

# *New Uses for Vacuum Excavation Equipment*



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# *Topics*



Supersonic Air Jets

Humanitarian Demining

Unexploded Ordnance Remediation

Off road applications

Special Systems

Arborculture

# *Systems*



AIR-SPADE® System Model 30/150

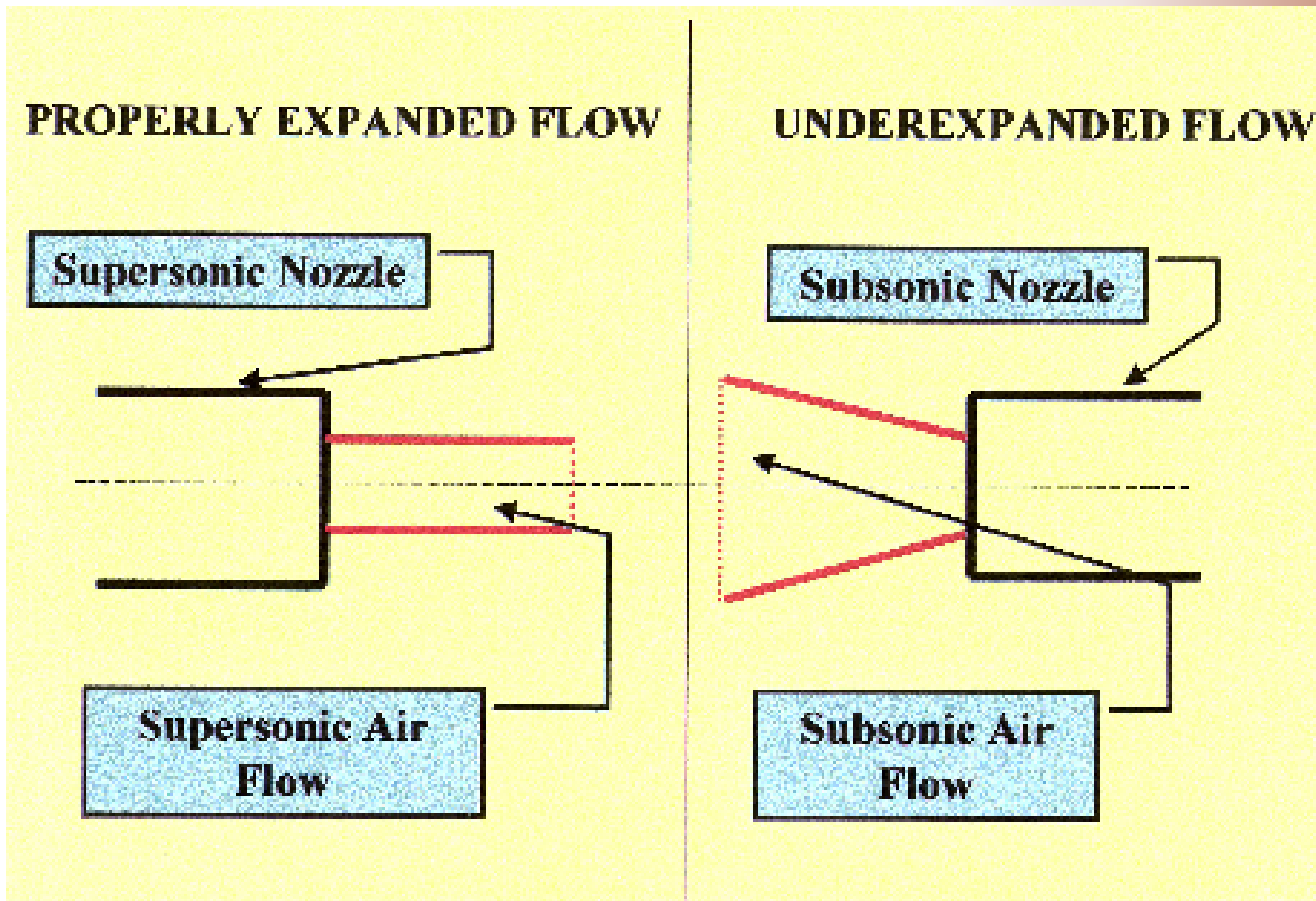
SAFEX® Jr. Model 60/150/300

AIR-SPADE® Model 90/150 Tool

Remote UXO Excavator

Soft Trencher

# *Supersonic vs. other air jets*



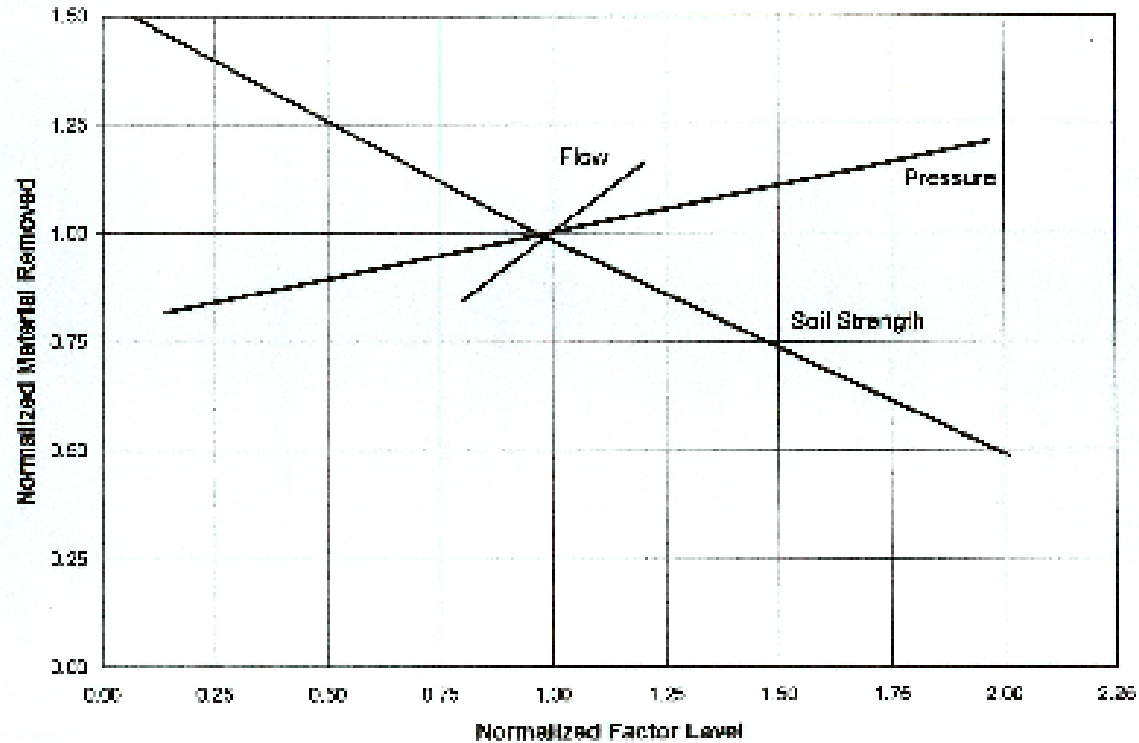
# *Supersonic Nozzle Standard Sizes*



Flow ( scfm )	Pressure ( psig )	Mach No.
30	39	1.5
25	90	2
60	90	2
60	135	2.2
150	90	2

# Excavation Rate Tests

Soil Excavation Rates



# *AIR-SPADE® System*

## *Model CGP 30/150*



# *AIR-SPADE<sup>®</sup> System Specifications*



13 bhp air cooled 4 cycle gasoline engine

30 scfm, 150 psig air compressor

36" long by 32" wide by 34" high

300 lbs weight

Air and oil pressure gauges

ASME air tank w/ relief valve

High / low pressure modes

# *AIR-SPADE<sup>®</sup> Mach 1.5*

## *Features / Benefits*



40% less horsepower to compress air

Lower operating, i.e., fuel, costs

25% higher volumetric efficiency

Lower capital costs and easier handling

35% cooler discharge air temperature

No hearing protection required < 90 dBA

# *AIR-SPADE® System*

## *Uses*



Humanitarian Demining  
Highway joint cleaning  
Light duty digging

# *Anti-personnel Land Mine*

## *Ft. A.P. Hill*



# *Anti-tank land Mine*

## *Ft. A.P. Hill*



# Demining Angola



# *Demining* *Kandahar, Afghanistan*



# *SAFEX<sup>®</sup> Jr.*

## *Model SGSV 60/150/300*



# *SAFEX Jr.® Specifications*



24 hp air cooled gasoline engine

60 scfm 150 psig rotary screw air compressor

300 cfm 6 in Hg pd vacuum pump

Polyester cartridge type secondary filter

44 in wide x 48 in long x 52 in high

940 lbs

# *John Deere Gator 6x4 Specifications*



18 bhp 38 cu in water cooled engine

6 psi ground pressure

2000 lbs weight

127 in long x 60 in wide x 76 in high

25 ft turning circle

Two person capacity

Transports on 2 wheeled trailer

# *Standard Equipment*



AIR-SPADE<sup>®</sup> handtool 60 scfm 135 psig nozzle

25 ft of 3 in dia vacuum hose

25 ft of  $\frac{3}{4}$  in dia air hose

Vacuum hose rack

Tool racks

# *SAFEX<sup>®</sup> Jr.*

## *Optional Equipment*



Secondary filter blowback system

2 gpm 2000 psig water system

45° adapter

Air and water hose reels

60 / 70 scfm paving breaker

30 scfm backfill tamper

Tool box

# *AP & AT Land mines*

## *Ft. A.P. Hill*



# *Unexploded Ordnance Jefferson Proving Ground*



# *SAFEX<sup>®</sup> Jr.*

## *Industrial Version*

- Fits into standard pickup truck bed
- Primary Separator located at tail gate
- Lots of room for tools & hoses



Super Duty F-250 XL Regular Cab 4x2 in Silver Clearcoat Metallic

# *SAFEX<sup>®</sup> Jr.*

## *Industrial Uses*

- Site remediation
- Pot holing
- Line location
- Line repair



# *Air-Spade® Model 50/90 Hand Tool*

- Designed to match output from portable air compressors
- General utility use



# *Model 150/90 Hand Tool Specifications*



Pressure	90 psig
Rated Flow	150 scfm
Length	64 inches
Weight	6.5 lbs
Barrel	Fiberglass
Nozzle	Stainless Steel

# *Hand Tool Options*



Smaller flow nozzles for more delicate jobs

Larger flow nozzles

Higher pressure nozzles

Custom length barrels

45° adapter

Light weight hose

Positive lock couplings

Travel case

# *Model 150/90 Hand Tool Uses*



- Utility locating, potholing, keyholing
- General excavation and trenching
- Pipe and cable repairs
- Joint, crack, and hopper cleaning
- Arboriculture
- Archeology

# *Uncovering Tree Roots*



# *UXO Remote Excavator Tyndall Air Force Base*



# *UXO Remote Excavator Specifications*



115 bhp diesel engine

175 scfm, 150 psig air compressor

1,000 cfm, 8 in Hg vacuum pump

18 in rubber tracks < 2 psi ground pressure

4 in diameter, fiber glass epoxy boom

7 ft digging depth below excavator boom

4800 lbs

115 in long by 60 in wide by 80 in high

2 cu yds / hr nom digging rate

# *Soft Trencher*

## *Electric Power Research Institute*



# *Soft Trencher Specifications*



270 bhp, 426 cid turbocharged diesel engine

600 cfm, 150 psig air compressor

4,300 cfm, 9 in Hg vacuum pump

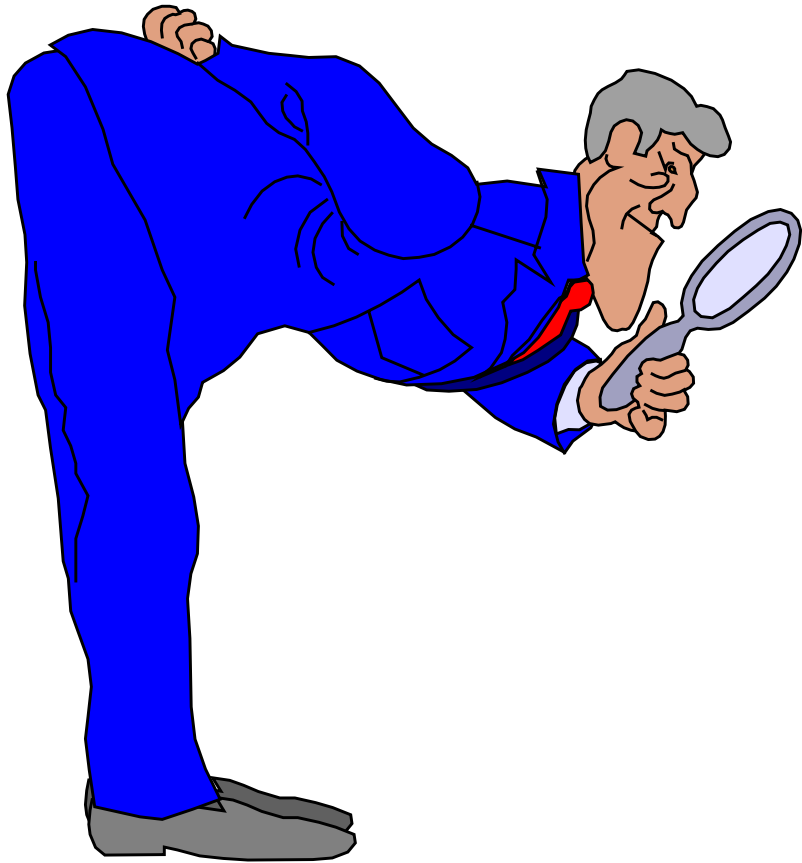
31' long by 8' 6" wide by 11' 5" tall

Weight 34,000 lbs

4 mph travel, 1 ft/min trenching

Digs 8' flat bottom at 11' 4" deep

# *After Detection - Be Safe! With Focused Supersonic Air*



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