The Unofficial Manual of the Chipley Custom Machine Series 5 Basic and the Series 6 Pump Markers

V 1.4

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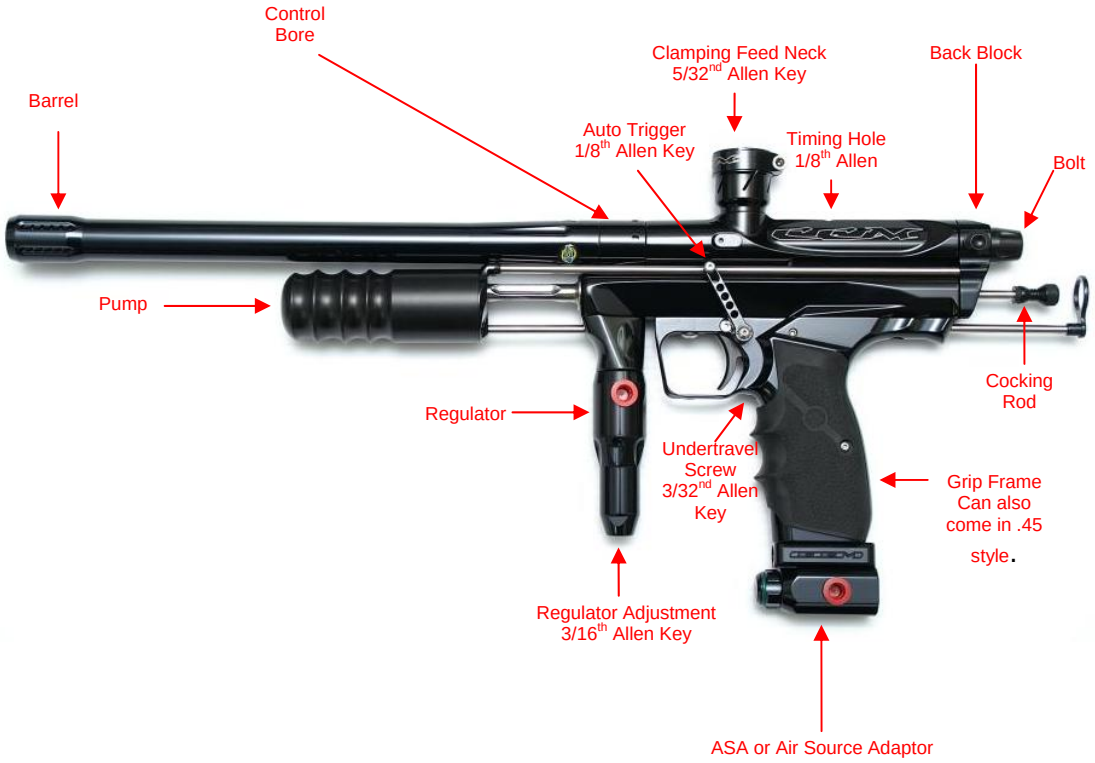

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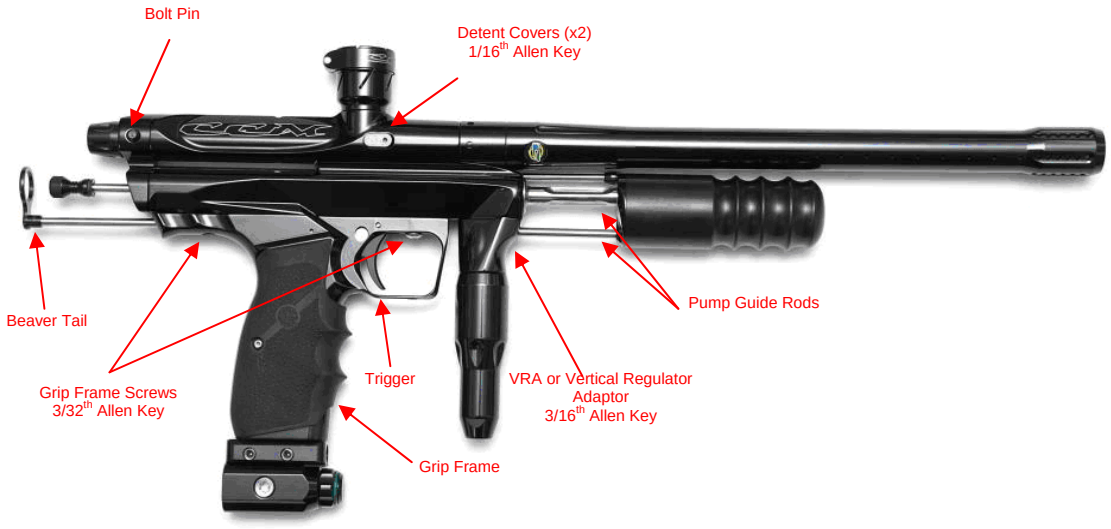


IV. Series 5 Basic (Facing Left)

V. Series 5 Basic (Facing Right)

Note: All of the other parts are as named on the Series 6. Besides milling, the pump, and the detent – the Series 5 Basic is a very similar marker.

VI. Liability:

Pumpenstein has no affiliation with Chipley Custom Machine or Datum Precision Machining. Likewise, we have no affiliation with WGP or the Autococker®. We do not work for them, are not sponsored by them, represent them, or speak for them in any way.

Pumpenstein or any of it's members does not accept any liability for the handling of these markers, tools, air tanks, or any other item mentioned in this Unofficial manual. You, the user accept this sole liability when purchasing and using any paintball marker. We, Pumpenstein disclaim any implied warranties or any responsibility for any errors that may appear in this unofficial manual.

If, as the user of the marker, you do not accept total liability for performing any of the maintenance, assembly, or work performed in this unofficial manual, Pumpenstein requests that you do not do anything described in this manual. You are not to use this unofficial manual unless you accept all liability and release Pumpenstein and all of its current and previous members of all liability through any use or misuse thereof.

Simply by using this manual or using the marker in general you release Pumpenstein of any and all liability associated with its use. When using the marker please adhere to all local, state and federal laws.

What we are trying to say is this. Forget you know us, forget you read this manual, do not try this at home – we *are* professionals, do not be a dumb ass, do not screw yourself up doing dumb stuff, and if you do - not only did we tell you so – do not blame us.

VII. Safety and Handling:

A Paintball Marker is not a toy. Any of the tools in this manual are not toys. Tools and paintball markers should be used only by adults or with adult supervision. Respect other peoples' property and when using any paintball marker, obey all local, state and federal laws. When entering a paintball field, become aware of their rules and regulations.

It is very important to have the proper paintball protection before going to the paintball field for play. This includes and is not limited to eye, head, throat, and body protection. All protection used should be designed for the sport of paintball, e.g. eye gear designed specifically for paintball usage.

Always have a barrel plug in place and keep the safety ON when handling your marker. When repairing or cleaning your marker first remove barrel and gas cylinder, then depressurize your marker by pointing in safe direction and dry firing. Always treat the paintball marker as if it were loaded.

When handling the marker, always keep your fingers or any other objects away from the trigger assembly to avoid accidental discharges. Make sure, when carrying or transporting the marker, to keep the muzzle pointed downward with a barrel-blocking device in place.

Before transporting your marker through public areas, such as airports, or bus and trains stations, call ahead for regulatory information regarding the carrying and transporting of such an item.

Remember, any paintball marker should never be pointed or fired at anyone, and should only be used at a supervised, licensed and insured paintball field.

VIII. Quick Start Guide:

1. Screw barrel onto marker – if your S5 Basic or S6 does not come with a barrel – use a barrel with Autococker® threads.

2. Place barrel blocking 'Barrel Bag' device properly onto the marker

CAUTION: Always wear paintball approved eye and face protection when dealing with a pressurized paintball marker.

3. Pull the cocking rod back until it latches into place. You will hear a click when this happens.

4. Connect the air source to the ASA (air system adapter.)

> Note: Make sure to always get air cylinders filled by authorized, skilled and knowledgeable technicians for the correct fill limits of each cylinder.
>
> Do not try to refill cylinders by yourself. Do not use cylinders that have not been properly maintained or that are damaged. It is very important that caution be exercised when refilling or attaching cylinders.

5. Attach the loader to the feed port of the marker. The Series 6 comes with a clamping feed neck. This feed neck either has a lever style clamping feature or an Allen bolt. This bolt takes a 5/32 Allen key. Clockwise tightens the band to your hopper.

> Note: Use only 0.68 caliber paintballs in your CCM® Series 6. Do not modify the paint in any way. If I hear you were freezing paint – we are going to come to your town, find you, bunker you, and then bonus ball you.
>
> Before field use, ensure the velocity is in compliance with field safety guidelines. General field velocity limits are usually between 250 fps to 300 fps (fps = feet per second.) Your paintball markers velocity should never exceed 300 fps. Observe and abide by all local laws, regulations and field safety guidelines pertaining to use of paintball markers.

IX. A Brief Description of the workings of the Series 5 and 6.

A cutaway of a Series 5 Body with Sear Engaged This is the marker cocked with a ball in the chamber.

When you pull the trigger a sear is lowered which releases a hammer (inside the bottom tube of the marker). This hammer is under spring pressure (you load a spring when you pull back the cocking rod or pump the marker). The hammer strikes a valve, which allows gas to flow through the valve, up through the bolt, and down the barrel, propelling a ball (if loaded) out of the barrel.

Series 5 Cutaway Sear disengaged, ball being propelled out of the barrel.

You must then manually cock this marker. With your finger off the trigger, grasp the handle under the barrel and move it back toward the rear of the marker. Pulling the pump rearward forces the pump arm back. The pump arm is attached to the back block, which moves the bolt and the cocking rod back as well. The bolt, when it clears the chamber, allows another paintball to fall into the chamber of the marker.

Marker being pumped – hammer and bolt traveling to the rear – ball ready to drop in breach.

The ball is temporarily held in place by the ball detents installed in your Series 6 marker (they are hidden under the little caps on the side of your marker that say S6). When the cocking rod (attached to the hammer) allows the hammer to clear the sear, the sear will catch (with a click).

Sear Engaged, Bolt moving forward ball entering the chamber.

At this point, move the pump forward (away from the rear of the marker). This will move the bolt forward, which will push the ball past the detents and into the breach / barrel of the marker.

Sear Engaged, Bolt at rest, ball in chamber.

This is one full cycle of the Series 6.

Note: This marker comes with an 'auto-trigger'. The auto-trigger allows the user to hold down the trigger and pump the marker – firing the marker

every time the pump is returned to the starting position. With practice, the user can fire his Series 6 over six balls per second with accuracy.

The auto-trigger is simply a cam that does not allow the trigger to fire until the pumping cycle is complete. The cam, behind your trigger, is attached to the pump arm (via a bolt – that takes a 1/8th Allen key). This allows for the proper timing of the auto-trigger.

X. Velocity:

CAUTION: Industry approved protective gear (for face and eyes) must be worn at all times while operating and performing adjustments on this marker.

• Do not insert objects into the space between the cocking block and the main body of the marker at any point in time. Improper marker treatment may result in damage to the marker and serious injury to the operator.

• Prior to beginning any work on your marker, check to make sure that all excess pressure has been released by pointing the marker in a safe direction and pulling the trigger. This is a necessary precaution because the marker may still contain pressure even after the removal of the gas source.

• If you are uncertain, unable or do not know how to perform work on the marker, have adjustments and repairs made by a qualified technician.

To adjust velocity:

1. Every CCM® I have owned has come from the factory set at about 290 F.P.S. In addition, every CCM® marker I have owned has come with the regulator set at about 300 PSI from the factory. This may not be the case with your S6. You may want to skip to the portion of this manual titled "Setting up your Series 6". However, you also may simply want to go out and play. If the latter is the case – here is how to adjust your velocity.

2. Pump the marker to the most rear position and hold it there.

3. Insert the short end of a 1/8" Allen wrench into one of the three holes in the IVG (Internal Velocity Governor). Turning the Allen wrench clockwise will increase the velocity while counterclockwise will decrease velocity.

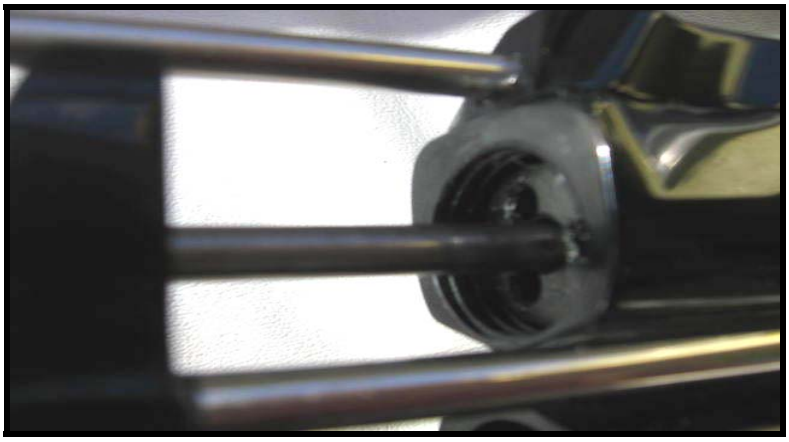
4. Movement of the wrench quarter turn in either direction will approximately yield a 15-20 fps change.

XI. Setting up the CCM® Marker:

If you have not played with your CCM® marker and have just pulled it out of the box – skip to #3 of this section. For those that have already been playing with their marker - start at #1.

1) Back out your regulator adjustment screw (3/16th) until the marker starts hissing down the barrel when you pull the trigger. Turn it up until this leak stops. Your marker will most likely be shooting about 230 - 250 FPS.

2) Use a 1/8th Allen key to set the IVG in two full turns from the back of the marker. In other words, set the IVG flush with the back of the body and then turn it in two full rotations of the IVG.



3) Shoot your maker (wearing proper safety equipment) over a Chronograph perhaps three times and not the average of the string.

4) Turn up your marker by using the regulator until either you achieve 300 FPS in this manner (if this is case skip to Step 7) or the FPS will plateau and after a few more turns starts to decrease again. This is because you have now given the valve too much pressure and it is closing faster than it should.

5) Remember the point where it plateaued and set the regulator at this point. With almost every CCM® marker I have owned the 3/16th screw is nearly flush with the bottom of the regulator.

6) Use the IVG to set the FPS the rest of the way if your regulator adjustments did not allow you to reach 300 fps.

This is the most efficient setting for your marker.

7) *(Optional)* If your regulator reached 300 fps before it plateued you could go to a weaker main spring and re do this procedure in order to have the most efficient marker. A heavier valve spring would accomplish the same thing.

However, a weaker main spring would lighten your pump stroke. I find the CCM® main spring is VERY light and I do not adjust my springs.

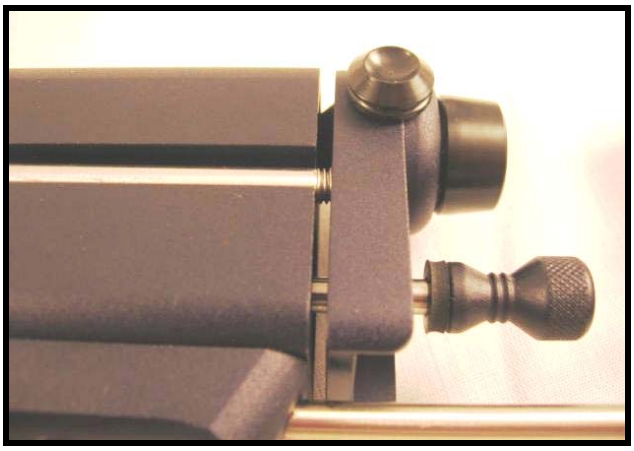
I have found that 300 PSI is a great place to start with CCM® markers. You can use a Pressure Testing Gauge or just start low on the Regulator and turn it up from there. Perhaps even start at 275 psi and make smaller adjustments to the regulator to get it to plateau at the highest FPS you can.

XII. Additional Adjustments to the CCM Marker:

Sear / Lug:

The lug height controls how far the trigger must be depressed in order to fire the marker. If this lug is set too high, the marker will not cock because the sear does not come into contact with the lug. If the lug is set too low – the marker will not cock or will not fire because the lug is dragging on the grip frame or the sear cannot drop far enough to release the hammer.

Make sure that when setting your Lug you properly set it for auto triggering. To do this properly, adjust the lug so that the marker fires (with the trigger depressed) with a 1/8th inch gap (see picture below) between the back block and the body of the marker. This will allow for proper firing of the marker and good air transfer from the valve to the bolt.



A CCM® Series 5 Basic is shown above. The setting is the same for the S6.

To Adjust the Lug:

Insert a 1/8th Allen Key into the top of the marker where you see a hole. This is an access hole to allow the adjustment of the lug on the bolt. Insert the Allen key until you feel it stop. If you have air in the marker the Allen Key should fall (with a little wiggling) directly into the lug. If you do not have air in the marker, you will need to pull the cocking rod toward the rear of the marker to allow the Allen key to fall into the hold of the lug.

Turn the Allen key clockwise to *lower* the lug (allow the marker to fire with a longer trigger pull – or during auto trigger – later in the cycle) and to the anticlockwise to *raise* the lug (allow the marker to fire with a shorter trigger pull - or during auto trigger - earlier in the cycle).

Lug adjustment shown in cutaway. Lug is at its highest point.

If the lug becomes to easy to turn with the Allen key it may vibrate loose and cause your timing to change. There is an Nylon Set Screw in the base of the hammer (inside the same screw hole as the Cocking Rod) that can be tightened. Take the Sear Lug completely out of the hammer and tighten the nylon set screw (10/32 Allen Key) until you see the nylon screw intrude into the area where the Sear Lug goes. Stop there and reinstall your Sear Lug. This will cause the Sear Lug to drag on the Nylon Screw and cause it to not vibrate loose while playing.

Undertravel Screw:

The undertravel screw (marked by the screwdriver in the picture below) is essentially only there to stop the Auto trigger and Cam from coming out of the grip frame.

Pump the marker until you hear the sear ‘click’. Holding the pump in this position adjust the undertravel screw until it touches the trigger.

This should set the undertravel screw to the proper position.

The undertravel does allow you to make your trigger pull shorter – but if you attempt to set this too short, you will cause drag on the rear most portion of your trigger pull. This is because the cam has rotated and is now dragging on the trigger itself.

Pump Arm:

Ensure that the bolt that attaches the Auto Trigger to the pump arm is perfectly perpendicular to the pump arm or else you will get binding and marring of the Auto Trigger arm.

Cocking Rod:

Set the cocking rod so that when you pump the marker the bolt just clears the chamber (looking down the feedneck) when the marker cocks. In other words, when you hear the click of the sear catching on the lug the bolt should have just cleared the chamber allowing another ball to enter the chamber. If this is not this way, or if the sear catches well beyond this point, adjust the cocking rod properly.

The cocking rod will be Loctite® d (Red). Make sure you have a non-marring vice and some heat in order to loosen the setscrew that allows you to adjust the cocking rod. In reality, the factory setting is usually proper. If it is close to being as described above – leave it alone.

XIII. Regular Cleaning.

CAUTION: Always make sure you and everyone around you wears protection when you clean the marker or check it for paintballs.

This is the cleaning I perform after every day of play.

1. Remove air source and ensure that all air has been released from the marker.

2. Remove the barrel. Spray a mix of rubbing alcohol, a little dish soap, and water down the barrel and run a pull through squeegee down it. Finish off with a swab.

3. Lightly spray marker down with the cleaning mix and then wipe down with a soft terry cloth. Be careful to clean off the pump guide rods, trigger, and anything that moves or has parts moving on it.

4. Remove bolt and clean it off. I check to see if there is wear on the bolt. The delrin bolt can get marred when grit gets into the marker. If this is case I use a very fine sand paper (1000 grit or above) to lightly take out these scratches. Let this bolt dry. Do not lubricate the bolt.

5. Remove cocking rod and quickly wipe down.

6. Run a pull through squeegee through the top tube, now empty, of the marker and finish off with a swab. Use your cleaning mix if a ball was chopped.

7. If I had chopped a ball, I remove the detents and clean those. These are Spyder® detents and can be purchased at any competent pro shop.

8. Reassemble marker.

9. Every 4-5 days of play I place 3-4 drops of KC Concepts® oil in the ASA, air the marker up, and dry fire it 10 – 20 times to move the oil through the marker.

Unless your marker is filthy, this is all that needs to be done after a normal day of play. If your marker is dirtier than this, or the regulator, valve, or other portion needs to be cleaned – no more cleaning is necessary.

XIV. Maintenance:

From time to time, it may be necessary to clean or replace worn parts within the marker. For this, you will need to break down the marker further than the regular maintenance lists above. This section will be broken into subsections: The Grip Frame, the Chassis, and the regulator. I will assume the marker has been degassed, the barrel has been removed and the marker checked for residual air and paint. Be SAFE!

Tools Needed:

A full set of American Allen Keys.

Autococker® Valve Tool

Spanner (Crescent Wrench)

Q-Tips©

Needle Nose Pliers

Small Socket Set (optional)

Quality Lubricant – I use KC Concepts® Blue oil and Dow® 55 Grease.

> NOTE: All of the reference photos currently show the Series 5 Basic. The premise is the same on the S6

Grip Frame Disassembly and Maintenance:

1. Remove the screw that attaches the auto trigger arm and cam to the frame.

2. Remove the grip screws (4 - 5/64th) and the grip panels and the Frame Screws (2 1/8th Allen Screws for the Series 5 Basic and 2 - 3/32nd for the Series 6) that attach the frame to the marker chassis. The screws on the Series 6 are submerged and thus can be simply loosened a turn or two and the frame slid to the rear of the marker and removed. The Series 6 screws are of two different lengths – ensure you replace these properly when reassembling. Set the chassis aside.

3. Remove the Auto Trigger Arm and Cam from the .45 frame. Sometimes you can simply rotate the AT arm to remove it - if it feels stuck you will most likely have to back out the undertravel screw (see below).

4. **Series 5 Basic – Pictured** Carefully (the sear is under slight spring tension) remove the sear retention pin. Simply push out the pin using a punch or a small Allen key.

5. **Step Four (Series 6 Frame - Not Pictured):** Carefully (the sear is under slight spring tension) remove the sear retention pin. There is a small grub screw to remove and then a small pin can be used to push out the sear retention pin.

6. The Sear, Sear Pin, and Spring will come out.

7. Inspect the Sear to see if it has wear where the lug catches. (Notice the slight wear on this sear.) Wear can cause the marker to 'skip' (not recock from time to time) or be VERY hard to time the auto trigger. Replace this if wear is evident or malfunctions are occurring. This should not need to be done often and perhaps will never need to be replaced on your marker.

8. Remove the Trigger Shoulder Bolt and slide the trigger from the frame (shown with the top Allen key). Also remove the Trigger Undertravel Screw (shown with the bottom Allen key) - it must be removed from the top of the frame. Use Blue Loctite® on these screws upon reassembly. Be sure not to over tighten the Trigger Shoulder Bolt. Over tightening can cause drag on the trigger.

9. Your trigger frame is now completely disassembled. Clean thoroughly and reassemble.

Chassis Disassembly and Maintenance:

1. Remove the Bolt Pin, Bolt, and Cocking Rod.
2. Remove the back block by spinning it anti clockwise. Note how many turns it took. This will ease reassembly.
3. Slide the Pump Handle and Pump Arm off the marker.

4. Use 3/16th Allen Key (Series 5 Basic) or a Spanner to remove the Pump Rod. On the Series 5 Basic the Pump Arm Guide Ring will come with it.

5. Inspect the o-rings on the Series 5 Basic's Guide Ring or the Series 6 Guide Rod. If either is damaged, replace them. Lightly lubricate these o-rings upon reassembly.

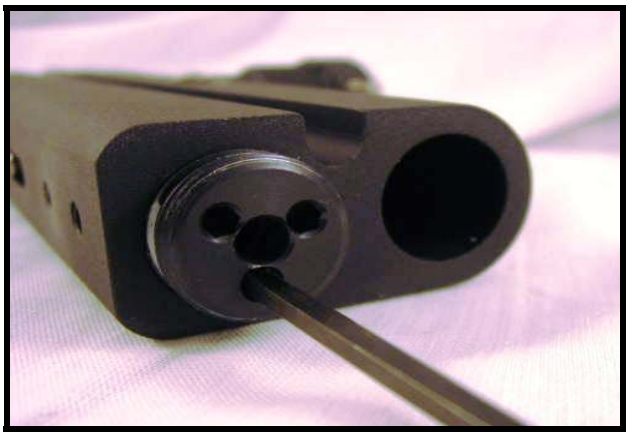
Series 5 Basic Pump Arm Guide Ring and o-rings.

6. Remove Vertical Regulator Adaptor (VRA). This is held on with red Loctite® and thus you may need to use some heat to remove it. I have never had to use heat, and this part never has to be removed, so be careful and do not strip the bolt.

This is the Series 5 Basic's VRA. The S6's has a small guide rod attached.

7. The VRA has one static o-ring – which I lightly lubricate upon reassembly.
8. Note the depth of the Lug before disassembly. You want to replicate this depth upon reassembly. It will make timing the marker much easier.

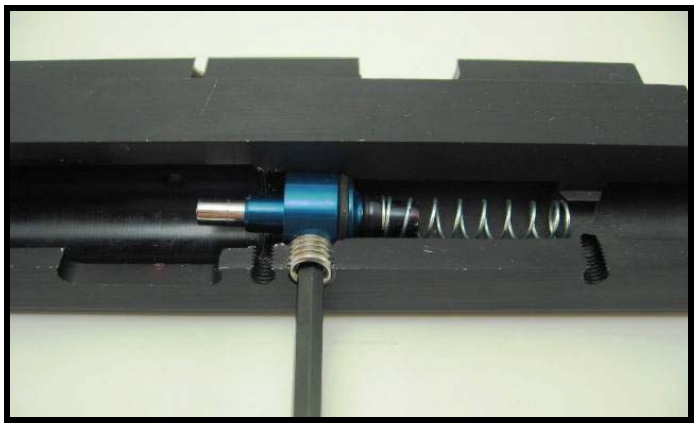
9. Remove the IVG from the marker (1/8th Allen Key) noting its depth from flush to the rear of the body. About 2 full turns or 2.5 turns are normal. The main spring will also come out at this point.



10. Insert a 1/8th Allen key into the Timing Hole (on the top of the marker) and turn the lug until it is flush with the hammer. This allows for the removal of the hammer.

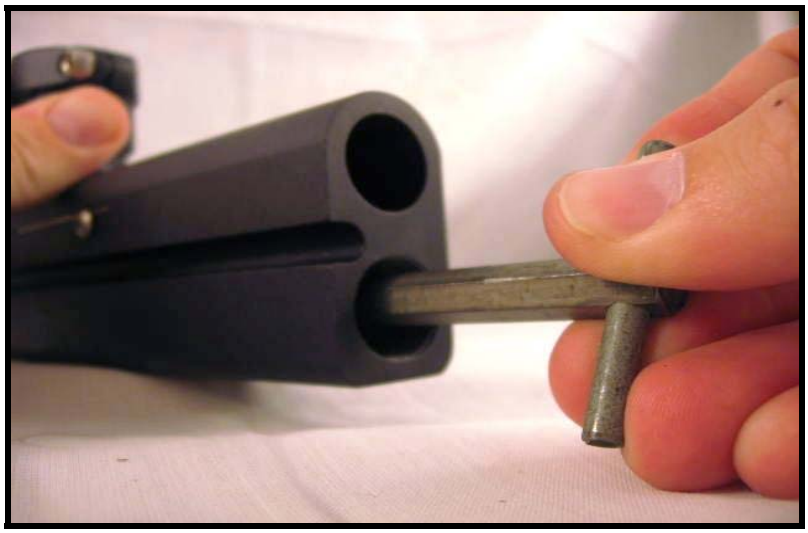
11. Remove the Valve Retaining Screw and the Valve Retaining Nut Set Screw from the bottom of the marker.

Cutaway view showing removal of Valve Retaining Nut Screw.



Cutaway view showing removal Valve Retaining Nut Set Screw.

12. Insert an Autococker® Valve Tool into the rear of the bottom tube until you feel it seat deeply on the Valve Retaining Nut and remove it. Because CCM® uses a Valve Retaining Nut Set Screw; the Valve Retaining Nut is often marred. This can make this nut a bit stiff to remove. Take your time, make sure the tool is seated as deeply as it can be, and be careful.



Cutaway showing Valve Wrench fully engaged in Valve Retaining Nut.

Cutaway showing Valve Wrench removing Valve Retaining Nut.

13. Carefully dump out the Valve, Valve Seal, and Valve Spring.

This is the CCM® internals set. From left to right – top to bottom: IVG, Main Spring, Hammer and Lug, Valve Alignment Nut, Valve Body and Valve Body O-Ring, Valve Pin and Cup Seal, Valve Spring.

14. Inspect the Valve Seal. If it appears damaged – replace it. These can last a very long time, but dirt and other debris can cause them to fail. If your marker is leaking down the barrel (and the cause is not the pressure of the marker being too low) it may be a bad Valve Seal.

    The good news and a great innovation by CCM is that the Valve Seal is replaceable without scrapping the whole Valve Pin Assembly. An N70-011 O-ring is used to repair a leak. Simply take apart the valve body from the valve top hat (or base) carefully (it is held together with blue Loc-tite) and snap on the O-Ring. Screw the pieces back together, using Loc-tite again, and you are ready for the field.

15. Use a 1/16th Allen Key to remove the Wire Detent Screw (Series 5 Basic) or both screws that retain the Detent Covers (S6). Inspect the rubber detents (S6) and replace if necessary. These are Intimidator® Detents and can be found at any competent pro-shop.

16. Clean these parts completely and reassemble.

    NOTE: When reassembling the Valve Assembly – stack the Valve Spring, Valve, and Valve body, and Valve Retaining Nut on top of the Autococker® Valve Tool and slide the body over this assembly. Be sure not to cross thread the Valve Retaining Nut into the Chassis of the marker upon reassembly. Take your time, go slow, and get help from a qualified airsmith if you do not know what you are doing.

Regulator Disassembly and Maintenance:

Assembled Regulator

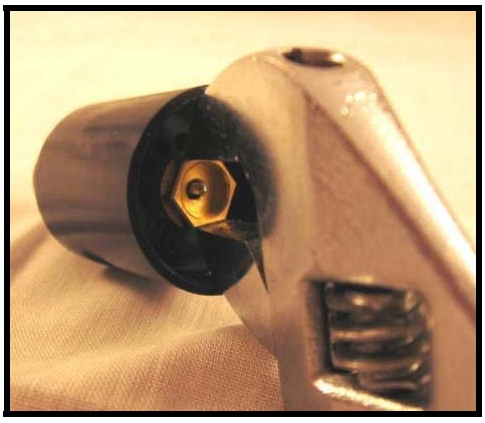
(CCM® has had various models of this regulator – the internals have not changed.)

Disassembled Regulator

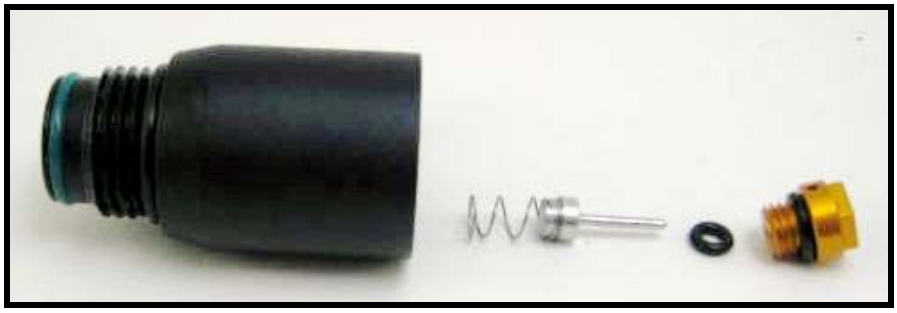
(From Right: to Left: 3/16th Adjustment Screw, Regulator Housing Bottom, Regulator Spring Seat, Spring, Regulator Piston and O-Ring, Poppet Nut, Poppet Seat, Poppet Pin, Poppet Spring, Regulator Housing Top, O-Ring.)

1. Unscrew the halves of the regulator. CCM® has machined flats into the bottom of the regulator to assist in disassembly however, this is often not necessary to use. If you do, use some sort of protection so that you do not mar the anodizing.

2. Use a spanner (or a 3/8th inch socket) to remove the Regulator Pin Retainer.



3. Carefully dump out the rest of the pieces from the top of the regulator.



4. Clean (use your Q-tips® in all the appropriate places on the regulator top) and replace the regulator Pin O-Ring if necessary. Apply a light coat of oil to these parts and replace them.

5. Use your Needle nose pliers to pull out the Regulator Piston and O-ring (marring the cone portion of the regulator piston is okay - just do not mar where the regulator pin touches the regulator piston).

You can also take the Velocity Adjustment Screw out of the bottom and push the piston out with a long rod.

6. Carefully dump out the Spring and Regulator Spring Seat (this may take a few taps on your hand or a non-marring surface).

7. Unscrew the 3/16 adjustment screw from the bottom.

8. Clean the bottom portion and replace the Regulator piston or Regulator Piston O-Ring if necessary.

9. CCM® packs the lower portion in clear grease. I have found no grease is necessary here and simply apply a coat of Dow® 55 or Hater Sauce on the Piston and Piston O-Ring.

10. Put the regulator bottom back together and screw in the 3/16th screw flush with the base of the reg.

11. Reassemble the regulator and check it. I use a simply pressure testing kit. Set the Regulator at 300 PSI. If not simply follow the set up instructions above.

XV. Pimpin' Your 'Ride':

There is very little one can do to either of these markers to improve their performance. Both come with delrin bolts, polished and lightly sprung internals, and a good pump kit. However, I have experimented with trying to squeeze a little more performance out of both since I have owned them. I will start with what is a waste of money and time and then move on to the few modifications that seem to work.

What Not To Buy:

Regulator:

The regulator that comes with the CCM® is essentially a Torpedo® style regulator. It is a tried and true design and I have had very few problems with my CCM® regulators. I have used a CCM® regulator for over two years without changing a seal and perform maintenance every few months as described above.

Barrel:

I have found that the stock barrel is a very good and accurate barrel. It comes stock with a 2" control bore at .690 Inner Diameter that opens up to .695 at the tip. If you want to match paint and have a greater flexibility in a barrel you may want to purchase additional backs for your CCM® marker. The two inch control bore, in my opinion, may not be the most efficient but it is accurate and very high quality.

A Low Pressure Tank:

I have used both 450 psi output tanks and 800 output tanks on my CCM® markers for a few years and see no difference in performance. I rarely even need to adjust my regulator to compensate for the slight difference in output from the secondary regulator when switching from tank to tank. The CCM® regulator is a 50 to 1 regulator and thus switching from a low pressure tank to a high pressure tank will only result in an 8 psi output difference at the secondary regulator. This will not make that much difference in FPS over the chronograph.

Some may argue that your regulator will work much less hard by using a high pressure tank – but I don't think with a pump that really matters. With that said, however, I do use a low pressure tank. This is simply because I already had it when I bought my first CCM® .

Agitating Hopper:

I have found that the fastest any pump with an auto trigger can be fired tops out at about 7 balls per second. Due to the rocking motion inherent in the pumping process, a good feeding gravity hopper will work just fine. I have had no issues with a VL 200, an Empire® Hopper, or even an Ammo Box

during high rates of fire. I currently use a modified Sportshot Hopper that feeds great at about 6 to 7 bps that I can achieve in rapid fire. I find that an agitating loader simply adds weight and is unnecessary.

Drop Forward:

This may be a matter of opinion on my part but I think that due to the risk of the bolt smacking you in the mask when you re-cock the marker a straight rail is probably the best option when mounting your tank. I have used the CCM® straight rail and even there small drop (mounted in reverse) with great success. I find it allows me to go off hand a little easier and lessens the chance of me getting lens bite.

What To Do:

Beside sweet spotting the regulator, buying fresh high quality paint, getting a fast feeding hopper, and a quality tank and tank regulator – you can polish the guide rods, the hammer and lug, the cocking rod, and the sear.

I use a polishing wheel (simply a polishing wheel attached to one side of a bench grinder) and I start with Non-Ferrous Rouge and finish with Jewelers' Rouge. Non-Ferrous Rouge is gray in color and can be aggressive. Go slow and pay attention. Both markers come fairly well polished so a little can go a long way. When you get the stainless parts very shiny clean the wheel and change to the Jewelers'' Rouge (which is deep red in color).

After achieving a mirror finish on these parts – reassemble the marker and test them out. You will notice a bit more smoothness – it won't be miraculous – but it will be a bit faster. I touch these parts up from time to time to keep them very smooth.

On the Series 5 Basic you could save up and buy a CCM® Deluxe kit for it. CCM® sells these in the same color and dust as the Basic and will match perfectly. The Economy Pump Kit is a very good kit and you will not see massive performance increases when switching to the Deluxe Kit – but it is an option.

CCM® also makes acrylic, colored, and clear pumps and triggers that can be purchased as well. These will add no performance but for those that like to accessorize – they are there for you.

XVI. Troubleshooting:

My velocity is very erratic.

This is most often caused by inconsistent paint sizing. See if your paint fits your barrel well and consistently. If not, try better paint.

I have good paint and my velocity is still erratic.

Clean your regulator. If this still is happening – replace the seals inside the regulator.

I have good paint, my regulator is working fine, and my velocity is still erratic.

Clean the bottom tube and hammer. If some sludge builds up on the hammer it can cause drag and cause the valve to open inconsistently.

Marker leaks down the barrel when I air it up but stops once I cock it.

This is normal and caused by CCM's use of a very light valve spring.

The light Valve Spring and heavier Main Spring force the valve open when not aired up.

This is a good thing overall and all you need to do is simply cock the marker *before* you air it up.

Marker leaks down the barrel after I pull the trigger but stops once I cock it again.

This is most likely caused by your Regulator Pressure being too low. Follow the set up instructions above and this should solve this problem, or set the regulator at 300 PSI and it should stop this leak.

Marker leaks down the barrel no matter what I do.

This is probably caused by a bad Valve Seal (Cup Seal). Replace this part. Sometimes you can get this leak to stop by running oil through the marker. Try this first and then replace the Valve Seal.

I have a Series 6 and I took off the grip frame and now the marker won't even pump to the cocking point.

You have the screws that hold the frame on the marker reversed and the rear screw is protruding into the bottom tube of the marker and stopping the hammer from re-cocking. Reverse these screws.

I pulled the bolt and replaced it out and now the marker won't shoot at all and is very quiet when I pull the trigger.

You have your bolt upside down. Reverse it.

My trigger is fine but when I lean my marker to the left (as I am shooting it), the trigger either won't move or gets very sticky.

Adjust the undertravel screw on the frame. Follow the set up instructions above. This screw stops the cam from being able to slide out of the grip frame.

I am chopping paint or getting a lot of barrel breaks.

If you are chopping paint, the most common cause of this is that your paint is too tight for the barrel of your marker. It is not causing your paint to chop it causing it to break in the barrel. Use a properly sized barrel or properly sized paint.

Your paint could simply be too brittle. I have found the CCM® markers tolerate brittle paint very well. Drop a few paintballs on the ground. If they

break very easily – this is most likely your culprit. Get a more robust shelled paint.

Another common cause is that your detents are bad and you are double feeding paint. Again, you are not chopping paint but causing one ball to hit the other and break in the barrel. Replace your detents.

If you are indeed chopping paint – it is either user error (you are simply closing the breach on a ball), feed issues (your hopper is not keeping up) or your paint is horribly out of round and not fitting in the breach. Practice, get a better feeding hopper, or better paint.

The marker does not fire when I am using the auto-trigger or skips shots.

Lower the lug. Follow the setup procedures. If this does not solve the problem, it could be a worn sear. Replace the sear.

Trigger is very sticky.

Check to see that you have not over tightened the Shoulder Bolt that retains the trigger. This can cause drag on the trigger against the frame. In addition, this can be caused by simply having a dirty trigger frame.

What feedneck threading is my marker?

CCM uses their own threads for the feedneck on the S6 and S5B. However, on older Series 5 markers they used two different threads. The first Series 5's were made to take Angel threaded feednecks. Later S5's were made with CCM threads akin to the S5B and S6. You know you have one of these later S5's if your serial number ends in 'A'. If you just have numbers – it is angel threaded.

XVII. Series 6 – Parts List

Item	Material	Vendor	Part #
Body Assembly:			
Body	6061 Aluminum	DPM	
Back Block	6061 Aluminum	DPM	
Body - Upper Tube **from the barrel:**			
Bolt Tip	Delrin	DPM	
Bolt Back	2011 Aluminum or Delrin	DPM	
Bolt Half Connecting Pin	Steel	McMaster	1/8 x 3/4 Roll Pin
Bolt Pin	Delrin	DPM	
Bolt Pin O-ring	Buna-N	McMaster	N90-009
Detents	Buna-N		Intimidator Detents (on S6)
Detent	Stainless Steel	McMaster	Spring (on S5 and S5B)
Detent Covers	2011 Aluminum	DPM	
Detent Cover Screws	Stainless Steel	Fastenal	4-40 x 1/8 SCS
Body - Lower Tube **from the pump:**			
Exhaust Valve Spring	Stainless Steel	Lee Springs	LC-028D 11
Exhaust Valve Hat	2011 Aluminum	DPM	
Exhaust Valve O-Ring	Buna-N	McMaster	N70-011
Exhaust Valve Pin	2011 Aluminum	DPM	
Exhaust Valve Body	2011 Aluminum	DPM	
Exhaust Valve Body O-ring	Buna-N	McMaster	N70-011
Valve Retaining Nut	2011 Aluminum	DPM	
Valve Alignment Screw	Stainless Steel	McMaster	5/16 - 24 x 1/4 SS
Valve Retaining Nut Set Screw	Stainless Steel	McMaster	10-32 x 3/16 SS
Hammer Body	Stainless Steel	DPM	
Hammer Sear Lug	Stainless Steel	Fastenal	1/4 - 28 x 5/8 SSCP (Turned at the bottom)
Hammer Nylon Set Screw	Nylon	Fastenal	10-32 x 3/16
Main Spring	Stainless Steel	Lee Springs	LC-038D 10S
Cocking Rod	300 Series Steel	DPM	
Cocking Rod Bumper	Rubber?	McMaster	ID 3170 OD .375 Thick .93
Cocking Knob	2011 Aluminum	DPM	
Cocking Rod Set Screw	Stainless Steel	Fastenal	10-32 x 3/16 SS
Pump Kit (Post 2000) **From the pump handle**			
Pump Handle	Delrin	DPM	
Pump handle Plate	2011	DPM	
Pump Plate Screws	Stainless Steel	Fastenal	10-32 x 1/2 FHSCS
Large Guide Rod	Stainless Steel	DPM	OD .375, Length 3.25

Small Guide Rod	Stainless Steel	DPM	OD .190, Length 3.10
Pump Arm - Drilled and Tapped	Stainless Steel	DPM	
Pump Kit Chassis	2011 Aluminum	DPM	
Pump Guide Screw	2011 Aluminum		
Pump Kit Guide Screw O-Rings	Buna-N	McMaster	N70-015
Grip Frame **from the Trigger Guard.**			
86 Degree or .45 Hinge Frame	6061 Aluminum	DPM	
Trigger	Delrin	DPM	
Trigger Bearing			H .250, W .110
Trigger Bearing Pin	Steel	McMaster	1/8 x 1/4 Dowel Pin
Sear			Standard cocker sear
Sear Pin	Steel	McMaster	1/8 x 1/2 Ground Pin
Sear Pin Lock Screw (no present on the S5 or S5B)	Stainless Steel	McMaster	8/32 x 1/8 Dowel Pin
Sear Spring (Same as Valve Spring)	Lee Springs	Lee Springs	LC-028D 11
Grips (on 86 degree grip)	Delrin	DPM	
Grips (optional on 86 degree grip)		Hogue	CZ Grips.
Grips on .45 Grip			Standard 45*, CCM Logo, standard hole pattern.
Grip Screws	Stainless Steel	Fastenal	6-32 x 1/4 ss BSHCS
Frame Mounting Screw (front)	Stainless Steel	Fastenal	10-32 x 1/2 BHCS
Frame Mounting Screw (rear)	Stainless Steel	Fastenal	10-38 x 3/8 LHSCS
Beaver Tail Rod	300 Series Steel	DPM	
Beaver Tail	6061 Aluminum	DPM	
Auto Trigger Assembly			
Auto Lever	6061 Aluminum	DPM	
Auto Lever Cam	300 Series Steel	DPM	
Cam Pins	Stainless Steel	Fastenal	1/16 x .250 Ground Pins
Cam to Lever Screw	Stainless Steel	Fastenal	6-32 x 1/4 BSHCS
Auto Lever Screw	300 Series Steel	DPM	
Vertical Regulator Adapter (VRA) and Regulator			
VRA with threaded Guide Hole	2011 Aluminum	DPM	
VRA Screw	Stainless Steel	Fastenal	1/4 - 28x3/4 18-8 SHCS
VRA O-Ring	Buna-N	McMaster	N70-113
Regulator Top Housing	2011 Aluminum	DPM	
Regulator Top O-Ring	Buna-N	O-Rings West	N90-015
Poppet Nut	2011 Aluminum	DPM	
Poppet Nut O-Ring	Buna-N	McMaster	N70-010
Poppet (pin)	2011 Aluminum	DPM	
Poppet Spring	Stainless Steel	McMaster	LC 016C 055
Poppet Seat	Buna-N	McMaster	N90-006

Regulator Lower Housing	2011 Aluminum	McMaster	
Lower Housing top O-ring	Buna-N	McMaster	N70-017
Regulator Piston	Delrin	DPM	
Regulator Piston O-ring	Buna-N	McMaster	N70-113
Regulator Main Spring	Music Wire	Lee Springs	Special Grind
Regulator Spring Seat	2011 Aluminum	DPM	
Regulator Adjustment Screw	Stainless Steel	McMaster	3/8 - 24 x 5/8 18-8SS
Feedneck:			
Feedneck	2011 Aluminum	DPM	7/8 x 20
Clamp Ring	2011 Aluminum	DPM	
Clamp Ring Screw	Stainless Steel	Fastenal	10-32x1/2 SCHMS
Rail	2011 Aluminum	DPM	
Mounting Screws	Stainless Steel	Fastenal	10-32 x 1/2 SCHMS
Rail Spreading Screws	Stainless Steel	Fastenal	1/4 - 28 x 5/8 SSCP
Side Port Plug Screw	Zinc Plated	McMaster	1/8 pipe plug
Knob O-ring	Buna-N	O-Rings West	N90-015
On-Off Body	2011 Aluminum		
On-Off Shaft O-Ring	Buna-N	McMaster	N70-008

XVIII. Contact Information for CCM:

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XIX. Additions and Changes:

We will be making changes to this manual periodically as we find out more and add more information.

Please feel free to contact TF@Pumpenstein.com with any additions, corrections, or changes.