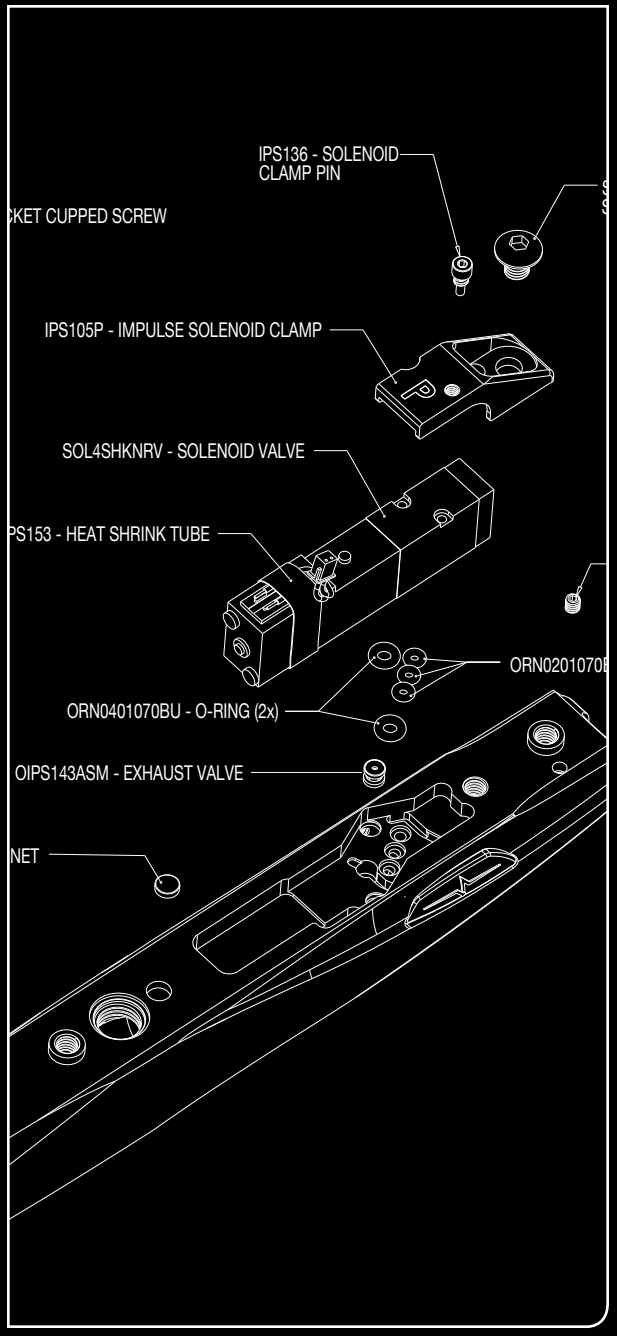
IMPULSE®

SMART PARTS

Operation and adjustment instructions

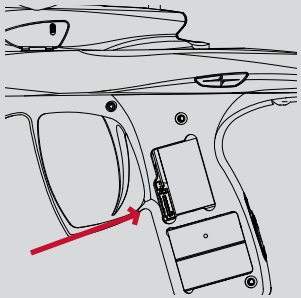


QUICK START

WARNING

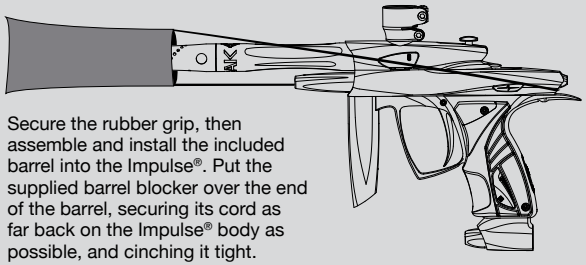
THE IMPULSE® IS DESIGNED FOR USE WITH COMPRESSED AIR (NITROGEN) AND CAN BE DAMAGED BY LIQUID CO_2.

01 CHARGE BATTERY



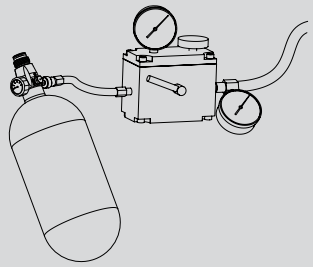
Make sure that the Impulse® Lithium-Polymer battery is fully charged. Use a 5/64-inch allen wrench to open the left side of the rubber grip and connect the Impulse® charger to the charging port before plugging the charger into a domestic 110 or 240 volt AC electrical outlet (plug adapters may be needed outside of US, Canada or Mexico.) The charger LED will glow green when charging is complete (20 to 40 minutes.)

02 BARREL BLOCKER



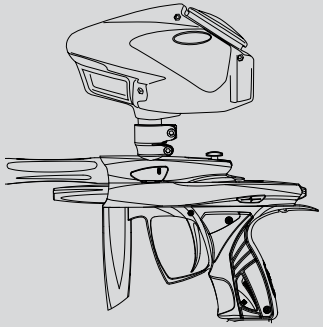
Secure the rubber grip, then assemble and install the included barrel into the Impulse®. Put the supplied barrel blocker over the end of the barrel, securing its cord as far back on the Impulse® body as possible, and cinching it tight.

03 FILL TANK



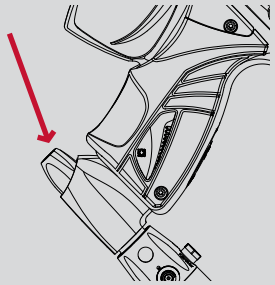
Have your compressed air (HPA) tank filled by a person who is properly trained to do so. If using an HPA system with an on/off valve make sure it is in the OFF position. If using a screw-in style preset HPA system like the Max-Flo™ SIS™, fill it while it is removed from the marker. See the Gasses section of this manual for more information.

04 LOADER



Unlock the Q-Lock™ feedneck and insert your loader and close the locking lever. If the locking lever does not close easily, do not force it - consult the loader section of this manual.
Due to the high rates of fire that the Impulse® can achieve, we recommend the use of a modern high-performance loader.

05 TURN ON AIR

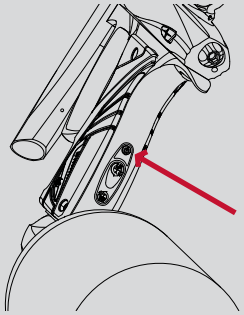


Gently gas up the Impulse® by slowly turning on the air system or turning the Impulse® bottom-line adapter knob clockwise.

WARNING

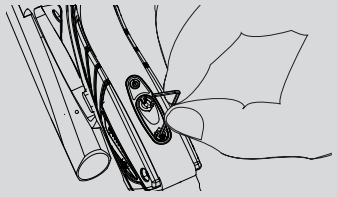
A gentle rise in pressure is important, as a sudden blast may reduce the service life of the Impulse®'s internals.

06 TURN ON IMPULSE®



Turn on the Impulse® by pressing the power button momentarily. The Impulse® will indicate its battery charge level (see the Battery section for more information.) and be ready to fire. If you need to disable Vision® mode to fire gas without paint, push the button for approximately one-half second. Press and hold the power button until the Impulse® control panel LED goes dark, to turn the marker off. This acts as an electronic safety.

07 ADJUST VELOCITY



Fill the loader with paintballs and turn it on. While wearing ASTM compliant paintball goggles in an area where all bystanders are protected, remove the barrel blocker and fire over a chronograph to measure the velocity. Using a 3/32-inch allen-wrench, adjust the primary regulator through the lower (red) opening in the Impulse control panel on the rear of the grip frame. Turn counter-clockwise to increase velocity/pressure, and clockwise to decrease. Take three or four shots after every adjustment to allow the gas pressure inside the marker to stabilize. Adjust until the marker is firing consistently within the limits for the field where you are playing (for safety reasons, never adjust the Impulse to fire at greater than 300 feet per second.) If you are unable to reach the desired velocity, or for more advanved velocity and pressure adjustment instruction, see the pressure balancing section of this manual. Depending on what modes of fire are allowed at the field where you are playing (semi-automatic, PSP, etc.) you may need to adjust the Impulse®'s Firing Mode. See the Firing Mode section for more information.

TABLE OF CONTENTS

WARNING

- THE IMPULSE® IS NOT A TOY.
- MISUSE OF THE IMPULSE® MAY RESULT IN SERIOUS INJURY OR DEATH.
- EYE PROTECTION DESIGNED FOR PAINTBALL USE MUST BE WORN BY THE USER AND ANY PERSON WITHIN RANGE OF THE IMPULSE®.
- SMART PARTS® RECOMMENDS THAT THE IMPULSE® ONLY BE SOLD TO PERSONS 18 AND OLDER.
- THOROUGHLY READ THE IMPULSE® OPERATION AND INSTRUCTION MANUAL BEFORE OPERATING.

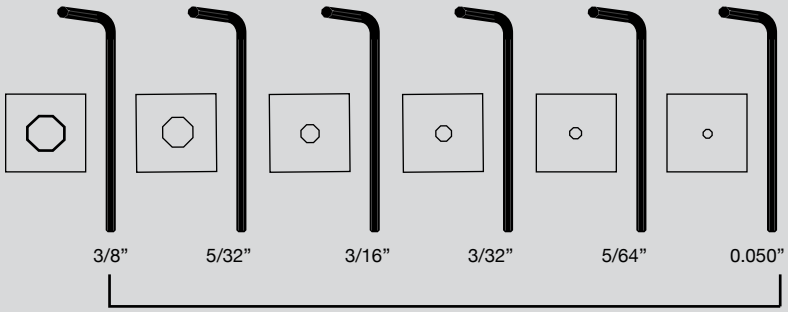
GETTING FAMILIAR

PLEASE READ CAREFULLY

STATISTICS

WEIGHT:	2.1 lbs.
OPERATING PRESSURE:	260-320 psi propulsion / 50-60 psi pneumatic control
POWER SOURCE:	Impulse® Lithium Polymer Rechargeable Battery
PROPELLANT:	Nitrogen/Compressed air
RATE OF FIRE:	20bps in league modes - Uncapped in semi-automatic
OPERATION:	Low pressure electropneumatic
MODES OF FIRE:	11 Semi-automatic and Enhanced Modes
ANTI CHOP SYSTEM:	Break Beam Vision®
BARREL THREAD:	Smart Parts®
LUBRICANT:	For proper and consistent operation, the Impulse® should only be lubricated with SL33K™ lubricating grease.

REQUIRED ITEMS FOR MAINTENANCE



ALLEN WRENCHES

3/8” - Relief Valve

5/32” - Foregrip / Q-Lock / ASA

3/16” - Valve Chamber / End Cap

3/32” - Regulator Adjustment

5/64” - Grip Screws

0.050” - Trigger Adjustments

MAINTENANCE

The Impulse® has been designed with simplicity in mind so that you can concentrate on your game instead of your marker. It has a bolt and hinged eye covers that allow for fast-access field-stripping and cleaning. This DOES NOT mean that you should neglect your Impulse®. If you take care of it off the field, your Impulse® will take care of you on the field. For best performance, clean and grease your Impulse® frequently. Many players disassemble and clean their Impulse® after every use. While this may seem a bit extreme, being vigilant in the upkeep of your Impulse® will extend its useful life considerably. Playing in the rain will not damage your Impulse®, but you should NEVER immerse it in water. If your Impulse® should become waterlogged, remove the barrel and rubber grips and allow it to dry out, then follow the disassembly instructions for full cleaning. Clean out mud and paint with a damp cloth and alcohol. Grease the Impulse® ONLY with SL33K™ pneumatic grease. Use high quality paintballs.

BARREL BLOCKER/HOPPER

PLEASE READ CAREFULLY

BARREL BLOCKER

The Barrel Blocking Device is a critical piece of paintball safety equipment - nearly as important as paintball goggles. The Barrel Blocker serves to protect against accidental discharge of a paintball by catching it before it can cause harm. A Barrel Blocker is included with the Impulse® and must be used every time it is handled in an area where people or property are not properly protected by paintball goggles or paintball field netting. To use the Barrel Blocker simply slip it over the end of the barrel and stretch its cord back over the back of the Impulse® or the rearmost part over which it can be securely looped. Use the strap's adjuster to cinch the strap tight, so that the Barrel Blocker can provide protection against accidental discharge of a paintball.

⚠WARNING

The Barrel Blocker should only be removed when the Impulse® is on a "live" paintball field and all persons involved are wearing proper paintball protection.

HOPPER

The Impulse® is a high performance tournament grade paintball marker. The break-beam Vision system means that you won't need to worry about chopping paint because your trigger finger is faster than your hopper. However, if you want to realize the Impulse®'s maximum firepower potential, you will need to use a high performance loader. High performance loaders, especially those which provide force-feeding, will yield the best results with the Impulse®.

The Impulse® is equipped with a Q-Lock™ locking feedneck that allows it to adapt to the small size differences in hopper neck sizes, yet lock or release quickly. Flipping the Q-Lock™ latch outward will open the locking mechanism, and folding the latch into its slot, flush against the feedneck will cause the feedneck to clamp onto a hopper. If the Q-Lock™ is not gripping tightly enough, or can not be easily locked because it is too tight, it may be easily adjusted. Simply flip the Q-Lock™ latch to the open position, and turn the Q-Lock™ adjuster clockwise with an allen wrench to tighten the mechanism, or counter-clockwise to loosen.

FIG. 1 → BARREL BLOCKER IN USE

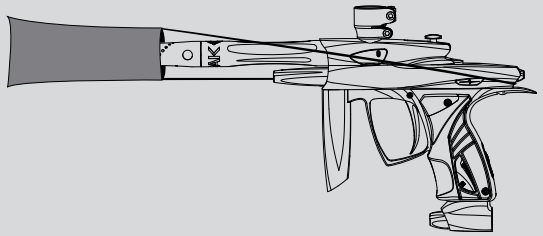
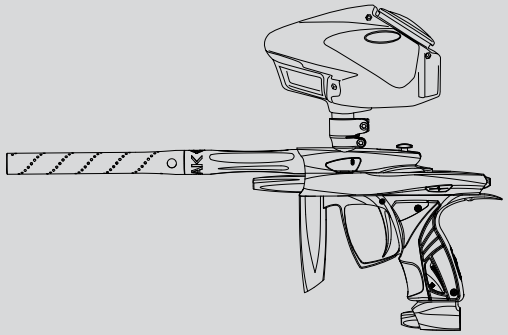


FIG. 2 → USE HIGH PERFORMANCE LOADER



GASES

WARNING
NEVER PUT OIL IN A COMPRESSED AIR REGULATOR OR TANK - ONLY APPLY MANUFACTURER RECOMMENDED LUBRICANTS.

GASES

The Impulse® is a low-pressure paintgun. It uses gas pressure of approximately 260 psi to fire a paintball, approximately 60 psi to operate its valve actuating piston. Because of this low operating pressure and a built in relief valve, it may safely use CO_2 as a power source. The Impulse® is optimized for compressed air, and best performance will be obtained when using an HPA system.

Whether using compressed air or CO_2 it is important that the Impulse® is not exposed to sudden “pops” of pressure. Always turn off (clockwise) the Impulse® grip-integrated Air System Adapter (ASA) before screwing in a compressed air system or anti-siphon CO_2 tank by turning its knob counter clockwise at least 3 full turns. When turning the grip-integrated ASA on, do so slowly, so that the gas pressure inside the marker is raised smoothly. Be gentle to the internals of your Impulse® and they will reward you with a long service life.

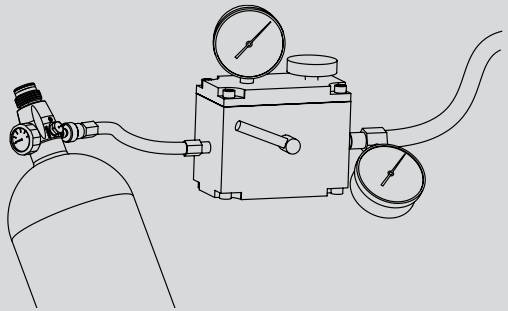
High Pressure Air systems (HPA) are the preferred power source used with the Impulse®, as they are unaffected by temperature fluctuations and do not have the potential for liquid problems. HPA systems consist of a tank and a regulator, and are typically rated to store air or nitrogen at pressures of 3,000 or 4,500 psi. Although pure nitrogen is almost never used in paintball, many players call compressed air “nitro” as air is made of more than 70% nitrogen.

The Impulse® is configured for use with screw-in style HPA systems. Although HPA systems pre-set to deliver approximatly 400 psi (low output) will work with the Impulse®, 800 psi (high output) systems are preferred, to reduce the risk of gas starvation under rapid fire.

WARNING
Never use oil or any petroleum based cleaner or lubricant in a compressed air regulator or tank. Exposure to pressurized air increases oil’s flammability and can cause a serious safety hazard. Only use manufacturer recommended lubricants with compressed air systems, and follow the manufacturer’s maintenance and operation instructions explicitly.

If you are using your Impulse® with an adjustable output compressed air system, it should be set to deliver about 800 psi. The Impulse®’s grip-integrated regulator can accommodate a wide range of input pressures, so exact adjustment of the air system is not critical.

FIG. 3 → HPA TANK BEING FILLED



GASES (CONT.)

PLEASE READ CAREFULLY

GASES (CONTINUED)

While CO_2 can be used to power the Impulse®, it not recommended, because its pressure fluctuates with temperature and use. The important thing to remember if using CO_2 is that liquid CO_2 must not be delivered to the Impulse®. Although the relief valve integrated into the Impulse® expanded volume foregrip provides the marker with protection from pressure spikes, those pressure fluctuations can cause poor marker performance. Because liquid CO_2 is more dense than CO_2 gas, it is easily blocked through the use of gravity.

Two ways to use CO_2 with the Impulse® are an anti-siphon tank or a remote line.

Anti-siphon tanks have a J shaped tube professionally installed inside. When the tank is screwed into a bottom line ASA, like the one that is standard on the Impulse®, with their anti-siphon side up, the tube delivers gas only. The anti-siphon tube works like a diver's snorkel, repositioning the gas intake from the valve to the top side of the tank.

A remote hose allows a standard (non-siphoned) CO_2 tank to be carried in a player's pack. Not only does this make the total weight of the Impulse® less, but it also allows the tank to be placed vertically, so that its valve is at the top, while gravity holds the liquid CO_2 at the bottom. It is important to note, that lying down on the field, or crawling while using a remote can cause liquid CO_2 to be fed to the paintgun as the tank is turned on its side.

FIG. 4 → COMPRESSED AIR

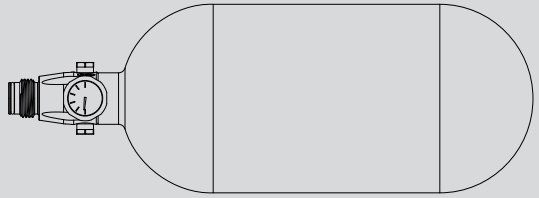
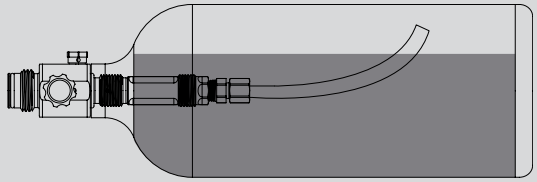


FIG. 5 → CO_2 WITH ANTI-SIPHON [CUTAWAY VIEW]



IMPORTANT

CO_2 may also be configured with a remote hose with-out Anti-Siphon. [Not Shown]

GAS SYSTEM MOUNTING

PLEASE READ CAREFULLY

GAS SYSTEM MOUNTING

The Impulse® integrated air system means that there are no hoses or hose fittings anywhere on the inside or the outside of the marker, instead gas is channeled through passages machined into the Impulse® body and grip frame, greatly reducing the possibility of leaks.

The Impulse® bottom-line style Air System Adapter (ASA) is mounted to the Impulse® grip frame by a pair of paintball industry standard inline 10-32 screws.

To remove the bottom-line ASA for cleaning or replacement, unload and degas the Impulse® following the instructions in this manual. Remove the compressed air system from the ASA, and remove the ASA control knob by fully unscrewing it from the ASA body.

Using a 5/32-inch allen wrench, access the two screws securing the ASA from underneath the ASA body (see arrows in Fig. 6.) Once these have been unscrewed, they may be individually slid to the center of the ASA, and lifted out the top.

Installation is performed in a reverse of the removal process, making certain that the integrated air o-ring (see arrow in Fig. 7) is properly seated in the bottom of the Impulse® grip frame before attaching the ASA. Lightly lubricate the ASA control knob o-ring with SL33K™.

If a slightly lower air system placement is desired, the optional integrated air drop rail may be installed between the ASA and the grip frame. Both the rail's integrated air o-ring, as well as that of the grip frame, must be inspected and the longer ASA screws included with the rail must be used.

FIG. 6 → REMOVE THE ASA CONTROL KNOB

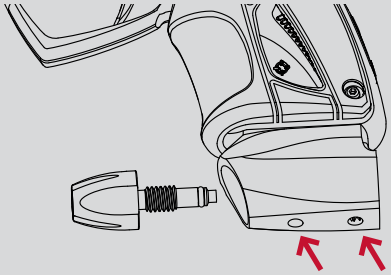


FIG. 7 → ASA MOUNT SCREWS

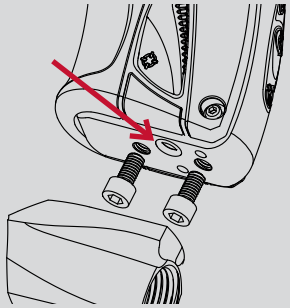
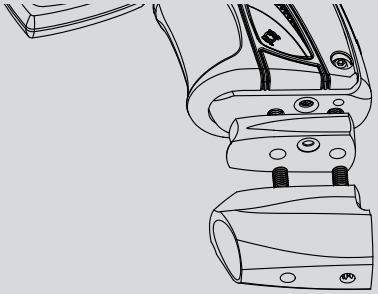


FIG. 8 → INSTALLING DROP RAIL



BATTERY SAFETY

PLEASE READ CAREFULLY

BATTERY SAFETY

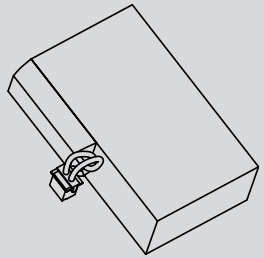
The Impulse® uses a Lithium Polymer battery as its power source. To ensure a long and safe operational life, the battery must be handled with care. Do not expose the battery to high temperatures, such as leaving it out in strong sunlight or an enclosed vehicle in hot weather for a prolonged period of time. Do not expose the battery to high levels of static electricity, as this may damage its on-board control circuits. These types of situations may cause damage leading to fire or explosion. If the battery leaks, avoid contact with the fluids. In case of eye contact, do not rub. Rinse with clean running water and seek medical attention immediately or loss of sight may occur. If the battery gives off an odor, generates heat, becomes discolored/deformed or appears abnormal, remove it from any connected device and place it in a metal box for immediate disposal.

When traveling, make sure that any spare Impulse® batteries are protected from moisture or physical damage. Check with your airline and or the Transportation Safety Administration for specific policies regarding packing and transport of Lithium batteries on passenger aircraft.

⚠WARNING

DO NOT IMMERSE THE BATTERY IN LIQUID. STORE IN A COOL, DRY ENVIRONMENT WHEN NOT IN USE. DO NOT REVERSE POSITIVE (+) AND NEGATIVE (-) TERMINALS OR SHORT-CIRCUIT. DO NOT CONNECT THE BATTERY TO AN ELECTRICAL OUTLET. DO NOT STRIKE OR THROW THE BATTERY AGAINST A HARD SURFACE. DO NOT MODIFY, PIERCE OR SOLDER NEW CONNECTIONS TO THE BATTERY. STORE AND TRANSPORT THE BATTERY IN A CASE WHICH PROTECTS IT FROM DAMAGE OR CONTACT WITH SHARP OR METAL OBJECTS WHEN NOT IN USE.

FIG. 9 → IMPULSE® LI-PO BATTERY



IMPORTANT

THE IMPULSE® BATTERY AND CHARGER CONTAIN BUILT IN OVERCHARGE AND OVER-DISCHARGE PROTECTION CIRCUITRY, AND ARE NOT COMPATIBLE WITH OTHER CHARGER OR MARKER SYSTEMS.

BATTERY CHARGE & SWAP

WARNING

ONLY USE THE SUPPLIED CHARGER TO CHARGE THE IMPULSE®. USE OF AN INCORRECT CHARGER TYPE CREATES A RISK OF FIRE OR EXPLOSION AND INJURY OR DEATH.

CHARGE LEVELS

The Impulse® battery uses Lithium Polymer chemistry, the same type of batteries used to power mobile phones. In addition to rapid charging capabilities, the LiPO batteries are immune to “battery memory” effects caused by only draining them part way. When the Impulse® is turned on, the status LED in the Impulse® control panel at the rear of the grip frame will blink five times, indicating an estimate of the battery’s charge level. The blink colors, green, yellow and red will indicate a progressively weaker battery charge level. Because battery discharge rates vary with load and temperature, it is best to always make sure the Impulse® is fully charged before a day’s play, rather than rely on the charge level estimate.

To charge the Impulse®, unload and degas the marker following the instructions in this manual. Use a 5/64-inch allen wrench to open the left side of the rubber grip and connect the Impulse® charger to the charging port before plugging the charger into a domestic 110 or 240 volt AC electrical outlet (plug prong adapters may be needed outside of US, Canada or Mexico). The charger LED will glow red to indicate that the battery is charging and green when charging is complete. Unplug the charger from the wall outlet, then from the Impulse®. Close and resecure the grip before use. Mobile charging from a car’s electrical system may be accomplished by plugging the Impulse® charger into a 120 volt AC power inverter, or obtaining an optional Smart Parts® Impulse® 12-volt charger.

BATTERY SWAP

Swapping a low battery for a fully charged battery can be used as a rapid alternative to charging when either the electrical power or time needed to charge is unavailable. To exchange the Impulse® battery, unload and degas the marker, then open the left side of the grip, the same as when charging. Gently lift out the battery, taking care not to strain its leads. Unplug the battery from the Impulse® circuit board, taking care to pull on the connector itself, not the leads. Plug in and install the new battery. The battery plugs into a small white connector located just above the black charging port. Battery orientation is important. The battery is not completely rectangular, the bulge in the battery’s edge created by its internal discharge control circuit board should be oriented to the top and front, above the charging port in the grip frame. The battery connection is charge-oriented, and designed so that it can not be plugged in backwards. If the battery connector does not plug in easily, do not force it, try reversing it, make sure the plug us facing the correct direction. Make sure the battery leads (wires) are tucked neatly into the grip frame before closing and resecuring the grip. Later, when charging is available, charge the battery in the marker, then swap batteries again and charge the low battery in the marker.

FIG. 10 → CHARGING PORT

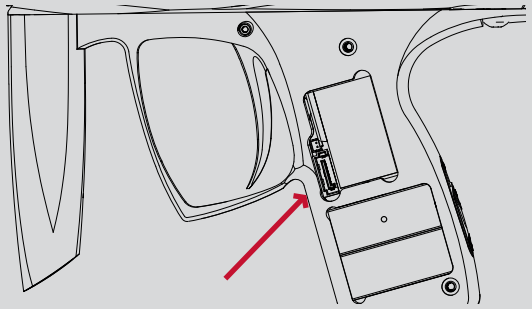
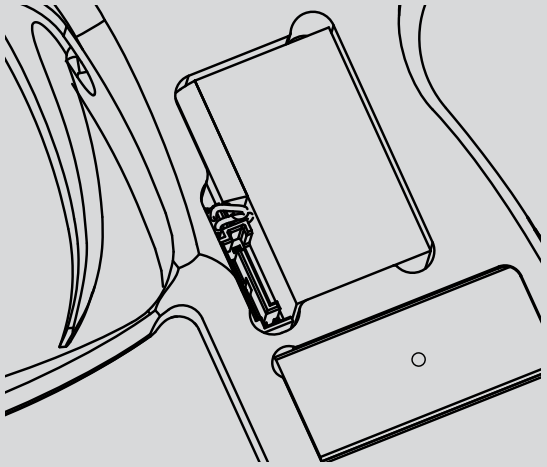


FIG. 11 → BATTERY ORIENTATION



PAINT/VELOCITY/VISION

WARNING

NEVER ADJUST THE IMPULSE® TO FIRE ABOVE 300 FEET PER SECOND, AS SERIOUS INJURY MAY RESULT.

PAINT

Even the best quality paintballs will vary in size from one batch to the next and as weather conditions change. While your Impulse® will work well even with a poor paint to barrel fit, optimal performance will be achieved with a proper fit. Paintgun barrels are available in a variety of bore sizes to allow the user to select the best possible fit. The Impulse® barrel is factory configured with The Freak® bore insert. The Freak® Kit or Freak JR™ kits will provide you with a set of compatible inserts that will allow your Impulse® barrel to quickly adapt to paint of different diameters.

The ideal fit between the paintball and the barrel is when the ball is inserted in the bore (the end that screws into the Impulse®) and does not slip or roll through to the muzzle (the business end) on its own. The ball should sit in place, even when the barrel is pointed straight down. If the paintball can roll out on its own, the fit is too loose. The ball should be able to be expelled from the barrel by blowing it out, like a blowgun, using a minimal amount of breath. If the ball is difficult to blow through, the fit is too tight, which can lead to ball breakage.

VELOCITY

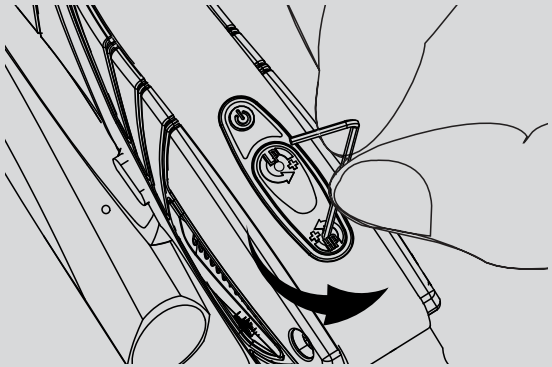
The velocity, or speed at which the Impulse® fires a paintball, must be measured and adjusted to below the paintball field's velocity limit immediately before each day of play (for player safety.) If CO_2 is used, velocity should be checked and adjusted multiple times during the day. In an area where it is safe to fire paintballs, while wearing ASTM compliant eye and face protection for paintball, fire three or four shots over a chronograph to measure the velocity at which the paint is being fired.

If velocity adjustment is necessary, use a 3/32-inch allen-wrench to adjust the primary regulator. Adjustment is made through the center of the circular red arrow on the Impulse® control panel at the rear of the grip frame. Turn counter-clockwise to increase velocity/pressure, and clockwise to decrease. Take three or four shots after every adjustment to allow the gas pressure inside the marker to stabilize. Measure velocity with the chronograph, and continue adjusting until the marker is firing consistently within the velocity limits for the field where you are playing. For safety reasons, never adjust the Impulse® to fire at greater than 300 feet per second.

VISION® INSTRUCTIONS

When the Impulse® is turned on it will be in Vision® mode. The internal infrared eye will be used to detect whether or not a paintball is in the breech. This feature practically eliminates the possibility of a chopped paintball. Vision® mode is indicated by a green glow of the status LED on the Impulse® at the rear of the grip frame. Vision® mode can be de-activated by pressing the power button for 1/2-second while the Impulse® is on. Vision® mode off is a red glow of the Impulse® control panel LED. Vision® mode may be turned back on by once again pressing the power button for 1/2-second.

FIG. 12 → INCREASING VELOCITY



PRESSURE BALANCING

WARNING

BETWEEN THE DWELL TIMING, PRIMARY REGULATOR AND SECOND-STAGE REGULATOR THE IMPULSE® OFFERS A WIDE RANGE OF ADJUSTMENT. IF THESE SETTINGS ARE NOT PROPERLY BALANCED, PERFORMANCE WILL SUFFER.

PRESSURE BALANCING

The velocity and cyclic rate of the Impulse® depend on the balance of three settings. The dwell setting affects how long the marker will hold open its solenoid valve to drive the firing piston towards the pressure balanced poppet valve. The pressure setting of the primary regulator will determine the pressure of gas released each time the valve opens, and the pressure setting of the second-stage regulator will determine the pressure of the gas used to drive the ram forward.

The interrelationship of these three adjustments affect how long the poppet valve stays open. This in turn has a direct effect on the marker's feel, sound signature and efficiency. The Impulse® valve uses seals that expose both ends of the valve core to the atmosphere in order to balance against internal gas pressure. It takes very little force to open the valve, regardless of the pressure of the gas it is controlling. This allows the Impulse® to fire reliably with a variety of pressure and volume combinations while still using a very low pressure on the firing piston, making the marker gentle with brittle paint and giving it almost no recoil.

For best all-around performance, Smart Parts® recommends the following initial set-up proceedure for balancing dwell and pressure settings. Further tuning to personal taste may be done from there, but if the marker becomes unbalanced and performs poorly, performing the pressure balancing procedure will restore reliable operation.

Set the dwell timing to its default value of 8ms, following the the electronic adjustment section of this manual.

Using a 3/32-inch allen-wrench through the Impulse® control panel on the rear of the grip frame, turn the lower adjustment screw (red) all the way in (clockwise) then back out 6 turns. This will place the primary regulator at its factory default setting.

Next, while wearing paintball goggles, and in a safe area (such as the chrono range at a paintball field) turn the the upper (blue) adjustment screw all the way in. Then set the second-stage regulator by backing the adjuster out while firing over a chronograph until the Impulse® can fire consecutive shots at a consistent velocity. Then set the velocity following the velocity adjustment procedure.

WARNING

Always follow the velocity adjusting procedure after making any pressure adjustments to ensure that the Impulse® is not fired at velocities over 300 feet per second. If, after adjustment, the Impulse® shows inconsistent velocity, increase the second-stage (upper, blue) regulator by adjusting counter-clockwise with a 3/32-inch allen wrench.

FIG. 13 → ADJUSTING PRIMARY REGULATOR

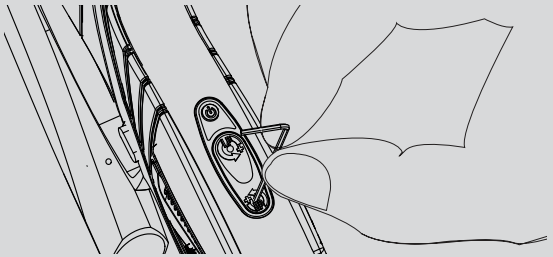
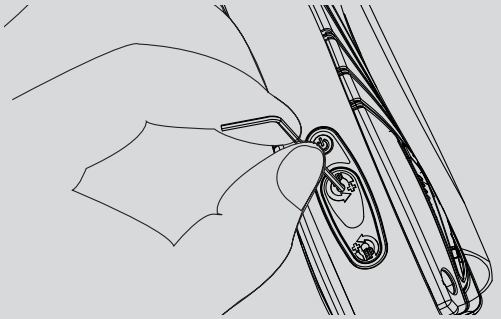


FIG. 14 → ADJUSTING SECOND-STAGE REG



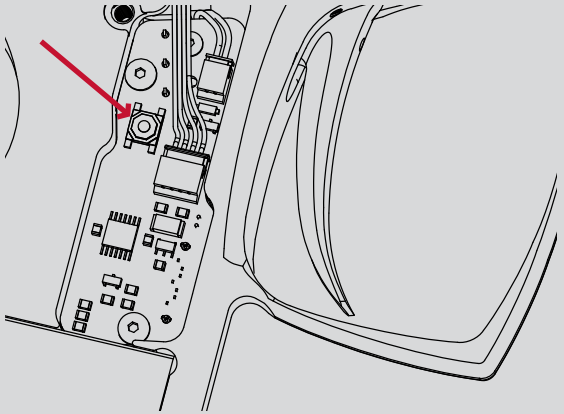
ELECTRONIC ADJUSTMENT

PLEASE READ CAREFULLY

LOCKING/UNLOCKING

Most paintball tournaments, scenario games and fields have rules which do not allow a player to make adjustments that can affect velocity (such as dwell) or firing mode during a game. These rules require that a marker be locked so that such adjustments can not be made without using tools, which are not allowed on-field. Although used in all types of paintball, this is commonly called a tournament lock. To lock or unlock the Impulse® circuit board, unload and degas the marker following the instructions in this manual, then use a 5/64-inch allen-wrench to open the right side of the rubber grip. Turn the Impulse® on, then press and hold the tournament lock button for approximately two seconds. The Impulse® indicator LED will blink twice to indicate the the field-lock has been toggled. The LED will blink red to indicate that the marker has been locked, or green to indicate that it has been unlocked.

FIG. 15 → TOURNAMENT LOCK



ENTERING PROGRAMMING MODE

Enter programming mode, after the marker has been unloaded and degassed, by holding the trigger back and then pressing the power button to turn the marker on, then releasing the trigger. Once in programming mode, pull the trigger to cycle through the available parameters. The speed and color at which the LED on the Impulse® control panel blinks will indicate the selected parameter. If the marker will not switch into programming mode, the Impulse® is locked, and must be unlocked before changes can be made.

When the desired parameter is selected, wait approximately three seconds, and the LED will blink light blue, with the number of blinks corresponding to the parameter's current value. To enter a new value, pull and hold the trigger until the LED turns off, then pull the trigger a number of times corresponding to the desired setting. The LED will blink light blue a number of times to confirm that a new value has been set. To exit programming mode, press and hold the power button, turning the marker off.

ADJUSTMENT PARAMETERS

PLEASE READ CAREFULLY

FIRING MODES (LED: *Solid Red*) The Impulse®'s firing mode parameter determines how the marker fires relative to how the trigger is pulled.

1. **Semi-Automatic:** One shot per trigger pull (uncapped.) This is the default firing mode for the Impulse®.
2. **Capped Semi-Automatic:** One shot per trigger pull, limited by BPS Cap setting.
3. **NXL:** Fires one shot per trigger pull until the trigger is pulled three times in quick succession at which point it fires repeatedly while the trigger is held or pulled quickly. After one second of inactivity, NXL mode reverts to firing one shot per trigger pull.
4. **PSP:** Fires one shot per trigger pull until the trigger is pulled three times in quick succession at which point it switches into a ramping mode firing more than one shot per trigger pull while the player pulls the trigger repeatedly. After one second of inactivity, PSP mode reverts to its beginning single shot per pull operation.
5. **Millennium:** Fires one shot per trigger pull until the trigger is pulled at a rate of 8 times per second or faster, at which point it begins firing more than one shot per trigger pull. When the user pulls the trigger at rates below 8 times per second, Millennium mode reverts to firing one shot per trigger pull.
6. **CFOA:** Fires one shot per trigger pull until the trigger is pulled three times at a rate of 5.5 times per second or faster, at which point more than one ball is fired per trigger pull, until the rate of trigger pulls drops below 5.5 per second, at which point CFOA mode reverts to firing one shot per trigger pull.
7. **Auto Response:** Fires both on the pull and release of the trigger.
8. **Rebound®:** Fires one shot per trigger pull until the rate set in the Shots To Enter parameter is achieved. The Impulse® will then fire more than one shot per trigger pull, as long as the trigger is pulled as fast, or faster than the value set in the Shots To Sustain parameter.
9. **Full-Automatic:** When the trigger is pulled and held, the Impulse® will fire repeatedly until the trigger is released.
10. **Burst Mode:** When the trigger is pulled, the Impulse® fires a number of shots, determined by the value set in the Burst Length parameter.
11. **Billy Ball™:** The Impulse® fires one shot per trigger pull, restricted to extremely low rates of fire, for playing on an even footing against new paintball players, players with Billy Ball™ equipped markers, or paintball players with pump-action markers. Billy Ball™ games offer a less intimidating introduction to paintball for new players, and a game style similar to the early days of paintball, relying more on movement and stealth than high volume firing.

FACTORY RESET

The Impulse® circuit board can be quickly and easily reset to all of its factory default values. While the board is unlocked, and the marker is unloaded and degassed, hold down the trigger and press the power button. Continue holding the trigger for ten seconds until the status LED flashes white. Release the trigger, and all parameters will have been reset to their default values.

ADJUSTMENT PARAMETERS

PLEASE READ CAREFULLY

DWELL (LED: *Solid Green*) The dwell parameter determines how long the Impulse® energizes its solenoid valve to cycle the ram and fire each shot. If the dwell is set too low, the bolt may not close completely, and the ram may not strike against the poppet valve hard enough to fire a full velocity shot. If the dwell is set too high, the poppet valve may be held open longer than is necessary, resulting in reduced gas efficiency. Dwell is adjustable from 1 to 25 milliseconds, with a default value of 8ms.

ROF Cap (LED: *Solid Yellow*) The Rate Of Fire Cap places a limit on how many balls per second the Impulse® may shoot. The ROF Cap is adjustable from 5 to 20 bps. The ROF Cap affects all modes except uncapped semi-automatic. The default ROF Cap is 10 balls per second.

ROF Fine Adjust (LED: *Solid Blue*) The ROF Fine adjust may be set between zero and 0.75 balls per second in 0.25 ms increments (1=0.00bps, 2=0.25bps, 3=0.50bps, 4=0.75bps) This value is added to the ROF Cap setting. ROF Fine Adjust is only used in PSP, Millennium and CFOA firing modes. The default setting for ROF Fine Adjust is one (0bps.)

FSDO (LED: *Solid White*) The Impulse® is equipped with a First Shot Drop Off (FSDO) compensation function. Sometimes the pneumatics system in a marker will bind slightly when it is not fired for a period of time, resulting in a slower response. If the marker starts firing slower than normal, the dwell time will have expired before the valve has been fully opened. FSDO compensation corrects this problem by increasing the dwell time on the first shot in a string that is fired after the marker has been at rest.
The FSDO parameter sets how much the dwell time will be increased for the first shot and is adjustable between 0 and 15 milliseconds. The length of FSDO compensation will be the value of this setting minus one (a setting of 5=4 milliseconds.) A setting of one (0ms) will turn off the FSDO Compensation. The default FSDO setting is 3 (2ms.)

FSDO Timer (LED: *Solid Purple*) This value sets the amount of time the marker must be at rest before FSDO Compensation is activated. The FSDO Timer is adjustable from 30 seconds to 2 minutes in 30 second intervals (1=30sec, 2=1minute, 3=1.5 minutes, 4=2 minutes) and has a default value of 1 (30 seconds.)

CHECKING THE SOFTWARE VERSION
The software driving the Impulse® can be flash-updated by Smart Parts® factory technicians to keep pace with changing tournament rules.

The Impulse® software version number can be checked by unloading and degassing the marker, and turning it on, then pressing the tournament lock button for five full seconds. The LED will turn white, and turn off after two seconds, but the button must be held for the full five seconds.

After the button is released, the LED will stay dark for one second, then it will blink blue, a number of times indicating the major revision number, followed by a series of white blinks to indicate the minor revision number.

As an example, a single blue blink, followed by two white blinks would indicated Impulse® software version 1.2.

ADJUSTMENT PARAMETERS

PLEASE READ CAREFULLY

LOADER DEBOUNCE (LED: *Slow Blink Red*) For reliability, the Vision® anti-chop eye is located mid-way in the Impulse®'s breech, meaning that it will detect a paintball before the ball is completely seated. The Loader Debounce setting specifies how long the Impulse® will wait after first detecting a paintball before firing in order to allow the paintball to fully seat itself. With forced-fed loaders, the time needed to wait can be less than for loaders relying on gravity alone. Loader Debounce is adjustable from 1 to 11 (0 to 10 milliseconds) and has a default setting of 1 (0ms.)

TRIGGER DEBOUNCE (LED: *Slow Blink Green*) The operating software in the Impulse® filters out electronic noise created by the contacts in the trigger switch as they first make contact, to prevent them from being counted as trigger pulls. The debounce sets the minimum length of time that a signal must be detected from the trigger before it is considered a valid trigger pull. Trigger Debounce is adjustable from 1 to 10 milliseconds and has a default value of 8ms. CAUTION: Setting trigger debounce too low may result in the Impulse® firing more than one shot per user-initiated full pull of the trigger, even when in semi-automatic mode, and may not be allowed under some tournament or field rules.

MECHANICAL DEBOUNCE (LED: *Slow Blink Yellow*) The Impulse® also filters out signals from the trigger switch that were most likely caused by internal vibration of the marker rather than a user-initiated pull of the trigger. Mechanical Debounce is adjustable between 1 and 5. CAUTION: Setting mechanical debounce too low may result in the Impulse® firing more than one shot per user initiated full pull of the trigger, even when in semi-automatic mode, and may not be allowed under some tournament or field rules. The default value is one (mechanical debounce off).

AUTO OFF (LED: *Slow Blink Blue*) To conserve its battery charge, the Impulse® will turn itself off when it is unused for an extended period of time. The amount of time to auto-shutdown is adjustable from 5 to 30 minutes in one minute increments, with 30 minutes as the default.

VISION® MODES (LED: *Slow Blink White*) How the Vision® anti-chop system responds when the trigger is pulled and no paintball is loaded depends on the configuration of this parameter. At a setting of 1 (default) the marker is in Classic Vision® mode, and will only fire if a paintball has been detected. A setting of 2 is Delay Vision® and will wait up to half a second to detect a paintball before firing. A setting of 3 selects Forced Vision® which will not fire without a paintball in the breech unless the trigger is pulled and held for a full second.

BYPASS ROF (LED: *Slow Blink Purple*) Regardless of the selected firing mode, this lower Rate Of Fire Cap will be used when the Vision® anti-chop system is turned off. Bypass ROF may be set from 6 to 12 balls per second, and is set to 10 bps by default.

PULLS TO ENTER (LED: *Fast Blink Red*) This parameter sets the number of consecutive trigger pulls that must be made at the Sustain Rate, in order for the Rebound® firing mode to activate and fire more than one shot per trigger pull. This parameter may be set from 1 to 5 and is set at 3 by default.

SUSTAIN RATE (LED: *Fast Blink Green*) This is the rate at which the trigger must be pulled to activate, and remain in the Rebound® firing mode. The Sustain Rate is adjustable from 2 to 10 pulls per second and is set at 3 by default.

BURST DURATION (LED: *Fast Yellow*) The Burst Duration parameter specifies the number of shots per trigger pull-and-hold that the Impulse® will fire in burst mode. This parameter may be set from 2 to 4 shots and is set at 3 by default.

BILLY BALL™ ROF (LED: *Fast Blue*) This parameter sets the extra low Rate Of Fire Cap that is used in the Billy Ball™ firing mode. By default this setting is 0.5 balls per second (one shot every two seconds.) The Billy Ball™ ROF may be set from 0.5 to 2 balls per second (1=0.5bps, 2=1bps, 3=1.5bps, 4=2bps.)

TRIGGER

TRIGGER

The Impulse® has four main points of trigger adjustment providing the ability to set up the perfect trigger for any player's style of play. Adjustments in the pre-travel, post-travel, return tension, and switch activation are possible with a wide range of adjustment for each. It may be tempting to set your Impulse® to the shortest, lightest trigger pull possible, and that is easy to do. Many players however opt for a slightly longer pull with enough resistance that the trigger resets more positively, allowing them to walk the trigger to higher rates of fire. No matter what kind of trigger pull suits your fancy, it's easy to get the Impulse® trigger balanced to your taste. All four adjustment points are located near the trigger pivot point. All trigger adjustments are performed with a .050-inch allen-wrench.

PRE-TRAVEL determines how far the trigger is allowed to swing forward after it is released. The pre-travel screw located on the right side of the grip frame, just below and behind the trigger pivot point. Turn the pre-travel screw counter clockwise to allow the trigger to reset further forward or clockwise to reduce pre-travel. Turning too far in will keep the trigger from resetting after each shot.

POST-TRAVEL determines how far back the trigger is allowed to move. The post-travel adjustment screw is located just forward of the pre-travel screw. To reduce post-travel turn this screw clockwise. Turn counter-clockwise to increase. Turning the post-travel screw in too far will prevent the trigger from moving far enough back to activate the trigger switch and fire the Impulse®.

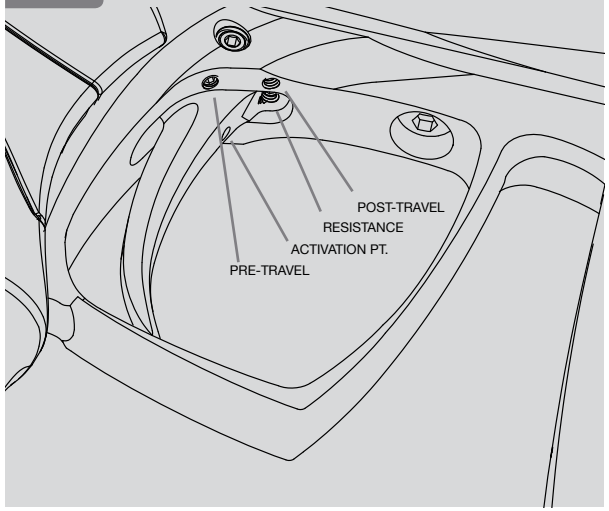
TRIGGER ACTIVATION POINT affects the point in the trigger pull where the trigger switch is activated. This adjustment screw is located at the upper end of the trigger's face. Turn the screw in (clockwise) to make the trigger activate earlier in the trigger pull or turn the screw out (counter-clockwise) to activate later in the trigger pull. Turning the trigger activation point screw too far in or out will prevent the trigger from activating properly, and may lead to trigger switch damage (see warning).

TRIGGER RETURN FORCE defines how hard the Impulse® trigger is to pull. This adjustment screw is located at the very top, front extension of the trigger. Turning clockwise moves the steel screw closer to the rare-earth trigger return magnet, increasing trigger pull weight, while turning counter-clockwise moves the screw further away, decreasing trigger resistance.

WARNING

Turning the trigger activation point screw in too far may cause SEVERE TRIGGER SWITCH DAMAGE. When you finish adjusting the pre-travel, post-travel and trigger activation point screws, the trigger should stop with the solid feel of the post-travel screw making contact with the grip frame. If the trigger activation point screw is adjusted in too far, the trigger will feel more "mushy" at the end of its stroke, and the trigger switch may be damaged by hard or rapid pulling.

FIG. 16 → TRIGGER ADJUSTMENT POINTS



BARREL

WARNING

The thin walls of The FREAK® bore insert can be damaged if packed loose in a gear bag. Always store or transport the insert in the barrel back, FREAK® case or similar protective case.

THE FREAK® COMPATIBLE BARREL

The Impulse® barrel is compatible with the The Freak® barrel system and consists of three main components, all of which are protected by an ultra-smooth hard-anodized finish for a durable super-low friction interior.

The back section is equipped with Smart Parts® barrel threads, a pattern which originated with the Classic Impulse and has become standard for all Smart Parts® markers.

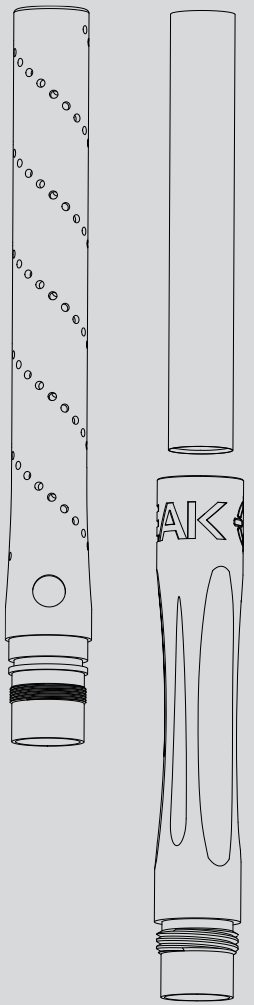
Inside the barrel back is a Freak .693-inch diameter insert for general paintball use. The addition of a Freak Kit will allow barrel inserts to be selected to closely match changing paint conditions for optimal efficiency and accuracy.

The All-American style spiral ported barrel front features dual-spiral porting which allows gas pressures to equalize around the paintball before it exits the barrel for a quiet, accurate shot. Standardized mounting threads mean the All-American front can be quickly exchanged for a variety of Smart Parts® barrel fronts for any situation - such as the portless All-American Rain Front or the linear ported Tactical.

The barrel may be disassembled by simply unscrewing the front section from the back. The insert is removed by sticking a clean fingertip in either end and bending the finger, so that the pad of the finger and knuckle grip against opposite sides of the bore, then pulling out the insert.

O-rings on the rear threads of the front and back sections provide friction so that firing vibration will not unscrew them during operation. These o-rings should not be lubricated, as lubrication would reduce their effectiveness. Two o-rings inside the back section keep the bore insert in place, and if removal of the insert is difficult, they may be lubricated *very sparingly* with SL33K™.

FIG. 17 → IMPULSE® BARREL



UNLOADING/DEGASSING

PLEASE READ CAREFULLY

UNLOADING/DEGASSING

At the end of each day's use and before performing maintenance work on your Impulse®, it will need to be degassed, and all paint removed. In an area where it is safe to shoot (the chronograph area at a paintball field) and while wearing paintball goggles, remove the hopper from the Impulse®. By turning the Impulse® upside down, you can empty any extra paintballs from the feedneck into your hand. Turn the Impulse® on, then de-activate Vision mode by pressing the power button for one-half second until the status LED switches colors to red. Dry-fire 2 or 3 shots in a safe direction to ensure that no paintballs remain in the Impulse®. Turn off the compressed air system by turning the ASA control knob counter-clockwise.

Continue to dry fire the Impulse® in a safe direction until all of the gas pressure inside has been released. At this point the only sound you should hear when you pull the trigger is the click of the solenoid valve. Turn off the Impulse®.

If using a CO_2 tank or screw in HPA system, unscrew it the rest of the way.

WARNING

Even with no CO_2 or compressed air system attached, the Impulse® may still have enough gas pressure stored in the regulator and fire chamber to fire 2 or more shots. You must degas your Impulse® before performing any of these maintenance procedures.

BOLT/EYE CLEANING

01

Unload and degas the Impulse® before any cleaning or maintenance work.

02

Both the bolt and eye covers of the Impulse® may be quickly removed or opened without the use of tools for easy cleaning in the field.

03

To remove the Impulse® bolt, lift the head of the bolt pin up and rear-ward, sliding the bolt out of the upper receiver. The bolt's o-ring may be very lightly lubricated with SL33K™ – but do not lubricate the bolt itself, as it is made from low-friction nylon, and oil or grease may capture debris.

04

After cleaning the bolt with a soft cloth and the breech with a squeegee, replace the bolt, locking its pin down into the firing piston. If the bolt slides freely back and while the marker is tilted forward and back, the bolt pin has not engaged the piston.

05

Both the sensor and emitter for the Impulse® Vision® anti-chop system are protected by hinged eye covers. For cleaning access, simply slide the eye cover's release latch, and allow the cover to swing open. A cotton swab may be used to clean in and around the spaces under the eye cover.

06

While the eye cover is open, be sure to check the ball detent. A worn or damaged detent can lead to double-feeding and or chopped paintballs. With the barrel removed, use a finger tip to press the detent out from the inside of the breech for inspection and cleaning. After inspection and cleaning of the Vision® system and ball detents, make sure both are properly seated, then close the eye cover, allowing it to latch automatically.

FIG. 18 → BOLT REMOVAL

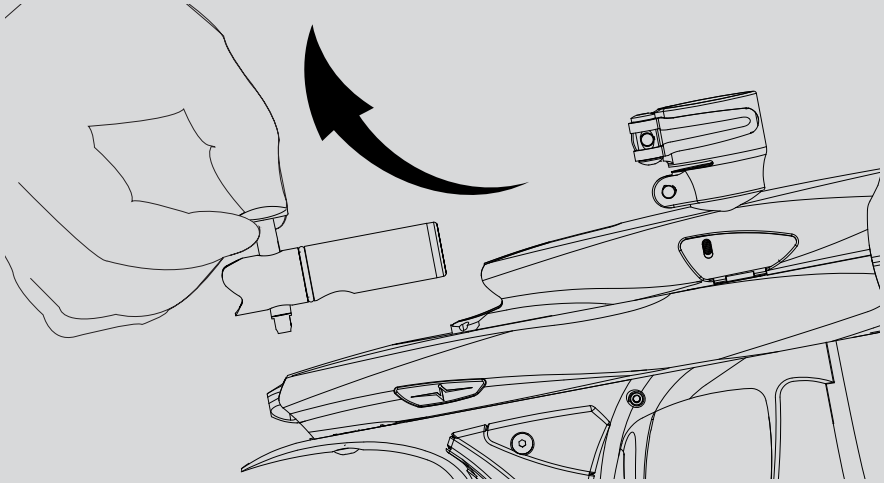
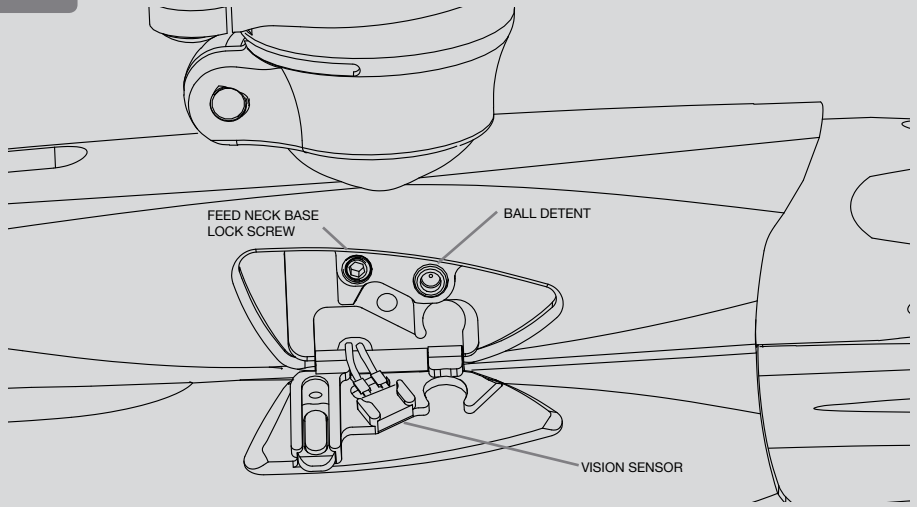


FIG. 19 → VISION® EYE ACCESS



PISTON/VALVE CLEANING

Regular Maintenance
NOTE: Unload and degas the Impulse® before any cleaning or maintenance work.

01 PISTON

The firing piston opens and closes the Impulse®'s bolt, and opens the valve to fire a paintball. Its movement is caused by low-pressure gas, controlled by the solenoid valve inside the marker's grip frame.

02 PISTON

Remove the bolt, and use a 3/16-inch allen wrench to unscrew the rear cap from the Impulse®. Using the same allen wrench, reach through the bolt pin slot in the upper receiver and push the piston out the back of the Impulse®.

03 PISTON

Clean the piston and lower body interior as needed with a cotton swab, and inspect all o-rings and the rubber bumper in the back of the piston for signs of damage – replace if necessary. When finished, lightly lubricate all of the o-rings with SL33K™ and reinsert the piston into the rear of the Impulse®.

04 PISTON

Gently place the rear cap in position and turn it the first few turns gently by hand to ensure that it is not cross-threaded. Secure the rear cap with the long end of the allen wrench, making sure it is seated firm, but do-not over-tighten.

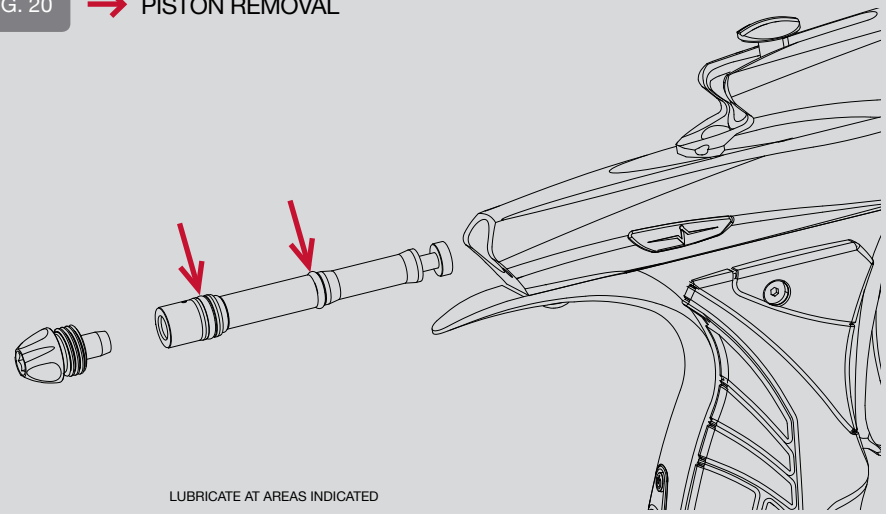
01 VALVE

The heart of the Impulse® is its pressure-balanced firing valve. The valve chamber holds air at a pressure determined by the marker's primary regulator. When the Impulse® is fired, the piston pushes the firing valve core, sliding it forward and allowing gas to flow around its seat, up and through the bolt to fire a paintball.

02 VALVE

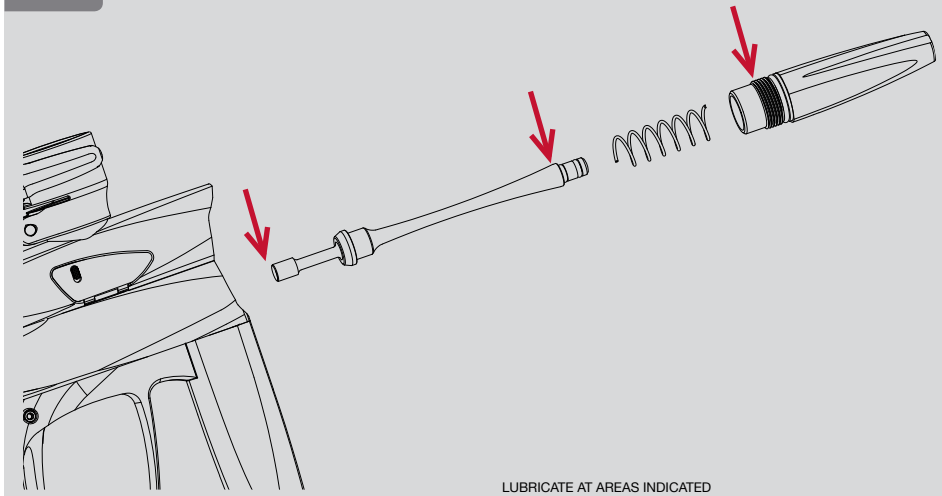
To clean and inspect the valve core, the marker must first be unloaded and degassed. Grasp the valve housing and unscrew it from the lower receiver. If the valve housing is too tight to turn easily by hand, use a 3/16-inch allen wrench for removal. Both the valve spring and valve core may be lifted out by hand. After cleaning, use SL33K™ to lightly lubricate the valve core and valve housing o-rings as well as the rear pin on the valve core.

FIG. 20 → PISTON REMOVAL



LUBRICATE AT AREAS INDICATED

FIG. 21 → VALVE CORE REMOVAL



LUBRICATE AT AREAS INDICATED

FOREGRIP / CIRCUIT BOARD

Advanced Maintenace:
recommended for a trained technician.
NOTE: Unload and degas the Impulse® before any cleaning or maintenance work.

01 FOREGRIP

Using a 3/8-inch allen wrench, remove the relief valve from the bottom of the foregrip.

Use a long 3/16-inch allen wrench to remove the foregrip mounting screw from inside the top of the foregrip.

02 FOREGRIP

Before re-assembly make sure the foregrip o-ring is clean, undamaged and seated properly in the top of the foregrip.

Make sure the relief valve is clean, and nothing is obstructing its gas ports. The relief valve protects the entire Impulse® from over-pressure damage.

The relief valve o-ring should be lightly lubricated with SL33K™.

01 BOARD

To remove the Impulse® circuit board, first remove the battery, following the instructions in this manual.

02 BOARD

Unplug the Vision® wiring harness and the solenoid valve from the right side of the circuit board.

03 BOARD

Using a 1/16-inch allen wrench, remove the two circuit board mounting screws, then lift the circuit board from the grip frame.

04 BOARD

Reinstall in a reverse of the same process. Proceed gently, as the trigger switch lever can catch on the trigger activation screw and be broken by excessive force. Also, do not over-tighten the circuit board mounting screws too much force can damage the board. If the head of the lower screw is large enough to overlap a component on the board, take extreme care not to over-tighten and cause damage.

FIG. 22 → RELIEF VALVE

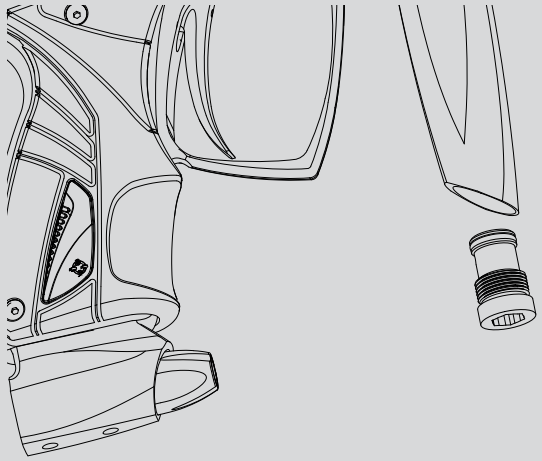


FIG. 23 → FOREGRIP MOUNT SCREW

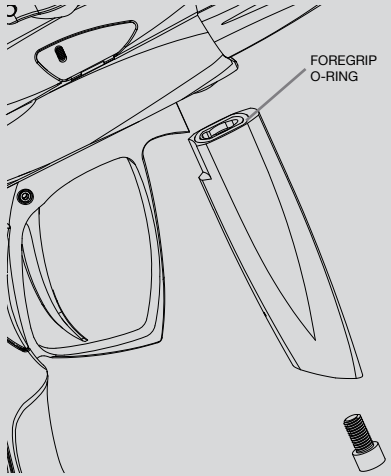
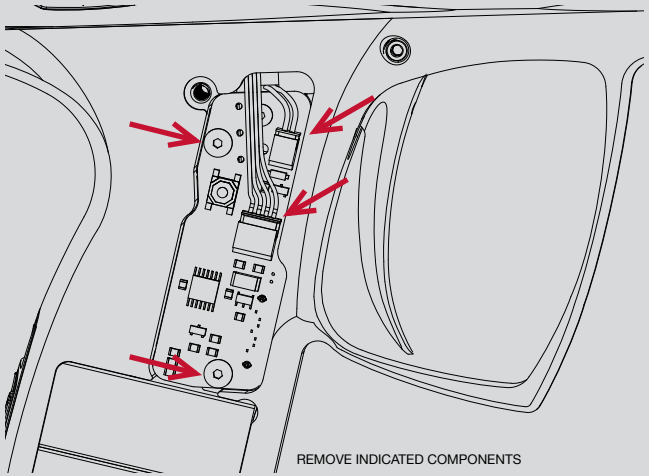


FIG. 24 → CIRCUIT BOARD REMOVAL



REGULATORS

Advanced Maintenace:
recommended for a trained technician.
NOTE: Unload and degas the Impulse® before any cleaning or maintenance work.

01 REGULATORS

The dual-regulators in the Impulse® allow its valve to operate at a pressure that gives optimal efficiency, while the piston is driven at a lower pressure for minimal kick. Both regulators are self contained and can be easily removed for inspection.

02 REGULATORS

With the Impulse® unloaded and degassed, use an o-ring pick to remove the Impulse® control panel's rubber cover.

Use a 1/8-inch allen wrench to remove the control panel screw.

03 REGULATORS

If the control panel plate does not rise up on its own, turn upper (velocity) adjuster screw clockwise until the low-pressure's spring pressure pushes out the control panel plate.

Lift out the control panel plate.

04 REGULATORS

Slide out the two regulator bodies, taking care not to drop the o-rings that seal their air passages to the grip frame.

The regulators should only be disassembled one at a time to avoid mixing parts. Tapping a back corner of the regulator body on a table will dislodge the piston and spring.

05 REGULATORS

The regulator adjustment sleeve may be removed by taking out its snap ring with a pair of snap ring pliers.

The small black screws in the second-stage (upper) regulator plug air passages created during manufacturing and should not be removed, ever. Don't do it. Really, don't.

06 REGULATORS

After inspection and cleaning re-stack the regulators. Slide them back into the grip frame, taking care not to pinch and damage the o-rings that seal them to the grip frame. Reinstall the control panel plate and rubber cover.

Always re-check and adjust velocity after making any regulator adjustments.

FIG. 25 → REGULATOR REMOVAL

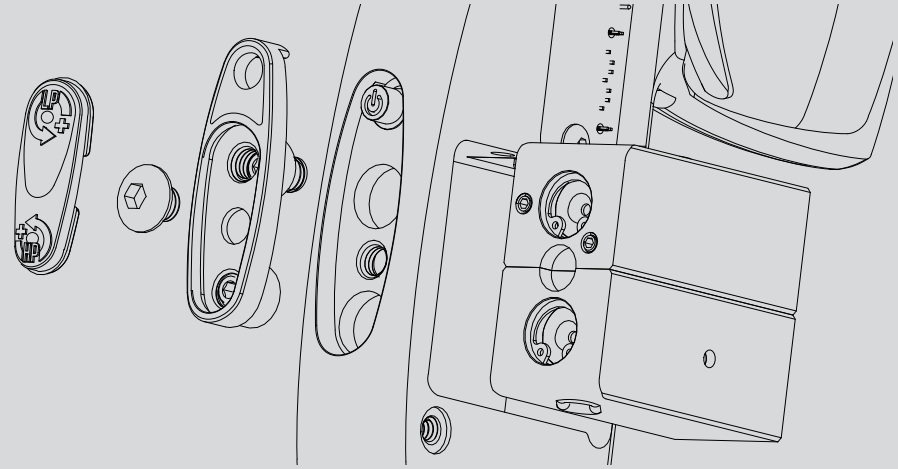
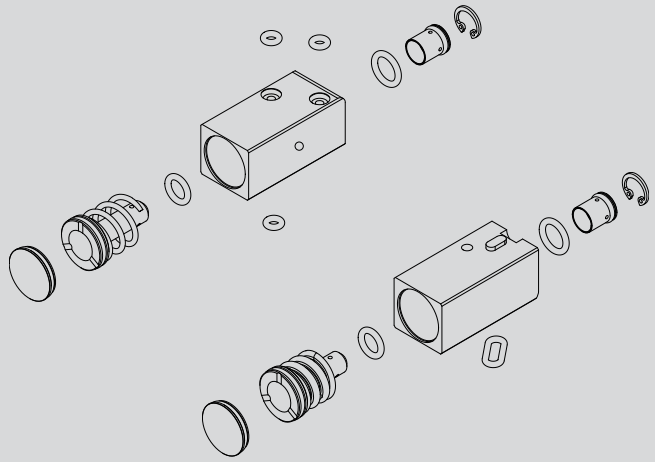


FIG. 26 → REGULATOR DISASSEMBLY



GRIP FRAME / SOLENOID VALVE

Advanced Maintenace:
recommended for a trained technician.
NOTE: Unload and degas the Impulse® before any cleaning or maintenance work.

01

With the Impulse® unloaded and degassed, use a 5/64-inch allen wrench to remove the marker's rubber grip, then unplug both the Vision® wiring harness and solenoid valve wires from the Impulse® circuit board, as when removing the cir-cuit board.

02

Remove the foregrip.
Use a 1/8-inch allen wrench to remove the two grip frame screws. Gently separate the grip frame from the Impulse® body. Take care not to expose the gas transfer pipes in the grip frame to bending forces. The gas transfer pipes should be removed with a 3/32-inch allen wrench only if being replaced due to scratches or bending, in which case thread sealant is required.

03

If removing the solenoid valve, use a 1/8-inch allen wrench to remove the solenoid valve clamp screw and the solenoid valve clamp. The solenoid valve may then be lifted out of its pocket in the Impulse® body. Note the position of the three solenoid valve o-rings in the body.

04

To the left and right of these o-rings are the gas transfer ports, both of which have o-rings within their walls. Replacing these o-rings is a task best suited for an experienc-ed technician.

05

Very lightly lubricate the outside of the gas transfer tubes before reassembly, then reinstall the solenoid valve and its clamp. When reassembling the grip frame to the body, first thread the solenoid valve and Vision® wires into the grip frame.

06

Take care to guide the Vision® wires and make sure they are not pinched while fitting the grip frame back to the body.

Only stock grip frame screws should be used, as incorrect screw length may cause solenoid valve damage.

Secure the grip frame in the body with the grip frame screws and re-attach the rubber grip, then reinstall the foregrip.

FIG. 27 → GRIP FRAME SCREWS

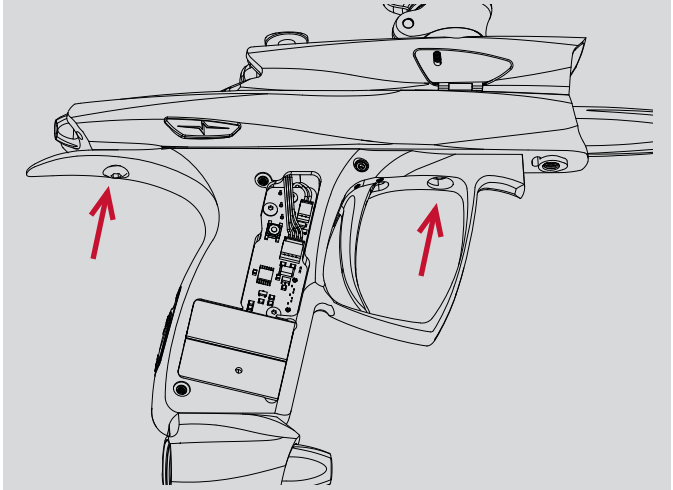


FIG. 28 → GRIP FRAME REMOVAL

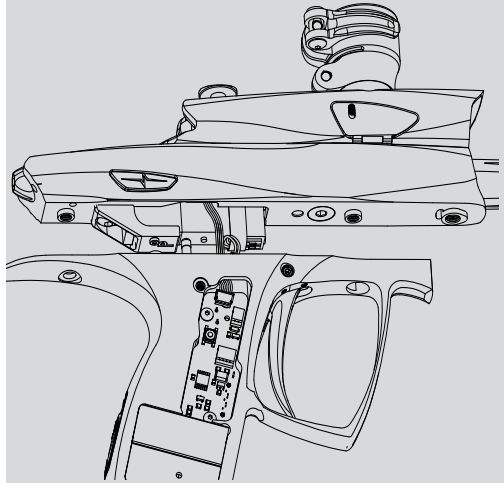
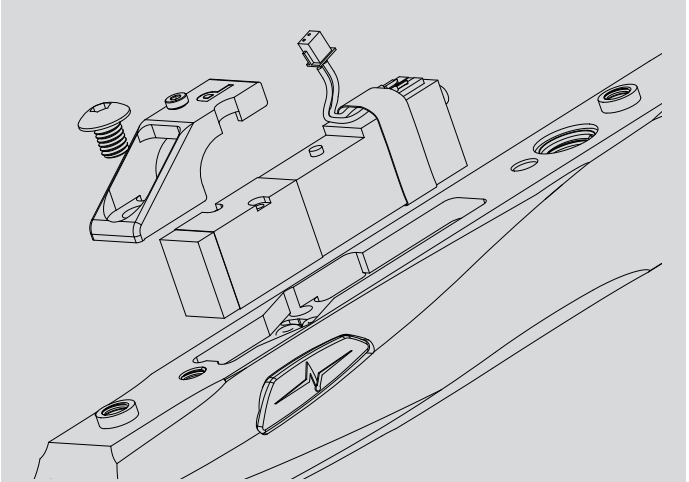


FIG. 29 → SOLENOID VALVE REMOVAL



BODY SEPARATION

Advanced Maintenace:
recommended for a trained technician.
NOTE: Unload and degas the Impulse® before any cleaning or maintenance work.

01

Separate the body only when necessary, as internal Vision® components may be damaged by unnecessary movement.

Remove the Impulse® bolt, and remove the body from the grip frame following the instructions in this manual.

02

Using a 1/8-inch allen wrench, remove the rear body joiner screw.

Use a 1/8-inch allen wrench to loosen the clamp on the bottom of the Q-Lock feedneck, and remove the feedneck from the upper body.

03

Using a 3-32-inch allen wrench, remove the two front body joiner screws from inside the breech. Due to the angled placement of these screws, the use of a ball-end allen wrench is advised. Carefully separate the two body halves, guiding the Vision® wiring harness through the Vision® slot in the lower body. Both the Vision® Eye covers and the Vision® wiring harness may be removed or replaced if necessary while the body halves are apart.

04

Inspect the three body joiner o-rings and be certain they are properly seated in the top surface of the lower body.

If the Vision® covers must be removed, they may be opened and lifted out while the body halves are separate.

05

Notice that body halves contain small plug screws installed during the manufacturing process to block holes drilled to make internal gas passages. These screws should not be removed. Please, resist peer pressure and curiosity, and leave these screws alone.

06

When reassembling the Impulse® body, make sure the Vision® wires are properly seated in the upper receiver, then guide the Vision® plug and wiring through the Vision® slot in the lower body. Join the body halves, then secure them with the body joiner screws. Take extra care with the front body joiner screws, to make sure that they go in at the correct angle and are not cross-threaded.

FIG.30 → BODY SEPARATION

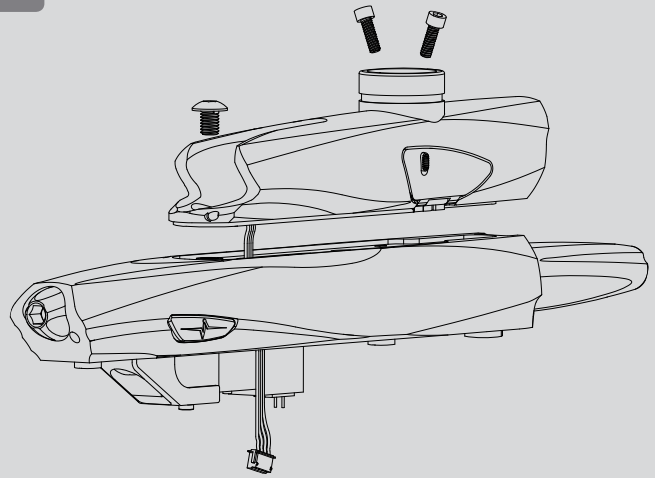
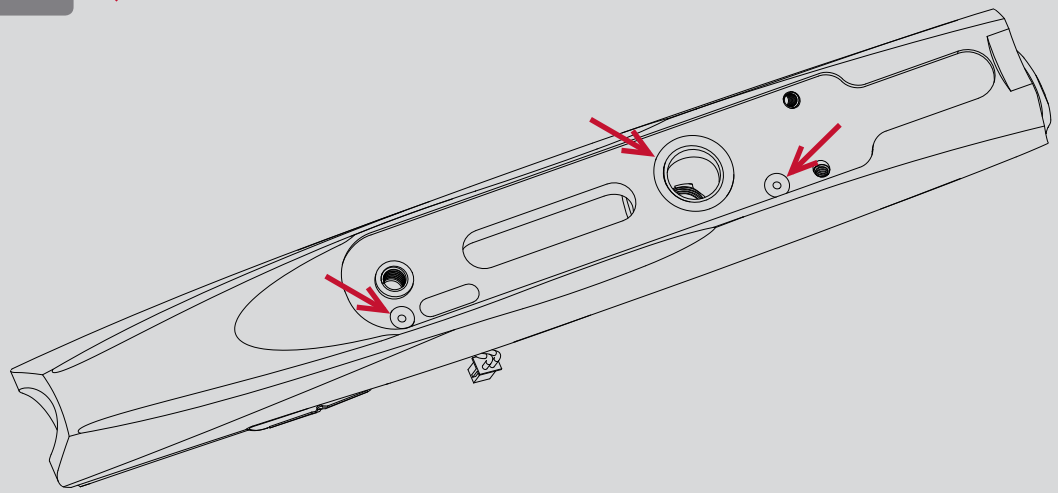


FIG. 31 → BODY O-RING PLACEMENT ON THE LOWER BODY



TROUBLESHOOTING

IMPULSE® WILL NOT TURN ON:

- Make sure the battery is plugged into the circuit board.
- Make sure the battery is fully charged, and or change to a fully charged spare battery.
- Open the rubber grip, as when changing the battery, and inspect to make sure no debris is preventing the power button from pressing the power switch on the Impulse® circuit board.

BREAKING PAINT:

- Paint to barrel match is wrong. The paint you are using is too large for the barrel you are shooting it through. Get a Freak Insert Set and select the proper size insert, or find a paintball that fits your barrel properly.
- Ball Detents are damaged or missing. See manual section on cleaning the Vision system. Inspect and replace detents if damaged or missing.
- Paint is too low quality or too brittle. Switch to a name brand, high quality manufacturer.
- Turn on Vision®.
- Check the Impulse® battery. It may be low, causing incomplete cycling.
- Loader may not be keeping up. Check loader batteries or use a faster loader.

IMPULSE® TURNS ON BUT WILL NOT FIRE:

- Make sure the battery is fully charged, and or change to a fully charged spare battery.
- Make sure the trigger adjustments allow the trigger to activate the trigger switch when pulled, and reset when released.
- Make sure the bolt pin is correctly seated in the firing piston.
- Clean the bolt and breech.
- Reset the dwell setting to 8ms.
- A regulator may be adjusted too low. Complete the pressure balancing procedure described in this manual.

AIR LEAKS DOWN THE BARREL WHEN GASSING UP THE IMPULSE®:

- The rear face of the firing valve core is dirty or damaged. See the cleaning section of this manual, clean and inspect the firing valve core, replace if damaged.

IMPULSE®: FIRES, BUT VELOCITY DROPS UNDER RAPID FIRE:

- Make sure the Impulse® battery is fully charged.
- Increase the secondary regulator pressure.
- If problem persists, clean and inspect regulators.
- Make sure the On/Off control knob is turned all the way on.

IMPORTANT

TECH SUPPORT

Technical support and repair is available through Authorized Smart Parts service centers, and directly at the Smart Parts factory.

Markers sent to Smart Parts, Inc. for warranty and post-warranty technical support must be accompanied by a Return Materials Authorization (RMA) number. Packages without a valid RMA number will be refused.

To search for your nearest Authorized Smart Parts service center, or obtain an RMA and factory service shipping information, visit the support section at www.SmartParts.com

TROUBLESHOOTING

IMPORTANT

REGULATOR LEAK OR CLIMB IN PRESSURE:

- Clean both regulators, inspect, and if necessary replace their piston seats.

LEAK IN THE GRIP FRAME, NEAR THE REGULATORS:

- Clean and inspect both regulators.
- Inspect and and replace any o-rings that show signs of damage.

LEAK BETWEEN GRIP FRAME AND BODY:

- While the Impulse® is pressurized, decrease the pressure in the primary regulator (turn clockwise) until the regulator is off. If the leak stops, inspect the right side air transfer linkage, and the lower body o-ring into which it fits – replace if damaged.
- If leak continues, inspect and if damaged replace the firing piston o-ring.
- If leak continues, inspect and if damaged replace the solenoid valve o-rings.

LEAK BETWEEN BODY HALVES:

- Inspect, and if damaged, replace the body o-rings

LEAK FROM FRONT OF MARKER

- Inspect, lubricate, and if damaged, replace the front o-ring on the firing valve core.

THE IMPULSE® HAS FIRST SHOT DROP OFF (FSDO)

- Clean, lubricate and inspect the bolt, firing piston and firing valve core.
- Increase the second-stage regulator pressure.
- Increase the FSDO setting value.

TRIGGER IS STUCK AND WILL NOT MOVE FREELY:

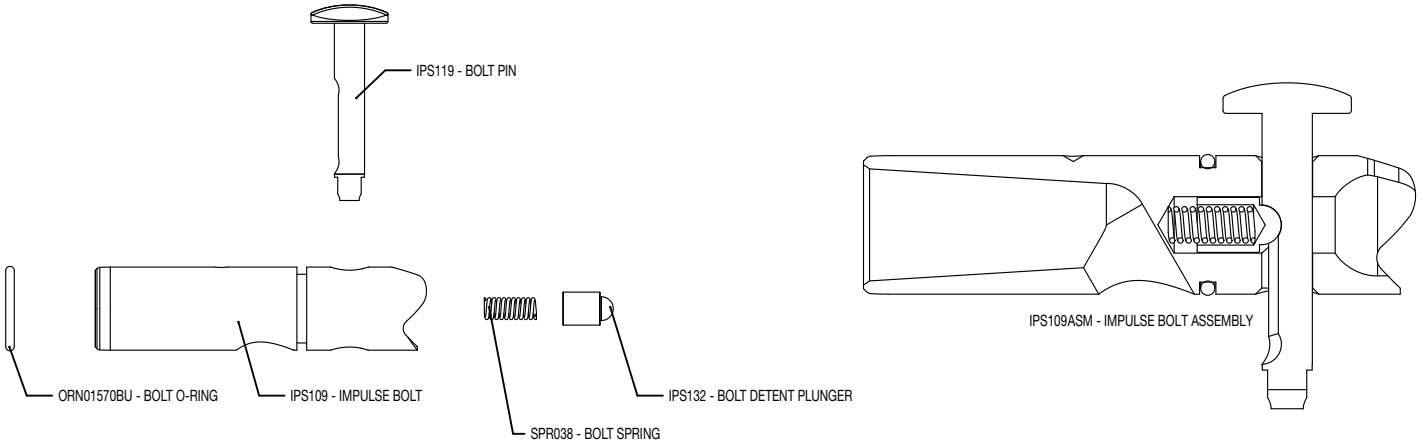
- Make sure the trigger mount screws have not been overtightened. Loosen them slightly.
- Remove the grip frame and remove the trigger. Clean any debris that may be impeding trigger movement.
- Make sure none of the trigger adjustment screws have been set beyond their limits of operation.

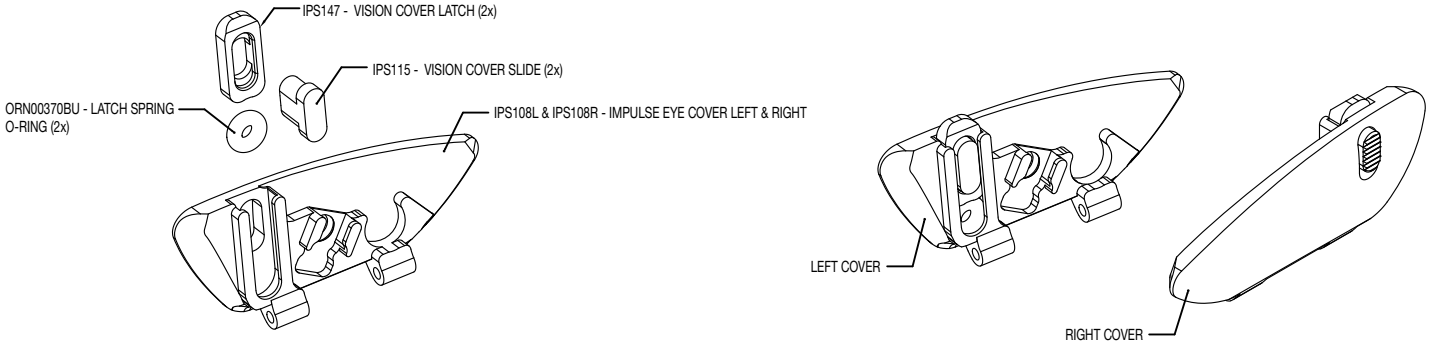
TECH SUPPORT

Our Technical Support Department is open Monday through Friday, from 10am to 6pm EST, and can be reached at 724-539-2660. Additional support and downloadable product manuals are available through our web site, www.smartparts.com.

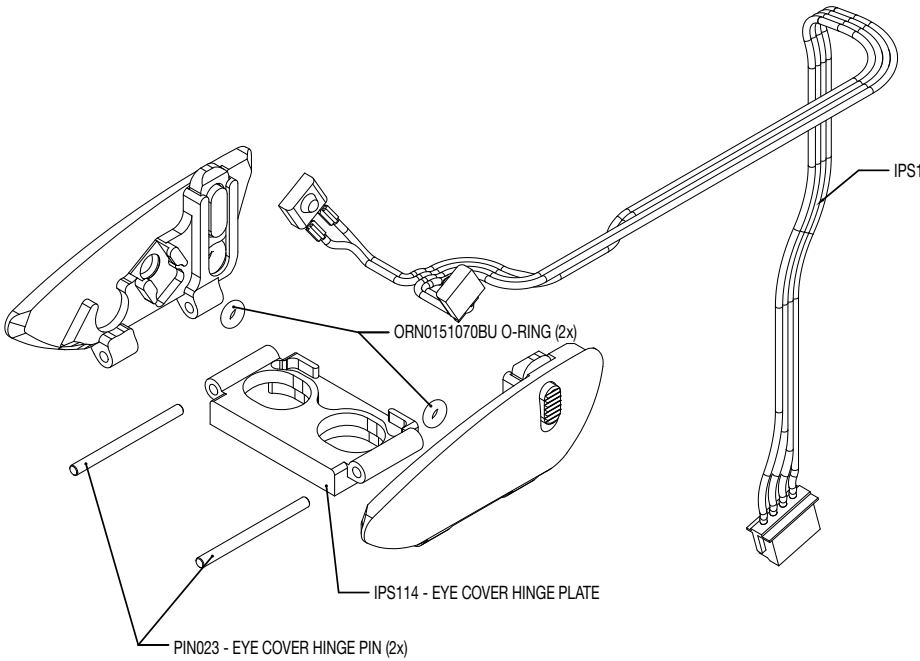
WARRANTY

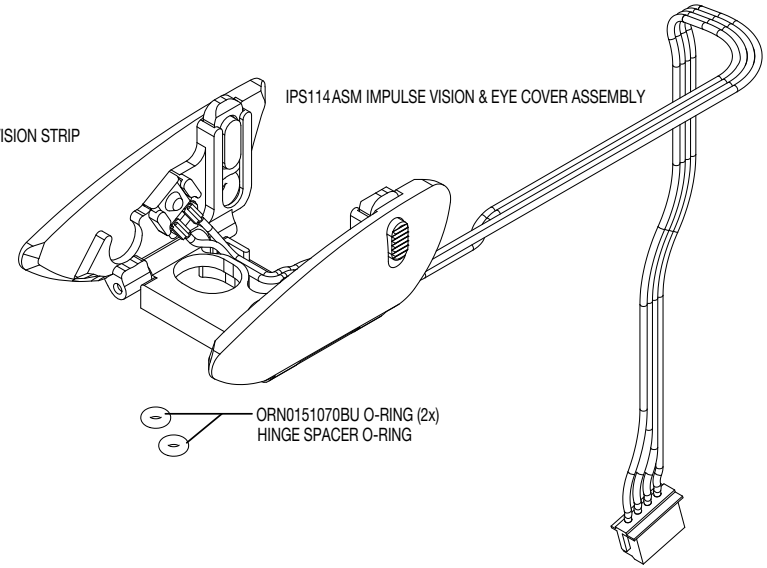
Smart Parts warrants for one (1) year to initial retail purchaser that the paintball marker and regulator are free from defects in materials and workmanship. Disposable parts (batteries, o-rings, seals, etc.) are not warranted. The valve assembly is warranted for six (6) months. The solenoid and electronics on the marker are warranted for six (6) months, plus an additional warranty of six months for electronic parts only (installation and labor are not included.) This warranty does not cover surface damages (scratches and nicks), misuse, improper disassembly and re-assembly, attempts made to drill holes or remove metal from the external surfaces which could degrade performance and reduce pressure safety factors of the marker. Do not make changes to the basic marker parts without written approval. The only authorized lubricant for the marker is SL33K Lubricant. Use of any other lubricant could result in voiding your warranty. Paintball markers are non-refundable. This warranty is limited to repair or replacement of defective parts with the customer to pay shipping costs. This warranty is effective only if the customer returns the warranty registration card enclosed with the marker. The warranty is non-transferrable. Do not attempt to alter the trigger assembly in any way, as this will void your Smart Parts Inc. warranty. Trigger alteration of any kind may result in serious injury.


IPS119 - BOLT PIN
ORN01570BU - BOLT O-RING
IPS109 - IMPULSE BOLT
SPR038 - BOLT SPRING
IPS132 - BOLT DETENT PLUNGER
IPS109ASM - IMPULSE BOLT ASSEMBLY

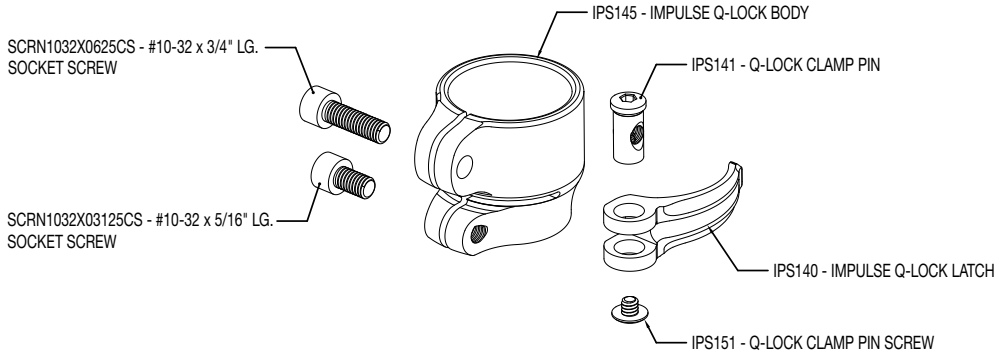

IPS147 - VISION COVER LATCH (2x)
IPS115 - VISION COVER SLIDE (2x)
ORN00370BU - LATCH SPRING
O-RING (2x)
IPS108L & IPS108R - IMPULSE EYE COVER LEFT & RIGHT
LEFT COVER
RIGHT COVER

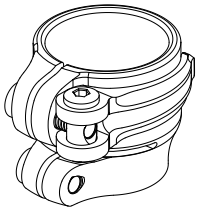
IMPULSE VISION & EYE COVER ASSEMBLY



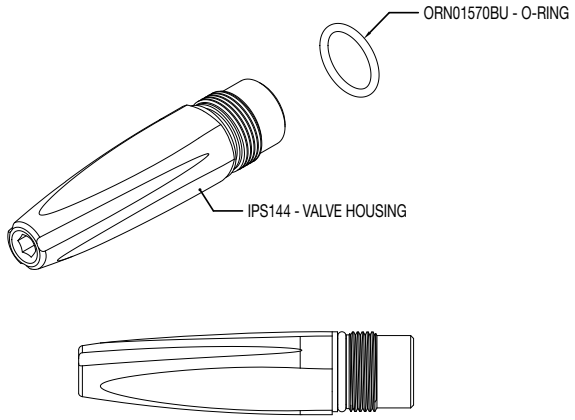


IMPULSE Q-LOCK FEEDNECK

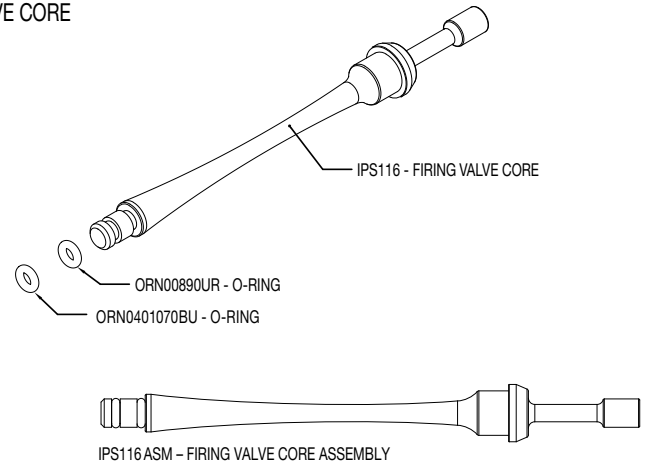




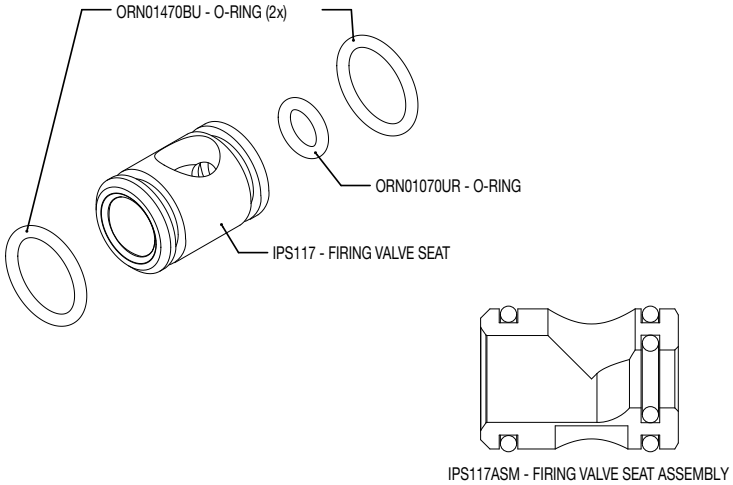
VALVE HOUSING



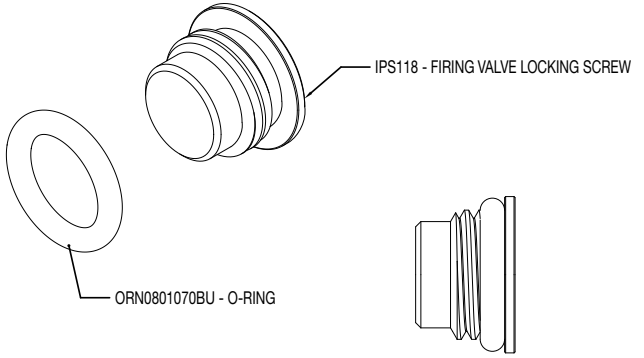
FIRING VALVE CORE



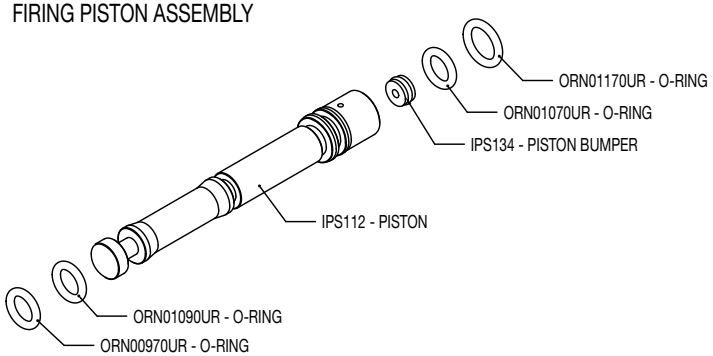
FIRING VALVE SEAT

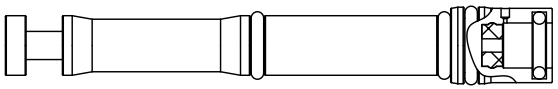


FIRING VALVE LOCKING SCREW



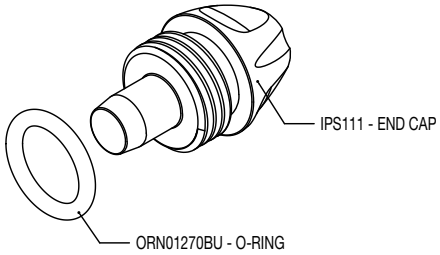
FIRING PISTON ASSEMBLY

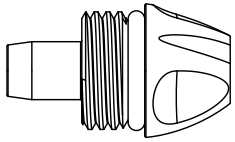




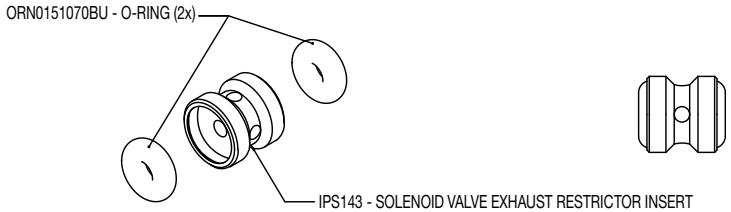
IPS112ASM – FIRING PISTON ASSEMBLY

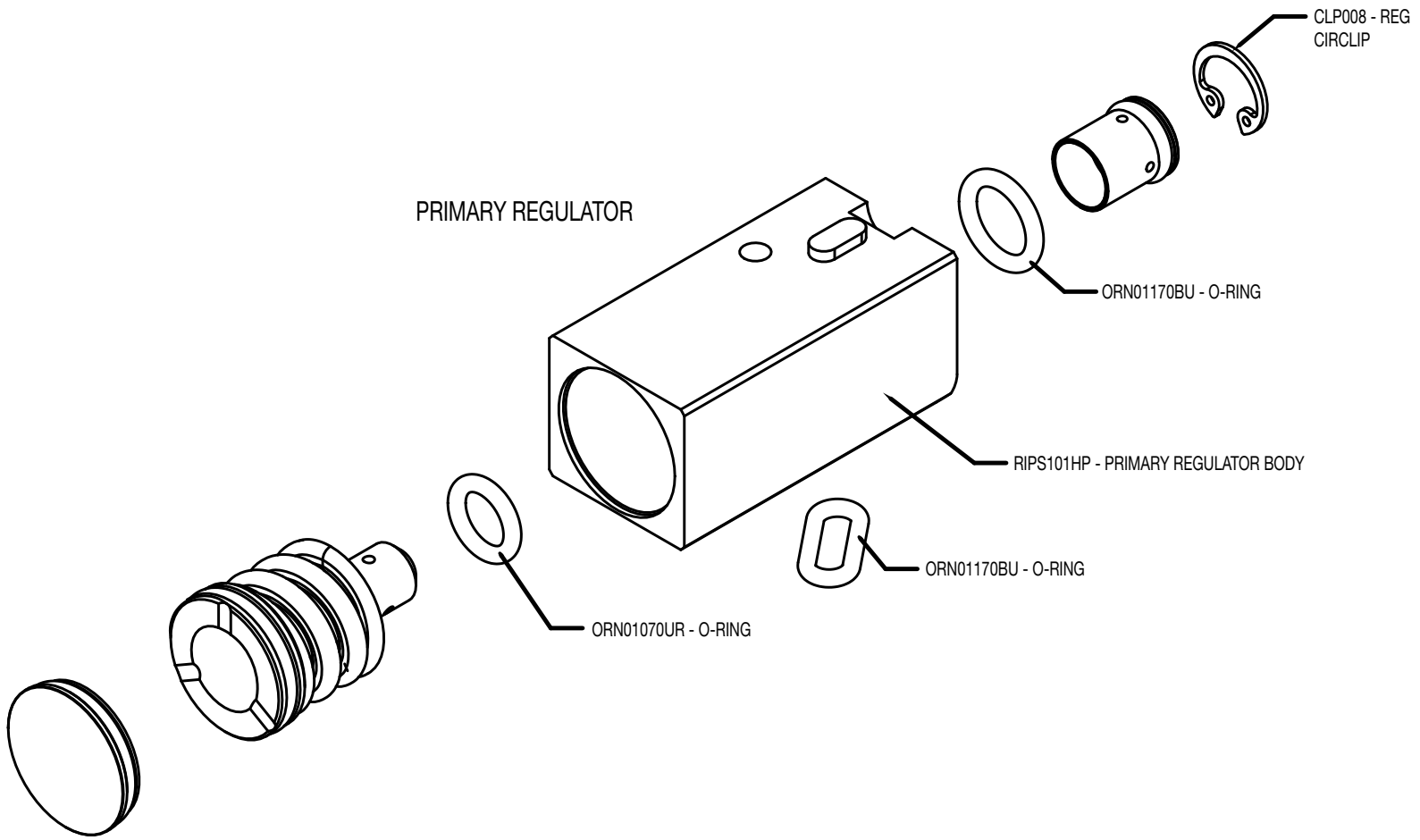
END CAP ASSEMBLY



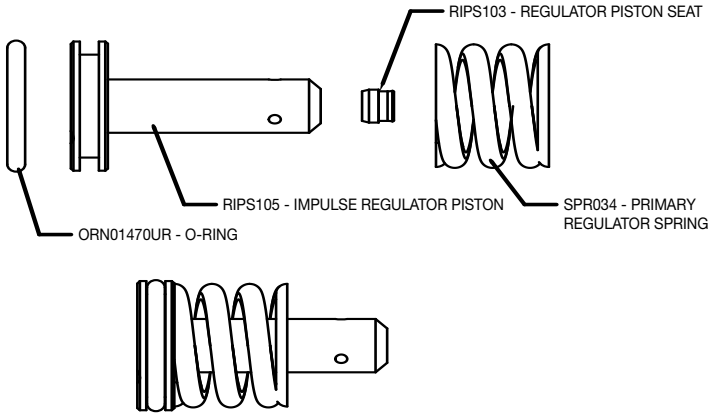


EXHAUST RESTRICTOR INSERT ASSEMBLY

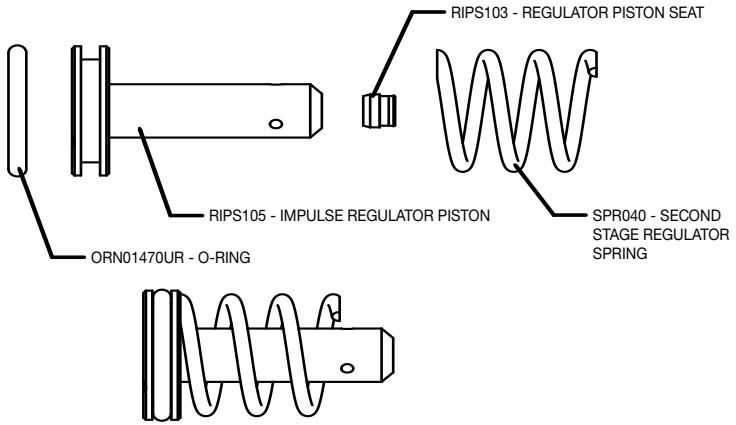



CLP008 - REG
CIRCLIP
PRIMARY REGULATOR
ORN01170BU - O-RING
RIPS101HP - PRIMARY REGULATOR BODY
ORN01170BU - O-RING
ORN01070UR - O-RING

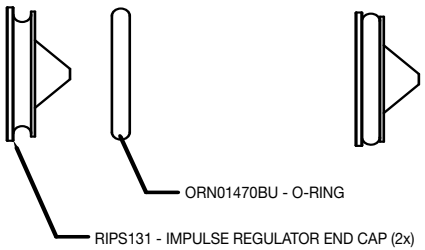
PRIMARY REGULATOR PISTON ASSEMBLY



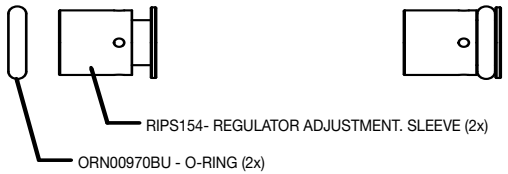
SECOND STAGE REGULATOR PISTON ASSEMBLY

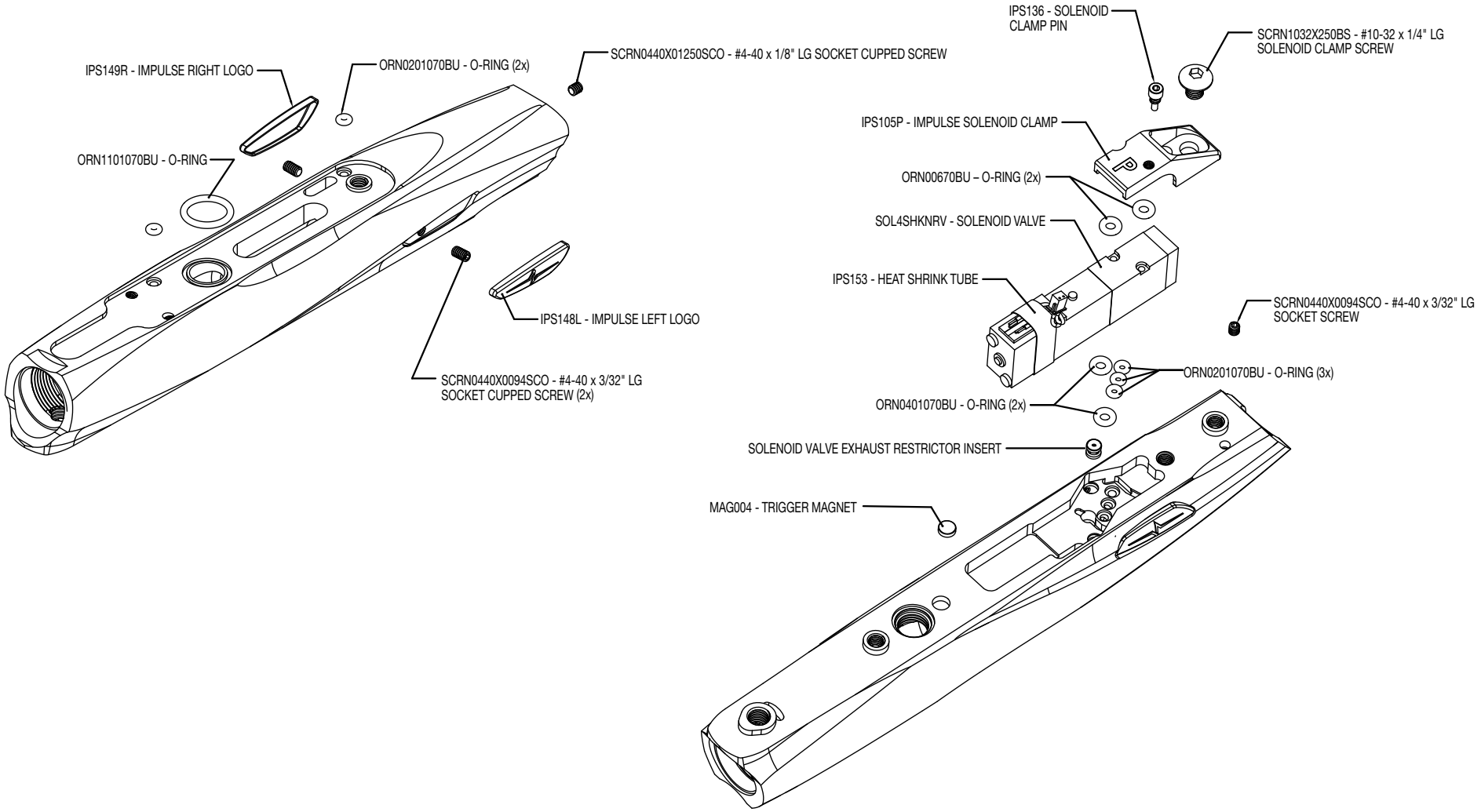


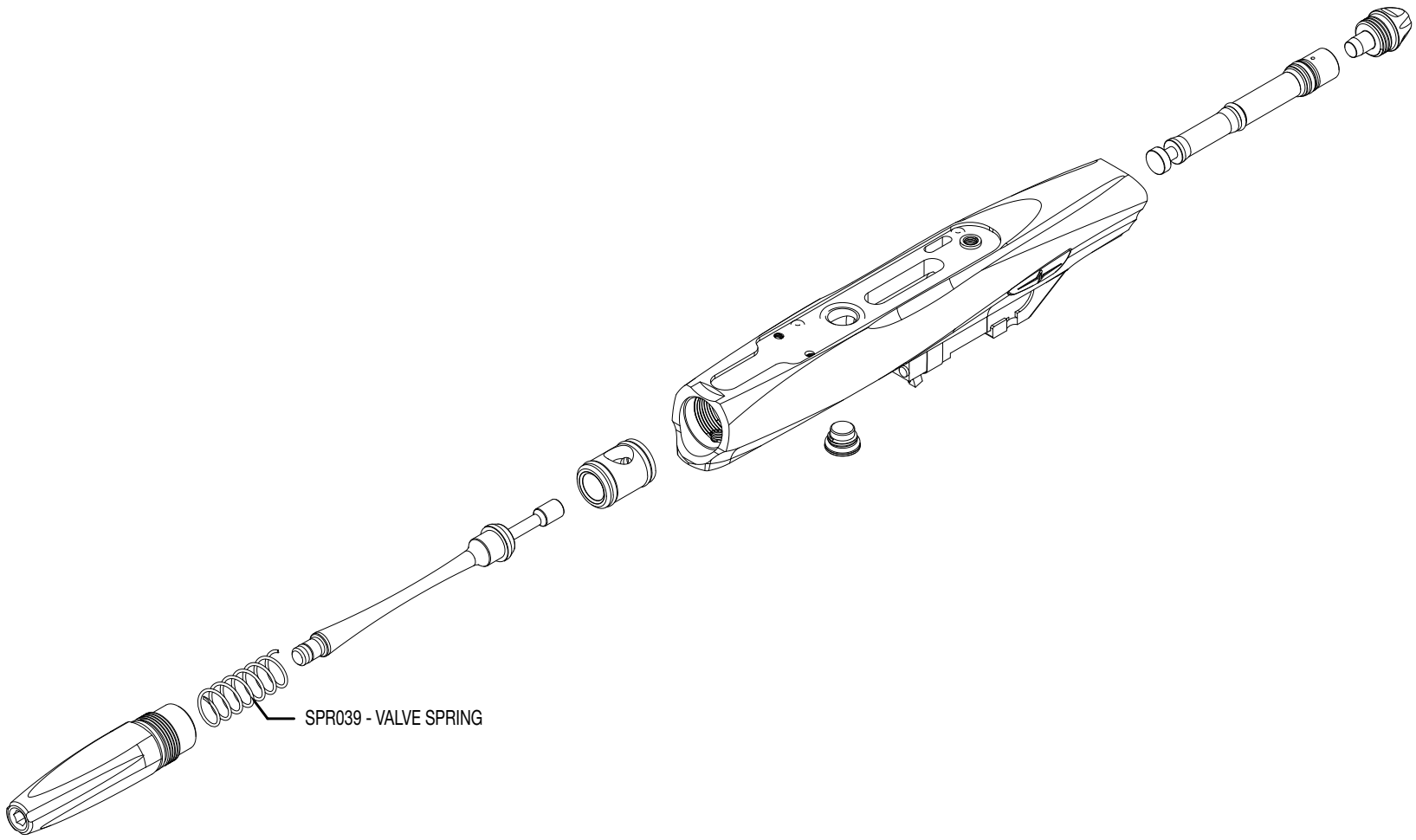
REGULATOR END CAP ASSEMBLY (2x)

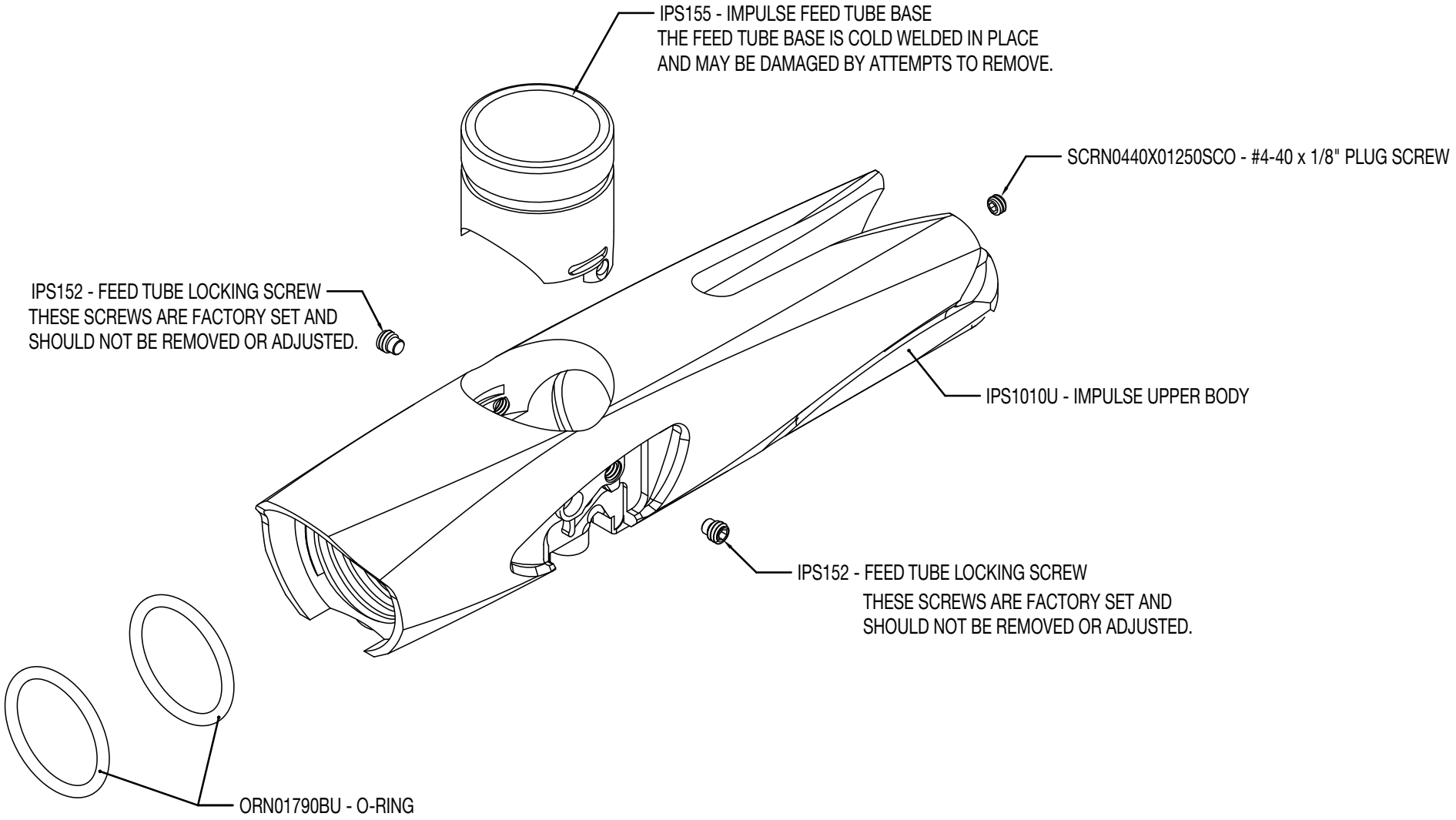


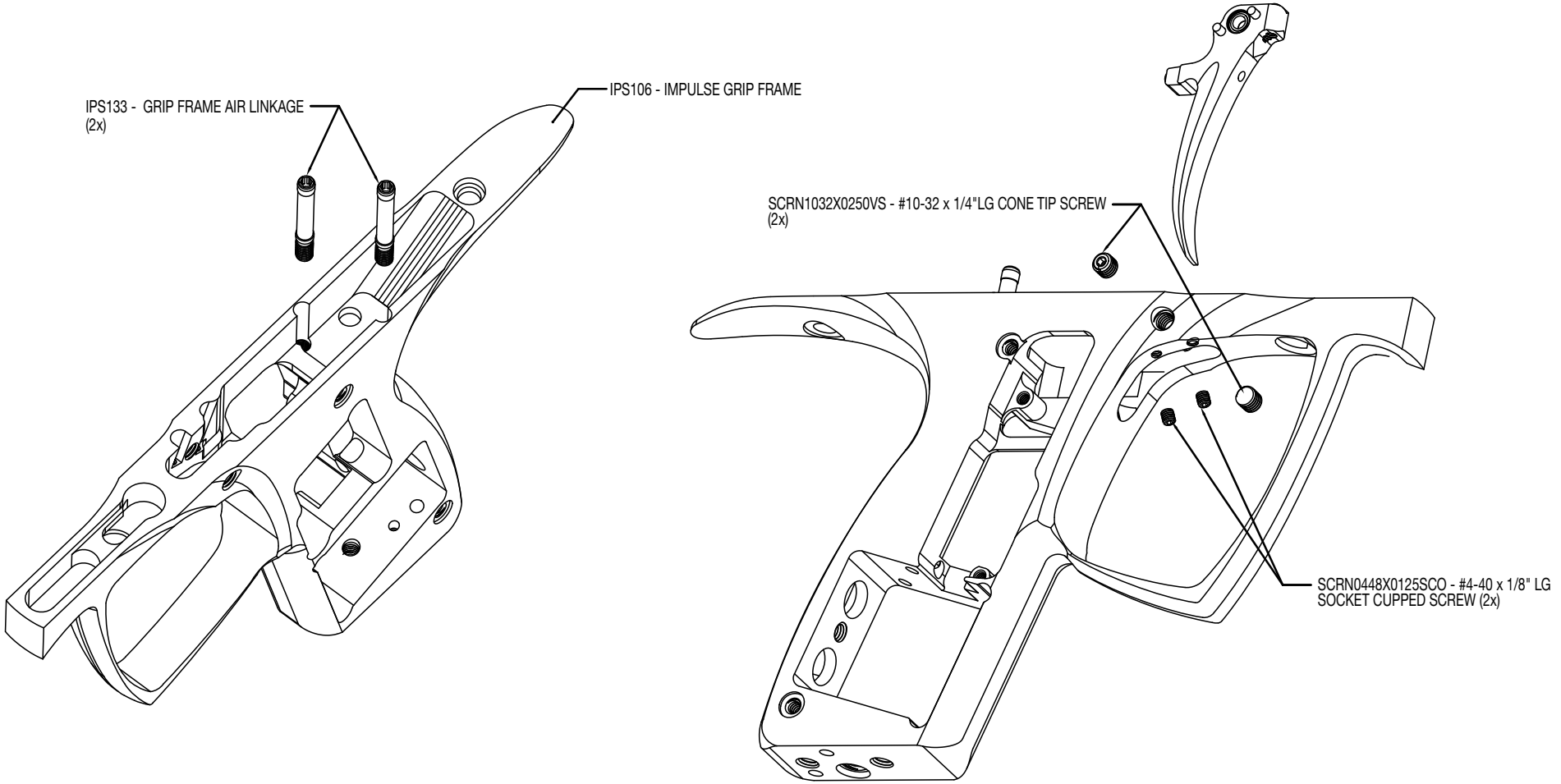
REGULATOR ADJUSTMENT SLEEVE ASSEMBLY (2x)

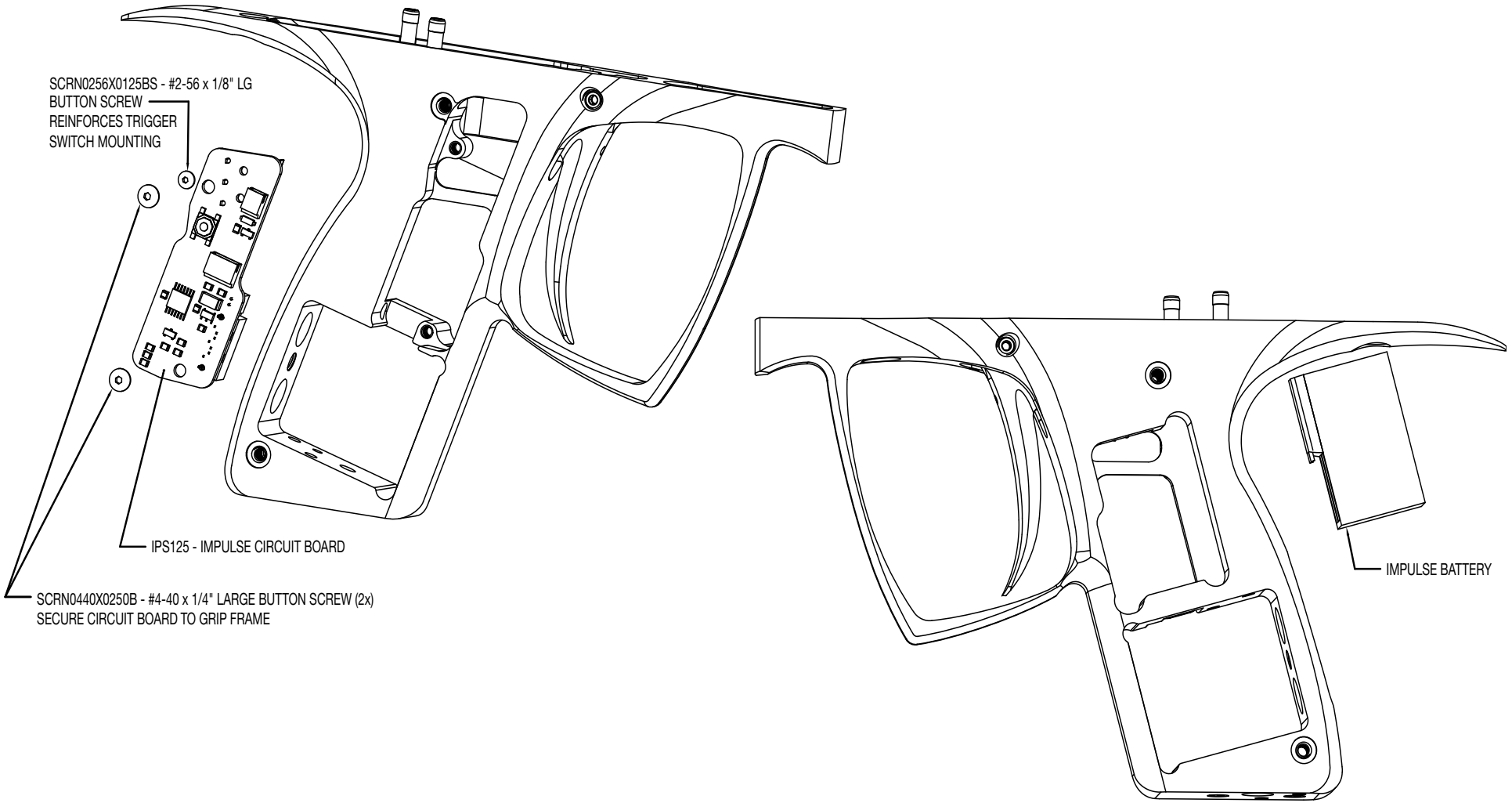


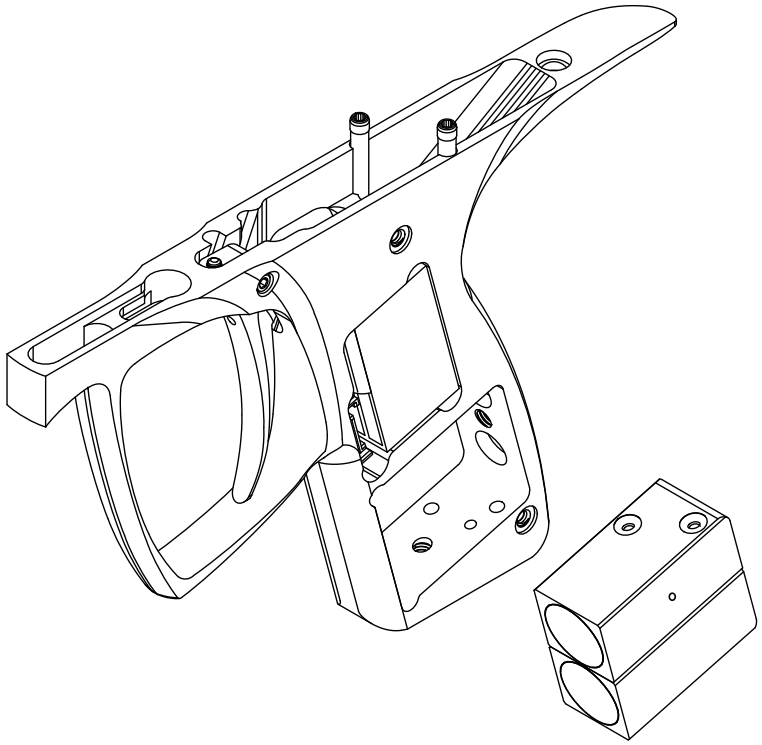

IPS149R - IMPULSE RIGHT LOGO
ORN0201070BU - O-RING (2x)
SCRN0440X01250SCO - #4-40 x 1/8" LG SOCKET CUPPED SCREW
ORN1101070BU - O-RING
IPS148L - IMPULSE LEFT LOGO
SCRN0440X0094SCO - #4-40 x 3/32" LG SOCKET CUPPED SCREW (2x)
IPS136 - SOLENOID CLAMP PIN
SCRN1032X250BS - #10-32 x 1/4" LG SOLENOID CLAMP SCREW
IPS105P - IMPULSE SOLENOID CLAMP
ORN00670BU – O-RING (2x)
SOL4SHKNRV - SOLENOID VALVE
IPS153 - HEAT SHRINK TUBE
SCRN0440X0094SCO - #4-40 x 3/32" LG SOCKET SCREW
ORN0201070BU - O-RING (3x)
ORN0401070BU - O-RING (2x)
SOLENOID VALVE EXHAUST RESTRICTOR INSERT
MAG004 - TRIGGER MAGNET

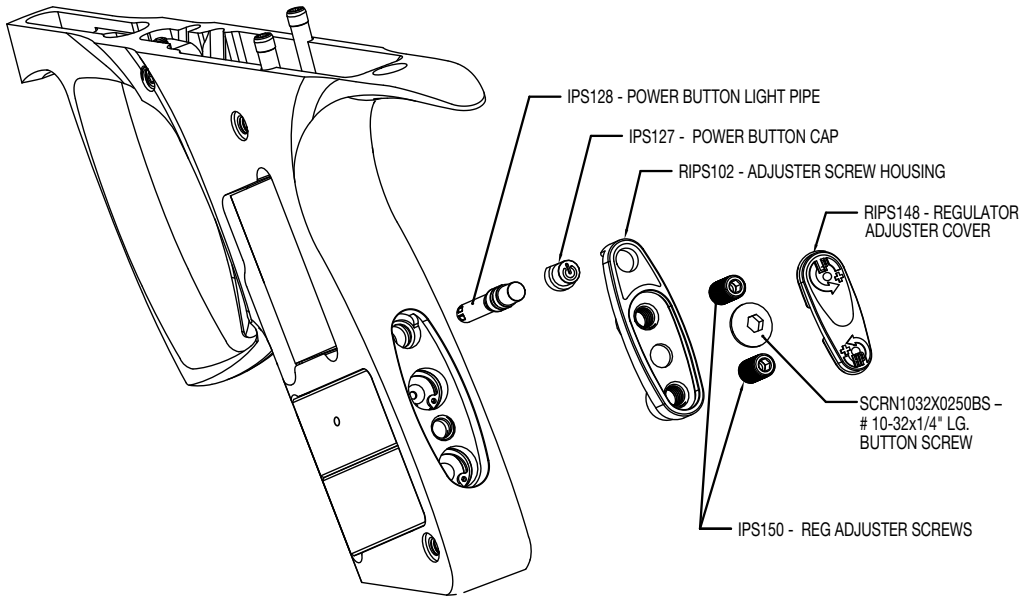

SPR039 - VALVE SPRING

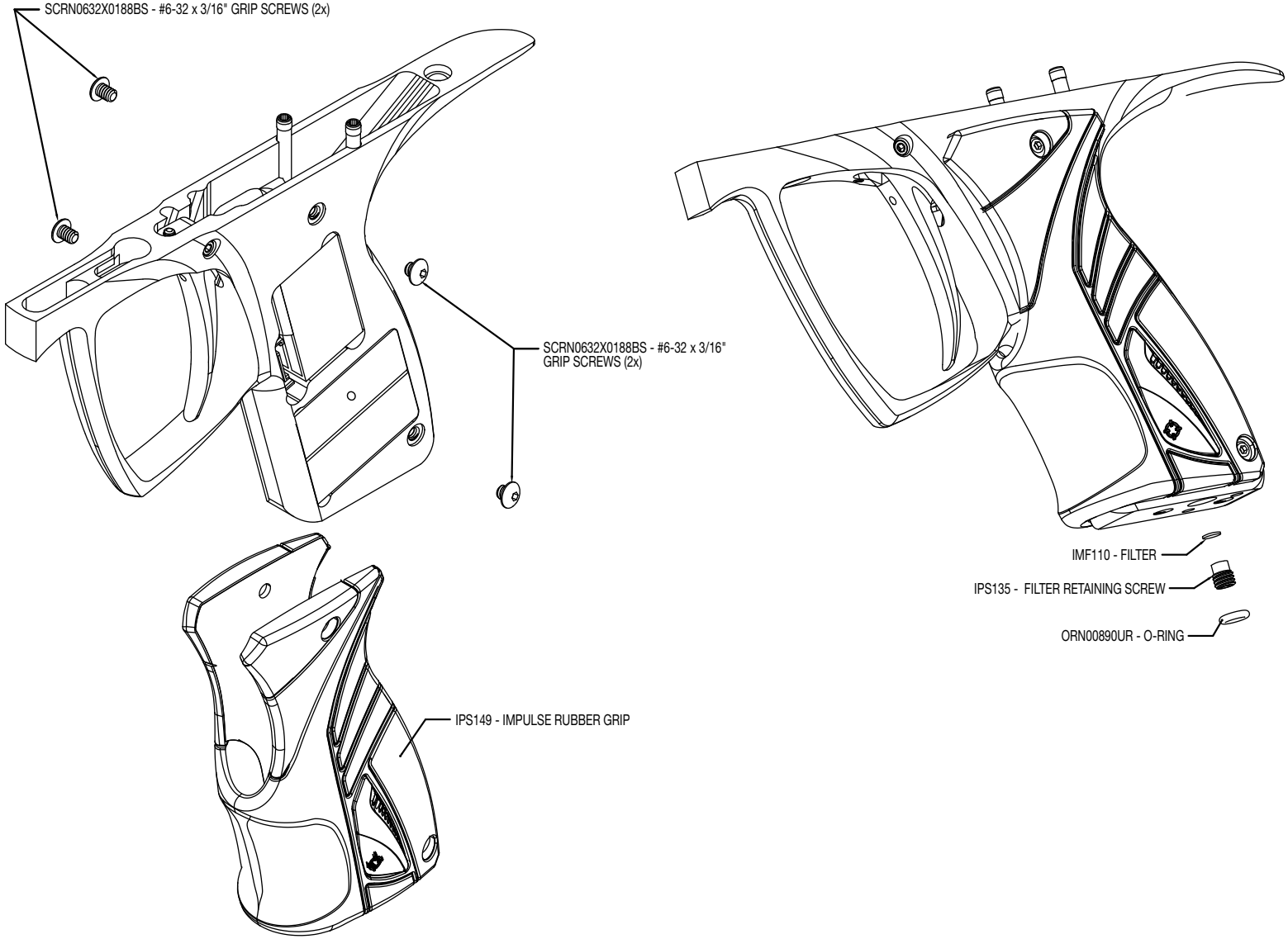

IPS155 - IMPULSE FEED TUBE BASE
THE FEED TUBE BASE IS COLD WELDED IN PLACE
AND MAY BE DAMAGED BY ATTEMPTS TO REMOVE.
SCRN0440X01250SCO - #4-40 x 1/8" PLUG SCREW
IPS152 - FEED TUBE LOCKING SCREW
THESE SCREWS ARE FACTORY SET AND
SHOULD NOT BE REMOVED OR ADJUSTED.
IPS1010U - IMPULSE UPPER BODY
IPS152 - FEED TUBE LOCKING SCREW
THESE SCREWS ARE FACTORY SET AND
SHOULD NOT BE REMOVED OR ADJUSTED.
ORN01790BU - O-RING


IPS133 - GRIP FRAME AIR LINKAGE
(2x)
IPS106 - IMPULSE GRIP FRAME
SCRN1032X0250VS - #10-32 x 1/4"LG CONE TIP SCREW
(2x)
SCRN0448X0125SCO - #4-40 x 1/8" LG
SOCKET CUPPED SCREW (2x)


SCRN0256X0125BS - #2-56 x 1/8" LG
BUTTON SCREW
REINFORCES TRIGGER
SWITCH MOUNTING
IPS125 - IMPULSE CIRCUIT BOARD
SCRN0440X0250B - #4-40 x 1/4" LARGE BUTTON SCREW (2x)
SECURE CIRCUIT BOARD TO GRIP FRAME
IMPULSE BATTERY




IPS128 - POWER BUTTON LIGHT PIPE
IPS127 - POWER BUTTON CAP
RIPS102 - ADJUSTER SCREW HOUSING
RIPS148 - REGULATOR ADJUSTER COVER
SCRN1032X0250BS – # 10-32x1/4" LG. BUTTON SCREW
IPS150 - REG ADJUSTER SCREWS


SCRN0632X0188BS - #6-32 x 3/16" GRIP SCREWS (2x)
SCRN0632X0188BS - #6-32 x 3/16" GRIP SCREWS (2x)
IMF110 - FILTER
IPS135 - FILTER RETAINING SCREW
ORN00890UR - O-RING
IPS149 - IMPULSE RUBBER GRIP