MACDEV

www.macdevpaintball.com

PRIME ™

PRIME™
Owners Manual

MACDEV

Prime Owners Manual
V1.00
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MacDev Warranty
MacDev offers a 12 month limited warranty period on your MacDev manufactured electro-pneumatic marker. The MacDev electro-pneumatic marker is warranted to be free from all manufacturing and production defects for a period of 12 months from the date of original purchase. If requested by MacDev, an original proof of purchase must be provided. Warranty exceptions include, but are not limited to, accidental damage, misadventure, reasonable wear and tear and consumable components such as O-rings, detents, batteries and eyes. Warranty work must be undertaken by an authorized MacDev Tech Centre or at a MacDev sanctioned Tech Support booth.

For assistance with your warranty, please visit www.macdevpaintball.com/warranty or contact customer service on our website (www.macdevpaintball.com)

Warning!

This is not a toy. Misuse may cause serious injury or death. Eye protection designed specifically for paintball must be worn by user and persons within range. Recommend 18 years or older to purchase. Persons under 18 must have adult supervision.
READ OWNER'S MANUAL BEFORE USING.

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KNOW YOUR Prime®

Congratulations on your purchase of a new MacDev Prime. The Prime paintball marker uses a highly efficient spool valve drive for a flat, consent and accurate shot. The drive is powered by a high precision, low power solenoid valve, manufactured in house by MacDev. The entire system is controlled by a new generation, robust microprocessor running a proprietary operating system.

The latest features have been added around this powerful base core to bring you a marker with unrivalled usability, quality and reliability.

Please take the time to learn the parts of your Prime, it will help you when reading this manual.

Numbered basic parts as shown in the figure on the left:

1. Shift 2 barrel
2. Feed clamp lever (used to affix your loader)
3. Drive cover (pull up and back to remove)
4. Velocity regulator adjustment (anti clockwise to increase velocity)
5. Eye covers and screws
6. OLED display used to view gun status/settings
7. Trigger with screw adjustments
8. Membrane pad with power and programming buttons
9. Venting ASA, screw your air system in here
10. Venting ASA on/off lever (used to turn the air on or off)
11. Front grip assembly

Please note, the features and included accessories are subject to change, and may vary from those show in this manual.

QUICK SETUP

Switching your Prime on and off

The on/off button is located on a membrane pad on the rear of the frame. Push the button with the power symbol (⏻), when done correctly, your OLED will display the MacDev logo and the marker will be set with the beam sensor system on and ready to fire. Turn your marker off by holding the power button down until the OLED system goes blank.

Firing your marker

If a paintball is loaded in your marker, and the power is switched on, you may fire the marker by pulling the trigger. If a paintball is not loaded, then you need to either load one, or read the section below on disabling the beam sensor.

Understanding the beam sensor

Your marker is equipped with a visible light sensor to determine if a paintball is correctly loaded. This system is used to prevent accidental ball breakage due to misloaded paintballs. The OLED indicator on the side of your grip will show you the status of the beam sensor:

🟢 Ball loaded   ❎ Sensor disabled

⚫ No ball loaded   ❓ Sensor fault

Disabling the beam sensor

To disable the sensor (for dry firing), hold the scroll button on the membrane pad (⬍) until the beam sensor disabled icon appears on the OLED display. You can re-enable the beam sensor the same way.

Membrane Pad

⏻ Power button
(for power on/off)

⬍ Scroll button
(for eyes on/off and programming)

OLED Display

- Battery meter
- Cycle mode
- Cycle speed (max)
- Sensor status
- ROF meter

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Installing a preset air system

Your marker comes equipped with a high quality venting ASA (Air System Adaptor) that is designed for use with commercially available air/nitrogen systems.

The venting ASA included with your marker uses a lever to turn the air from your preset system on or off. Before installing your preset air system, you must move the lever into the off position, which is flipping it towards the front of the marker. Once this is done, carefully screw your air system into the ASA until it stops.

> WHEN SCREWING YOUR AIR SYSTEM INTO THE ASA, THE THREADS SHOULD BE LOOSE. IF AT ANY POINT THEY BECOME TIGHT, DO NOT FORCE THE THREADS, THIS MAY CAUSE DAMAGE TO YOUR AIR SYSTEM OR YOUR MARKER!

Turning the air on and off

To pressurise your marker, swing the lever backwards into place in the ASA body. This will depress the pin on the end of your air system and pressurise the marker (provided you have sufficient air in your air system).

To depressurise your marker, flip the lever back to the forward position. You should hear air being vented from the ASA. Your air system is now turned off and safe to remove.

Installing an air system

Turning the air on

Using a loader with your Prime

Your marker can operate using any commercially available loader. The software and beam sensor will compensate for the speed of the hopper, ensuring that the marker fires as quickly as the loader allows.

Installing a loader onto your Prime

Open the cam lever as shown. This should allow your loader neck to fit into the feed tube as shown. If your loader does not fit into the feed tube, then you may have to loosen the cam lever - this is done by rotating the cam lever (anticlockwise). Once your loader is pushed all the way down into the feed tube, close the cam lever. If your loader is loose, you may need to open the cam lever, and tighten it (by turning clockwise) to adjust the cam system to hold your hopper tightly. Only ever adjust your cam lever by one turn at a time to prevent overtightening.

DO NOT OVER TIGHTEN YOUR FEED CLAMP! OVERTIGHTENING MAY RESULT IN DAMAGE TO YOUR LOADER OR CLAMP.

Removing your loader

Open the clamp by swinging the lever on its hinge. This will loosen the loader and allow you to remove it easily. If it does not remove easily, then it means that you have the cam lever overtightened.

IOpen the clamp and push in a loader

Close the clamp to lock the loader in

USING YOUR Prime

To get the most out of your Prime, make sure that you follow the instructions in this section to ensure that the Prime is adjusted correctly.

Adjusting the velocity

Your Prime is equipped with a single regulator in the frame, to adjust the velocity adjust the regulator setting. Use an 1/8" allen key from the set provided, and use only small adjustments whilst checking over a chrono. Turn anti clockwise to increase velocty.

DO NOT ADJUST YOUR VELOCITY ABOVE 300FPS, AND ALWAYS OBEY LOCAL LAWS AND REQUIREMENTS.

Velocity adjustment

Adjusting the trigger

Your trigger has four adjustment screws, they are located in the front face of the trigger and also on the upper face. In order of top to bottom, they are the trigger rest point, spring tension, actuation point and stop point.

You can easily adjust these screws to personalise the feel of your trigger.

CAUTION! WHEN ADJUSTING THE SWITCH ACTUATION SCREW, MAKE CERTAIN THAT YOU DO NOT ADJUST THE SCREW IN TOO FAR, AS THIS MAY RESULT IN DAMAGE TO YOUR MICROSWITCH.

Trigger adjustment

Replacing the battery

Remove the two screws holding the wrap around grip onto the left hand side of your grip frame. Gently remove the battery from the clip on harness. Replace the battery with a high quality alkaline 9V battery (type 6LR61).

ADVANCED SETUP

About the tourney lock

The marker board is equipped with a tourney lock system. When the tourney lock system is activated, the marker cannot be reprogrammed on the field - making it tournament legal.

If your board is in locked mode, you can view your settings, but a lock indicator will be shown on the right hand side of the screen, indicating that your board will need to be unlocked before settings may be changed.

The lock status can be changed by opening the left hand side of the marker wrap around grip to gain access to the circuit board. The tournament lock is a black button. Press and hold the tourney lock button until an on screen indication of tourney lock status is shown.

Tourney lock

Entering program mode

To program the board, hold down the trigger whilst turning the marker on. When done correctly, you will see a message on your display screen indicating that programming mode is loading. You must continue to hold the trigger until the program mode is loaded, then release the trigger.

Finding and changing settings

Once in program mode, the OLED display will show a current setting. you can advance to the next setting by tapping the scroll button (⬦). You can go back to the previous setting by tapping the power button (⏻).

Once you have found a setting you would like to change, press and hold the trigger until the setting changes to red.
The setting can now be changed by tapping the scroll button to increase its value (or change to a different option), or tapping the power button to decrease its value.

Once you have adjusted the setting to a value you would like, press and hold the trigger again until the setting returns to white colour, it has now been saved.

If your tourney lock is on, settings that can change the tournament legality of your marker will be locked. Their setting can be viewed, but not changed. You will know if the tournament lock is blocking editing, because a red lock symbol will show in the upper left hand corner of the screen, and the setting will not change to the usual red colour. If you would like to change a locked setting, you must open the wrap around grip and hold in the tourney lock button. This may be done inside program or normal running mode.

Settings in detail

Settings are explained here in detail.

Mode - The type of firing system used, semi auto, Millenium and PSP are common tournament modes. Ramp mode allows the programming of custom ramping behaviour.

ROF - This is the maximum rate of fire allowed by the marker. This setting is only observed if the nex setting, rate of fire cap is set on.

ROF cap - If the cap is enabled, the marker will be limited to the ROF setting. Otherwise, it will fire as fast as the laws of physics (and paint supply) will allow.

Dwell - the amount of time your solenoid is given power - the Prime should be set to a maximum of 12ms. If the weather is very cold, or your marker requires it, you may set this a little higher.

Debounce - the amount of bounce filtering applied by the software. This setting may be increased to remove unwanted trigger bounce.

Ball delay - this is a parameter used to give a paintball time to settle in the breach of the gun. If you have unexplained ball breakage, then you may need to increase this setting.

Eye sensitivity - the sensitivity of the software to changes in your eyes. Please do not change this parameter unless directed (default 10).

Forced shot - when enabled, this will allow the user to force a shot by holding the trigger in - even if the eyes cannot detect a ball. Set this to off, if you would not like to use this function.

FSDO time - FSDO stands for First Shot Drop Off. If you leave your gun for some time, and the first shot is lower than it should be, then you can use this parameter to correct it. This parameter is the time that the software waits before correcting for FSDO.

FSDO dwell - this is the amount of extra dwell given to the solenoid to overcome FSDO - if directed to do so by the above parameter.

Ramp semishots - this setting (and the other three below) is only used if you are using the Ramp firemode. This is the number of semi auto shots which must be fired before ramping is allowed.

Ramp rate - this is the number of shots per trigger pull when in ramp mode.

Ramp ROF - this is the rate of fire which must be achieved and maintained to stay in ramp mode.

Ramp timeout - the amount of time the user can spend below the ramp ROF before ramping is exited.

Sound - turn sounds on or off.

Auto power off - save power by automatically turning the marker off after 30 minutes.

Load/Save profiles - Your marker has two profile save slots. Once you have your marker set up as you like it, go to save profile and select one of the profiles. Hold the trigger in on the profile number you would like, and the current settings will be save to that profile slot. You can reload them at any time using the load profile option. There is an option under load profile, to load factory defaults.

Version information and shot counter is shown on the final setting screen.

Using the USB connector
Your stock board has a mini USB connector on the bottom of the board to the right of the 9V battery. The USB connectivity may be used to update your software via a standard USB/mini USB cable.
Your marker firmware requires MacDev software MDFlash V4 or above to update the firware.

Never update your board with software unless it has been downloaded directly from the MacDev website (www.macdevpaintball.com), the use of non genuine software on your stock board will immediately void your entire marker warranty.

MAINTENANCE

If you take 10 minutes after every day of play to maintain your marker, you will be rewarded with consistent reliable performance.

You should perform basic cleaning after every day of play, and you should perform drivetrain maintenance every 5 cases. You should perform inline regulator maintenance every 20 cases. You can clean and maintain your marker more often, it is up to you.

When maintaining your marker, use only MacDev accessories. Your marker is packaged with an allen key set and a small tube of MacDev Militia Lube, only use Militia Lube for lubrication.

Basic cleaning

After using your marker, always clean old paint from the outside. Always clean your barrel using a barrel swab to remove traces of dirt and paint. Use your barrel swab to clean the breech and feed tube in a similar way.
Your marker internal parts are quite well protected and sealed. However, when not in use, dirt can get into the marker and cause problems - so storage of your marker is just as important as cleaning. When storing your marker, ensure that it is stored a bag that is free of dirt, otherwise dirt may get into the venting ASA or breech.
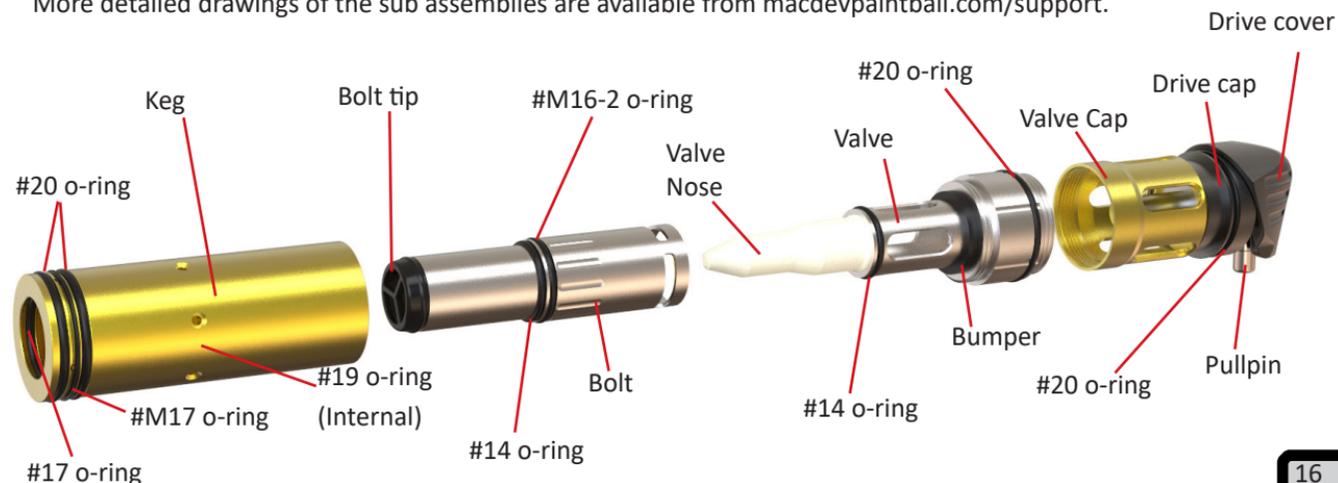
Maintaining the drivetrain

To maintain your drive, ensure your marker is fully degassed and pull the drive cover up to release the drive. Slide the drive out of your Prime. Unscrew the drive parts to access the components shown in the diagram below.

Clean the old grease and dirt from the keg, bolt and valve. Apply fresh Militia Lube to the keg inner o-rings (#17 and #19). Apply fresh lube to the #M16-2 o-ring on the bolt, as well as the inside of the larger end of the bolt. Slide the bolt back into the keg. Apply fresh lube to the #14 o-ring on the valve and slide it into the bolt, then screw the valve into place. Complete the drive assembly by screwing the valve cap back onto the valve.

When the drive is re-assembled, push the drive cover up and down to ensure the detent and spring are working correctly. Lightly regrease the outside of the drive and slide it back into your Prime marker.

More detailed drawings of the sub assemblies are available from macdevpaintball.com/support.

Keg | Bolt tip | #M16-2 o-ring | #20 o-ring | Valve Cap | Drive cover | Drive cap | Valve | Valve Nose | #20 o-ring | Bumper | Pullpin | #14 o-ring | #19 o-ring (Internal) | Bolt | #M17 o-ring | #17 o-ring | #14 o-ring | #20 o-ring

Maintaining the inline regulator

Your inline regulator regulates the pressure from your air system down to the pressure used to fire your marker. It is very important that your inline regulator is working well, if not, you may experience problems with velocity fluctuation or shootdown.

Before working on your inline reg, make certain that the air supply is turned off (via the venting ASA), and safely fire any gas out of the gun to ensure it does not have any residual pressure.

To access the regulator, remove the left hand side of your wrap around grip. This will allow you to unscrew the body of the regulator.

Clean the inside of the frame bore with a q-tip, and remove old grease from the regulator piston. Apply new grease to the piston shaft, and the #11 o-ring on the piston, as well as the #8 o-ring.

Apply new grease to the inside of the frame bore before re-installing your regulator.

More detailed drawings of the sub assemblies are available from macdevpaintball.com/support.

Piston

#11 o-ring

Spring

#8 o-ring

Piston stem (Lubricate here)

#11 o-ring

#12 o-ring

Filter
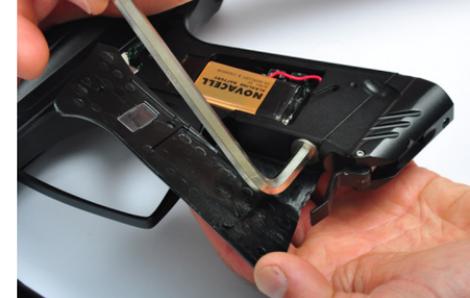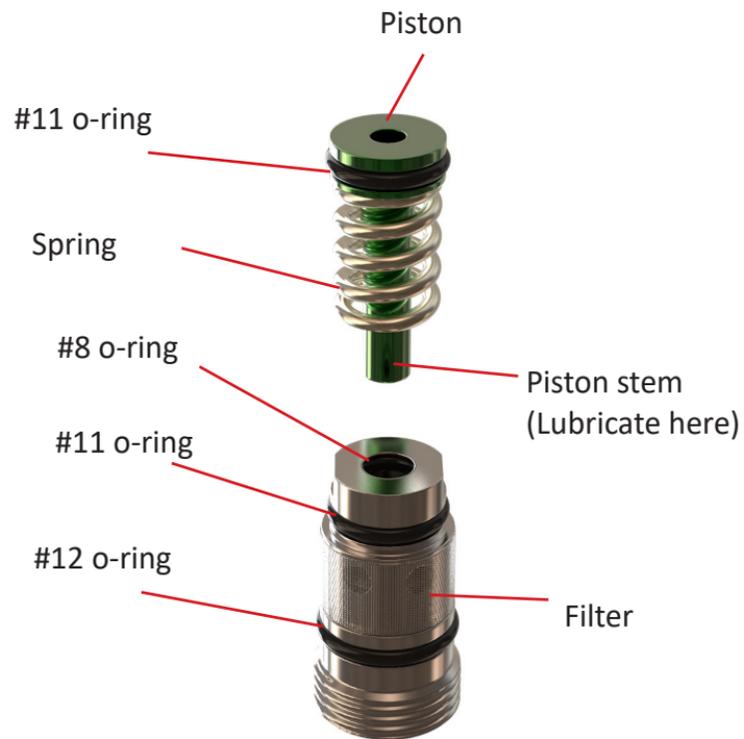
Unscrew regulator from frame (degass marker first)

The piston may not come out with the regulator body. Never use pliers or any tool to grab the piston, this can damage it. Use a 1/8" allen key pushed into the centre hole of the allen key to help remove the piston if it is lodged in the frame bore.

TROUBLESHOOTING

If you are experiencing difficulties with your marker, please check this table first to see if there is an easy solution listed. If at any time you are unsure about how to work on your marker, please contact a certified MacDev technician or service centre.

Symptom	Possible Cause	Solution
Although a fresh battery has been fitted, your marker will not turn on	The battery has not been fitted correctly	Ensure that the battery is firmly connected to both terminals. Ensure that the positive (+) terminal is connected to the positive terminal on your battery.
Your marker leaks from the solenoid	Leaking bolt #M16-2 o-ring	Clean and relubricate the drivetrain with particular attention to the bolt o-ring #M16-2. Replace if necessary.
	Solenoid installation or operational fault	Check the solenoid is mounted correctly. If mounting is correct and the seal is in place, contact your local tech.
	Pressure too high	Reduce the pressure setting on your inline regulator
Your Prime uses excessive air	Keg internal number 19 o-ring leaks	Relube and check the keg o-ring. Replace as necessary.
	General leak	Make certain that there are no leaks from your gun or air system wasting your air supply.

Symptom	Possible Cause	Solution
The beam sensor is not reading correctly	Bolt is not moving	Trying to cycle your Prime without air can lead to sensor fault signals, ignore them unless your bolt is moving back and forth.
	Eyes are dirty	Check that the eyes are clean and not blocked.
	Eyes are faulty	Replace the eye pair.
Your Prime is chopping paintballs	Beam sensor is turned off	Always play with the beam sensor enabled.
	Beam sensor is dirty or blocked	Clean the breach, bolt and sensor.
	Loader is set on a force setting too high for your paintballs	Some force fed loaders can apply enough force to break a fragile paintball. If this is the case, consult your loader manual to reduce the force setting.
	Detents are missing or incorrectly installed	Replace or re-install your detents.
	Eye delay too low	Increase the eye delay (pg 13)
Your Prime will not fire	The trigger is set up incorrectly	Ensure that the trigger actuates the micro-switch by adjusting the actuator screw.
	The beam sensor is on, and there are no paintballs loaded	Load some paintballs.
	The solenoid is not plugged in	Plug the solenoid into the board.

Symptom	Possible Cause	Solution
Your Prime fires high on the first shot or inconsistently.	Creeping regulator	Clean and lubricate the reglulator, ensure that the seat and piston are in good condition.
Your Prime fires low on the first shot	Sticking drivetrain	Clean and relubricate the drivetrain. If you continue to have problems: -increase the dwell by 1-2 ms. -increase the ABS parameter on your board.

PRIME SPECIFICATIONS

(Specs are a guide only and may change without notice)
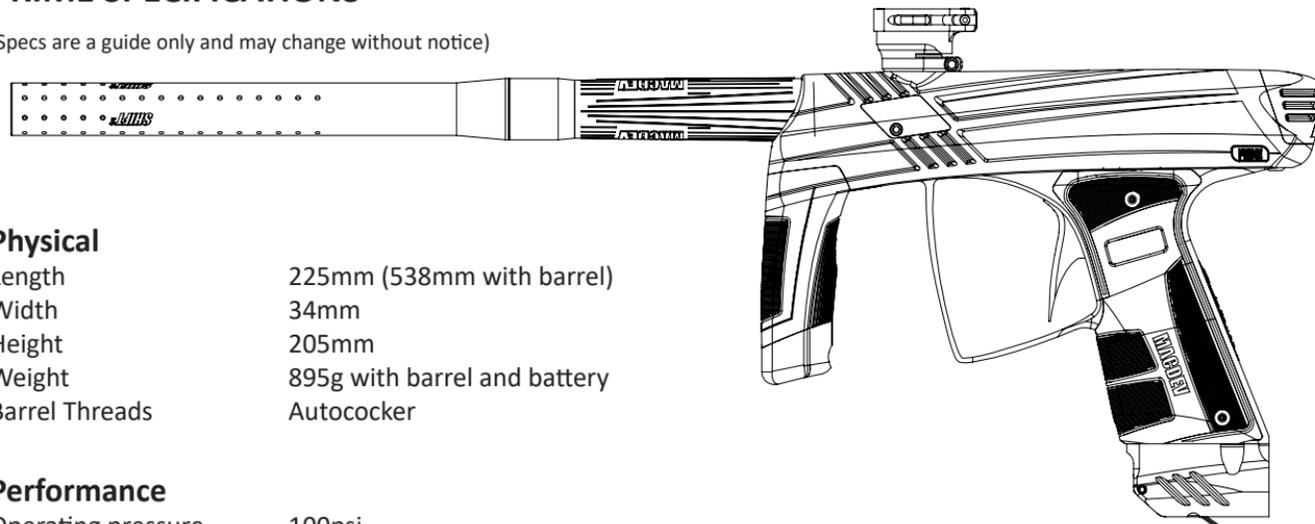
Physical
Length	225mm (538mm with barrel)
Width	34mm
Height	205mm
Weight	895g with barrel and battery
Barrel Threads	Autococker

Performance
Operating pressure	100psi
Maximum Rate of Fire	30 BPS (only allowed with eyes on, and paint)

Electronics
Software	Militiasoft V1.xx
Hardware	PRIME V1.03 (Lead Free)
Display	65K colour OLED, low power usage 128x32px
Power	9V standard battery 6LR61
Fire modes	Semi, NXL, PSP, Custom ramp, Full Auto
Connectivity	Mini USB
Solenoid	5V 1W

MACDEV TECHNICAL ASSISTANCE

If you require technical assistance, please contact your local MacDev service centre. You can also find assistance on the MacDev support website :
macdevpaintball.com/support