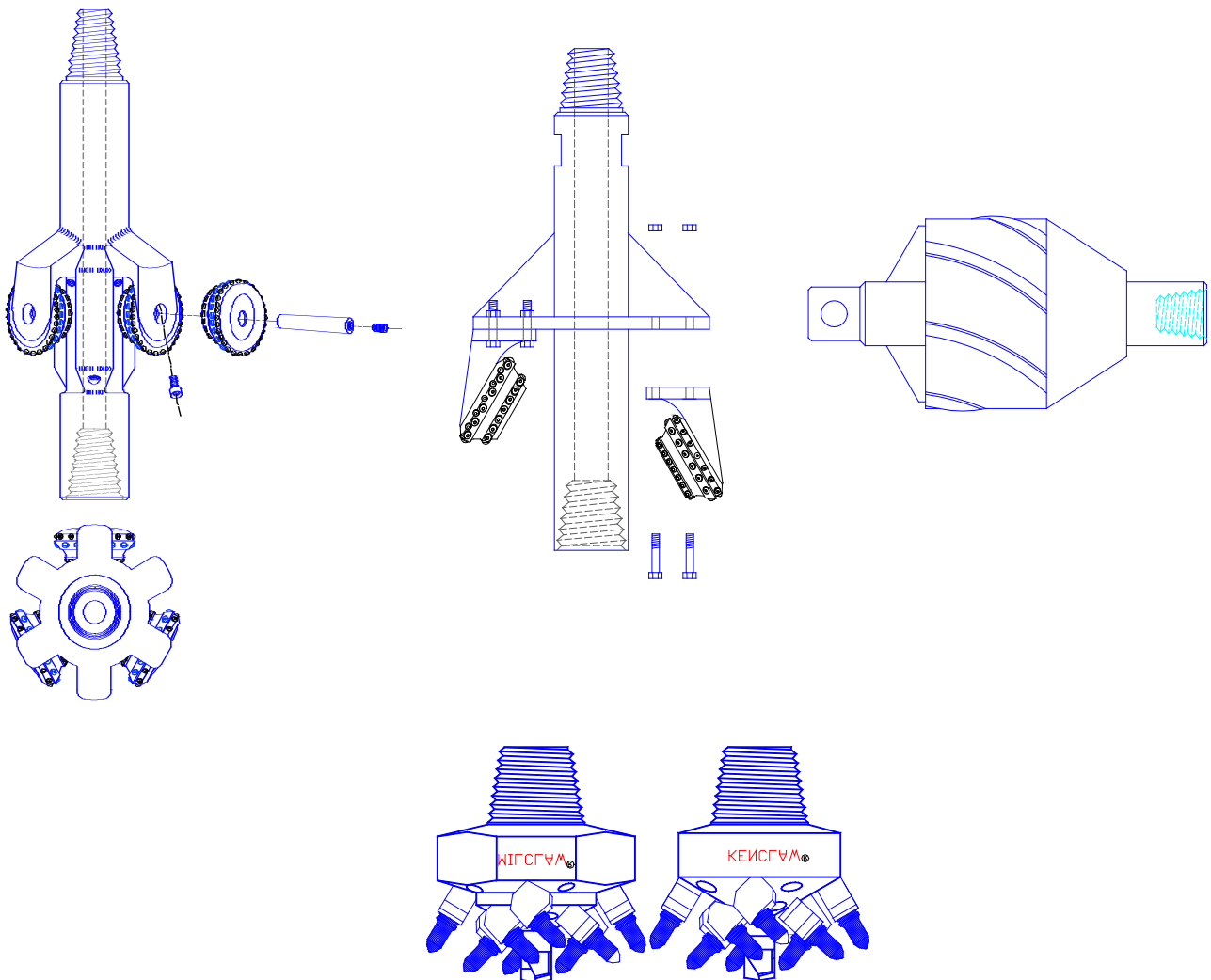


# Horizontal Directional Drilling (HDD)

Horizontal Directional Drilling (HDD) continues to be the most popular method of installing electrical cable, fiber optics, utility conduits and irrigation lines in industrial, commercial and residential applications. This technology eliminates the need for open trenching to install utility lines and surface obstructions can be avoided with minimal environmental disturbance and limited interruptions to traffic or services.

Mills Machine has been manufacturing horizontal drilling bits, holeopeners and horizontal road boring bits for over twenty years. Specific information regarding these products is found in sections 4, 6, 7, and 8 of our general product catalog. We also, manufacture hollow stem augers and solid core augers that have HDD applications found in sections 1 and 4 of our catalog.

This new catalog section features Claw, Blade or Roller Horizontal Holeopeners and Claw, Blade or Roller Back Reamers.



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Phone: 800-654-2703 or 405-273-4900 Fax: 405-273-4956

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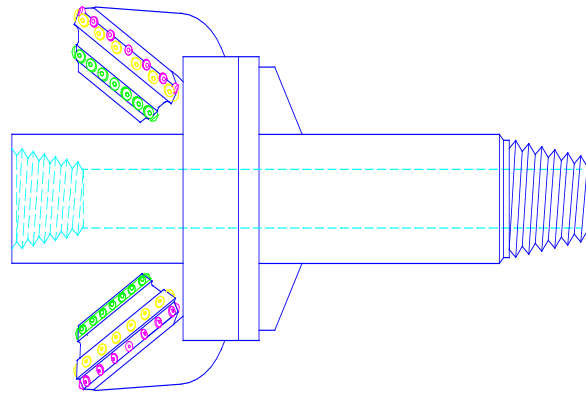
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# Horizontal Directional Drilling (HDD)

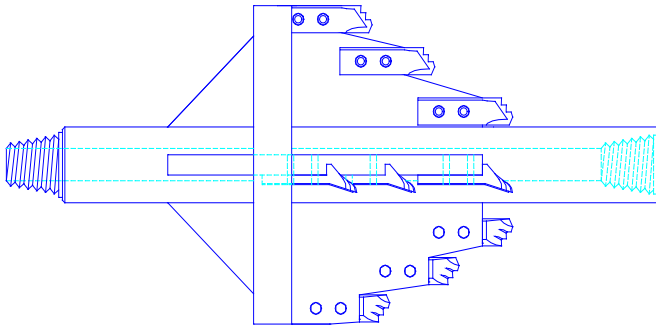
## Roller Cone Horizontal Holeopeners.

Mills Machine has over **forty-five years of experience** in manufacturing our custom designed horizontal roller holeopeners, which are, available in sizes from 6 to 120 (150 mm to 3 Meters) and larger. We custom manufacture these Holeopeners to meet your specific requirements. These ruggedly constructed units are made from **4142 alloy steel** and the roller rock bit cutters of your choice.

The horizontal holeopeners are available in single stage, two stages or multiple stage depending on the pilot hole and the finished hole size. The lead and trailing necks can be as long as you desire with breakout flats or lugs as needed. Circulation can be standard or reverse for horizontal or raised bore drilling and circulation can be fluid or air depending on your rig capabilities.



Roller Cone Horizontal Holeopeners are made with tricone roller rock bits and are available in Steel Tooth or TCI Button, in new, retip or rerun condition and with open or sealed journal bearings.

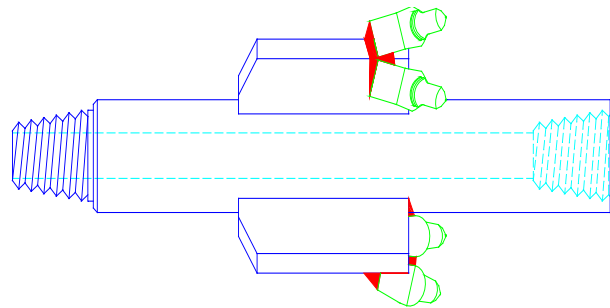


## Drag Type Horizontal Holeopeners

Mills also manufacturers large drag (blade) Holeopeners for horizontal drilling using replaceable bolt on teeth in a step tooth or chevron apex tooth construction or a combination of teeth and bullet bits. This type of reamer is designed for soft to medium formations and can be made in any size with any thread front or back. Another option to this bit is to put cutters and jets on the back side of the bit if you have to reverse out of the hole.

## Bullet Type Horizontal Holeopeners

Truly one of the most versatile bits that we manufacture is the Bullet Type Reamer. Designed for hard compacted clay to soft limestone this rugged bit with replaceable carbide cutters offers the most capability and convenience for the money. It is a very aggressive cutting bit that will increase your production while reducing your overhead.

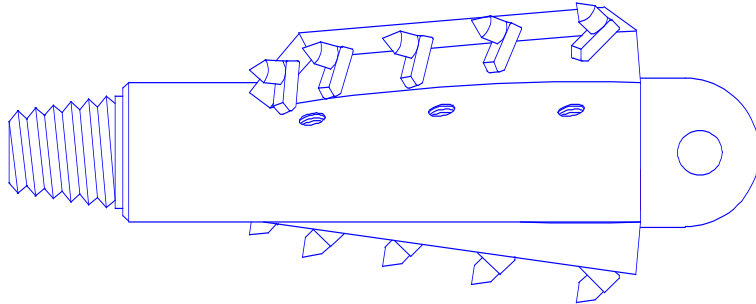


**The only limit of our capabilities is your imagination. Working together, we can help solve all of your tough drilling problems.**

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# HDD Components

## Winged Claw Backreamer



**Carbide bullet cutters rotate in their block to promote a self-sharpening action and reduce torque on the drill string. The** Inexpensive, replaceable cutters are easy to change in the field. This bit works well in unconsolidated formations where layers of soft and hard rock are encountered. Water jets clean the bullet cutters as you drill. We can add the box, pin or connection of your choice.

Available in sizes shown in the table or to meet your specific needs. On the sizes 10 and larger we can build this bit to include the pull swivel to reduce the overall length. Contact us for details.

Part #	Description
CBBR6	6 Claw Backreamer, connections TBD
CBBR8	8 Claw Backreamer, connections TBD
CBBR10	10 Claw Backreamer, connections TBD
CBBR12	12 Claw Backreamer, connections TBD
CBBR14	14 Claw Backreamer, connections TBD
CBBR16	16 Claw Backreamer, connections TBD
CBBR18	18 Claw Backreamer, connections TBD
CBBR20	20 Claw Backreamer, connections TBD
CBBR22	22 Claw Backreamer, connections TBD
CBBR24	24 Claw Backreamer, connections TBD

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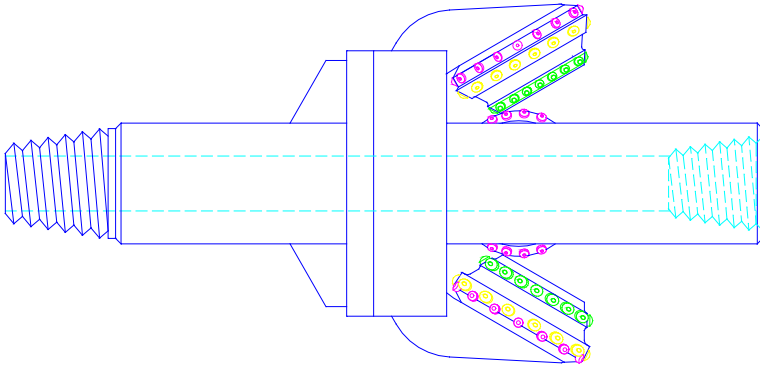
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# HDD Components

## Roller Cone Backreamers

Mills Machine has over **forty-five years of experience** in manufacturing our custom designed horizontal roller holeopeners, which are, available in sizes from 6 to 120 (150 mm to 3 Meters) and larger We have transferred that technology to the design of backreamers. These ruggedly constructed units are made from **4142 alloy steel** and the roller rock bit cutters of your choice.



Horizontal backreamers are available in single stage, two stages or multiple stage depending on the pilot hole and the finished hole size. The lead and trailing necks can be as long as you desire with breakout flats or lugs as needed. Circulation can be standard or reverse for horizontal or raised bore drilling and circulation can be fluid or air depending on your rig capabilities.

Roller Cone Horizontal Backreamers are made with tricone roller rock bits and are available in Steel Tooth or TCI Button, in new, retip or rerun condition and with open or sealed journal bearings.

Part #	Description
RCBR6	6 Roller Cone Backreamer, connections TBD
RCBR8	8 Roller Cone Backreamer, connections TBD
RCBR10	10 Roller Cone Backreamer, connections TBD
RCBR12	12 Roller Cone Backreamer, connections TBD
RCBR14	14 Roller Cone Backreamer, connections TBD
RCBR16	16 Roller Cone Backreamer, connections TBD
RCBR18	18 Roller Cone Backreamer, connections TBD
RCBR20	20 Roller Cone Backreamer, connections TBD
RCBR22	22 Roller Cone Backreamer, connections TBD
RCBR24	24 Roller Cone Backreamer, connections TBD

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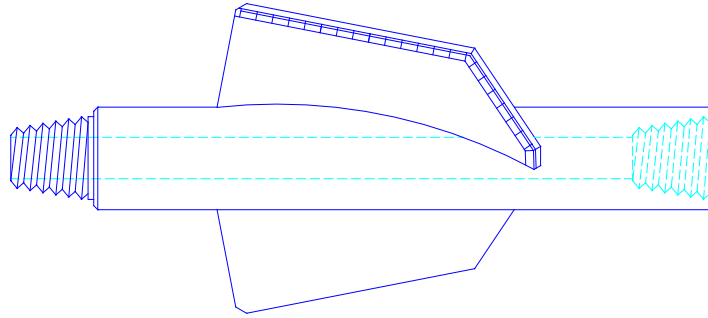
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# HDD Components

## Spiral Blade Backreamer

Mills also manufactures spiral blade backreamers for horizontal drilling using carbide tipped drag blades. This type of reamer is designed for soft to medium formations and can be made in any size with any thread or connection on the front or back.



Part #	Description
DBBR6	6 Drag Blade Backreamer, connections TBD
DBBR8	8 Drag Blade Backreamer, connections TBD
DBBR10	10 Drag Blade Backreamer, connections TBD
DBBR12	12 Drag Blade Backreamer, connections TBD
DBBR14	14 Drag Blade Backreamer, connections TBD
DBBR16	16 Drag Blade Backreamer, connections TBD
DBBR18	18 Drag Blade Backreamer, connections TBD
DBBR20	20 Drag Blade Backreamer, connections TBD
DBBR22	22 Drag Blade Backreamer, connections TBD
DBBR24	24 Drag Blade Backreamer, connections TBD

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# HDD Components

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