

BSA Bolt Action Rifle HuMa Regulator fitting instructions – XTX Air

Bolt Action rifles – not for MMC actions.

Thank you for purchasing a HuMa regulator for the BSA Ultra, Scorpion, Dynamax, Hornet and Goldstar SE. If you follow the instructions provided properly you should be able to fit your regulator and get your air rifle running consistently shot to shot, getting rid of the power curve, which should help with accuracy and also improve the shot count.

WARNING – You are going to be working with parts that work under very high pressure, which can be dangerous if you do not follow the instructions properly. If in doubt please get the regulator fitted by somebody competent. XTX Air and HuMa take no responsibility for you damaging yourself or any part of your rifle, if you follow the instructions you should not have any problems. Ignoring or deviating from the instructions is done at your own risk. By stripping your rifle you will invalidate your BSA warranty, if you are not the first owner of the rifle you are not covered by BSA's warranty, as it only covers the original owner.

Power restrictions – In the UK the current legal power limit for an unlicensed airgun is 12ftlbs. If you are caught in possession of a rifle doing more than 12ftlbs you will be charged with Section 1 firearms offences, which are no joke. You WILL go to jail!

First of all make sure you have something suitable to work on, like a workbench or table, good lighting also helps. It may be an idea to lay down a clean towel or sheet to prevent damage to the table and rifle parts.

WARNING – if you use your wife's best Egyptian cotton towel to work on you may be injured!

Remove the magazine and make sure there are no pellets in the barrel, dry fire the rifle into a safe backstop to be sure.

You will need the following tools to complete this task:

3mm Allen/hex key,

4mm Allen/hex key,

Pillar or hand drill (for the AT/blanking plug, if fitted),

4-5mm steel drill bit (for the AT/blanking plug, if fitted),

Centre punch and hammer (for the AT/blanking plug, if fitted),

4.5mm steel drill bit for the drilling the transfer port (only applies if you are not replacing the standard port with a new port),

A medium and large sized flat screwdriver (a power adjusting tool bit available from the eShop),

A pair of pump pliers,

A piece of leather (soft jaws) to protect parts that you use the pump pliers on,

You can use the soft jaws or a collet from the eShop to remove the hammer spring cap,

A chronograph,

A selection of pellets to use for setting the power,

Please note the number in brackets (16-XXXX) are BSA part numbers. Exploded parts drawings can be found on the [BSA website](http://www.bsa-airguns.com) or on www.airgunspares.com.

Remove the stock, scope and any other accessories that are fitted to the rifle, put them out the way,

Drain the air:

Dry fire the rifle until the rifle is completely empty – *there is no problem dry firing a PCP, unlike some springers.*

Once you are happy that the rifle has no more air in it, try to loosen the air cylinder, if it is easy to

loosen then there is no air left in the cylinder, if it is difficult to turn then there is probably still air in the cylinder.

Strip down:

Now we start stripping the rifle, there is no set way of stripping the rifle but if you follow the instructions below you should be able to get the action apart and back together again.

New rifles that have never been worked on before will more than likely have a silver coloured anti-tamper blanking plug in the rear of the trigger mechanism. This will need to be removed for you to be able to get the action apart. I find the best way is to:

- use a centre punch to punch a mark in the centre of the blanking plug,
- support the action in a vice or other flat/level surface,
- use a 4-5mm steel drill bit in a pillar drill (you can use a hand drill but you will need to be more careful because they are more prone to slipping),
- drill into the blanking plug, using the centre punch mark as a guide, until you feel it break through the back of the plug, then stop. The plug is only 5mm thick, if you drill too deep you will damage the head of the bolt below and it will be a lot of work to remove it,
- if you have an air line or "canned air", blow away the swarf,
- if you have drilled it in the centre of the blanking plug you should see the head of the bolt under the plug.



Now use a 3mm Allen/hex key to remove the front bolt from the trigger mechanism, *Some tactical models may have a little black plastic plug in the screw, you will need to pop it out to gain access to the bolt.*



Use the same 3mm hex key to remove the bolt from the back of the trigger mechanism (through the blanking plug you have just drilled).

If you try to remove the back bolt first you can damage the trigger mechanism because the blanking plug will cause the mechanism to lift while the front bolt is still holding it down.



Remove the cocking bolt/handle using a 3mm Allen/hex key, be sure to support the head/ball of the bolt to avoid putting strain on the probe. The little bolt/probe extension should come off with the bolt handle, if not use a piece of leather around the extension and a pair of pliers to wiggle it loose.



Use a flat screw driver to remove (anti-clockwise) the blanking plug (16-6728) on the top of the breech/scope rail. *They are normally fitted with Loctite, so can be stiff, a screwdriver that fits the slot well will be able to remove it nicely, a poor fitting screwdriver may cause a bit of damage to the plug.*



Use a 3mm Allen/hex key to remove (anti-clockwise) the cap head bolt that is now visible through the hole in the top of the breech, where you removed the blanking screw in the previous step. *Be sure to remove it completely or else the next step will be impossible. When this bolt is removed the black cap and power adjuster housing may pop out the back of the action.*



Use a small screwdriver/pokey device to push the little silver looking part that you can see inside the hole in the left hand side of the breech, next to the magazine slot. Pushing this will unlatch/unlock the pellet probe.



Use a screwdriver to push the probe and black plastic probe guide (magazine bridging guide) (via the magazine slot) backwards until you can see the bolt head of the forward breech fixing bolt, via the previously blanked off hole in the top of the breech.



Use a 3mm Allen/hex key to remove (anti-clockwise) the cap head bolt that is now visible through the hole in the top of the breech, that was blanked off before carrying out the previous step.



Turn the complete action over, while holding it together (*remember you have just removed the 2 bolts that hold that air cylinder/hammer assembly and breech block/barrel together!*).

Carefully lift the air cylinder/hammer tube off the barrel/breech assembly and lay it down.

If you did not turn the action over before separating the breech section off the air cylinder section you will now be crawling around on your hands and knees looking for little springs and ball

bearings!

Let's work on the barrel and breech assembly first:

Lift out the little spring (16-6671) and ball bearing (16-5339) that are next to the brass transfer port (16-7819) at the front of the breech block *(you can use a little magnet to remove the ball or you can tip the action over but make sure you hold the bigger spring near the back of the action in place or else you will be on your hands and knees again looking for the spring and ball).*

Once the spring and ball have been removed you can slide the magazine latch/catch rod (16-7935) out, just pull it in the direction of the muzzle.



Once the magazine latch rod has been removed you can remove the brass transfer port. *There should be a rubber O ring either end of the transfer port, one may still be inside the air cylinder/hammer tube assembly (leave it there).*

If you have bought a replacement 4.5mm brass transfer port then you will need to fit it in place of the original transfer port.

If you do not have a replacement transfer port then you will need to drill out your transfer port to 4.5mm, using a drill or lathe.

Make sure that the O ring is inside the breech block before dropping the replacement/drilled transfer port into place.

Slide the magazine latch rod back into place. If it will not go all the way back in then you may have fitted the transfer port the wrong way around, turn it around and try again.

Drop the little ball bearing back into the breech block, next to the transfer port,

Drop the little spring back into the breech block, on top of the little ball bearing,

Clean and inspect the rest of the breech block, then put it to one side.

Now let's work on the hammer and air cylinder assembly:

Unscrew the air cylinder *(if there is still air in it then it will not unscrew)*, there may be a few parts to remove that are part of the air cylinder, depending on the model of rifle you have. If they are tight then you can use a piece of leather/soft jaws and a pair of pump pliers to undo them.



Once the air cylinder and the various adaptors etc have been removed you should have the brass firing valve body (16-7450) on show, remove the brass firing valve cover/lid (16-6622) (*looks like a pepper pot lid*).



Once the lid/cover has been removed then pull out the internals and put the brass knockoff restrictor (16-6623) to one side, it is not fitted when a regulator is used. Refit the firing valve (16-6057) (*aka knock-off valve*) and the pre-load spring (16-6092) and cover/lid (16-6622). Now fit the new HuMa regulator onto the brass firing valve, it only needs to be hand tight.



Fit the pressure gauge banjo (16-7690) onto the regulator being sure not to damage the O rings.

Fit the small cylinder adaptor (16-7692) to the end of the regulator, it only needs to be hand tight.

Fit the air cylinder onto the cylinder adaptor, it only needs to be hand tight.

The air cylinder part of the rifle should now look standard again, just a little longer.

Now we need to sort out the hammer area:

When you removed the rear top breech bolt and the rear trigger mechanism bolt (*early on in the process*) the power adjusting ring (16-6734) and hammer spring should have popped out the back of the rifle.



There is a black cap (16-6530) fitted to the power adjuster which needs to be removed to gain access to the power adjuster. There are a few ways of doing this:

Option 1

- Hold the adjuster (16-6734) in a vice,
- Heat the adjuster up using a hot air gun, hair drier or gas torch,
- Use a pair of pump pliers (*with either soft jaws or a piece of leather to protect the finish of the cap*) to unscrew the cap (16-6530) (*anti-clockwise*).



Option 2

Use a sharp tool like a chisel, Stanley knife etc to separate the cap from the adjuster but please note this will strip the threads on the cap (*stripping the threads on the cap is not a real issue because you can glue/silicone the cap back on after you have finished working on the rifle*). Some of the older rifles do not have a threaded cap, they are stuck on. Unfortunately there is no way of telling which type of cap your rifle has without removing it.

Option 3

You can purchase a collet from the eShop which you can then hold in a vice, heat up the adjuster and remove the cap. *This is the best option because it will prevent possible damage to the cap.*



Optional: Remove the steel hammer spring guide (*top hat*) (16-6523) from the hammer tube and replace it with a plastic spring guide (available from the eShop). *Some rifles don't have spring guides fitted at all, don't worry about this, fit the plastic spring guide if you have one.*

Now assemble the complete action in the reverse order making sure you don't leave out or damage any parts. You can leave the black power adjuster cover off for now because you will need to adjust the power next.

Cock the rifle and fire it to make sure everything still works and the trigger engages properly etc.

Once you are happy that everything is working as it should, cock the action (*don't load a magazine or pellets!*) and fill the action slowly to around 120bar using your pump or dive cylinder as you normally would.

Make sure you can't hear/feel any leaks from anywhere, if you do then you may need to either tighten up whatever is leaking or strip the part that is leaking to check/replace the O ring/s concerned.

Dry fire the action a few times to make sure everything is working as it should (*best to fit a silencer first unless you want to deafen yourself*).

Now fit/set up your chrono and a safe backstop/pellet catcher.

We now need to set the power:

Fire 4-5 pellets over/through the chrono and make a note of the feet per second and power. The first couple of pellets may be a bit under/over powered while the regulator cycles but it should level out after a few shots.

If the power is too high/low then you will need to turn the power down/up using the power adjuster (16-6732) which is visible at the back of the action. The power adjusting ring can be adjusted with a large flat bladed screw driver, a butter knife (*don't let your wife catch you using it!*) or the power adjusting tool that is available from the eShop. Turn it clockwise to increase the power and anti-clockwise to reduce the power.

It is best to make small ¼ turn adjustments, then chrono another 3-5 pellets to see where the power settles, then make further adjustments if necessary.

PS remember you only put 120bar in the rifle, so you may need to top up the air during your chrono session.

Some rifles will need the hammer spring to be shortened or changed for a softer/shorter spring because there is not enough adjustment on the power adjuster to get them down to 11.5ftlbs.

Hammer springs are available from John Knibbs (www.airgunspares.com) or your local spring supplier.

Once you have set the power to where you would like it to be and you are sure it is under 12ftlbs (*unless it is an FAC rated rifle or you live outside the UK*) you can put a drop of Loctite/thread lock/nail varnish/paint on the power adjusting ring to stop it moving on it's own in use.

Replace the black cap (16-6530) to cover the power adjuster,

Fit the action back in the stock,

Fit your scope and other accessories,

Go out and zero your rifle,

Enjoy yourself and stay safe.

If your rifle and regulator is working properly then you should get consistent shots (ideally less than 10fps spread shot to shot, using decent quality pellets) from 232bar down to whatever pressure your regulator has been set at, then the power should drop with each shot after that. The consistency will depend on the quality of the pellets being used, some have huge weight/size variations. Also try not to fire the rifle like a semi-auto, the regulator needs a few seconds to cycle properly between shots.

Please have a look on the [Guides & Links](#) page on the website for links to videos that show you how to maintain, clean and repair your rifle.

General Notes & Tips

Please clean your barrel when changing pellet brands/batches, allow 30-50 pellets to re-lead the barrel after changing.

If you are not getting tight groups then it is advisable to try different pellet brands & batches, some rifles are pellet fussy.

If your rifle has been left standing it is advisable to dry fire a few shots to cycle the regulator before using the rifle.

Do not spray oil directly onto/into your rifle, rather spray it onto a cloth and wipe it over. Most gun oils will damage O rings.

It is advisable to occasionally use a drop of a product like Abbey SM50 on the pellet probe and fill probe O rings

Check my website and YouTube channel for tips and guides on how to get the most out of your rifle.

Inspect the pellet probe O ring regularly for wear/damage, worn O rings will cause inconsistency and low power.

I don't recommend using pointed or plastic pellets. Dome/diablo shaped pellets are best for long range accuracy.

Chronograph your rifle on a regular basis to ensure the power has not crept up or down.

If you use a Combro chrono please make sure the batteries are fresh, if not you will get wild readings.

PCPs should be used regularly, it is a good idea to fire a few shots on a regular basis to keep things from seizing up.

It is advisable to leave PCPs with air in the cylinder when storing them long term to maintain the seals.

When filling a PCP do so very slowly to avoid heat build up and damage to your fill valve O ring.

It is advisable to get your rifle serviced every 2 years or when you are experiencing any issues.

If you have any queries please feel free to get in touch, I will do my best to help.