

**COMMANDO<sub>2</sub> 40<sup>®</sup>**



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**IMPORTANT SAFETY INSTRUCTIONS. READ BEFORE OPERATION.**



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## 1.0 INTRODUCTION

Thank you for choosing Nu-Ice Age™ Dry Ice Blasting equipment. This guide is designed to assist the user whose primary responsibility is to maintain and operate the Nu-Ice Age™ Commando 40 Dry Ice Blasting Machine. This manual provides specific information on assembly, operation, safety, and maintenance procedures. **Please read, understand and follow all procedures stated in this manual.**

## 1.1 WARRANTY

Nu-Ice Age shall warrant the **Commando 40 Dry Ice Blasting Machine** to be free of defects in material and / or workmanship for One (1) Year from the date of shipment to the buyer. The warranty shall cover 100% of all parts and labor with the exception of misuse, abuse, or neglect. The warranty also does not cover the following items which are deemed to be consumables.

- Blast Hose Assembly including Pneumatic Signal Lines
- Air Lock Feed Wheel

Nu-Ice Age will at it's option repair, replace or issue credit for the value of any defective **Commando 40**. Failure to follow proper operation and maintenance procedures described in the Owners Manual may limit or void this warranty.

Buyer accepts all responsibility for compliance with any / all Local, State and Federal Laws or Regulations including Regulations of Foreign Governments.

No equipment shall be returned to Nu-Ice Age without a Return Authorization Number from our customer service department. Upon evaluation and determination of warranty, replacements or repairs will be sent to the buyer. If a replacement is needed immediately, a Purchase Order is required to cover the cost of the product until the warranty is determined.

The warranty is limited to replacing any goods that are proved to be defective and Nu-Ice Age in no event shall have any liability for paying incidental or consequential damages including and without limitation, damages resulting in personal or bodily injury or death, or damages to, or loss of use of any property. Notwithstanding any of these terms and conditions, the warranty set forth shall apply in connection with any sales of goods, services or design by Nu-Ice Age and are in lieu of all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

**Manufacture Date**

**Serial #**

## 1.2 IMPORTANT SAFETY INSTRUCTIONS



**WARNING** – When operating this machine, basic precautions should always be followed, including the following:

1. Read all the instructions before using this machine.
2. To reduce the risk of injury, do not operate this machine near children.
3. Always wear the proper eye, ear and skin protection specified in this manual when operating the machine.
4. Know how to stop the machine and bleed pressures quickly. Be thoroughly familiar with the controls.
5. Stay alert – watch what you are doing.
6. Do not operate this machine when fatigued or under the influence of alcohol or drugs.
7. Keep operating area clear of all unauthorized personnel.
8. Do not overreach or stand on unstable support. Keep good footing and balance at all times.
9. Follow the maintenance instructions specified in this manual.
10. This machine must be grounded. Follow the grounding instructions specified below.

### GROUNDING INSTRUCTIONS

This machine must be grounded while in operation. The process of dry ice blasting can generate static electricity and result in electric shock. This product is equipped with three grounding points outlined on page 10. These grounding points should be in place at all times during operation to avoid the risk of electric shock.



**DANGER** – Improper connection of the equipment-grounding conductors can result in static electric shock. Check with a qualified electrician or service technician if you are in doubt as to whether the unit is properly grounded. Do not modify the grounding points provided with the product without approval from a qualified service technician. If the machine cannot be fully grounded for a particular application, consult a qualified electrician to minimize the risk of static electric shock.



**WARNING** – Risk of injection or injury. Do not discharge blasting stream at persons.

### SAVE THESE INSTRUCTIONS

## 1.3 DRY ICE SAFETY PRECAUTIONS

### Dry Ice (Solid CO<sub>2</sub>) Safety Data

- At a temperature of -110°F (-79°C), insulated gloves should be worn at all times when handling dry ice to prevent frostbite.
- Proper eye, ear and skin protection should be worn at all times when operating or in the vicinity of dry ice blasting equipment.
- Even though CO<sub>2</sub> gas is non-poisonous, it does displace oxygen in the atmosphere so working spaces should be properly ventilated. Because CO<sub>2</sub> is 40% heavier than air, when blasting in an enclosed area, placement of exhaust vents at or near ground level is recommended. In an open environment, existing ventilation is sufficient to prevent undue CO<sub>2</sub> buildup. It is recommended that a breathing apparatus is used in enclosed work areas where CO<sub>2</sub> gas may accumulate to hazardous levels.
- Store dry ice only in containers approved and labeled for dry ice storage. Storing dry ice in a container without proper ventilation may result in an explosion hazard due to the pressure that builds up when dry ice sublimates into gas form.
- Ensure your dry ice supplier provides a current MSDS sheet for any additional safety information

### + First Aid Measures

**Contact with Skin:** Immediately flush effected area with warm water. Do not attempt to pop any blisters that may appear as a result of frostbite. Seek medical assistance as soon as possible.

**Contact with Eyes:** Immediately flush eyes thoroughly with water for at least 15 minutes. In case of frostbite, spray with lukewarm water for at least 15 minutes. Apply a sterile dressing. Seek medical assistance as soon as possible.

**Excess Inhalation:** In high concentrations (5000 ppm or higher), CO<sub>2</sub> can cause asphyxiation by displacing the oxygen required for breathing. Symptoms may include loss of mobility or consciousness. The victim may not be aware of asphyxiation. In case of asphyxiation, immediately move victim to an uncontaminated area. Apply artificial respiration if breathing has stopped. Keep victim warm and rested. Seek medical assistance as soon as possible.

***Refer to the MSDS sheet provided by your dry ice supplier for additional first aid information.***

### Safety Training

Asphyxiation and other potential safety hazards must be stressed during operator training. Always review safety procedures with operators before allowing them to operate any dry ice blasting equipment. Before using this product in any new process, a material compatibility and safety study should be performed.

Always ensure that all Local, State and Federal Laws and Regulations are observed, including Regulations of Foreign Governments.



## 1.3 DRY ICE SAFETY PRECAUTIONS *(continued)*

**Additional safety information can be found at the following websites:**

<http://www.osha-slc.gov/>

<http://www.ansi.org>

<http://www.nfpa.org>

## 1.4 MOVING AND DRY ICE STORAGE INFORMATION

When transporting the machine, always secure with straps or other appropriate method to avoid the risk of damaging equipment.

Do not transport dry ice in any vehicle where the storage area is not separate from the driver's compartment (such as a car or station wagon). Driver must be aware of the potential hazards of CO<sub>2</sub> and know what to do in the event of an accident or emergency. Ensure dry ice containers are secured and that adequate ventilation is provided before transporting.

Unused dry ice may still remain in the ice blaster after blast cleaning work. As a safety precaution, purge the remaining dry ice from the machine until the hopper is empty. This also prevents ice clumps from building up in the machine.

**Only properly labeled equipment that is approved for use with dry ice should be used to store dry ice pellets. Always keep containers in a well-ventilated area.**

## 1.5 SAFETY DURING OPERATION

Prior to blasting, carry out a risk assessment in order to have the proper safety precautions in place. Ensure that those operating the equipment have been properly trained and understand the risks associated with dry ice. Always secure the area that is to be blasted with dry ice — **no unauthorized or untrained personnel should be allowed to operate the machine or enter the working area.**

Confirm the nature of the coating or substance that is to be cleaned before beginning the blasting process. If hazardous materials are present, appropriate safety precautions must be taken to avoid exposure, such as local exhaust ventilation or personal protective equipment.

Always inspect air supply and blasting hoses for any potential damage and ensure all connections are secure prior to operation.

**This machine may be used indoors and outdoors. Operating the machine in heavy rain is not recommended, water will freeze up the dry ice pellets and clog the hopper.**

***Follow All Safety Precautions During Setup and Operation shown on Page 7***

## 1.5 SAFETY DURING OPERATION *(continued)*



### FACE PROTECTION OR GOGGLES

Always wear safety goggles or face protection when operating dry ice blasting equipment, especially to ensure protection from any blowback of the contaminant being removed.



### PROTECTIVE GLOVES

Always use suitably insulated protective gloves when handling dry ice or cold parts of the machinery. Contact with dry ice may cause cold burns or frostbite, use gloves and the supplied Ice Scoop to avoid this.



### EAR PROTECTION

Always wear proper hearing protection. Harmful noise levels can be experienced that can result in permanent hearing loss. Nearby workers must also have hearing protection when standing within 100 ft (30.5 m) of the work area. Double ear protection (ear plugs & ear muffs) is recommended to all workers in the blasting area. Pregnant women should not operate machine or be in the noise area.



### BREATHING APPARATUS

Wherever suitable ventilation cannot be provided, a breathing apparatus with a supply of breathing air should be present. Dry ice blasting can cause airborne particulates and correct respiratory protection should be matched with the contaminant(s) being removed (i.e. mold, lead paint, etc.).



### ASPHYXIATION HAZARD

In small enclosed rooms and areas with little or no ventilation, CO<sub>2</sub> may accumulate to dangerous levels. A CO<sub>2</sub> detector should be used to confirm safe conditions. Where necessary, a breathing mask with a fresh air supply should be worn.



### CAUTION!

Never touch the pellet stream or nozzle during operation.  
Never blast or aim blasting gun at people or animals.  
Do not ingest dry ice or handle without proper protection.



### ELECTRIC SHOCK HAZARD

Objects to be cleaned must be grounded in order to avoid a potential static electrical discharge caused by the velocity of the pellets in the air stream. **Do not operate the blaster if you wear a pacemaker.**



### LOW TEMPERATURE

The temperature of dry ice is -110°F (-79°C). Do not touch or allow direct contact with dry ice. Always use protective clothing and gloves when handling dry ice and equipment that contains dry ice.

## 2.0 ASSEMBLY

Each Commando 40 Dry Ice Blaster ships complete with the following items:

- Dry ice blasting unit & protective cover
- 25 ft (7.6 m) blasting hose with signal lines and 40 ft (12.2 m) air supply hose
- Commando 40: Blasting gun plus 1 round nozzle, 1 fan nozzle
- Commando 40 PRO additional items: 1 nozzle extension and 1 twist grip handle
- Ice Scoop

## 2.1 INSPECTION UPON DELIVERY

Inspect your new dry ice blasting machine upon arrival for any damage that may have occurred during shipping. Please notify the transportation company as well as Nu-Ice Age within 24 hours if any damage is present. Verify that all parts described on your packing list have been delivered.

## 2.2 ASSEMBLY INSTRUCTIONS

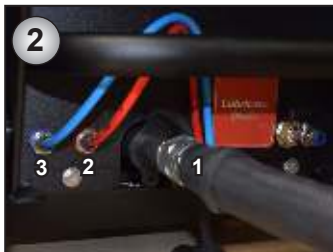


### 1. Connect the Air Supply:

Ensure the air shut-off valve (red handle located at the air inlet) is in the "OFF" position - pressed all the way down. Connect the air supply hose from the machine to an appropriate air supply. The **Commando 40** machine requires an air compressor that can supply 60-125 psi of air @ a minimum of 185 CFM (5.2 m<sup>3</sup>). The **Commando 40 PRO** machine requires 60-250 psi of air @ a minimum of 185 CFM (5.2 m<sup>3</sup>). Attach the whip check to the hose as shown. Use a wrench to firmly secure the JIC fitting.

Always ensure hose is securely attached and inspect for damage prior to operation. Replace damaged hoses as needed. Never disconnect hoses while the machine is in operation. After use, first shut down the compressed air source, then press the air shut-off valve down to cut off the air supply and depressurize the machine.

Always use clean, dry air free from oil, particles and humidity. An aftercooler/air dryer is recommended (portable units available from Nu-Ice Age). When using shop air, ensure that consideration has been given to the volume of air required for operation.



### 2. Blasting Hose and Pneumatic Signal Lines:

Connect the blasting hose, red & blue pneumatic signal lines, and the blasting gun ground wire at the lower front of the blaster as shown. Attach the JIC connection securely using a 3/4" wrench (1" for the PRO model). The order of attachment from right to left is as follows:

- 1.) Blasting Hose
- 2.) Red Pneumatic Signal Line
- 3.) Blue Pneumatic Signal Line



## 2.2 ASSEMBLY INSTRUCTIONS (continued)

### 3. Blasting Gun Connection:

Connect the gun to the blasting hose. Attach the red and blue pneumatic signal lines into the push-to-lock fittings. Use a 1 1/2" wrench to secure the JIC connection to the gun.



### 4. Blasting Nozzle and/or Extension Connection:

Use the nozzle adapter on the gun to thread on the nozzle and/or extension pipe. **BARREL EXTENSIONS SHOULD BE FIRMLY TIGHTENED WITH A WRENCH.** Attach the twist-grip handle (if needed) by hand tightening onto the extension. It is highly recommended to leave the adapter connected to the gun rather than on the nozzle. Blasting nozzles should be firmly hand tightened, but may be adjusted with a wrench to change the orientation.



A selection of blasting nozzles are available for a variety of different cleaning applications. It is recommended that a test area be blasted first to establish which nozzle will function the best for each cleaning application. Always ensure the air shut-off valve is off when making any changes (nozzle, extensions, fittings etc.) at the blast gun.

*Continued on page 10...*



Blasting Gun Assembly

## **2.2 ASSEMBLY INSTRUCTIONS (continued)**



### **5. Static Grounding Clip and Drag Line:**

To minimize the risk of shock due to static electricity, always attach the grounding clip to the object you are blasting. Ensure the location of the clip is not in an area where it is at risk of being blasted or slipping off.

There are two grounding points on this machine to minimize the risk of static electric shock:

- 1.) **Work Surface Grounding Clip:** Located on the back of the machine attached with the orange cable. Attaches to your work area.
- 2.) **Floor Surface Grounding Drag Line:** Located at the bottom of the front of the machine. This makes a grounding point at the floor and should remain in contact with the floor while blasting. **DO NOT USE THIS AS A STRAP TO SECURE THE MACHINE DURING TRANSPORT.**



## **3.0 DRY ICE PELLET SIZE & QUALITY**



Dry ice pellets contaminated with moisture can result in freezing of the air chamber rotor and hose. Pellets typically become mushy or clumped together when they contain too much moisture. For best performance, the use of fresh dry ice pellets without signs of moisture contamination is recommended. To the left is an example of dry ice pellets that are compatible with the Commando 40 Dry Ice Blaster.

The correct size of dry ice pellets for the Commando 40 and 40 PRO is approx. 1/8" (3 mm) dia. and is commonly referred to as "blasting rice."

Any foreign objects other than dry ice pellets that fall into the hopper can result in serious damage to the air/CO<sub>2</sub> chamber.

Always keep the top lid closed during operation to avoid dirt and debris from falling into the hopper.

Do not leave dry ice in the hopper for an extended period of time (10 minutes or more). It may solidify and cause a blockage.

## 4.0 OPERATION

### Top Control Panel on the Commando 40 Model

*Air pressure gauge only*



### Top Control Panel on the Commando 40 PRO Model

#### 1. Air Shut-off Valve

Once the power and all cables/hoses are properly connected, pull up on the air shut-off valve to supply air to the machine. The air shut-off valve also acts as an emergency stop. To shut down the machine and cut off the air supply, press down on the air shut-off valve.



#### 2. Air Pressure Adjustment (40 PRO models only)

The working pressure can be read at the gauge located in the center of the control panel. To adjust the pressure, use the regulator dial to the left of the air pressure gauge. Turn the dial clockwise to increase the pressure and counter-clockwise to decrease. Air pressure may be adjusted before and during work.

The maximum operating air pressure for the Commando 40 is 125 psi (8.6 bar) and 250 psi (17.2 bar) on the 40 PRO model. When first beginning a job, it is recommended to start off at a lower setting. The air pressure required will depend on the cleaning application. It is highly recommended that a test clean is performed at low pressure and gradually increased until the point where it removes the unwanted substrate or coating.

#### 3. Pellet Feed Rate (40 PRO models only)

To adjust the consumption of pellets, the speed of the feed wheel can be adjusted by turning this knob on the front panel. For higher pellet consumption, turn the knob counterclockwise; for lower consumption, turn it clockwise. When first beginning a job, it is recommended to start off with 1-2 lbs/min and adjust accordingly based on your cleaning application.

**Note:** This control provides approximate proportional control of the pellet quantity. The regulation of pellet consumption will not interfere with the air pressure or air stream.

## 4.1 FUNCTION TESTING AND FEEDING DRY ICE

With all connections in place, actuate the blasting gun. High pressure air flow should be coming out of the nozzle. Observe the feed wheel located at the bottom of the hopper, the wheel should be turning while holding the trigger on the blasting gun. Increase pellet feed if the wheel is not turning or turning too slow. Pellet feed may be adjusted later and optimized for your blasting application. Ensure the vibrator is operational (hopper should be vibrating). Always ensure these functions on the machine are operating properly prior to blasting.

**Prior to filling dry ice into the hopper ALWAYS activate the blast function for about 30 seconds by pulling the trigger on the gun to empty the hose and machine of humidity and moisture.**

After function testing, pour dry ice into the hopper. Fresh dry ice is always recommended to avoid clogging. Close the lid to minimize evaporation of dry ice and the ingress of humidity and dirt. Do not overfill to the point where the lid cannot be closed. Use only dry ice — use of other materials in this machine will void the warranty. Upon initial use, start by pouring about a gallon of dry ice in the hopper and blast it out. This will allow the parts to chill and then you can fill the hopper with ice as needed. Do not blast without any dry ice in the hopper (after initial system purging). Without dry ice the feed wheel inside the machine will run extremely hot and may be damaged.

## 4.2 START/STOP PROCEDURES

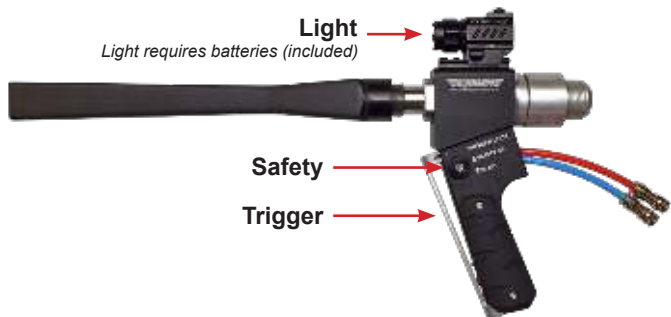
### Start of Dry Ice Blasting

When the blaster is connected properly, correct air pressure is adjusted and dry ice is in the hopper, you are ready to begin dry ice blasting.

Before beginning, have a firm grip of the gun and do not point at yourself or in the direction of other people. Stand in a safe working position. **Operators and anyone near the blasting area should also be wearing the required hearing, face and eye protection outlined on page 7.**

To start ice blasting, first ensure the air shut-off valve on the machine is in the ON position (pulled up). To engage, ensure the safety is in the down (blast) position, then pull the trigger on the pistol grip (once started it is only necessary to keep the trigger pressed). If only air is spraying from the gun, the hopper is out of dry ice.

When starting, keep the gun some distance from the object to be cleaned until you are able to confirm the back-pressure of the gun. Blasting pressure and amount of dry ice can be adjusted during operation.



## 4.2 START/STOP PROCEDURES *(continued)*

### Stop of Dry Ice Blasting

To stop blasting, release the trigger on the gun. Once the trigger is released, the hopper vibrator will stop, however air will continue to flow for approx. 1/2 second to purge any dry ice left in the hose.

If stopping for more than 15 minutes, ensure the hopper is empty and blast air through the system for a short period to clear out any dry ice that may be left in the system. This avoids dry ice clumping in the hopper and air chamber chute.

**Important! When the system is empty, stop blasting to avoid unnecessary wear on the feed wheel.**

If dry ice pellets are not returned to storage immediately, care should be taken to ensure their safe disposal. Avoid leaving pellets exposed where untrained personnel or children may be able to touch them, or in an enclosed area where sublimation could cause a hazardous atmosphere.

## 4.3 ICE BLASTING PROCEDURES

- Small objects should be fixed or mounted properly before blasting.
- Do not leave loose parts in the blasting area.
- Some dry contaminants tend to pulverize while cleaning. If a maximum total dust concentration of 6 mg/m<sup>3</sup> (fine dust) is exceeded, a breathing mask must be worn. Protective measures should be taken such as Local exhaust ventilation and/or other personal protective equipment. A suitable mask or other control measures may be required to protect against specific hazardous contaminants. In poorly ventilated enclosed spaces, forced ventilation or breathing apparatus may be required to avoid asphyxiation by sublimated carbon dioxide.
- The nozzle gun discharges gases and CO<sub>2</sub> pellets at very high velocities (up to 300 m/sec or 1000 ft/sec). Never aim the gun at human beings or animals as serious/fatal injuries may be caused.
- When activating blasting, back-thrust will occur in the opposite direction of the airflow. In order to anticipate the reactive thrust, always take a wide stance (with feet approx. 2 ft or 60 cm apart) and your upper body leaning into the direction where the nozzle is pointing.



### WARNING

Do not attempt to modify any controls or other components on this machine. Tampering with the safety trigger, pressure control, pressure relief valve or any other components can lead to serious risk of injury.

## 5.0 MAINTENANCE



### Pneumatic Lubricator Maintenance

This machine is equipped with a lubricator for the dry ice feed motor. The lubricator is located on the right side of the machine and is labeled with the red tag. The lubricator should be checked and filled every 4-6 hours of operation. Use only pneumatic air motor lubricant in the lubricator. The correct setting on the lubricator is factory preset to LOW and should not be modified.



### Used Lubricant Catch Drain

The used lubricant catch drain is located at the bottom front side of the machine. This should be drained every 16 hours of operation. To empty the drain, turn the ball valve 90° (toward the front of the machine). Turn the valve back in the closed position when finished draining.

### Additional Maintenance

Additional maintenance is necessary only if the performance of the dry ice blasting machine is no longer satisfactory. However, inspection and cleaning of the unit/hoses at regular intervals is recommended. **Servicing this machine beyond the basic maintenance procedures listed on this page should only be performed by an authorized service representative.**

### Inspection of Blasting and Air Supply Hoses

Prior to blasting, always inspect the blasting hose and air supply hose for damage (such as cuts, holes or excessive wear). A damaged hose can be a serious safety hazard. If hoses are damaged replace immediately. **Do not operate the machine with a damaged hose. Replace only with Nu-Ice Age OEM hoses, use of other air hoses may void warranty.**



## 5.0 MAINTENANCE *(continued)*

### Accessing Internal Parts

Panels on each side of the machine are easily removable to provide access to the air chamber and other internal parts (see photos below). Simply turn the two locking screws on each side to open the panels.



Left Side: Air Valves/Pneumatic Signal Lines



Right Side: Motor/Air Chamber & Plumbing

## 6.0 CLEANING INSTRUCTIONS



Clean your dry ice blasting machine with low pressure compressed air. If the equipment has become dirty, it should be cleaned by means of a wiper moistened with a cleaning material (degreaser). Do not pressure wash.

### **Automatic Moisture/Particulate Filter (40 micron)**

On the front of the machine is an automatic filter/drain for removal of moisture in the air line. This filter will automatically drain when full. Frequency of drainage will vary based on the amount of moisture in the air supply line, and if a dryer is installed in the air supply system the filter will likely drain less frequently. If the filter is no longer draining, it may be clogged or require replacing (**Part #IB1530B01-1**).

## 7.0 STORAGE

The machine can be stored at temperatures of 23°F to 104°F (-5°C to 40°C). Please note that temperature changes overnight of 68°F (20°C) might cause condensation inside the hopper and blast head. If condensation is suspected, run warm dry air through the system for 30-60 seconds to dry out the components.

## 8.0 TROUBLESHOOTING

If you have a problem with your machine that cannot be resolved, please contact our customer service department to receive technical assistance. **Improper maintenance or attempted repair that results in damage to the machine is not covered in the manufacturer's warranty (see section 1.1).**

Problem	Possible Cause	Solution
<b>Blaster does not start</b>  <b>Blaster Stops</b> (Motor not running)	No Air	Verify Air Shut-off valve is in the "ON" position (pulled up). Check air connections and verify all hoses are connected. Verify air source is functioning properly.
	Emergency Stop/Air Shut-off valve is pressed in	Verify Air Shut-off valve is in the "ON" position (pulled up).
	Air supply is off, disconnected or inadequate	Check air supply and hoses. Ensure air supply meets the minimum requirements to operate the machine (pg. 17).
	Dirt or debris is in the air chamber	Clean/check air chamber for damage.
	Air motor not running	This can be caused by freezing (ice left in the machine, significant frost build-up, or lubricant not being supplied to the motor). Evacuate ice if frozen and run warm air for 60 seconds. If lubricator is empty, fill and add a small amount of oil directly to the motor through the green air inlet line.
	Feed wheel not turning	Check for debris lodged in the feed wheel or if the feed wheel is frozen (see page 17). Call customer service for feed rotor clearance specs.
	Damaged/Loose Pneumatic Signal Lines	Check for proper connection and damage. Replace if damaged.



## 8.0 TROUBLESHOOTING (continued)

Problem	Possible Cause	Solution
<b>Little or No Dry Ice Delivery</b>	No pellets in the hopper	Fill hopper with pellets
	Dry ice delivery is turned off at the blasting gun (air only)	Verify red and blue pneumatic signal lines are connected properly (see pages 8-9)
	Twisted feed hose	Check hose and uncoil if necessary
	Dry ice is clogged due to too much moisture	Use a water separator & after cooler on the air compressor. Check to see whether old dry ice has breached above the feed chute at the bottom of the hopper.
	Frozen hopper	Remove ice clump from hopper outlet. To avoid this problem, ensure the hopper lid is kept closed between fillings. Also check to verify the hopper vibration unit is functioning, as this should prevent this from happening.
	Hose, gun, pipe or nozzle is blocked by ice	Check for pellet blockage inside the feed hose. If blockage is found, disconnect the hose and gun and allow the dry ice to sublime. Sublimation can be increased by applying heat. If an ice crusher is being used, ensure that a large aperture nozzle is being used. You may also try using higher pressure, older, softer dry ice or a larger size grating.
<b>Low Air Pressure at the Nozzle When Blasting</b>	Problem with air supply to the blasting machine	Check air pressure at the air supply. Examine air supply hoses for kinks or damage.
	Damaged feed wheel	Check the feed wheel for damage causing excessive air leakage.
	Blasting nozzle is too big	Use smaller nozzle.
	Insufficient air supply	See air supply requirements on page 17.
	Moisture/particulate filter is clogged or needs replacing	Inspect filter & drain, replace moisture filter if necessary. (Pt. # IB1530B01-1)

## 8.0 TROUBLESHOOTING *(continued)*



### Feed Wheel Exhaust Valve

The Commando 40 is equipped with a Feed Wheel Exhaust valve inside the machine, located on top of the feed wheel assembly. This can be accessed by removing the back or right cover. **This is factory preset at approx. 1/4 turn (2-3 CFM) and should not be adjusted unless the feed wheel is frozen and not feeding dry ice.**

To increase the air exhaust in order to free up a frozen feed wheel, turn the lever up slowly counterclockwise. Once the wheel is free, turn it back to the factory preset.

## 9.0 TECHNICAL DATA

<b>Air Supply Requirements</b>	100-250 PSI @ 185 scfm (5.2 m <sup>3</sup> /min) <i>Must be clean, dry air. Air dryer or aftercooler recommended.</i>
<b>Air Supply Hose Requirements</b>	1" (25.4 mm) I.D. for most applications (hose included) <i>For working radius of 200 ft or more, a 1.5" ID hose is required</i>
<b>Air Motor Max Torque</b>	33 FT LBS @ 85 RPM
<b>Dimensions</b>	32" (813 mm) L x 20" (508 mm) W x 36.5" (0.9 m) H
<b>Weight</b>	40: 152 LB (69 KG)   40 PRO: 162 LB (73.5 KG)
<b>Hopper Size</b>	40 LB (13.6 KG)
<b>Pellet Feed Rate</b>	0 - 4 lbs/min (0 - 1.8 KG/min)
<b>Dry Ice Consumption</b>	0 - 240 lbs/hr (0-109 kg/hr)
<b>Operating Range</b>	40: 60-125 psi @ 85-375 CFM (2.4-10.6 m3) 40 PRO: 60-250 psi @ 85-375 CFM (2.4-10.6 m3)
<b>Blasting Pressure</b>	40: 60 - 125 psi (3.4-8.6 bar) 40 PRO: 60 - 250 psi (3.4-17.2 bar)
<b>Noise Level</b>	60-120 dB(A) <i>Noise level varies depending on blasting pressure, nozzle and material surface.</i>

## 10.0 TRAINING CHECKLIST

The following is a list of operational procedures that should be included in dry ice blasting training sessions:

### 1. Equipment Identification and purpose of use

- ☐ Review ID tag on machine
- ☐ Properties of dry ice blasting (gas flushing, non-abrasive)
- ☐ Only properly trained individuals should operate the machine.
- ☐ Pregnant women should not operate the equipment or be in the noise area.

### 2. Discuss Hazards

- ☐ Dry ice (asphyxiation, burn hazard, lifting blocks, transferring pellets)
- ☐ Blast hazard (aim the gun safely, plastic barrier curtains)
- ☐ Pinch Points
- ☐ Static and proper grounding, do not use if you wear a pacemaker
- ☐ Electrical connection
- ☐ Stored compressed air, placement of air hose, use of whip checks
- ☐ Confined space work (refer to OSHA requirements)

### 3. Attire

- ☐ Long sleeve shirts, long pants, Tivek suits
- ☐ Gloves
- ☐ Safety shoes
- ☐ Eye protection (safety glasses, side shields, goggles, face shields)
- ☐ Ear protection (both plugs and muffs are recommended)

### 4. Air Supply

- ☐ Pressure and SCFM, minimum and maximum
- ☐ Separators, dryers, aftercoolers (need for clean/dry air)

### 5. Guns & Nozzles

- ☐ Review all Components
- ☐ Install / remove nozzles, inserts, extensions
- ☐ Explain function of different nozzles

### 6. Operation

- ☐ Air and blast hose connections, blow down inlet air
- ☐ Explain control panel, start up and shut down procedures
- ☐ Explain machine components (hopper, vibrator, motor, airlock system)

### 7. Maintenance

- ☐ Review Owners Manual
- ☐ Cleaning (exterior, guns, nozzles, hoses, hopper)
- ☐ Hoses and fittings (inspect for wearing or cracking)



# Operation Manual

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## 10.0 TRAINING CHECKLIST *(continued)*

### 8. Blast Technique

- ☐ Trigger safety and blasting gun operation
- ☐ Proper, balanced way to hold the gun and position the blast hose
- ☐ Do not “kink” any hose at any time
- ☐ Plastic barriers for removing oil, grease, ink etc.
- ☐ Powdery materials (may require vacuuming before blasting)

### 9. Hands on Blasting

- ☐ All trainees will run the machine and practice blasting

### 10. Answer Questions

### 11. Names of Trainees

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Training was provided for Model \_\_\_\_\_

Training was provided by \_\_\_\_\_

Accepted By \_\_\_\_\_ Date \_\_\_\_\_

Company \_\_\_\_\_

## MACHINE ACCESSORIES & BLASTING NOZZLES



**IB1MC03** Storage Cover  
(included with new machine)



**CA-500** Command Air® 500  
Portable Aftercooler/Air Dryer



**IB10GH1025-AP** (40 Model)  
**IB10GH1025-PRO** (40 PRO)  
Replacement Blasting Hose  
25 ft (7.6m), 50-250 PSI



**IB10IC01**  
Ice Scoop



**BG19BEXT**  
Adapter Connector



**IB15GA01**  
40 PRO Blast Gun

**IB15GA01-1**  
40 Blast Gun  
(excludes LED Light)



**IBN003** 12" x 1" Fan Nozzle



**IBN003HFL** 12" x 1" High Flow Fan Nozzle



**IBN009**  
12" Long x 3" Wide Fan Nozzle



**IBNMCBB**  
Multi-choke Blast Barrel



**IB10G40** 24" Aggressive Nozzle



**IBFN007** Pellet Fragmenter



**IB10G134** 5" Long Medium Flow Round Nozzle



**IBN090** 90° Special Nozzle



**IBN045**  
45° Special Nozzle



**IB19GL01**  
LED Light  
Replacement



Straight Nozzle Extension  
(3 custom lengths)



**IB10EXHA01**  
Extension Handle



Angled Nozzle Extension  
(Custom lengths available upon request)

*Additional nozzles and accessories may be available for your application.  
Please contact customer service at 517-990-0665 for more information.*

**SAVE THESE INSTRUCTIONS**



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