

Horizontal EARTH BORING TOOLS

Nothing bores like a Borzall

- Slurry Bits
- Conduit Bits
- Dry Boring Bits
- Compaction Bits
- Backreamers
- Drill Rod
- Duct Pullers
- Water Swivels
- Pulling Swivels
- Thread Adapters
- Safety Accessories
- Alignment Devices
- Auntie C's Thread Lube
- Earth Boring Equipment

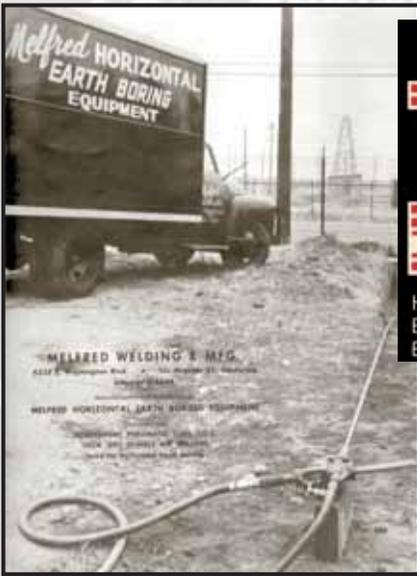
The # 1 Source for Horizontal Earth Boring Tools

**MELFRED
BORZALL**

Phone: 800-558-7500
Outside the U.S. 805-739-0118
Fax: 805-739-0698

NEW!
NEW!
NEW!
NEW!
Dry Boring
Drill Rod and Bits

In the beginning...
In the beginning...



In 1946, Fred Melsheimer developed the first commercial system for horizontally drilling underground utility installations. Built with quality materials and using concepts and technologies from the oilfield, the system was a tremendous success. His new application of drilling technology minimized the disruptions and costs of traditional trenching and open cut methods, and in turn, helped a rapidly growing country install and upgrade its underground infrastructure during the post WWII years.

After more than half of a century of ongoing development and innovation, Melfred Borzall horizontal earth boring tools continue to lead the industry with quality construction, productive designs, and affordable prices. Today, in addition to its line of conventional slurry boring tools, Melfred Borzall produces a wide assortment of underground construction products, including directional drilling tools, locating equipment, pullback devices, mud mixing units, drill tracks, mud motors, and rock drilling tools. Melfred Borzall continues to lead the way to more productive underground construction through innovative drilling tools.



Melfred Borzall horizontal boring tools are built in our modern California manufacturing facilities from top quality materials and are engineered for performance. Designed for dependable, productive, and affordable operation, the famous red Melfred Borzall drilling tools are the standard by which all others are measured.

Take a close look at the design and construction of our earth boring tools. You will see the features that make Melfred Borzall tools productive and reliable. One example of this is our flexible drill rod. The male threads are rolled, rather than cut to improve the material grain structure and fatigue life. The threaded couplings are induction heat treated, to provide hardness and strength in the threads and shouldering faces while maintaining ductility and shock resistance in the weld area. Behind each coupling weld, staggered "stringer" weld beads are made to protect the main weld from abrasive wear and to minimize radial heat affected zones. The tubing used is custom made by an American mill to our exacting specifications, providing a product superior to commercially available grades. This is just one of the many quality designs that go into Melfred Borzall's complete product line. Browse our catalog to learn more about how Melfred Borzall tools can make your underground construction projects more productive, reliable, and profitable!



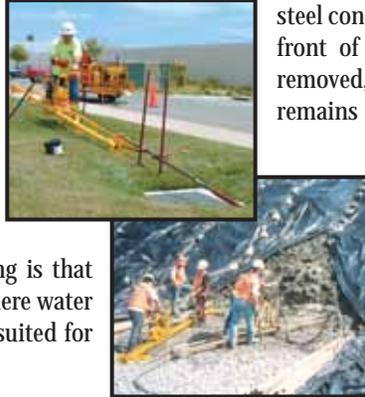
www.melfredborzall.com

TRENCHLESS BORING AT A COST THAT WON'T BURY YOU

Boring Guide

Slurry Boring is a fluid assisted drilling process. It enables diverse soil conditions to be drilled, including sand, clay, hardpan, and loose rock. The drill bit or backreamer mechanically cuts the hole. Drilling fluid pumped at low pressure through the drill string helps stabilize the hole, remove cuttings, and lubricate the hole for the installed product. Often, simply connecting to a house water service will provide sufficient fluid pressure for many slurry boring situations.

Dry (Compaction) Boring is a rotary drilling method that does not use drilling fluid. The soil is compacted into the walls of the borehole, normally by a bit or reamer with a tapered spiral shape. The main advantage of dry boring is that there is no need for fluid, making it very useful in areas where water is not easily accessible. Dry (Compaction) Boring is best suited for softer, compactible soils.



Direct Drilling Conduit is a highly productive method for installing galvanized steel conduit, often used for traffic or street lighting installations. The steel conduit itself is used as the drill rod. A Conduit Adapter is screwed on to the front of the drill track that allows it to rotate steel conduit instead of a drill rod. A special bit is threaded to the front of the conduit. Once the bore is completed, the bit is removed, the conduit is cleaned and you're finished. The conduit remains underground and the wires or cables can be pulled through. Direct drilling conduit can be done with 3/4" up to 4" steel conduit, in sections up to 20 feet.



Ordering Information

Ordering couldn't be easier. Our friendly representatives are always ready to assist you. Order by phone, 800-558-7500 or fax, 805-739-0698. All orders for stock items ship the same day. You can have your order in hand by the very next morning! We accept Visa, Mastercard, and American Express, as well as open accounts on approved credit.

100% Satisfaction Guaranteed

We offer the best money-back guarantee in the industry. If for any reason you're not satisfied with your purchase, we work with you until you are. Otherwise, a full refund is issued on all merchandise returned within 30 days of delivery. We offer this extraordinary guarantee because we go to great lengths to supply our customers with the highest quality products available.



Thread Reference Chart

Melfred Borzall offers end-connections for use with most types of horizontal boring equipment. The listing of end-connections below will help you in selecting the correct bits, reamers, drill rods, and adapters. Use the Thread Reference chart to determine the correct thread on any tool where the end-connection factors into your product selection.

THREAD DESIGNATION	DESCRIPTION
-02	7/8"-9NC thread
-03	1"-8NC thread
-05	13/16" hex
-06	AW thread
-12P	3/4" pipe thread
-16P	1" pipe thread

THREAD DESIGNATION	DESCRIPTION
-24P	1-1/2" pipe thread
-32P	2" pipe thread
-40P	2-1/2" pipe thread
-48P	3" pipe thread
-56P	3-1/2" pipe thread
-64P	4" pipe thread

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 *Hydra Bore is a registered trademark ...
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**MELFRED
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Drill Bits for Boring On-Target



Melfred Borzall drill bits have evolved through decades of on the job use. They are designed to meet a variety of soil conditions, including clay, sand, hardpan, shale, and borable rock. Our bits are made from cast steel and are designed with the cutting reliefs and clearances for maximum performance. MBI bits are available with hardfaced cutting edges for abrasion resistance or with carbide inserts for aggressive performance in harder soils and longer wear life. In addition to standard drill rod threads (7/8"-9NC, 1"-8NC, AW, and 13/16"-Hex Snap Pin), MBI bits are available in pipe thread sizes for use with extra heavy pipe (3/4" and 1") and direct drilling electrical conduit from 1-1/4 inches through 4 inches.

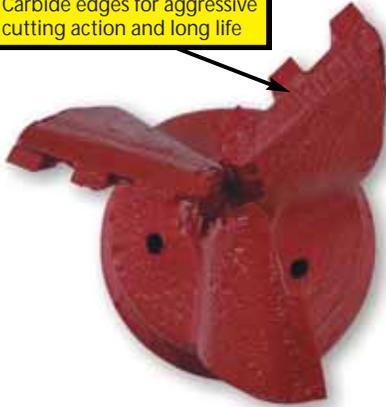
Melfred Borzall Bits
can be used with

Pneumatic bore motors
Hydra Bore* **Roto Witch***
Dyna Mole* **Mighty Mole***

Three Bladed Bits

Excellent for hardpan, shale, and sandstone

Carbide edges for aggressive cutting action and long life



3 Bladed Bit also available with a closed center for sandstone drilling

Melfred Borzall's Three Bladed Bits are used for drilling harder soils such as decomposed granite, loose rock, or shale. They often achieve improved accuracy due to greater distribution of cutting area and additional fluid circulation. The carbide tipped version of this bit

actually improves with use! As the cast steel blades wear, carbide insert "fingers" are exposed, providing aggressive cutting action. Special styles can be ordered, including front or center located fluid holes, and a closed-center style, ideal for drilling sandstone and other continuous formations.



Specify "C" for Carbide, or "H" for Hardface when ordering



3 Bladed Bits - Style 1200			
PART # for Hardfaced Bits	PART # for Carbide Bits	DIAMETER	THREAD
1200-12P-C	1200-12P-H	2"	3/4" pipe
1200-02-C	1200-02-H	2"	7/8"-9NC
1200-03-C	1200-03-H	2"	1"-8NC
1200-05-C	1200-05-H	2"	13/16"-Hex
1202-12P-C	1202-12P-H	2-3/4"	3/4" pipe
1202-02-C	1202-02-H	2-3/4"	7/8"-9NC
1202-03-C	1202-03-H	2-3/4"	1"-8NC
1202-16P-C	1202-16P-H	2-3/4"	1" pipe
1203-12P-C	1203-12P-H	3-1/2"	3/4"-pipe
1203-02-C	1203-02-H	3-1/2"	7/8"-9NC
1203-03-C	1203-03-H	3-1/2"	1"-8NC
1203-16P-C	1203-16P-H	3-1/2"	1" pipe
1203-24P-C	1203-24P-H	3-1/2"	1-1/2" pipe
1203-32P-C	1203-32P-H	3-1/2"	2" pipe
1204-40P-C	1204-40P-H	4"	2-1/2" pipe
1205-48P-C	1205-48P-H	5-1/2"	3"
1206-64P-C	1206-64P-H	6"	4"

Drill Bits

Fish Tail Bits

For most soil conditions, including sand and clay

An economical bit for most soil conditions. The carbide cutting edges give the Fish Tail Bits aggressive cutting action and long life. Efficient relief and clearance angles for faster, easier drilling. Water holes in back of the cutting edges are standard and can be drilled in the center or in front of the cutting edges for sandy soil bores.

Specify "C" for Carbide or "H" for Hardface when ordering



All styles are not shown

Carbide edges for aggressive cutting action and long life

Fish Tail Bits - Style 100

PART # for Hardfaced Bits	PART # for Carbide Bits	DIAMETER	THREAD
100-12P-C	100-12P-H	1-3/4"	3/4" pipe
100-02-C	100-02-H	1-3/4"	7/8"-9NC
100-03-C	100-03-H	1-3/4"	1"-8NC
101-12P-C	101-12P-H	2"	3/4" pipe
101-02-C	101-02-H	2"	7/8"-9NC
101-03-C	101-03-H	2"	1"-8NC
102-12P-C	102-12P-H	2-5/8"	3/4" pipe
102-02-C	102-02-H	2-5/8"	7/8"-9NC
102-03-C	102-03-H	2-5/8"	1"-8NC
102-16P-C	102-16P-H	2-5/8"	1" pipe
103-02-C	103-02-H	3-1/4"	7/8"-9NC
103-16P-C	103-16P-H	3-1/4"	1" pipe
103-24P-C	103-24P-H	3-1/4"	1-1/2" pipe
104-32P-C	104-32P-H	4"	2" pipe
104-40P-C	104-40P-H	4"	2-1/2" pipe
105-48P-C	105-48P-H	5"	3" pipe
106-64P-C	106-64P-H	6"	4" pipe

Fish Tail Bits for conduit

Melfred Borzall Fish Tail bits are available with pipe threads for direct drilling with galvanized conduit.



Clay Bits

Excellent for clay and working through tree roots

The economical Clay Bit is designed primarily for efficiently drilling through clay and tree roots. The large water holes allow the Clay Bit to function with a low pressure supply. Center- enclosed water hole protects against clogging in clay.

Specify "C" for Carbide or "H" for Hardface when ordering

Clay Bits - Style 1300

PART # for Hardfaced Bits	PART # for Carbide Bits	DIAMETER	THREAD
1300-12P-C	1300-12P-H	2-1/4"	3/4" pipe
1300-02-C	1300-02-H	2-1/4"	7/8"-9NC
1300-03-C	1300-03-H	2-1/4"	1"-8NC



Center enclosed water hole

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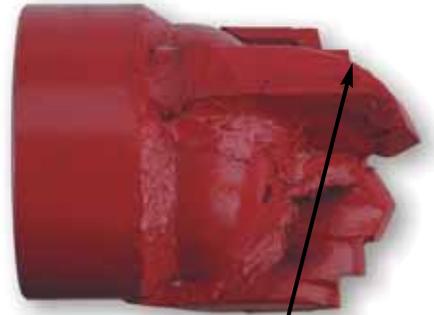
Rock Bits

Excellent for hard, rocky soils, shale, and sandstone

This heavy duty bit is excellent for loose rock and hard soil boring. Melfred Borzall's Rock Bit features large carbides for exceptional wear resistance and massive blade construction for maximum strength and rigidity. Large protected water holes are standard.



Large protected water holes



Extra large carbides

Available in Carbide only

Rock Bits - Style 30

PART #	DIAMETER	THREAD
31-02-C	2"	7/8"-9NC
31-03-C	2"	1"-8NC
32-02-C	2-1/4"	7/8"-9NC
32-03-C	2-1/4"	1"-8NC
32-05-C	2-1/4"	13/16"-Hex
32-06-C	2-1/4"	AW
32-16P-C	2-1/4"	1" pipe
33-06-C	3"	AW
34-24P-C	3-1/2"	1-1/2" pipe
34-32P-C	3-1/2"	2" pipe
35-48P-C	5"	3" pipe
36-64P-C	6"	4" pipe



Melfred Borzall now offers their Rock Bit with the new Hex-connection. Call 800-558-7500 for more details.



32-02-C



31-02-C

All styles are not shown

Pilot Bits

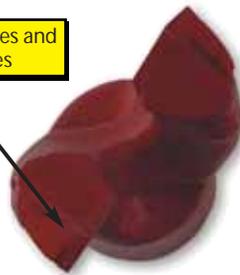
Heavy duty for hardpan, shale, sandstone and clay

The Pilot Bit will drill a variety of soils. The open, free-cutting design allows rapid penetration rates. Heavy duty cast steel blades and large, full edge carbides allow aggressive cutting action and longer life. The Pilot Bits feature large protected water holes to prevent clogging.



Large, protected water holes prevent clogging

Heavy duty blades and full edge carbides



Available in Carbide only

Pilot Bits - Style 100

PART #	DIAMETER	THREAD
110-02	2"	7/8"-9NC
110-03	2"	1"-8NC
110-12P	2"	3/4" pipe
111-02	2-1/4"	7/8"-9NC
111-03	2-1/4"	1"-8NC
111-06	2-1/4"	AW
111-16P	2-1/4"	1" pipe
112-02	2-1/2"	7/8"-9NC
112-03	2-1/2"	1"-8NC
112-06	2-1/2"	AW

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Drill Bits

Dry Compaction Bits

Ideal for dirt and sand type loams, where access to water is limited

Melfred Borzall's Compaction Bits are ideally suited for bores in areas where water is not readily available. These bits are self-feeding, produce very accurate holes, and have a precisely cast flighting to maximize the rate of production in dirt and sand type loam soil conditions. The solid one-piece construction makes for unsurpassed durability. The push-pull compaction bits have a reversed flighting making backing out easy. Available in a Push-Pull design (1.75", 2.25") with reversed flighting for easy backouts and Push-only design (1.5", 2.0", 2.5") for economical operation.



Solid, one-piece construction for unsurpassed durability



35-150-02



35-175-05 Hex



35-200-02



35-225-02



35-225-02

Dry Compaction Bits - Style 35

PART #	DIAMETER	THREAD
35-150-02	1-1/2"	7/8"-9NC
35-150-03	1-1/2"	1"-8NC
35-150-05	1-1/2"	13/16"-Hex
35-175-02	1-3/4"	7/8"-9NC
35-175-03	1-3/4"	1"-8NC
35-175-05	1-3/4"	13/16"-Hex
35-200-02	2"	7/8"-9NC
35-200-03	2"	1"-8NC
35-200-05	2"	13/16"-Hex
35-225-02	2-1/4"	7/8"-9NC
35-225-03	2-1/4"	1"-8NC
35-225-05	2-1/4"	13/16"-Hex
35-250-02	2-1/2"	7/8"-9NC
35-250-03	2-1/2"	1"-8NC
35-250-05	2-1/2"	13/16"-Hex

All styles are now available with the new Hex-connection

Carbide tips are a standard feature on all styles of compaction bits

To place an order for tools, call Toll Free

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A Reamer For Every Job, Every Soil

The Adjuster

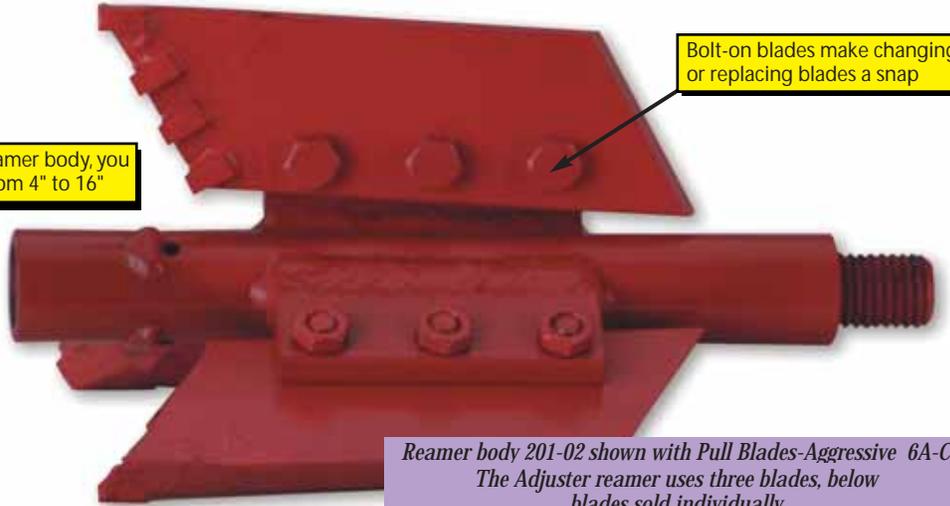
Features interchangeable blades for most soil types

With one Adjuster reamer body, you can build a reamer from 4" to 16"

Bolt-on blades make changing or replacing blades a snap



201-02



Reamer body 201-02 shown with Pull Blades-Aggressive 6A-C
The Adjuster reamer uses three blades, below blades sold individually

Adjuster Reamer Body

PART #	THREAD
201-02	7/8"-9NC

Make your job easier with the Adjuster reamer body. Bolt-on blades make it easy to change worn out blades or to add on different size blades. With one Adjuster reamer body you

can build a reamer from 4 inches up to 16 inches. All blade styles shown below can be used on the same body, making it a very versatile and economical reamer.

Pull Blades

Pull blades cut during return operation and are available in standard and aggressive styles. Blades are sold individually.

Pull Blades - Standard

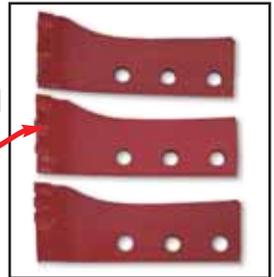
PART # for Carbide blades	PART # for Hardfaced blades	DIAMETER
4S-C	4S-H	4"
5S-C	5S-H	5"
6S-C	6S-H	6"
8S-C	8S-H	8"
10S-C	10S-H	10"
12S-C	12S-H	12"
14S-C	14S-H	14"
16S-C	16S-H	16"

Specify "C" for Carbide, "H" for Hardface when ordering

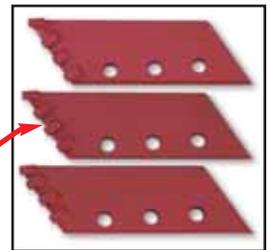
Pull Blades - Aggressive

PART # for Carbide blades	PART # for Hardfaced blades	DIAMETER
4A-C	4A-H	4"
5A-C	5A-H	5"
6A-C	6A-H	6"
8A-C	8A-H	8"
10A-C	10A-H	10"

Standard Blades



Aggressive Blades



Push-Pull Blades

Specify "C" for Carbide, "H" for Hardface when ordering

Push-Pull reamer blades cut either as a return reamer (pull) or while the drill string is being fed into the bore (push). The push-pull reamer can also be used to push back through, swabbing the hole and forcing soil to be deposited in the pot-hole or sump.

Available in Carbide or Hardface for aggressive cutting action



Push-Pull Blades

PART # for Carbide blades	PART # for Hardfaced blades	DIAMETER
4PP-C	4PP-H	4"
5PP-C	5PP-H	5"
6PP-C	6PP-H	6"
8PP-C	8PP-H	8"
10PP-C	10PP-H	10"
12PP-C	12PP-H	12"
14PP-C	14PP-H	14"
16PP-C	16PP-H	16"



Reamers

The Chopper

Clay Reamer for the stickiest types of clay



Step-up blade design gradually increases hole diameter

Carbide tipped blades for aggressive cutting action and wear resistance.

Larger sizes can be made to order

The Chopper - Style 63

PART #	DIAMETER	THREAD
63-3-02-C	3"	7/8"-9NC
63-4-02-C	4"	7/8"-9NC
63-5-02-C	5"	7/8"-9NC
63-6-02-C	6"	7/8"-9NC
63-8-02-C	8"	7/8"-9NC
63-10-02-C	10"	7/8"-9NC
63-12-02-C	12"	7/8"-9NC

The Chopper cuts through the stickiest of clays without balling up. The forward swept blade design improves the cutting and mixing action. The Chopper's blades are tipped with

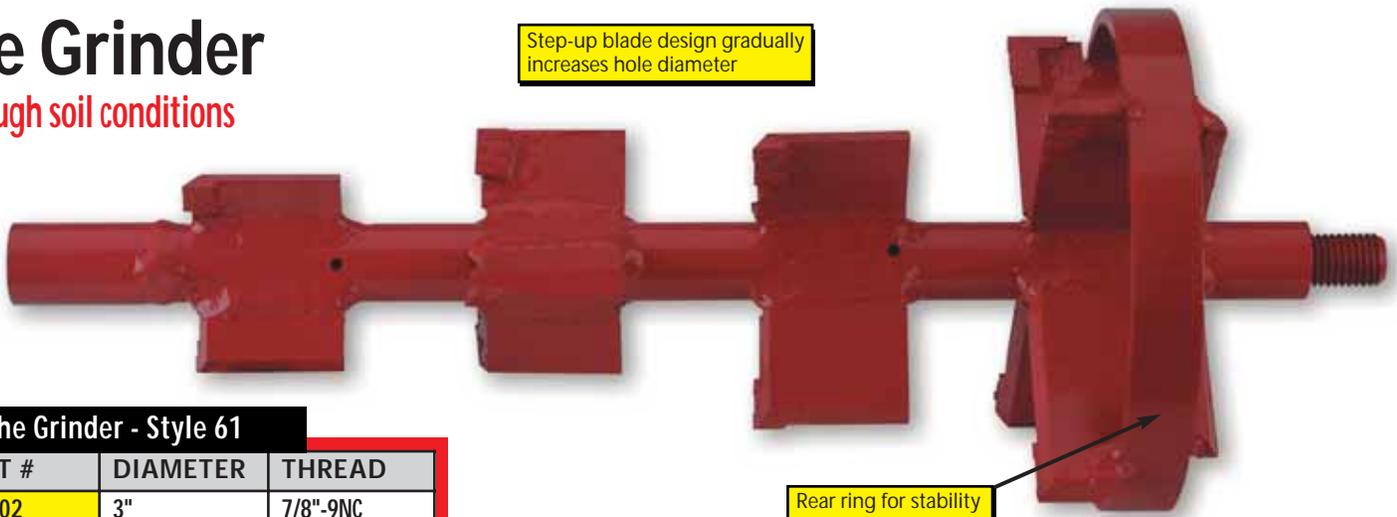
carbide teeth for aggressive cutting and wear resistance. The blades step-up in size at each stage to gradually increase hole diameter.

Melfred Borzall—
for all your Horizontal
Drilling tools

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The Grinder

For tough soil conditions



Step-up blade design gradually increases hole diameter

Rear ring for stability

The Grinder - Style 61

PART #	DIAMETER	THREAD
61-3-02	3"	7/8"-9NC
61-4-02	4"	7/8"-9NC
61-5-02	5"	7/8"-9NC
61-6-02	6"	7/8"-9NC
61-8-02	8"	7/8"-9NC

The Grinder features several stages of progressively larger carbide tipped blades. The heavy duty blades are designed to stand up to extremely difficult soil conditions. The

rear ring stabilizes the reamer in cobblestone and strengthens the last stage of blades. The blades step up in size at each stage to gradually increase hole diameter.

To place an order for tools, call Toll Free

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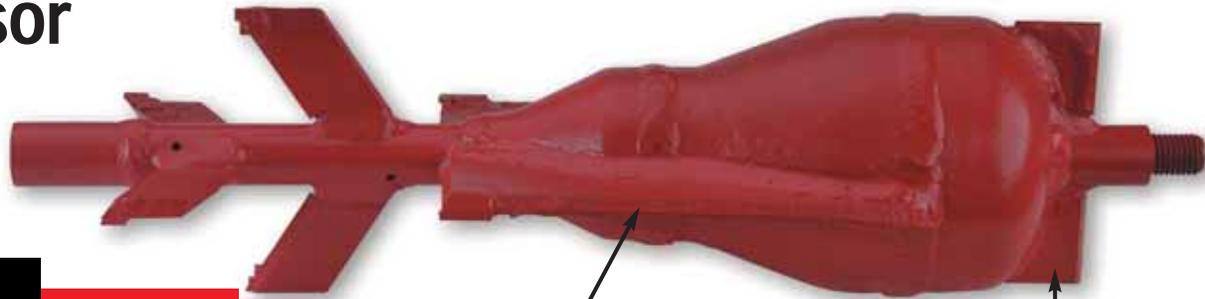
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The Aggressor

Ideal for clay, sand, and most unstable soils



Packer blades provide an excellent mixing action

Back-up blades help in pushing the reamer back out of the hole

The Aggressor - Style 73

PART #	DIAMETERS	THREAD
73-3-02	3" cut, 2-5/8" pack	7/8"-9NC
73-4-02	4" cut, 3-5/8" pack	7/8"-9NC
73-5-02	5" cut, 4-5/8" pack	7/8"-9NC
73-6-02	6" cut, 5-5/8" pack	7/8"-9NC
73-8-02	8" cut, 6-5/8" pack	7/8"-9NC
73-10-02	10" cut, 8-5/8" pack	7/8"-9NC
73-12-02	12" cut, 10-3/4" pack	7/8"-9NC

The Aggressor is ideal for clay and most unstable soils. The unique blade and packer combination cuts the hole and then packs it for stabilization. The Aggressor features

carbide-tipped cutting blades for longevity. Back-up blades help in pushing the reamer back out of the hole.

The Mighty Mite

Ideal for clay, hardpan, and soft soils

This compact reamer is only six inches long, making it easy to install in a small receiving pit. Combining two compact reamers

together produces an outstanding tool for reaming clay. The blades are sharpened to allow cutting during push or pull operation.

Compact size makes it easy to install in a small receiving pit



The Mighty Mite - Style 64

PART #	DIAMETER	THREAD
64-3-02-C	3"	7/8"-9NC
64-4-02-C	4"	7/8"-9NC
64-5-02-C	5"	7/8"-9NC
64-6-02-C	6"	7/8"-9NC

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For all your directional drilling needs



The Razorback

For sandy loams and sticky clays

Contractors asked for a highly productive, inexpensive, yet durable reamer to use in a wide variety of soil conditions. The Razorback is the answer! Massive carbides completely

line the leading edge in an aggressive sawtooth pattern. The open blade design greatly improves the mixing action.

The Razorback - Style 67

PART #	DIAMETER	THREAD
67-4-02	4"	7/8"-9NC
67-6-02	6"	7/8"-9NC
67-8-02	8"	7/8"-9NC
67-10-02	10"	7/8"-9NC
67-12-02	12"	7/8"-9NC

Open blade design greatly improves the mixing action

Carbide lined edge increases durability in a variety of soils



Reamers

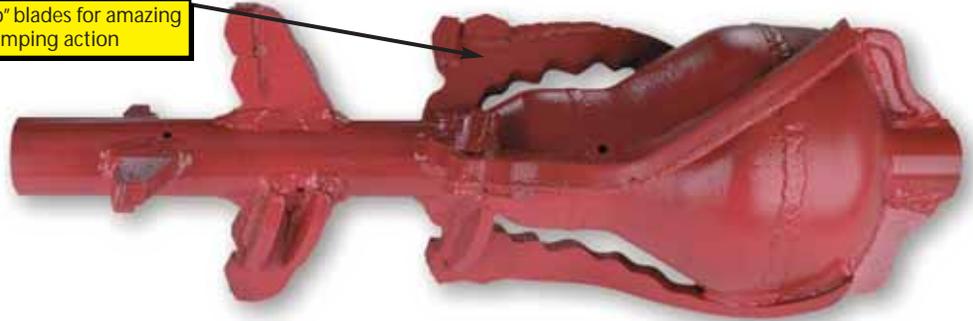
The Turbo

For sand, sandstone, and sandy loam

The "Big Boy" for long bores in sand and unstable soils. The Turbo is designed for long life and productivity. Heavy duty blades and massive carbide cutters

provide an excellent cutting and mixing action. Spiraled packer blades provide the maximum in mixing and actually "pump" slurry through the bore hole.

Spiraled "turbo" blades for amazing mixing and pumping action



The Turbo - Style 83

PART #	DIAMETERS	THREAD
83-6-02	6" cut, 5-5/8" pack	7/8"-9NC
83-8-02	8" cut, 6-5/8" pack	7/8"-9NC
83-10-02	10" cut, 8-5/8" pack	7/8"-9NC
83-12-02	12" cut, 10-3/4" pack	7/8"-9NC

The Compactor

For soft soils and clay

The Compactor comes standard as a dry reamer. The solid one-piece casting adds strength and durability. The Compactor can

be used in conjunction with a standard slurry reamer. Water holes can be added on request.



The Compactor - Style 35

PART #	DIAMETER	THREAD
35-350-02	3-1/2"	7/8"-9NC
35-350-03	3-1/2"	1"-8NC
35-350-05	3-1/2"	13/16"-Hex

Spiraled flighting feeds reamer back through the hole

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Push-Pull Reamer

Compact design

The Push-Pull Reamer is a compact design with special blades that cut either as a normal return reamer (pull) or while the drill string is being fed into the hole (push). During return reaming

in certain soil conditions, the Push-Pull Reamer can be fed back to swab out the hole, forcing soil to be deposited in the pot-hole or sump.

Push-Pull Reamer

PART #	DIAMETER	THREAD
62-3-02-C	3"	7/8"-9NC
62-4-02-C	4"	7/8"-9NC
62-6-02-C	6"	7/8"-9NC



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MELFRED
BORZALL

Largest Selection of Top Quality Drill Rod for all your drilling needs

Series 301

Flexible Drill Rod 1-1/8" O.D. Tube



Our most popular drill rod for conventional earth boring. Series 301 is the standard drill rod used for most normal drilling condi-

tions. It combines strength and flexibility. The drill rod can be used with water, slurry, air, or dry boring.

Series 302

Flexible Drill Rod 15/16" O.D. Tube



Series 302 is designed for light duty applications such as the installation of telephone cable and copper tubing. Especially useful in

restricted areas where short trenches are desired and applications requiring greater drill rod flexibility.

Flexible Drill Rod - Series 301

PART #	LENGTH	THREAD
301-5-02	5ft.	7/8"-9NC
301-10-02	10 ft.	7/8"-9NC
301-15-02	15 ft.	7/8"-9NC
301-20-02	20 ft.	7/8"-9NC
301-5-03	5 ft.	1"-8NC
301-10-03	10 ft.	1"-8NC
301-15-03	15 ft.	1"-8NC
301-20-03	20 ft.	1"-8NC

Custom lengths are available on request

Flexible Drill Rod - Series 302

PART #	LENGTH	THREAD
302-10-02	10 ft.	7/8"-9NC
302-15-02	15 ft.	7/8"-9NC
302-20-02	20 ft.	7/8"-9NC

Extend the Life of Your Drill Rod with replacement couplings from **Melfred Borzall**



Thread Studs

PART #	THREAD
601	7/8"-9NC
609	1"-8NC
675	AW

The life of your drill rod can be extended by replacing worn couplings. Replaceable couplings eliminate the wear and breakage often experienced when using pipe threads and couplings. Melfred Borzall's couplings are designed to withstand the intense conditions encountered in earth boring.

Replacement Couplings

PART #	TUBE	THREAD
401-M	301, 188	7/8"-9NC-M
401-F	301, 188	7/8"-9NC-F
402-M	3/4" X-H pipe	7/8"-9NC-M
402-F	3/4" X-H pipe	7/8"-9NC-F
403-M	1" std. pipe	7/8"-9NC-M
403-F	1" std. pipe	7/8"-9NC-F
404-M	1" X-H pipe	7/8"-9NC-M
404-F	1" X-H pipe	7/8"-9NC-F
408-M	302	7/8"-9NC-M
408-F	302	7/8"-9NC-F
409-M	301, 188	1"-8NC-M
409-F	301, 188	1"-8NC-F
415-M	188	13/16"-Hex
415-F	188	13/16"-Hex
175-M	277	AW-M
175-F	277	AW-F

Drill Rod

Series 188

Flexible Drill Rod 1-3/16" O.D. Tube



Series 188 is a medium duty drill rod specially designed for long bores of 400 feet or more. The heavier walled tubing has the extra strength and rigidity required for drill tracks

and more powerful boring machines and attachments. Series 188 drill rod is also available with a coupling sleeve for added strength where the drill rod encounters the most stress.



188-10-02-SL F



188-10-02-SL M

188 Rod also available with welded sleeve for extra strength

Flexible Drill Rod - Series 188

PART #	LENGTH	THREAD
188-5-02	5 ft.	7/8"-9NC
188-10-02	10 ft.	7/8"-9NC
188-15-02	15 ft.	7/8"-9NC
188-20-02	20 ft.	7/8"-9NC
188-5-03	5 ft.	1"-8NC
188-10-03	10 ft.	1"-8NC
188-15-03	15 ft.	1"-8NC
188-20-03	20 ft.	1"-8NC
188-5-05	5ft.	13/16"-Hex
188-10-05	10 ft.	13/16"-Hex
188-15-05	15 ft.	13/16"-Hex
188-20-05	20 ft.	13/16"-Hex
188-10-02-SL	10 ft.	7/8"-9NC w/sleeve
188-20-02-SL	20 ft.	7/8"-9NC w/sleeve

Hex Drive Drill Rod

188 Flexible Drill Rod with Hex Connection

Now available—a low maintenance reversible dry boring system. Male and female 13/16" hex ends are machined for close tolerances. Heat treated alloy steel tool joints for maximum life. Replacement couplings also available.

NEW!
NEW!
NEW!



188-10-05-Hex

188 Flexible Drill Rod Series is now available with the new Hex-connection

Auntie C's Thread Lube

Auntie C's Premium Copper Thread Lube is excellent for use in demanding drilling conditions. This lead free, environmentally safe drill pipe compound provides maximum protection against galling, seizing and down-hole makeup under even the most challenging conditions. Auntie C's Premium Copper Thread Lube contains copper flake, graphite, an extreme pressure additive, and rust and corrosion inhibitors in a water resistant aluminum complex grease carrier. Auntie C's thread lube contains no zinc or other materials which may be affected by elevated temperatures. Now available in a convenient 20 oz. size for grease guns.

Thread Lube

PART #	SIZE
AS-402-JT	20 oz. tube
AS-410	10 lb. pail
AS-420	20 lb. pail
AS-445	45 lb. pail



Now available in 20 oz. tubes

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13

Pulling Swivels

For pulling pipe, cable, and other utility lines

Cable swivels are used in pulling back pipe, cables, and other utility lines. They can be attached directly to the drill rod or in a combination with Borzall reamers. The swivels are designed specifically to hold up to the harsh demands of horizontal boring. Repair kits are available for both style swivels.

Cable Swivels

PART #	CAPACITY	THREAD
1015-02	600 lbs.	7/8"-9NC-F
1015-03	600 lbs.	1"-8NC-F
1021-02	1750 lbs.	7/8"-9NC-F
1021-03	1750 lbs.	1"-8NC-F
1015-R	1015 REPAIR KIT	
1021-R	1021 REPAIR KIT	



Part # 1015 600 lb. Capacity



Part # 1021 1750 lb. Capacity

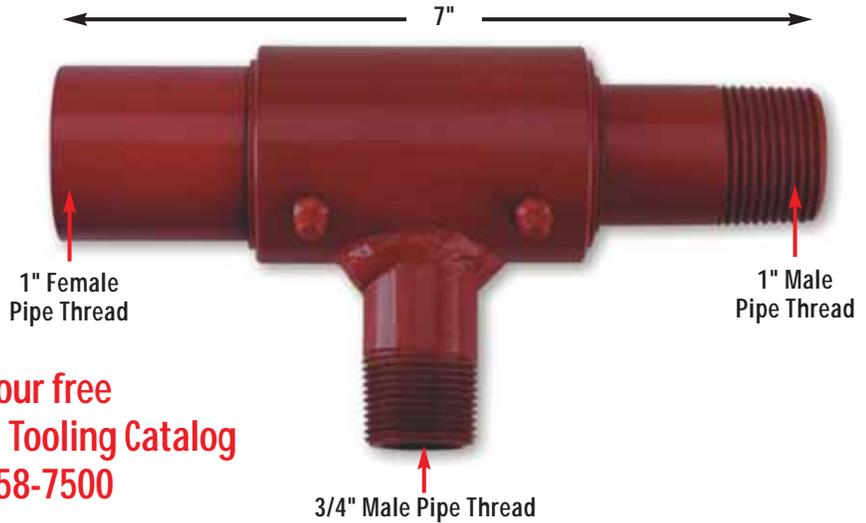
Water Swivels

Designed for high speed, high torque boring tools

The Melfred Borzall water swivel has o-ring seals, grease fittings, and a heat-treated alloy shaft for longer life. It has been designed for high speed, high torque boring tools and can be used as a replacement swivel for trencher-mounted boring attachments.

Water Swivels

PART #	TYPE
388	O Rings
388-R	Repair Kit



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Spline and Shank Adapters

The SPL-16PM adapter, along with the 388 water swivel, connects to the Ditch Witch Roto-Witch* boring units, upgrading them to high performance wet boring. The SHA-16PM adapter, along with the 388 water swivel, connects to Case* attachment mounted boring units.

Water Swivels

PART #	TYPE
SPL-16PM	Spline Used with Ditch Witch Roto-Witch* boring units
SHA-16PM	Shank Used with Case* attachment mounted boring units



Turn your boring unit into a *high performance wet* boring unit with our adapters



1" Male Pipe Thread

Pulling Devices

Deluxe Duct Pullers

Deluxe Duct Pullers

PART #	DUCT SIZES
00650-125	1.25" duct w/a 1.28" to 1.50" I.D.
00650-150	1.5" duct w/a 1.44" to 1.65" I.D.
00650-200	2" duct w/a 1.81" to 2.09" I.D.
00650-250	2.5" duct w/a 2.22" to 2.56" I.D.
00650-300	3" duct w/a 2.66" to 3.06" I.D.
00650-400	4" duct w/a 3.44" to 4.06" I.D.
00650-500	5" duct w/a 4.25" to 5.00" I.D.
00650-600	6" duct w/a 5.06" to 6.00" I.D.

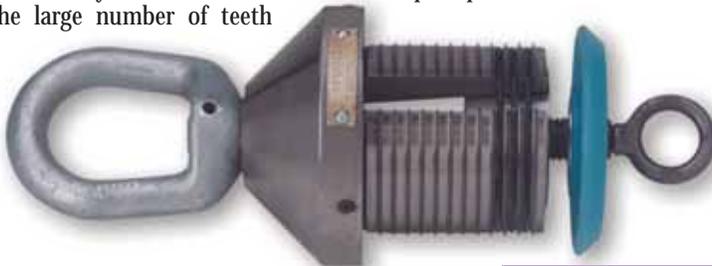


Melfred Borzall's Deluxe Duct Pullers are the best means of pulling in your poly or PVC pipe. This design has many new features including being completely sealed to prevent any fluids from entering either the duct or even the puller itself. The outer sleeve prevents stretching and allows even thin wall duct to be pulled. The precision machined and hardened alloy steel pulling head will handle the abuses of horizontal earth boring. The Deluxe Duct Puller has a long range of jaw expansion to suit ducting from 1-1/4" to 6" with wall sections from SDR9 to SDR21.

Standard Duct Pullers

Melfred Borzall's Standard Duct Pullers enable you to begin pulling in plastic pipe within a couple of minutes. The extra long extension that slides inside the duct provides much more stability than those other brands. The large number of teeth

results in a much stronger connection. Available for polyethylene and PVC duct from 1-1/4" to 12" with wall sections from SDR11 to SDR17. Pluggers are available to help keep mud out of duct.



Shown with optional duct plugger

Standard Duct Pullers

PART #	DUCT SIZES
00620-125	1.25" duct w/a 1.28" to 1.50" I.D.
00620-150	1.5" duct w/a 1.50" to 1.72" I.D.
00620-200	2" duct w/a 1.88" to 2.12" I.D.
00620-250	2.5" duct w/a 2.25" to 2.50" I.D.
00620-300	3" duct w/a 2.75" to 3.06" I.D.
00620-400	4" duct w/a 3.50" to 4.06" I.D.
00620-500	5" duct w/a 4.50" to 5.00" I.D.
00620-600	6" duct w/a 5.40" to 6.12" I.D.
00620-800	8" duct w/a 6.40" to 7.75" I.D.
00620-1000	10" duct-Please Specify SDR
00620-1200	12" duct-Please Specify SDR

Innerduct Pullers

Melfred Borzall's Innerduct Pullers are an economical means of pulling small diameter duct and innerduct. Both styles are machined from steel and chrome plated for durability. The Lug Style puller is typically used

when a direct connection between the innerduct and the swivel is preferred. All Innerduct Pullers have double cutting edges to actually cut a thread into the duct as it is screwed in.

Lug Style Innerduct Pullers

PART #	DUCT SIZES
00604-075	0.75" duct w/a 0.72" to 1.50" I.D.
00604-100	1" duct w/a 0.94" to 1.15" I.D.
00604-125	1.25" duct w/a 1.26" to 1.44" I.D.
00604-150	1.5" duct w/a 1.48" to 1.66" I.D.
00604-200	2" duct w/a 1.91" to 2.08" I.D.

Clevis Style Innerduct Pullers

PART #	DUCT SIZES
00605-100	1" duct w/a 0.94" to 1.15" I.D.
00605-125	1.25" duct w/a 1.26" to 1.44" I.D.
00605-150	1.5" duct w/a 1.48" to 1.66" I.D.
00605-200	2" duct w/a 1.91" to 2.08" I.D.



Lug Style Innerduct Puller



Clevis Style Innerduct Puller

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15

TRENCHLESS BORING AT A COST THAT WON'T BURY YOU

Low initial investment. Low cost per foot. Minimal maintenance. It all adds up to an extremely productive and cost efficient way to install underground utilities without open cutting.

Set-up is quick. So is clean-up. And it's versatile—just choose

between pit or surface launch.

Whether your underground installation is 20' or 300', Melfred Borzall is the only place to go for rugged, high quality equipment that'll help you get down to business.

Model 4000 Slurry Boring Unit

The fastest hydraulic slurry boring unit available

HYDRAULIC FEED AND HYDRAULIC ROTATION

The Model 4000 is the fastest hydraulic slurry boring unit available. With the option of pit or surface launch, the Model 4000 is ideal for boring under streets, highways, or sidewalks, as well as dewatering and grouting applications.

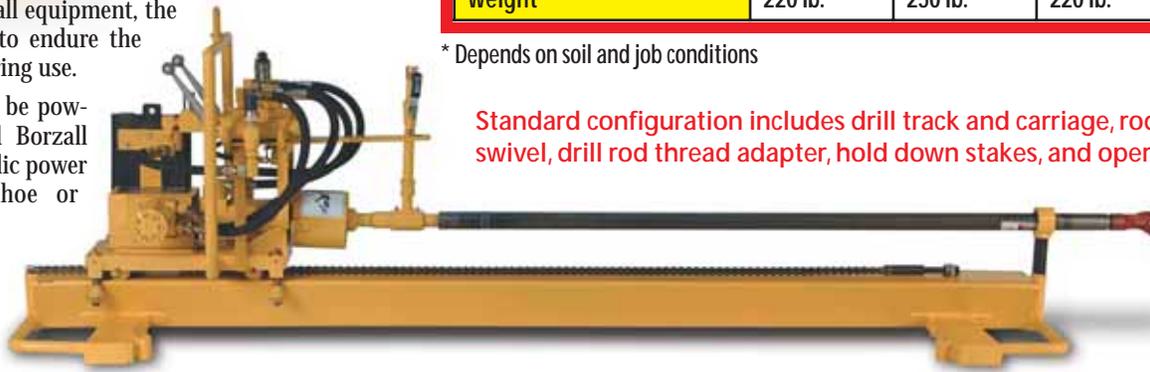
Both the spindle rotation and the carriage feed are hydraulically powered for a high production boring operation.

The Model 4000 is designed to bore with Melfred Borzall drill rod or to directly drill rigid conduit.

With properly spaced guide holes, the Model 4000 is capable of boring in excess of 300 feet.

Like all Melfred Borzall equipment, the Model 4000 is built to endure the rigors of everyday boring use.

The Model 4000 may be powered by the Melfred Borzall Model 6023-K hydraulic power pack, or any backhoe or trencher with a minimum hydraulic flow of 14 gpm at 2000 psi.



Model 4000 Slurry Boring Units				
OPERATIONAL SPECS.	4265-5	4265-10	4210-5	4210-10
Drill Rod Length	5 ft.	10 ft.	5 ft.	10 ft.
Max. Spindle Speed	265 rpm	265 rpm	210 rpm	210 rpm
Max. Spindle Torque	350 ft.-lbs.	350 ft.-lbs.	375 ft.-lbs.	375 ft.-lbs.
Max. Thrust/Pullback	4200 lb.	4200 lb.	4200 lb.	4200 lb.
Pilot Bore Diameter*	2" - 4"	2" - 4"	2" - 4"	2" - 4"
Max. Backream Diameter*	6" +	6" +	8" +	8" +
Max. Bore Length*	300 ft. +	300 ft. +	300 ft. +	300 ft. +
DIMENSIONS				
Standard Length	8 ft.	13 ft.	8 ft.	13 ft.
Length with Insul-Bor	10 ft.	15 ft.	10 ft.	15 ft.
Width	24 inches	24 inches	24 inches	24 inches
Weight	220 lb.	250 lb.	220 lb.	250 lb.

* Depends on soil and job conditions

Standard configuration includes drill track and carriage, rod guide, water swivel, drill rod thread adapter, hold down stakes, and operator's manual.

Model 1000 Slurry Boring Unit

Productive and accurate pneumatic boring operation

HAND FEED AND PNEUMATIC ROTATION

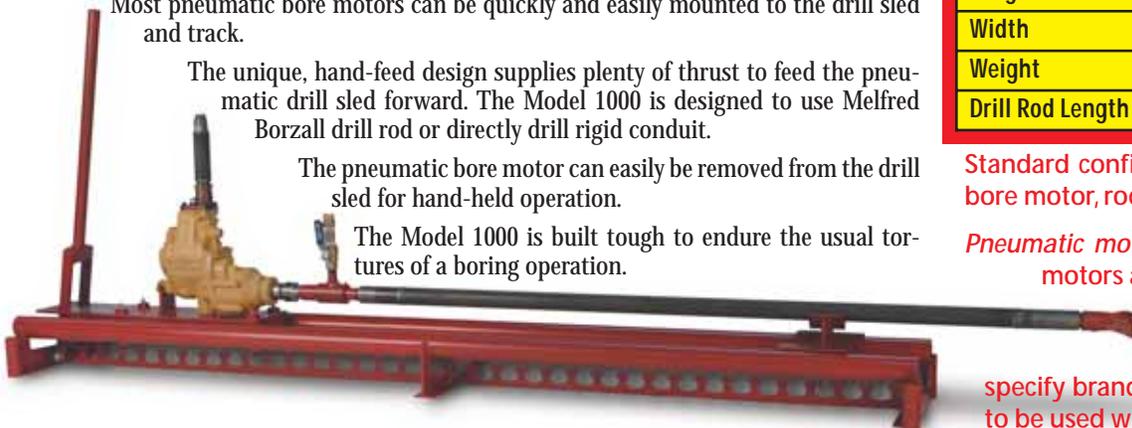
The Model 1000 is an inexpensive means to make pneumatic boring a much more productive and accurate operation.

Most pneumatic bore motors can be quickly and easily mounted to the drill sled and track.

The unique, hand-feed design supplies plenty of thrust to feed the pneumatic drill sled forward. The Model 1000 is designed to use Melfred Borzall drill rod or directly drill rigid conduit.

The pneumatic bore motor can easily be removed from the drill sled for hand-held operation.

The Model 1000 is built tough to endure the usual tortures of a boring operation.



Model 1000 Slurry Boring Units		
DIMENSIONS	1000-5	1000-10
Standard Length	8 ft.	13 ft.
Length with Insul-Bor	10 ft.	15 ft.
Width	14 inches	14 inches
Weight	128 lb.	195 lb.
Drill Rod Length	5 ft.	10 ft.

Standard configuration includes drill track, sled for bore motor, rod guide, and hold-down stakes.

Pneumatic motor is not included. A variety of bore motors are available through Melfred Borzall.

Operational specifications depend on bore motor being used. Please specify brand and model of Pneumatic bore motor to be used with the Model 1000.

Boring Units

Model 2000 Slurry Boring Unit

The most cost effective and versatile slurry boring unit available

Power your drill track with an MBI Hydraulic Power Pack. Call 800-558-7500 for more details.

HAND FEED AND HYDRAULIC ROTATION

The Model 2000 is the most cost effective slurry boring unit available. This drill track may be pit or surface launched making it extremely versatile.

With the spindle rotation hydraulically powered, the Model 2000 is capable of direct drilling up to 4" rigid conduit.

The unique, hand feed design applies plenty of thrust while keeping it a very economical and low-maintenance package.

The Model 2000 is designed to use Melfred Borzall drill rod or directly drill

rigid conduit.

The low weight of the Model 2000 components make it fast and easy for two men to transport and set up.

The Model 2000 is built tough to endure the usual tortures of a boring operation.

The Model 2000 may be powered by the Melfred Borzall Model 5016-K hydraulic power pack, or any backhoe or trencher with a minimum hydraulic flow of 8 gpm at 2000 psi.

Model 2000 Slurry Boring Units

OPERATIONAL SPECS.	2325-5	2325-10	2205-5	2205-10	2090-5	2090-10
Drill Rod Length	5 ft.	10 ft.	5 ft.	10 ft.	5 ft.	10 ft.
Max. Spindle Speed	325 rpm	325 rpm	205 rpm	205 rpm	90 rpm	90 rpm
Max. Spindle Torque	135 ft.-lbs.	135 ft.-lbs.	220 ft.-lbs.	220 ft.-lbs.	500 ft.-lbs.	500 ft.-lbs.
Max. Thrust/Pullback	varies	varies	varies	varies	varies	varies
Pilot Bore Diameter*	2" - 4"	2" - 4"	2" - 4"	2" - 4"	2" - 4"	2" - 4"
Max. Backream Diameter*	6" +	6" +	6" +	6" +	8" +	8" +
Max. Bore Length*	200 ft. +					
DIMENSIONS	2325-5	2325-10	2205-5	2205-10	2090-5	2090-10
Standard Length	8 ft.	13 ft.	8 ft.	13 ft.	8 ft.	13 ft.
Length with Insul-Bor	10 ft.	15 ft.	10 ft.	15 ft.	10 ft.	15 ft.
Width	18 inches					
Weight	170 lb.	220 lb.	170 lb.	220 lb.	170 lb.	220 lb.

* Depends on soil and job conditions

Standard configuration includes drill track and carriage, rod guide, water swivel, drill rod thread adapter, hold down stakes, and operator's manual.



Quick, easy set up
Light enough for two men to lift
Versatile – can be used for pit or surface launch

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**MELFRED
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Alignment Devices

Alignment devices are used to align the drill rod before and during drilling.

Alignment Devices that come in direct contact with the drilling components and must be held by hand are available with an insulated fiberglass section.

Alignment Devices

PART #	DESCRIPTION
901	The Rod Guide Stakes are driven into the ground to secure the horizontal and vertical alignment.
902, 902-1, 903	The alignment of the drill rod is checked with the Sighting Device and the Target.
904, 904-1	The Grab Hook is used to assist in the alignment of the bore path. Available as standard or with the fiberglass insulated section.
905-1	The Insulated Pry Bar is used to help redirect the drill bit from side-to-side as it comes through the pit.

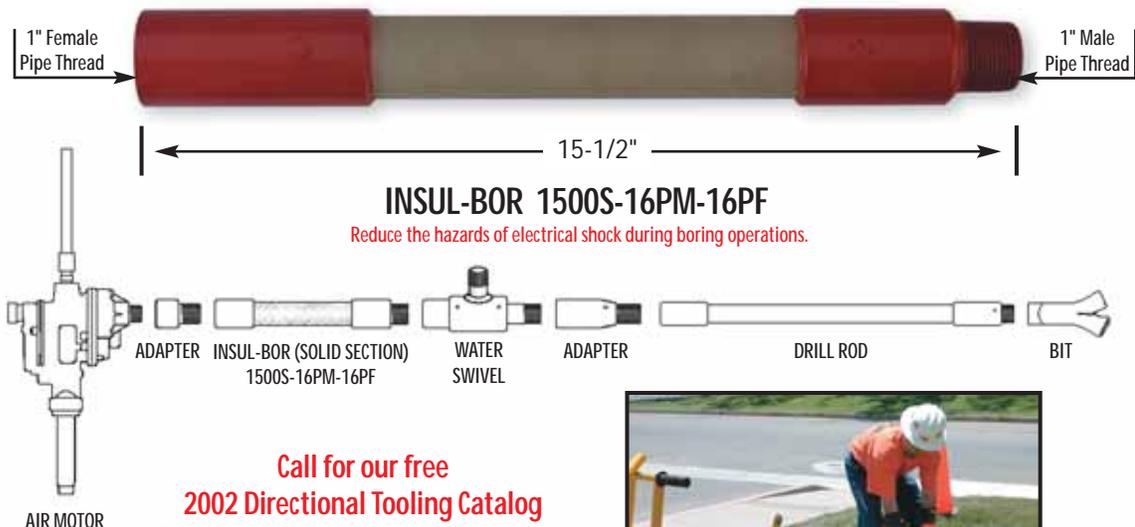


Insul-Bor

The Insul-Bor is designed to significantly reduce the hazard of operators being electrocuted from boring into electric conductors such as distribution lines.

Primary protection is gained by using a solid section between the operators (bore motor) and the steel drill tube. The Insul-Bor is designed to withstand 600 ft.-lbs. of torque.

The voltage potential the Insul-Bor will protect against will vary with the cleanliness of the section and the weather. If the primary section is dirty or if the weather is humid or wet, the amount of protection will be reduced.



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Electrical Conduit Adapters

1 INCH PIPE FEMALE x CONDUIT THREAD

The Melfred Borzall Electrical Conduit Adapters are used for direct drilling conduit installations. On sizes up to 2", the male thread of the adapter is a standard straight pipe thread and is designed so that the straight pipe thread coupling contacts the shoulder of the adapter. Load shock and stress is transmitted to the adapter shoulder and not through the threads. Larger sizes have standard tapered pipe threads.

Electrical Conduit Adapters

	1 inch	1-1/4 inch	1-1/2 inch	2 inch
1 inch Pipe-Female	16PF-10SM	16PF-12SM	16PF-15SM	16PF-20SM
	2-1/2 inch	3 inch	3-1/2 inch	4 inch
1 inch Pipe-Female	16PF-40PF	16PF-48PF	16PF-56PF	16PF-64PF



16PF-20SM

Air Motor Adapters

1 INCH PIPE MALE x AIR MOTOR THREAD

Air Motor Adapters are designed to fit most commonly used air motors including Thor, Ingersoll-Rand, Jet, and Uryu.



501-6

Air Motor Adapters

	Thor 66	Thor 88 Jet JRD40	IR33SMA IR44L	IR33SMA IR55J	URYU32	URYU40
1 inch Pipe-Male	501-1	501-2	501-5	501-6	501-9	501-6U

Thread Adapters

Other combinations available.
Call 800-558-7500 for information.

Thread Adapters

	Ditch Witch Roto Witch spline	Case 1" shank	7/8"-9NC Male	7/8"-9NC Female	1"-8NC Male	1"-8NC Female
1 inch Pipe-Male	SPL-16PM	SHA-16PM	02M-16PM	02F-16PM	03M-16PM	03F-16PM
1 inch Pipe-Female			02M-16PF	02F-16PF	03M-16PF	03F-16PM
7/8"-9NC Male			02M-02M		02M-03M	02M-03F
7/8"-9NC Female				02F-02F	02F-03M	02F-03F



ELECTRICAL SAFETY BOOTS

These 18" Over-the-Shoe Safety Boots are made of high quality, tear resistant rubber. They are fitted with a non-conductive strap and buckle. Boots are tested to ANSI Z41-1983 Section 4, ensuring that each boot will withstand 14,000 volts AC with less than 5.0 milliamp leakage. Boot Sizing—specify men's whole sizes only.

Electrical Safety Boots

PART #	DESCRIPTION
1820-BT	Safety Boot
1820-SH	Safety Shoe



ELECTRICAL SAFETY GLOVES

These seamless, Dielectric Rubber Gloves are rated use at up to 17,000 volts. The gloves are visually inspected inside and out and tested at their proof voltage in accordance with ASTM specification D-120. Wear Leather Protectors (sold separately) over gloves to help prevent glove damage.

Glove Sizing—measure the circumference of the worker's hand below the base of the fingers, on a line parallel to the finger crotches, passing through the thumb crotch. Add one inch. Half and whole sizes available.

Electrical Safety Gloves

PART #	DESCRIPTION
1820-GLV	Rubber Glove
1820-PRO	Leather Protector
1820-BAG	Glove storage bag

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TUFF BITS FOR A TUFF MOTHER.

Mother Earth is one tough customer. Rock, clay, sand, and gravel beneath her surface. (Not exactly an easy situation for horizontal trenchless boring.) Unless you're Melfred Borzall.

By far the most experienced company in the trenchless slurry boring field. We'll cut through your toughest jobs. Easily. With a complete inventory of conventional and directional bits, reamers, drill tubing, and all the rest.



In stock. Ready for 24-hour delivery. Not cheap, inferior bits, either. We design and manufacture our own out of high-grade steel. With carbide teeth that'll bite through everything under the earth.

So if you've got a tough job ahead of you, call the company that stands behind you. Melfred Borzall. Nobody knows more about slurry horizontal boring than we do. Because we pioneered it. **Nothing bores like a Borzall**

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