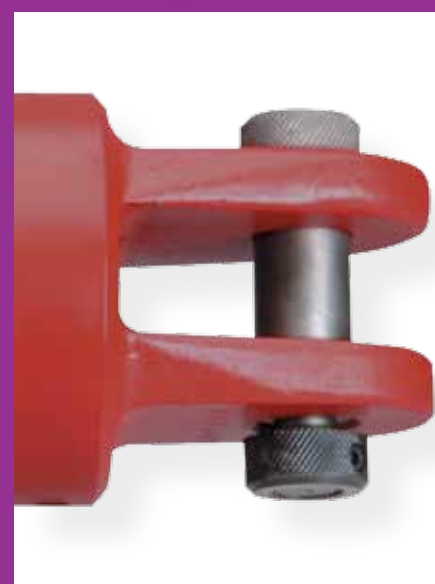




DIRECTIONAL DRILLING **TOOLS** **AT A HOLE LOT LESS.**

Volume 9, Issue 1



Melfred Borzall's Directional Depot

Phone: **800-833-1252**

Outside the US: **805-614-4344**

2712 Airpark Dr., Santa Maria, CA 93455

www.melfredborzall.com

WHAM. BAM.



INTRODUCING THE IRON FIST FROM MELFRED BORZALL. IT'S A REAL KNOCKOUT.

Get ready to pack a punch that cobblestone won't recover from with the new Iron Fist Bit. A unique, periphery cutting front carbide block keeps the bore on track by busting through cobbles or rolling them out of the way, and a concave conical steering face ensures a successful bore the first time, every time. And long beads of hardfacing embedded with granular carbide guarantee this is the bit you want when you go down swinging again and again. For more information, give us a call at 800-558-7500 (outside the U.S. call 805-739-0118). Or visit www.melfredborzall.com. Innovative HDD products on the cutting edge... **that's the Borzalledge.**

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**MELFRED
BORZALL**
Nothing bores like a Borzall

Melfred Borzall Website

ALL
NEW
BORZALL
WEB DESIGN

- View videos within the site or through the You Tube link
- Quick links for most used pages
- Slide show with new product
- Easy to use navigation bar



Made with Solar Power

Our signature red tools are manufactured with equipment powered by solar energy. Between 2004 and 2006, the Melfred Borzall Santa Maria plant was fitted with approximately 1,000 photo voltaic panels, producing about 135 kW, enough electricity to help run the manufacturing and office system. When you see the "Made with Solar Power" symbol, you can rest assured that not only are our tools manufactured to the highest standards, they are made "green" as well.



Solar panels on the roof of the Santa Maria plant.

Your satisfaction is our #1 priority



If you're not happy, we're not happy. That's why we offer the best money-back guarantee in the industry. We'll work with you to make sure you're 100% satisfied with your purchase. In fact, full refunds are issued on all merchandise returned within 30 days of delivery. We offer this extraordinary guarantee because we go to great lengths to provide our customers the highest quality products available. We also offer "Fast Ship"—orders for in-stock items placed before 6 p.m. EST ship the same day.



"Fast Ship"—Orders for in-stock items placed before 6 p.m. EST ship the same day.

To place an order or find a dealer **800-833-1252**

Fax 24 hours a day: **805-614-9548**

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VERMEER

DITCH WITCH

ASTEC

MELFRED BORZALL

GIVE YOUR VERMEER® DRILL THE BORZALL **EDGE**



All the tools you need to get the maximum production out of your Vermeer drill rig. Housings, bits, quick-disconnects and more. Get the gear. Get the edge. Melfred Borzall knowledge.



SIDE-LOAD, BOLT-ON TRANSMITTER HOUSINGS

Designed for 2-cell Digitrak® Transmitters

(Housings for Subsite beacons to be used on Vermeer drill rigs can be found on pages 17-19.)

3632-HT-13 Bolt-on, 7-hole blade style housing, 3-1/4" diameter.

Perfect for Vermeer D24x40, D33x44, D36x50

ALL NEW BORZALL HOUSING DESIGN



- Heat-treated, chrome-nickel-moly alloy steel for maximum strength and durability—the same high strength, fatigue resistant steel used in landing gears and propeller shafts
- Removable, replaceable tail-piece increases life of housing while standard API threads adapt easily to various rigs

- Bolt holes are thread milled to give a better quality thread and allow more threads to engage
- Engraved batch number to trace material, heat-treat, and manufacturing date; engraved part number for identification
- Lid slots are epoxied to minimize the transmitter getting exposed to mud
- Incorporates the Super Nozzle designed to minimize clogging

SUPER NOZZLE

Made with heat-treated alloy for maximum wear life



All MBI steels are sourced only from US steel mills.

Heat-treated to MBI specs to meet toughness & strength requirements of HDD.

Straight through gundrilled hole results in less clogging and easy cleanout. No cross-drilled or welded passages to leak



Above: Workers assemble a transmitter housing.



Not only are our tools manufactured to the highest standards, they are made "green" as well.

To place an order or find a dealer **800-833-1252**

Fax 24 hours a day: **805-614-9548**

www.melfredborzall.com



3625-HT-13 Bolt-on, 7-hole blade style housing, 2-1/2" diameter. *Perfect for Vermeer D7x11, D9x13, D10x15*



ALL
NEW
BORZALL
HOUSING DESIGN

3627-HT-13 Bolt-on, 7-hole blade style housing, 2-3/4" diameter. *Perfect for Vermeer D16x20, D18x22, D20x22, D24x26*



Bolt-On Transmitter Housings for DigiTrak		
Drill Rig Model	Configuration	Part #
D7x11, D9x13, D10x15	2-1/2" dia. side-load, for 7-hole blades 2" IF box X Vermeer 6-bolt	3625-HT-13
D16x20, D18x22, D24x26, D20x22	2-3/4" dia. side-load, for 7-hole blades 2" IF box X Vermeer 6-bolt	3627-HT-13
D24x40, D33x44, D36x50	3-1/4" dia. side-load, for 7-hole blades 2-3/8" API-R box X Vermeer 6-bolt	3632 -HT-13



CNC machine milling face on housing before milling threads for bolt-on blade feature. Threads are milled to the bottom of the hole allowing more thread engagement for the bolts and stronger connection.



SIDE-LOAD, THREAD-ON TRANSMITTER HOUSINGS

Designed for 2-cell DigiTrak® Transmitters

(Housings for Subsite beacons to be used on Vermeer drill rigs can be found on pages 17-19.)

3632-HT Thread-on bit style housing, 3-1/4" diameter with Timing Mechanism.

Perfect for Vermeer D24x40, D33x44, D36x50

Engraved batch number and part number for traceability and identification

Made from chrome-nickel-moly alloy steel for maximum strength

Transmitter pocket corners are radiused to reduce stress concentrations & increase strength



Replaceable tailpiece with standard API threads adapts easily to various drill rigs

Extra large locking tabs hold lid securely in place—no bolts through lid

Only two bolts to remove the lid for easy access to transmitter

- Heat-treated, chrome-moly alloy for maximum strength and durability
- Removable, replaceable tail-piece increases longevity of housing
- Versatile housings can be used with Eagle Claw or Iron Fist bits (See pages 33 - 37)
- Simple Timing Mechanism on all 3625, 3627, 3632, thread-on style housings
- Use with the Bolt-On Bit Body (See page 7)

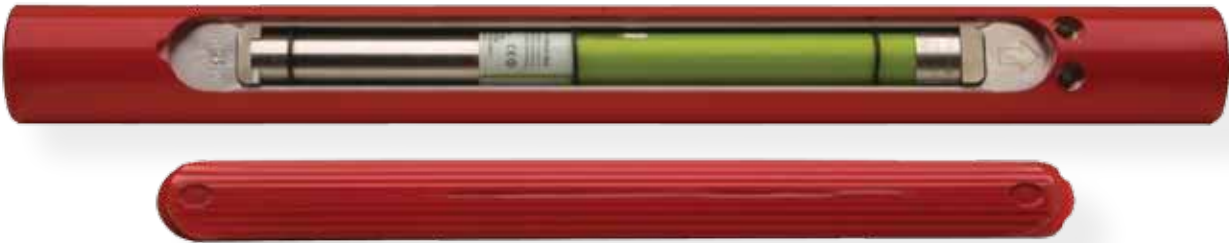
3627-HT Thread-on bit style housing, 2-3/4" diameter with Timing Mechanism. *Perfect for Vermeer D16x20, D18x22, D20x22, D24x26*



Simple, stainless steel timing mechanism makes clocking the transmitter to the bit a cinch.*
*The same mechanism used for 2-1/2", 2-3/4" and 3-1/4" housings.



3625-HT Thread-on bit style housing, 2-1/2" diameter with Timing Mechanism. *Perfect for Vermeer D7x11, D9x13, D10x15*



3742-HM Thread-on bit style housing, 4-1/4" diameter with Locking Bolt & Timing Mechanism. *Perfect for Vermeer D80x100, D60x90*



Thread-On Transmitter Housings for DigiTrak		
Drill Rig Model	Configuration	Part #
D6x6, D7x11, D9x13, D10x15	2-1/2" dia. side-load, thread-on bit 2" IF box X 2" IF box	3625-HT
D16x20, D18x22, D20x22, D24x26	2-3/4" dia. side-load, thread-on bit 2" IF box X 2" IF box	3627-HT
D24x40, D33x44, D36x50	3-1/4" dia. side-load, thread-on bit 2-3/8" API-R box X 2-3/8" API-R box	3632-HT
D50x100, D80x100, D60x90	4-1/4" dia. side-load, thread-on bit 2-7/8" IF box (rear) X 2-7/8" API-R box (front)	3742-HU



New Borzall Iron Fist with the redesigned thread-on housing on the job site.

TRANSMITTER HOUSING ADAPTERS

For all Vermeer® style connections

23M-L400M Quick-Fire® X 2-3/8" API-reg pin.
Perfect for Vermeer Navigator D24x40 Series 2

ALL
NEW
BORZALL
HOUSING ADAPTER



Transmitter Housing Adapters		
3625 & 3627 Style Housings Drill Rig Model	Connection	Part #
Navigator D7x11, D9x13, D10x15	Direct to Drill Rod (200-FS1) x 2" IF pin Quick-Disconnect starter rod x 2" IF pin Quick-Fire® 300 x 2" IF pin	21M-31F 21M-L300M
Navigator D16x20, D18x22, D20x22, D24x26, L400	Direct to Drill Rod (250-FS1) 2" IF pin Direct to Drill Rod (400-FS1) 2" IF pin Quick-Disconnect starter rod x 2" IF pin Quick-Fire® 400 x 2" IF pin	21M-32F 21M-30F 21M-L43M 21M-L400M
3632 Style Housing Drill Rig Model	Connection	Part #
Navigator D24x40, D33x44, D36x50	Direct to Drill Rod (600-FS1) x 2-3/8" API-R pin Direct to Drill Rod (FS2) x 2-3/8" API-R pin Direct to Drill Rod (700-FS1) x 2-3/8" API-R pin Quick-Disconnect starter rod x 2-3/8" API-R pin Quick-Fire® 400 x 2-3/8" API-R pin Quick-Fire® 460 x 2-3/8" API-R pin	23M-40F 23M-33F 23M-41F 23M-L43M 23M-L400M 23M-L460M
3742 Style Housing Drill Rig Model	Connection	Part #
Navigator D50x100, D60x90 Navigator D80x100 Navigator D80x120	Direct to Drill Rod (900 FS1) x 2-7/8" IF pin Direct to Drill Rod (800 FS1) x 2-7/8" IF pin Direct to Drill Rod (FS2) x 2-7/8" IF pin	27M-50F 27M-80F 27M-81F

- *Extends the life of your transmitter housing*
- *Don't throw away your housing just because the threads are worn out*
- *Allows different threads to be used on a single housing*

Same adapters can also be used with Melfred Borzall reamers on pages 42-50.



BOLT-ON BIT BODIES

For screw-on bit style housings

- *Allows blades to be used on Thread-On style and High Flow housings*
- *Incorporates the Super Nozzle designed to minimize clogging*

1742-23 6-bolt Vermeer 5/8" bolt-on bit body. *Perfect for Vermeer Navigator D80x100*



Melfred Borzall offers a variety of replacement bolts for your blades and housings. Call for complete selection.

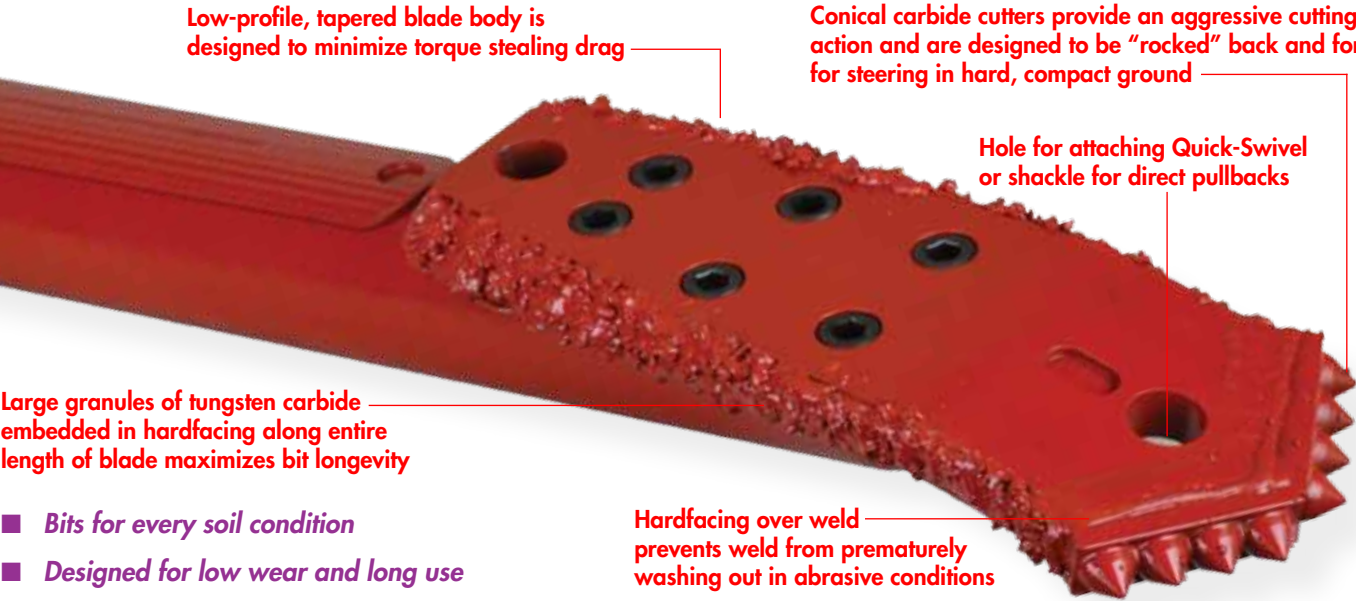
Bolt-On Bit Bodies		Other bolt patterns and threads can be special ordered.	
Description	Thread	Housing	Part #
6-bolt Vermeer, 1/2" bolt	2" IF pin	3625-HT, 3627-HT	1725-13
6-bolt Vermeer, 1/2" bolt	2-3/8" API-R pin	3632-HT, D285, D287	1632-13
6-bolt Vermeer, 5/8" bolt	2-7/8" API-R pin	3742-HU, ELH-425	1742-23
6-bolt Vermeer, 3/4" bolt	3-1/2" API-R pin	ELH-487	1748-33



BOLT ON BLADES FOR VERMEER®

Designed to use directly on Bolt-on housings or thread on housings with the Bolt-on Bit Body*

(*Bolt-On Bit Bodies found on page 7.)



- Bits for every soil condition
- Designed for low wear and long use
- Borzall carbide faced bits grind through the toughest ground conditions

BLADE SELECTION CHARTS

To use the blade charts, find the hole pattern for your machine and sonde housing on the first chart. Use the second chart to find the blade style for your particular soil conditions. Generally, larger blades work better in softer soils and smaller blades work better in harder soils.

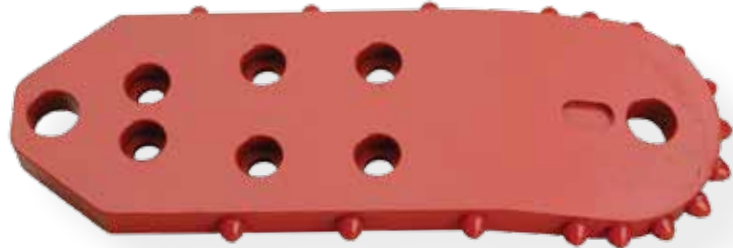
Pattern #	Machine	# Holes	Bolt Size
-13	All Vermeers up to D40x40	6 + 1	1/2"-13
-23	Vermeer D50x100, D80x100, D80x120	6 + 1	5/8"-11
-33	Vermeer D100x120	6 + 1	3/4"-10

EXCALIBUR

For clay and abrasive soil conditions

- Carbide button bits grind through tough ground conditions
- Bullnose design minimizes drag while rotating

1600-13-40-BBX 4" Excalibur



- Strategically placed carbides along side give this blade a long, productive life

SOIL CONDITION	1ST CHOICE BLADE	2ND CHOICE BLADE
Sand	Excalibur	Chunky
Sand with cobbles	Steep Taper UltraBit 3	UltraBit 3
Sandstone	UltraBit 3	Bear Claw
Sticky clay	Excalibur	UltraBit 3
Clay with cobbles	Steep Taper UltraBit 3	UltraBit 3
Hardpan	Steep Taper UltraBit 3	Bear Claw
Shale	UltraBit 3	Bear Claw
Caliche	UltraBit 3	Steep Taper UltraBit 3
River rock	Steep Taper UltraBit 3	Bear Claw
Glacial til	Excalibur	UltraBit 3
Sandy loam	Excalibur	ValuBlade

Excalibur	
3-1/2" Cut - Bolt Pattern	Part #
7-hole Vermeer for 1/2" bolt	1600-13-35-BBX
4" Cut - Bolt Pattern	Part #
7-hole Vermeer for 1/2" bolt	1600-13-40-BBX
5" Cut - Bolt Pattern	Part #
7-hole Vermeer for 1/2" bolt	1600-13-50-BBX
7-hole Vermeer for 5/8" bolt	1600-12-50-BBX

LONG LASTING PREMIUM BLADES

ULTRABIT 3

For hard, compact soil and gravel

- Conical carbide cutters make this an aggressive bit for hard soils
- Chunky carbide hardfacing the entire length of blade for maximum longevity
- Low-profile, tapered design to minimize torque stealing drag



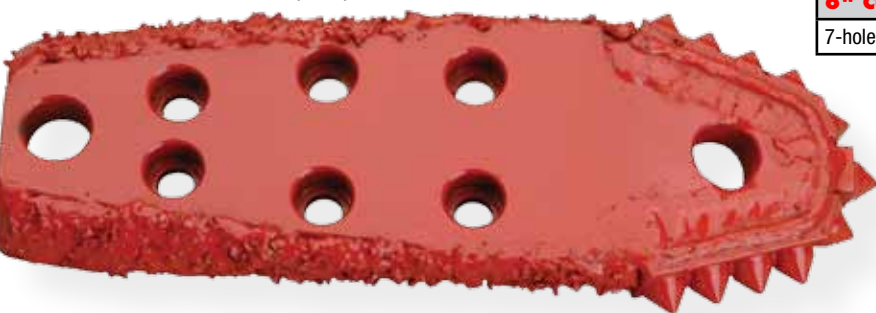
Steep Taper UltraBit 3 on the job site.

STEEP TAPER ULTRABIT 3

For hard, compact soil and gravel

- Bit of choice for ground where it is hard to do directional "pushes"
- Conical carbide cutters set in an aggressive angle to get through cobbles
- Chunky carbide hardfacing the entire length of blade for maximum longevity
- Center point tooth for easier penetration

1600-13-40-BSU3 4" Steep Taper UltraBit 3



UltraBit 3	
4" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 1/2" bolt	1600-13-40-BBU3
5" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 1/2" bolt	1600-13-50-BBU3
6" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 5/8" bolt	1610-23-60-BBU3
7-1/2" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 3/4" bolt	1612-33-75-BBU3

1600-13-50-BBU3 5" UltraBit 3



Check out our new Blade Pulling Eye. Easily bolts on to any Borzall blade for direct pullbacks. See page 63 for more information.

- Low-profile, tapered design to minimize torque stealing drag

Steep Taper UltraBit 3	
4" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 1/2" bolt	1600-13-40-BSU3
5" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 1/2" bolt	1600-13-50-BSU3
7-hole, Vermeer for 5/8" bolt	1610-23-50-BSU3
6" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 5/8" bolt	1610-23-60-BSU3

What Our Customers are Saying . . .

"We did an 18,000' bore in all small & medium cobble. The Vermeer 7-hole finally gave out and we replaced it with Borzall's 5" SteepTaper Ultra Bit 3 Blade. Better than Railhead."

Tim at Bakken Underground, Inc.



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Fax 24 hours a day: **805-614-9548**
www.melfredborzall.com



"Fast Ship"—Orders for in-stock items placed before 6 p.m. EST ship the same day.

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BEAR CLAW
For hard, rocky soil conditions

- The King of the Beasts uses large conical carbide cutters to eat through shale, sandstone and other tough conditions
- Hardfacing along all wear edges makes this one long lasting blade

1600-13-40-BBBC 4" Bear Claw



Below: Heated blade in the process of being bent before going to heat treating.



Bear Claw	
3-1/2" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 1/2" bolt	1600-13-35-BBBC
4" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 1/2" bolt	1600-13-40-BBBC
5" Cut - Bolt Pattern	Part #
7-hole, Vermeer for 1/2" bolt	1600-13-50-BBBC

CHUNKY II
Cast blade for sand and sandy loams

- A cast, heat-treated blade that is economical yet very durable
- Cutting edges are impregnated with carbide chunks to resist wear
- Low-profile, tapered design to minimize torque stealing drag

1600-13-40-BVC2 4" Chunky II



Chunky-II	
3-1/2" Cut - Bolt Pattern, 3/4" Thick	Part #
7-hole Vermeer for 1/2" bolt	1600-13-35-BVC2
4" Cut - Bolt Pattern, 7/8" Thick	Part #
7-hole Vermeer for 1/2" bolt	1600-13-40-BVC2
5" Cut - Bolt Pattern, 1" Thick	Part #
7-hole Vermeer for 1/2" bolt	1610-13-50-BVC2
7-hole Vermeer for 5/8" bolt	1610-23-50-BVC2
6" Cut - Bolt Pattern, 1" Thick	Part #
7-hole Vermeer for 5/8" bolt	1610-23-60-BVC2

VALU-BLADE II
Cast blade for standard soil conditions

- A cast, heat-treated blade that is economical yet very durable
- Low-profile, tapered design to minimize torque stealing drag

1600-13-35-BBV2 3-1/2" Valu-Blade II



Valu-Blade-II	
3-1/2" Cut - Bolt Pattern, 3/4" Thick	Part #
7-hole Vermeer for 1/2" bolt	1600-13-35-BBV2
4" Cut - Bolt Pattern, 7/8" Thick	Part #
7-hole Vermeer for 1/2" bolt	1600-13-40-BBV2
5" Cut - Bolt Pattern, 1" Thick	Part #
7-hole Vermeer for 1/2" bolt	1610-13-50-BBV2
7-hole Vermeer for 5/8" bolt	1610-23-50-BBV2
6" Cut - Bolt Pattern, 1" Thick	Part #
7-hole Vermeer for 5/8" bolt	1610-23-60-BBV2



DURABLE DRILL ROD AT UNBEATABLE PRICES*

Designed for use with Vermeer Navigators®



Other sizes and thread styles available.

The difference?
Our drill rod lasts longer and costs less.

Lifetime Guarantee
Against Failure of Any Inertia Weld!



Don't forget a new Sub-Saver, page 14,
and new Breakout Jaws, page 66,
to go with that new drill rod!

Depot Drill Rod to Fit Vermeer		
Rig Model	Rod Specifications	Part #
Navigator D7x11	O.A.L. 72" +/-0.25" 1.66" O.D. with 0.24" wall thickness 1.88" tool joint O.D. 135,000 psi yield strength, minimum 98.1 ft. bend radius	816-6-31
Navigator D10x15	O.A.L. 120" +/-0.25" 1.66" O.D. with 0.24" wall thickness 1.88" tool joint O.D. 135,000 psi yield strength, minimum 98.1 ft. bend radius	816-10-31
Navigator D16x20, D18x22	O.A.L. 120" +/-0.25" 1.66" O.D. with 0.24" wall thickness 1.88" tool joint O.D. 135,000 psi yield strength, minimum 98.1 ft. bend radius	819-10-32
Navigator D24a, D24x26, D20x22	O.A.L. 120" +/-0.25" 2.063" O.D. with 0.24" wall thickness 2.25" tool joint O.D. 135,000 psi yield strength, minimum 121.9 ft. bend radius	820-10-30
Navigator D24x40	O.A.L. 120" +/-0.25" 2.375" O.D. with 0.28" wall thickness 2.62" tool joint O.D. 135,000 psi yield strength, minimum 140.4 ft. bend radius	824-10-40
Navigator D40x40	O.A.L. 180" +/-0.25" 2.375" O.D. with 0.28" wall thickness 2.62" tool joint O.D. 135,000 psi yield strength, minimum 140.4 ft. bend radius	824-15-40
Navigator D50x100, D60x90 (15 foot only)	O.A.L. 180" +/-0.25" 2.875" O.D. with 0.36" wall thickness 3.25" tool joint O.D. 135,000 psi yield strength, minimum 170 ft. bend radius	828-15-50
Navigator D80x100	O.A.L. 180" +/-0.25" 3.50" O.D. with 0.37" wall thickness 3.62" tool joint O.D. 135,000 psi yield strength, minimum 206.9 ft. bend radius	835-15-80
Navigator D100x120	O.A.L. 240" +/- 1.50" 3.5" O.D. w/ 0.37" wall thickness 4.125" tool joint O.D. 135,000 psi yield strength, minimum 206.9 ft. bend radius	835-20-27DS

IT STARTS WITH A CAREFUL INSPECTION OF THE RAW MATERIAL

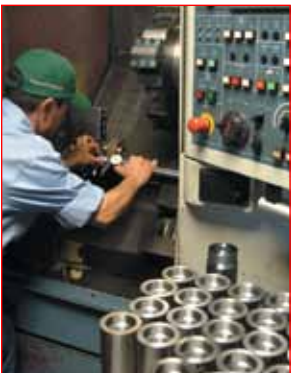


Careful inspection at the start guarantees the highest quality drill rod.

■ **Manufacturing:** Everything from forging and CNC threading to heat treating and inertia welding is all done in-house by Premier Drill Pipe for a superior drill-rod design that maximizes strength and durability.



A straightening process then insures the rods are true and accurate.



CNC lathes are used to cut threads to precise dimensions.

It may look like a simple steel tube, but today's drill rod carries a heavy load—especially when it comes to your bottom line. Considering today's skyrocketing steel and fuel costs, drill rods have suddenly become a very expensive wear item to any HDD operation.

The strongest team in the business

That's why it pays to work with proven industry leaders. Melfred Borzall and Premier Drill Pipe* have teamed up to offer the highest quality and most complete line of HDD drill rods available.



The rods are strengthened through a careful heat-treating process.

■ **Material Selection:** Based on exhaustive research and years of experience in manufacturing drill rod, Premier Drill Pipe has chosen materials that are best suited for HDD applications.



Using inertia welding, the threaded connection is "fused" to the forged tube to make a superior connection.



A cross section of the inertia weld shows the strength of the weld.



Every final product is meticulously inspected for maximum quality control.

■ **Inspection and Quality Control:** No other manufacturer does the detailed inspections and quality controls that Premier Drill Pipe does. The QC tests include Brinell hardness, dry mag particles inspection, wet mag and visual thread inspections.



DRIVE CHUCKS, SUB-SAVERS & QUICK-DISCONNECTS

Designed to use with Vermeer Navigators®



- Protect your drill rod threads with our precision machined Chucks and Sub-Savers
- All Drive Chucks are available with a replaceable, inexpensive Sub-Saver
- Completely heat-treated alloy for maximum durability

Drive Chucks & Sub Savers			
Navigator D7x11, D7x11 Series II	Part #	Navigator D24x40, D24x40 Series II	Part #
Complete chuck – flange, sub-saver, glue Sub-Saver for Depot flange on D7x11 Sub-Saver for D7x11 Series II Flange only	VC-31M-CM VS-31M-31F VS-31M-32F VF-31M-FO	Complete chuck – flange, sub-saver, glue Complete chuck – flange, long-saver, glue Sub-Saver for D24x40 (s/n 383 and lower), 5-1/2" long Long Sub-Saver for D24x40, 7" long (s/n 384 and higher) Extra long Sub-Saver for D24x40 Series II, 9-1/2" long Flange only	VC-40M-CM VCL-40M-CM VS-40M-40F VSL-40M-40F VSXXL-40M-40F VF-40M-FO
Navigator D10x15	Part #	Navigator D40x40	Part #
Complete chuck – flange, sub-saver, glue Sub-Saver for Depot flange Flange only	VCL-31M-CM VSL-31M-31F VF-31M-FO	Complete chuck – flange, sub-saver, glue Sub-Saver for Depot or Vermeer flange, 8-1/2" long Flange only	VCXL-40M-CM VSXL-40M-40F VF-40M-FO
Navigator D16x20	Part #	Navigator D50x100	Part #
Complete chuck – flange, sub-saver, glue Sub-Saver for Depot flange Flange only	VC-32M-CM VS-32M-32F VF-32M-FO	Complete chuck – flange, sub-saver, glue Sub-Saver for Depot flange Flange only	VC-50M-CM VS-80M-50M VF-80z-FO
Navigator D20x22	Part #	Navigator D50x100, D80x100 for 3-1/2" drill rod	Part #
Sub-Saver for Depot sub-saver	VS-30M-40F	Complete chuck – flange, sub-saver, glue Sub-Saver for Depot flange Flange only	VC-80M-CM VS-80M-80M VF-80F-FO
Navigator D24x26	Part #	Navigator D60x90	
Complete chuck – flange, sub-saver, glue Sub-Saver for Depot flange Flange only	VCL-30M-CM VSL-30M-30F VFL-30M-FO	Sub-saver for D60x90	VS-50M-50F



Glue Kit for Sub-Savers	
Glue Kit	Part #
Glue Kit	VF-GLUE

DELUXE QUICK-DISCONNECTS

VLR-40F-L43F Deluxe Quick-Disconnect for D24x40a



■ Internal check valve

Over
15,000
Sold & Counting

Deluxe Quick-Disconnects	
Navigator D7x11, D10x15	Part #
2" Hex Quick-Disconnect for D7x11, D10x15	VLR-31F-L42F-XL
Navigator D16x20, D18x22	Part #
2-1/2" Hex Quick-Disconnect for D16x20, D18x22	VLR-32F-L43F
Navigator D24x26	Part #
2-1/2" Hex Quick-Disconnect for D24x26	VLR-30F-L43F-XL
Navigator D20x22	Part #
2-1/2" Hex Quick-Disconnect for D20x22	VLR-30F-L43F-XXL
Navigator D24x40a	Part #
2-1/2" Hex Quick-Disconnect D24x40a	VLR-40F-L43F

- Completely heat-treated alloy for maximum durability
- Spiraled carbide studs to minimize wear on quick-disconnect and collar
- Internal check valve to minimize clogging
- 1/2" bolt retains slide collar

VALUE QUICK-DISCONNECTS

- Completely heat-treated alloy for maximum durability at a value price
- 1/2" bolt retains slide collar

VLRV-30F-L43F-XL Value Quick-Disconnect for D24x26



Value Quick-Disconnects	
Navigator D16x20, D18x22	Part #
2-1/2" Hex Quick-Disconnect for D16x20, D18x22	VLRV-32F-L43F
Navigator D24x26	Part #
2-1/2" Hex Quick-Disconnect for D24x26	VLRV-30F-L43F-XL
Navigator D20x22	Part #
2-1/2" Hex Quick-Disconnect for D20x22	VLRV-30F-L43F-XXL
Navigator D24x40a	Part #
2-1/2" Hex Quick-Disconnect for D24x40a	VLRV-40F-L43F
Navigator D33x44	Part #
2-1/2" Hex Quick-Disconnect D33x44 w/FS2	VLRV-33F-L43F

WHEN IT COMES TO COLLARS, BORZALL GIVES YOU A CHOICE

- Extra-heavy wall thickness
- Completely heat-treated alloy for maximum durability
- Available with carbide studs or hardfacing for maximum wear life



VLR-25-HC 2-1/2" Hex Collar

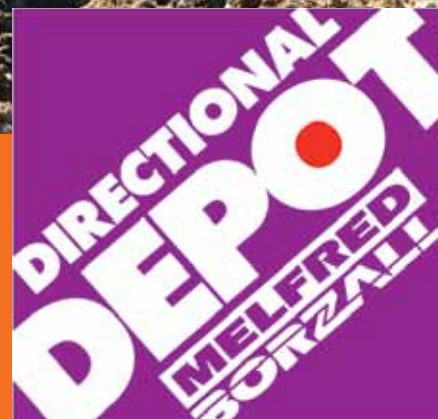


VLR-20-HC-HFC 2" Chunky Carbide Hardfaced Hex Collar

Collars	
Hex Slide Collars for Vermeer	Part #
2" Hex Collar for D7x11, D10x15	VLR-20-HC
2" Chunky Carbide Hardfaced Hex Collar for D7x11, D10x15	VLR-20-HC-HFC
2" Carbide Hex Collar for D7x11, D10x15	VLR-20-HC-C
2-1/2" Hex Collar for D16x20, D24x26, D24x40, D40x40, D18x22, D20x22	VLR-25-HC
2-1/2" Chunky Carbide Hardfaced Collar for D16x20, D24x26, D24x40, D40x40, D18x22, D20x22	VLR-25-HC-HFC
2-1/2" Carbide Collar for D16x20, D24x26, D24x40, D40x40, D18x22, D20x22	VLR-25-HC-C



GIVE YOUR DITCH WITCH DRILL THE **BORZALL** **EDGE**



All the tools you need to get the maximum production out of your Ditch Witch drill rig. Housings, bits, quick-disconnects and more. Get the gear. Get the edge. Melfred Borzall knowledge.



SIDE-LOAD, BOLT-ON TRANSMITTER HOUSINGS

*Designed for Ditch Witch Subsite Beacon®**

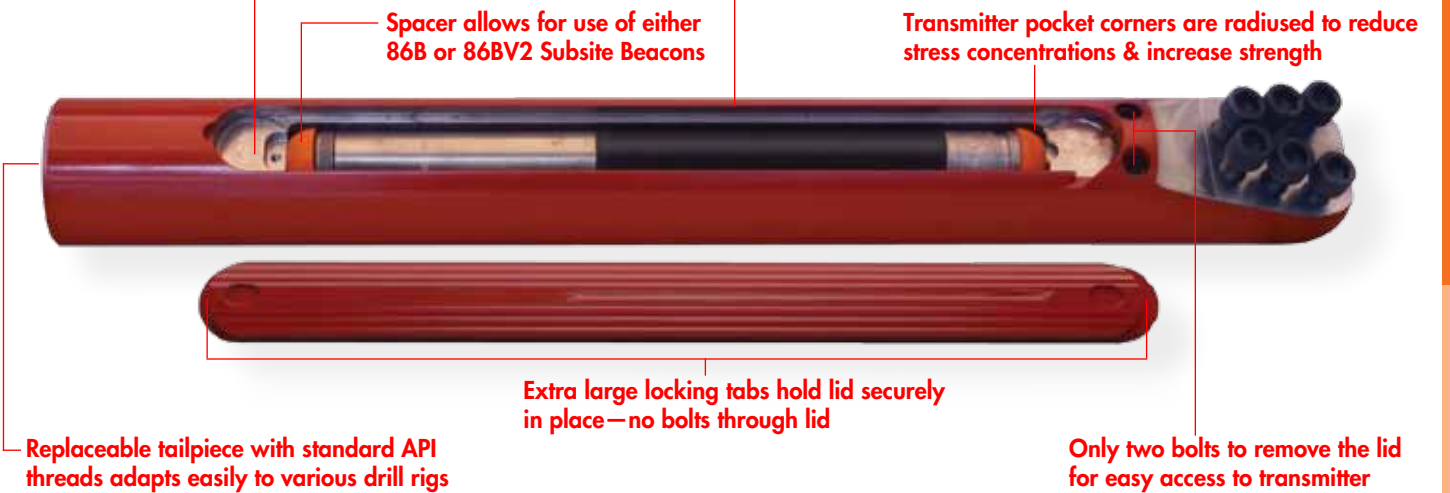
*Works with 86B and 86BV2 Beacons

3935-HD-15 Bolt-on, 6-hole blade style housing, 3-1/2" diameter
Perfect for JT2720, JT2720 Mach1, JT3020, JT4020, JT4020 Mach1

Engraved batch number and part number for traceability and identification

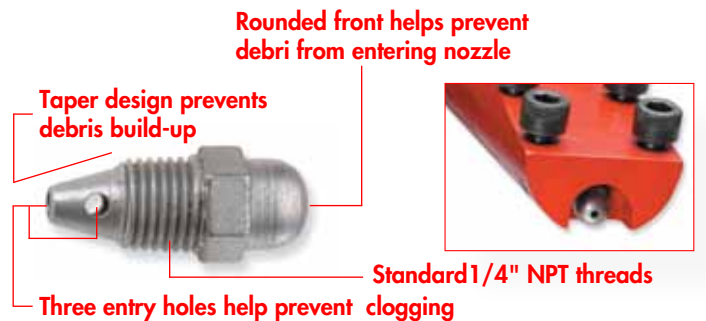
Made from chrome-nickel-moly alloy steel for maximum strength

ALL
NEW
BORZALL
HOUSING DESIGN



- Heat-treated, chrome-nickel-moly alloy steel for maximum strength and durability—the same high strength, fatigue resistant steel used in landing gears and propeller shafts
- Removable, replaceable tail-piece increases life of housing while standard API threads adapt easily to various rigs
- Epoxied lid slots help prevent debris from entering the housing
- Incorporates the Super Nozzle designed to minimize clogging
- Bolt holes are thread milled, not tapped, allowing more threads to engage for a stronger connection

SUPER NOZZLE
Made with heat-treated alloy for maximum wear life



Borzall housing and Ultra bit ready to help out a Ditch Witch JT2020.zzzzz



"Fast Ship"—Orders for in-stock items placed before 6 p.m. EST ship the same day.

To place an order or find a dealer **800-833-1252**

Fax 24 hours a day: **805-614-9548**

www.melfredborzall.com



3932-HD2-15 Bolt-on, 6-hole blade style housing, 3-1/4" diameter *Perfect for Ditch Witch JT2020, JT2720, JT2720 Mach1*

ALL NEW BORZALL HOUSING DESIGN



3927-HD-14 Bolt-on, 5-hole blade style housing, 2-3/4" diameter *Perfect for Ditch Witch JT920, JT920L, JT921, JT922, JT1220, JT2020, JT1720, JT1720 Mach1*

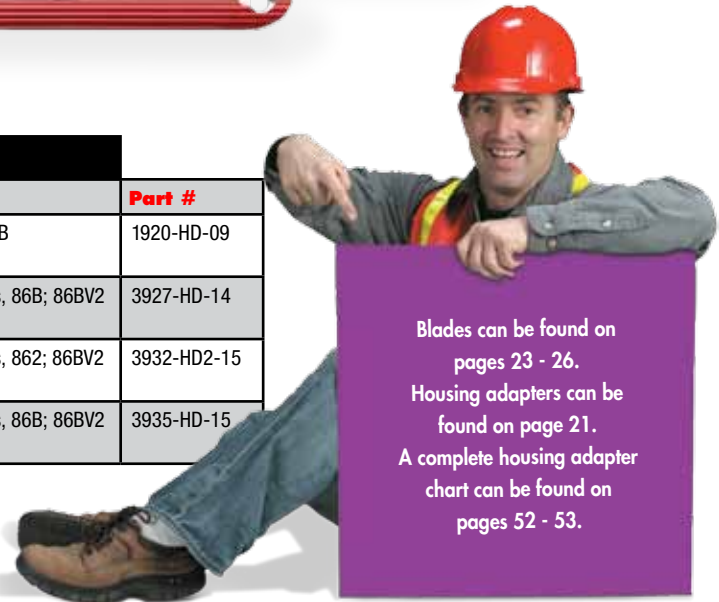
ALL NEW BORZALL HOUSING DESIGN



1920-HD-09 Bolt-on, 3-hole blade style housing, 2" diameter *Perfect for Ditch Witch JT520, JT5*



Transmitter Housings for Subsite Beacons		
Drill Rig Model	Configuration	Part #
JT520 mini Subsite beacon (88B), JT5	2" dia. side-load, for 3-hole blades, 88B 1.21"-6 box X Ditch Witch 3-bolt	1920-HD-09
JT920, JT920L, JT921, JT922, JT1220, JT1720, JT1720 Mach1, JT2020	2-3/4" dia. side-load, for 5-hole blades, 86B; 86BV2 2" IF box X Ditch Witch 5-bolt	3927-HD-14
JT2020, JT2720, JT2720 Mach1	3-1/4" dia. side-load, for 5-hole blades, 862; 86BV2 2-3/8" API-R box X Ditch Witch 6-bolt	3932-HD2-15
JT2720, JT2720 Mach1, JT3020, JT4020, JT4020 Mach1	3-1/2" dia. side-load, for 6-hole blades, 86B; 86BV2 2-3/8" API-R box X Ditch Witch 6-bolt	3935-HD-15



Blades can be found on pages 23 - 26.
Housing adapters can be found on page 21.
A complete housing adapter chart can be found on pages 52 - 53.

SIDE-LOAD, SCREW-ON TRANSMITTER HOUSINGS
Designed for Ditch Witch Subsite Beacon®

3932-HD2 Screw-on bit style housing, 3-1/4" diameter *Perfect for JT2720, JT2720 Mach1*



- Heat-treated, chrome-nickel-moly alloy steel for maximum strength and durability—the same high strength, fatigue resistant steel used in landing gears and propeller shafts
- Removable, replaceable tail-piece increases life of housing while standard API threads adapt easily to various rigs
- Epoxied lid slots help prevent debris from entering the housing
- Versatile housings can be used with Eagle Claw or Iron Fist (page 33)
- Use with the Bolt-On Bit Body (See page 21)
- Accommodates Subsite* Beacons 86B, 86BH, 86BG, 86BV2
- Bolt holes are thread milled, not tapped, allowing more threads to engage for a stronger connection
- Engraved batch number to trace material, heat-treat, and manufacturing date; engraved part number for identification

All MBI steels are sourced only from US steel mills.
Heat-treated to MBI specs to meet toughness & strength requirements of HDD.
Straight through gundrilled hole results in less clogging and easy cleanout. No cross-drilled or welded passages to leak

3935-HD Screw-on bit style housing, 3-1/2"z diameter *Perfect for JT2720, JT2720 Mach1, JT3020, JT4020, JT4020 Mach1*



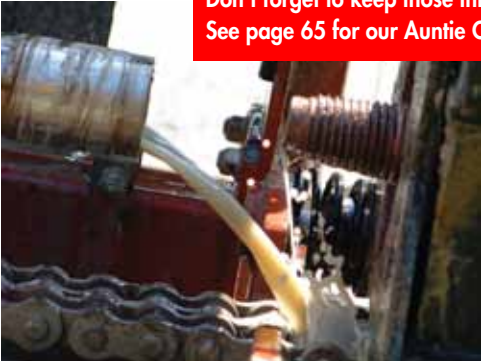
3927-HD Screw-on bit style housing, 2-3/4" diameter *Perfect for JT920, JT920L, JT921, JT922, JT1220, JT1720, JT2020*



3942-HU Screw-on bit style housing, 4-1/4" diameter *Perfect for JT7020, JT8020 Mach1*



Transmitter Housings for Subsite Beacons		
Drill Rig Model	Configuration	Part #
JT920, JT920L, JT921, JT922, JT1220, JT1720, JT2020	2-3/4" dia. side-load, screw-on bit, 86B; 86BV2 2" IF box X 2" IF box	3927-HD
JT2720, JT2720 Mach1	3-1/4" dia. side-load, screw-on bit, 86B 2-3/8" API-R box X 2-3/8" API-R box	3932-HD2
JT3020, JT4020, JT4020 Mach1	3-1/2" dia. side-load, screw-on bit, 86B 2-3/8" API-R box X 2-3/8" API-R box	3935-HD
JT7020, JT8020 Mach1	4-1/4" dia., side-load, screw-on bit, 86B 2-7/8" IF box (rear) X 2-7/8" API-R box (front)	3942-HU



Don't forget to keep those threads clean and lubed.
See page 65 for our Auntie C's premium thread lube.



Tough conditions?
Check out the Iron Fist on page 33.
Specifically designed for cobble conditions.

Borzall housing and Iron Fist bit on a JT3020 ready to start the bore.

TRANSMITTER HOUSING ADAPTERS

For all Melfred Borzall Housings*

*Same adapters can also be used with Melfred Borzall reamers on pages 42-50.

- Extends the life of your transmitter housing
- Don't throw away your housing just because the threads are worn out
- Allows different threads to be used on a single housing

23M-L54F Housing adapter to EZ-Connect 2



Transmitter Housing Adapters		
1920 Style Housing Drill Rig Model	Connection	Part #
JetTrac JT520	EZ Connect 2 starter rod x taper thread pin	05M-L52F
3927 Style Housings Drill Rig Model	Connection	Part #
JetTrac JT920, JT920L, JT921, JT922	EZ Connect 2 starter rod x 2" IF pin	21M-L55F
JetTrac JT1220	EZ Connect 2 starter rod x 2" IF pin	21M-L58F
JetTrac JT1720, JT2020	EZ Connect 2 starter rod x 2" IF pin	21M-L54F
JetTrac JT920, JT921, JT922	Direct to drill rod thread x 2" IF pin	21M-01M
JetTrac JT1220	Direct to drill rod thread x 2" IF pin	21M-34M
JetTrac JT2020, JT2720	Direct to drill rod thread x 2" IF pin	21M-35M
JetTrac JT1720	Direct to drill rod thread x 2" IF pin	21M-86M
3932, 3935 Style Housings Drill Rig Model	Connection	Part #
JetTrac JT2720	EZ Connect 2 starter rod x 2-3/8" API-R pin	23M-L54F
JetTrac JT2720 Mach1	EZ Connect 2 starter rod x 2-3/8" API-R pin	23M-L56F
JetTrac JT3020 Mach1	EZ Connect 3 starter rod x 2-3/8" API-R pin	23M-L59F
JetTrac JT4020, 4020 Mach 1	EZ Connect 2 starter rod x 2-3/8" API-R pin	23M-L57F
JetTrac JT2020, JT2720	Direct to drill rod thread x 2-3/8" API-R pin	23M-35M
JetTrac JT2720 Mach1, JT 3020 Mach1	Direct to drill rod thread x 2-3/8" API-R pin	23M-36M
JetTrac JT4020	Direct to drill rod thread x 2-3/8" API-R pin	23M-42M
JetTrac JT4020 Mach 1	Direct to drill rod thread x 2-3/8" API-R pin	23M-43M
3942 Style Housing Drill Rig Model	Connection	Part #
JetTrac JT7020, JT8020 Mach 1	Direct to drill rod thread x 2-7/8" IF pin	27M-72M



BOLT-ON BIT BODIES FOR SCREW-ON BIT STYLE HOUSINGS

- Allows blades to be used on Thread-On style and High Flow housings
- Incorporates the Super Nozzle designed to minimize clogging



1932-15 6-bolt Ditch Witch bolt-on bit body

Bolt-On Bit Bodies			
Description	Thread	Housing	Part #
5-bolt Ditch Witch, 12mm bolt	2" IF pin	3927-HD	1927-14
5-bolt Ditch Witch, 12mm bolt	2-3/8" API-R pin	3932-HD2, D285, D287	1932-14
6-bolt Ditch Witch, 16mm bolt	2-3/8" API-R pin	3932-HD2, 3935-HD, D287	1932-15
6-bolt Ditch Witch, 20mm bolt	2-7/8"z API-R pin	3942-HU, ELH-425	1942-25

Other bolt patterns and threads can be special ordered.

Melfred Borzall offers a variety of replacement bolts for your blades and housings.
Call for complete selection.



BOLT ON BLADES FOR DITCH WITCH®

Designed to use directly on Bolt-On Housings or Thread-On Housings with the Bolt-On Bit Body*

*Bolt-On Bit Body found on page 21.

- Borzall Carbide faced bits grind through the toughest ground conditions
- Designed for low wear and long use
- Bits for every soil condition



BLADE SELECTION CHARTS

To use the blade charts, find the hole pattern for your machine and sonde housing on the first chart. Use the second chart to find the blade style for your particular soil conditions. Generally, larger blades work better in softer soils and smaller blades work better in harder soils.

SOIL CONDITION	1ST CHOICE BLADE	2ND CHOICE BLADE
Sand	Excalibur	Chunky
Sand with cobbles	Steep Taper UltraBit 3	UltraBit 3
Sandstone	UltraBit 3	Bear Claw
Sticky clay	Excalibur	UltraBit 3
Clay with cobbles	Steep Taper UltraBit 3	UltraBit 3
Hardpan	Steep Taper UltraBit 3	Bear Claw
Shale	UltraBit 3	Bear Claw
Caliche	UltraBit 3	Steep Taper UltraBit 3
River rock	Steep Taper UltraBit 3	Bear Claw
Glacial til	Excalibur	UltraBit 3
Sandy loam	Excalibur	ValuBlade

Pattern #	Machine	# Holes	Bolt Size
-09	Ditch Witch JT520	3	10mm
-14	Ditch Witch JT920, JT920L, JT922, JT1220, JT1720, JT2020, JT2720 (some),	5	12mm
-15	Ditch Witch JT2720 (some) JT3020, JT4020 (some)	6	16mm
-25	Ditch Witch JT4020 (some) JT4020 Mach1, JT7020, JT8020, JT100	6	20mm

EXCALIBUR

For rocky and abrasive soil conditions

- Carbide button bits grind through tough ground conditions
- Bullnose design minimizes drag while rotating
- Strategically placed carbides along side give this blade a long, productive life

1600-09-25-BBX 2.5" Excalibur



1600-15-40-BBX 4"z Excalibur



Excalibur bit ready to start the bore.

Excalibur	
2-1/2" Cut - Bolt Pattern	Part #
3-hole Ditch Witch for 10mm bolt	1600-09-25-BX
3-1/2" Cut - Bolt Pattern	Part #
5-hole Ditch Witch for 12mm bolt	1600-14-35-BBX
4" Cut - Bolt Pattern	Part #
5-hole Ditch Witch for 12mm bolt	1600-14-40-BBX
6-hole Ditch Witch, for 16mm bolt	1600-15-40-BBX
5" Cut - Bolt Pattern	Part #
5-hole Ditch Witch for 12mm bolt	1600-14-50-BBX
6-hole Ditch Witch, for 16mm bolt	1600-15-50-BBX

Out-performs the competition hands down!



ULTRA BIT 3

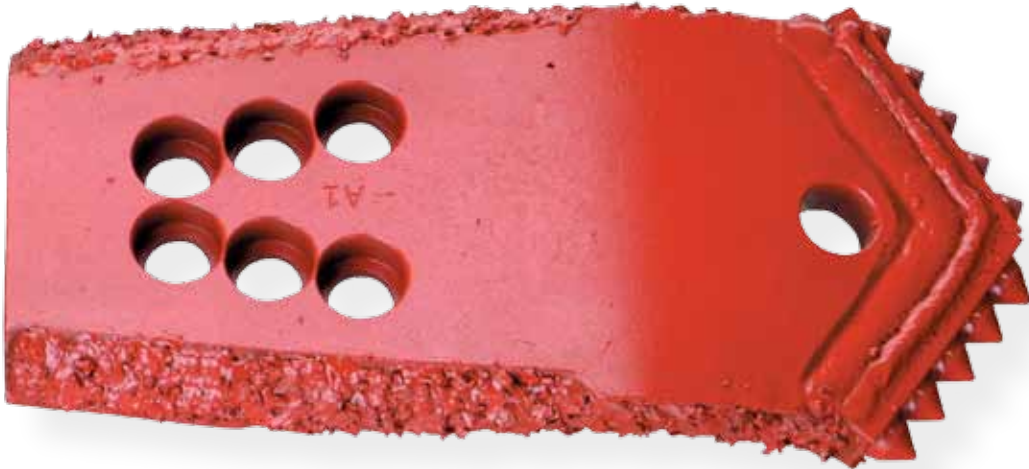
For hard, compact soil and gravel

UltraBit 3	
4" Cut - Bolt Pattern	Part #
5-hole, Ditch Witch for 12mm bolt	1600-14-40-BBU3
6-hole, Ditch Witch for 16mm bolt	1600-15-40-BBU3
5" Cut - Bolt Pattern	Part #
5-hole, Ditch Witch for 12mm bolt	1600-14-50-BBU3
6-hole, Ditch Witch for 16mm bolt	1600-15-50-BBU3
6" Cut - Bolt Pattern, 1" Thick	Part #
6-hole, Ditch Witch for 20mm bolt	1610-25-60-BBU3

- Conical carbide cutters provide an aggressive cutting action and are designed to be "rocked" back and forth for steering in hard, compact ground
- Large granules of tungsten carbide embedded in hardfacing along entire length of blade maximizes bit longevity
- Low-profile, tapered design to minimize torque stealing drag
- Conical carbide cutters provide an aggressive cutting action and are designed to be "rocked" back and forth for steering in hard, compact ground
- Low-profile, tapered design to minimize torque stealing drag

1600-15-50-BBU3 5" UltraBit 3

Check out our new Blade Pulling Eye. Easily bolts on to any Borzall blade for direct pullbacks. See page 63 for more information.



STEEP TAPER ULTRA BIT 3

For hard, compact soil and gravel

Steep Taper UltraBit 3	
4" Cut - Bolt Pattern	Part #
5-hole, Ditch Witch for 12mm bolt	1600-14-40-BSU3
6-hole, Ditch Witch for 16mm bolt	1600-15-40-BSU3
5" Cut - Bolt Pattern	Part #
5-hole, Ditch Witch for 12mm bolt	1600-14-40-BSU3
6-hole, Ditch Witch for 16mm bolt	1600-15-50-BSU3

- Hardfacing over weld prevents weld from prematurely washing out in abrasive conditions
- Conical carbide cutters provide an aggressive cutting action and are designed to be "rocked" back and forth for steering in hard, compact ground
- Center cutter and pointed design enable this bit to "wobble" through cobblestones and penetrate hard compact soil
- Large granules of tungsten carbide embedded in hardfacing along entire length of blade maximizes bit longevity
- Low-profile, tapered blade body is designed to minimize torque stealing drag
- Bit of choice for ground where it is hard to do directional "pushes"
- Hole for attaching Quick-Swivel or shackle for direct pullbacks

1600-14-40-BSU3 4" Steep Taper UltraBit 3



BEAR CLAW

For hard, rocky soil conditions

- The King of the Beasts uses large conical carbide cutters to eat through shale, sandstone and other tough conditions
- Hardfacing along all wear edges makes this one long lasting blade

1600-14-40-BBBC 4" Bear Claw



Bear Claw	
3-1/2" Cut - Bolt Pattern	Part #
5-hole, Ditch Witch for 12mm bolt	1600-14-35-BBBC
4" Cut - Bolt Pattern	Part #
5-hole, Ditch Witch for 12mm bolt	1600-14-40-BBBC
6-hole, Ditch Witch for 16mm bolt	1600-15-40-BBBC
5" Cut - Bolt Pattern	Part #
5-hole, Ditch Witch for 12mm bolt	1600-14-50-BBBC
6-hole, Ditch Witch for 16mm bolt	1600-15-50-BBBC



Applying hardfacing to the Ultra Bit 3 blades.



To place an order or find a dealer **800-833-1252**
Fax 24 hours a day: **805-614-9548**
www.melfredborzall.com



"Fast Ship"—Orders for in-stock items placed before 6 p.m. EST ship the same day.

To place an order or find a dealer **800-833-1252**
Fax 24 hours a day: **805-614-9548**
www.melfredborzall.com



CHUNKY
For sand and sandy loams

- An economical and long lasting blade
- Cutting edges are impregnated with carbide chunks to resist wear
- Heat-treated steel for resistance to abrasive soils

Chunky	
2-1/2" Cut - Bolt Pattern	Part #
3-hole Ditch Witch for 10mm bolt	1600-09-25-BVC
3-1/2" Cut - Bolt Pattern	Part #
5-hole Ditch Witch for 12mm bolt	1600-14-35-BBVC
4" Cut - Bolt Pattern	Part #
5-hole Ditch Witch for 12mm bolt	1600-14-40-BBVC
6-hole Ditch Witch for 16mm bolt	1600-15-40-BBVC
5" Cut - Bolt Pattern, 1" Thick	Part #
6-hole Ditch Witch for 16mm bolt	1610-15-50-BBVC
6-hole Ditch Witch for 20mm bolt	1610-25-50-BBVC
6" Cut - Bolt Pattern, 1" Thick	Part #
6-hole Ditch Witch for 16mm bolt	1610-15-60-BBVC
6-hole Ditch Witch for 20mm bolt	1610-25-60-BBVC



1600-14-40-BBVC 4" Chunky



VALU-BLADE
For standard soil conditions

- Economical bit holds up through multiple bores
- Ideal bit for drilling in standard soil conditions
- Heat-treated steel for resistance to abrasive soils



1600-14-35-BBV 3.5" Valu-Blade

Valu-Blade	
2-1/2" Cut - Bolt Pattern	Part #
3-hole Ditch Witch for 10mm bolt	1600-09-25-BBV
3-1/2" Cut - Bolt Pattern	Part #
5-hole Ditch Witch for 12mm bolt	1600-14-35-BBVC
4" Cut - Bolt Pattern	Part #
5-hole Ditch Witch for 12mm bolt	1600-14-40-BBV
6-hole Ditch Witch for 16mm bolt	1600-15-40-BBV
5" Cut - Bolt Pattern, 1" Thick	Part #
6-hole Ditch Witch for 16mm bolt	1610-15-50-BBV
6-hole Ditch Witch for 20mm bolt	1610-25-50-BBV
6" Cut - Bolt Pattern, 1" Thick	Part #
6-hole Ditch Witch for 16mm bolt	1610-15-60-BBV
6-hole Ditch Witch for 20mm bolt	1610-25-60-BBV

DURABLE DRILL ROD AT UNBEATABLE PRICES
DESIGNED FOR USE WITH DITCH WITCH JET TRAC*

Depot Drill Rod to Fit Ditch Witch		
Rig Model	Rod Specifications	Part #
JetTrac JT520	O.A.L. 59" +/-0.25" 1.125" o.d. with 0.179" wall tubing 1.75" tool joint O.D. 110,000 psi yield strength, minimum 77.1" ft. bend radius	812-5-05
JetTrac JT920	O.A.L. 78.75" +/-0.25" 1.66" O.D. with 0.24" wall thickness 2.00" tool joint O.D. 135,000 psi yield strength, minimum 98.1" ft. bend radius	816-6-01a
JetTrac JT920L	O.A.L. 118.0" +/-0.25" 1.66" o.d. with 0.24" wall thickness 2.00" tool joint O.D. 135,000 psi yield strength, minimum 98.1" ft. bend radius	816-10-01a
JetTrac JT922	O.A.L. 72" +/-0.25" 1.66" O.D. with 0.24" wall thickness 2.00" tool joint O.D. 135,000 psi yield strength, minimum 98.1 ft. bend radius	817-6-01
JetTrac JT1220	O.A.L. 118.0" +/-0.25" 1.90" O.D. with 0.24" wall thickness 2.38" tool joint O.D. 135,000 psi yield strength, minimum 112.3 ft. bend radius	819-10-34
JetTrac JT1720	O.A.L. 118.0" +/-0.25" 2.063" O.D. with 0.27" wall thickness 2.50" tool joint O.D. 135,000 psi yield strength, minimum 121.9 ft. bend radius	820-10-86
JetTrac JT2020	O.A.L. 120.0" +/-0.25" 2.063" O.D. with 0.27" wall thickness 2.625" tool joint O.D. 135,000 psi yield strength, minimum 121.9 ft. bend radius	820-10-20
JetTrac JT2720	O.A.L. 118.0" +/-0.25" 2.375" O.D. with 0.28" wall thickness 2.75" tool joint O.D. 135,000 psi yield strength, minimum 140.4 ft. bend radius	824-10-35
JetTrac JT2720 Mach 1, JetTrac JT3020 Mach 1	O.A.L. 118.0" +/-0.25" 2.375" O.D. with 0.28" wall thickness 3.0" tool joint O.D. 135,000 psi yield strength, minimum 140.4 ft. bend radius	824-10-36
JetTrac JT4020	O.A.L. 177.2" +/-0.25" 2.875" O.D. with 0.36" wall thickness 3.25" tool joint O.D. 135,000 psi yield strength, minimum 170 ft. bend radius	828-15-42
JetTrac JT4020 Mach 1	O.A.L. 177.2" +/-0.25" 2.875" O.D. with 0.36" wall thickness 3.5" tool joint O.D. 135,000 psi yield strength, minimum 170 ft. bend radius	828-15-43
JetTrac JT7020, JT8020, JT100	O.A.L. 177.2" +/-0.25" 3.50" O.D. with 0.37" wall thickness 4.0" tool joint O.D. 135,000 psi yield strength, minimum 207 ft. bend radius	835-15-72



- **Material Selection:** Based on exhaustive research and years of experience in manufacturing drill rod, Premier Drill Pipe has chosen materials that are best suited for HDD applications, all made right here in the USA.

Lifetime Guarantee
against failure of any Inertia weld!

- **Inspection and Quality Control:** No other manufacturer does the detailed inspections and quality controls that Premier Drill Pipe does. Their QC tests include birnell hardness, dry mag particle inspection, wet mag, and visual thread inspections.



Don't forget a new Sub-Saver, page 28, and new Breakout Jaws, page 66, to go with that new drill rod!



DRIVE CHUCKS, SUB-SAVERS & QUICK-DISCONNECTS

Designed to use on Ditch Witch Jet Trac®

- Completely heat-treated alloy for maximum durability
- Precision gun-drilled and CNC machined



DLR3-36M-L59M Quick-Disconnect for JT3020



DLR2-34M-L58M Quick-Disconnect for JT1220



DLR2-86M-L54M Quick-Disconnect for JT1720

DIRECTIONAL DEPOT GIVES YOU A CHOICE

DL54-25-OC-HFC Chunky Carbide Hardfaced Collar (HFC)

- Hard face ring to reduce wear



All collars are not the same!

- Carbide studs greatly increase collar life



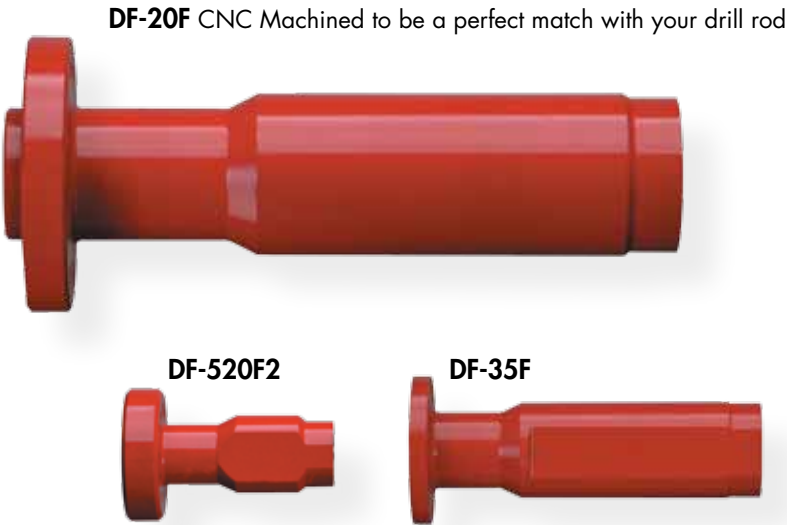
- Completely heat-treated alloy for maximum durability
- Extra-heavy wall thickness
- Available with carbide studs or hardfacing for maximum wear life

Collars	
Octagon Slide Collars for JetTrac	Part #
2" Chunky Carbide Hardfaced Collar for EZ-2 - JT920, JT920L, JT921	DL55-18-OC-HFC
1-1/2" Octagon Collar for EZ-2 - JT520	DL52-15-OC
2-1/4" Octagon Collar for EZ-2 - JT1220	DL58-22-OC
2-1/4" Chunky Carbide Hardfaced Collar for EZ-2 - JT1220	DL58-22-OC-HFC
2-1/4" Carbide Collar for EZ-2 - JT1220	DL58-22-OC-C
2-1/2" Octagon Collar for EZ-2 - JT1720, JT2020, JT2720	DL54-25-OC
2-1/2" Chunky Carbide Hardfaced Collar for EZ-2 - JT1720, JT2020, JT2720	DL54-25-OC-HFC
2-1/2" Carbide Collar for EZ-2 - JT1720, JT2020, JT2720	DL54-25-OC-C
2-3/4" Octagon Collar for EZ-2 - JT2720 Mach1	DL56-27-OC
2-3/4" Chunky Carbide Hardfaced Collar for EZ-2 - JT2720 Mach1	DL56-27-OC-HFC
2-3/4" Octagon Collar for EZ-3 - JT3020 Mach1	DL59-27-OC
2-3/4" Chunky Carbide Hardfaced Collar for EZ-3 - JT3020 Mach1	DL59-27-OC-HFC
3" Octagon Collar for EZ-2 - JT4020, JT4020 Mach1	DL57-30-OC
3" Chunky Carbide Hardfaced Collar for EZ-2 - JT4020, JT4020 Mach1	DL57-30-OC-HFC

DRIVE CHUCKS FOR DITCH WITCH DRILLS

- Direct replacement for the one that came with your JetTrac
- Completely heat-treated alloy for maximum durability
- CNC Machined to be a perfect match with your drill rod

Drive Chucks	
Drive Chucks for JetTrac	Part #
JT520 Version 2	DF-520F2
JT920, JT920L	DF-01AF
JT1720, JT1720 Mach 1	DF-86F
JT2020	DF-20F
JT2720	DF-35F
JT4020	DF-42F



EZ Quick-Disconnects	
EZ Quick-Disconnects for JetTrac	Part #
JT520, 1-1/2" Octagon Quick-Disconnect	DLR2-05M-L520M
JT920, JT920L, JT921, 2" Quick-Disconnect	DLR2-01AM-L55M
JT1220, 2-1/4" Quick-Disconnect	DLR2-34M-L58M
JT1720, 2-1/2" Quick-Disconnect	DLR2-86M-L54M
JT2020, 2-1/2" Quick-Disconnect	DLR2-20M-L54M
JT2720, 2-1/2" Quick-Disconnect	DLR2-35M-L54M
JT2720 Mach1, 2-3/4" Quick-Disconnect	DLR2-36M-L56M
JT3020 Mach1, 2-3/4" Quick-Disconnect	DLR3-36M-L59M
JT4020, 3" Quick-Disconnect	DLR2-42M-L57M
JT4020 Mach1, 3" Quick-Disconnect	DLR2-43M-L57M

Changing out worn sub-savers and drive chucks is an inexpensive and easy way to help get the maximum life out of your drill rod. If they are allowed to wear too much, then the drill rod thread will start to deform to the shape of the worn sub-saver threads. When attaching the drill rod to the sub-saver or chuck, be sure to torque it up to the correct pressure. And don't forget the Auntie C's thread lube!



To place an order or find a dealer **800-833-1252**
Fax 24 hours a day: **805-614-9548**
www.melfredborzall.com



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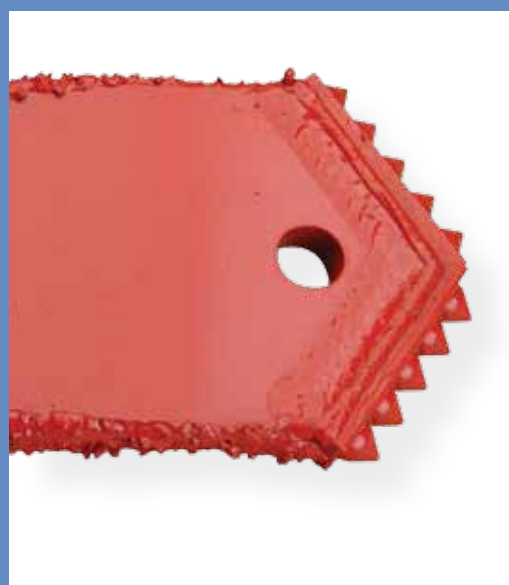
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GIVE YOUR ASTEC DRILL THE **BORZALL** *EDGE*



All the tools you need to get the maximum production out of your Astec drill rig. Housings, bits, quick-disconnects and more. Get the gear. Get the edge. Melfred Borzall knowledge.



MELFRED BORZALL TOOLS FOR ASTEC® RIGS

Tooling to make all current models more productive

Including DD65, DD1416, DD2024, DD3238, DD4045, DD9014.

We have the tools you need. At Directional Depot we offer a wide selection of tooling to go on your Astec directional drill rigs—from housings and blades to quick-disconnects and reamers.

Not sure of the best way to connect our tooling to your Astec

rig? Give one of our HDD tooling experts a call. We know all the connections used on the Astec rigs and can help in choosing the right tools. We can even help to standardized your tooling and connections to match your other drill rig brands.

HOUSINGS

- Made with heat-treated, chrome-moly alloy for maximum strength and durability
- Removable tail-piece increases longevity of the housing
- More slots for better signal strength and battery life

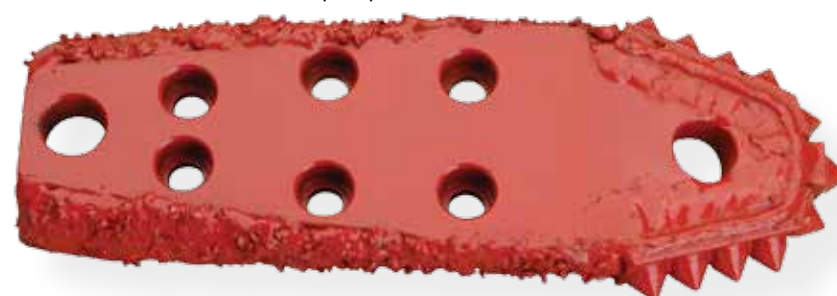
3632-HT Thread-on bit style housing, 3-1/4" diameter *Perfect for Astec DD3238, DD4045*



BITS & BLADES

- Carbide faced bits grind through the toughest ground conditions
- Specially designed for low wear and long use
- Bits for every soil condition

1600-13-40-BSU3 4" Steep Taper UltraBit 3



QUICK-DISCONNECTS

- Completely heat-treated alloy for maximum durability
- Internal check valve to minimize clogging
- Spiraled carbide studs to minimize wear on quick-disconnect and collar
- 1/2" bolt retains slide collar

ALR-38F-L43F Deluxe Quick-Disconnect for DD3238



PREMIUM QUALITY DURABLE DRILL ROD AND MORE *Call today to order drill rod for your Astec rig*



Not only are our tools manufactured to the highest standards, they are made "green" as well.

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GET THE
EDGE
WITH **BORZALL**
ROCK TOOLS

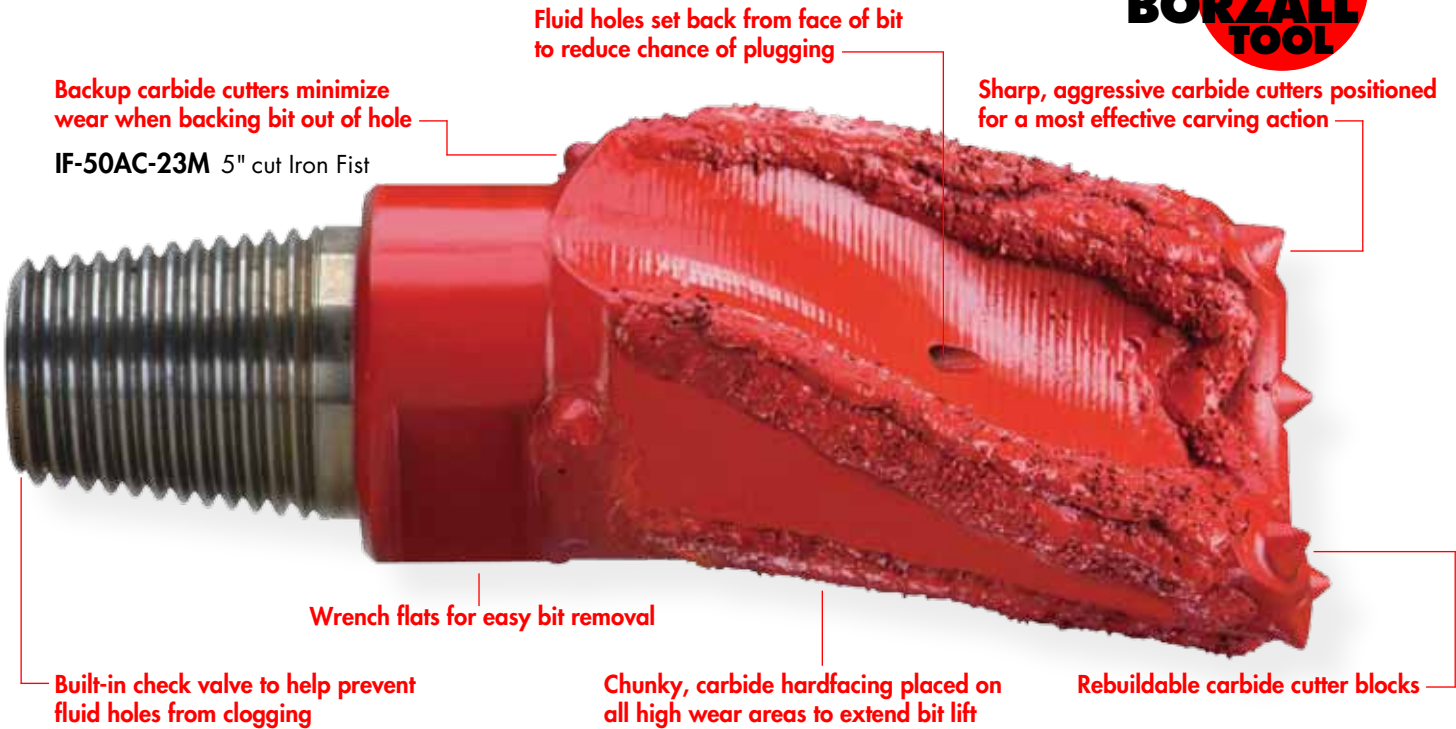


Don't let solid rock slow you down. Get the bits, mud motors and tools you need to get through the toughest conditions. Get the Edge. Melfred Borzall Knowledge.

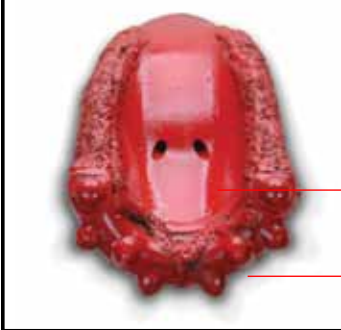


MELFRED BORZALL'S IRON FIST
Specifically designed for cobble conditions

ALL
NEW
BORZALL
TOOL



IF-50AC-23M 5" cut Iron Fist



Contoured steering face ideal for cobblestone conditions

Balanced cutters for downhole stability. Compact cutters are less likely to hang up on cobbles

Available in two styles

- AC**—Cutters are more conical to help fracture softer rock formations.
- DC**—Cutters are more rounded to help roll past the cobbles.

- Contoured design
- Wrench flats for easy removal
- Ideal for drilling in cobble conditions
- Balanced cutters for downhole stability
- Built-in check valve to minimize chance of clogging
- Compact cutters—less likely to hang up on cobbles
- 1/4" recessed water holes to prevent clogging
- Main carbide cutters positioned to allow for "rocking" the bit through rocks

Iron Fist			
Description	Thread	Aggressive Cutters Part #	Dome Cutters Part #
4-1/4" cut	2" IF Pin	IF-42AC-21M	IF-42DC-21M
5" cut	2-3/8" API-Reg Pin	IF-50AC-23M	IF-50DC-23M
5-1/2" cut	2-7/8" API-Reg Pin	IF-55AC-26M	IF-55DC-26M



Above: Melfred Borzall engineer examines the Iron Fist on the job site.
Below: Minimal wear on the Iron Fist after a 300 ft. bore in rocky soil conditions.



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MELFRED BORZALL

IRON FIST

MELFRED BORZALL'S EAGLE CLAW

#1 bit for hard, rocky soil conditions

- Unique balanced cutting design improves cutting efficiency
- Aggressive tri-tooth carbide cutting action gets through the hardest conditions
- Smooth running with minimal vibration to drill stem and drill rig
- Carbide buttons precisely placed to minimize wear on bit body
- Quick and easy change out of carbide cutter teeth
- Easily threads on to a side load or high flow housing
- Steering face has conical shape for quicker reaction to directional "pushes"
- Different tooth styles to accommodate a wide variety of job conditions

6-1/2" EAGLE CLAW

EC-65A1-28M 6-1/2" cut Eagle Claw
Perfect for Vermeer D80x120, D100x120;
Ditch Witch JT8020, JT100;
Astec DD8, DD10, DD9014, DD140

The Eagle Claw body is machined on state-of-the-art 5-axis, CNC mills, producing a bit with smooth, balanced drilling action; maximum steerability and minimal drag

Replaceable cutters are available in three different configurations, ensuring the right cutter for your specific job conditions

Back-up carbides minimize wear on bit body while pulling back out of the hole

Wrench flats for easy bit removal

Carbide buttons placed to minimize wear on the bit body, extend bit life, and help grind through tough ground

Straight-through knock-out holes make driving out and changing cutter teeth quick and easy

6-1/2" Eagle Claw		
For use with 80,000 to 150,000 lb. rigs, including: Vermeer D80x120, D100x120; Ditch Witch JT8020, JT100; Astec DD8, DD10, DD9014, DD140		
EC-65A1-28M — Use with the following housings: ELH-487 High Flow housing ;3748-HT; 3948-HD		
EC-65A1-26M — Use with the following housings: ELH-425 High Flow housing ;3742-HT; 3942-HD		
Description	Thread Size	Part #
6-1/2" Eagle Claw	3-1/2" API-R Pin	EC-65A1-28M
6-1/2" Eagle Claw	2-7/8" API-R Pin	EC-65A1-26M
6-1/2" Eagle Claw Replacement Cutters		
Description	Part #	
Standard conical carbide cutter	EC65A1-C-01	
Dome carbide cutter	EC65A1-C-02	
Large conical carbide cutter	EC65A1-C-03	

Replacement Cutters for 6-1/2" Eagle Claw



5-1/2" EAGLE CLAW

EC-55A1-26M 5-1/2" cut Eagle Claw
Perfect for Vermeer D50x100, D60x90, D80x100;
Ditch Witch JT4020 Mach 1, JT4020 AT, JT7020;
Astec DD5, DD6



Replacement Cutters for 5-1/2" Eagle Claw



5-1/2" Eagle Claw		
For use with 40,000 to 80,000 lb. rigs, including: Vermeer D50x100, D60x90, D80x100; Ditch Witch JT4020 Mach 1, JT4020, JT7020; Astec DD5, DD6		
EC-55A1-26M — Use with the following housings: 3742-HT, 3942-HD Side-load housings; ELM-425		
Description	Thread Size	Part #
5-1/2" Eagle Claw	2-7/8" API-R Pin	EC-55A1-26M
5-1/2" Eagle Claw Replacement Cutters		
Description	Part #	
Standard conical carbide cutter	EC55A1-C-01	
Dome carbide cutter	EC55A1-C-02	
Large conical carbide cutter	EC55A1-C-03	



Eagle Claw on the job site after a bore.



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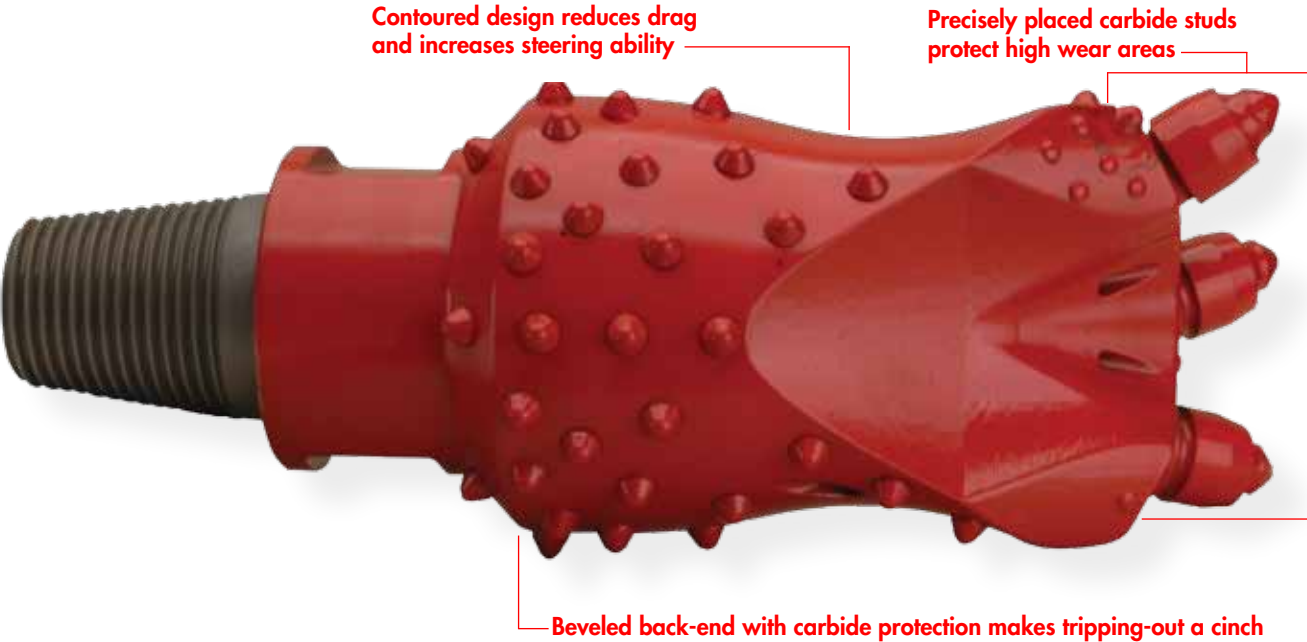
Not only are our tools manufactured to the highest standards, they are made "green" as well.

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5" EAGLE CLAW

EC-50C1-23M 5" cut Eagle Claw
Perfect for Vermeer D24x40, D24x40 Series 2, D33x44, D36x50, D40x40;
Ditch Witch JT2720, JT2720 Mach1, JT3020 Mach1, JT4020;
Astec DD1416, DD2024, DD3238, DD4045



Replacement Cutters for 5" Eagle Claw

EC50A1-C-01

EC50A1-C-02

EC50A1-C-03

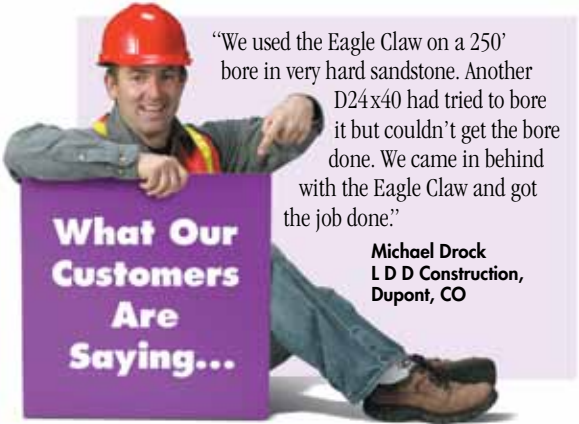
EC50A1-C-01-X



Cut-away shows large carbide tooth in the cutter

Carbide studs minimize wear on cutter and bit body

5" Eagle Claw		
For use with 24,000 to 40,000 lb. rigs, including: Vermeer D24x40, D24x40 Series 2, D33x44, D36x50, D40x40; Ditch Witch JT2720, JT2720 Mach1, JT3020 Mach1, JT4020; Astec DD3238, DD4045		
EC-50A1-26M — Use with the following housings: 3632-HT, 3932-HD Side-Load housings; D285, D287 High-Flow housings		
Description	Thread Size	Part #
5" Eagle Claw	2-3/8" API-R Pin	EC-50C1-23M
5" Eagle Claw Replacement Cutters		
Description	Part #	
Standard conical carbide cutter	EC50A1-C-01	
Lead conical cutter with extra carbide studs	EC50A1-C-01-X	
Dome carbide cutter	EC50A1-C-02	
Large conical carbide cutter	EC50A1-C-03	



"We used the Eagle Claw on a 250' bore in very hard sandstone. Another D24x40 had tried to bore it but couldn't get the bore done. We came in behind with the Eagle Claw and got the job done."

Michael Drock
L D D Construction,
Dupont, CO

4-1/4" EAGLE CLAW

EC-42A1-23M 4-1/4" cut Eagle Claw
Perfect for Vermeer D16x20a, D18x22, D20x22, D24x26, D24x40;
Ditch Witch JT1720, JT2020, JT2720;
Astec DD1416, DD2024



4-1/4" Eagle Claw		
For use with 18,000 to 25,000 lb. rigs, including: Vermeer D16x20a, D18x22, D20x22, D24x26, D24x40; Ditch Witch JT1720, JT2020, JT2720; Astec DD1416, DD2024		
EC-42A1-23M — Use with the following housings: 3632-HT, 3932-HD Side-load housings; D285 High-flow housing		
EC-42A1-21M — Use with the following housings: 3627-HT, 3927-HD Side-load housings		
Description	Thread Size	Part #
4-1/4" Eagle Claw	2-3/8" API-R Pin	EC-42A1-23M
4-1/4" Eagle Claw	2" IF Pin	EC-42A1-27M
4-1/4" Eagle Claw Replacement Cutters		
Description	Part #	
Standard conical carbide cutter	EC42A1-C-01	
Dome carbide cutter	EC42A1-C-02	
Large conical carbide cutter	EC42A1-C-03	

Replacement Cutters for 4-1/4" Eagle Claw

EC42A1-C-01

EC42A1-C-02

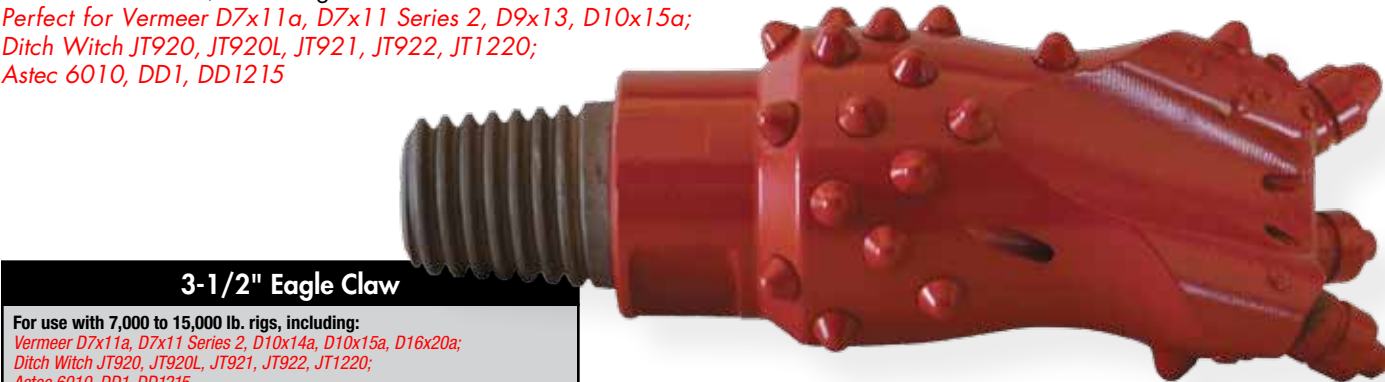
EC42A1-C-03



Perfect size for Ditch Witch JT2020, Vermeer D20x22, Astec DD2024.

3-1/2" EAGLE CLAW

EC-35A1-21M 3-1/2" cut Eagle Claw
Perfect for Vermeer D7x11a, D7x11 Series 2, D9x13, D10x15a;
Ditch Witch JT920, JT920L, JT921, JT922, JT1220;
Astec 6010, DD1, DD1215



3-1/2" Eagle Claw		
For use with 7,000 to 15,000 lb. rigs, including: Vermeer D7x11a, D7x11 Series 2, D10x14a, D10x15a, D16x20a; Ditch Witch JT920, JT920L, JT921, JT922, JT1220; Astec 6010, DD1, DD1215		
EC-35A1-21M — Use with the following housings (10,000 lb. rig or smaller): 3625-HT, 3927-HD Side-load housings		
Use with the following housings (10,000 to 20,000 lb. rigs): 3627-HT, 3927-HD Side-load housings		
Description	Thread Size	Part #
3-1/2" Eagle Claw	2" IF Pin	EC-35A1-21M
3-1/2" Eagle Claw Replacement Cutters		
Description	Part #	
Standard conical carbide cutter	EC35-C-01	
Dome carbide cutter	EC35-C-02	

Replacement Cutters for 3-1/2" Eagle Claw

EC35A1-C-01

EC35A1-C-02



ROCK-IT MUD MOTORS

Built for HDD performance

- High performance mud motor designed specifically for HDD
- Can be operated at a slower speed that is more compatible with tri-cone bits
- High torque to flow ratio means you get more drilling power with less fluid
- High quality internal parts results in more drilling time before regular maintenance is required

ROCK-IT MUD MOTOR RENTALS

1. Fixed, known rental price – no hidden fees! Know what your costs are up front
2. Just 1 weekly rental charge. That’s it. No hidden costs or surprise repair bills
3. Rent the tool for as little as one week
4. Rental period starts from the time you receive the tool, not from when it is shipped
5. Rental period ends from the time you ship the tool back, not from when we actually receive the tool



Rock-It Mud Motors							
Standard Sizes	3" 5/6 Lobe	3-1/2" 6/7 Lobe	3-3/4" 5/6 Lobe	4-3/4" 5/6 Lobe	5" 7/8 Lobe	6-3/4" 7/8 Lobe	8-1/2" 7/8 Lobe
Torque Rating	250 ft-lbs	325 ft-lbs	1200 ft-lbs	1200 ft-lbs	2500 ft-lbs	5,000 ft-lbs	5,000 ft-lbs
Rotational Speed	80-346 rpm	70-240 rpm	200-400 rpm	180-370 rpm	105-230 rpm	70-150 rpm	70-150 rpm
Length	9-1/2 ft	13-3/4 ft	12-1/2 ft	12-1/2 ft	13 ft	16 ft	16.5 ft
Weight	175 lbs	290 lbs	450 lbs	650 lbs	700 lbs	1,500 lbs	2,000 lbs
Flow Requirements (@ 1000 psi)	20-60 gpm	40-100 gpm	100-170 gpm	100-170 gpm	140-300 gpm	200-500 gpm	200-500 gpm
Operating Range	350 psi	500 psi	350 psi	350 psi	600 psi	500 psi	500 psi
Recommended Bit Size	3-7/8" to 4-1/2"	4-1/2" to 5-1/2"	5-1/4" to 6-1/4"	6" to 7-7/8"	6" to 7-7/8"	8-3/4" to 9-7/8"	10-5/8" to 12-1/4"
Recommended Drill Rig	D24x40 D33x44 D40x40 JT2720 Mach 1 JT2720 DD3238	D36x50 D40x40 JT3020 Mach1 JT4020 Mach1 JT4020 DD4 DD4045	D50x100 D55x100 D60x90	D80x100; JT7020 Mach 1 D60x90 DD6	D80x120 D100x120 JT8020 Mach 1 JT100 Mach 1 DD10 DD140B DD9014	Maxi-Rigs	Maxi-Rigs

Mud Motors available in more sizes and configurations than listed above. Call for more information.

INCREDIBLE RENTAL AND PURCHASE PRICES.
NO HIDDEN FEES AND NO SURPRISE CHARGES.



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HIGH-FLOW TRANSMITTER HOUSING

Ideal to use with your mud motor

The new Borzall End-Load, High Flow Housings are a perfect match for your next rock job when utilizing a mud motor or air hammer. It has the design, strength, and flow capacity to handle the toughest rock bores.

ELH-425 4-1/4" diameter High-Flow Housing
Perfect for Mud Motors, Eagle Claw bits, Iron Fist bits and Bolt-On Bit Bodies

Standard API threads allow for easy adapting to various drill rigs

Made with heat-treated, chrome-nickel-moly alloy steel for maximum strength and durability

Long, fully epoxied slots allow for maximum signal strength from all walk-over locating system transmitters

Multiple, straight-through fluid ports provide maximum flow without pressure restrictions making it ideal for mud motors

Shock absorbing stainless steel springs in front and back minimizes transmitter vibration allowing the housing to be used with air hammers

Tapered battery cap keeps transmitter perfectly centered in housing

Housing design accomodates all walk-over locating system transmitters, including cable-transmitters

Simple, stainless steel retaining plug utilizes roll calibration from the receiver making it easy to time the transmitter to the mud motor or bit steering face

- Heat-treated, chrome-nickel-moly alloy steel for maximum strength and durability—the same high strength, fatigue resistant steel used in landing gears and propeller shafts

- Multiple fluid passages allow for maximum flow without pressure restrictions
- End-load design for maximum torsional, compressive, and bending strength
- Simple, interchangeable internal mechanism allows the same housing to be used with most locating systems
- Accommodates Digitrak 2-cell, 4-cell, and cable transmitters (Mark V systems and newer); Subsite 86B, 86BV2 beacons
- For rigs from 20,000 to 160,000+ lbs. thrust
- Stainless steel springs support and cushion the transmitter allowing it to be used with air hammers, as well as mud motors
- Can be used with Mud Motors, Eagle Claw bits, Iron Fist bits and Bolt-On Bit Bodies

High-Flow Housings		
Description	Housing Threads	Part #
3-1/2" dia. housing, For rigs from 20,000 - 50,000 lbs. thrust	2-3/8" API Reg box front and rear	ELH-350
4-1/4" dia. housing, For rigs from 50,000 - 100,000 lbs. thrust	2-7/8" API Reg box front 2-7/8" IF box rear	ELH-425
4-7/8" dia. housing, For rigs from 100,000 - 160,000 lbs. thrust	3-1/2" API Reg box 3-1/2" IF box rear	ELH-487
6-3/8" dia. housing, For rigs from 160,000 lbs. & up thrust	4-1/2" API Reg box front 4-1/2" IF box rear	ELH-638

The new ELH High-Flow Housing can be used with Borzall's new Iron Fist Bit, Eagle Claw, Bolt-On Bit Bodies and Mud Motors.



ELH High-Flow Housing accommodates Digitrak 2-cell, 4-cell, and cable transmitters (Mark V systems and newer); Subsite 86B and 86BV2 beacons.



SANDVIK® TRI-CONE ROCK BITS

Ideal for drilling in solid rock

SANDVIK HDS+ SERIES HDD BITS

- Designed specifically for HDD applications in rock up to 30,000 psi
- Tungsten carbide inserts available in a variety of tooth profiles
- Maximum gage and leg protection for a longer bit life
- Sealed friction bearing system

1538-HDSP-55 Tri-Cone Bit

Smith HDS+ Series HDD Rock Bits			
Diameter	Thread Size	Formation Type	Part #
3-7/8"	2-3/8" API-Reg	Soft to Medium/Hard	1538-HDSP-55
4-3/4"	2-7/8" API-Reg	Soft to Medium/Hard	1547-HDSP-58
5-1/2"	2-7/8" API-Reg	Soft to Medium/Hard	1555-HDSP-55
6-1/2"	3-1/2" API-Reg	Soft to Medium/Hard	1565-HDSP-70
7-7/8"	4-1/2" API-Reg	Soft to Medium/Hard	1578-HDSP-95
8-3/4"	4-1/2" API-Reg	Soft to Medium/Hard	1587-HDSP-95



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GET THE
EDGE
WITH A **BORZALL**
REAMERS



"Melfred Borzall's Terminator—stand by it day-by-day. Nothing's better for reducing prereaming time. Twice as fast as the OEM product." Brett Greenwalt, Aurora, CO



MELFRED BORZALL REAMERS

The highest quality reamers in the industry, bar none

From push to pull, Melfred Borzall reamers get the job done. With replaceable cutters on some models and built with hardened steel, Melfred Borzall reamers are versatile and long lasting.

HEDGEHOG

Works in a variety of soil conditions

Tapered blade provides a smooth cutting action

68-12-21F-21F
12" cut Hedgehog

Hard-facing on shaft to minimize wear

Unique cutter and blade design allows reamer to be used as a pull or push reamer

- *Compact, aggressive reamer works in a variety of soil conditions*
- *Tapered blade for a smoother cutting action*
- *Economical—carbide cutters are built on blocks so they can be factory rebuilt at a lower cost than replacing the entire reamer*
- *Reamers over eight inches are built with a ring for strength and stability*
- *Reamers over 20" & over feature four blades*

Hedgehog			
Shaft Size	2-3/4"	3-1/4"	4-1/4"
Thread Type	2"IF box X box	2-3/8"Reg box X box	2-7/8"IF box X box
Cutting Size	Part #	Part #	Part #
Cut 8"	68-08-21F-21F	68-08-23F-23F	
Cut 10"	68-10-21F-21F	68-10-23F-23F	68-10-27F-27F
Cut 12"	68-12-21F-21F	68-12-23F-23F	68-12-27F-27F
Cut 14"	68-14-21F-21F	68-14-23F-23F	68-14-27F-27F
Cut 16"	68-16-21F-21F	68-16-23F-23F	68-16-27F-27F
Cut 18"	68-18-21F-21F	68-18-23F-23F	68-18-27F-27F
Cut 20"		68-20-23F-23F	68-20-27F-27F
Cut 24"		68-24-23F-23F	68-24-27F-27F
Cut 28"			68-28-27F-27F
Cut 30"			68-30-27F-27F



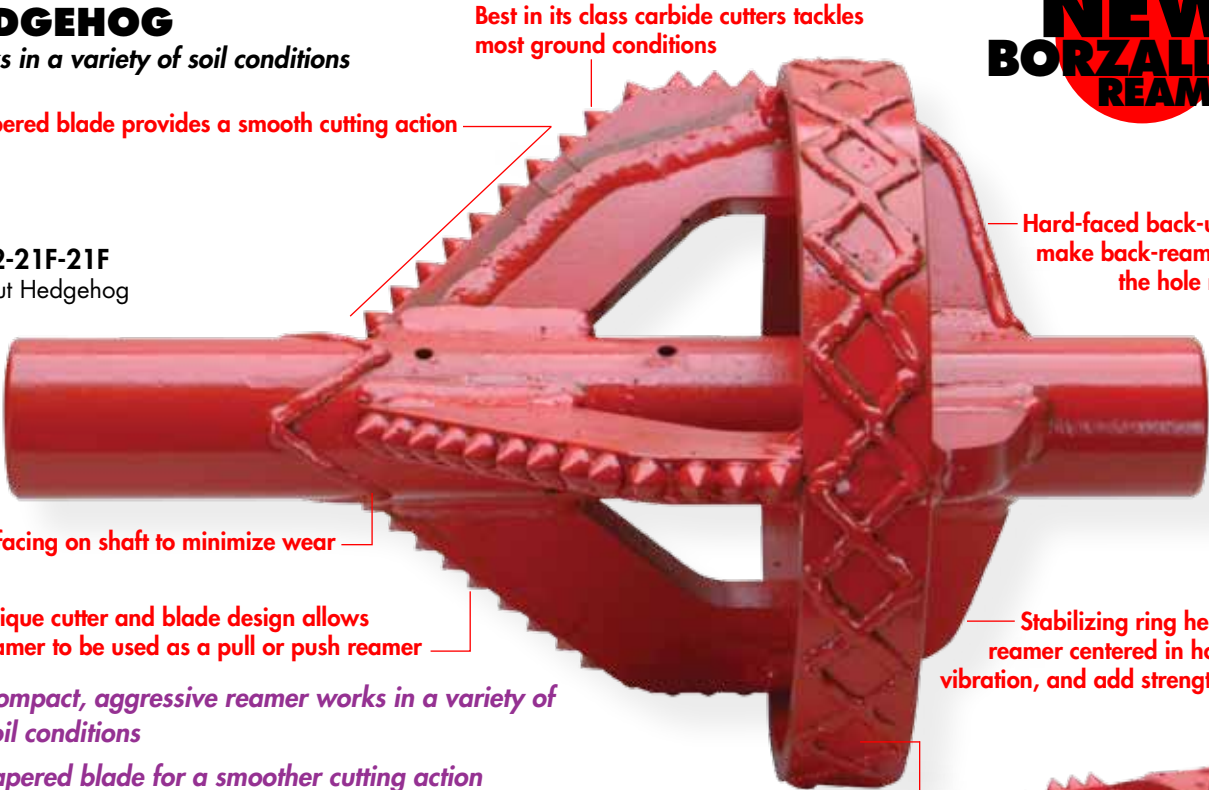
Not only are our tools manufactured to the highest standards, they are made "green" as well.

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**ALL
NEW
BORZALL
REAMER**

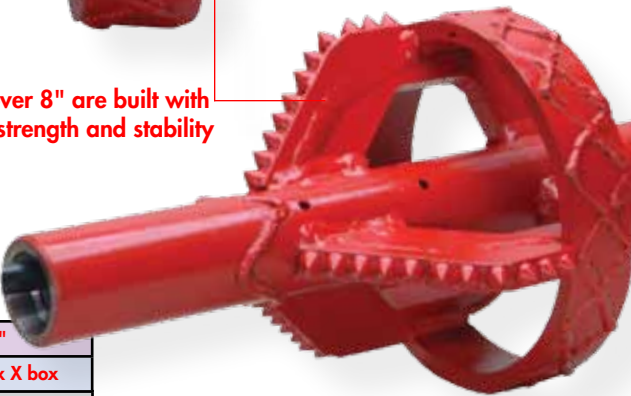


Best in its class carbide cutters tackles most ground conditions

Hard-faced back-up blades to make back-reaming through the hole much easier

Stabilizing ring helps to keep reamer centered in hole, reduce vibration, and add strength to blades

Reamers over 8" are built with a ring for strength and stability



68-8-21F-21F
8" cut Hedgehog



JUGGERNAUT REAMER

Jug-ger-naut - a massive inexorable force, movement, or object that crushes whatever is in its path

- Deluxe fluted backreamers
- More cutters than any other reamer in its class resulting in a smoother cutting action
- Welded shark teeth with extra thick carbide inserts for maximum cutting action
- Deep, spiraled flutes allow for plenty of slurry to flow past the reamer
- Compact, pocket swivels available in a range of capacities for all size Juggernauts
- Pulling eye adapters available for all sizes



85-12-23F-F31X
12" cut Juggernaut



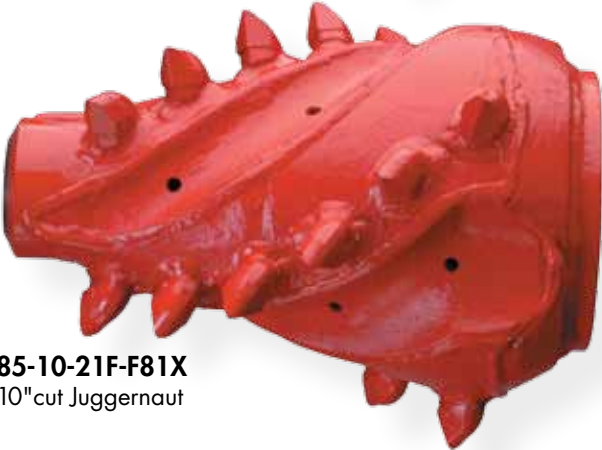
85-04-21F-44F
4-1/2" cut Juggernaut



85-08-21F-45F
8" cut Juggernaut



85-06-21F-44F
6" cut Juggernaut



85-10-21F-F81X
10"cut Juggernaut

Juggernaut		
Description	Juggernaut Configuration	Part #
4-1/2" cut, 4" pack	2"IF-F x 2-1/4"-F - for 4.5 ton Pocket Swivel	85-04-21F-44F
6" cut, 5" pack	2"IF-F x 2-1/4"-F - for 4.5 ton Pocket Swivel	85-06-21F-44F
8" cut, 6" pack	2"IF-F x RTH-F - for 4.5 or 10 ton Pocket Swivel	85-08-21F-45F
8" cut, 6" pack	2-3/8"REG-F x RTH-F - for 4.5 or 10 ton Pocket Swivel	85-08-23IF-45F
10" cut, 8" pack	2"IF-F x flange for 10, 15-ton ValuDUB flange swivels	85-10-21F-F31X
10" cut, 8" pack	2"IF-F x flange for 10-ton Deluxe DUB flange swivel	85-10-21F-F81X
10" cut, 8" pack	2-2/8"REG-F x flange for 10, 15-ton ValuDUB flange swivels	85-10-23F-F31X
10" cut, 8" pack	2-2/8"REG-F x flange for 10-ton Deluxe DUB flange swivel	85-10-23F-F81X
12" cut, 10" pack	2"IF-F x flange for 10, 15-ton ValuDUB flange swivels	85-12-21F-F31X
12" cut, 10" pack	2-3/8"REG-F x flange for 10, 15-ton ValuDUB flange swivels	85-12-23F-F31X



See pg. 57 for
fluted reamer swivels.

SHREDDER

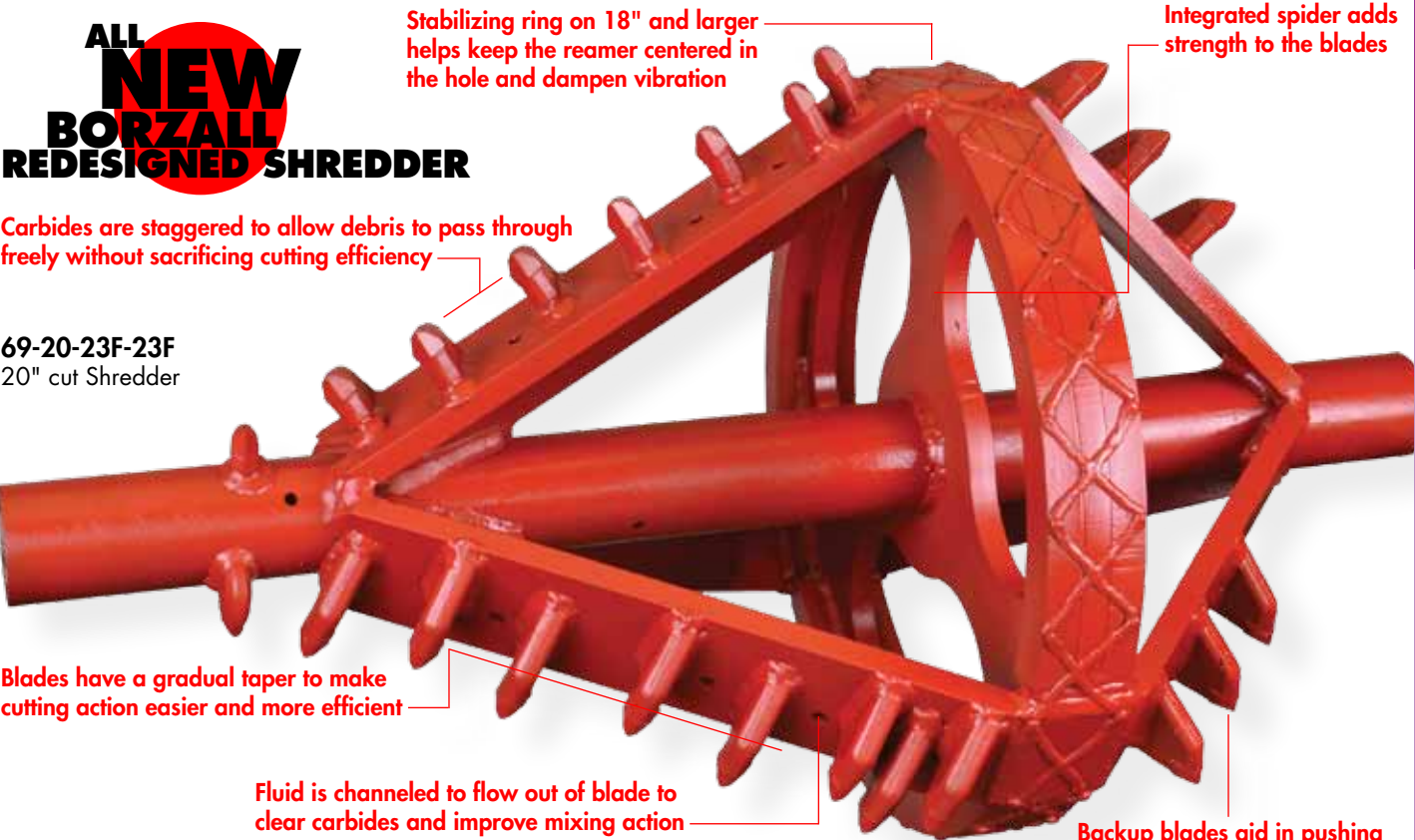
For sand with cobbles, sandstone, and hardpan

- Carbide tipped shark teeth efficiently rip through tough ground conditions
- Gradual taper of blades lessens torque requirement
- Drilling fluid is channeled out through the blades,as well as the shaft
- Backup cutters make push-backs a breeze
- More cutter teeth than any other similar reamer
- Integrated "spider" support and stabilizer ring built into Shredders 18" and larger

ALL NEW BORZALL REDESIGNED SHREDDER

Carbides are staggered to allow debris to pass through freely without sacrificing cutting efficiency

69-20-23F-23F
20" cut Shredder



Shredder		Larger sizes available on request		
Shaft Diameter	2-3/4"	3-1/4"	4-1/4"	4-3/4"
Thread Type	2"IF box X box	2-3/8"Reg box X box	2-7/8"IF box X box	3-1/2"IF box X box
Cutting Size	Part #	Part #	Part #	Part #
Cut 8"	69-08-21F-21F	69-08-23F-23F		
Cut 10"	69-10-21F-21F	69-10-23F-23F	69-10-27F-27F	
Cut 12"	69-12-21F-21F	69-12-23F-23F	69-12-27F-27F	
Cut 14"	69-14-21F-21F	69-14-23F-23F	69-14-27F-27F	69-14-29F-29F
Cut 16"	69-16-21F-21F	69-16-23F-23F	69-16-27F-27F	69-16-29F-29F
Cut 18"	69-18-21F-21F	69-18-23F-23F	69-18-27F-27F	69-18-29F-29F
Cut 20"		69-20-23F-23F	69-20-27F-27F	69-20-29F-29F
Cut 24"		69-24-23F-23F	69-24-27F-27F	69-24-29F-29F
Cut 28"			69-28-27F-27F	69-28-29F-29F
Cut 30"			69-30-27F-27F	69-30-29F-29F
Cut 34"			69-34-27F-27F	69-34-29F-29F
Cut 36"			69-36-27F-27F	69-36-29F-29F
Cut 38"			69-38-27F-27F	69-38-29F-29F
Cut 40"			69-40-27F-27F	69-40-29F-29F



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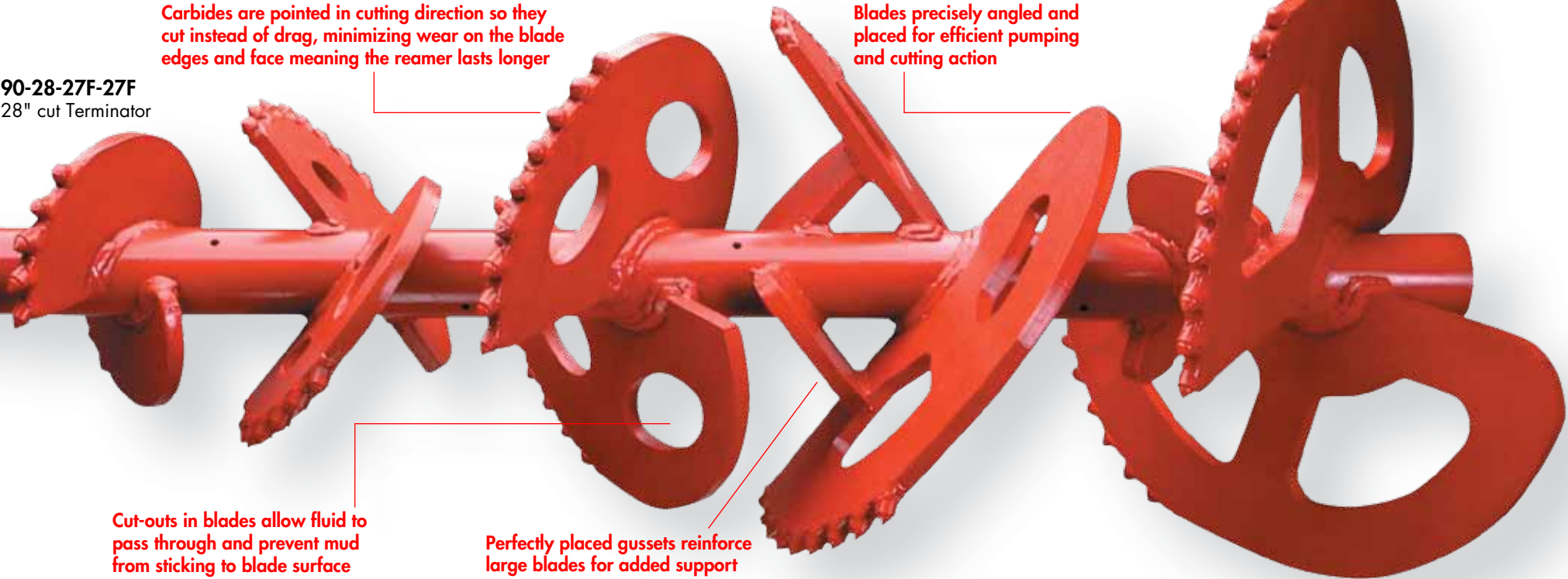


TERMINATOR REAMER

Aggressive cutting, superior mixing

- Efficient cutting action helps reduce pullback and rotary pressures
- Incredible mixing and pumping action makes this the ideal reamer for sticky situations
- An excellent choice for shale and sandstone as well
- Carbide tipped cutting blades are precisely positioned and angled so all the abuse is placed on the carbide tooth

Terminator				
Shaft Size	2-3/4"	3-1/4"	4-1/4"	4-3/4"
Thread Type	2" IF box X box	2-3/8" Reg box X box	2-7/8" IF box X box	3-1/2" IF box X box
Cutting Size	Part #	Part #	Part #	Part #
Cut 6"	90-06-21F-21F	90-06-23F-23F		
Cut 8"	90-08-21F-21F	90-08-23F-23F		
Cut 10"	90-10-21F-21F	90-10-23F-23F	90-10-27F-27F	
Cut 12"	90-12-21F-21F	90-12-23F-23F	90-12-27F-27F	
Cut 14"	90-14-21F-21F	90-14-23F-23F	90-14-27F-27F	90-14-29F-29F
Cut 16"	90-16-21F-21F	90-16-23F-23F	90-16-27F-27F	90-16-29F-29F
Cut 18"	90-18-21F-21F	90-18-23F-23F	90-18-27F-27F	90-18-29F-29F
Cut 20"	90-20-21F-21F	90-20-23F-23F	90-20-27F-27F	90-20-29F-29F
Cut 24"		90-24-23F-23F	90-24-27F-27F	90-24-29F-29F
Cut 28"			90-28-27F-27F	90-28-29F-29F
Cut 30"			90-30-27F-27F	90-30-29F-29F
Cut 34"			90-34-27F-27F	90-34-29F-29F
Cut 36"			90-36-27F-27F	90-36-29F-29F
Cut 38"			90-38-27F-27F	90-38-29F-29F
Cut 40"			90-40-27F-27F	90-40-29F-29F
Cut 42"			90-42-27F-27F	90-42-29F-29F
Aggressive cutting. Efficient mixing action. This is one versatile reamer!				



90-28-27F-27F
28" cut Terminator

OGRE

Smooth, efficient cutting action

- One tough, solid reamer with more cutters than any other reamer in its class
- Carbide blocks prevent shaft from wearing directly in front of reamer body
- Slow taper and deep spiraled fluting combine to give the Ogre maximum mixing and pumping
- Angled water holes keep the carbides clear of debris
- Hardfacing on all wear areas
- Curved, hard-faced backup blades for added wear resistance during pushbacks
- Deep flutes carry away cuttings

95-24-27F-27F
24" cut Ogre



Ogre			
Shaft Size	3-1/4"	4-1/4"	4-3/4"
Thread Type	2-3/8"Reg box X box	2-7/8"IF box X box	3-1/2"IF box X box
Cutting Size	Part #	Part #	Part #
Cut 12", Pack 10"	95-12-23F-23F	95-12-27F-27F	
Cut 14", Pack 12"	95-14-23F-23F	95-14-27F-27F	95-14-29F-29F
Cut 16", Pack 14"	95-16-23F-23F	95-16-27F-27F	95-16-29F-29F
Cut 18", Pack 16"	95-18-23F-23F	95-18-27F-27F	95-18-29F-29F
Cut 20", Pack 18"	95-20-23F-23F	95-20-27F-27F	95-20-29F-29F
Cut 24", Pack 22"		95-24-27F-27F	95-24-29F-29F
Cut 28", Pack 26"		95-28-27F-27F	95-28-29F-29F
Cut 30", Pack 28"		95-30-27F-27F	95-30-29F-29F
Cut 34", Pack 32"		95-34-27F-27F	95-34-29F-29F
Cut 36", Pack 34"		95-36-27F-27F	95-36-29F-29F

What our customer's are saying about the Ogre . . .

"I had the first opportunity to test the **Ogre** and we put it up to a big challenge. We were drilling hard compacted rocky ground, our longest and most difficult bore on the whole job. After burning through several stacked plate reamers, I called my Melfred Borzall rep and he outfitted us with the **Ogre**. Even after boring 225 feet, the teeth on the **Ogre** looked brand new. It performed so well on this job, I wish we could have had it a month sooner."

Ken Brand, K&B Directional, Corona, CA

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SABERTOOTH

For cobbles, shale, river rock, glacial til and hardpan

- The must-have reamer for tough, combination soils
- Large shark teeth carbide cutters give an aggressive yet smooth cutting action
- Angled placement of cutters and spiral pattern results in an excellent mixing and pumping action

Sabertooth				
Shaft Size	2-3/4"	3-1/4"	4-1/4"	4-3/4"
Thread Type	2"IF box X box	2-3/8"Reg box X box	2-7/8"IF box X box	3-1/2"IF box X box
Cutting Size	Part #	Part #	Part #	Part #
Cut 6", Pack 4-5/8"	96-06-21F-21F			
Cut 8", Pack 6-5/8"	96-08-21F-21F	96-08-23F-23F		
Cut 10", Pack 6-5/8"	96-10-21F-21F	96-10-23F-23F	96-10-27F-27F	
Cut 12", Pack 8-5/8"	96-12-21F-21F	96-12-23F-23F	96-12-27F-27F	
Cut 14", Pack 10-3/4"	96-14-21F-21F	96-14-23F-23F	96-14-27F-27F	96-14-29F-29F
Cut 16", Pack 12-3/4"	96-16-21F-21F	96-16-23F-23F	96-16-27F-27F	96-16-29F-29F
Cut 18", Pack 14"		96-18-23F-23F	96-18-27F-27F	96-18-29F-29F
Cut 20", Pack 16"		96-20-23F-23F	96-20-27F-27F	96-20-29F-29F
Cut 24", Pack 20"			96-24-27F-27F	96-24-29F-29F
Cut 28", Pack 24"			96-28-27F-27F	96-28-29F-29F
Cut 30", Pack 28"			96-30-27F-27F	96-30-29F-29F
Cut 32", Pack 28"			96-32-27F-27F	96-32-29F-29F
Cut 36", Pack 32"			96-36-27F-27F	96-36-29F-29F
Cut 40", Pack 36"			96-40-27F-27F	96-40-29F-29F
Cut 48", Pack 44"			96-48-27F-27F	96-48-29F-29F

Reamer selection chart for front couplings and rear pulling eyes can be found on pages 52 & 53.

Incredible production in cobbles and shale.

96-14-21F-21F
14" cut Sabertooth

What our customer's are saying about the Sabertooth . . .

"In June 2012 we had a 380" bore pulling 36" fuseable PVC gravity sewer at .75% under a stream 16' deep. The soil was clay with some cobbles. EBI utilized 20", 32", 40", and 48" Sabertooth reamers on this job. We choose the Sabertooth because of the design and this drill proved they stay where you want them when you need the bore to be perfect. After insatillation the pipes were verified to be within 3/8" of the planned design. Melfred's staff is wonderful to work with from start to finish."

Terry Anderson, EBI Drilling Inc., Deluth, MN

96-32-29F-29F
32" cut Sabertooth

TURBO

For sand, sandstone and clay

- Reamer of choice for sand and unstable soils
- Curved packer blades provide maximum mixing and pumping
- Heavy duty blades with massive carbides provide an aggressive cutting action

ALL NEW BORZALL REDESIGNED TURBO

New aggressive cutter design

83-20-27F-27F 20" cut Turbo

Turbo				
Shaft Size	2-3/4"	3-1/4"	4-1/4"	4-3/4"
Thread Type	2"IF box X box	2-3/8"Reg box X box	2-7/8"IF box X box	3-1/2"IF box X box
Cutting Size	Part #	Part #	Part #	Part #
Cut 6", Pack 4-1/2"	83-06-21F-21F	83-08-23F-23F		
Cut 8", Pack 6-5/8"	83-08-21F-21F	83-08-23F-23F		
Cut 10", Pack 8-5/8"	83-10-21F-21F	83-10-23F-23F	83-10-27F-27F	
Cut 12", Pack 10-3/4"	83-12-21F-21F	83-12-23F-23F	83-12-27F-27F	
Cut 14", Pack 12-3/4"	83-14-21F-21F	83-14-23F-23F	83-14-27F-27F	83-14-29F-29F
Cut 16", Pack 14"	83-16-21F-21F	83-16-23F-23F	83-16-27F-27F	83-16-29F-29F
Cut 18", Pack 16"		83-18-23F-23F	83-18-27F-27F	83-18-29F-29F
Cut 20", Pack 18"		83-20-23F-23F	83-20-27F-27F	83-20-29F-29F
Cut 24", Pack 20"			83-24-27F-27F	83-24-29F-29F
Cut 28", Pack 24"			83-28-27F-27F	83-28-29F-29F
Cut 32", Pack 28"			83-32-27F-27F	83-32-29F-29F
Cut 36", Pack 32"			83-36-27F-27F	83-36-29F-29F

Contractor's #1 reamer of choice for sand!

RIPPER

For river rock and caliche

- Extremely aggressive conical carbide teeth rip through most hard, rocky soils
- Carbide pre-cutters reduce wear on cutter holders and shaft
- Features easily replaceable conical cutters
- Packer body stabilizes any loose rocks and cuttings

Ripper			
Shaft Size	2-3/4"	3-1/4"	4-1/4"
Thread Type	2"IF box X box	2-3/8"Reg box X box	2-7/8"IF box X box
Cutting Size	Part #	Part #	Part #
Cut 8", Pack 6-5/8"	75-08-21F-21F	75-08-23F-23F	
Cut 10", Pack 8-5/8"	75-10-21F-21F	75-10-23F-23F	75-10-27F-27F
Cut 12", Pack 10-3/4"	75-12-21F-21F	75-12-23F-23F	75-12-27F-27F
Cut 14", Pack 12-3/4"	75-14-21F-21F	75-14-23F-23F	75-14-27F-27F
Cut 16", Pack 14"	75-16-21F-21F	75-16-23F-23F	75-16-27F-27F
Cut 18", Pack 16"		75-18-23F-23F	75-18-27F-27F
Cut 20", Pack 18"		75-20-23F-23F	75-20-27F-27F
Cut 24", Pack 22"			75-24-27F-27F
Cut 28", Pack 24"			75-28-27F-27F

75-12-23F-23F 12" cut Ripper

The Ripper features replaceable cutters.



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TERMINATOR JR.
Bolt-on blade reamer

- Ream a hole without ever taking off your drill head
- Conical carbide cutters on an angled blade gives both a cutting and mixing action
- Swivel is locked in line with the axis of rotation
- Bolts on to an Excalibur or Grizzly blade to create an 8" to 10" hole

Terminator Jr.	
Description	Part #
Cut 8", fits 4" Excalibur blades	92-8-40-BR
Cut 9", fits 5" Excalibur blades	92-9-50-BR
Cut 10", fits 6" Grizzly blades	92-10-60-BR

92-8-40-BR 8" cut Terminator Jr.



Use with 5-ton and 7-1/2-ton Value DUB. Swivels sold separately on page 56.

DON'T SEE WHAT YOU NEED?

Can't find the right tool, or maybe need a combination of two tools in one? Call us with your ideas and we'll work with you to get the tool you need. Not only do we custom make the tool you need, we do it in the fastest turn-around time possible.



Above: A custom reamer is put into priority production for a customer needing it "yesterday".

Melfred Borzall's Directional Depot offers most of their quality reamers in custom sizes and configurations for those jobs with unique conditions.



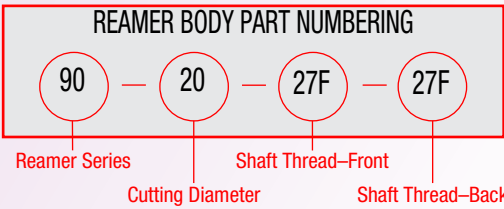
Above: Under extreme weather conditions on a jobsite in Oregon, Apex Directional Drilling uses the Terminator and Turbo on several bores.

HOW TO BUILD A BORZALL BACKREAMER

With Melfred Borzall's new thread system and the charts on pages 52 & 53, it doesn't get any easier!

1 Choose a reamer style

Select the part number for the **Reamer Body** you want, based on the reamer size and style.
For example—a 20" Cut, 4-1/4" Shaft Terminator is 90-20-27F-27F

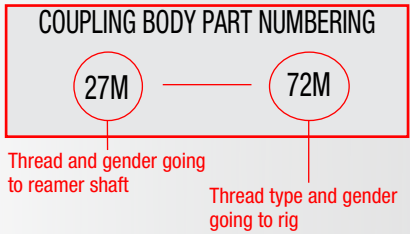


90-20-27F-27F with 27M-72M and 27M-EYE820

2 Next...

Using the charts shown on the next page, choose the **Front Reamer Coupling**. This will connect the reamer to the connection on your drill rig based on the make, model and connection type (quick-disconnect or direct to drill rod).

For example—if using a reamer shaft with a 27F shaft and connecting direct to drill rod on a JT7020, the **Front Reamer Coupling** will be part #27M-L72M.



27M-72M JT7020 drill rod thread

3 Finally...

Pick a **Rear Reamer Pulling Eye** from the chart on page 53 based on the swivel type and capacity.

For example—if using a reamer with a 27F shaft and a 20-ton Deluxe DUB swivel, the **Rear Reamer Pulling Eye** would be part #27M-EYE820.



27M-EYE820 Pulling eye for 20-ton Deluxe DUB Swivel

More threads and pulling eye sizes available.
Thread-on swivels available.
Call 800-833-1252 for ordering assistance.



REAMER THREAD SELECTION CHART

Front Couplings					
	Shaft Size	2-3/4"	3-1/4"	4-1/4"	4-3/4"
	Thread Type	2"IF box X box	2-3/8"Reg box X box	2-7/8"IF box X box	3-1/2"IF box X box
Drill Rig Make & Model	Connection Type	Part #	Part #	Part #	Part #
Vermeer					
D6x6, D7x11, D7x11 Series 2, D9x13 Series 2, D10x15	Low Profile Quick-Disconnect	21M-L42M	23M-L42M		
	Quick-Fire™ Connection	21M-L300M	23M-L300M		
	Direct to Drill Rod (200-FS1)	21M-31F	23M-31F		
D16X20, D16X20 Series 2, D18X22	Low Profile Quick-Disconnect	21M-L43M	23M-L43M		
	Quick-Fire™ Connection	21M-L300M	23M-L400M		
	Direct to Drill Rod (250-FS1)	21M-32F	23M-32F		
D20X22 Series 2, D24X26	Low Profile Quick-Disconnect	21M-L43M	23M-L43M		
	Quick-Fire™ Connection	21M-L400M	23M-L400M		
	Direct to Drill Rod (400-FS1)	21M-30F	23M-30F		
D24X40, D24X40 Series 2, D40x40	Low Profile Quick-Disconnect	21M-L43M	23M-L43M		
	Quick-Fire™ Connection	21M-L400M	23M-L400M		
	Direct to Drill Rod (600-FS1)	21M-40F	23M-L40F		
D33x44, D36x50, D36x50 Series 2	Low Profile Quick-Disconnect	21M-L43M	23M-L43M	27M-L43M	
	Quick-Fire™ Connection	21M-L460M	23M-L460M	27M-L460M	
	Direct to Drill Rod (FS2)	21M-33F	23M-33F	27M-33F	
	Direct to Drill Rod (650-FS1)		23M-46F	27M-46F	
	Direct to Drill Rod (700-FS1)		23M-41F	27M-41F	
D50x100, D60x90 (2-7/8" OD tube)	Direct to drill rod (900 FS1)			27M-50F	
D50x100, D80X100, D80X100 Series 2 (3-1/2" OD tube)	Direct to drill rod (800 FS1)			27M-80F	29M-80F
D80X120, D100X120 Series 2	Direct to drill rod (FS2)			27M-81F	29M-81F
	Direct to drill rod (1000 FS1)			27M-82F	29M-82F
D330x500 - 3-1/2" IF	Direct to drill rod			27M-29F	29M-29F
Ditch Witch					
JT520	EZ-Connect 2	21M-L52F			
	Direct to drill rod	21M-05M			
JT920, JT920L, JT921, JT922	EZ-Connect 2	21M-L55F			
	Direct to drill rod	21M-01M			
JT1220 Mach1	EZ-Connect 2	21M-L58F			
	Direct to drill rod	21M-34M			
JT1720, JT1720 Mach1	EZ-Connect 2	21M-L54F	23M-L54F		
	Direct to drill rod	21M-86M			
JT2020 Mach1, JT2720	EZ-Connect 2	21M-L54F	23M-L54F		
	Direct to drill rod	21M-35M	23M-35M		
JT2720 Mach1	EZ-Connect 2	21M-L56F	23M-L56F	27M-L56F	
	Direct to drill rod	21M-36M	23M-36M	27M-36M	
JT3020 Mach1	EZ-Connect 2	21M-L59F	23M-L59F	27M-L59F	
	Direct to drill rod	21M-36M	23M-36M	27M-36M	
JT4020	EZ-Connect 2		23M-L57F	27M-L57F	
	Direct to drill rod		23M-42M	27M-42M	
JT4020 Mach1	EZ-Connect 2		23M-L57F	27M-L57F	
	Direct to drill rod		23M-43M	27M-43M	
JT7020, JT8020, JT00	Direct to drill rod			27M-72M	29M-72M

More threads and pulling eye sizes available. Call 800-833-1252 for ordering assistance.

Front Couplings (con't)					
	Shaft Size	2-3/4"	3-1/4"	4-1/4"	4-3/4"
	Thread Type	2"IF box X box	2-3/8"Reg box X box	2-7/8"IF box X box	3-1/2"IF box X box
Drill Rig Make & Model	Connection Type	Part #	Part #	Part #	Part #
Astec/American Augers					
DD65	Quick-disconnect	21M-L65F			
DD1215, DD1416	Quick-disconnect	21M-L58F			
	Direct to drill rod	21M-15F			
DD2024	Quick-disconnect	21M-L54F	23M-L54F		
	Direct to drill rod	21M-22F	23M-22F		
DD3238	Quick-disconnect	21M-L43M	23M-L43M	27M-L43M	
	Direct to drill rod	21M-38F	23M-38F	27M-27F	29M-27F
DD6, DD8, DD9014	Direct to drill rod			27M-27F	29M-27F

Rear Pulling Eyes				
Shaft Size	2-3/4"	3-1/4"	4-1/4"	4-3/4"
Thread Type	2"IF box X box	2-3/8"Reg box X box	2-7/8"IF box X box	3-1/2"IF box X box
Swivel Style & Size	Part #	Part #	Part #	Part #
Deluxe-DUB				
5-ton	21M-EYE805			
10-ton	21M-EYE810	23M-EYE810		
15-ton, 20-ton, 30-ton		23M-EYE820	27M-EYE820	
40-ton			27M-EYE840	29M-EYE840
60-ton			27M-EYE860	29M-EYE860
80-ton			27M-EYE880	29M-EYE880
Valu-DUB				
4-ton	21M-EYE304			
5-ton	21M-EYE305			
7-1/2-ton, 10-ton	21M-EYE310	23M-EYE310		
15-ton	21M-EYE315	23M-EYE315	27M-EYE315	
20-ton, 30-ton, 45-ton		23M-EYE820	27M-EYE820	

A variety of Juggernaut Fluted Reamers can be found on page 44.



Rear Couplings for Juggernaut Fluted Reamer					
Reamer Size	4" Juggernaut	6" Juggernaut	8" Juggernaut	10" Juggernaut	12" Juggernaut
Swivel Style & Size	Part #	Part #	Part #	Part #	Part #
Valu-DUB					
4-ton	44M-EYE304	44M-EYE304			
5-ton	44M-EYE305	44M-EYE305	45M-EYE305	85-F31X-EYE305	
7-1/2-ton, 10-ton	44M-EYE310	44M-EYE310	45M-EYE310	85-F31X-EYE310	85-F31X-EYE310
15-ton			45M-EYE315	85-F31X-EYE315	85-F31X-EYE315
20-ton, 30-ton, 45-ton				85-F31X-EYE820	85-F31X-EYE820

More threads and pulling eye sizes available. Call 800-833-1252 for ordering assistance.



GET THE
EDGE
WITH A **BORZALL**
SWIVEL



Specifically designed to protect the bearings from the harshest conditions on the planet, our full line of pulling swivels have become the industry standard—bar none.



MELFRED BORZALL PULLING SWIVELS

The industry standard—bar none

DELUXE DUB PULLING SWIVELS

Made from high quality, heat-treated steel to withstand a straight tensile load of five times the safe working limit

Back-to-back tapered or spherical roller bearings combined with a 3-way sealing system makes this a long lasting swivel

Accessible grease nipple with pressure relief valve for worry-free lubrication, prepacked with an extreme pressure, calcium based grease

Specifically designed for the harsh environment of HDD



Relief valve prevents over-pressurizing and damage to the mechanical seal

00508-230 30-ton Clevis x Clevis

Rugged 3-stage sealing system is designed to act progressively for maximum bearing protection and swivel life.

Hardened clevis pin with locking clevis pin nut to ensure everything comes back through the hole

- Not the least expensive swivel but it will save you the most money
- Deluxe bearings that can handle tensile, compressive, and side loads
- Intricate quad-stage seal system designed specifically for HDD conditions
- Available with Built-in, Clevis, or Pin connections

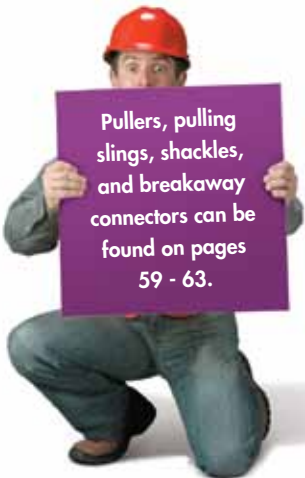
Deluxe DUB (Clevis X Clevis)	
Description	Part #
2-1/2-ton, 2" diameter	00508-202
5-ton, 3" diameter	00508-205
10-ton, 4" diameter	00508-210
15-ton, 4-3/4" diameter	00508-215
20-ton, 5-3/4" diameter	00508-220
30-ton, 6" diameter	00508-230
40-ton, 6-1/2" diameter	00508-240
60-ton, 7-1/2" diameter	00508-260
80-ton, 9" diameter	00508-280

Deluxe DUB (Clevis X API Box)		
Description	API Box Style	Part #
20-ton, 5-3/4" diameter	2-7/8" IF box	00508-120D
30-ton, 6" diameter	2-7/8" IF box	00508-130D
30-ton, 6" diameter	3-1/2" IF box	00508-120E
40-ton, 6-1/2" diameter	3-1/2" IF box	00508-140E
40-ton, 6-1/2" diameter	4-1/2" IF box	00508-140F
60-ton, 7-1/2" diameter	4-1/2" IF box	00508-160F
80-ton, 9" diameter	4-1/2" IF box	00508-180F

**ALL
NEW
BORZALL
SWIVEL STYLE**

Deluxe DUB (Clevis X API Pin for Depot Reamers)		
Description	API Thread	Part #
10-ton, 4" diameter	2-3/8"z Reg	00508-710-23M
15-ton, 4-3/4" diameter	2-3/8" Reg	00508-715-23M
15-ton, 4-3/4" diameter	2-7/8" IF Pin	00508-715-27M
20-ton, 5-3/4" diameter	2-7/8" IF Pin	00508-720-27M
30-ton, 6" diameter	2-7/8" IF Pin	00508-730-27M
40-ton, 6-1/2" diameter	2-7/8" IF Pin	00508-740-27M
10-ton, 4" diameter, connection to 2-1/2" hex Quick-Disconnect		00508-710V
15-ton, 4-1/2" diameter, connection to 2-1/2" hex Quick-Disconnect		00508-715V

DCD Design; US Patent #5,529,421; Canadian Patent #2,109,041



00508-715-23M 15-ton Clevis x 2-3/8" Reg API Thread

Connect a Deluxe DUB swivel directly to your Vermeer quick-disconnect starter rod.



00508-715V 15-ton Clevis x 2-1/2" Hex Quick-Disconnect



Not only are our tools manufactured to the highest standards, they are made "green" as well.

To place an order or find a dealer **800-833-1252**

Fax 24 hours a day: **805-614-9548**

www.melfredborzall.com



VALU-DUB PULLING SWIVELS

- By far the most swivel for your money
- Features a triple stage sealing system to keep debris from destroying bearings
- Push and pull loads are absorbed by premium quality angular contact bearings
- Fitted with a grease nipple for easy lubrication making it a long lasting swivel

Available with clevis, flange or API thread


Hardened clevis pin for durability and long life

Labyrinth seal, SKF Flocking washer, and a lip seal make up the triple seal system to withstand fluid and debris

00503-210 10-ton Clevis x Clevis

High quality angular contact bearings absorb the loads for both pushing and pullbacks

Accessible grease nipple factory pre-packed with calcium based grease



00503-230 30-ton Clevis x Clevis swivel



Valu DUB (Clevis X Clevis)	
Description	Part #
4-1/4-ton, 2" diameter	00503-204
5-ton, 2-1/4" diameter	00503-205
7-1/2-ton, 2-1/2" diameter	00503-208
10-ton, 2-1/2" diameter	00503-210
15-ton, 3" diameter	00503-215
20-ton, 4-3/4" diameter	00503-220
30-ton, 5-3/4" diameter	00503-230
45-ton, 6" diameter	00503-245

Valu DUB (Clevis X API Pin for Depot Reamers)		
Description	API Thread	Part #
5-ton, 2" diameter	2" IF Pin	00503-705-21M
10-ton, 2-1/2" diameter	2" IF Pin	00503-710-21M
15-ton, 3" diameter	2-3/8" Reg	00503-710-23M
15-ton, 3" diameter	2-3/8" Reg	00503-715-23M
20-ton, 4-3/4" diameter	2-3/8" Reg	00503-720-23M
30-ton, 5-3/4" diameter	2-7/8" IF Pin	00503-730-27M
45-ton, 6" diameter	2-7/8" IF Pin	00503-745-27M
15-ton, 3" diameter, connection to 2-1/2" to 2-1/2" hex Quick-Disconnect		00503-715V

Connect a Valu-DUB swivel directly to your quick- disconnect starter rod.

00503-710-21M 10-ton Clevis x 2" IF API Pin



00503-715V 15-ton Clevis x 2-1/2" Hex Quick-Disconnect



QUICK-SWIVEL

Designed exclusively for Depot blades

- Lets you do direct pullbacks without removing the drill head
- Quickly bolts on to an Excalibur blade
- Swivel stays in line with the rotation of the drill head
- Made from the same quality components as the 5-ton ValuDUB swivel

Quick-Swivel	
Description	Part #
5-ton Quick-Swivel	00503-205-QS

Do direct pullbacks without removing the drill head.



00503-205-QS 5-ton Quick-Swivel



VALU-DUB FLUTED REAMER SWIVELS

Designed Depot Juggernaut reamers

VALU-DUB FLUTED REAMER SWIVELS

- Features a triple stage sealing system to keep debris from destroying bearings
- Push and pull loads are absorbed by premium quality angular contact bearings
- Totally self contained and greaseable making it a long lasting swivel
- Hard-facing around face of flange minimizes wear at the head of the bolts

00503-604-44M 4-1/4 ton Pocket Swivel



- Pocket Swivel—threaded for use on 4", 6", and 8" Juggernauts
- The Pocket Swivel has all the same features as the ValuDUB

Swivels for Depot's Juggernaut Reamers		
For use on . . .	Description	Part #
4", 6" Juggernaut	4-1/4-ton Pocket Swivel	00503-604-44M
8" Juggernaut	4-1/4-ton Pocket Swivel	00503-604-45M
8" Juggernaut	10-ton Pocket Swivel	00503-610-45M
10" Juggernaut	5-ton Deluxe DUB Swivel	00508-605
10" Juggernaut	10-ton Deluxe DUB Swivel	00508-610
10", 12" Juggernaut	10-ton Valu DUB Swivel	00503-610
10", 12" Juggernaut	15-ton Valu DUB Swivel	00503-615

00508-610 10-ton Deluxe-DUB Flange Swivel



00503-615 15-ton Valu-DUB Flange Swivel



OEM REPLACEMENT SWIVELS

For OEM fluted reamers

00504-D27 Replacement swivel for OEM fluted Reamers



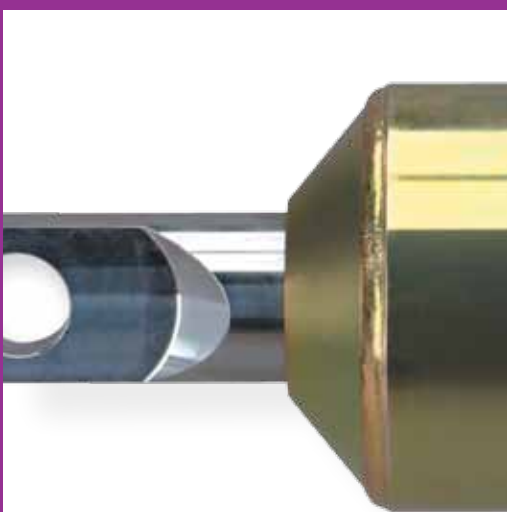
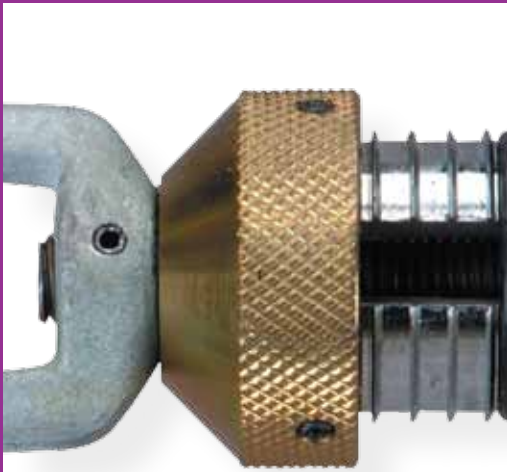
OEM Replacement Swivels		
Use with	Capacity	Part #
Ditch Witch fluted reamer #368-942 and #368-944	13-1/2-ton	00504-D27
Vermeer fluted reamers for D16x20 to D24x40 8" to 16" diameter	12-ton	00504-V24



GET THE
EDGE
WITH A **BORZALL**
PULLER



Easy to install and remove, our wide selection of pullers is designed to meet the challenges of every job and fit every budget. Whether you're looking for pullers for PVC, single or multi-duct pullers, or pulling grips and slings, we've got just what you're looking for.



DUCT PULLERS FOR EVERY JOB & EVERY BUDGET

From single or multi-duct pullers to pulling grips and slings, we've got what you're looking for

SUPER DELUXE PULLERS

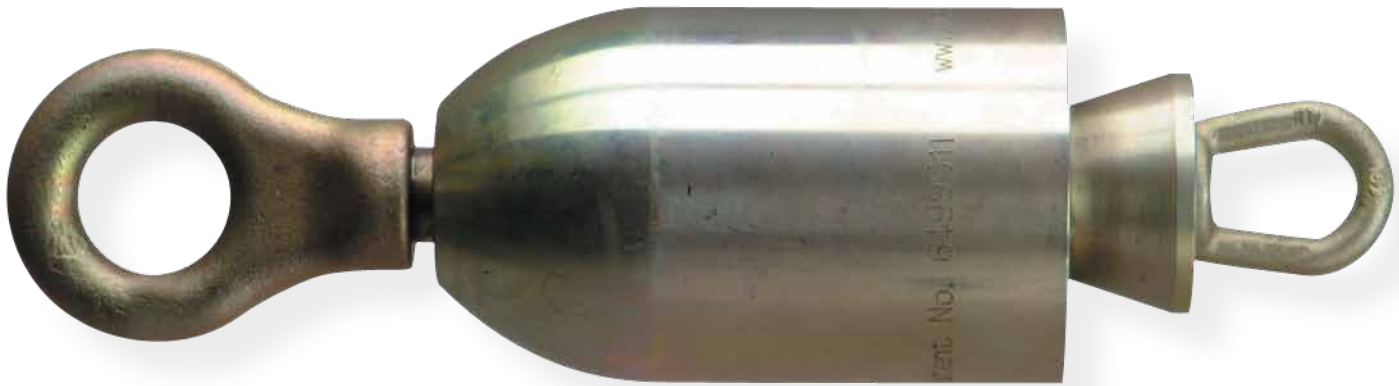
The Super Deluxe Duct Pullers from Directional Depot

- A rugged puller that is quick and easy to install and remove
- Water tight by sealing on the inside of the product pipe
- High-tensile drop-forged eyebolt
- Can be disassembled in the field by hand for easy maintenance

Super Deluxe Duct Pullers	
Description	Part #
1-1/4" duct w/ a 1.18" to 1.68" I.D.	00660-125
1-1/2" duct w/ a 1.39" to 1.92" I.D.	00660-150
2" duct w/ a 1.68" to 2.40" I.D.	00660-200
2-1/2" duct w/ a 2.24" to 2.90" I.D.	00660-250
3" duct w/ a 2.55" to 3.52" I.D.	00660-300
4" duct w/ a 3.31" to 4.52" I.D.	00660-400
5" duct w/ a 4.29" to 5.61" I.D.	00660-500
6" duct w/ a 5.20" to 6.69" I.D.	00660-600
8" duct w/ a 6.71" to 8.80" I.D.	00660-800

Metric-sized Pullers available.

00660-400 4" Super Deluxe Puller



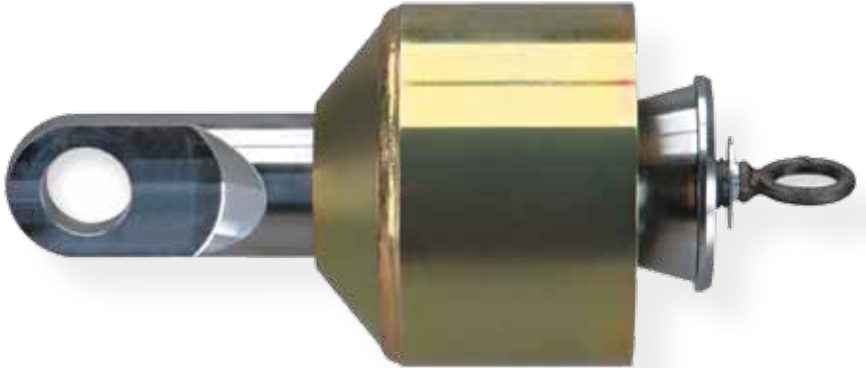
DELUXE DUCT PULLERS

- Precision machined, hardened alloy steel pulling head will handle the abuses of HDD
- Outer sleeve prevents stretching and provides a water tight seal to protect ducting
- Fits most duct sizes from SDR9 through SDR21
- Expanding jaws grip the inside of the duct as the front eye is rotated, spreading the load evenly around the inside diameter of the duct
- Oversized rear eye

Deluxe Duct Pullers	
Description	Part #
1-1/4" duct w/ a 1.25" to 1.50" I.D.	00650-125
1-1/2" duct w/ a 1.44" to 1.69" I.D.	00650-150
2" duct w/ a 1.81" to 2.19" I.D.	00650-200
2-1/2" duct w/ a 2.19" to 2.56" I.D.	00650-250
3" duct w/ a 2.69" to 3.06" I.D.	00650-300
4" duct w/ a 3.44" to 4.25" I.D.	00650-400
5" duct w/ a 4.31" to 5.13" I.D.	00650-500
6" duct w/ a 5.06" to 6.06" I.D.	00650-600

Metric-sized Pullers available.

00650-400 4" Deluxe Duct Puller



Not only are our tools manufactured to the highest standards, they are made "green" as well.

To place an order or find a dealer **800-833-1252**

Fax 24 hours a day: **805-614-9548**

www.melfredborzall.com



PREMIUM PULLERS

NEW Directional Depot Premium Puller with Phenomenal Gripping Power

- Fewer moving parts for easy repair and maintenance
- Expanding jaws securely grip inside wall of duct
- Comes standard with a polyurethane plugger
- Made from zinc dichromate coated steel

Premium Duct Pullers	
Description	Part #
2" duct w/ a 1.81" to 2.19" I.D.	00616-200
2-1/2" duct w/ a 2.19" to 2.62" I.D.	00616-250
3" duct w/ a 2.69" to 3.12" I.D.	00616-300
4" duct w/ a 3.31" to 4.06" I.D.	00616-400
5" duct w/ a 4.25" to 5.06" I.D.	00616-500
6" duct w/ a 4.87" to 6.19" I.D.	00616-600



00616-200 2" Premium Duct Puller

POLY PULLERS

- Extremely durable yet economical duct puller
- Expanding jaws securely grip inside wall of duct
- Polyurethane nose cone

00619-400 4" Poly-Puller Duct Puller



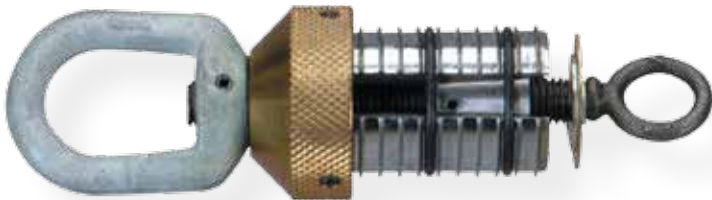
- Comes standard with a polyurethane plugger

Poly-Puller Duct Pullers	
Description	Part #
2" duct w/ a 1.81" to 2.19" I.D.	00619-200
2-1/2" duct w/ a 2.19" to 2.62" I.D.	00619-250
3" duct w/ a 2.69" to 3.12" I.D.	00619-300
4" duct w/ a 3.31" to 4.06" I.D.	00619-400
5" duct w/ a 4.25" to 5.06" I.D.	00619-500
6" duct w/ a 4.87" to 6.19" I.D.	00619-600

STANDARD DUCT PULLERS

- Quick and easy to install with no special tools required
- Expanding jaws securely grip inside wall of duct
- Large number of jaw teeth compared to other brands results in a much stronger grip
- Fits most duct sizes from SDR11 through SDR17

00620-250 2-1/2" Standard Duct Puller



- Pluggers are available to keep the mud out

Standard Duct Pullers	
Description	Part #
1-1/4" duct w/ a 1.28" to 1.50" I.D.	00620-125
1-1/2" duct w/ a 1.47" to 1.69" I.D.	00620-150
2" duct w/ a 1.88" to 2.12" I.D.	00620-200
2-1/2" duct w/ a 2.25" to 2.50" I.D.	00620-250
3" duct w/ a 2.75" to 3.06" I.D.	00620-300
4" duct w/ a 3.50" to 4.06" I.D.	00620-400
5" duct w/ a 4.50" to 5.00" I.D.	00620-500
6" duct w/ a 5.44" to 6.12" I.D.	00620-600
8" duct w/ a 6.44" to 7.87" I.D.	00620-800
10" duct – Please specify SDR	00620-1000
12" duct – Please specify SDR	00620-1200



INNERDUCT PULLERS

Directional Depot Pullers have Phenomenal Gripping Power

- Economical means of pulling small diameter duct and innerduct
- Machined from steel and chrome plated for durability
- Double cutting edges that actually cut a thread into the duct
- Quick and easy to install

00604-125 1-1/4" Lug Style Innerduct Puller



00605-150 1-1/2" Clevis Style Innerduct Puller



Lug Style Innerduct Pullers	
Description	Part #
3/4" duct w/ a 0.72" to 0.93" I.D.	00604-075
1" duct w/ a 0.94" to 1.15" I.D.	00604-100
1-1/4" duct w/ a 1.26" to 1.44" I.D.	00604-125
1-1/2" duct w/ a 1.48" to 1.66" I.D.	00604-150
2" duct w/ a 1.91" to 2.08" I.D.	00604-200

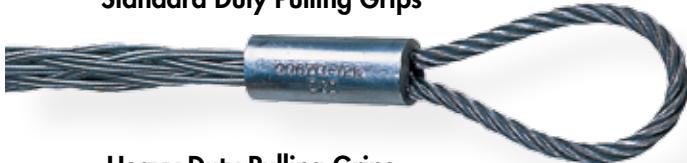
Clevis Style Innerduct Pullers	
Description	Part #
1" duct w/ a 0.94" to 1.15" I.D.	00605-100
1-1/4" duct w/ a 1.26" to 1.44" I.D.	00604-125
1-1/2" duct w/ a 1.48" to 1.66" I.D.	00604-150
2" duct w/ a 1.91" to 2.08" I.D.	00604-200



WIRE MESH PULLING GRIPS

- Made with a double weave of galvanized wire for maximum durability
- Return weave design so there are no crimped ends at the trailing end
- At least a 2X safety factor
- Available in Heavy-Duty and Standard-Duty

Standard Duty Pulling Grips



Heavy Duty Pulling Grips



Standard Duty Pulling Grips		
Description	Maximum Recommended Load	Part #
1/4" duct w/ an 0.24" to 0.39" O.D.	750 lb.	00670-025
3/8" duct w/ an 0.40" to 0.75" O.D.	950 lb.	00670-038
1/2" & 3/4" duct w/ an 0.78" to 1.18" O.D.	1,100 lb.	00670-050
1" duct w/ a 1.18" to 1.56" O.D.	1,750 lb.	00670-100
1-1/4" & 1-1/2" duct w/ a 1.57" to 1.97" O.D.	2,700 lb.	00670-125
2" duct w/ a 2.00" to 2.50" O.D.	4,000 lb.	00670-200
2-1/2" duct w/ a 2.55" to 3.15" O.D.	6,000 lb.	00670-250

Heavy Duty Pulling Grips		
Description	Maximum Recommended Load	Part #
1/2" & 3/4" duct w/ a 0.78" to 1.18" O.D.	1,460 lb.	00680-050
1" duct w/ a 1.18" to 1.56" O.D.	2,410 lb.	00680-100
1-1/4" & 1-1/2" duct w/ a 1.57" to 1.97" O.D.	3,600 lb.	00680-125
2" duct w/ a 2.00" to 2.50" O.D.	5,600 lb.	00680-200
2-1/2" duct w/ a 2.55" to 3.15" O.D.	8,200 lb.	00680-250
3" duct w/ a 3.15" to 3.74" O.D.	12,200 lb.	00680-300
4"z duct w/ a 4.33" to 5.12" O.D.	20,100 lb.	00680-400



MULTI-DUCT PULLING PACKER

Securely pull multiple ducts

- A simple and secure means of pulling several ducts at one time
- Can be used with the Series 00619, 00620, 00650 or 00604 pullers
- Actual pulling device is protected by a heavy-duty packer housing
- Packer provides a gradual transition from the swivel
- Large variety of duct size combinations can be pulled

Call for more details

00640-109 20-way Multi-duct Pulling Packer with ducts. (Pullers sold separately, see pages 59-61)



A large variety of duct size combinations can be pulled at one time. Custom configurations are available.



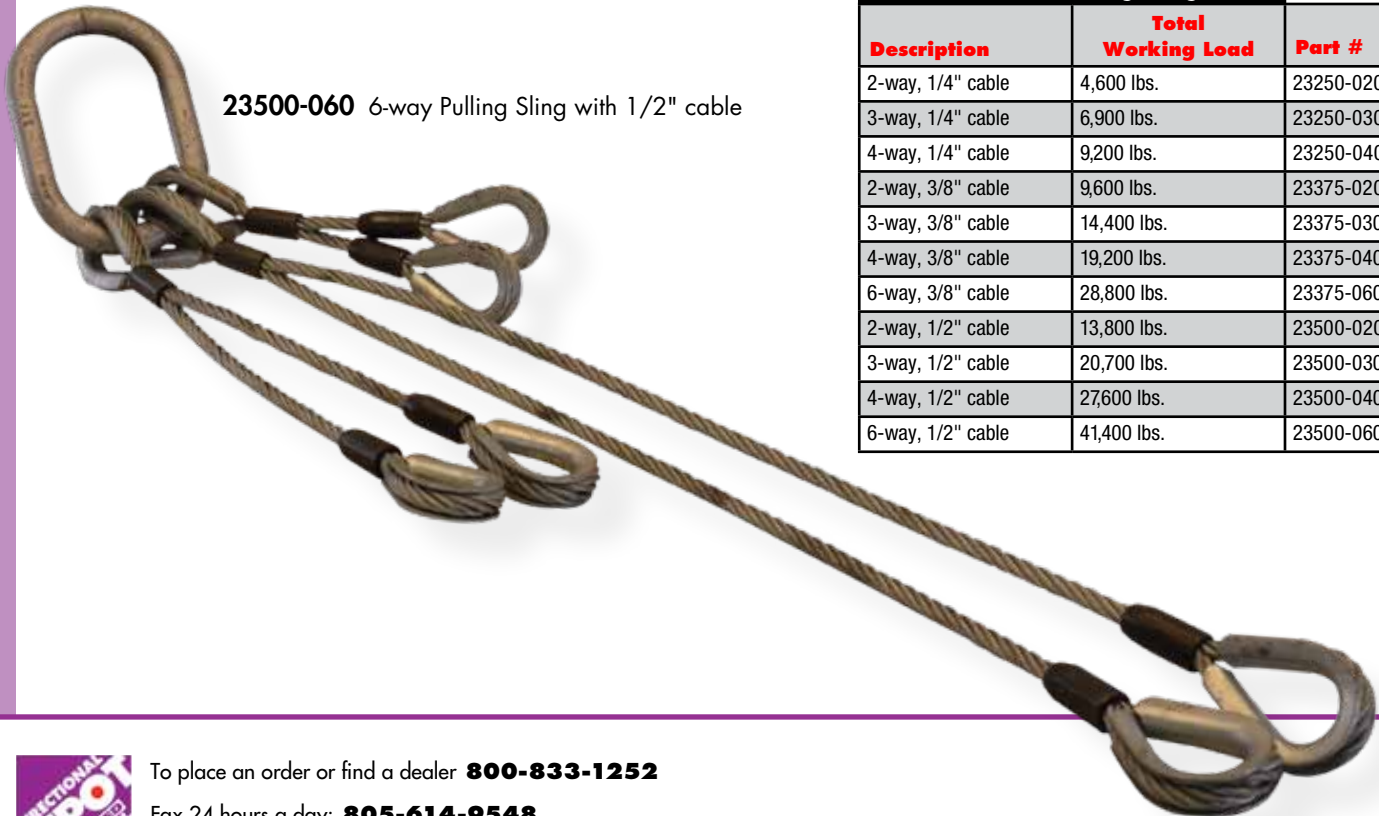
MULTI-DUCT PULLING SLINGS

- An inexpensive and effective way to hook up and pull 2 to 6 ducts at a time
- Constructed from heavy-duty, aircraft quality wire rope
- Legs are replaceable



Multi-Duct Pulling Slings		
Description	Total Working Load	Part #
2-way, 1/4" cable	4,600 lbs.	23250-020
3-way, 1/4" cable	6,900 lbs.	23250-030
4-way, 1/4" cable	9,200 lbs.	23250-040
2-way, 3/8" cable	9,600 lbs.	23375-020
3-way, 3/8" cable	14,400 lbs.	23375-030
4-way, 3/8" cable	19,200 lbs.	23375-040
6-way, 3/8" cable	28,800 lbs.	23375-060
2-way, 1/2" cable	13,800 lbs.	23500-020
3-way, 1/2" cable	20,700 lbs.	23500-030
4-way, 1/2" cable	27,600 lbs.	23500-040
6-way, 1/2" cable	41,400 lbs.	23500-060

23500-060 6-way Pulling Sling with 1/2" cable



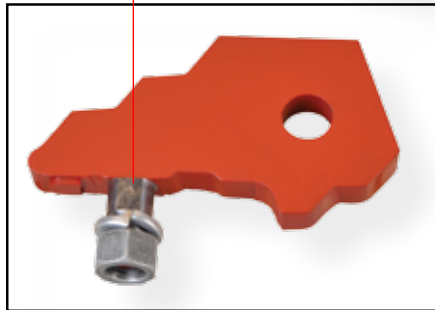
EAGLE-EYE

Blade pulling eye

- Easily bolts onto any Borzall blade for direct pullbacks
- More secure and faster than using multiple shackles
- The swivel bolts directly to the Eagle Eye, holding it in-line with the rotation of the drill head

Eagle Eye Blade Pulling Eye	
Description	Part #
Fits #00503-205, 5 ton ValuDUB swivel	EAGLE-EYE305
Fits #00503-210, 10 ton ValuDUB swivel	EAGLE-EYE310

Easily bolts to any Borzall blade for direct pullbacks



ALL NEW BORZALL PULLING TOOL



SHACKLES

- Don't forget to stock up on shackles to connect the pulling grips and pullers to your swivel
- Other sizes available upon request



Shackles	
Description	Part #
7/16" shackle	SHACKLE-7/16
5/8" shackle	SHACKLE-5/8
3/4" shackle	SHACKLE-3/4
7/8" shackle	SHACKLE-7/8
1"z shackle	SHACKLE-100

BREAKAWAY CONNECTORS

Protect your Duct from Failure

- Designed to protect polyethylene ducting from overload during installation
- Utilizes up to 5 pins that are designed to break in tension at a specific load
- Available in 2 sizes covering a range of breaking points from 750 lbs to 45,000 lbs

Breakaway Connectors	
Description	Part #
Light-duty Breakaway Connector	00560-010
750 lb. pin kit (5 per kit)	00565-075
1,000 lb. pin kit (5 per kit)	00565-100
1,500 lb. pin kit (5 per kit)	00565-150
2,000 lb. pin kit (5 per kit)	00565-200
2,500 lb. pin kit (5 per kit)	00565-250
Description	Part #
Heavy-duty Breakaway Connector	00560-020
3,000 lb. pin kit (5 per kit)	00565-300
6,000 lb. pin kit (5 per kit)	00565-600
7,000 lb. pin kit (5 per kit)	00565-700
8,000 lb. pin kit (5 per kit)	00565-800
9,000 lb. pin kit (5 per kit)	00565-900

00560-010 Light Duty Break-Away Connector and Pins



00560-020 Heavy Duty Break-Away Connector and Pins



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GET THE
EDGE
WITH **BORZALL**
HDD ACCESSORIES



From Digitrak® locators and thread lube to safety gloves and boots, we carry the accessories you need to outfit any size job—small, medium, large or gargantuan.



DIGITRAK®
Authorized Supplier of Digitrak Locating Equipment

Digitrak locating equipment features stunning 3D imaging, the first color display in the industry and ease of operation. Born from over two decades of experience, developed from over a million miles of drilling, and backed by world-class customer service.

Digitrak F5. A display of brilliance.

- Dual-frequency transmitters allow in-ground frequency change
- Five frequencies to avoid interference underground
- Fluid pressure viewed when drilling pilot bores
- SSI steering compatible
- Built-in Datalog® and TensiTrak®
- Off-track locating and Target Steering®
- Wireline ready

SAVE MONEY!
Ask about our locator trade in program!



Also available

Digitrak F2. Streamlined for easy operation.

- Single button user interface and picture-driven menu for universal use
- Real-time, bird's-eye view provides operators with critical on-the-fly steering ability
- Off-track locating and Target Steering®
- Sensitive Pitch 0.1%

SE. Hard work and reliability at an exceptional value.

- Combined select technology from both the F2 and Eclipse® locating systems
- Designed for compatibility with any existing Mark Series remote display
- Roll Offset Calibration
- Easy to use Target-in-the-Box® locating with left/right remote steering

AUNTIE C'S®
Premium Copper Thread Lube

- Premium copper thread lube designed specifically for the demanding conditions found in HDD
- Provides maximum protection against galling and seizing
- Contains no zinc or other materials which may be affected by elevated temperatures
- Available in Arctic Grade for cold conditions and with auto-lubers
- 20 ounce tubes, 1 gallon, 2 gallon, and 5 gallon pails
- Lead free compound



20 oz. size fits directly onto the JT920L, D6x6
20 lb. size fits directly onto the JT1720, JT1220, JT2020
20 lb. size fits directly onto the JT2720 and JT4020
For JetTrac autolubers, use the Arctic Grade Auntie C's

Sold exclusively through Directional Depot.



Thread Lube		
Description	Part#	Arctic Grade Part #
20 oz. tube	AS-402-JT	AS-402-JT-AG
10 lb. pail (1 gal.)	AS-410	AS-410-AG
20 lb. pail (2 gal.)	AS-420	AS-420-AG
45 lb. pail (5 gal.)	AS-445	AS-445-AG



"Fast Ship"—Orders for in-stock items placed before 6 p.m. EST ship the same day.

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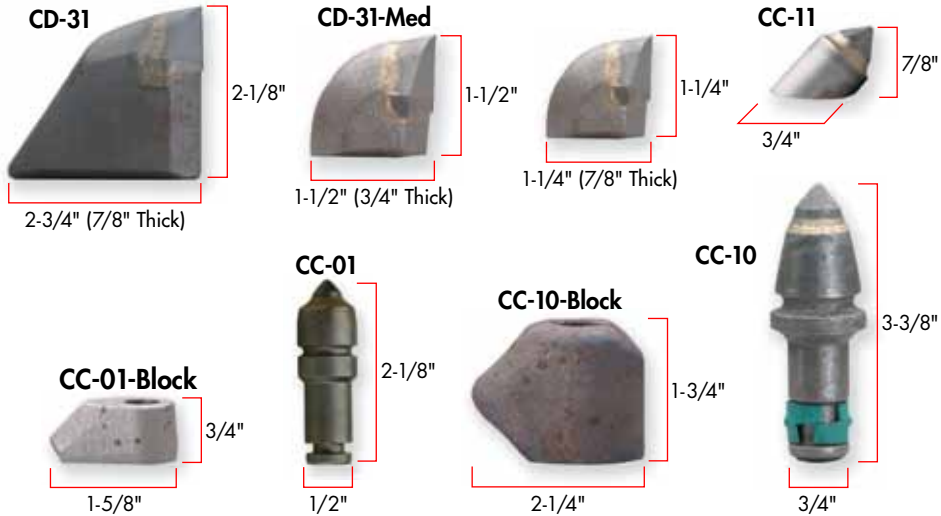
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HIGH-QUALITY CARBIDE CUTTER TEETH

Use to rebuild your Melfred Borzall tools

Replacement Cutters	
Description	Part #
Conical cutter block – small	CC-01-BLOCK
Conical cutter block – large	CC-10-BLOCK
Conical cutter – small	CC-01
Conical cutter – large	CC-10
Angled conical cutter, weld-on	CC-11
Small shark tooth cutter	CD-31-SHORT
Medium shark tooth cutter	CD-31-MED
Large shark tooth cutter	CD-31



BREAKOUT JAWS

Directional Depot breakout wrench replacement jaws will keep you drilling longer.

- High quality replacement jaws

Breakout Jaws	
Vermeer	
Description	Part #
Jaws for D24a, D24x26	JAW-30
Jaws for D7x11, D10x15, stationary	JAW-31
Jaws for D7x11, D10x15, cylinder	JAW-31-CT
Jaws for D16x20, stationary	JAW-32
Jaws for D16x20, cylinder	JAW-32-CT
Jaws for D33x44, stationary	JAW-33
Jaws for D33x44, insert	JAW-33-INS
Jaws for D36x50, stationary	JAW-36
Jaws for D24x40a, stationary	JAW-40
Jaws for D40x40, cylinder	JAW-40-CT
Jaws for D24x40, insert	JAW-40-INS
Jaws for D50x100, 2-7/8" rod, cylinder	JAW-50-CT
Jaw Inserts for D50x100, 2-7/8" rod, insert	JAW-50-INS
Jaws for D50x100, 3-1/2" rod, cylinder	JAW-80-CT
Jaws for D80x100, 3-1/2" rod, cylinder	JAW-80-CT
Jaw Inserts for D80x100, 3-1/2" rod, insert	JAW-80-INS
Jaw Inserts for D100x120, 3-1/2" rod, insert	JAW-120-INS
Ditch Witch	
Description	Part #
Jaw inserts for JT922	JAW-01-INS
Jaw inserts for JT2020	JAW-20-INS
Jaw inserts for JT2720M1, JT3020	JAW-37-INS
Jaw inserts for JT4020M1	JAW-43-INS
Jaw inserts for JT8020, JT100	JAW-100-INS



Breakout Jaws	
Astec	
Description	Part #
Jaw inserts for DD2024	JAW-24-INS
Jaw inserts for DD3238	JAW-38-INS
Jaw inserts for 6010	JAW-61-INS
Jaw inserts for 6030	JAW-63-INS
Jaw block for DD9014	JAW-90-BLOCK
Jaw inserts for DD9014	JAW-90-INS

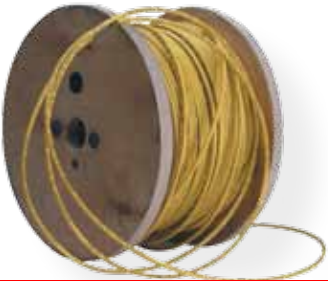
HDD TRACER WIRE

Don't play the "numbers game"

Directional Depot's Direct Detect Stainless Steel Tracer Wire and Copperhead's Copper Clad Reinforced Tracer Wire holds up to the rigors of HDD.

- Both have HDPE insulating jacket for maximum durability during pullback
- Rugged tracer wires designed specifically for HDD applications
- Copperhead's #12 copper-clad – 1,150 lbs. tensile strength
- Direct Detect #8 Stainless steel – 1,700 lbs. tensile strength
- Custom lengths and insulating jacket colors available

1049-STR-SS10
 1,000 ft. Reel of stainless steel wire



Special colors and custom lengths available.



Directional Depot Tracer Wire	
Copper Clad	Part #
500 ft. Reel	1049-STR-SS5
1,000 ft. Reel	1049-STR-SS10



Copperhead Tracer Wire	
Copper Clad	Part #
500 ft. Reel	1059-STR-CC5
1,000 ft. Reel	1059-STR-CC10

PUMP PARTS

From Directional Depot

Don't pay inflated prices for mud pump parts!

- Wide variety of replacement drill fluid pump parts
- FMC™, MP Pumps™
- Low prices

We carry these parts and more

JT920L FMC Valve Seat
JT2720 FMC Piston Cup



DRILL ROD WIPERS

Keep your drill rod clean

- Direct replacement for most OEM wipers
- High quality solid rubber wiper keeps drill rod clean



REAMER CARRIER

From Directional Depot

- Safely lower a reamer into the pit
- Easy way to install a reamer when the drill rig is locked out
- Dual-bearing blocks allows the reamer to be turned by hand without rotating the drill rod
- Adjustable to accommodate a wide range of reamer sizes and styles



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ZAPALERT®
Electrical Strike Alarm

- Helps alert crews to the possibility of a strike on an underground power line
- Easily installs on HDD rigs
- Tested from 100 to 100,000 volts AC

Zapalert	
Description	Part #
12/24v Zapalert w/ cable & stake	1750
Zapalert tester	1760

U.S. Patent #5,027,108

- Retrofit Zapalerts and parts available for Vermeer Navigator internal Zapalert



1760 Zapalert Tester

1750 Zapalert Strike Alarm

ELECTRICAL SAFETY GLOVES

- Dielectric rubber gloves are rated for usage at up to 17,000 volts
- Leather protectors go over to protect rubber glove from damage
- Meet ASTM specification D-120

Safety Gloves	
Description	Part #
Rubber glove	1820-GLV
Leather protector	1820-PRO
Glove storage bag	1820-BAG



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 BOOTS AND SHOES

- Dielectric boots and gloves are made of high quality, tear resistant rubber
- Conform with ASTM F1117 and tested to 20,000 volts
- 100% waterproof
- Boots are a 12" over-the-shoe style
- Shoes are an over-the-shoe style

Safety Boots and Shoes	
Description	Part #
Over-the-shoe Safety Boot	1830-BT
Over-the-shoe Safety Shoe	1830-SH

1830-BT Safety Boot

1830-SH Safety Shoe



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HOLES
WITHOUT
LEAVING YOU
IN ONE.**



**THE HEDGEHOG.
IT'S SMALL, MEAN
AND READY TO REAM.**

With all of the bite of a regular reamer packed into a compact size, the Hedgehog Reamer from Melfred Borzall packs a whole lot of burrow for your buck. Tapered blades with carbide cutting teeth ensure aggressive cutting action, while the size and versatility make it a deal worth digging. For more information, give us a call at 800-558-7500 (outside the U.S. call 805-739-0118). Or visit www.melfredborzall.com. Superior HDD products that won't cut a hole in your wallet... **that's the Borzalledge.**

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NEW PRODUCTS!

Hedgehog Backreamer



See page 44

Iron Fist Cobble Bit



See page 34

Premium Duct Puller



See page 61

Digitrak® Locators



See page 66

