

HOLLO-BLAST JR.
INTERNAL-PIPE BLAST TOOL
O. M. 06159

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 **WARNING**

Do not use this equipment before READING this MANUAL and UNDERSTANDING its contents.

These WARNINGS are included for the health and safety of the operator and those in the immediate vicinity. Failure to read and understand these warnings can result in injury or death.

Electronic files include a preface containing the same important information as in the orange cover.

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1.0 INTRODUCTION

1.1 Scope of manual

1.1.1 These instructions cover setup, operation, maintenance, troubleshooting, and replacement parts for Clemco's Hollo-Blast Jr. (HBJR) internal-pipe cleaning tool.

1.1.2 These instructions contain important information required to safely operate the Hollo-Blast Jr. tool. The tool requires a blast machine and accessories to deliver the air-abrasive mixture (blast stream) to the tool. Before using the Hollo-Blast Jr., all personnel associated with the operation must read this entire manual, including the orange cover, and have knowledge of how to safely operate the blast machine and all accessories.

1.1.3 All personnel involved with the abrasive blasting process must be made aware of the hazards associated with abrasive blasting. The Clemco booklet "Abrasive Blasting Safety Practices" (Stock No. 22090), which also is available in Spanish (Stock No. 22931), contains important safety information about abrasive blasting that may not be included in equipment operations manuals. To request additional copies, email info@clemcoindustries.com.

1.2 Safety Alerts

1.2.1 Clemco uses safety alert signal words, based on ANSI Z535.4-2011, to alert the user of a potentially hazardous situation that may be encountered while operating this equipment. ANSI's definitions of the signal words are as follows:



This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

NOTICE

Notice indicates information that is considered important, but not hazard-related, if not avoided, could result in property damage.

CAUTION

Caution indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

WARNING

Warning indicates a hazardous situation that, if not avoided, could result in death or serious injury.

DANGER

Danger indicates a hazardous situation that, if not avoided, will result in death or serious injury.

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1.4 Components – Figure 1

1.4.1 Components of the Hollo-Blast Jr. are shown in Figure 1 and include:

1. Hollo-Blast Jr. Pipe Tool
2. Reducer with Nozzle Washer:
Threads into a 1-1/4" nozzle holder and has 3/8" FNPT threads to accommodate a pipe lance.
3. 3/8" NPT Example Lance: This is an example of the user-provided pipe lance. The actual lance is provided by the user, and it should be the same length as the pipe being blasted.
4. 1-Set of Centering Collars: Consists of four pairs of collars.
5. 5/64" Hex Key Wrench: Tightens centering-collar setscrews onto the Hollo-Blast Jr. pipe tool.

The Hollo-Blast Jr. tool is made from the finest materials available. However, some of its internal wear parts are of necessity small and somewhat brittle due

to their extreme hardness. The tool should therefore be handled carefully to avoid dropping it, or bumping it against pipe or other objects.

1.5 Theory of Operation – Figure 2

1.5.1 The Hollo-Blast Jr. is designed to blast clean the inside of pipe and tubing ranging in size from 3/4" inside diameter (ID) to 2" ID. The tool connects to an abrasive blast hose in place of a standard nozzle. The blast hose and nozzle holder are too large to fit inside the small diameter pipe for which the tool is designed. The reducer adapts a 3/8" NPT pipe lance, which attaches to the entry end of the Hollo-Blast Jr. tool.

1.5.2 When correctly connected to a blast hose and blast machine and when the blast machine is pressurized, the blast stream flows through the blast hose and nozzle holder and into the reducer, which replaces the standard nozzle. The outlet end of the reducer is threaded with 3/8" female threads, which accommodate a user provided 3/8" NPT pipe lance.

1.5.3 The lance carries the blast stream into and through the tool and deflects off the deflection tip at the exit end of the tool. The tip spreads the blast stream into a wide, 360° circular blast pattern, which blast cleans the inside of the pipe without having to rotate it.

1.5.4 Centering collars, available in various sizes, center the tool in the pipe during passes.

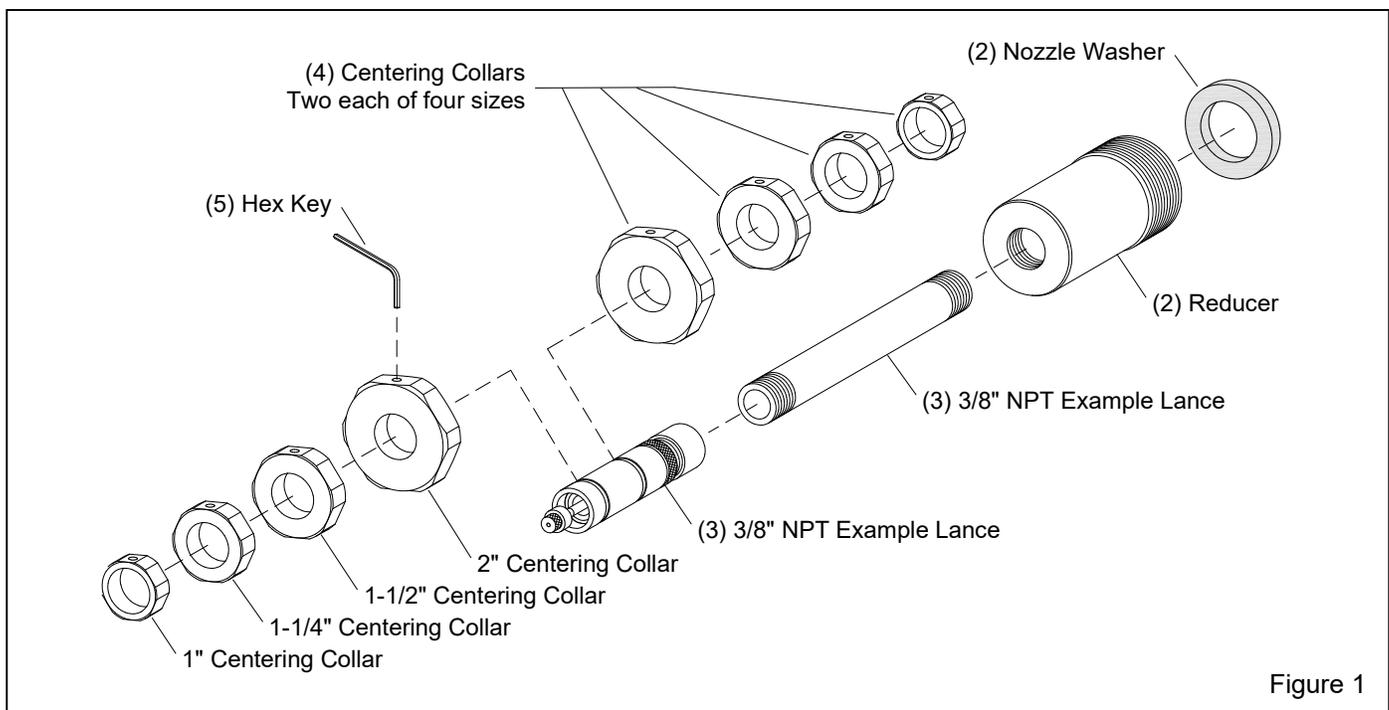


Figure 1

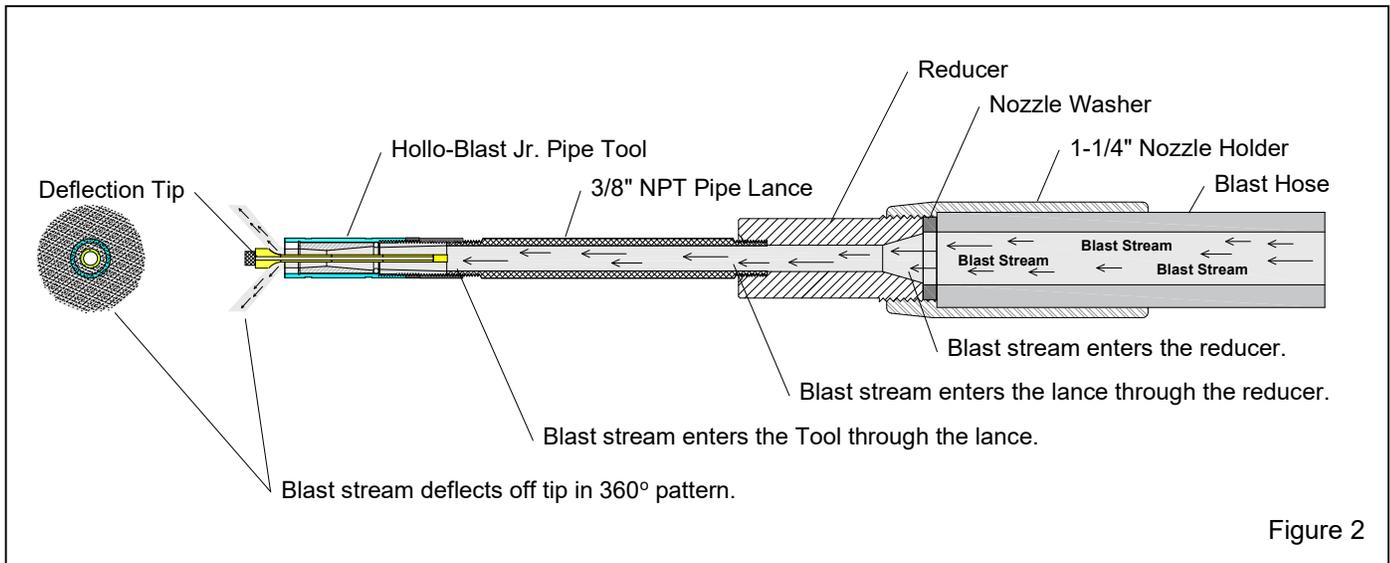


Figure 2

2.0 ANCILLARY EQUIPMENT REQUIREMENTS

2.1 Blast Machine and Accessories

2.1.1 The blast machine should have a minimum external piping size of 1" ID, a blast hose assembly with a minimum of 1" ID, and a standard 1-1/4" nozzle holder. The blast hose should be long enough to feed the lance from the pipe's entrance to the far end.

2.1.2 The reducer attaches to the nozzle holder in place of a standard nozzle.

2.2 Personal Protective Equipment

⚠ WARNING

Before blasting, test the coating and substrate for toxic materials, such as lead or other heavy metals, or asbestos. These hazards require special measures to protect the operators and the environment.

Obtain a safety data sheet (SDS) for the blast abrasive to identify hazardous substances. Silica sand (crystalline) can cause silicosis, lung cancer, and breathing problems in exposed workers. Slag abrasives may contain trace amounts of toxic metals such as arsenic, beryllium, and cadmium. Any abrasive dust has potential to cause lung disease.

Abrasive blasting operations can create high levels of dust and noise. No dust is safe to breathe. Abrasive blasting can produce

harmful dust. Failure to wear NIOSH-approved respirators can result in serious lung disease or death. The respirators must be properly fitted and maintained, and be NIOSH-approved, Type-CE supplied-air respirators approved for abrasive blasting.

During abrasive blasting, abrasive particles and dust in the area around the blast machine and blast nozzle become airborne. Everyone working near abrasive blasting must wear properly maintained, NIOSH-approved respiratory protection and eye protection appropriate for the job site hazards.

Loud noise generated by the use of compressed air can cause hearing damage. Everyone in the blasting area must wear approved hearing protection.

It is the employer's responsibility to train employees to identify hazardous substances and to provide suitable policies, procedures, monitoring, recordkeeping, and personal protective equipment.

2.2.1 Operators and anyone else who may be exposed to the hazards generated by the blasting process must wear appropriate protective gear, including abrasive-resistant clothing, leather gloves, eye and hearing protection, and a NIOSH-approved Type-CE supplied-air respirator.

2.2.2 Don protective blasting attire outside the blast area in a clean nonhazardous environment, free of contaminants, where the air is safe to breathe.

2.2.3 When finished blasting and after cleanup is completed, remove the respirator and protective clothing outside the respirator-use area in a clean environment where the air is safe to breathe.

2.3 Pipe Lance – Provided by the user.

2.3.1 A lance is one or more length of standard 3/8" NPT schedule-40 pipe that fits between the reducer and Hollo-Blast Jr. totaling the same length as the pipe being blasted. Use multiple lengths of pipe coupled together with standard pipe couplings to obtain the required length.

2.3.2 The rigid pipe lance provides a means to feed the tool through the pipe.

2.4 Compressed Air Requirements

2.4.1 The compressor and air supply must be sized to supply at least 80 cfm and maintain minimum pressure of 100 psi.

2.5 Abrasive

⚠ WARNING

Abrasives and dust from blasting may contain toxic materials (e.g., lead paint, silica) that are hazardous to workers. Before blasting, obtain a safety data sheet (SDS) for the blast abrasive and identify all substances removed by the blasting process.

- **Silica sand (crystalline) can cause silicosis, lung cancer, and breathing problems in exposed workers.**
- **Slags can contain trace amounts of toxic metals such as arsenic, beryllium, and cadmium and have the potential to cause lung disease.**

NO DUST IS SAFE TO BREATHE. DUST PRODUCED FROM ANY ABRASIVE OR FROM THE BLASTING PROCESS CAN CAUSE SERIOUS LUNG DISEASE AND DEATH WHEN INHALED. It is the employer's responsibility to train employees to identify hazardous substances and to provide suitable policies, procedures, monitoring, recordkeeping, and personal protective equipment.

NOTE: Use only abrasives specifically manufactured for abrasive blasting that are compatible with the surface being blasted. Abrasives produced for other applications may be inconsistent in size and shape and produce an unsatisfactory finish, contain particles that could jam the abrasive metering valve, or cause irregular wear.

2.5.1 Selection of blasting abrasive can play a significant part in worker health risk, job productivity, and maintenance of the pipe tool. **DO NOT USE** abrasives containing more than 1% crystalline (free) silica. Obtain safety data sheets (SDS) for the blasting abrasive prior to blasting, paying particular attention to worker health risks and the presence of any hazardous or toxic substances.

2.5.2 Abrasive Mesh Size

2.5.2.1 The choice of abrasive mesh size depends on the desired profile, cleaning rate, and availability of clean, dry air. Generally, larger, denser abrasives provide a deeper profile, while smaller abrasives clean faster. Finer abrasives are especially sensitive to moisture and require very dry air to prevent bridging in the metering valve. The abrasive must be well screened and dry. This is more important with the Hollo-Blast Jr. than with most blasting operations because of the small gaps within the tool. Use 40-mesh or finer.

2.5.3 Sand: Sand should never be used because of the respiratory hazards associated with abrasives containing free silica.

2.5.4 Slag: Slag abrasives are compatible with the tool. Obtain a safety data sheet (SDS) to identify hazardous substances.

2.5.5 Steel: Steel grit and steel are generally too dense to use with the Hollo-Blast Jr. Impact of heavy steel abrasive can chip the carbide stem support fins and deflection tip.

2.5.6 Silicon carbide, aluminum oxide, and garnet: Aggressive abrasives such as these should be avoided. These abrasives cause extremely rapid wear on the small carbide parts within the tool.

2.5.7 Glass bead and crushed glass: Most beads are treated to ensure free-flow operation even under moderately high humidity. Glass beads subjected to excessive moisture may be reused after thorough drying and breaking up of any clumps. Clean, dry air is a necessity. Glass media applications may require the use of a pneumatically operated metering valve, such

as the Sentinel or AQV Auto-Quantum, which can help to prevent surging at startup.

2.5.8 Lightweight media: Plastic media and most agricultural media give poor results because too much energy is lost when the media deflects off the tip.

3.0 INITIAL SETUP

3.1 Ancillary Equipment

3.1.1 The Hollo-Blast Jr. tool requires the same equipment as any other abrasive blast cleaning operation, i.e. an air compressor and an abrasive blast machine. The compressor must be able to supply 80 cfm, at a pressure of 100 psi at the nozzle. Set up all ancillary equipment as noted in their operations manual.

3.1.2 Blasting is most easily controlled when the remote control handle is attached to the end of the blast hose where the reducer and lance are attached.

3.2 Pipe Lance – Provided by the user.

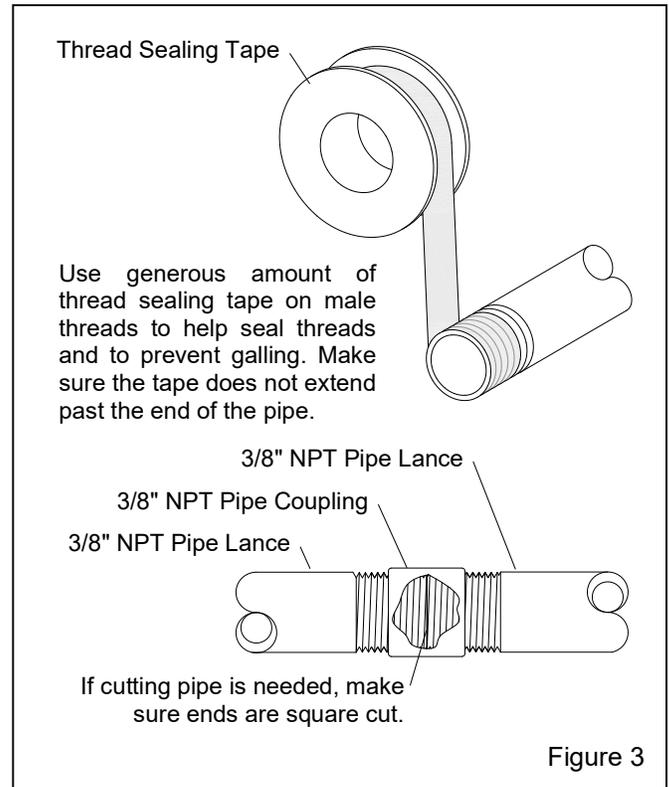
3.2.1 A lance is one or more length of standard 3/8" NPT schedule-40 pipe, connected end-to-end to equal the length of the pipe being blasted. Use 3/8" NPT pipe couplings to join pipe sections.

3.2.2 When connecting a lance to the reducer, coupling, or pipe tool, apply a generous amount of thread sealing tape to the male threads, as shown in Figure 3. It helps seal the connection, prevent abrasive from getting between the threads, and prevent thread galling.

NOTICE

Use pipe-joint compound only joining lance sections and only if the sections will not be taken apart. Do not use pipe-joint compound to seal threads on the reducer or pipe tool. Abrasive sticks to the compound and can cause thread damage when parts are unthreaded.

3.2.3 If it is necessary to cut a pipe lance, make sure the ends are square cut to allow it to butt neatly against another lance or the parts of the tool it touches.



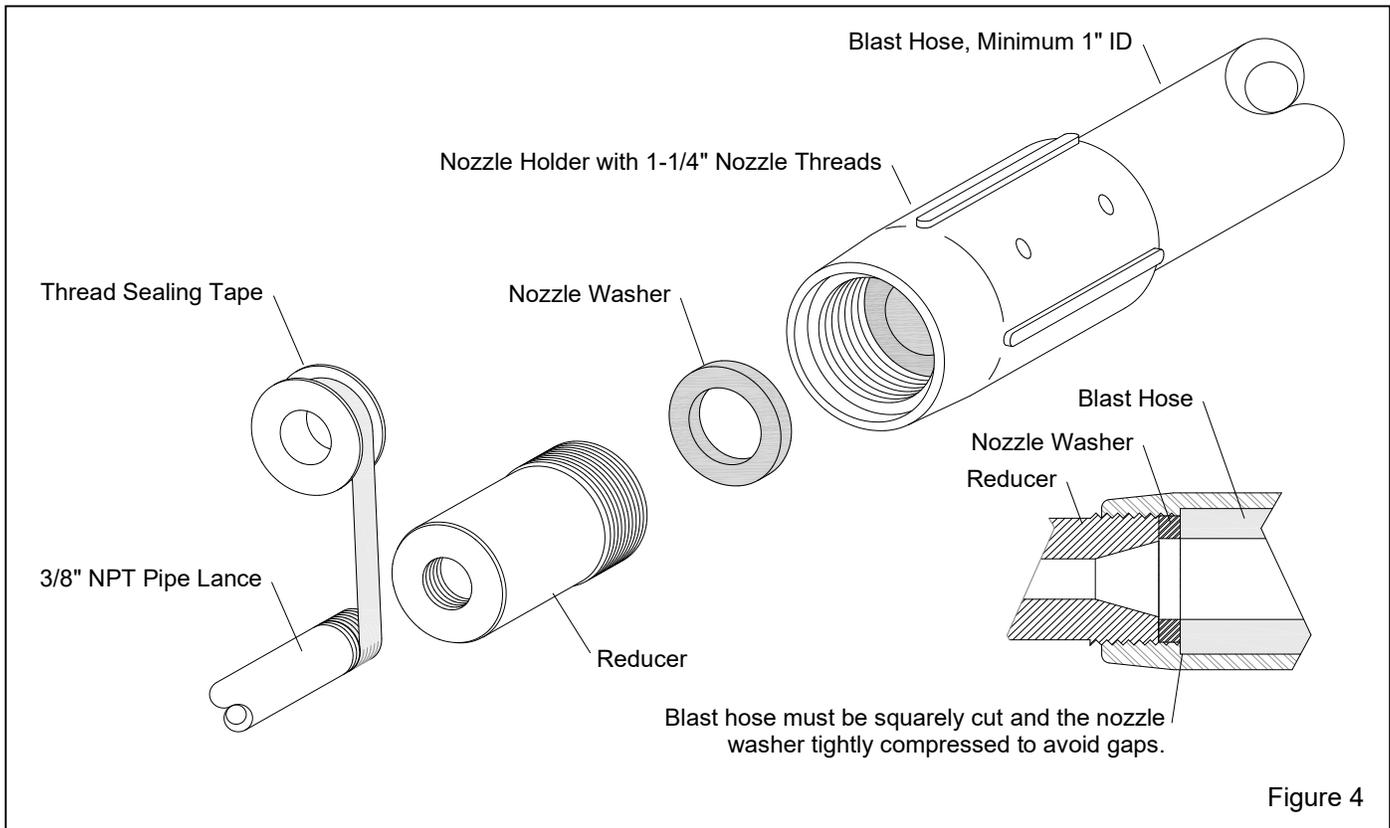
3.3 Reducer

NOTICE

Before threading the reducer into the holder, make sure the blast hose is squarely cut. To eliminate leaks, gaps, and voids that can cause turbulence and wear, the reducer should tightly and evenly compress the nozzle washer between the reducer and blast hose, as shown in the lower right corner of Figure 4.

3.3.1 Insert the nozzle washer into the nozzle holder and then screw the reducer tightly into the holder.

3.3.2 At any convenient time before attaching the Hollo-Blast Jr. tool to the lance, screw the lance into the end of the reducer.



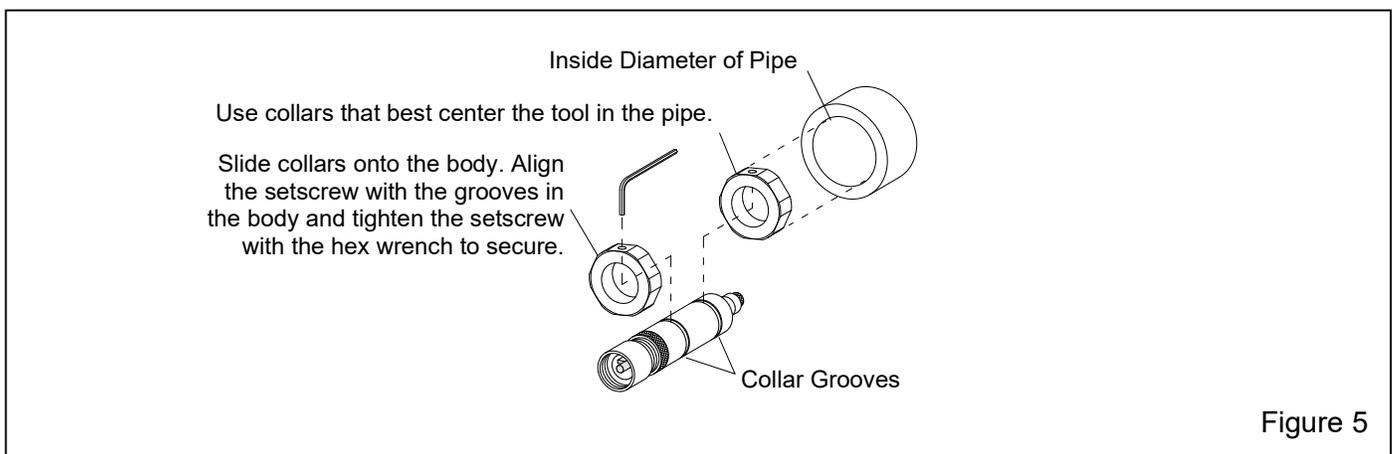
3.4 Centering Collars

3.4.1 The tool without collars centers inside a 3/4" ID pipe.

3.4.2 Select the pair of centering collars the fit best into the pipe being blasted and attach them to the tool body, as shown in Figure 5. Make sure the collar setscrews are placed over the grooves and that the setscrews are tightened securely to prevent the collars from falling off within the pipe.

NOTICE

If the collars fit tight in the pipe and are likely to bind or drag in the pipe, use the next smaller size. Any binding, dragging, or jerking when the tool passes through the pipe will result in uneven blasting.



3.5 Attach Pipe Tool to the Lance

3.5.1 The last item to set up before beginning blasting is to attach the Hollo-Blast Jr. to the end of the pipe lance.

3.5.2 Apply thread sealing tape to the male threads on the lance and screw the tool tightly onto the lance.

3.5.3 Insert the tool into the pipe being careful not to hit the deflection tip against the pipe.

NOTICE

Be very careful when handling the tool and especially when inserting it into the pipe. Do not hit the deflection tip or other parts of the tool against any object. The carbide pieces are brittle due their hardness and can easily break.

3.5.4 Push the tool through the pipe and slowly withdraw it to make sure it does not drag or hang up anywhere in the pipe.

4.0 Operation

WARNING

Hose disconnection while under pressure could cause serious injury or death. Use safety lock pins and safety cables on all coupling connections to help prevent hose couplings from accidental disconnection.

4.1 Set up ancillary equipment: Load abrasive into the blast machine and connect air lines, blast lines, and blast equipment as described in the applicable operation manuals.

4.2 Connect the blast hose and lance.

4.3 Attach centering collars to fit the inside diameter of the pipe. NOTE: The tool without collars centers inside 3/4" ID pipe.

4.4 Being careful not to hit the deflection tip against the pipe, place the tool inside the entrance of the pipe. Push the tool through the pipe until deflection tip exits the opposite end.

4.5 Don personal protective equipment.

4.6 Pressurize the blast machine and begin blasting.

4.7 Adjust Abrasive Flow

4.7.1 While the tool is at the exit end of the pipe, adjust abrasive flow leaner than with open blasting. Too much abrasive seriously hampers the efficiency of the Hollo-Blast Jr., and results in heavier wear on the parts, with lower production. When blasting at 100 psi the tool should use approximately 5 cuft of abrasive per hour of continuous blasting. Adjust abrasive feed if your rates differ significantly from these.

4.8 Pull the tool through pipe at a constant speed to achieve the desired degree of blast cleanliness. Spent abrasive will blow out the far end of the pipe.

4.9 As the tool exits the pipe, turn off the air-abrasive supply from the blast machine. NOTE: Provide a cradle or other means at the exit end of the pipe to support the tool and a shroud to contain the blast stream as the tool exits the pipe.

4.10 Re-blast as Needed: Pipe that requires extensive cleaning may require a second pass. Examine the pipe and repeat the process if necessary.

4.11 If it is necessary to remove the tool for any reason before blasting is completed, mark the lance so the tool can be inserted, and blasting resumed at the same spot.

4.12 Clear abrasive from inside the pipe: If abrasive remains inside the pipe, shut off the abrasive flow so only air comes out of the tool. Push the tool through the pipe to blow out remaining materials.

4.13 Shut down: Follow instructions in applicable operations manuals and shut down the blast machine and accessory equipment.

5.0 MAINTENANCE

5.1 Preventive Maintenance – Figure 6

5.1.1 Carbide parts are extremely hard and therefore brittle; they break or chip easily. Be careful not to bump or drop the tool or any of the internal carbide parts.

5.1.2 When disassembling the tool for inspection, brush abrasive from the threads and clean the parts before reassembly.

5.1.3 Inspect the following before each use.

- Inspect the nozzle-reducer washer. Replace it before the ID wears enough to expose the reducer's nozzle jacket to the abrasive stream.
- Inspect the stem support casing and fins for wear. Replace the stem support before they are worn through.
- Inspect the throat rod for wear. Replace the throat rod when the carbide tip or rod are worn.
- Replace the nozzle O-ring at the first sign of wear.
- Rotate the deflection tip for symmetrical wear.
- Clean all reusable parts; make sure that no abrasive or dirt particles get between them during reassembly. Parts must be fully seated; loose parts create voids causing turbulence and accelerate wear.
- Hand tighten the throat-rod nut snugly at reassembly. Over tightening can damage brittle carbide parts.

Make sure all parts are snugly hand tightened at reassembly.

5.2 Disassemble and Inspection – Figure 6

5.2.1 Remove the tool from the lance.

5.2.2 Remove centering collars from the body.

5.2.3 Hold the carbide end of the throat rod and unscrew the throat-rod nut. Slide the deflection tip and carbide sleeves from the front of the tool.

5.2.4 Remove the throat rod from the back of the tool.

5.2.5 Loosen the knurled lock nut and unscrew the stem support from the backend of the tool, being careful not to drop the nozzle.

5.2.6 Remove the nozzle O-ring and nozzle.

5.2.7 Unscrew the knurled lock nut and coupling from the stem support.

5.2.8 Inspect the following items for wear:

- Inspect the retaining ring, which is still in the body. Replace it if worn thin.
- Inspect the stem support casing look for wear in the threaded area. Check for wear on the carbide fins and stem. Replace the stem support if any part is worn.
- Inspect the throat rod for wear. Replace the throat rod when the carbide tip is worn or damaged, or if the rod shows any wear.
- Inspect all threaded parts. Replace parts with thread damage or parts that do not easily thread into a mating part.
- Replace the carbide sleeves if the sides or edges are worn or no longer parallel.
- Replace the nozzle when the orifice is worn to 0.330", chipped, or otherwise damaged.
- Replace the nozzle O-ring at the first sign of wear or damage.
- Rotate the deflection tip for symmetrical wear. Replace the deflection tip if it is undercut or when 75% of the straight parallel sides are worn away.

5.3 Reassembly – Figure 6

Installation Note: Before reassembly, make sure that worn parts are replaced and that reused parts are clean and reusable.

5.3.1 If the retaining ring was removed, install a new ring into the retaining-ring groove toward the front of the body.

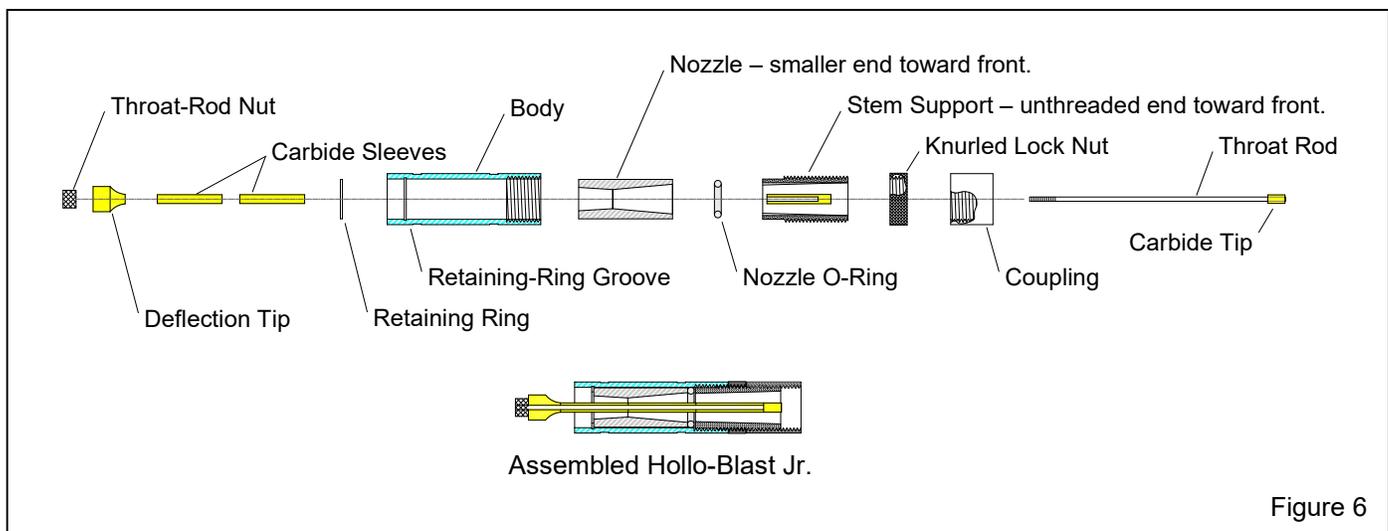


Figure 6

5.3.2 Insert the smaller end of the nozzle into the backend of the body and seat it against the retaining ring.

5.3.3 Place the nozzle O-ring into the body and push it against the back of the nozzle.

5.3.4 Insert the unthreaded end of the stem support into the body and screw it in hand-tight, compressing it against the nozzle O-ring and the nozzle.

5.3.5 While maintaining pressure on the stem support, thread the knurled lock nut onto the stem support and tighten it against the body.

5.3.6 Slide the throat rod through the stem support sleeve.

5.3.7 Hold the throat rod in place at the back of the tool and slide both carbide sleeves onto the front end of the throat rod.

5.3.8 Slide the deflection tip onto the throat rod and firmly hand-tighten the tip-holding nut to secure.

5.3.9 Install the rear coupling, centering collars, and lance.

6.0 REPLACEMENT PARTS

6.1 Hollo-Blast Jr. Tools

Description	Stock No.
Hollo-Blast Jr. with reducer (item 12 in Figure 7) ..	01098
Hollo-Blast Jr. without reducer	01099

6.2 Replacement Parts – Figure 7

Item	Description	Stock No.
1.	*Deflection tip	01100
2.	Body	01101
3.	*Stem support assembly, includes item 5	01102
4.	*Sleeve, carbide stem, each, 2 required	01105
5.	*Throat rod and tip assembly	01162
6.	*Throat rod nut	01108
7.	Retaining ring	01109
8.	Nozzle, 9/32", tungsten carbide	01113
9.	*O-ring, nozzle, 9/16" OD x 1/8"	08977
10.	Knurled lock nut	01111
11.	Coupling, 3/8" diameter	01112
12.	Reducer	01115
13.	*Nozzle washer, NW-4, pack of 10	00869
14.	Hollo-Blast Jr. Centering collar set Includes two of each size collars	01114

* Recommended spares

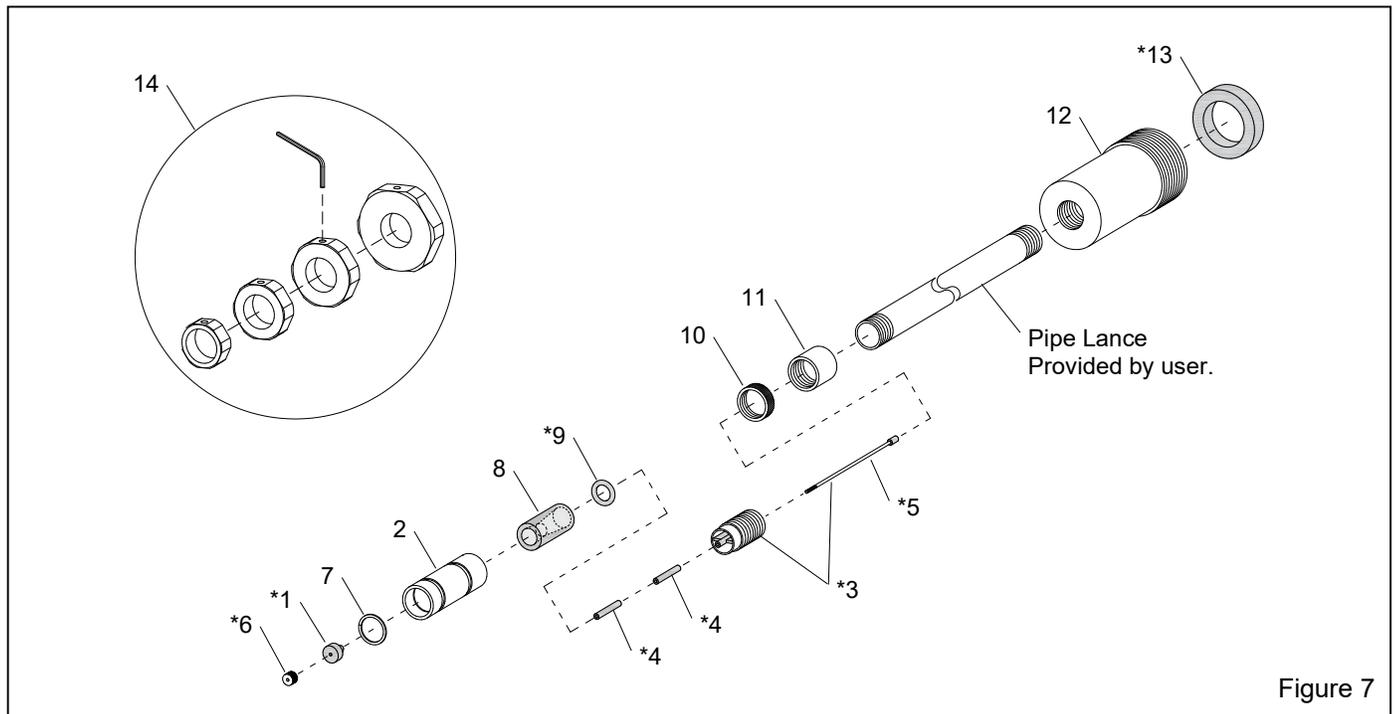


Figure 7