

Angel A.I.R. Manual



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⚠ WARNINGS

IMPORTANT SAFETY INSTRUCTIONS

WARNINGS FOR SAFE CYLINDER / a.i.r.[™] HANDLING

- ⊙ Observe these warnings and all others that appear throughout this manual
- ⊙ The a.i.r.[™] is not a toy. Careless or improper use, including failure to follow instructions in the operators Manual, could cause death or serious injury.
- ⊙ Read Operators Manual before use and comply with all safety instructions.
- ⊙ Paintball industry standard head / face / throat / eye protection designed specifically for paintball games must be worn by user and any person within 200 yards (183 meters) when used in conjunction with a paintball marker.
- ⊙ Observe all local laws, regulations, and guidelines concerning use.
- ⊙ Use only on professional paintball fields where codes of safety are strictly enforced.
- ⊙ Use compressed AIR or NITROGEN only. DO NOT USE CO2
- ⊙ Use to power 0.68 calibre paintball markers only.
- ⊙ Do not expose the cylinder/a.i.r.[™] to ambient temperatures above 110°F (43°C)
- ⊙ As the new owner of the a.i.r.[™] it is your statutory obligation to comply with current and future legislation regarding maintenance and use of the a.i.r.[™] pressure vessel and associated parts.
- ⊙ Should you sell the cylinder/a.i.r.[™] assembly to third parties it is your obligation to ensure it complies with current regulations before disposal.
- ⊙ Never purge or fill the a.i.r.[™] in confined spaces or near naked flames. Air under pressure will aid combustion. Nitrogen in high concentrations will cause asphyxiation therefore adequate ventilation is required.
- ⊙ Vented gases at high pressures can emit high sound levels, which may damage your hearing. Precautions must be taken to protect your and others hearing.
- ⊙ Never use damaged hoses or fittings. Spill, torn, crushed hoses may fail in a violent manner. Inspect all hoses & fittings at regular intervals.
- ⊙ Never over-tighten any threads or fittings as excessive torque can damage the threads.
- ⊙ Do not transport pressurised gas cylinders

Continued . . .

⚠ WARNINGS

Continuation

- ⊙ Never use inappropriate oils or greases on the cylinder assembly, the only lubricant approved for use is ROCOL SAPPHIRE ENDURE. The use of inappropriate lubricants may result in spontaneous ignition, explosion or oxidation.
- ⊙ Never put pressurised gas directly against skin or use the a.i.r.[™] to blow debris around, as serious injury can result to yourself and others.
- ⊙ Never pressurize the cylinder/ a.i.r.[™] beyond its safe working pressure of 4500 psi (310bar)
- ⊙ Never use incorrect safety rupture devices. The one-piece burst disc/nut assembly used in the a.i.r.[™] incorporates a captive burst disc in its burst nut. The one-piece burst disc/nut assembly supplied is only for use with the a.i.r.[™] and no other applications. In the event of rupture of the captive burst disc the one-piece burst disc/nut assembly should only be replaced with another one-piece burst disc/nut assembly, and not with a separate copper burst disc. The fitting of a separate burst disc with the one-piece burst disc/nut assembly can result in the pressure relief safety device on the regulator failing to operate correctly. This could lead to the cylinder exploding which may result in serious injury or death. A 4500 psi (310 bar) working pressure cylinder uses a 7500psi (517 bar) rupture disc.
- ⊙ Only use suitable fill stations that are fitted with industry standard connectors. Inspect all connectors prior to filling for signs of wear, abuse and suitability. Filling only to be carried out by competent trained personnel.
- ⊙ The a.i.r.[™] regulator is designed only to be used in conjunction with a Carleton Technologies cylinder as supplied attached. The cylinder is a dual approved cylinder to DOT & HSE standards. The cylinder may be identified by the a.i.r.[™] logo that is embedded within the cylinder. Any other cylinder or regulator must not be attached to this assembly.
- ⊙ Fast filling of cylinders results in heating of the gas and cylinder. If filled too fast, this heat can become excessive which may cause damage to the cylinder. Such damage can lead to failure of the cylinder, causing potential property damage and personal injury. Care must be taken to fill the cylinder at a rate so the cylinder temperature does not exceed 140 degrees F (60 degrees C). Prior to each filling, the cylinder should also be examined for signs of damage, including heat/flame exposure. If any damage is observed, do not fill the cylinder. Take the suspect cylinder to a DOT or HSE authorised hydrostatic tester for inspection and pressure testing. Any questions concerning the safe filling or use of these fibre wrap cylinders should be directed to the cylinder manufacturer. The a.i.r.[™] uses Carleton Technologies cylinders who can be contacted at: Customer service department of Carleton Technologies, Pressure Technology Division, Tel: (USA) 410-760-9856.

Pages 4 & 5

ADDITIONAL ITEMS REQUIRED TO USE THE a.i.r.TM

- ③ Access to a decanting fill station.
- ③ Suitable connectors to match your marker.
- ③ 0.68 calibre paintball marker & instruction manual.

CONNECTING YOUR a.i.r.TM TO YOUR MARKER (fig 2)

- ③ The removal of the cylinder from the a.i.r.TM may assist you in attaching the system to the marker.

▲ WARNING The cylinder must only be removed once all pressure has been relieved from the system.

▲ WARNING Do not apply any thread sealant in any form when re-attaching the cylinder to the a.i.r.TM. Tighten the a.i.r.TM to the cylinder by hand torque only. Failure to follow this instruction will invalidate your warranty.

- ③ Familiarise yourself with the LCD display and layout prior to commencing.
- ③ Mount your a.i.r.TM onto your marker using the mounting supplied. The industry standard is 10/32 UNF screws that fit into the majority of markers at the bottom of the grip frame, ensure that you use the correct length of screws for the marker frame.
- ③ Attach suitable hose fitting to the a.i.r.TM regulator. The threads in the a.i.r.TM for suitable gas fittings are 1/8 NPT.

CAUTION: Care must be shown with the fittings to ensure that excessive torque is not applied as damage to the a.i.r.TM threads or fittings may occur.

FILLING YOUR CYLINDER/ a.i.r.TM ASSEMBLY (fig6)

▲ WARNING

Only suitable fill stations that can supply a regulated gas output pressure that does not exceed the rated working pressure of the cylinder should be used for filling. Only use suitable fill stations that are fitted with industry standard connectors. Inspect all connectors prior to filling for signs of wear, abuse and suitability. Filling only to be carried out by competent trained personnel.

▲ WARNING

Fast filling of cylinders results in heating of the gas and cylinder. If filled too fast, this heat can become excessive and may result in damage to the cylinder. Such damage can lead to failure of the cylinder, causing potential property damage and personal injury. Care must be taken to fill the cylinder at a rate so the cylinder temperature does not exceed 140 degrees F (60 degrees C). Prior to each filling the cylinder should also be examined for signs of damage, including heat/flame exposure. If any damage is observed, do not fill the cylinder. Take the suspect cylinder to a DOF or HSE authorised hydrostatic tester for inspection and pressure testing. Any questions concerning the safe filling or use of these fibre wrap cylinders should be directed to the cylinder manufacturer. The a.i.r.TM uses Carleton Technologies cylinder whom may be contacted at: Customer service department at Carleton Technologies, Pressure Technology Division, Tel: (USA) 410-760-9856

- ③ Turn the output adjuster (AR036) screw fully counter-clockwise using a 2.5mm across flats Allen key, until it is flush with the top of the regulator piston.
- ③ Scroll the LCD menu by pressing the tactile button on the LCD display until the display shows "TANK PSI".
- ③ Have the system filled by a trained authorised person to the safe working pressure of the tank 4500 psi (310bar).

NOTE: If filling does not commence within 20 seconds of pressing the tactile, the display will SHUT OFF. The display will remain active whilst the tank is being filled until it sees no further pressure increases for a period of 20 seconds. Filling may commence with the display OFF. Once the tactile is pressed and tank pressure has been selected the display will show the cylinder pressure.

NOTE: The pressure will drop in the cylinder within a few minutes, this drop may be observed on the LCD display, this does not signify a leak. This is a thermal effect caused by the gas within the cylinder cooling after filling. As the temperature falls the pressure also falls. Filling your cylinder slowly will reduce this effect significantly and save you having to re-visit the fill station to achieve a full fill. Do not over-fill the cylinder to compensate for this pressure drop as you will exceed the working pressure of the cylinder.

OUTPUT PRESSURE ADJUSTMENT (fig 7/8)

- Scroll the LCD menu by pressing the tactile button on the LCD display until the display shows "OUTPUT PSI".

NOTE: The display will SHUT OFF after 20 seconds of inactivity. To re-activate the display press the tactile button once.

- Using the 2.5mm A/T Allen key rotate the grub screw (AR036) located at the end of the regulator clockwise to increase the output pressure. The display will show the output pressure as it increases. 1/2 turn = 100 PSI.

NOTE: The output pressure will only be displayed when "OUTPUT PSI" is selected on the menu.

NOTE: Pressure less than 100 P.S.I. will not be displayed, the display will show "Lo-P"

NOTE: If pressures greater than 850 psi are selected then an in built safety feature will operate and a vent will open to relieve the excess pressure. Should this occur dial your output pressure down.

⚠ WARNING

Never use incorrect regulator safety vent devices. The assembly used in the a.Lt.™ incorporates a unique vent seal held captive under a spring plate. The vent seal/spring assembly is only for use with the a.Lt.™ and no other applications. In the event of replacement the vent seal and spring assembly should only be replaced with another genuine a.Lt.™ part. The fitting of non-genuine parts can result in the regulated pressure relief safety device failing to operate correctly. This could lead to over pressurised components, which may fail resulting in serious injury or death. The regulated safety vent seal and spring must not be modified in any way or obstructed from activating.

- To decrease the output pressure rotate the grub screw (AR036) counter clockwise. You must relieve the pressure upstream so that the LCD may display the new selected output pressure. This may be achieved by shooting the marker or bleeding off the surplus pressure.

CYLINDER PRESSURE DISPLAY (fig 7/8)

- Scroll the LCD menu by pressing the tactile button on the LCD display until the display shows "TANK PSI".
- This display will change as the tank pressure changes. Changes to the cylinder pressure can occur due to the following reasons:

- Gas usage due to firing the marker.
- Gas leaks.
- Ambient temperature changes.
- Cool down of the gas within the cylinder after filling.

NOTE: The display will shut down after 20 seconds. It may be re-activated by pressing the tactile button and selecting "TANK PSI" on the menu.

NOTE: Pressures less than 198 P.S.I. will not be displayed, the display will show "Lo-P"

SHOTS LEFT FEATURE (fig 3)

The "SHOTS LEFT" feature will calculate the gas consumption of your marker and predict the number of shots left in your tank to within +/- 10% until it reaches your selected output pressure. This prediction is to advise you of the number of good shots left in your system. To achieve this prediction, the marker / a.Lt.™ combination has to go through a calibration process. Once this calibration process has been completed it will be stored in the internal memory for future use.

Errors in the calculation can occur due to the following reasons:

- Marker anomalies (sticking exhaust valves, poor timing, poor paint quality etc.)
- Gas leakage
- Incorrect calibration procedure
- Changing gas types without recalibration (Air/Nitrogen)
- Fitting new batteries without recalibration
- Changing velocity without recalibration
- Changing output pressure without recalibration
- Significant ambient temperature changes
- Changing barrel without recalibration

To view the shots left scroll the LCD menu by pressing the tactile button on the LCD display until the display shows "SHOTS LEFT". If the display shows " - - - " then calibration is required. (See calibration or shots left feature)

CALIBRATION OF THE SHOTS LEFT FEATURE (fig 3)

Ensure your marker has had the following parameters set correctly, prior to commencing with the calibration.

- ⊙ Required output pressure.
- ⊙ Required velocity.
- ⊙ Barrel has been selected.
- ⊙ Paint has been selected.
- ⊙ Scroll the LCD menu to display "SHOTS LEFT", keeping the tactile pressed down whilst on the "SHOTS LEFT" display for 2 seconds until the word "CALC" appears.
- ⊙ The "CALC" mode will remain active for 30 seconds maximum or until it has received sufficient data to perform the calculations.
- ⊙ Shoot the marker until the number of shots left is displayed.
- ⊙ This calibration is now complete and providing you do not change the markers settings will remain valid through subsequent gas fills.
- ⊙ In our trials we have found that minor adjustments to your marker can sometimes negate the need to recalibrate. We suggest to evaluate this by trial and error to your particular marker set-up.

NOTE: The number of shots you are required to fire is dependant on the gas consumption of your marker, a marker that uses a large quantity of gas will require less shots than one that uses a low quantity of gas. Should the 30 second time out occur before the shots left is displayed, repeat the process but fire your marker faster. Calibration should not be selected using a cylinder with less than 2000 PSI. present within it.

MAIN SEAL REPLACEMENT (fig 2/9/10)

The main seal should only need replacement due to contamination by debris that causes the seal face to become damaged. To replace the seal follow the procedures listed below:

⚠ WARNING All pressure must be relieved from the cylinder a.L.r.™ assembly prior to servicing

- ⊙ Remove the cylinder from the a.L.r.™ regulator by unscrewing the assembly counter-clockwise.
- ⊙ Unscrew the pressure adjusting screw (AR036) by rotating counter clockwise and remove.
- ⊙ Using the a.L.r.™ regulator service tool unscrew the spring stack retaining nut (AR003) counter clockwise.
- ⊙ Carefully remove the spring stack (AR041) noting the spring stacking arrangement. See fig 9
- ⊙ Insert an M5 metric screw into the piston (AR004) to act as a puller.
- ⊙ Withdraw the piston by pulling on the M5 screw that you had previously inserted. Care must be shown so that damage does not occur to the piston or bore.
- ⊙ Unscrew seal retaining nut (AR006) using a the a.L.r.™ regulator service tool and remove.
- ⊙ Remove the flange (AR002) from the body (AR001) by extracting the 4 retaining screws (AR035).

8.

- ⊙ Carefully withdraw the guide manifold (AR010). The following parts: piston spring (AR044) & cone piston (AR005) should have also been removed remaining attached to the guide manifold (AR010). Insert a suitable blunt dowel through the body (AR001) into the hole that the guide manifold (AR010) was extracted from.
- ⊙ Push the dowel to remove the main seal (AR007).
- ⊙ Remove the main seal O ring (AR034).
- ⊙ Replace the main seal O ring (AR034) with a new one.
- ⊙ Replace the main seal (AR035) with a new clean assembly. NOTE the correct face has to be inserted face down. See fig 9
- ⊙ Re-insert the seal retaining nut (AR006). NOTE: The torque for tightening this nut must not exceed 6newtons (4.5ft/lbs).
- ⊙ Re-assemble the remainder in reverse order.
- ⊙ Ensure that the adjuster screw is not inserted too far, it is to be flush with the top of the piston.
- ⊙ Re-pressurise the cylinder after refilling

⚠ WARNING Do not apply any thread sealant in any form when re-attaching the cylinder to the a.L.r.™ tighten the a.L.r.™ to the cylinder by hand torque only Failure to follow the instruction will invalidate your warranty

- ⊙ Check for leaks.
- ⊙ Slowly adjust your output pressure and re check for leakage.

FILTER CLEANING (fig 2/10)

The a.L.r.™ incorporates a sintered filter AR045 on the inlet gas port that is located internally within the regulator flange AR002. This filter will reduce the likelihood of particles entering the system and fouling the main valve seal. It is still very important that you ensure that the quick disconnects are kept clean and free from dirt prior to filling. Should the filter become blocked it may be replaced by the following procedure:

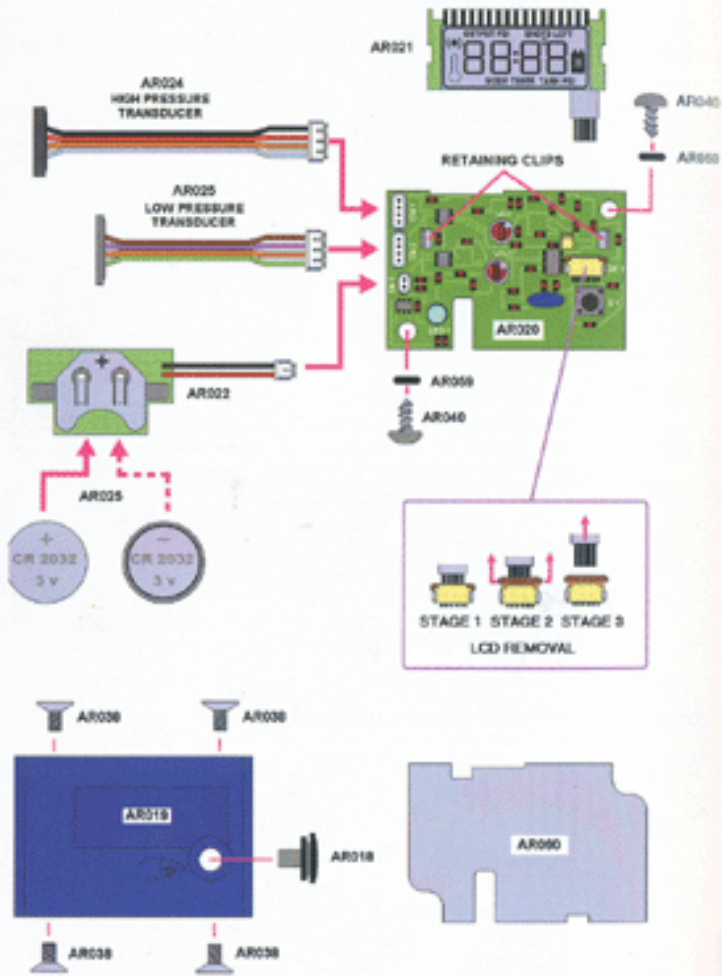
⚠ WARNING All pressure must be relieved from the cylinder a.L.r.™ assembly prior to servicing

Remove the a.L.r.™ regulator from the cylinder.
Remove the flange AR002 by extracting the 4 retaining screws AR035. Push a suitable dowel through the flange body AR002 by inserting it at the cylinder thread end and extract the filter AR045.
The filter may be cleaned in soapy water and dried or replaced with a new filter re-assemble in reverse order.

9.

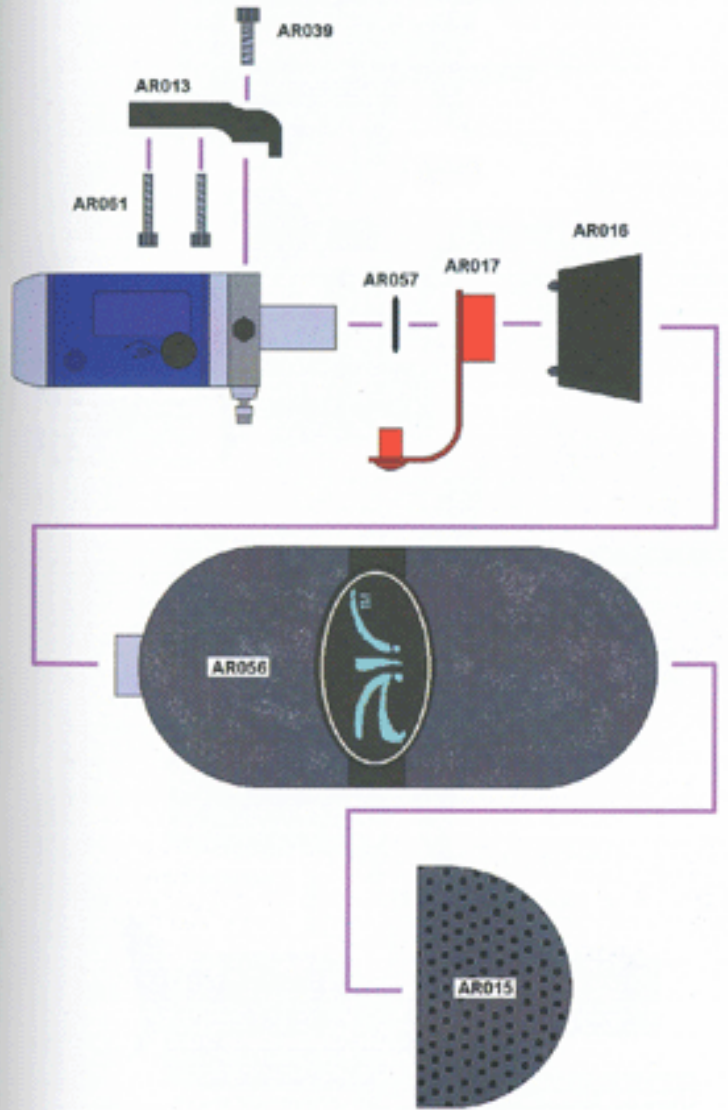
Pages 12 & 13

ELECTRONICS ASSEMBLY (fig 1)



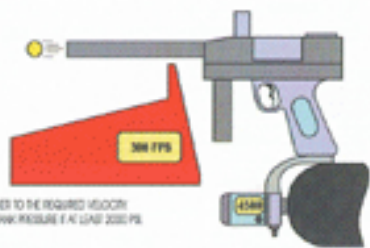
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GENERAL ASSEMBLY (fig 2)



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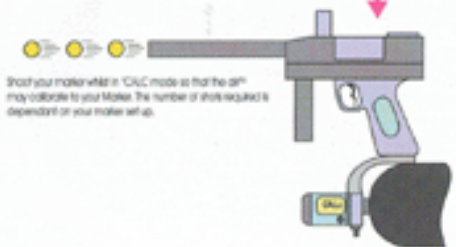
CALIBRATION OF SHOTS LEFT FEATURES (fig 3)



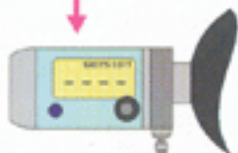
- SET YOUR MARKER TO THE REQUIRED VELOCITY
- ENSURE YOUR INK PRESSURE IS AT LEAST 2000 PSI



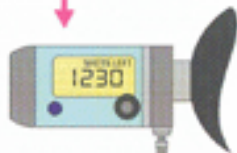
- Look the LCD menu to display 'SHOTS LEFT', keeping the toggle pressed down until on the 'SHOTS LEFT' screen for 2 seconds until the word 'CALC' appears.



Shoot your marker while in 'CALC' mode so that the air may calibrate to your Marker. The number of shots required is dependent on your marker set up.



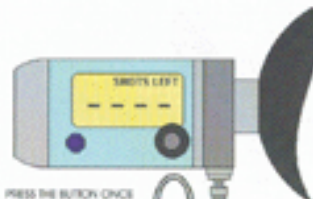
This display indicates that sufficient shots have NOT been fired during the calibration time period. The time period for calibration is 30 seconds. Repeat the calibration process and shoot the marker faster.



This display shows the number of good shots remaining in your tank +/- 10%. The shots left display is updated whenever the shots left feature is selected. The display will count down in blocks of numbers, each block may be up to 25 shots, this is variable dependent on your marker set up.
THE CALIBRATION NEED ONLY BE DONE ONCE PER MARKER SET UP. PLACING THE CYLINDER AFTER CALIBRATION WILL INCREASE THE NEW NUMBER OF SHOTS AVAILABLE TO YOU.

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DISPLAY MENUS (fig 4)



The display shows that SHOTS LEFT mode has not been calibrated.

PRESS THE BUTTON ONCE



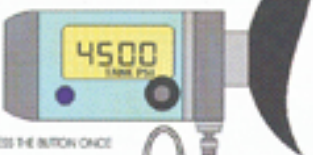
The display shows the number of good shots remaining in your cylinder +/- 10%. The shots left display is updated whenever the shots left feature is selected. The display will count down in blocks of numbers, each block may be up to 25 shots, this is variable dependent on your marker set up.

PRESS THE BUTTON ONCE



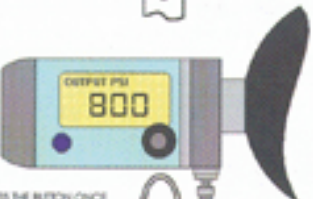
The display shows the system is ready for calibration. The calibration mode will remain active for 30 seconds or until sufficient shots have been fired to process the calibration. If the display does not display the shots left figure after calibration repeat the calibration cycle and fire the marker faster.

PRESS AND HOLD THE BUTTON DOWN FOR 2 SECONDS



The display shows how much pressure is present in your cylinder.

PRESS THE BUTTON ONCE

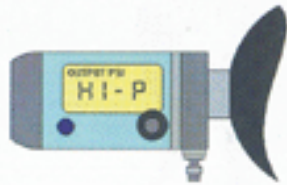


The display shows the pressure you have set for the output to your marker. (The output pressure)

PRESS THE BUTTON ONCE

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DISPLAY MENUS (fig 5)



This display shows that you have selected an output pressure that is above the working range of the regulator. A pressure in excess of 1237 PSI (85bar) has been achieved. The safety vent also will have operated to relieve the excess pressure. You must turn the regulator down and investigate the cause.

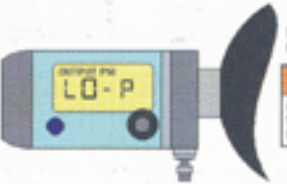


This display shows that you have exceeded the working pressure of the cylinder. The pressure that has been achieved is in excess of 4500 PSI (311 bar). You must relieve the pressure and have the cylinder inspected by a DOT or HSE approved test house as the cylinder may have been damaged. The safety rupture device will operate at 7000 PSI (482 bar).



This display shows that the cylinder pressure remaining in the cylinder is less than 790 PSI (55bar).

WARNING
ALL PRESSURE MUST BE RELIEVED FROM THE CYLINDER PRIOR TO DISASSEMBLY OF THE REGULATOR FROM THE CYLINDER.

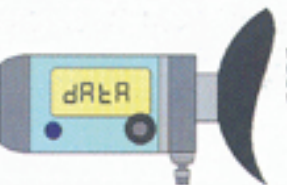


This display shows that the output pressure is set below 100 PSI (6.9 bar).

WARNING
ALL PRESSURE MUST BE RELIEVED FROM THE CYLINDER PRIOR TO DISASSEMBLY OF THE REGULATOR FROM THE CYLINDER.



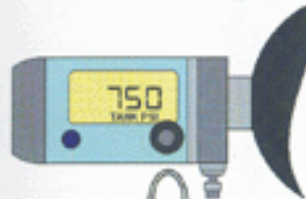
This display shows that the battery is low on power and needs replacing. The batteries have only 10% of their power left when the battery icon appears. If no display is possible you must replace the batteries as they are totally discharged of power.



This display may appear for 1 second when the menu is being scrolled through. This indicates that test data is being calculated and checked prior to displaying the data.

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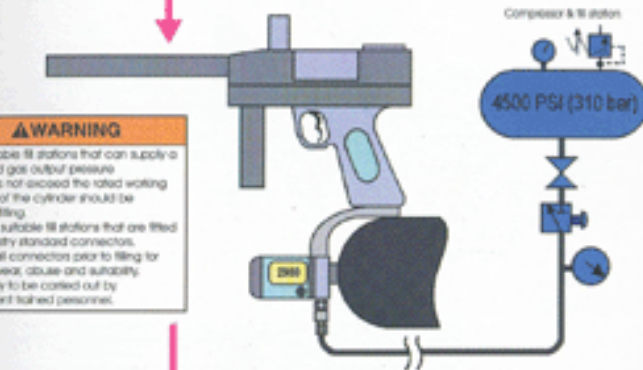
FILLING THE a.i.r™/CYLINDER ASSEMBLY (fig 6)



This display shows how much pressure is present in your cylinder.

NOTE: The display will remain active for 20 seconds unless charging when it will remain active whilst it's seeing an increasing pressure within the cylinder.

WARNING
Only suitable fill stations that can supply a regulated gas output pressure that does not exceed the rated working pressure of the cylinder should be used for filling.
Only use suitable fill stations that are fitted with industry standard connectors. Inspect all connectors prior to filling for signs of wear, abuse and suitability. Filling only to be carried out by competent trained personnel.



Once the cylinder has been charged to a maximum pressure of 4500 PSI, it may be disconnected from the fill station when advised by the operator.

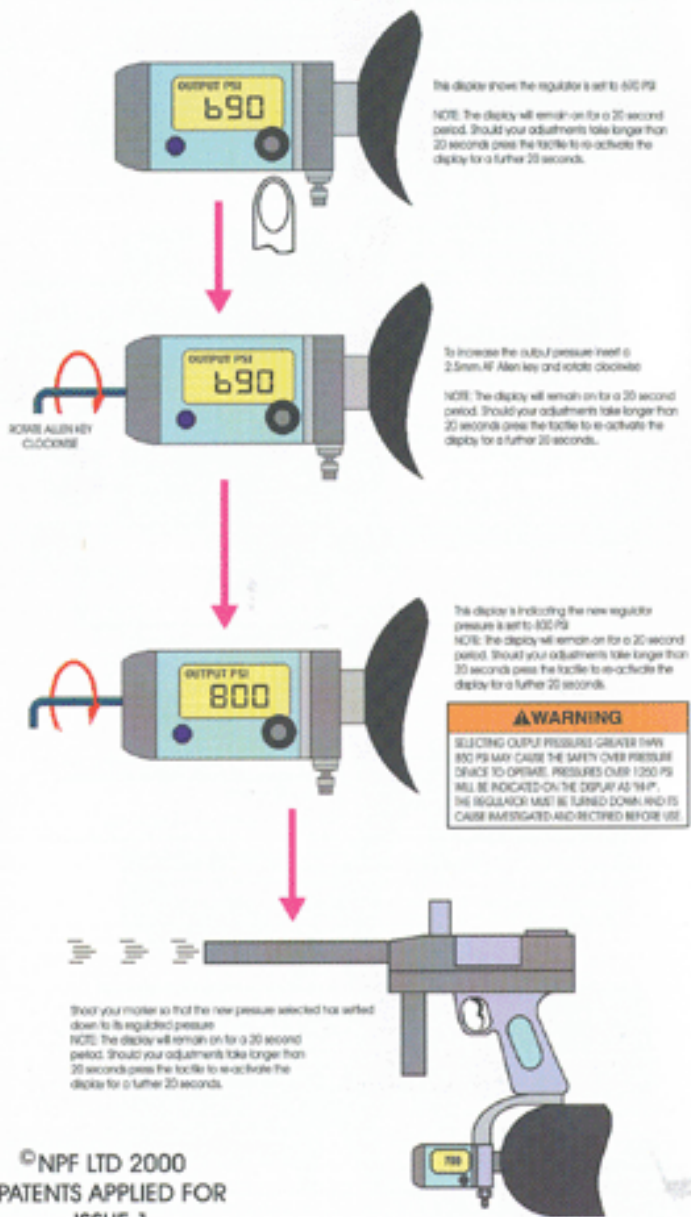
NOTE: When the regulator sees no further pressure increase within the cylinder the display will shut down after 20 seconds. To re-activate press the tactile button.



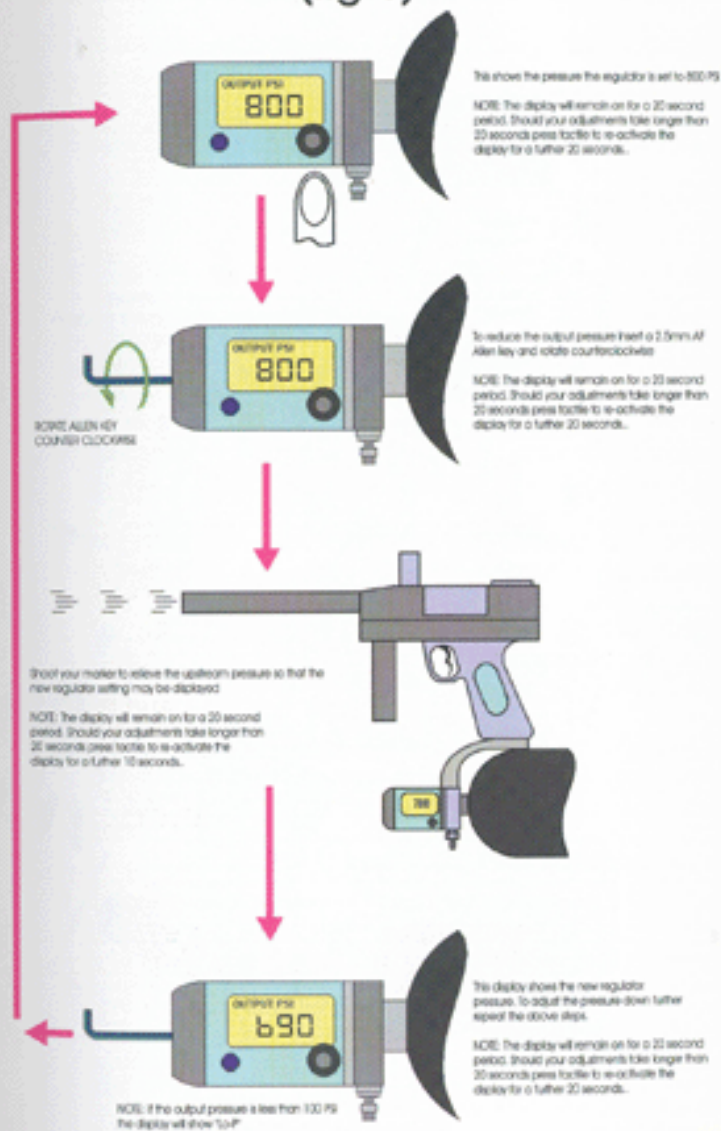
NOTE: The pressure indicated on the display may start to fall after filling. This effect is caused by heat being generated whilst filling. When the gas begins to cool the pressure within the cylinder will also fall. The effect may be reduced by filling the cylinder slowly to reduce the heating effect.
THE EFFECT DOES NOT NECESSARILY INDICATE A LEAK.

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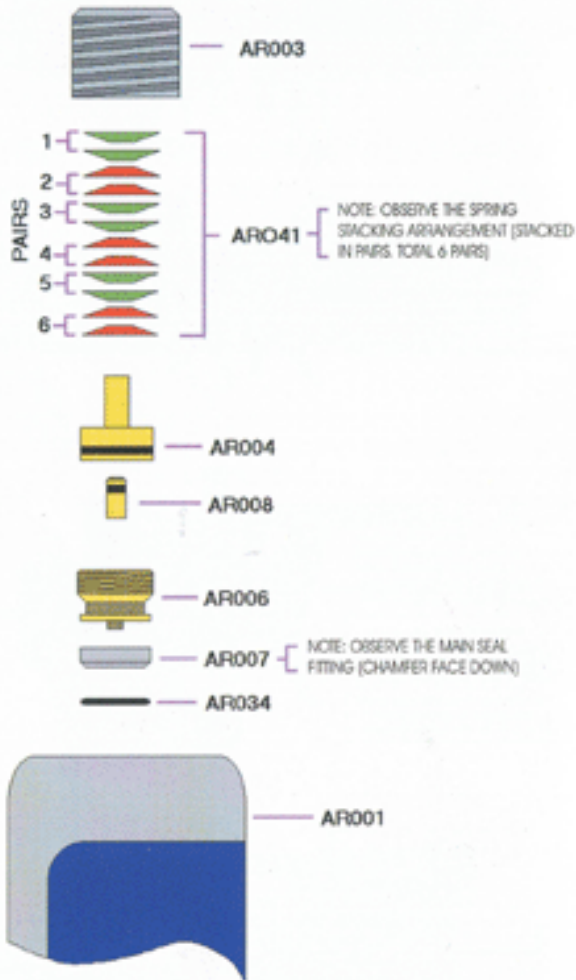
INCREASING OUTPUT PRESSURE (fig 7)



DECREASING OUTPUT PRESSURE (fig 8)

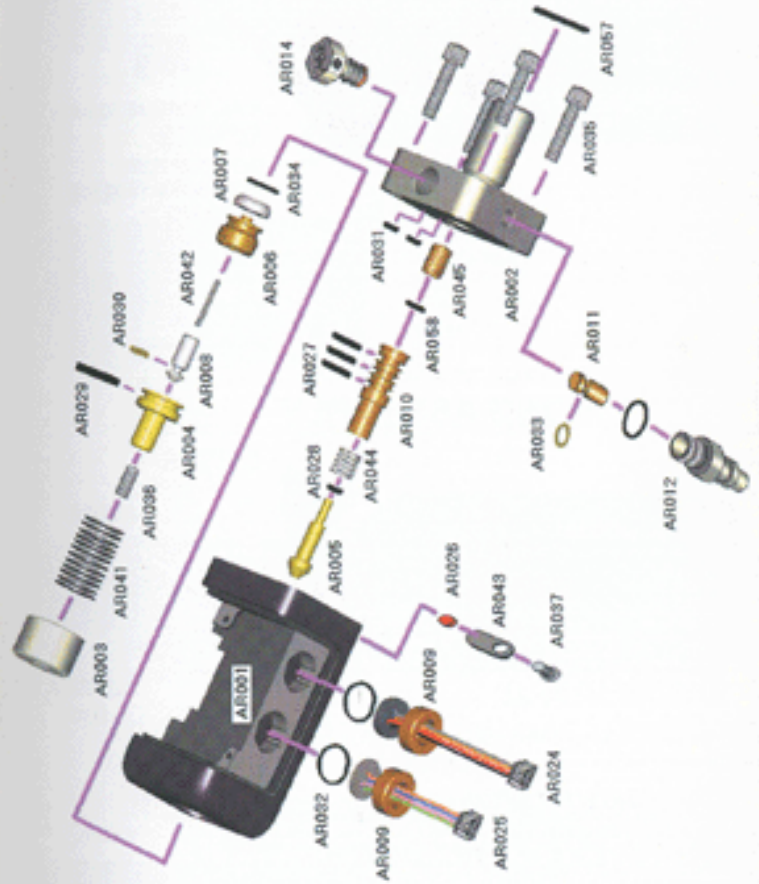


SPRING STACK AND MAIN SEAL LOCATION (fig 9)



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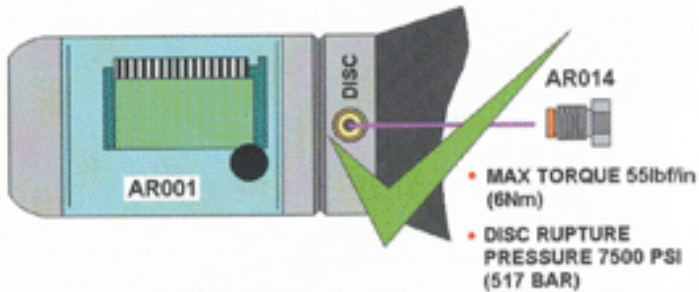
INTERNAL ASSEMBLY (fig 10)



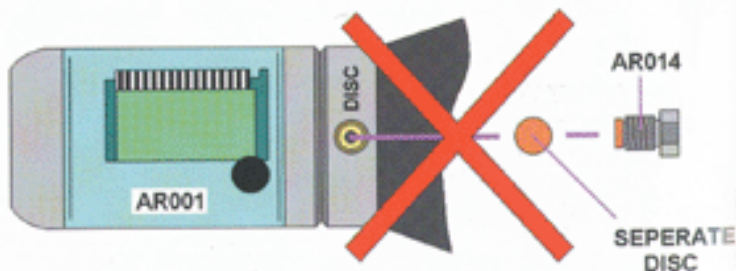
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BURST DISC ASSEMBLY (fig 11)

CORRECT ASSEMBLY



WRONG ASSEMBLY



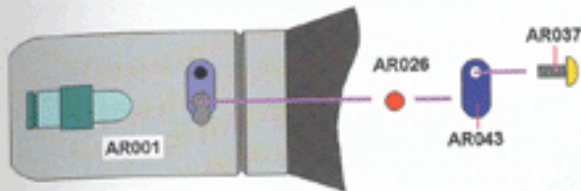
WARNING

Never use incorrect safety rupture devices. The one-piece burst disc/nut assembly used in the a.i.r.[™] incorporates a captive burst disc in its burst nut. The one-piece burst disc/nut assembly is only for use with the a.i.r.[™] and no other applications. In the event of rupture of the captive burst disc the one-piece burst disc/nut assembly should only be replaced with another one-piece burst disc/nut assembly, and not with a separate copper burst disc. The fitting of a separate burst disc with the one-piece burst disc/nut assembly can result in the pressure relief safety device on the regulator failing to operate correctly. This could lead to the cylinder exploding which may result in serious injury or death. A 4500psi (310 bar) working pressure cylinders use a 7500psi (517 bar) rupture disc.

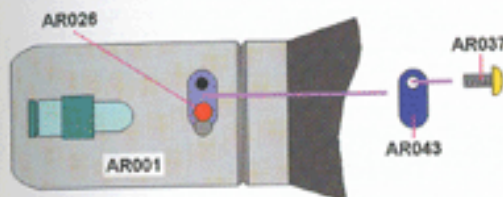
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SAFETY VENT ASSEMBLY (fig 12)

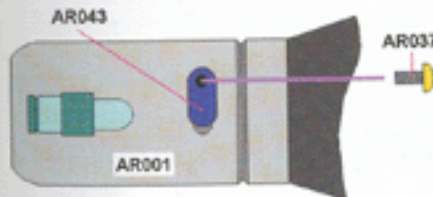
STEP 1



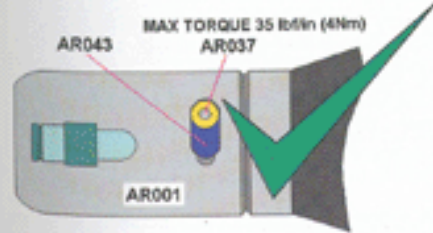
STEP 2



STEP 3



STEP 4



WARNING

Never use incorrect regulator safety vent devices. The assembly used in the a.i.r.[™] incorporates a unique vent seat held captive under a spring pin. The vent seat/spring assembly is only for use with the a.i.r.[™] and no other applications. In the event of replacement the vent seat and spring assembly should only be replaced with another genuine a.i.r.[™] part. The fitting of non-genuine parts can result in the regulated pressure relief safety device failing to operate correctly. This could lead to over pressurised components, which may fail resulting in serious injury or death. The regulated safety vent seat and spring must not be modified in any form or obstructed from actuating.

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PATENTS APPLIED FOR
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BATTERY REPLACEMENT (fig 1)

The batteries used in the a.Lr.TM are 2x CR2032 3volt. These batteries can give an operating life up to 6 months. This life can be reduced by its frequency of use. Ensure you dispose of the batteries in a safe manner after replacing.

- ③ Remove the 4 screws (AR038) holding the polycarbonate lens (AR019) in place using a 2.0 mm Allen key.
- ③ Slide the polycarbonate lens (AR019) off the regulator.
- ③ Unplug the battery holder PCB from the main board. (AR021)
- ③ Carefully slide the batteries from the holder.
- ③ Insert new batteries observing the polarity indicators on the batteries and holders.
- ③ Re-insert the battery holder plug into the main board.
- ③ Re-locate the battery PCB onto the body.
- ③ Replace the polycarbonate lens so the clear window is located over the LCD display.
- ③ Re-insert the 4 retaining screws using a 2.0mm Allen key.

CAUTION: Care must be shown when replacing the batteries to observe the polarity markings. Do not incinerate, puncture or short circuit and dispose of your discharged batteries in a sensible manner.

LCD DISPLAY REPLACEMENT (fig 1)

CAUTION: Point blank shots onto the LCD may cause damage to the LCD display. Avoid the screen been shot at ranges of 6 feet or less. The LCD display can be replaced should it become damaged. Recalibration of the transducers is not required for this procedure. Follow the procedure to remove the LCD screen.

- ③ Remove the 4 screws (AR038) holding the polycarbonate lens in place using a 2.0 mm Allen key.
- ③ Slide the polycarbonate lens off the regulator.
- ③ Carefully lift the LCD (AR021) from the retaining clips.
- ③ Removal of the LCD ribbon cable is achieved by following the stages below.
- ③ The ribbon cable will appear as per stage 1, located in a ZIF socket on the main board (AR020).
- ③ Open the ZIF socket. (per fig 1 stage 2).
- ③ Slide the ribbon cable out. (per fig 1 stage 3)
- ③ Replace with new LCD (AR021) display.
- ③ Reassemble in reverse order

MAIN PCB & PRESSURE TRANSDUCERS REPLACEMENT

The main PCB and its transducers can be replaced should they become damaged; these parts may be replaced and recalibrated by a service centre. Contact your service agent to carry out this operation.

CAUTION: Any tampering with the electronics will invalidate your warranty. This will also seriously impair the performance and accuracy of the readings

GENERAL CARE AND CLEANING

The a.Lr.TM should be cleaned externally using a moistened cloth only. Under no circumstances should you use hydrocarbon-based oils, as these will cause irrevocable damage, e.g.: WD40, Vaseline, Duck oil, Engine oil, Plus gas, 3in1.

⚠ WARNING

The only lubricant approved for internal use is ROCOL SAPPHIRE ENDURE. No solvents or abrasive cleaning products should be used. The use of any inappropriate lubricant may result in spontaneous ignition, explosion or oxidation.

The frequency for internal servicing should be at least every 12 months; this frequency may be shorter dependant on the environment of use.

The a.Lr.TM should never be immersed into water otherwise damage may occur to the electronics. The electronics are moisture / damp proof to IP65. Ensure correct tools are used at all times. All threads are metric except gun accessory mountings onto the grip frame which is industry standard 10/32 UNF at centres 0.75 inches.

FAULT FINDING TABLES

MARKER WILL NOT FIRE?

- IS AIR/NITROGEN PRESENT? - Fill with gas
- IS THE OUTPUT PRESSURE TOO LOW? - Adjust output pressure
- HAVE YOU FITTED A GAS ON/OFF DEVICE? - Switch on gas valve
- IS THE MARKER SWITCHED ON? - Electronic markers must be switched ON
- IS THE MARKERS SAFETY ON? - Switch safety OFF
- IS THE MARKER FUNCTIONING CORRECTLY - Refer to your marker instructions

VELOCITY TOO LOW OR HIGH?

- IS INLET PRESSURE FROM REGULATOR SET CORRECTLY? - Adjust output
- IS THE OUTPUT PRESSURE CREEPING UP? - Replace main seal / clean filter
- IS THE MARKER FUNCTIONING CORRECTLY - Refer to your marker instructions

INCONSISTENT VELOCITY?

- IS THE OUTPUT PRESSURE TOO HIGH OR LOW? - Adjust output pressure
- IS THE SYSTEM GAS TIGHT? - Check for leaks
- IS THE OUTPUT PRESSURE CREEPING UP? - Replace main seal / clean filter
- IS GAS EMITTING FROM THE SAFETY VENT? - Check output pressure
- IS THE OUTPUT PRESSURE DROPPING UNDER RAPID SHOOTING? - Replace main seal
- ARE GOOD QUALITY PAINTBALLS BEING USED? - Try another brand
- DOES YOUR BARREL MATCH YOUR PAINT BALLS? - Try another barrel
- IS THE MARKER FUNCTIONING CORRECTLY? - Refer to your marker instructions

SYSTEM SLOW TO FILL?

- IS THE INTERNAL GAS FILTER BLOCKED? - Remove filter and replace
- IS THE FILL NIPPLE BLOCKED? - Remove inlet nipple and clean
- DOES THE FILL STATION HAVE SUFFICIENT FLOW? - Refer to fill station manual

FAULT FINDING TABLES CONTINUED

DISPLAY DOES NOT WORK

ARE THE BATTERIES FLAT? - Replace the batteries
 IS THE "B" SYMBOL SHOWING ON THE DISPLAY? - Replace the batteries
 IS THE BATTERY CONNECTOR PLUGGED IN? - Check battery connectors
 HAVE YOU PRESSED THE TACTILE? - Press tactile to activate display
 DISPLAY SHUTS DOWN - The display will shut down after 20 seconds

SYSTEM LEAKS GAS

DOES YOUR MARKER LEAK GAS? Refer to marker manual
 DO THE FITTINGS LEAK GAS? - Check fittings with soapy water and repair
 DOES SAFETY VENT LEAK? - Is output pressure too high, adjust output pressure
 DOES SAFETY VENT LEAK? - Replace safety vent seal / investigate cause

WARNING Only genuine a.Lr™ replacement parts must be used

SYSTEM LEAKS GAS - HAS BURST DISC RUPTURED - Replace ruptured disc and investigate cause

WARNING

Never use incorrect safety rupture devices. The one-piece burst disc/nut assembly used in the a.Lr™ incorporates a captive burst disc in its burst nut. The one-piece burst disc/nut assembly is only for use with the a.Lr™ and no other applications. In the event of rupture of the captive burst disc the one-piece burst disc/nut assembly should only be replaced with another one-piece burst disc/nut assembly, and not with a separate copper burst disc. The fitting of a separate burst disc with the one-piece burst disc/nut assembly can result in the pressure relief safety device on the regulator failing to operate correctly. This could lead to the cylinder exploding which may result in serious injury or death. A 4500psi (310 bar) working pressure cylinder uses a 7500psi (517 bar) rupture disc.

SPARE PARTS

AR001 Body	AR033 Check O ring
AR002 Flange	AR034 ManSeal O ring
AR003 Cap	AR035 Flange bolts
AR004 Piston	AR036 Adjuster screw
AR005 Cone piston	AR037 Vent screw
AR006 Seal retainer	AR038 Lens screws
AR007 Main Seal	AR039 Mounting screw
AR008 Adjuster Rod	AR040 Self tapers
AR009 Transducer nuts	AR041 Disc springs
AR010 Guide manifold	AR042 Connecting rod
AR011 O-ring	AR043 Leaf spring
AR012 GD	AR044 Piston spring
AR013 Mounting bracket	AR045 Filter
AR014 Burstisk 7500 PSI	AR046 1/4 tube
AR015 Lok-sok	AR047 Elbow
AR016 Color	AR048 Straight
AR017 Fill/pipe cover	AR049 Packaging box
AR018 Buffer	AR050 Sieve
AR019 Lens cover	AR051 Softie label
AR020 Main PCB	AR052 Instruction book
AR021 LCD	AR053 Polystyrene inserts
AR022 Battery PCB	AR054 Gell logo
AR023 Transducer LDW	AR055 2.5 Allen Key
AR024 Transducer HIGH	AR056 Tank DOH4E
AR025 Spare Batteries	AR057 Tank O ring
AR026 Vent seal	AR058 Flange O ring large
AR027 Manifold seals	AR059 PCB Mount O rings
AR028 Cone O ring	AR060 PCB shield
AR029 Piston O ring	AR061 Grip Screws
AR030 Adjuster rod O ring	AR062 5/32 Allen Key
AR031 Flange O rings small	AR063 2.0 Allen Key
AR032 Transducer seals	AR064 5.0 Allen Key

USEFUL CONVERSIONS

Listed are some useful conversions relating to pressure, velocity, volume, mass & distance.

PRESSURE

1 atm	=	1.01325 bar
1 atm	=	14.6959 psi
1 bar	=	14.5038 psi
1 psi	=	0.0689476 bar

VELOCITY

1 ft/s	=	1.09728 Km/h
1 ft/s	=	0.3048 m/s
1 ft/s	=	0.6818 mph
1 m/s	=	3.28084 ft/s
1 m/s	=	3.6 Km/h

MASS

1 g	=	0.05274 oz
1 Kg	=	2.20462 lb
1 oz	=	0.0283495 Kg

DISTANCE

1 mm	=	0.0393701 inch
1 inch	=	25.4 mm
1 thou	=	25.4 micron
1 micron	=	0.0393701 thou

VOLUME

1 Litre	=	61 cu.inch
1 cu.inch	=	0.0164 Litres
1 cu.ft	=	28.32 Litres
1 cc	=	0.061 cu.inch

GAS COMPOSITION

Air: Breathable grade
 Oxygen 21%
 Nitrogen 78%
 Argon 1%
 Other trace gases not included e.g.: carbon dioxide, helium
 Hydrogen etc..

TERMS OF WARRANTY EEC / R.O.W. EXCLUDING USA & CANADA

Subject to the conditions set out below WDP warrants that the a.i.t.[™] will correspond to its specification at the time of delivery and will be free from defects in materials and workmanship for a period of six months from the date of purchase.

WDP gives this warranty subject to the following conditions:

- ③ Proof of purchase is required in all warranty claims.
- ③ Warranty is not transferable.
- ③ The company shall be under no liability in respect of any defect arising from fair wear and tear.
- ③ Seats, batteries, wiring, transducers, circuit boards and LCD displays are not covered by this warranty. Willful damage, negligence, abnormal working conditions, weather, accident, tampering, failure to follow manufacturer's instructions (whether oral or in writing), misuse or alteration or repair of the a.i.t.[™] without the company's written approval will invalidate this warranty and the company shall be under no obligation whatsoever to the purchaser in respect of any of the above breaches of this warranty.
- ③ The above warranty does not extend to parts, materials or equipment not manufactured by the company, in respect of which the purchaser shall only be entitled to the benefit of any such warranty or guarantee as given by the manufacturer to the company.
This warranty does not cover the following:
 - ③ Repairs, alterations or replacements not authorised by the manufacturer
 - The gradual reduction in performance linked to the age of the a.i.t.[™] or usage
 - ③ Anything caused directly or indirectly by vandalism or theft
 - ③ Any damage to parts which are recalled by the Manufacturer
 - ③ Any loss damage or failure, which a qualified engineer appointed by the Manufacturer, believes could have been avoided or was totally or partly caused by a lack of maintenance.

Subject as expressly provided in these conditions and except where the goods are sold to a person dealing as a consumer (within the meaning of the Unfair Contract Terms Act 1977) all warranties, conditions or other terms implied by statute or common law are excluded to the fullest extent permitted by law.

Where the goods are sold under a consumer transaction (as defined by the Unfair Terms in Consumer Contracts Regulations 1994 S13159) the statutory rights of the purchaser are not affected by these conditions. Carriage charges in relation to warranty claims shall be borne by the customer. Where any valid claim in respect of the a.i.t.[™] is based on the quality or condition of the a.i.t.[™] or its failure to meet specification, and such valid claim is notified to the company in writing and is in accordance with the company's standard terms and conditions of sale the company shall be entitled to repair or replace the goods or the part in question free of charge or, at the company's sole discretion, refund to the purchaser the price of the goods (or a proportionate part of the price) but the company shall have no further liability to the purchaser.

Except in respect of death or personal injury caused by the company's negligence, the company shall not be liable to the purchaser by reason of any representation, or any implied warranty, condition or other term, or any duty of common law, or under the express terms of this guarantee, for any direct or indirect, special or consequential loss or damage, whether to persons or property, costs, expenses or other claims for compensation or damages whatsoever (whether caused by the negligence of the company, its employees or agents or otherwise) which arise out of or in connection with the supply of the a.i.t.[™] its use, or misuse, or resale by the purchaser, or any individual, and the entire liability of the company under or in connection with the purchase or use or misuse of the a.i.t.[™] shall not exceed the purchase price of the a.i.t.[™]. Purchaser agrees to adhere strictly to all warnings and safety procedures and the contents of the Operator's Manual.

The laws of England shall govern this warranty and the purchaser agrees to submit to the non-exclusive jurisdiction of the English courts.

The supply and purchase of the a.i.t.[™] is subject to the company's standard terms and conditions of sale, a copy of which is available on request. a.i.t.[™] patents applied for, design rights and all rights reserved. The a.i.t.[™] is marketed and distributed by WDP Ltd a company registered in England No. 2114341.

No warranty is given to parts not manufactured by the Manufacturer and all liability for loss damage or injury is excluded.

This warranty must be construed and read in conjunction with the products terms and conditions of sale.

To make a warranty claim, buyer must first contact the nearest authorised a.i.t.[™] Service Centre for instructions. A list of authorised a.i.t.[™] Service Centres may be obtained through WDP website www.wdp-paintball.com, or by contacting WDP by mail at WDP Metro Triangle, 221 Mount Street, Neshells, Birmingham, England, B7 5QT, or by fax at + (44) (0) 121 327 3967, or by calling + (44) (0) 121 328 2228.

WDP LIMITED EXPRESS WARRANTY USA / CANADA ONLY

1. General Express Warranties.

WDP warrants to the buyer who is purchasing to place into use ("Buyer") only, that the a.i.t.™ ("Product") shall be free from material manufacturing defects in materials and workmanship for six months from the date of purchase, subject to the requirements, disclaimers and limitations of this Warranty. This is not a Warranty of performance, but a limited Warranty as to the condition of the Product at the beginning of the Warranty period, this Warranty is only against such defects and not against any other failures such as, but not limited to, those due to wear and tear, exposure to the elements, unusual operating environments, misuse, negligence, accident, alteration or repair in any respect which, in the judgement of WDP adversely affects the condition or operation of the Product. Normal maintenance and perishable items such as seals, batteries, wiring, indicator lamps and exhaust valves are excluded from this limited Warranty against defects. This Warranty is not transferable and it may not be waived or expanded except in writing signed by WDP. The terms and limitations of this Warranty shall also apply to any additional goods or information, which may be distributed by WDP relating to the a.i.t.™

2. Disclaimer and Limitation of Express and Implied Warranties.

There are no express Warranties other than those contained in this Warranty. Whether or not the Product is to be used exclusively by Buyer, there shall be no third party beneficiaries to this Warranty herein. NO WARRANTY IS PROVIDED TO DISTRIBUTORS OR DEALERS EXCEPT AS MAY BE EXPRESSLY PROVIDED IN A SEPARATE AGREEMENT OF SALE. All descriptions, illustrations of the Product and other information in catalogues, brochures and price lists or otherwise provided by WDP or others are intended for general information only. WDP is not responsible for any errors or omissions therein or for any loss or damage resulting from reliance on them. WDP does not warrant that the Product is in compliance with any law or industry standards, guidelines or procedures. WDP Ltd standard terms and conditions of sale also apply if Buyer is a direct purchaser from WDP. WDP DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, BUT NOT LIMITED TO, THOSE OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY.

3. Remedy and Limitation of WDP liability.

Defective or non-conforming Product or parts thereof discovered and returned to WDP freight prepaid, with proof of purchase, during the Warranty period shall be repaired or replaced by WDP without any additional charge and shipped to Buyer, FOB WDP. In lieu of repair or replacement, if WDP elects, WDP may, upon return of such product and making a determination of non-conformity or defect, keep the product and refund the purchase price paid by Buyer. Buyer's remedies shall be limited (even in the event of WDP default of its Warranty obligations) exclusively to those provided in this Warranty. UNDER NO CIRCUMSTANCES SHALL WDP OR ANY SUPPLIER, DISTRIBUTOR, DEALER, OR OTHER PERSON BE LIABLE FOR EXEMPLARY, PUNITIVE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, NOR FOR ANY AMOUNT IN EXCESS OF THE BUYER'S PURCHASE PRICE. Buyer waives any causes of action or theories of liability including, but not limited to, those arising under contract, tort, strict liability, Product liability, statutes, or otherwise, except as to those specifically provided by the Uniform Commercial Code (as adopted in Michigan) as excluded, modified and limited in this warranty.

4. Additional Consumer Protection.

The products are offered for sale for end use in supervised commercial establishments where professional safety codes are enforced, and not for personal, family or household use. Nevertheless, if the Product is determined in a transaction to be a customer Product under applicable law, the following provisions shall become applicable:

(a) THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS OF THE PRODUCT FOR A PARTICULAR PURPOSE THAT CANNOT BE DISCLAIMED ARE LIMITED IN DURATION TO THE INITIAL EXPRESS WARRANTY PERIOD.

(b) Some states do not allow limitations on how long an implied Warranty lasts, so the above limitation in (a) may not apply.

(c) Some states do not allow the exclusion or limitation of incidental or consequential damages, so such limitations may not apply.

(d) And this Warranty gives buyer specific legal rights, and buyer may also have other rights provided for by law.

5. Parts, Service and Training performed by WDP.

All Warranty and non-Warranty parts, labour and service, if any, provided by WDP related to the product are subject to all limitations and disclaimers of warranties and remedies provided in this Warranty. The replacement or repair of a product by WDP does not give rise to any new Warranty except the Warranty period provided for herein shall be extended by the length of any period in which defective or non-conforming product is in possession of WDP. WDP may have access to the Product after purchase of the Product. WDP is not under any duty to inspect the product for any defects or any improper use or modification of the Product, nor to correct or advise anyone of any such condition, use or modification, which is observed. Any notification, which may be given, is voluntary and subject to all limitations and disclaimers in this Warranty.

6. User's Responsibility for Safety and Indemnification

It is Buyer's or other user's responsibility to obtain all training and means that may be necessary to effectively protect all individuals and property from damage and bodily injury, which otherwise may result from the use or maintenance of the Product, and to use the Product in accordance with operating instructions and due care. If operating instructions are not provided with the Product or have been lost, a copy will be provided by WDP without cost on request. Buyer shall use and shall require all others to use all safety devices and guards furnished with or intended to be used with the Product, and to follow proper safe operating procedures in accordance with general industry standards and as set forth in manuals and instruction information furnished by WDP. If Buyer fails to comply with the obligations set forth in this section, the buyer shall defend and indemnify WDP harmless from any claim, liability or obligation incurred by WDP or its suppliers, distributors, or dealers to persons injured directly or indirectly in connection with the use of the product contrary to this Warranty or any warning or instruction from WDP.

7. Law and Jurisdiction.

This Warranty shall be governed by the laws of Michigan, and Buyer irrevocably submits to the non-exclusive jurisdiction of courts sitting in Michigan to resolve all disputes arising from or related to this warranty or use of the Product.

8. Claims and Information procedure.

To make a warranty claim, Buyer must first contact the nearest authorised a.i.t.™ Service Centre for instructions. A list of authorised a.i.t.™ Service Centres may be obtained through WDP website www.wdp-paintball.com, or by contacting WDP by mail at WDP, Metro Triangle, 221 Mount Street, Nechells, Birmingham, England, B7 5GJ, or by fax at 011 44 121 327 3967, or by calling 011 44 121 328 2228.

UPDATES

The specification & photographs in this material are for general guidance purposes only. Our products are continuously updated and changes may be made to specifications, design, or appearance from time to time. For the latest specification, virtual products and on line technical support we recommend that you visit our web site.

www.wdp-paintball.com

To receive regular updates please Email sales@wdp-paintball.com to have your Email address included in our database, and you will receive current information.

PERSONAL DETAILS RELATING TO YOUR a.i.r.™

BODY SERIAL No:

PURCHASED FROM:

DATE: COUNTRY: CITY:

STATE: ZIP: