2013 REAMER CATALOG
The Right Reamer – Available for Every Drill.

StraightLine® Reamers are available in diameters from 4 to 96 inches and are built on eight shaft sizes, ranging from 2 to 9½ inches (2, 3, 3½, 4¼, 5, 6½, 8, and 9½ inches). Choose from 80 common HDD thread types, with new connections added as needed.

StraightLine® Custom Reamers: Use Our Experience to Enhance Your Profits.

Consistently making a profit in the fast-changing HDD industry isn’t easy. That’s why StraightLine® specialists can be found working alongside contractors in the field, identifying solutions and more importantly learning what it takes to drill profitably.

StraightLine® has been in the directional drilling industry from the beginning and the application of that time, energy and experience shows in our superior tool design. Regardless of the make or model of your rig, you can boldly Fear No Ground with the StraightLine custom reamer design team. We can engineer, fabricate and even deliver to your job site, the reamer you need to produce money-making bores - fast!

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OUR CYCLONE REAMER IS THE UNDISPUTED CHAMPION IN STICKY CLAY.

Independent wing groups, steep wing angles and extremely low torque requirements contribute to the overwhelming success of this tool. In sands, loams and sticky clays, the StraightLine® Cyclone is designed to lower your cost per foot and generate a strong return on your investment.

GROUND CONDITIONS:
Sands, Loams & Sticky Clays.

SHAFT SIZE: 2½" - 6⅜"
SIZE RANGE: 8" - 24"

FEATURES

- Independent wing groups (3 wing groups on 8" & 10" reamers; 4 wing groups on reamers 12" and larger)
- Soil shear passages on all wing segments 10" and larger
- Steep wing angles
- Heavy duty Carbide teeth & hard surfacing on the wing edges
- Replaceable fluid ports located along the edges of the wings

BENEFITS

- Wing groups do not overlap so sticky clays cannot build a bridge and ball up
- Reduction in surface area, limits clay build up and reduces clays to fines
- Further prohibits sticky clays clinging to the wings
- Aggressive cutters help reduce sticky clays to fines, while hard surfacing dramatically reduces tool wear
- Lowers the torque on the drill string and makes efficient use of the drilling fluid
AVAILABLE IN 3, 4 AND 5-WING DESIGNS, DEPENDING ON THE DIAMETER OF THE REAMER.
Key features include a centralizing ring with large carbide cutters placed along the length of the wings, hard surfacing along the leading edges of wings, and replaceable fluid ports positioned along the rear of each wing to presoak the path of the oncoming cutters. All of this adds up to a low-mass, low-torque tool that accomplishes more footage with less effort.

GROUND CONDITIONS: Loams, Light Aggregates & Shale.

SHAFT SIZE: 3” – 5”
SIZE RANGE: 12” – 48”

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>BENEFITS</th>
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<tbody>
<tr>
<td>Open body design</td>
<td>Low-mass/low-torque tool that allows more work to be accomplished with less effort</td>
</tr>
<tr>
<td>Long shallow cutting wings</td>
<td>Delivers smooth stable cutting action</td>
</tr>
<tr>
<td>Centralizing ring</td>
<td>Helps the tool run true in the bore hole</td>
</tr>
<tr>
<td>Large carbide cutters positioned along the length of the wings</td>
<td>Delivers aggressive cutting and long tool life</td>
</tr>
<tr>
<td>Replaceable fluid ports located along the low pressure side of each wing to presoak the path of the oncoming cutters</td>
<td>Delivers super efficient mixing of soil and fluid</td>
</tr>
<tr>
<td>Leading edge of wings feature carbide impregnated hard surfacing</td>
<td>Extends tool life</td>
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</table>
**STRATIGHTLINEHDD®**

**STEEP-TAPERED FLY-CUTTER REAMER**

**AVAILABLE IN 3, 4 AND 5-WING DESIGNS DEPENDING ON THE DIAMETER OF THE REAMER.**

This open-bodied reamer features steep tapered wings with two rows of large carbide cutters and a heavy-duty centralizing ring for added toughness in hard ground and with larger drill rigs.

The Heavy duty centralizing ring supports two rows of large carbide cutters positioned along the length of each wing. Hard surfacing is applied to the leading edge of the wings and replaceable fluid ports are found along the rear of each wing to presoak the path of the oncoming cutters resulting in highly efficient mixing and smooth cutting action.

**GROUND CONDITIONS:** Loams, Aggregates, Shale & Limestone.

**SHAFT SIZE:** 3” – 6 1/2”
**SIZE RANGE:** 12” – 54”

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<tr>
<td>Open body design</td>
<td>Low-mass/low-torque tool that allows more work to be accomplished with less effort</td>
</tr>
<tr>
<td>Steep cutting wings</td>
<td>Heavier design delivers aggressive cutting action</td>
</tr>
<tr>
<td>2-rows of large carbide cutters positioned along the length of the wings</td>
<td>Delivers aggressive cutting and long tool life</td>
</tr>
<tr>
<td>Centralizing ring</td>
<td>Helps the tool run true in the bore hole</td>
</tr>
<tr>
<td>Replaceable fluid ports located along the rear of each wing to presoak the path of the oncoming cutters</td>
<td>Delivers super efficient mixing of soil and fluid</td>
</tr>
<tr>
<td>Leading edge of wings feature carbide impregnated hard surfacing</td>
<td>Extends tool life</td>
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</table>
I'm bragging about your reamers... They are built heavy duty. Your reamer stood up and completed a tough 100' bore when another from the big boys couldn't... theirs got plumb worn-out.

CHRIS WILLIS
Kajacs Contractors
Poplar Bluff, Mo
AVAILABLE IN 3, 4, 5 & 6-WING DESIGNS DEPENDING ON THE DIAMETER OF THE REAMER.

With large carbide cutters and carbide hard surfacing on the edges, the StraightLine® Winged Reamer features double slope wings with a low-mass, open body design that delivers exceptional toughness and unmatched efficiency in cutting and mixing. The result is more work with less wear and tear on your drill and drill string. In addition, fluid ports along the rear perimeter of each wing, aid in presoaking the path of the oncoming cutters.

GROUND CONDITIONS:
Non-compactible conditions including Sands, Aggregates, Shale and Limestone.

SHAFT SIZE: 3” – 6½”
SIZE RANGE: 10” – 48”

FEATURES

- Open body design
- Double slope wing design
- Large carbide cutters positioned along the length of the wings
- Replaceable fluid ports located along the rear of each wing to presoak the path of the oncoming cutters
- Leading edge of wings feature carbide impregnated hard surfacing

BENEFITS

- Low-mass/low-torque tool that allows more work to be accomplished with less effort
- Provides exceptional toughness and improved mixing
- Delivers aggressive cutting and long tool life
- Perimeter fluid placement delivers efficient mixing of soil and fluid
- Extends tool life
EXTREMELY VERSATILE DESIGN DELIVERS EXCELLENT PERFORMANCE IN SANDS AND LOAMS TO LIGHT AGGREGATES AND SANDSTONE.

This compact reamer design combines precise carbide placement and efficient fluid delivery to effectively reduce torque on the drill string, increase productivity and reduce wear. Key features include independent path carbide cutters coupled with redundant carbide cutters on wing edges, presoaking fluid jets, compact body for confined spaces and low torque design for effective use with all drill sizes.

GROUND CONDITIONS:
Sand, Loam, Light Aggregates & Sandstone.

SHAFT SIZE: 2" - 4 1/4"
SIZE RANGE: 6" – 24"

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each carbide cutter follows independent paths</td>
<td>Cutters engage the entire bore face for efficient cutting</td>
</tr>
<tr>
<td>Redundant carbide cutters on wing edges</td>
<td>Provides wear resistance to the wings outer edges and extends tool life</td>
</tr>
<tr>
<td>Fluid jets are positioned along the edges of the wing to presoak the path of the oncoming cutters</td>
<td>Efficient fluid placement lowers torque on the drill string and enhances mixing of the cuttings</td>
</tr>
<tr>
<td>Compact design</td>
<td>Makes it easy to install and remove in confined spaces</td>
</tr>
<tr>
<td>Low torque requirement</td>
<td>Extends the drill rig capabilities</td>
</tr>
</tbody>
</table>
A VERSATILE ALL-IN-ONE TOOL THAT CUTS, MIXES, AND PACKS IN ONE EASY STEP.

The Rhino features large carbide cutters, positioned over the length of the body, to over cut and allow drilling fluid to pass by the reamer. All leading edges are protected with hard surfacing and the strategically placed fluid ports are completely replaceable.

GROUND CONDITIONS:
Loams, Clays, Hardpan and Small Aggregates.

SHAFT SIZE: 2” – 4½”
SIZE RANGE: 6” – 20”

FEATURES

- Multi-purpose tool with an emphasis on cutting
- 3-rows of large carbide cutters positioned along the tapered portion of the body
- Replaceable fluid ports located along the taper of the tool
- Packing bell packs the cuttings
- Optional built-in swivel

BENEFITS

- Combines cutting, mixing and packing into a single tool
- Delivers aggressive cutting and long tool life
- Delivers efficient fluid placement and improves mixing of soil and fluid
- Facilitates utility installation
- Keeps the overall tool short so that it’s easy to handle
StraightLine puts in the same built-in swivel...so they're interchangeable... which can really save you in a pinch...

DUSTIN BECK
Utility Services Group, Inc.
Camp Hill, PA
TRI-ACTION REAMER

THE TRI-ACTION IS DESIGNED TO CUT, PULVERIZE AND FORM THE WALL.

The long tapered compaction style body with three relief flutes allow cuttings, small aggregates and drilling fluid to pass through the reamer. The leading edge of each flute is hard surfaced and the replaceable jets and carbide cutters maximize performance and tool life.

GROUND CONDITIONS:
Loams, Clays, Hardpan, Aggregates and Rock formations up to 15,000 PSI.

SHAFT SIZE: 3” - 4 1/4”
SIZE RANGE: 6”, 8” & 10”

FEATURES

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>BENEFITS</th>
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</thead>
<tbody>
<tr>
<td>Long tapered spiral body</td>
<td>Promotes smooth cutting action</td>
</tr>
<tr>
<td>Heavy duty carbide teeth</td>
<td>Delivers aggressive cutting action and extends service life</td>
</tr>
<tr>
<td>Leading edges are protected by carbide impregnated hard surfacing</td>
<td>Extends service life</td>
</tr>
<tr>
<td>Replaceable fluid ports located in each flute</td>
<td>Easy to adjust fluid placement to maximize drilling performance</td>
</tr>
<tr>
<td>Optional built-in swivel</td>
<td>Built-in design engineered to prohibit the swivel from tipping to the side as backwards pressure is applied to the tool.</td>
</tr>
</tbody>
</table>
THE HEAVY CONSTRUCTION OF THE ALL-TERRAIN REAMER MAKES IT SIMPLY THE TOUGHEST, MOST DURABLE FLUTE AVAILABLE ON THE MARKET TODAY.

This tool cuts, pulverizes and forces the remaining pieces into the formation wall. Constructed from steel plate and fully welded, the StraightLine® All-Terrain Reamer features aggressive spiraling flutes which allow cuttings, small aggregates and drilling fluids to pass by the body. Replaceable jets facilitate precise mud flow and placement, while extra heavy duty carbide cutters and extensive hard surfacing on all wear surfaces provide maximum performance and tool life.

GROUND CONDITIONS:
Clay, Hardpan, Aggregate and Rock formations up to 20,000+ PSI.

SHAFT SIZE: 2” – 9½”
SIZE RANGE: 8” – 48”

FEATURES

- Constructed from fully welded steel plate segments
- Aggressive spiraling flutes
- Heavy duty carbide teeth
- All welds and cutting edges are protected by carbide impregnated hard surfacing
- Replaceable fluid ports are located in the bottom of each flute
- Optional built-in swivel

BENEFITS

- Provides unequaled service life
- Delivers smooth cutting action and provides relief for cuttings and drilling fluid to pass by the body
- Delivers aggressive cutting action and extends service life
- Extends the service life of the tool
- Easy to adjust fluid placement to maximize drilling performance
- Keeps the overall tool short so that it’s easy to handle
HOLE OPENERS DELIVER SMOOTH CUTTING IN SOLID FORMATIONS FROM SHALE TO GRANITE.
Designing the proper Hole Opener for a given situation takes expertise and experience - StraightLine\textsuperscript{®} has both. Hole Openers are classified as a custom product - designed and built on a job by job basis. With variables such as cutter selections, Mill Tooth or Tungsten Carbide Insert (TCI) cutters, new or premium re-run condition cutters, size and quantity of of cones, front and/or rear stabilizers, StraightLine's\textsuperscript{®} knowledgeable staff will help guide you through the process of specifying the best tool for the job.

GROUND CONDITIONS:
Solid non-compactable formation from Caliche to Granite.

SHAFT SIZE: 3" - 9 1/2"
SIZE RANGE: 10" - 60"

<table>
<thead>
<tr>
<th>FEATURES</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Constructed from premium cones to match the formation</td>
<td>Provides unequaled service life</td>
</tr>
<tr>
<td>Each tool is designed specifically to the customer requirement</td>
<td>Maximum production is delivered through tool design for the ground condition</td>
</tr>
<tr>
<td>Proper cone spacing, minimizing the distance between the cones individually, and the distance to the shaft.</td>
<td>Facilitates less torque and allows pressure to be equally spread across the cone face.</td>
</tr>
<tr>
<td>Push back cone provides a tapered surface to push against.</td>
<td>Creates a surface that does not bind if the reamer is pushed backwards.</td>
</tr>
<tr>
<td>Cones are sized specifically to the pilot bore and the reamer size.</td>
<td>Maximizes bearing life and promotes proper edge protection</td>
</tr>
</tbody>
</table>
StraightLine® listened to us and customized a tool specific for our ground conditions and pull-back. It worked great. I will be buying more.

DAVID BROOKS
Brooks Construction
Burden, Kansas
BI-DIRECTIONAL CUTTING, EXTREME TOUGHNESS AND A COMPACT, OPEN BODY DESIGN.
The success of the RRF centers around its low-mass / high-strength core that enables this extreme tool to perform well in sands, aggregates, and light rock. The open body design delivers exceptional mixing while the extra heavy wing segments gain incredible footage through some of the toughest ground conditions. The compact design allows for ease of installation and extraction in confined spaces. Precise carbide placement coupled with perimeter drilling fluid displacement provides the operator with unmatched versatility, making the StraightLine® Reverse Radial Flow Reamer one of the most popular large diameter tools in the industry.

GROUND CONDITIONS:
Loams, moderate aggregates, clays, shale and light rock formations.

SHAFT SIZE: 4" – 10"
SIZE RANGE: 16" – 72"

FEATURES

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<tr>
<td>Bi-directional</td>
<td>Facilitates cutting backwards out of the hole</td>
</tr>
<tr>
<td>Replaceable conical carbide cutters</td>
<td>Extends service life. Excellent field serviceability</td>
</tr>
<tr>
<td>Centralizing ring</td>
<td>Helps reamer run centered in the bore</td>
</tr>
<tr>
<td>Perimeter flow fluid jets</td>
<td>Presoaks the path of oncoming cutters</td>
</tr>
<tr>
<td>Low mass</td>
<td>Low mass allows the tool to be short and efficient in large diameters</td>
</tr>
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BARREL REAMER STABILIZES TUNNEL AND EASES UTILITY INSTALLATION.
A versatile tool, featuring a relatively flat face lined with rows of carbide cutters, the StraightLine® Barrel Reamer cuts and opens the hole at a slightly larger diameter, than that of its solid body. Commonly used in soft formations, the tool is also often utilized as a stabilizer when pulling larger reamers, fly cutters or hole openers and is regularly down hole when installing final product.

**SHAFT SIZE:** 3” – 9½”
**SIZE RANGE:** 12” – 48”

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<tr>
<td>Full diameter compaction</td>
<td>Eases utility installation</td>
</tr>
<tr>
<td>Long full diameter body</td>
<td>Centralizes reamer and the utility in the hole during pullback</td>
</tr>
<tr>
<td>Large conical carbide cutters</td>
<td>Maximizes cutting performance</td>
</tr>
<tr>
<td>Critical wear areas feature carbide impregnated hard surfacing</td>
<td>Extends tool life</td>
</tr>
<tr>
<td>Replaceable fluid ports positioned along the face of the tool</td>
<td>Provides operator mud flow and placement control</td>
</tr>
<tr>
<td>Helixed wear bars with carbide impregnated hard surfacing</td>
<td>Provides protection for the fluid ports</td>
</tr>
</tbody>
</table>
THE MAXI-BARREL REAMER STABILIZES THE TUNNEL EASING PRODUCT INSTALLATION.

All the versatility of the Barrel Reamer, with heavier weight construction; Maxi Barrel Reamers are constructed from material up to 50% greater than a standard barrel. StraightLine engineers had longevity in mind, with the incorporation of replaceable conical carbide cutters and replaceable carbide jets in the added value design. This tool is effective in sealing formation walls and stabilizing large reamers, fly cutters and hole-openers. The Maxi Barrel is regularly used for pulling back large final product, utilizing its design to open the hole with its long, solid body.

**SHAFT SIZE:** 4\(\frac{1}{4} \)" – 9\(\frac{1}{2} \)"

**SIZE RANGE:** 24” – 96”

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<td>Extends tool life</td>
</tr>
<tr>
<td>Replaceable carbide jets</td>
<td>Minimizes erosion and allows operator to precisely manage output flow and pressure</td>
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**MAXI FLY-CUTTER REAMER**

**THE MAXI-FLY CUTTER HANDLES BIG TORQUE TO TACKLE A VARIETY OF CONDITIONS FROM SAND TO LIMESTONE.**  
This tool is a 3-wing design that features three large cutting surfaces and three equal sized spoil passage areas. The Maxi-Fly features extra heavy-duty construction; wing structures are constructed using ¾” or 1” plate depending on tool size that are then welded to the 1” thick centralizing ring to form a tool that is capable of handling the torque and pullback of today’s Maxi-Rigs. The centralizing ring helps the reamer run true in the bore hole; shallow wing angle facilitates smooth cutting in large diameter holes; replaceable conical carbide cutters for maximum performance and tool life; and replaceable carbide jets deliver precise fluid placement.

**SHAFT SIZE:** 3” – 5”  
**SIZE RANGE:** 24” – 96”

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>Semi open body design</td>
<td>exceptional cutting and mixing qualities</td>
</tr>
<tr>
<td>Extra heavy-duty box type construction</td>
<td>Delivers long service life</td>
</tr>
<tr>
<td>Extra wide centralizing ring</td>
<td>Helps reamer run true in the bore hole</td>
</tr>
<tr>
<td>Precise carbide placement and shallow wing angles</td>
<td>Facilitates smooth cutting in large diameter holes</td>
</tr>
<tr>
<td>Large replaceable conical carbide cutters</td>
<td>Delivers excellent cutting performance and maximizes tool life</td>
</tr>
<tr>
<td>Reamer edges feature carbide impregnated hard surfacing</td>
<td>Extends tool life</td>
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<tr>
<td>Replaceable carbide jets</td>
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**MAXI FLY-CUTTER REAMER**