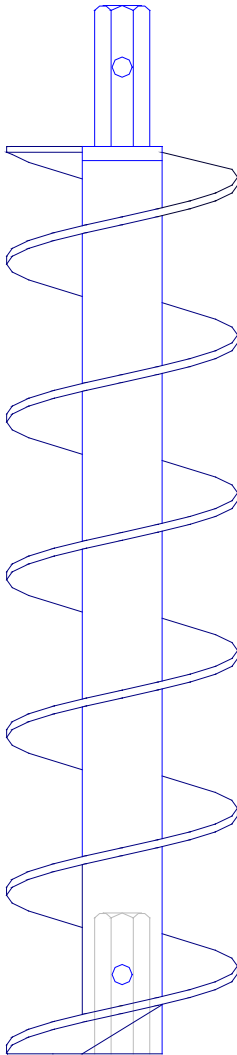


Solid Augers



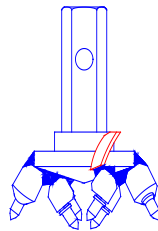
Solid (construction) augers from Mills Machine are furnished with rugged steel flighting, heavy-duty steel center shaft and have a variety of cutting heads available. Used for utility, industrial, mining, and construction applications, they are available in standard diameters from 3 1/2 to 48 and larger sizes are available upon request. Standard solid augers have a hex shank (pin) up and a hex socket (box) down but can be made with any connection you desire. The normal length is five feet with other lengths readily available.

Several cutter head styles are available ranging from a fish tail or screw bit design for soft formations, forged steel finger type for soft to medium formations and a carbide tipped bullet cutter for medium to hard formations. Each type of cutter head is specially designed in a spiral shape or with flighting to efficiently convey the cuttings or spoils to the auger flighting.

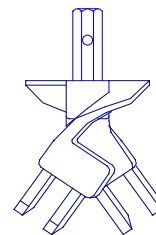
Mills Machine Company excels in custom designed augers and cutter heads. We have presented several drawings on this page to show some of the versatility in our product design. Available are standard flow and jet auger designs (drill rod with flighting), cutting heads for standard duty or heavy duty for tough drilling applications. Custom diameters, variations of pitch, flighting and connections are some options available. Let our experienced sales people help you match your desired designs with our broad experience and custom manufacturing abilities.

**Custom augers available on request.
Custom augers are non-returnable.**

Solid Auger Section



Bullet Cutter Head



Finger Bit Cutter Head

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Check our Web Site
www.MillsMachine.com

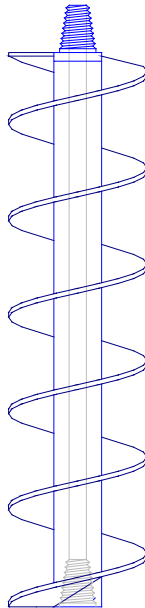
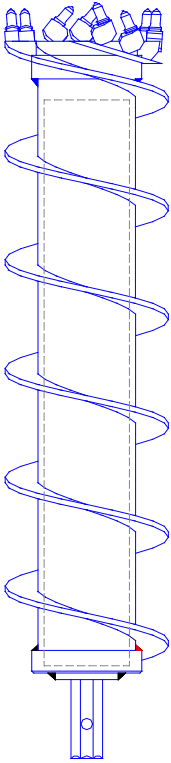
MILLS MACHINE CO. INC., P O BOX 1514, SHAWNEE, OK, 74802
Phone: 800-654-2703 or 405-273-4900 Fax: 405-273-4956

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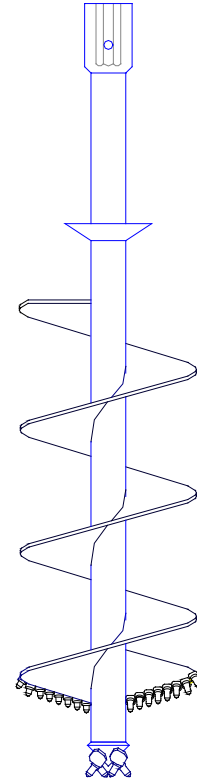
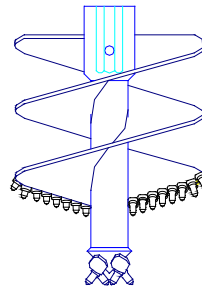
4-1

SOLID AUGERS

Post Remover: Easy, fast removal of highway or other posts. Fits over the top of the post and removes dirt and cement from around the post for fast post extraction.



Jet Auger: For passage of fluid through the auger to the cutter head for removal of cuttings and cooling.



Core Barrel: Large Diameter with bullet cutters around the circumference.



Depending on cutters and length this can be a “Post”, “Rock”, “Dirt” or “Tree” Auger. We can furnish to any length, single or double helix, choice of cutters, choice of pilot bits, and choice of connection.

Other variations of solid augers are available on a custom basis. We manufacture custom augers at standard prices and in lead times that are competitive. Custom augers are manufactured on a non-returnable basis. There are thousands of variations available and Mills Machine manufactures most all of them.

“PLEASE CALL FOR CUSTOM OPTIONS AND OTHER ACCESSORIES”

Solid augers have a hex shank (pin) up and a hex socket (box) down. The standard length is 5' with other length sections available. All Mills Machine built solid augers have **hard surface** coating on the outer flighting edge.

1 11/16 Dia. Center Tube with 1 1/8 Hex Shank

Part #	Description *	Hex	Pitch	Auger Diameter	Weight	
					Lbs	Kgs
SS35118	3 1/2 O.D. Hole Size	1 1/8	3	3 1/4	35	15.9
SS45118	4 1/2 O.D. Hole Size	1 1/8	3	4	39	17.7
SS50118	5 O.D. Hole Size	1 1/8	4	4 1/2	40	18.1
SS60118	6 O.D. Hole Size	1 1/8	5	5 1/2	43	19.5

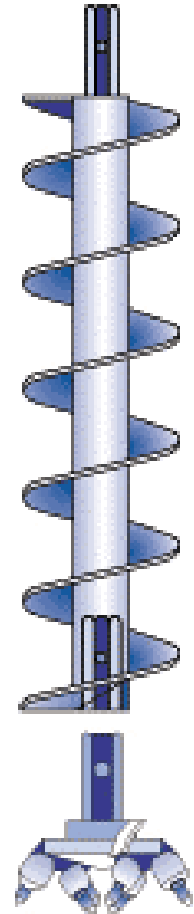
2 3/8 Dia. Center Tube with 1 5/8 Hex Shank

SS45158	4 1/2 O.D. Hole Size	1 5/8	3	4	48	21.8
SS50158	5 O.D. Hole Size	1 5/8	4	4 1/2	52	23.6
SS60158	6 O.D. Hole Size	1 5/8	5	5 1/2	53	24.0
SS70158	7 O.D. Hole Size	1 5/8	5	6	62	28.1
SS80158	8 O.D. Hole Size	1 5/8	7	7	63	28.6

2 7/8 Dia. Center Tube with 1 5/8 Hex Shank

SS90158	9 O.D. Hole Size	1 5/8	7	7 7/8	77	34.9
SS100158	10 O.D. Hole Size	1 5/8	8	8 7/8	87	39.5
SS120158	12 O.D. Hole Size	1 5/8	9	10	102	46.3
SS120200	12 O.D. Hole Size	2	9	10	110	50.0

* **Solid Auger diameters are designated by the hole diameter cut by the solid auger cutter head. The actual diameter of the auger is smaller so the auger flighting conveys the cuttings and the cutter head does the work. See Auger Diameter column above for actual diameter of the auger.**



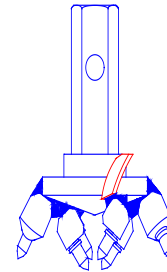
"PLEASE CALL FOR CUSTOM OPTIONS AND OTHER ACCESSORIES"

Solid Auger Cutter Heads

The outside diameter of the Auger Cutter Head determines the auger hole size.

Bullet Bit, Solid Auger Cutter

Part #	Description	Hex	No. of Cutters	Weight	
				Lbs	Kgs
SABB312118	3 1/2 O.D. Mini-Bullet Cutter Head	1 1/8	4-CCM4		
SABB400118	4 O.D. Mini-Bullet Bullet Cutter Head	1 1/8	4-CCM4		
SABB412118	4 1/2 O.D. C-23 Bullet Cutter Head	1 1/8	4-C23		
SABB600158	6 O.D. C-23 Bullet Cutter Head	1 5/8	6-C23		
SABB700158	7 O.D. C-23 Bullet Cutter Head	1 5/8	8-C23		
SABB800158	8 O.D. C-23 Bullet Cutter Head	1 5/8	8-C23		
SABB1000158	10 O.D. C-23 Bullet Cutter Head	1 5/8	10-C23		
SABB1200158	12 O.D. C-23 Bullet Cutter Head	1 5/8	10-C23		

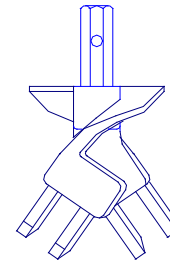


Bullet Bit Cutter Head

Finger Bit, Solid Auger Cutter Head

The finger bit cuts a 1/2 larger diameter hole, on the 5 and larger sizes, than the corresponding bullet bit or fish tail bit.

SAFB312118	3 1/2 O.D. Tungsten Carbide Finger Bit	1 1/8	2.5	1.2
SAFB412118	4 1/2 O.D. Tungsten Carbide Finger Bit	1 1/8	10	4.5
SAFB512118	5 1/2 O.D. Tungsten Carbide Finger Bit	1 1/8	11	5.0
SAFB612118	6 1/2 O.D. Tungsten Carbide Finger Bit	1 1/8	15	6.8
SAFB412158	4 1/2 O.D. Tungsten Carbide Finger Bit	1 5/8	48	21.8
SAFB512158	5 1/2 O.D. Tungsten Carbide Finger Bit	1 5/8	52	23.6
SAFB612158	6 1/2 O.D. Tungsten Carbide Finger Bit	1 5/8	53	24.0
SAFB712168	7 1/2 O.D. Tungsten Carbide Finger Bit	1 5/8	62	28.1
SAFB812158	8 1/2 O.D. Tungsten Carbide Finger Bit	1 5/8	63	28.6
SAFB912158	9 1/2 O.D. Tungsten Carbide Finger Bit	1 5/8	77	34.9
SAFB1012158	10 1/2 O.D. Tungsten Carbide Finger Bit	1 5/8	87	39.5
SAFB1212158	12 1/2 O.D. Tungsten Carbide Finger Bit	1 5/8	102	46.3



Finger Bit Cutter Head

Fish Tail Screw Bit, Solid Auger Cutter Head

Screw Bit, Head Only, all are Hard Faced		Weight	
		Lbs	Kgs
SASBH312HFM	3 1/2 O.D. Fish Tail Screw Head Medium		
SASBH412HFM	4 1/2 O.D. Fish Tail Screw Head Medium		
SASBH500HFL	5 O.D. Fish Tail Screw Bit Head Large		
SASBH600HFL	6 O.D. Fish Tail Screw Bit Head Large		
SASBH700HFL	7 O.D. Fish Tail Screw Bit Head Large		
SASBH800HFL	8 O.D. Fish Tail Screw Bit Head Large		
SASBH900HFL	9 O.D. Fish Tail Screw Bit Head Large		
SASBH100HFL	10 O.D. Fish Tail Screw Bit Head Large		



Screw Bit Head

Shank for Screw Bit, use as listed above.

SASHSHK118M	1 1/8 Medium Shank		
SASBSHK118L	1 1/8 Large Shank		
SASBSHK158M	1 5/8 Medium Shank		
SASBSHK158L	1 5/8 Large Shank		



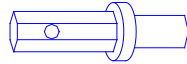
Screw Bit Shank

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Solid Auger Components

Hex Components

Hex Repair Shanks



Part #	Description	Weight	
		Lbs	Kgs
RS-1687	1 1/8 Hex Repair Pin Shank for 1 11/16 Tube		
RS-2375	1 5/8 Hex Repair Pin Shank for 2 3/8 Tube		
RS-2875	1 5/8 Hex Repair Pin Shank for 2 7/8 Tube		



Hex Repair Sockets

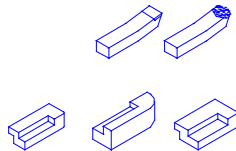
RK-1687	1 1/8 Hex Box Repair Socket for 1 11/16 Tube		
RK-2375	1 5/8 Hex Box Repair Socket for 2 3/8 Tube		
RK-2875	1 5/8 Hex Box Repair Socket for 2 7/8 Tube		



Hex Drive Pins

DP-1687	Drive Pin for 1 11/16 Tube		
DP-2375	Drive Pin for 2 3/8 Tube		
DP-2875	Drive Pin for 2 7/8 Tube		

Finger Bit Components



FBH1	Mini Finger Bit, Hard Surfaced		
FBH2	Standard Finger Bit, Hard Surfaced		
FBC3	Standard Finger Bit, Carbide Coated		
W33	Finger Bit Wedge		
W34	Finger Bit Wedge		
W37	Finger Bit Wedge		

Hex Extension Rods

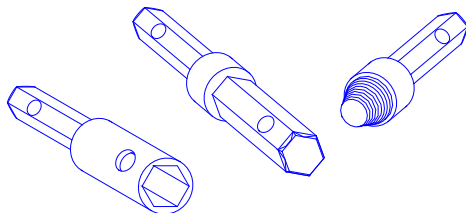
158EXT	Adjustable 1 5/8 Hex Male Shank to Female Socket, 24 to 36		
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Solid Hex Extensions are available in any length.

Hex Adapters

Mills Machine has a complete line of Hex adapters available. Sizes range from combinations of 1 1/8 hex to 2 1/4 hex shank and socket with 3 and 4 hex available. They include:



- Hex Male Shank to Hex Male Shank
- Hex Male Shank to Hex Female Socket
- Hex Female Socket to Hex Female Socket.
- Hex Connection to Standard Pin or Box of your choice

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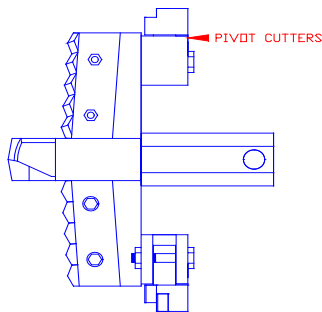
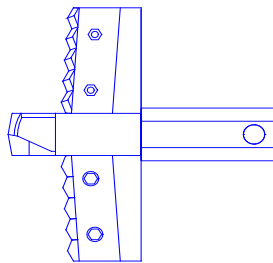
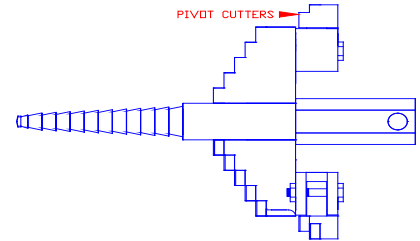
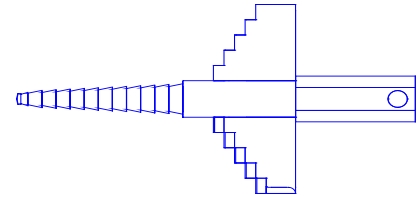
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Horizontal Drilling Bits

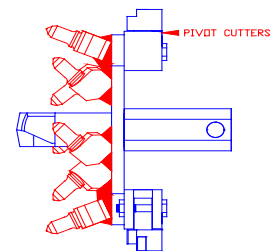
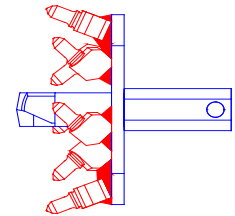
Mills Machine's horizontal drilling bits are designed to cut a variety of formations. The different cutter configurations include Step, Apex (Chevron) or Claw (Bullet) type configurations to drill from dirt to hard rock formations. Two popular styles are available in Free Bore and Casing Push with retractable wings (pivot cutters) to set casing as you drill.

Step Construction – HDD. This type of bit is designed to cut soft to medium-soft formations. It features a carbide step type design and a carbide tipped spiral pilot neck. The swept back tapered design keeps the bit centered in the hole. This type of bit should be used in dirt, clay, sand rock, and light sandstone formations. The HDD is known for its fast penetration due to its stair step blades, which produce small cuttings that are easily removed from the hole.



Apex (Chevron) Construction – RQT. This type of bit is designed for soft to medium formations. It features bolt on blades with apex carbide inserts giving it a serrated look. The self-centering heavy duty pilot bit is also, carbide tipped and screws out for easy replacement. The shape of the blade and carbide inserts offers an aggressive but durable cutting action with the added bonus of field replaceable cutters.

Claw (bullet) Construction – HDR. This type of bit is designed for medium to hard formations. The HDR features our popular carbide tipped bullet cutters that rotate in their holders providing a self-sharpening action. These inexpensive carbide cutters are field replaceable and are rated at up to 10,000 PSI rock. This aggressive bit can be used to cut hard compacted clay, sand rock, shale and soft limestone formations. The HDR is known for its rapid penetration rate and durability.



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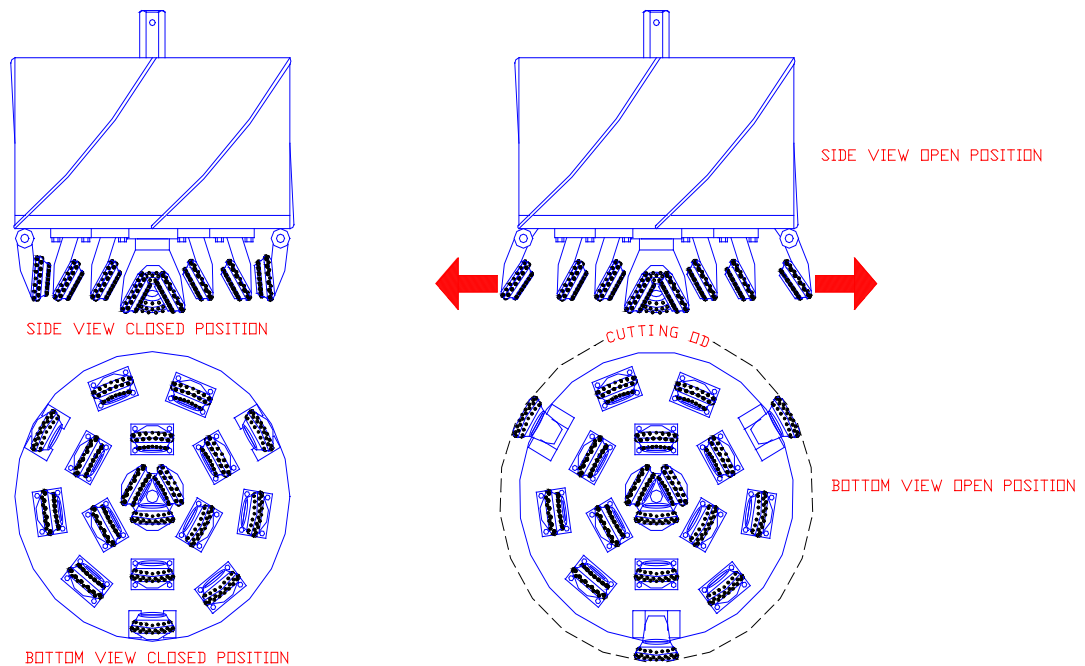
Horizontal Drilling Bits

Horizontal Roller Rock Head (HRR)

Mills Machine has been custom manufacturing horizontal **hard rock** drilling bits for over 20 years. We make two types of HRR bits a **Free Bore** and **Casing Push** type. Both of these designs feature steel tooth or tungsten carbide button roller cone bit segments with sealed bearings. We offer new or economical reconditioned roller cones manufactured by major oil field bit companies.

Free Bore bits have fabricated fixed cutters that can be cut off and replaced extending the body life. **Casing Push** bits feature gage cutters that open out when rotated to the right (clockwise) to cut a larger hole than the outside diameter of the casing or pipe. If warranted the bit can be rotated to the left (counter clockwise) to close the cutters and the bit can be retracted leaving the casing in the hole. This is not possible with a free bore bit. Also, both types of bits can be manufactured with bolt on field replaceable cutters. **Free Bore bits can be manufactured in any size** and the **casing push type currently starts at 18 and larger**. We are working on smaller casing push designs so, please ask if smaller sizes are available.

HORIZONTAL ROLLER ROCK BIT



The casing push design features the **Mills Cam Lok** technology which enables the hinged roller gage cutter to positively lock in place and just as positively close back into the body for retraction from the hole. Normally two small water lines are tacked to the top of the casing to provide water or drilling fluids to keep the roller cones cool and to flush the small rock cuttings out of the hole. The common drive for these type of bits are solid flight augers, but we also offer rotary threaded drill rod or jet augers (drill rod with flighting). These bits offer an economical solution to your hard rock boring needs. Call for more information about our custom designed bits for your special application.

We can also manufacture these bits in **drag (blade) type**, for boring soft to medium formations. Drag type feature bolt-on field replaceable carbide tipped teeth. **Bullet type** construction falls into a category between drag type and roller type head. Suitable for soft to medium hard formations this versatile, fast cutting head is capable of drilling up to 10,000 psi rock.

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Application Questionnaire Horizontal Road Boring Bits

Company _____

Phone _____

Address _____

Fax _____

City, State Zip _____

Contact _____

Sketch:

****Quantity:** _____ ****Closed Diameter** _____

****Open Diameter** _____

****Casing ID** _____ ****Casing OD or Wall Thickness** _____

Cutters ****Bearing:** Conventional Sealed

****Steel Tooth Cones** New Retip

Formation: Soft Med. Soft , Medium ,
Med. Hard , Hard

OR ****TCI Button Bit Cones** New Rerun

Formation: 1, 2, 3, 4, 5, 6, 7, 8, 9

****Top Connection Hex Size:** _____

or Thread Size _____ Pin Box

**** Must fill out these items. Fill out more if possible
or custom product requested.**

Barrel Length _____

Top Neck Dimensions: OD _____ ID _____ Length _____

Knurled

Breakout

Flats: Two Sided Four Sided

Special _____

Flat Length _____ Location _____

Dimensions: Flat to Flat _____ OR Depth per Side _____

Location _____

Float Valve: Bore Only Install: Customer Furnished Mills Furnished

Brand _____ Model & Size _____

Special Requirements: _____

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