one and slide to the bottom of another. Just the simple act of carrying your gun in the field may allow the bullet to slide forward and when compression of the powder is lost the result is a misfire or poor accuracy.

We recommend a quality tight fitting sabot for the most consistent accuracy and ignition.