

## AIR-SPADE® ACCESSORIES

For additional items including air hose, protective face shield, air compressors, folding dirt screens, and soil test instruments please see our web site [www.air-spade.com](http://www.air-spade.com)

# AIR-SPADE®

3000 Series



ARBOR



RESCUE



UTILITY

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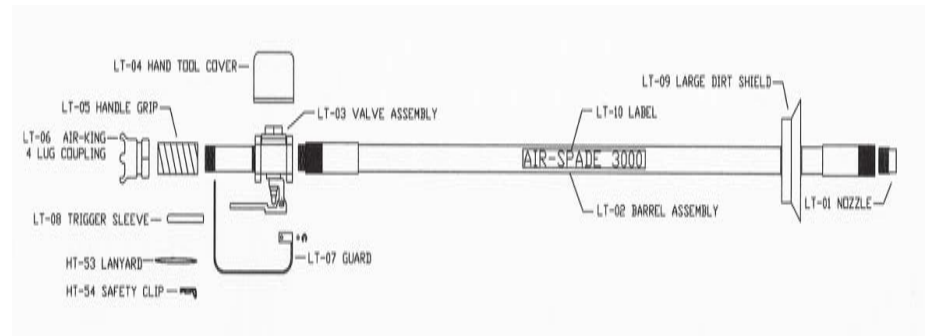
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**STANDARD AIR-SPADE® PARTS LIST**

<u>Item</u>	<u>Part Number</u>
Nozzle 330 scfm @ 90 psig	LT-01
Barrel Assembly	LT-02
Valve Assembly	LT-03
Cover	LT-04
Grip	LT-05
Air-King 4 lug coupling	LT-06
Guard	LT-07
Trigger Sleeve	LT-08
Large Dirt Guard	LT-09
Label	LT-10
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AIR-SPADE® Exploded Parts Diagram



AIR-SPADE® parts and specifications are subject to change or improvement at manufacturer's discretion.

The AIR-SPADE® 3000 is covered by U.S. Patent 5,782,414



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## AIR-SPADE® PARTS, DISASSEMBLY AND RE-ASSEMBLY

### AIR-KING® HOSE FITTING

- Should It be necessary to remove the AIR-KING® hose fitting, remove plastic valve cover and carefully snug valve in a vise. Being careful not to unscrew nipple from valve casting, loosen and remove the AIR-KING® fitting by turning it counter clockwise. **Before reinstalling the hose fitting, wrap the treads with pipe tape to prevent galling of the threads between the pipe nipple and the AIR-KING® hose fitting.**

### NOZZLE

- The nozzle has been designed for removal by using the flats on the nozzle for wrench application. **Before re-installing the nozzle, remove any dirt or foreign material from the threads and apply teflon pipe tape or pipe dope to the threads.**

## SPECIFICATIONS

Model:	Series 3000
Standard nozzle:	330 scfm
Pressure	90 psig
Mach Number	2
Length	6 feet
Weight	15 lbs.

## COMPRESSOR REQUIREMENTS

<u>NOZZLE</u>	<u>COMPRESSOR SIZE</u>
(scfm) 330	(scfm) 375 or larger

## MAINTENANCE

As with any quality tool, the AIR-SPADE® does require good care to ensure it works properly . It is good practice, prior to each use, to inspect the tool for any loose or visibly damaged parts. Dirt or other foreign material around the trigger or valve stem should be removed. A light oil or lubricant (e.g. WD40) may be applied around the exposed valve stem. Tighten or replace worn parts as needed.

## LIMITED WARRANTY

The AIR-SPADE® Series 3000 tool is warranted by Guardair Corporation against defects in material and workmanship for a period of 180 days. The unit will be replaced or repaired at Guardair Corporation's option as a result of such defects. Warranty will commence upon date of shipment of tool by Guardair Corporation.

Guardair Corporation's warranty shall not be effective if the tool has been the subject of misuse, negligence or accident, or if it is configured or used in any manner inconsistent with the directions set forth in this operator's manual. Wear and tear from normal use is not covered under this warranty.

Any and all claims for warranty consideration must be coordinated through Guardair Corporation. Do not return unit or parts without prior authorization. Returned unit or parts must be postage prepaid.

The purchaser's recovery for damages resulting from any and all causes whatsoever, including, but not limited to, breach of contract, breach of warranty, negligence or strict product liability will be limited to the replacement of the components of the tool with respect to which losses or damages are claimed, provided that Guardair Corporation has been notified of any alleged defect within the warranty period.

- For shallow, wide excavations, hold the AIR-SPADE® at an angle between 30° and 45° from the horizontal and point it in the direction that is to be excavated. With the trigger depressed, move the nozzle from side to side for the desired width and blow the loosened soil ahead of the AIR-SPADE®. Continue until the excavation is formed to the required length. Canvas cloth, plywood, or a collapsible barrier (see accessories) can be useful to confine the loosened material to the work area.
- For deeper sheet excavations or trenches, like with larger holes, loosen the soil in lifts of several inches and remove the soil by appropriate means including a shovel, backhoe, or vacuum unit (like the AIR-VAC® or SAFEX®).

## SHUT DOWN

- Shut down the air compressor according to the manufacturer's instructions.
- Close the air compressor's air supply valve.
- With the AIR-SPADE® pointed up and away from all personnel or loose objects, depress and hold in the AIR-SPADE® trigger until all compressed air from the tool and hose is fully expelled.
- Disconnect the air hoses and store the AIR-SPADE® as desired.

**Note, when excavating always observe proper safety instructions as listed in this manual and other procedures specific to the application.**

- Except in very hard and compacted clays, dwelling on the same spot tends to reduce the rate at which material is excavated and can increase the amount of material blown away from the excavation site.
- Watering the work area ahead of time can be helpful. Watering reduces airborne dust if the soil is extremely dry. It also reduces the soil strength making digging easier.
- For small diameter holes, place the nozzle close to the soil, depress the trigger, and thrust the tool into the soil slowly. When resistance is met, draw the AIR-SPADE® slowly out of hole and reinsert. This will usually allow the loose soil to exit the hole and the tool can then be inserted down to the depth of the barrel.
- For large diameter holes, move the tool back and forth across the footprint of the excavation to loosen the soil to a depth of several inches. Each lift of disturbed soil should then be removed by suitable means such as a shovel or a vacuum. This procedure should continue until the desired depth of hole is reached.
- Note when plunging the tool into loose soil or when boring a narrow hole in the soil, the tendency to expose the operator to material blown back directly out of the hole is increased. The dirt shield should be positioned close to the ground surface to best confine any excavated material from the hole.

**IN NO EVENT SHALL GUARDAIR CORPORATION BE LIABLE TO THE PURCHASER OR ANY USER OF THE AIR-SPADE®, OR TO ANY OTHER PERSON OR ENTITY, FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING THE COST OF PROVIDING SUBSTITUTE EQUIPMENT DURING PERIODS OF MALFUNCTION OR NON-USE AND DAMAGES FOR DELAY. THE WARRANTIES AND REMEDIES SET FORTH ABOVE ARE THE SOLE AND EXCLUSIVE WARRANTIES AND REMEDIES AVAILABLE. GUARDAIR CORPORATION SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY.**

## **SAFETY INSTRUCTIONS**

**DO NOT operate the AIR-SPADE® until operating and safety instructions are fully read and understood.**

**DO NOT use the AIR-SPADE® as a pry bar.**

**DO NOT make any modifications to the AIR-SPADE®.**

**DO NOT point or aim the AIR-SPADE® at any person during operation.**

**DO NOT tie, tape or otherwise lock or fasten the trigger into an open operating position.**

**DO NOT expose bare skin to the supersonic air stream exiting the nozzle.**

**ALWAYS wear appropriate protective work clothing and equipment. Cut and puncture resistant gloves, approved safety eye glasses with side shields and / or face protection, and approved hearing protective earplugs or earmuffs are recommended while operating the AIR-SPADE®. Eye protection should comply with ANSI Z87.1 -1989. Ear protection should provide a NRR of at least 20 dB. In extremely dusty conditions, always wear approved respiratory protection. Wear approved electrically insulated footwear and gloves if working near underground electrical lines.**

## **STARTING**

- Start the compressor according to the manufacturer's instructions which may vary from unit to unit.
- Check that the compressor is operating correctly and that the dead head pressure is sufficient for proper tool operation.
- Make sure that the AIR-SPADE® trigger is not depressed, i.e. that the valve is closed, and that the nozzle is pointed away from all personnel or any loose object that could be moved accidentally by the air stream. Open the compressor's air supply valve.
- Securely holding and pointing the AIR-SPADE® away from all personnel and any loose objects, depress the AIR-SPADE®'s trigger, opening its valve, and read the compressor discharge compressor pressure gauge. The pressure at the compressor should be between 100 and 120 psig to allow for pressure loss. If it is not, the output pressure of the compressor and / or the size of the hose may need to be changed.

## **NORMAL EXCAVATION**

- For normal excavation, the best performance is achieved by holding the nozzle roughly perpendicular to the ground about 1 inch away from the surface.
- Depending on the soil type, the AIR-SPADE® is best moved along the surface to be excavated at a rate on the order of one to two feet per second.
- A portable barrier or fence is useful as a backdrop to keep dislodged soil confined to the working area. (See accessories)

## OPERATING INSTRUCTIONS

IT IS THE RESPONSIBILITY OF THE USER TO READ AND UNDERSTAND THESE INSTRUCTIONS PRIOR TO OPERATION. FAILURE TO ADHERE TO THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY. THE OPERATOR SHOULD HAVE A THOROUGH WORKING KNOWLEDGE ON HOW TO PROPERLY USE THE AIR COMPRESSOR TO WHICH THE TOOL IS ATTACHED.

### BEFORE OPERATION

- Check the compressor for sufficient fuel and oil levels.
- If a portable compressor is used, make sure it is secure from accidental motion.
- Make sure the compressed air supply valve on the compressor is closed, i.e. no air flowing.
- Make sure that all hose connections are securely made and all safety clips are installed. The Series 3000 tool comes equipped with an Air-King 4 lug quick –acting coupling rated at 150 psig.
- Use hose for compressed air service rated 150 psi minimum working pressure.
- Use of 1 1/4" minimum inside diameter air hose is recommended (see table below).

Hose I.D. Size	Pressure loss (psi) for 100' hose
1"	20
1 1/4"	8
1 1/2"	3

**ALWAYS** check that the compressor is delivering the specified pressure to operate the AIR-SPADE® .

**ALWAYS** ensure that all personnel near the area being excavated are aware that AIR-SPADE® is being used and that they wear appropriate personal protection as indicated.

**ALWAYS** protect any surface that could be chipped or damaged by a dislodged soil or rock particle adjacent to the excavation work area by suitable drop cloths, screens, or other means.

**ALWAYS** connect air hoses in full compliance with federal, state, and local codes. Inspect hoses for leakage, kinking, abrasion, corrosion or any other signs of wear or damage. Worn or damaged hose assemblies should be replaced immediately. Safety devices should be used in accordance with manufacturer's recommendations.

**ALWAYS** inspect the AIR-SPADE® tool for loose or damaged parts prior to use. Tighten, repair, and / or replace as necessary before use.

**ALWAYS** adhere to all the safety instructions for the compressor as set forth in its manufacturer's manual.

## GENERAL INFORMATION

The AIR-SPADE® Series 3000 is a hand held tool that produces a "laser-like" jet of air moving at approximately 1,200 mph, i.e. twice the speed of sound. The Series 3000 nozzle is designed to utilize 330 standard cubic feet per minute (scfm) of compressed air at 90 pounds per square inch gauge (psig) . The AIR-SPADE® tool consists of a manually operated, spring return, on / off valve, a rigid barrel, and a supersonic nozzle. It is to be connected to a standard industrial air compressor capable of producing the above stated flow at the above stated pressure.

### CAUTION:

**The AIR-SPADE® Series 3000 is a very powerful air excavation tool. When operating, the air jet exerts approximately 23 pounds of reaction force back along the axis of the tool. The operator should be sure to hold the tool firmly with solid footing and proper balance.**

**The tool is capable of excavating about 2 1/2 cubic feet per minute of OSHA Type A, stiff, soils to 4 cubic feet per minute of OSHA Type C loose, soils.**

The AIR-SPADE®'s supersonic jet of air effectively penetrates and dislodges most types of soil, but is harmless to non-porous items like buried pipes or cables. Unlike the hard cutting edges of shovels, picks, digging bars, blades or buckets, only the high speed air of the jet contacts the soil. Excavating with an AIR-SPADE® is much easier and many times faster than hand excavation. The AIR-SPADE® can excavate rocky types of soils where a shovel cannot be used. Guardair's AIR-SPADE® is made in different sizes tailored for the job. The AIR-SPADE® is ideally suited

An AIR-SPADE® supersonic air jet is vastly different than pressured air exiting from a pipe nipple or a square edged orifice. These flows expand suddenly to atmosphere in a unfocused, complicated manner. The AIR-SPADE® supersonic jet has more kinetic energy and more focused momentum than these other air streams. In practical terms the AIR-SPADE® supersonic jet can do more work, dislodge harder materials, and move more material than these jets.

Patented supersonic nozzle turns 90 psig compressed air into laser-like Mach 2 jet. Jet penetrates and fractures friable materials like soil, but harmlessly goes around buried pipes, cables, fiber optic lines, or even tree roots.

