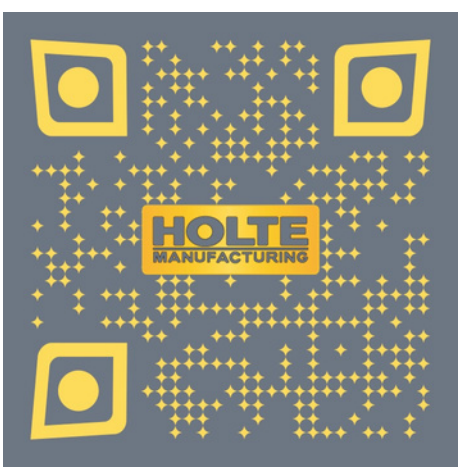
INNOVATION CREATING COMPLETE DRILLING SYSTEMS

HOLTE DRILLING TOOLS

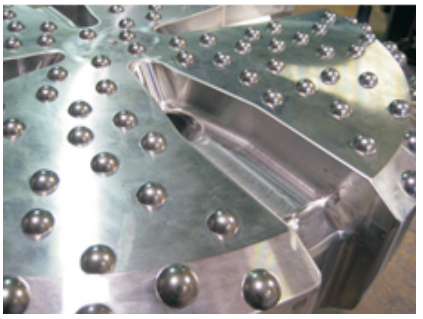
HOLTE MANUFACTURING


HOLTE
MANUFACTURING

Holte Manufacturing began as a drilling tool innovator more than 40 years ago, founded by Art Holte. Today Holte has many patents and continues the development and manufacturing of components for drilling tools and complete drilling systems from rig to bit. As the technology for efficient, durable tooling becomes more complex we have found it is essential to design, fabricate, manufacture and heat treat in house to ensure Holte's quality standards are met. Not only do we do this, we take it a step further and work directly with our customers in the field.

Through this constant connection with our customers, the latest machinery and design technology and our willingness to listen, we are able to innovate and build revolutionary systems that continually set the benchmark throughout the industry. Also, through our state of the art manufacturing process and dedicated employees we are able to design, fabricate and manufacture complete drill systems quickly. In the end our vision is simple. We want to work with you to drill faster and further than the competition with the most innovative drilling components, making Holte Drilling System's the right solution for your next job.

Call Holte Mfg. today at 541-935-5054 and get acquainted with one of our friendly representatives.



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DRILLING TOOLS

DRILLING ACCESSORY TOOLS

HOLTE REVERSE CIRCULATION HAMMERS

Holte RC Hammer Features

- Bolt together design allows rotation in both directions
- Quick change bit system allow quick access to the bit with hand tools, without removing hammer from drill string
- Oversized center return allows effective large debris removal for faster penetration
- Carburized center tube spans throughout hammer to minimize wear from cuttings
- Piston design transmits power to button face, breaking rock into large pieces versus grinding them to dust
- Designed to operate at higher pressure due to simple piston design and advanced porting
- Patented key drive reduces bit weight and length, offering better piston/bit weight ratio
- Check valves at the bottom of hammer reduce the possibility of debris entering the hammer

Early Pioneer of Reverse Circulation

From the beginning Holte recognized the significant advantages of reverse circulation (RC) drilling while out on the job site. Holte Customers have sought reverse circulation to solve a number of different drilling challenges .

Advantages of Reverse Circulation Drilling

Simply put, reverse Circulation (RC) drilling lowers operating costs and hassle compared to conventional drilling. In RC drilling the cuttings are exhausted up the center of the bit and drill pipe which allows for several ground-breaking advantages:

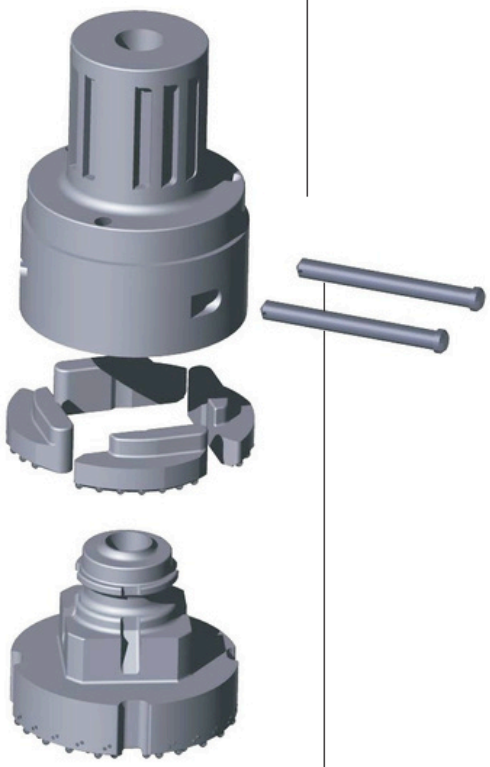
Removal of cuttings allows faster drilling (~2-8X faster than conventional drilling)
Lower drilling friction causes less wear, making tooling and buttons last longer
Uses less air and can take out bigger, heavier, rocks
Reduces the chances of rocks falling in the hole and getting the bit, hammer, or casing stuck
Drills more sensitize formations with less chance of borehole wall cave-in
Control of cuttings exhaust means less mess, a smaller affected area, and allows drilling in public places
Cuttings discharge often used for exploratory mineral sampling or just to route waste for easy hauling
Exhaust side check valves and water flow via the cuttings path lead to less drowning out of the hammer
Grout Through technology allows back filling of the hole as the drill retracts
No need for expensive and environmentally regulated lubricating foams for deeper jobs
uHolte's RC Down Hole Hammers allow easy access to key parts making them faster and easier to maintain

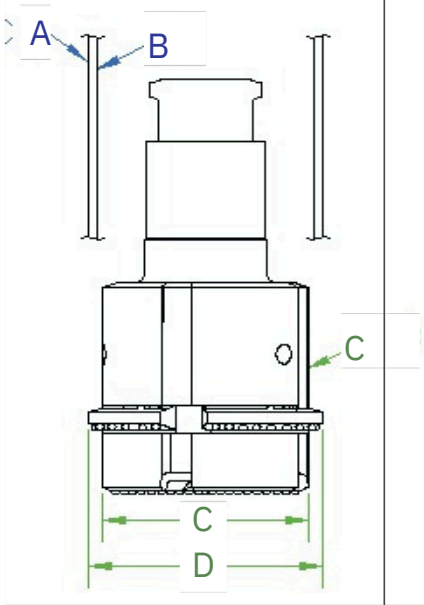
URG® UNDERREAMER

The **Holte URG®** (full gauge underreamer) has three to four extendible arms that underream a full gauge (360 degree) hole. This style will drill faster and straighter than the eccentric underreamers which swing out on only one side.

This bit design was pioneered by Holte Manufacturing while researching faster ways to drill large diameter holes. The full gauge URG resembles a conventional hole opener. We offer URG overburden systems from 10” to 42” for both conventional and reverse circulation drilling. Casing can be advanced by means of casing drivers, casing rotators or oscillators.

Drive shoe style shown here.





URG® SIZE CHART					
CASING SIZE			BIT SIZE		HAMMER
Nominal	Max O.D. A	Min. O.D. B	Retracted C	Extended D	Sizes
10”	10.75”	10”	9.9”	11.4”	8”,10” 11.85”
12”	12.75”	12”	13.7”	8”-12”	12.80”
14”	14”	13.25”	14.80”	10”-14”	14.90”
16”	16”	15.25”	16.80”	12”-16”	16.85”
18”	18”	17.25”	18.80”	12”-18”	18.85”
20”	20”	19.25”	20.80”	15”-20”	20.85”
22”	22”	21.25”	22.80”	15”-22”	23”
24”	24”	23.25”	24.95”	18”-24”	

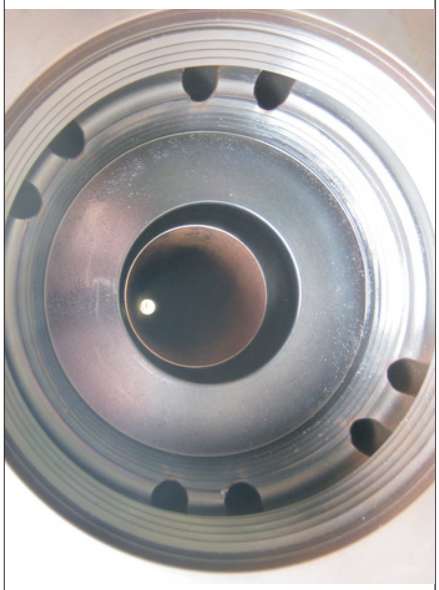
REVERSE CIRCULATION

Holte Reverse Circulation Drill Pipe is a one piece, dual tube joint with no center tube connectors. We have designed and built many custom variations, including a model that allows for individual control of multiple, individual chambers within the dual wall pipe, to maximize underwater hammer operation and removal of cuttings.

Holte's standard reverse circulation dual wall pipe allows for air to move through the annulus between the inner and outer pipe, while the cuttings flow freely through the center. All our pipe is made of heavy wall, durable drill steel, formulated and tempered for maximum wear resistance and strength to minimize costly repairs and downtime.

Prior to assembly, each joint (Pin and Box) are machined from high strength steel alloy then heat treated in house to develop a file hard surface and tough core. The pins and boxes are then assembled in a unique, proven manner that ensures the maximum durability and straightness.

Holte RC pipe is available in many sizes. Contact a Holte drilling representative to help you select the best pipe size for your drilling application.

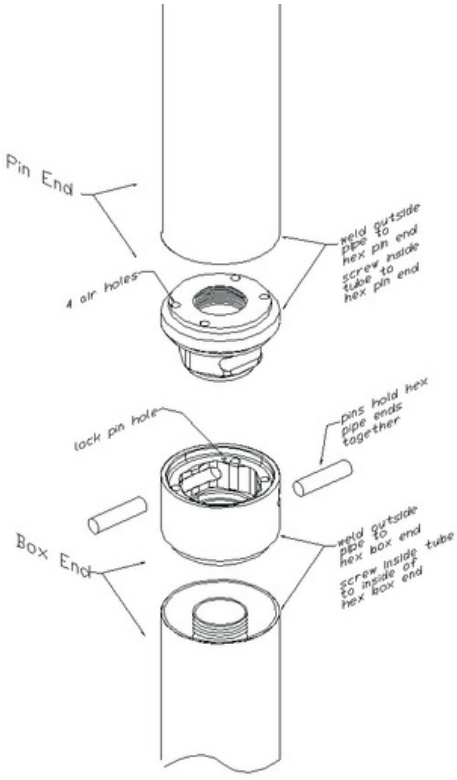


DUAL WALL PIPE

Quick Release Hex Head

Holte Dual Wall Pipe with quick release hex head was created by Holte Manufacturing as a solution to the problem of thread binding. This is particularly a problem with large diameter systems due to the amount of torque used in large diameter drilling. This unique joint also allows the pipe to turn in both directions without the risk of unscrewing.

The quick release hex connection is also available on Holte Reverse Circulation Down Hole Hammers, to easily disassemble hammers in the field. Drillers can now save time and frustration with this durable pipe. The hex head pipe ends are made of carburized alloy steel and built for long use. The pipe ends are machined with large radiuses, making it easier to plug together.



Holte RC Hex Pipe at the White Stone Bridge in New York

CASING DRIVER

Holte Casing Drivers are designed to be used with a down hole hammer and underreamer. The underreamer drills an oversize hole in overburdened soil, rock layers, clay bedrock, etc.

When the hole is first started, and while gravity is sufficient to make the casing follow the underreamer, the casing driver sits inactive on top of the casing and acts as a water diverter. Once the underreamer advances 1" ahead of the casing, the casing driver anvil closes, and the 140 Ib. piston in the casing driver (shown at right), starts cycling. Holte casing drivers turn on and off automatically just like a down hole hammer.

Accessories available for Casing Drivers are :

- Drill pipe shaft that fits through the casing driver
- Remote controlled air valve
- Air pressure regulator
- 7.5 gallon down hole hammer oiler
- Hydraulic cylinder kit with hoses and P.O. check

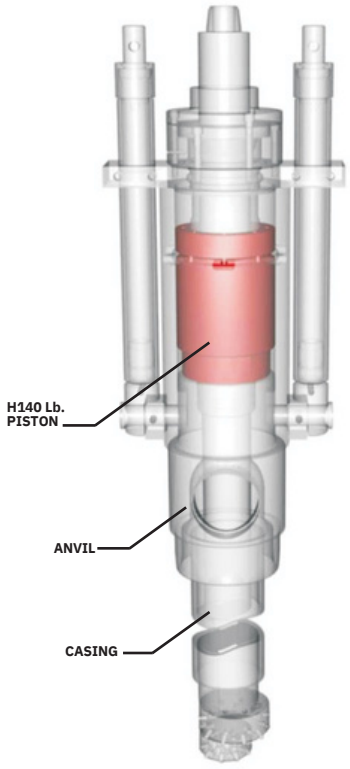
Holte Casing Driver 140, is 45" tall (not including the cylinders) and has a 12” diameter. Weight is approximately 750 lbs. This casing driver is mounted under the top head of a drill rig.

DIAMETER DEPTH GUIDE		
Casing Dia.	Hole Depth	CD Model
6”-10”	0’ - 400’	CD140
6”-14”	0’ - 800’	CD350
10”-20”	0’ - 500’	CD550
Over 20”	0’ - over 500’	CD1000

All of these categories are subject to drilling conditions and rig capabilities. Talk to a Holte drilling technician about your specific needs.

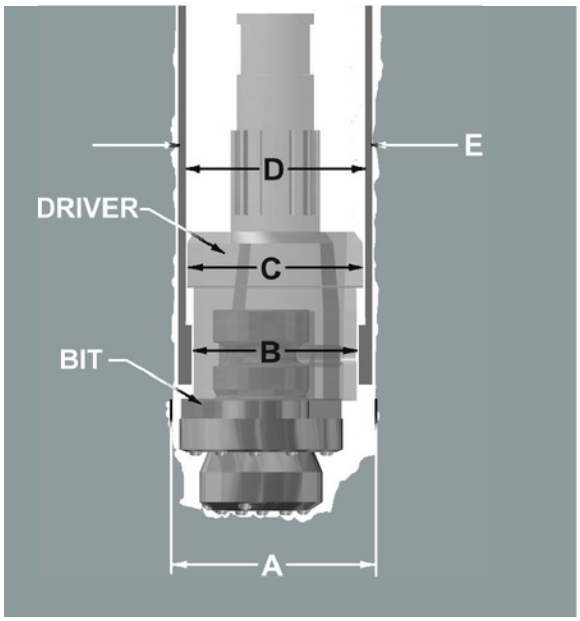
SIZE CHART					
MODEL	HEIGHT	DIA.	DRILL PIPE	PISTON	TOTAL
CD 140	40”	12”	4½”	140lbs.	750lbs.
CD 350	50”	15”	4½”	350lbs.	1300lbs.
CD550RC	46”	28”	9”	500lbs.	2800lbs.
CD1000RC	72”	28”	13”	1000lbs.	4800lbs.

Model **DC550RC** and **CD1000RC** are for larger diameter reverse circulation drilling.



Underreamer Systems Compared

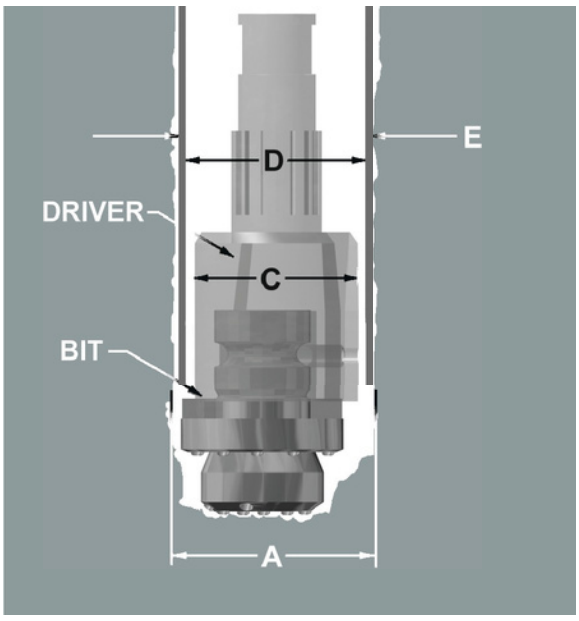
Shoe Style



The name **URE Shoe Style** stands for the eccentric underreamer system requiring a shoe. In this system shown above, the shoe provides a surface that the underreamer (UR) tool can hammer on to drive the casing. This system of hammering the casing down from the bottom has some limiting factors. The biggest draw back is that the shoe eventually wears out or breaks off from being hammered on by the UR tool. With this threat the operator can not always determine the depth that will be achieved.

Also, with the use of a shoe, the bit must be made slightly smaller to fit through the shoe. Although both Holte UR systems drill the same size hole, the smaller shoe bit system has less surface area contact. Therefore, the UR shoe style bits wear out sooner.

Casing Driver Style



The **URE Casing Driver Style** is a similar underreaming system, only there is no drive shoe at the bottom to worry about. The casing is hammered down from the top by a Casing Driver mounted on the top head drive. Although the Casing Driver down hole underreamer's energy can still be reduced by the flood out factor, the Casing Driver style underreamer does not have to move the casing. Therefore, the Casing Driver style system drills more effectively.

The Casing Driver style system also drills better, because the bit is slightly larger, since it does not need to fit through a drive shoe. In this case there is considerably more bit surface against the wall of the well bore. This larger size bit also lasts longer.

(URE) SIZE CHART

Casing I.D. (D)	Casing O.D. (E)	Bit Size	Hole Dia. (A)	Driver Dia. (B)	Driver O.D. (C)
5.00”	5.56”	URE5	6.10”	4.50”	4.95”
6.055”	6.625”	URE6	7.60”	5.50”	5.95”
8.07”	8.625”	URE8	9.75”	7.40”	7.90”
10.20”	10.75”	URE10	11.75”	9.15”	10.10”

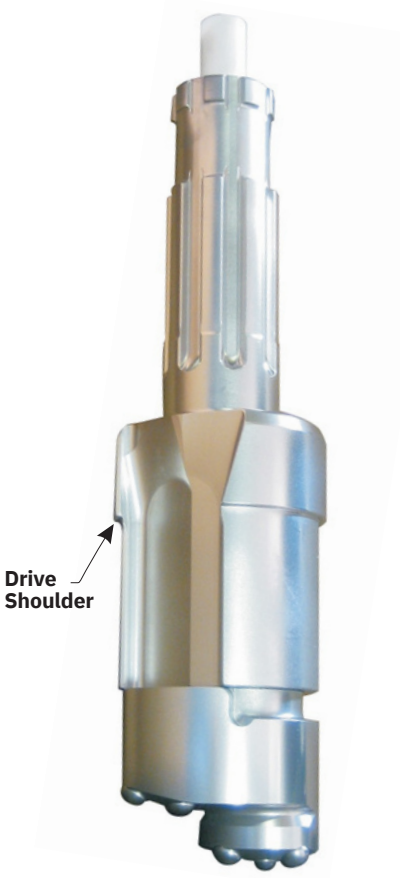
Note: See page 3 for larger Holte Underreamers.

URE Drive Shoe Style

Maximize your underreaming with a Holte URE designed to have a wider cutting edge where you need it most. The Holte oval shape places more cutting edge on the bore hole wall.

The URE Drive Shoe Style Underreamer is similar to the Casing driver style except the driver portion has a **drive shoulder**. This shoulder drives down the **drive shoe** that is welded to the casing. With this system, the down hole hammer is used to both drill and drive casing.

The URE Drive Shoe Style is more limited than underreaming with a casing driver but is an effective casing installation system.



Machined and heat treated
Drive Shoe.

Maximum Gauge Surface Contact

URE Casing Driver Style

The **Holte Percussion Underreamer** is a two piece tool; a driver section & a bit section. The driver (or splined section) fits into a down hole hammer.

The bit section has a pilot portion that is out of center to the rest of the bit and the drill string. As the hammer rotates, the pilot section tries to center itself. The friction of the nose of the bit also helps pull the nose out from under the casing enabling you to drill a larger hole than the OD of the drive shoes on the casing.

The whole bit swings out and has a short heavy pin on the top side that fits into a pocket on the driver. A small portion of the air escapes between the wall of the driver pocket and the pin portion of the bit. This keeps the bit free from sticking in place so that a very minimum of reverse rotation will swing the bit back in alignment with the drill string for retraction.

The percussion underreamer along with a compact **Holte Casing Driver** (which also serves as a diverter for water and air cuttings) will allow the casing to be placed easily in areas where it would have been a major struggle or next to impossible.

Maximum Gauge Surface Contact

RING BIT SYSTEM

The **Holte Ring Bit System** is a removable outer ring used with a down hole hammer and casing driver. Its purpose is to underream for casing installation. The ring bit fastens to the driver bit with a press fit which prevents the ring bit from falling off. This system enables a driller to both drill and case simultaneously leaving only the ring in the hole when the job is completed.

This ring portion of the bit is larger in diameter than the casing and has a smooth round outer surface. This is unlike eccentric underreamer bits which get stuck in a hole, frequently requiring more torque. This smooth O.D. bit hardly registers on the torque gauge.

This system uses no drive shoe or shoulder when driving casing down from the bottom. Instead, the driving is done from the top by the Holte Casing Driver which turns on and off automatically.

To remove the ring bit, the casing driver is lowered so the casing sits on the ring portion. The down hole hammer is then pulled up while the casing driver is hammering. This drives the ring off so the down hole hammer can be removed, leaving only the ring and the casing in the hole.

The ring bit system is available in 6" through 12".

Other sizes are available upon request.

EXTRACTOR HAMMER

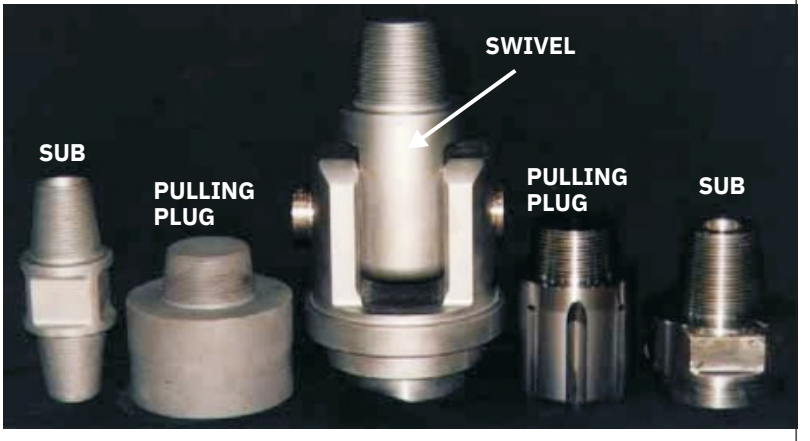
The **Holte Extractor Hammer** is a pneumatic hammer available in several models ranging from a 35 lb. to 900 lb. piston sleeve. The outer sleeve of the extractor is an air operated reciprocating weight. It cycles rapidly like a down hole hammer but is used above ground to extract stubborn casing and drill string. While the Holte Extractor Hammer is hammering up, the operator can pull up or push down, twisting simultaneously if desired. Normally, however, you need only to pull. The mid size is the most popular and comes standard with a 4 1/2" API thread at each end of the main body. Using the wide range of subs we manufacture, the extractor can be fastened to the top head drive or kelly of any rig. The sub on the bottom is fastened to the drill rod, casing or whatever you want to extract.

The extractor hammer package includes two subs to adapt to the 4 1/2" API of the tool. The following subs come standard with other options available at an additional cost: 3 1/2" API pin up or pin down (at the top) or 2 7/8" IF pin up or pin down (with a 6" pulling plug at the bottom). Some available subs include threaded casing adapters and a heavy duty hinge that allows the casing or drill pipe to be pulled out away from the rig as the top head is lowered back down.

	SLEEVE	TOP PIN	BOTTOM PIN
Small	35LBS.	3-½ API	3-½ API
Medium		4-½ API	4-½ API
Large	450-900LBS.	6-5/8 API	6-5/8 API

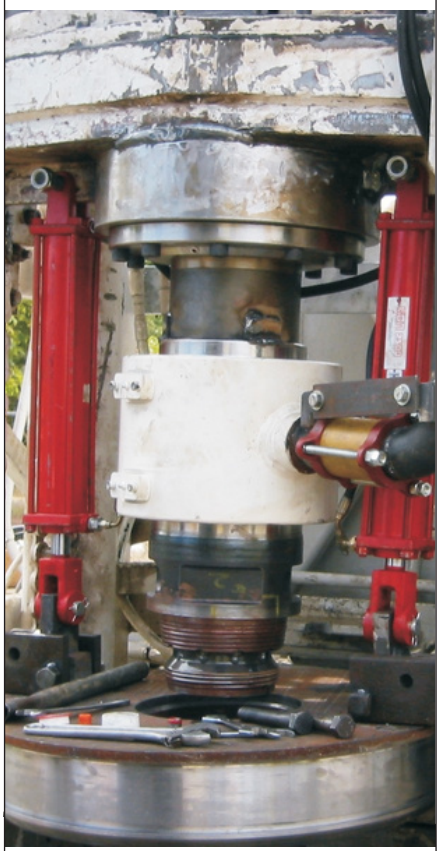
Holte Medium Size Extractor Hammer

Extractor Hammer Accessory Parts



AIR INLET

The **Holte Air Inlet**, is also made of a low carbon alloy steel and carburized to file hard prox 62 Rockwell. This gives the rotating seal surface a long lasting, smooth, hard surface. One ring nut on each end provides even pressure to the packing. A lantern ring in the center of each packing distributes lubricant evenly. The Holte Air Inlet will adapt to various drill rigs and drill pipe.



The **Air Inlet** is most commonly used to introduce air into a dual wall pipe chamber for reverse circulation drilling.

ROTARY TOP HEAD

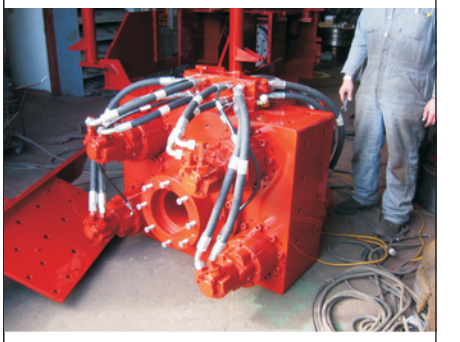
The **Holte Rotary Top Drive** serves several functions, it drives drill pipe and allows casing driver mounting. The large hole through the center allows for reverse circulation discharge internally. This top drive also allows for conventional drilling. This makes it a fantastic choice for drillers currently not running reverse circulation, but who are planning to switch to RC drilling in the future.

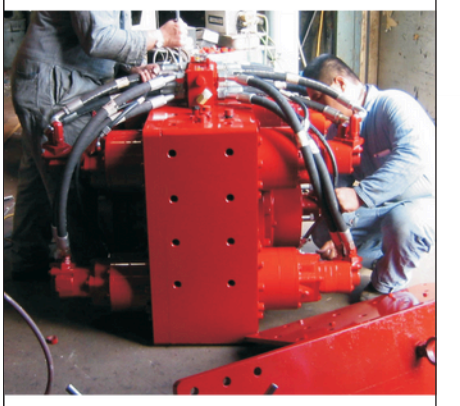
Customizing Your Top Head The top head can be equipped with one to four motors for the optimum balance between power and cost. A built in pump supplies lubrication to the main gear bearings. Systems are durable and may be easily upgraded for long-term trouble-free operation.

Rotation speeds are variable in the suggested range 6-20 RPM. Higher RPM is available. Torque ranges are available to 170,000 ft-lbs. Lifting capacity of the top head bearings are good to 1.5 million Ibs. Greater capacity may be available according to customer need.

For Your Convenience The top head drive easily mounts to the drill mast and allows convenient field maintenance and repair with off the shelf universal replacement components. Drive gears are hardened and ground. The large center through holes are up to 8" in diameter.

Reverse circulation (RC) TOP HEAD DRIVE with swivel and discharge elbow.





OILER

The **Holte Manufacturing Oiler** has an air powered, electronically controlled, positive displacement pump. Our uniquely simple pump system provides oil pressure at 4-1/2 times the air input. This allows an input air pressure of 100 PSI to provide an oil pressure of 450 psi.

Our easy to use electronic controller makes setup a breeze. Simply set the dial to the desired oil volume using the quick reference guide on the face of the tank.

PERFORATOR

20+ Years of Making Perforators Gives Holte Experience

The Holte Perforator effectively perforates the wall of installed steel and PVC casing in a variety of situations. The simple body design allows the 4”, 6” or 10” unit and adapter to be quickly threaded onto your drill string with the use of standard subs. Air or water engages the six point cutter wheel, while down pressure from the rig makes the wheel rotate and perforate to the desired depth. Puncture size is adjustable by several methods to ensure the desired end result is achieved.

Parts Designed to Last

A precision machined and carbon treated body ensures precision fit of internal parts. The result is a stronger and more reliable product.

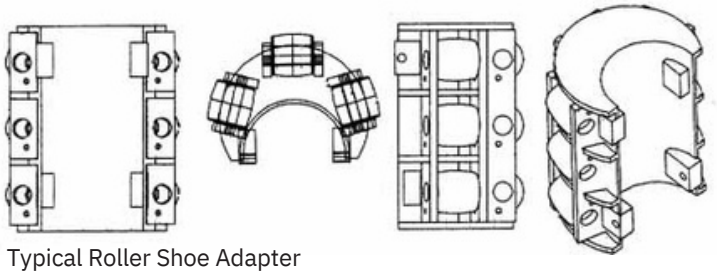
Standard units are designed to perforate up to .375” wall pipe and can be adapted for up to .500” wall.

Slide shoes adapt perforator units to perforate casing close to the nominal size of the perforator while roller shoes are used above 10" to ensure the casing is not able to distort and reduce control of perforations.

Holte stocks a full line of adapters and replacement parts available for same day shipping.

Available in the following sizes:

4" perforator units with adapters to 5" casing.
6" perforator units with adapters through 12" casing.
10" perforator units with adapters through 26" casing.
Larger sizes are also available for custom applications.

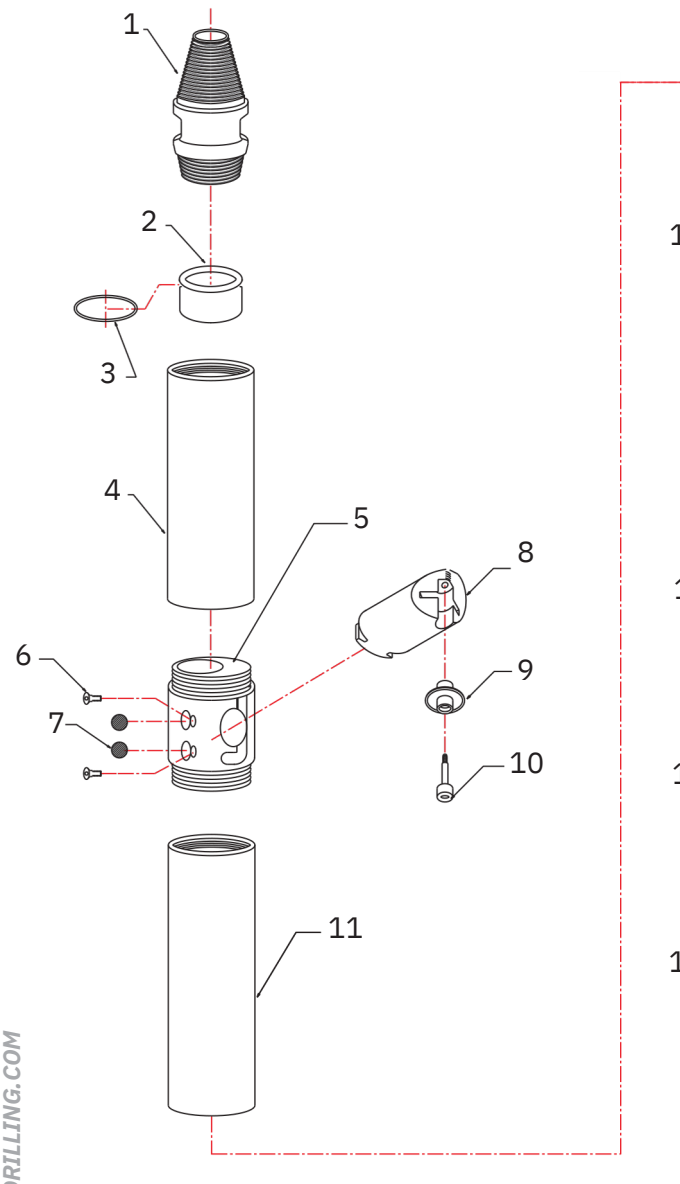


Typical Roller Shoe Adapter

CASING CUTTER

The Holte Casing Cutter cuts casing above or below ground. Cutting pipe can be done quickly and easily by simply lowering the tool to the depth of the cut and rotating it in a clock-wise direction. The operator then slowly brings air pressure up to approximately 150-200 PSI until the cut is completed. The air pressure is then bled off, and the tool is retracted from the hole.

Six inch, .250 wall casing takes approximately 60-90 seconds and 100 revolutions. Blade replacement is very simple and the blades are interchangeable with the adapters used when cutting larger casing. With two casing cutter models, and numerous adapters, we can provide a casing cutter solution for most sizes from 6” to 30”, or larger with a custom solution. Contact Holte today to discuss your casing cutter needs.



1.Top Pin Connector
2.Piston
3.Piston Seal
4.Cylinder Top Barrel
5.Main Center Body
6.Roller Ball Retainer Bolt
7.Roller Ball
8.Blade Holder Cross Slide
9.Cutter Blade
10.Cutter Blade Retaining Bolt
11.Spring Can Bottom Barrel
12.Vertical Slide
13.Lock Nut for stroke adjustment
14.Stroke Adjustment Bolt
15.Main Spring
16.Bottom Cap

FISHING TOOL

Tapered to a small stabbing nose, the **Holte Fishing Tool** wedges and cuts its way into lost pipe and threads the pipe. Once it is threaded in, the lost pipe can be pulled up with the fishing tool.

The fishing tool is hardened steel for durability. With careful use and removal, customers have been known to get multiple uses out of one tool.

GROUT THROUGH TECH AND RC SPECS

Ready to Grout

Holtes's Grout Through technology comes standard in all of our down hole hammers. By eliminating the traditional check valves in the top and distributing them around the bottom of the inner barrel, Holte Hammers minimize entry of water and debris into the operating portion within the hammer, resulting in extended hammer life. This innovation also facilitates grout pumping into the hole. Grout flows down the evacuation center of the dual wall Drill Pipe, Hammer, and Bit. In overburden conditions, the grout can serve as the casing.

Simply Switch the Valves

When the desired drilling depth is reached, a valve is opened in the Top Head, allowing grout to be pumped in through the system while the tooling is retracted back to the surface. Once the hole is complete, the fully rigged mast can be trammed to the next hole to repeat the process while rebar and pile reinforcement is added.

REVERSE CIRCULATION SOLUTION COMBINATIONS RC

HOLTE [RCDHH]	HOLTE [RCDHB]	HOLTE [RCPIPE]
RC10	10" - 14"	7" x 3.8"
RC14	14" - 18"	7" x 3.8" or 8.625" x 4.90"
RC20	18" - 25"	8.625" x 4.90" or 10.75" x 6.25"
RC24	24" - 36"	10.75" x 6.25" or 13.625" x 7.80"

*Specifications may change without notice. Additional sizes and combinations can be customized.

Standard Reverse Circulation Down Hole Hammers [RCDHH] RC

		RC10	RC14	RC20	RC24
Standard Diameter*	in (mm)	9 (229)	14 (356)	20 (508)	24 (610)
Length w/o Bit **	in (mm)	41.6 (1057)	56.6 (1438)	60.3 (1532)	56.0 (1422)
Weight w/o Bit	lb (kg)	605 (274)	2235 (1014)	3685 (1672)	4690 (2127)
Cylinder Bore	in (mm)	7 (178)	10 (254)	14 (356)	16.8 (427)
Stroke		4.0 (103)	4.4 (112)	4.7 (119)	4.8 (122)
Center Bore	in (mm)	3.4 (86)	4 (102)	6.2 (156)	6.2 (156)
Piston Weight	lb (kg)	88 (39.9)	335 (152)	735 (333)	1207 (547)
Working Pressure	psi (bar)	100-300 (7-21)	100-300 (7-21)	100-300 (7-21)	100-300 (7-21)
Maximum Working Pressure	psi (bar)	350 (24.1)	350 (24.1)	350 (24.1)	350 (24.1)
Min-Max CFM Required †	cfm	480-1600	800-1600	1275-2600	1275-4250
Standard Top Sub ††		5.4 RC Hex	9.4 RC Hex	11.2 RC Hex	9.4 RC Hex
Min/Max Bit	in (mm)	10-14 (254-356)	14-18 (356-457)	18-25 (457-635)	24-36 (610-914)

Specifications subject to change without notice. Specifications for sizes not shown available with order.
* Minimum outer barrel size available. Larger sizes can be accommodated to meet most specifications.
**Length from tool joint shoulder to hammer bottom.
†@200 psi. Min for 6000 ft/min velocity in largest I.D. drill pipe combo, Max for 20,000 ft/min velocity in smallest I.D.
††Additional top sub connections available.

Veneta Oregon

Holte's **manufacturing facility** in Veneta, Oregon is home to the innovative manufacturing team that produces our drilling tools. This is our headquarters, housing our design, machining, inventory and shipping center, as well as the office and support staff. Feel free to schedule a visit as we have an open door policy extended to Holte customers for tours and consulting.

This facility houses some of the largest CNC machining centers on the west coast, key to making the big hole drilling systems Holte is known for. If your project has the need, Holte is set up to manufacture with a quick turnaround time for custom projects.

Springfield Oregon

Holte's **heat treatment** facility in Springfield, Oregon houses over half a dozen industrial ovens, a pit furnace, an endothermic generator and several styles of quench tanks to ensure that our final products are the ultimate balance between hardness and durability, while allowing careful control throughout the process. In house heat treatment gives Holte the advantage of fast turn around and tight quality control.

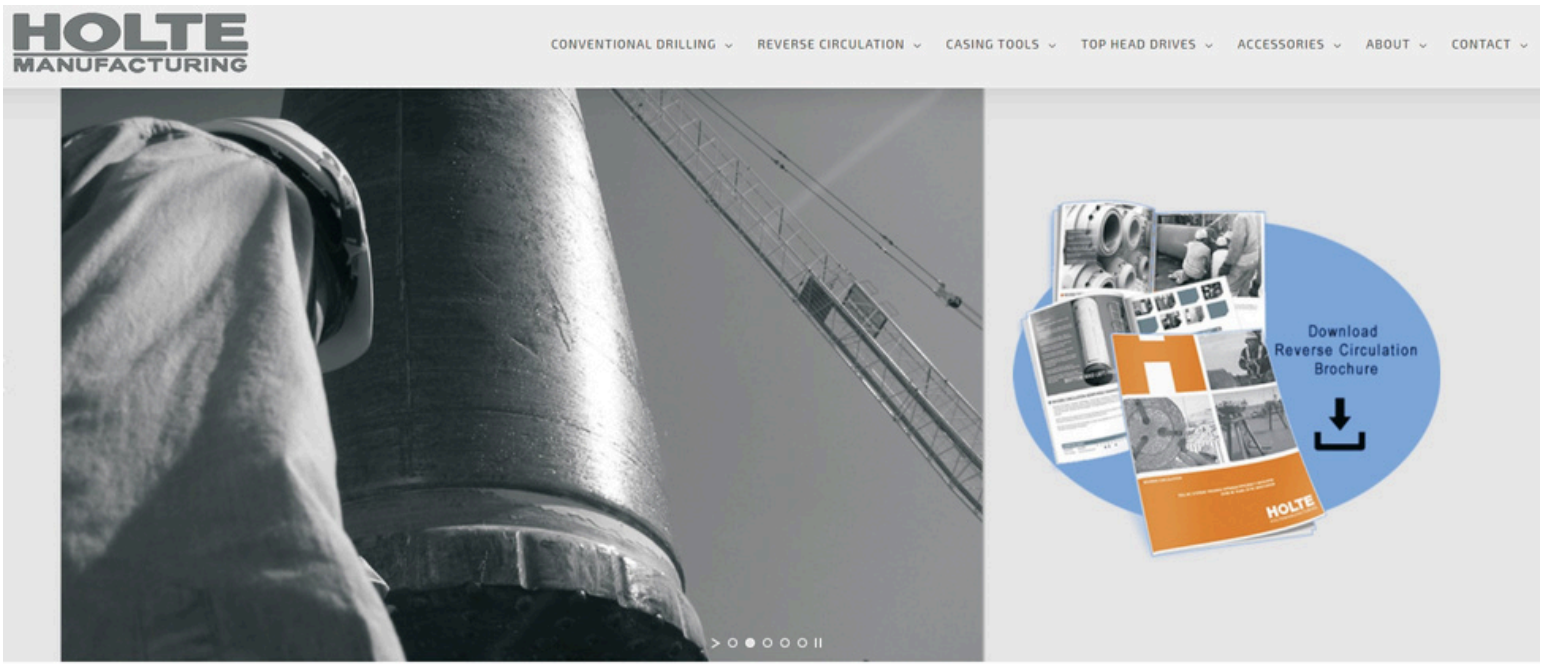
Veneta Oregon

Holte's large **fabrication facility** and storage yard in Veneta, Oregon is for custom and retrofit work on drill rigs as well as a product testing grounds for our tooling.

Holte is known for their pride and excellence in workmanship with steel fabrication and welding, hydraulic, and pneumatic systems as well as assembly and painting.

ON THE WEB

Visit Holte Manufacturing on the web at www.drilling.com



HOLTE MANUFACTURING

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