



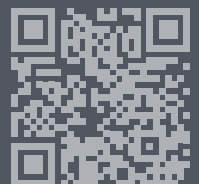
**BOART
LONGYEAR**™



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ROCK TOOLS

Drilling Products Catalog



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IMPORTANT SAFETY INFORMATION

Use appropriate eye protection, gloves, masks, and ventilation when using our tools.



Use care at all times when handling drill bits. Drill bits may become hot during operation and remain hot after drilling has stopped. Avoid direct skin contact with hot bits to avoid burns or other injuries.



Refer to our **Bit Grinding Safety Data Sheet** for safely grinding bits.

ROCK TOOLS

TRUSTED AT EVERY TURN

BOART LONGYEAR IS COMMITTED TO THE FOLLOWING:

Protecting the health and safety of our employees, contractors, and visitors at all our sites and facilities. We are proud of our safety innovations and certifications and strive to exceed the expectations of our clients when it comes to safe operations.

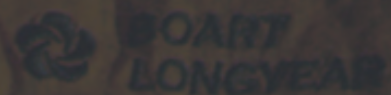
Maximize productivity while ensuring safety standards, programs, and processes are top of mind. We employ progressive and effective safety programs with field-designed safety innovations and cultivate an interdependent safety culture where every employee knows safety is a core value.

Offering high-quality, innovative tooling and drill rigs to keep your productivity promises.

ENVIRONMENTAL, SOCIAL AND GOVERNANCE STRATEGY

We endeavor to reinforce Boart Longyear as an employer and partner of choice as we seek to embed an ESG culture across all levels of the organization with performance overseen by our Governance, Safety, and Sustainability Committee of the Board. The committee is key in ensuring we adopt and integrate ESG considerations in all business decisions. Boart Longyear's ESG activities are guided by the United Nations Sustainable Development Goals (UN SDGs).

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INTRODUCTION

Whether a mining operation is in the development or production stage, the right tools and equipment are critical to the success of a project. Boart Longyear designs and manufactures some of the most technologically advanced drilling products in the industry. From development to production, we offer a range of innovative rock tools that can carry out any job.

This section provides general descriptions, guidelines, and recommendations for all of the components found in this catalogue. Design descriptions and explanations are provided to assist you in selecting the correct tooling for the job.

ROD TYPES
ROD ENDS & THREAD TYPES
COUPLING TYPES
BUTTON BIT COMPONENTS
BUTTON BIT FACE DESIGNS
BIT SKIRTS
REAMING BITS OR HOLE OPENERS
HYDRAULIC AND PNEUMATIC SHANKS

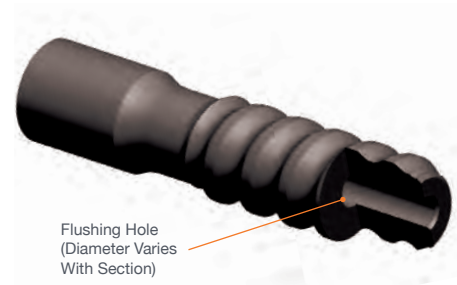
ROD FEATURES

Drill rod features:

- Cross-section profile - round or hexagon.
- Heat treatment can be applied to the rod to increase performance and durability.
- Rod ends - collared and tapered, or threaded male and female.
- Length - driven by application requirements.

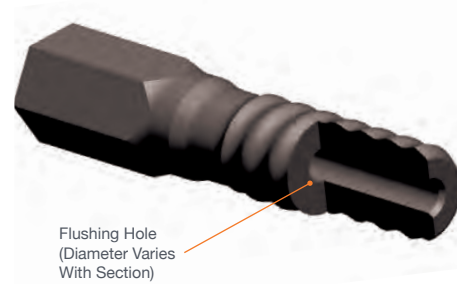
Round Rod Profile

- Normally used in extension drilling applications.
- Generally lighter than hexagonal rods of an equivalent size.
- Available in large x-sectional diameters.
- Diameter of rod is based on external dimension.
- Note: 32R = 32mm Round Cross Section.



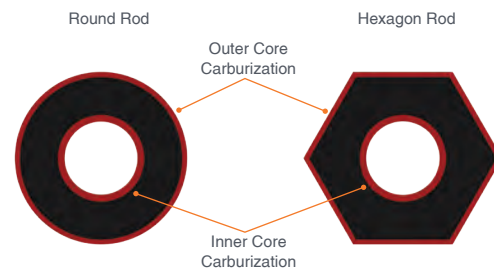
Hexagon Rod Profile

- The cross sectional dimension of material is measured across the flats.
- Normally used in development / tunneling application.
- More rigid, heavier, and transfers energy more efficiently.
- The geometry of the rod helps with flushing heavier cuttings through the annulus, especially with horizontal holes.
- Note: 22H = 22mm Hexagon Cross Section.



Carburized

- The entire rod is hardened providing a case over the entire rod surface both internal and external.
- Primarily used in underground applications and where water is used as a flushing medium.



High Frequency (H/F) Induction Finish

- Only the thread ends of the rod are hardened.
- Primarily used in surface drilling applications where air is the primary flushing medium.



ROD ENDS AND THREAD TYPES

Male/Female Rods

- More efficient drilling with the elimination of a separate coupling.
- Used primarily for longhole applications.
- Less energy is lost due to fewer connections.



Male/Male Rods

- Threads could be of different sizes.
- Traditional rod used with a coupling.
- Used for single pass, tunneling/drifted/ bolting, and long hole applications.



R Thread (Rope)

- Sizes: 25mm - 32mm
- Ideal for single pass or shorthole drilling such as underground tunneling applications that require infrequent uncoupling.



HM (T) Thread

- Sizes: 35mm - 60mm
- Ideal for extension drilling with multiple steel.
- Greater torque capacity.



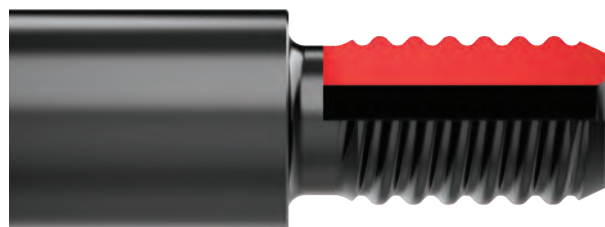
EL Thread

- Designed for a 60 mm diameter extension steel for use with the new generation high powered rockdrills.
- Excellent wear resistance and a pitch angle that uncouples easily.
- Unique to Boart Longyear.



BE (ST) Thread (Tubes)

- Thread is a shoulder drive system. The shoulders on the pin and box butt together to transmit the energy.
- Used in extension tube drilling with multiple tube steels.
- Compatible with high-torque top hammer rockdrills for surface and underground applications.



ROD ENDS AND THREAD TYPES

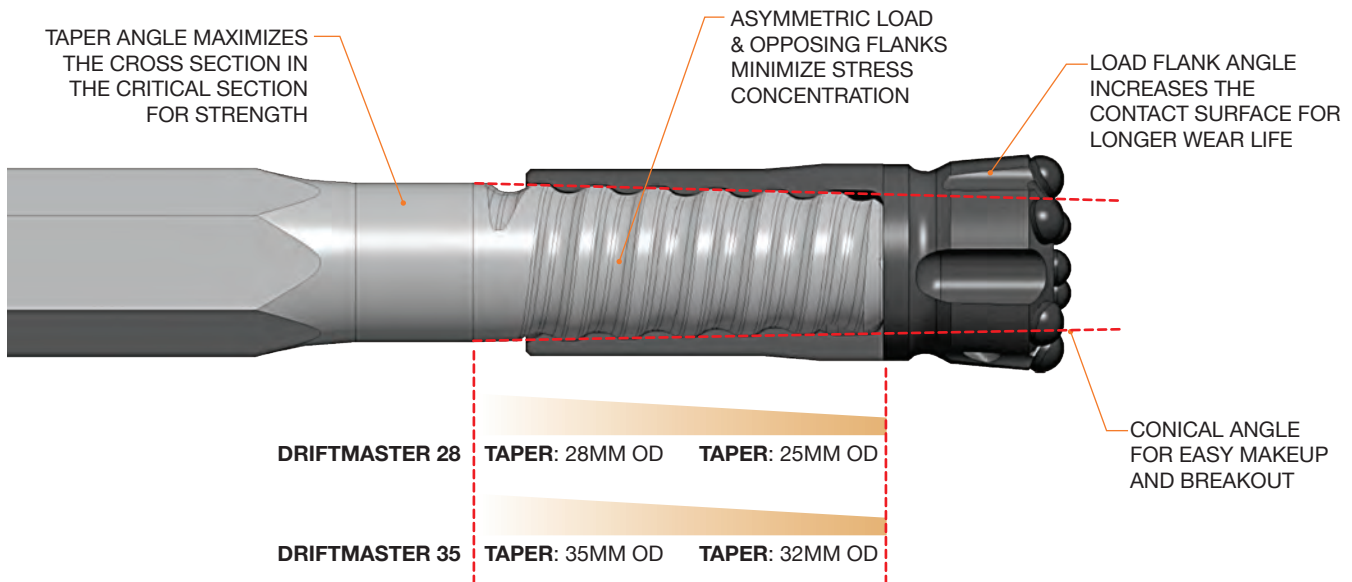
DM (DriftMaster®) Thread

- The tapered profile provides an increased material cross-section at the base of the threads.
- The asymmetric geometry was designed to create "PowerAngles" that minimize stress concentrations with greater contact surface.
- Combined with the wear resistance associated with carburizing heat treatment, the DriftMaster™ thread geometry maximizes resistance to wear under the harshest drilling conditions.
- Improve productivity with tapered thread profile offering superior rod-bit make-up and breakout characteristics. This key thread feature results in more drilling time.
- Unique to Boart Longyear.



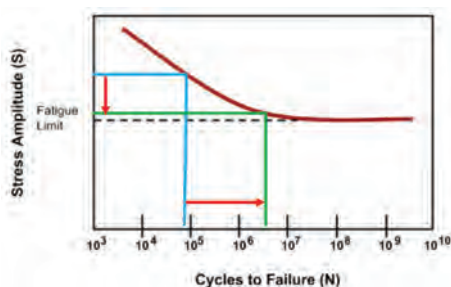
DRIFTMASTER OVERVIEW

Optimized strength, fatigue resistance, and wear life.



HIGH STRESS LEADS TO FATIGUE FAILURES

- Steel is a material with a fatigue limit (stress value threshold)
- An applied stress above the fatigue limit with sufficient load cycles will eventually lead to failure
- A reduction in the applied stress can lead to a significant increase in product life



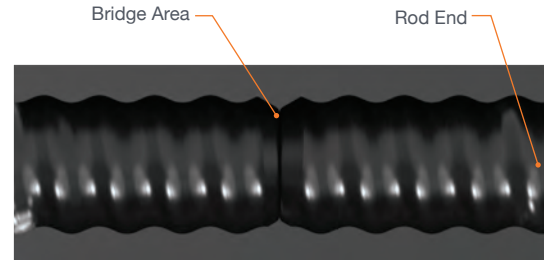
DRIFTMASTER THREADS REDUCE STRESS FOR EXTENDED LIFE

- The tapered thread profile provides a larger cross section at the high stress location (more steel where it is needed)
- The unique thread profile further reduces the thread root stress compared to standard designs
- A +25% reduction in applied stress leads to an exponential increase in the fatigue life offered by DM28 and DM35

COUPLING TYPES

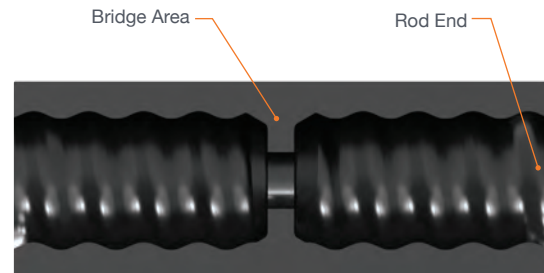
Semi-Bridge Couplings

- Small non-threaded bridge in the center.
- Steel cannot thread past bridge area.
- Smaller diameter steel end portions fit together in the center bridge area of the coupling.
- Semi-bridged couplings are most suited to high-torque machines.
- Most rope and HM threaded couplings are semi-bridged.
- Best energy transfer.



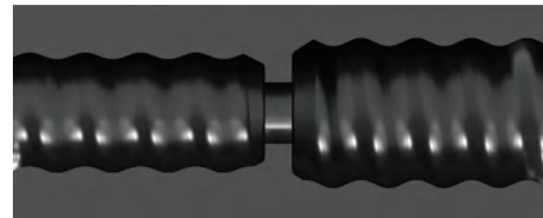
Full-Bridge Couplings

- Eliminates the potential for the coupling to creep along the threaded joints.
- Typically used in surface applications.
- Better uncoupling characteristics and tends to maintain tighter joints.
- Less chance of jamming.



Adapter Coupling

- Use when changing from one thread type or size to another and are typically required only in special circumstances.



BUTTON BITS

Boart Longyear bits are optimized for best drilling results in a variety of ground conditions. Each design strikes a balance of flushing, gauge- and face-button wear, life, and rate-of-penetration. More adaptable to different types of ground conditions, due to the different configurations of designs and buttons available.

CHIPWAYS
Provide channels to clear cuttings from hole

FLUSHING HOLES
Transport flushing medium to bit face

GAUGE BUTTONS
Outer ring

GAUGE FLUSHING (G)

FACE BUTTONS

FACE FLUSHING (F)

Button Bit Components

SKIRT TYPE

RETRAC TEETH

DIAMETER (MM)

BUTTON TYPE

FACE FLUSHING

GAUGE BUTTONS

FACE BUTTONS

Hemispherical Button	Parabolic / Semi-Ballistic Button	Ballistic Button	Conical Button
Universal button for hard, abrasive to very abrasive ground. 25,000 to 45,000 PSI (170 to 300 MPa)	Medium, mildly abrasive ground. Smaller contact area for fast penetration. 15,000 to 25,000 PSI (100 to 170 MPa)	Soft, non-abrasive ground types. Suited for smaller diameter bits. Smaller contact area for fast penetration. 10,000 to 20,000 PSI (70 to 140 MPa)	All non-abrasive ground types. Smaller contact area for fast penetration. Suited for smaller diameter bits (collar and tapered).

BUTTON BIT FACE DESIGNS

BR - Button Recessed

- “Drop Center” face characteristic.
- Reduced hole deviation.
- Broken ground conditions.



BF - Button Flat

- “Flat” face characteristic.
- General purpose bit.
- Hard to medium conditions.



BD - Button Dome

- Clearly defined raised face profiles.
- Primary reaming applications in soft ground.



BITS SKIRTS

Retrac Bit Skirt

- Cutting edges in skirt for easy removal of bit in adverse hole conditions.



Straightrac Bit Skirt

- Angled flute design for 360° of contact, reducing the hole deviation.
- Cutting edges in skirt.



REAMING BITS OR HOLE OPENERS

Description

- Pilot holes are drilled to depth and then reamed out to a larger diameter in a second pass.
- Required when hole diameter exceeds the capabilities of the rockdrill and drilling tools available.

Applications

- Large diameter service holes from level to level for drainage, electrical cable or pipe lines.
- Reaming cut holes for development rounds and for long hole blasting of drop raises.

Pilot Reamer – One Piece Bit

- Has an integral pilot on the face of the reamer.



Dome Reamer – One Piece Bit



Pilot Adapter/Reamer - Two Piece System

- The reaming assembly is made of a 6° tapered pilot adapter that threads on the lead steel with a taper socket reaming bit fitted on the pilot.
- 6.5° for collar reaming rods



Razorback®

- Patented cutting teeth on the back side of the reamer significantly reduces the time required to pull a drill string in broken ground conditions by maintaining cutting fluidity.



SHANK TYPES

- Shanks for hydraulic drills and some pneumatic drills have external or front head flushing.
- Pneumatic shanks tend to have internal or through flushing and can generally be identified by their lugs or 4-spline configuration.

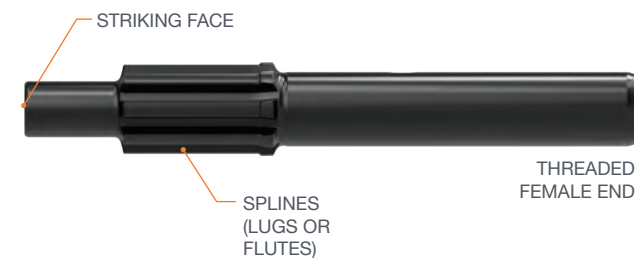
Male Shank Adapters

- Generally better suited for drifting, tunneling and extension applications where high bending stresses are present.



Female Shank Adapters

- Used when the drilling space is limited and the total feed length is important (i.e., underground roof bolting).



Internal Flushing

- Uses a water tube that fits through the centre of the drill and into an o-ring seal in the end of the shank, to transfer flushing into the drill string.



External Flushing

- Holes or a slot are required in the side of the shank adapter. These line up between seals inside the front head or water box of the rockdrill when the shank is installed. Flushing medium is supplied directly to this device and is introduced into the drill string through the shank.
- Considered superior to internal flushing as greater volumes of flushing agent can be delivered with less risk of leakage and hammer damage from the water.



ROCK TOOLS

NEW PRODUCTS



ROCK TOOLS

IMPAKT™ TECHNOLOGY

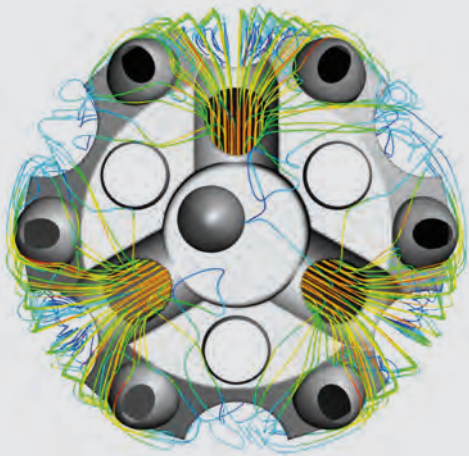
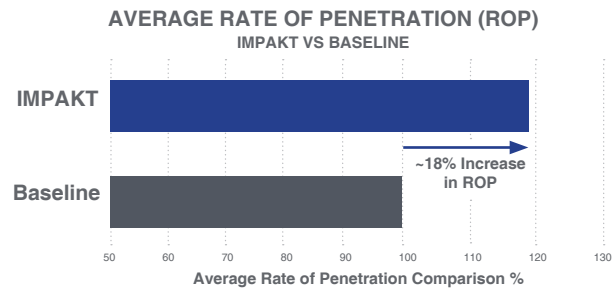
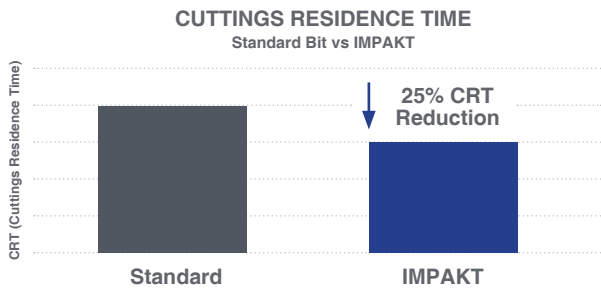
After development and global 3rd-party testing, the IMPAKT design innovation has been proven to actively clear cuttings from the entire cutting face.

With flushing speeds increased up to 25%, the resulting penetration rate has been improved by an average of 18%.



THE SCIENCE OF RACEWAY FLUSHING

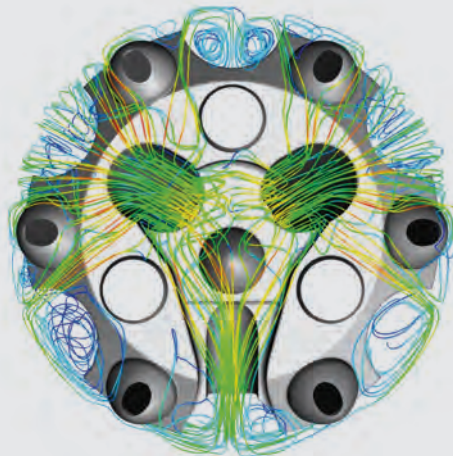
The IMPAKT face design is based on reducing the residence time of cuttings at the face. Raceway flushing quickly clears cuttings from the entire bit face for a lower Cuttings Residence Time (CRT) and more effective energy utilization.



TRADITIONAL FACE DESIGNS

TRADITIONAL BITS HAVE A CENTER DEADPOOL

- Standard designs focus on clearing the gauge.
- Center deadpool traps cuttings, limiting ejection from the bit face.
- This condition impedes effective energy transfer.



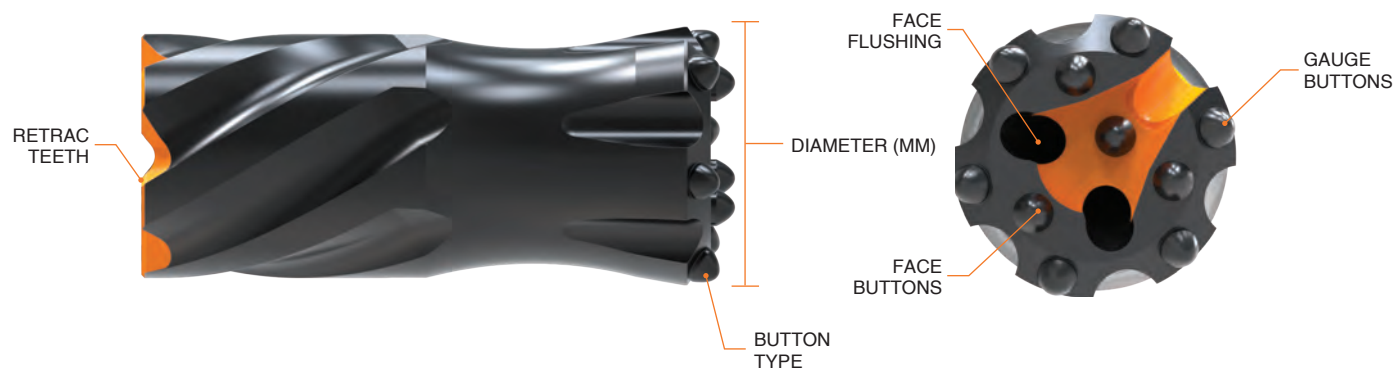
IMPAKT FACE DESIGN

RACEWAY ENSURES FULL-FACE FLUSHING

- Raceway design clears both the face and the gauge.
- Pressure and flow accelerate cutting removal.
- All buttons are in contact with fresh rock, maximizing efficiency in every strike.

IMPAKT™
BOART LONGYEAR ROCK TOOLS

BITS SELECTION



	Part #	Ø		Buttons		Thread Type	Carbide Profile
		mm	in	Gauge Qty/Size	Face Qty/Size		
	140271	64	2 1/2	6x11	4x10	HM38	Hemispherical
	140259	64	2 1/2	6x11	4x10	HM38	Parabolic
	140279	76	3	6x11	4x11	HM38	Hemispherical
	140281	76	3	6x11	4x11	HM38	Parabolic
	140280	76	3	8x11	4x11	HM38	Hemispherical
	140282	76	3	8x11	4x11	HM38	Parabolic
	140268	76	3	6x11	4x11	HM45	Hemispherical
	140263	76	3	6x11	4x11	HM45	Parabolic
	140270	76	3	8x11	4x11	HM45	Hemispherical
	140269	76	3	8x11	4x11	HM45	Parabolic
	140278	89	3 1/2	8x12	6x12	BE58	Hemispherical
	140277	89	3 1/2	8x12	6x12	BE58	Parabolic

DRILLING SYSTEMS

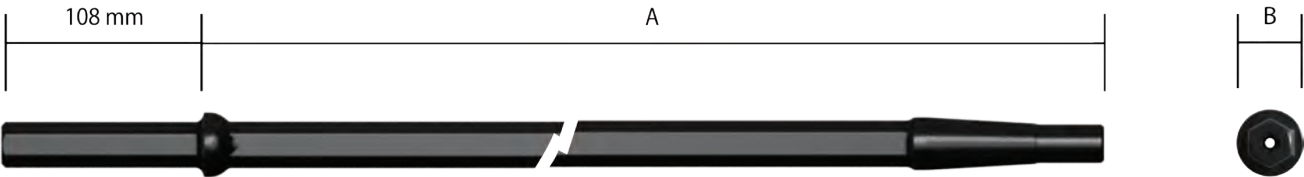


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6.5° REAMING BITS

		Part #	Ø mm / in		Face Profile	Button Profile	Button Configuration Quantity x Size (mm)		
							Gauge	Face	Center
6.5° REAMING BITS									
		070021	64	2 1/2"	Flat	Hemispherical	8x11	2x10	—
		070022	76	3"	Flat	Hemispherical	8x11	2x11	—

6.5° REAMING RODS

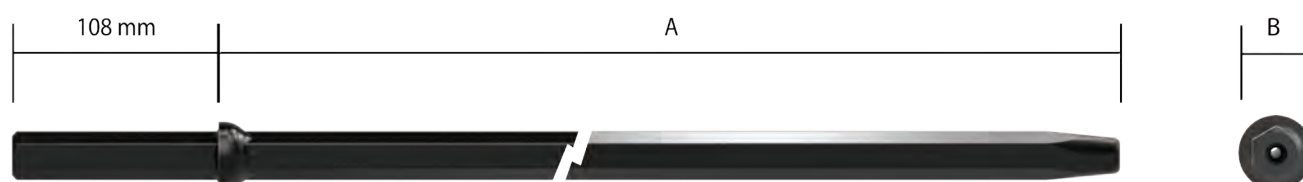


6.5° REAMING RODS				
Part #	Carburized	Length (A)		Cross Section (B) Ø mm / profile
		mm	feet - inches	
260001	●	610	2'	22H
260002	●	1220	4'	22H
260003	●	1830	6'	22H
260004	●	2440	8'	22H

11° PUSH-ON BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
22X11° 3X2 DESIGN										
		050114	32	1 1/4	Flat	Conical	3x8	2x7	—	1F / 2G
		050118	33	1 5/16	Flat	Conical	3x8	2x7	—	1F / 2G
22X11° 4X2 DESIGN										
		050172	34	1 11/32	Flat	Conical	4x7	2x7	—	2F / 1G
22X11° 5X2 DESIGN										
		050141	32	1 1/4	Flat	Parabolic	5x7	2x7	—	1F / 1G
		050122	36	1 13/32	Flat	Conical	5x8	2x7	—	2F / 1G
		050145	38	1 1/2	Flat	Conical	5x9	2x7	—	2F / 1G
		050220	39	1 17/32	Flat	Conical	5x9	2x8	—	2F / 2G
		050146	41	1 5/8	Flat	Parabolic	5x9	2x8	—	2F / 1G

11° TAPERED RODS



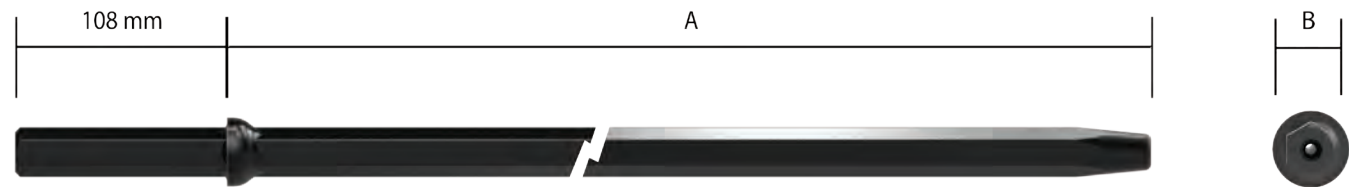
11° TAPER RODS				
Part #	Carburized	Length (A)		Cross Section (B) Ø mm / profile
		mm	ft in	
250183	●	610	2'	22H
250185	●	760	2' 6"	22H
250160	●	1220	4'	22H
250362	●	1630	5' 4"	22H
250161	●	1830	6'	22H
250191	●	1980	6' 6"	22H
250162	●	2440	8'	22H
250163	●	3050	10'	22H

Cross Section: H = Hex R = Round T = Tube Rod

12° PUSH ON BUTTON BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
20X12° 4X1 DESIGN										
		050228	28	1 1/8	Flat	Conical	4x7	1x7	—	2G
22X12° 4X1 DESIGN										
		050081	28	1 1/8	Flat	Hemi	4x7	1x7	—	2G
		950270	28	1 1/8	Flat	Parabolic	4x7	1x7	—	1F / 1G
22X12° 5X2 DESIGN										
		050096	32	1 1/4	Flat	Parabolic	5x7	2x7	—	2F / 1G
		050036	35	1 3/8	Flat	Hemi	5x8	2x7	—	1F / 2G
		050161	35	1 3/8	Flat	Conical	5x8	2x7	—	2F / 2G
		050066	38	1 1/2	Flat	Hemi	5x8	2x7	—	1F / 2G
		050254	41	1 5/8	Flat	Parabolic	5x9	2x7	—	1F / 2G
22X12° 6X2 DESIGN										
		050234	33	1 5/16	Flat	Parabolic	6x7	2x7	—	2F / 1G
		050225	37	1 15/32	Flat	Parabolic	6x8	2x8	—	1F / 1G

12° TAPERED RODS



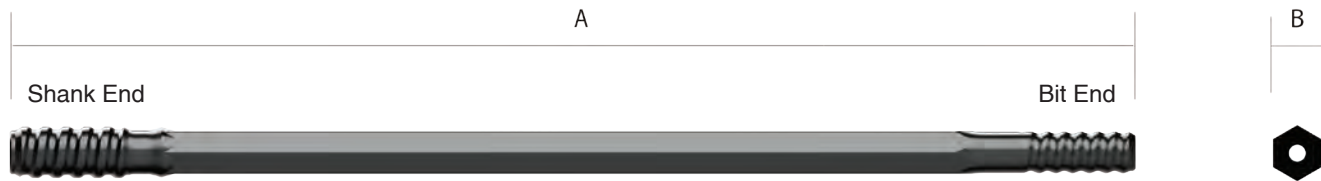
12° TAPER RODS				
Part #	Carburized	Length (A)		Cross Section (B) Ø mm / profile
		mm	ft in	
250118	●	610	2'	22H
250473	●	800	2' 7-1/2"	22H
250440	●	910	3'	22H
250119	●	1220	4'	22H
250189	●	1520	5'	22H
250063	●	1600	5' 3"	22H
250120	●	1830	6'	22H
250190	●	1980	6' 6"	22H
250121	●	2440	8'	22H
250122	●	3050	10'	22H
250123	●	3660	12'	22H
250201	●	4270	14'	22H

Cross Section: H = Hex R = Round

R25 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 5X2 DESIGN										
		110992	32	1 1/4	Flat	Hemi	5x7	2x7	—	1F / 1G
		110284	33	1 5/16	Flat	Hemi	5x7	2x7	—	1F / 1G
		110691	33	1 5/16	Flat	Parabolic	5x7	2x7	—	1F / 3G
		111038	35	1 3/8	Flat	Parabolic	5x8	2x7	—	2G
		110423	38	1 1/2	Flat	Parabolic	5x8	2x7	—	1F / 2G
		110003	38	1 1/2	Flat	Hemi	5x9	2x7	—	1F / 2G
		110169	41	1 5/8	Flat	Hemi	5x10	2x8	—	1F / 2G
		110476	45	1 3/4	Flat	Hemi	5x10	2x9	—	1F / 2G
		111003	33	1 5/16	Dome	Ballistic	5x8	2x7	—	1F / 3G
		110580	35	1 3/8	Dome	Hemi	5x9	2x7	—	1F / 1G
		110822	35	1 3/8	Dome	Parabolic	5x9	2x7	—	1F / 1G
		111033	36	1 13/32	Dome	Ballistic	5x8	2x7	—	1F / 3G
STANDARD SKIRT 6X2 DESIGN										
		110749	36	1 13/32	Flat	Parabolic	6x8	2x7	—	2F / 1G
		110690	38	1 1/2	Flat	Parabolic	6x8	2x8	—	2F / 1G
		110747	45	1 3/4	Flat	Ballistic	6x9	2x9	—	2F / 2G
STANDARD SKIRT 6X3 DESIGN										
		111095	41	1 5/8	Flat	Parabolic	6x9	3x8	—	3F / 1G
		111094	45	1 3/4	Flat	Parabolic	6x9	3x8	—	3F / 1G

R25 RODS



UNDERGROUND TUNNELING RODS M/M

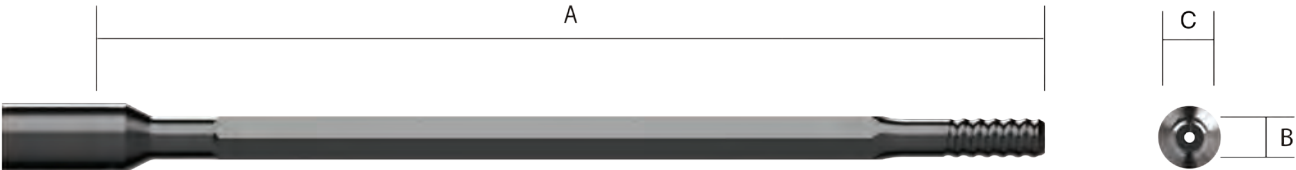
Part #	Carburized	Length (A)		Thread		Rod Type	Cross Section (B) Ø mm /profile
		mm	ft in	Shank	Bit		
220179	●	2150	7' 3/4"	R32	R25	M/M	25H
220262	●	2290	7' 6"	R32	R25	M/M	25H
220219	●	2430	8'	R32	R25	M/M	25H
220180	●	2480	8' 1-3/4"	R32	R25	M/M	25H
220404	●	2600	8' 6-3/4"	R32	R25	M/M	25H
220286	●	2800	9' 2-1/4"	R32	R25	M/M	25H
220443	●	2800	9' 2-1/4"	R32	R25	M/M	28H
220287	●	2900	9' 6-1/2"	R32	R25	M/M	25H
220303	●	3090	10' 1-3/4"	R32	R25	M/M	25H
220525	●	3100	10' 2"	R32	R25	M/M	28H
220229	●	3200	10' 6"	R32	R25	M/M	28H
220444	●	3400	11' 2"	R32	R25	M/M	28H
220543	●	4000	13' 1-1/2"	R32	R25	M/M	28H



UNDERGROUND EXTENSION RODS M/M

Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm /profile
		mm	ft in		
200496	●	610	2'	M/M	25H
200474	●	1000	3' 3-3/4"	M/M	25H
200102	●	1220	4'	M/M	25H
200106	●	1830	6'	M/M	25H
200378	●	2440	8'	M/M	25H

R25 RODS

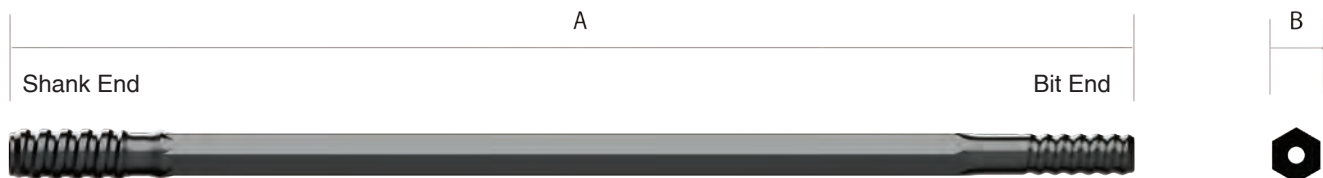


UNDERGROUND EXTENSION RODS M/F						
Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210139	●	800	2' 7-1/2"	M/F	25H	35 mm
210209	●	1220	4'	M/F	25H	35 mm
210160	●	1830	6'	M/F	25H	35 mm
210294	●	2440	8'	M/F	25H	35 mm

R28 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 5X2 DESIGN										
		110527	36	1 13/32	Flat	Hemi	5x8	2x7	—	1F / 2G
		111102	37	1 15/32	Flat	Hemi	5x9	2x7	—	1F / 2G
		110818	37	1 15/32	Flat	Hemi	5x8	2x7	—	1F / 2G
		110002	38	1 1/2	Flat	Hemi	5x9	2x7	—	1F / 2G
		110006	41	1 5/8	Flat	Hemi	5x10	2x8	—	1F / 2G
		110404	43	1 11/16	Flat	Parabolic	5x10	2x8	—	1F / 2G
		110118	45	1 3/4	Flat	Hemi	5x10	2x9	—	1F / 2G

R28 RODS



UNDERGROUND TUNNELING RODS M/M							
Part #	Carburized	Length (A)		Thread		Rod Type	Cross Section (B) Ø mm /profile
		mm	feet inches	Shank	Bit		
220296	●	1900	6' 2-3/4"	R32	R28	M/M	28H
220197	●	2200	7' 2-1/2"	R32	R28	M/M	28H
220194	●	2480	8' 1-3/4"	R32	R28	M/M	28H
220242	●	2590	8' 6"	R32	R28	M/M	28H
220198	●	2800	9' 2-1/4"	R32	R28	M/M	28H
220068	●	3090	10' 1-3/4"	R32	R28	M/M	28H
220075	●	3700	12' 1-3/4"	R32	R28	M/M	28H

DRIFTMASTER™ DM28 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 5X2 DESIGN										
		111103	33	1 5/16	Dome	Ballistic	5x8	2x7	—	1F / 3G
		111186	34	1 11/32	Flat	Parabolic	5x8	2x7	—	1F / 1G
		111133	35	1 3/8	Flat	Parabolic	5x9	2x7	—	1F / 1G
		111105	35	1 3/8	Dome	Hemi	5x9	2x7	—	1F / 1G
		111111	37	1 15/32	Flat	Hemi	5x9	2x7	—	1F / 2G
		111134	37	1 15/32	Flat	Parabolic	5x9	2x7	—	1F / 2G
		111109	38	1 1/2	Flat	Hemi	5x9	2x7	—	1F / 2G
		111104	41	1 5/8	Flat	Hemi	5x10	2x8	—	1F / 2G
STANDARD SKIRT 6X3 DESIGN										
		111131	48	1 7/8	Flat	Hemi	6x10	3x9	—	3F / 1G
STRAIGHTRAC SKIRT 6X3 DESIGN										
		140273	44	1 23/32	Flat	Parabolic	6x10	3x8	—	3F / 1G

DRIFTMASTER™ DM28 RODS



TUNNELING RODS M/M							
Part #	Carburized	Length (A)		Thread		Rod Type	Cross Section (B) Ø mm /profile
		mm	feet inches	Shank	Bit		
220589	●	2100	6' 10-3/4"	R32	DM28	M/M	28H
220593	●	2400	7' 10-1/2"	R32	DM28	M/M	28H
220603	●	2480	8' 1-3/4"	R32	DM28	M/M	28H
220590	●	2600	8' 6-1/4"	R32	DM28	M/M	28H
220597	●	2800	9' 2-1/4"	R32	DM28	M/M	28H
220576	●	3090	10' 1-3/4"	R32	DM28	M/M	25H
220577	●	3090	10' 1-3/4"	R32	DM28	M/M	28H
220610	●	3700	12' 1-3/4"	R32	DM28	M/M	28H

R32 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 5X2 DESIGN										
		110597	41	1 5/8	Flat	Hemi	5x9	2x8	—	1F / 2G
		110176	43	1 11/16	Flat	Hemi	5x10	2x8	—	1F / 2G
		110180	45	1 3/4	Flat	Hemi	5x11	2x8	—	1F / 2G
		110251	48	1 7/8	Flat	Hemi	5x11	2x9	—	1F / 2G
		110609	48	1 7/8	Flat	Parabolic	5x11	2x9	—	1F / 2G
		111025	51	2	Flat	Hemi	5x12	2x11	—	2F / 2G
STANDARD SKIRT 6X2 DESIGN										
		110770	45	1 3/4	Flat	Ballistic	6x9	2x9	—	2F / 2G
		110615	51	2	Flat	Hemi	6x11	2x11	—	2F / 2G
STANDARD SKIRT 6X3 DESIGN										
		111031	44	1 23/32	Flat	Parabolic	6x9	3x8	—	3F / 1G
		110903	45	1 3/4	Flat	Hemi	6x10	3x8	—	3F / 1G
		110552	51	2	Flat	Hemi	6x10	3x9	—	3F / 1G
		110515	51	2	Flat	Parabolic	6x10	3x9	—	3F / 1G
		110997	43	1 11/16	Flat	Hemi	6x9	3x8	—	3F / 1G
		111179	43	1 11/16	Flat	Parabolic	6x10	3x8	—	3F / 3G
		110526	45	1 3/4	Flat	Parabolic	6x9	3x8	—	3F / 1G
		110375	45	1 3/4	Flat	Hemi	6x9	3x9	—	3F / 1G
		110516	48	1 7/8	Flat	Parabolic	6x9	3x8	—	3F / 1G
		111112	48	1 7/8	Flat	Parabolic	6x11	3x10	—	3F / 1G
		111116	54	2 1/8	Flat	Ballistic	6x11	3x10	—	3F / 1G
		111119	54	2 1/8	Flat	Hemi	6x11	3x10	—	3F / 1G
		111026	51	2	Flat	Ballistic	6x9	3x9	—	3F / 1G
		111029	57	2 1/4	Flat	Ballistic	6x10	3x10	—	3F / 1G
		111108	57	2 1/4	Flat	Parabolic	6x11	3x10	—	3F / 1G
		110448	57	2 1/4	Flat	Hemi	6x11	3x10	—	3F
		111051	64	2 1/2	Flat	Ballistic	6x12	3x11	—	3F / 1G

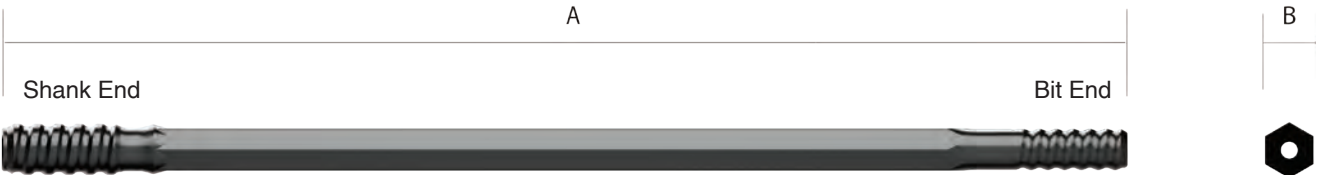
R32 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 6X4 DESIGN										
		110799	76	3	Flat	Hemi	6x12	4x10	—	3F / 1G
		110800	89	3 1/2	Flat	Hemi	6x14	4x12	—	3F / 1G
RETRAC SKIRT 6X3 DESIGN										
		130098	51	2	Flat	Hemi	6x10	3x9	—	3F/1RF
		130048	54	2 1/8	Flat	Parabolic	6x10	3x10	—	3F/1RF
		130056	64	2 1/2	Flat	Hemi	6x13	3x10	—	3F/1RF
STRAIGHTRAC SKIRT 6X3 DESIGN										
		140237	45	1 3/4	Flat	Ballistic	6x9	3x8	—	3F / 1G
		140137	51	2	Flat	Parabolic	6x10	3x9	—	3F

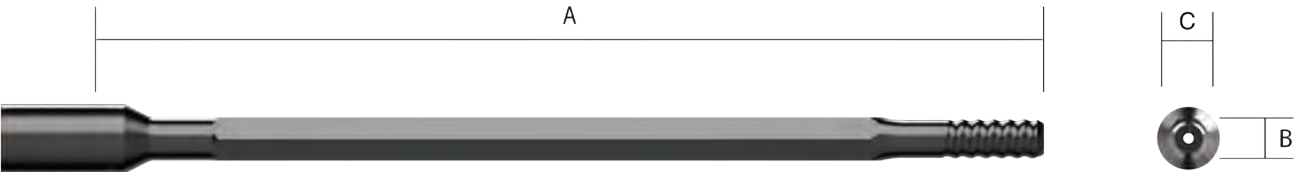
R32 REAMING BITS

				Part #	Ø (mm / in)		Pilot Ø (mm / in)	Button Profile	Buttons			Flushing
								Gauge	Face	Center		
PILOT REAMER												
		090051	76	3	43	1 11/16	Hemi	8x10	6x10	4x10/2x9	3F	
		090032	89	3 1/2	45	1 3/4	Hemi	8x11	6x11	3x10	2F	
		090029	102	4	41	1 5/8	Hemi	8x12	6x12	3x10	2F	
		090008	102	4	43	1 11/16	Hemi	8x12	6x12	4x10/2x9	3F	
		090053	127	5	43	1 11/16	Hemi	8x14	6x14	4x10/2x9	3F	

R32 RODS



UNDERGROUND TUNNELING RODS M/M							
Part #	Carburized	Length (A)		Thread		Rod Type	Cross Section (B) Ø mm /profile
		mm	ft in	Shank	Bit		
220292	●	2400	7' 10-1/2"	HM38	R32	M/M	35H
220497	●	2700	8' 10-1/4"	HM38	R32	M/M	35H
220152	●	3090	10' 1-3/4"	HM38	R32	M/M	32H
220164	●	3090	10' 1-3/4"	HM38	R32	M/M	35H
220166	●	3700	12' 1-3/4"	HM38	R32	M/M	35H
220400	●	3700	12' 1-3/4"	HM38	R32	M/M	32H
220095	●	4300	14' 1-1/4"	HM38	R32	M/M	32H
220209	●	4300	14' 1-1/4"	HM38	R32	M/M	35H
220157	●	4915	16' 1-1/2"	HM38	R32	M/M	32H
220170	●	4915	16' 1-1/2"	HM38	R32	M/M	35H
220042	●	5525	18' 1-1/2"	HM38	R32	M/M	35H



UNDERGROUND TUNNELING RODS M/F								
Part #	Carburized	Length (A)		Thread		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in	Shank	Rod/Bit			
300010	●	3700	12' 1-3/4"	HM38	R32	M/F	35H	57
300012	●	4310	14' 1-3/4"	HM38	R32	M/F	35H	57
300036	●	4915	16' 1-1/2"	HM38	R32	M/F	35H	57

R32 RODS



UNDERGROUND EXTENSION RODS M/M

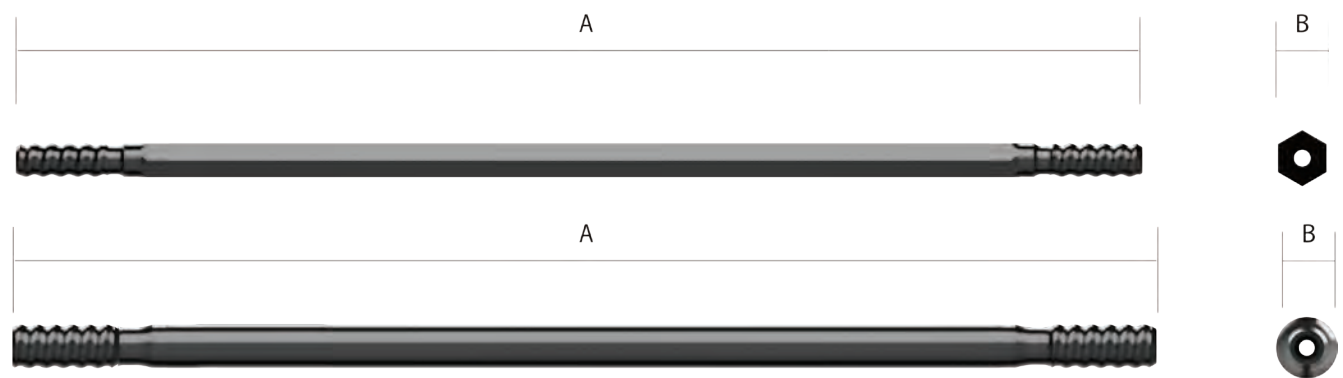
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
200600	●	1000	3' 3-3/8"	M/M	33R
200598	●	1220	4'	M/M	33R
200601	●	1830	6'	M/M	33R
200599	●	2440	8'	M/M	33R



UNDERGROUND EXTENSION ROD M/F

Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210068	●	910	3'	M/F	33R	45 mm
210023	●	1220	4'	M/F	33R	45 mm
210004	●	1525	5'	M/F	33R	45 mm
210005	●	1830	6'	M/F	33R	45 mm
210051	●	2440	8'	M/F	33R	45 mm

R32 RODS



SURFACE EXTENSION RODS M/M					
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
200585	●	3090	10' 1-3/4"	M/M	32H
200143	●	3050	10'	M/M	33R
200372	●	3660	12'	M/M	33R



SURFACE EXTENSION RODS M/F						
Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210006	●	3050	10'	M/F	33R	45 mm
210050	●	3660	12'	M/F	33R	45 mm

DRIFTMASTER™ DM35 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 5X2 DESIGN										
		111047	43	1 11/16	Flat	Hemi	5x10	2x9	—	1F / 2G
		111100	45	1 3/4	Flat	Hemi	5x11	2x9	—	1F / 2G
		111072	48	1 7/8	Flat	Hemi	5x13	2x9	—	1F / 2G
		111073	48	1 7/8	Flat	Parabolic	5x12	2x9	—	1F / 2G
		111057	51	2	Flat	Hemi	5x12	2x11	—	2F / 2G
STANDARD SKIRT 6X3 DESIGN										
		111063	43	1 11/16	Flat	Parabolic	6x10	3x8	—	3F / 1G
		111090	44	1 23/32	Flat	Hemi	6x10	3x8	—	3F / 1G
		111048	45	1 3/4	Flat	Hemi	6x10	3x8	—	3F / 1G
		111052	45	1 3/4	Flat	Parabolic	6x10	3x8	—	3F / 1G
		111075	48	1 7/8	Flat	Parabolic	6x10	3x9	—	3F / 1G
		111076	48	1 7/8	Flat	Hemi	6x10	3x9	—	3F / 1G
		111089	48	1 7/8	Flat	Parabolic	6x11	3x10	—	3F / 1G
		111137	48	1 7/8	Flat	Hemi	6x11	3x10	—	3F / 1G
		111080	51	2	Flat	Parabolic	6x11	3x10	—	3F / 1G
		111138	51	2	Flat	Hemi	6x11	3x10	—	3F / 1G
		111165	64	2 1/2	Flat	Parabolic	6x12	3x11	—	3F / 1G
		111166	64	2 1/2	Flat	Hemi	6x12	3x11	—	3F / 1G
STRAIGHTRAC SKIRT 6X3 DESIGN										
		140245	44	1 23/32	Flat	Parabolic	6x10	3x8	—	3F / 1G
		140244	45	1 3/4	Flat	Parabolic	6x10	3x8	—	3F / 1G
		140256	51	2	Flat	Parabolic	6x11	3x9	—	3F / 1G

DRIFTMASTER™ DM35 REAMING BITS

		Part #	Ø (mm / in)		Pilot Ø (mm / in)		Button Profile	Buttons			Flushing
			Gauge	Face	Center						
PILOT REAMER											
		990084	102	4	43	1 11/16	Hemi	8x12	6x12	4x10 / 2x9	3F
		990085	102	4	43	1 11/16	Hemi	8x15	6x13	4x10 / 2x9	3F
		990093	115	4 1/2	43	1 11/16	Hemi	8x12	6x12	3x10	2F
		990097	127	5	43	1 11/16	Hemi	8x14	6x14	3x10	2F
DOME REAMER											
		990088	102	4	—	—	Hemi	9x12	6x12	5x12	3F/1RF

DRIFTMASTER™ DM35 RODS



UNDERGROUND TUNNELING RODS M/M							
Part #	Carburized	Length (A)		Thread		Rod Type	Cross Section (B) Ø mm / profile
		mm	feet inches	Shank	Bit		
220613	●	2480	8' 1-3/4"	HM38	DM35	M/M	35H
220552	●	2700	8' 10-1/4"	HM38	DM35	M/M	35H
220545	●	3090	10' 1-3/4"	HM38	DM35	M/M	35H
220549	●	3700	12' 1-3/4"	HM38	DM35	M/M	35H
220614	●	4000	13' 1-1/2'	HM38	DM35	M/M	35H
220547	●	4300	14' 1-1/4"	HM38	DM35	M/M	35H
220546	●	4915	16' 1-1/2"	HM38	DM35	M/M	35H
220557	●	5525	18' 1-1/2"	HM38	DM35	M/M	35H

HM35 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 6X3 DESIGN										
		111042	51	2	Flat	Ballistic	6x9	3x9	—	3F / 1G
		110964	54	2 1/8	Flat	Hemi	6x10	3x9	—	3F / 1G
		110965	57	2 1/4	Flat	Hemi	6x10	3x9	—	3F / 1G
		110966	64	2 1/2	Flat	Hemi	6x12	3x11	—	3F
RETRAC SKIRT 6X3 DESIGN										
		130148	57	2 1/4	Flat	Hemi	6x11	3x9	—	3F
STRAIGHTRAC SKIRT 6X3 DESIGN										
		140211	57	2 1/4	Flat	Hemi	6x10	3x9	—	3F

HM35 RODS

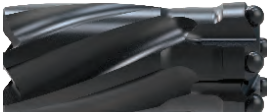


M/F RODS						
Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	feet inches			
210258	●	1525	5'	M/F	39R	48 mm
210202	●	1830	6'	M/F	39R	48 mm

HM38 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 6 GAUGE DESIGN										
		110912	54	2 1/8	Flat	Parabolic	6x11	3x10	—	3F / 1G
		110022	64	2 1/2	Flat	Hemi	6x12	3x10	—	1F / 2G
		110718	64	2 1/2	Recessed	Hemi	6x11	3x10	1x10	3F
		110719	64	2 1/2	Recessed	Parabolic	6x11	3x10	1x10	3F
		111097	64	2 1/2	Recessed	Hemi	6x13	3x11	1x10	3F
		110656	70	2 3/4	Recessed	Hemi	6x13	3x11	1x10	3F
		110720	76	3	Recessed	Hemi	6x11	3x11	1x11	3F
STANDARD SKIRT 8 GAUGE DESIGN										
		110199	64	2 1/2	Flat	Hemi	8x10	4x10	—	2F
		110712	76	3	Flat	Hemi	8x12	4x12	—	2F / 1G
		110793	76	3	Flat	Parabolic	8x11	4x11	—	2F / 1G
		110814	89	3 1/2	Flat	Hemi	8x12	5x11	—	2F / 2G
RETRAC SKIRT 5 GAUGE DESIGN										
		130049	64	2 1/2	Recessed	Hemi	5x11	3x10	1x10	2F
		130059	64	2 1/2	Recessed	Parabolic	5x11	3x10	1x10	2F

HM38 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
RETRAC SKIRT 6 GAUGE DESIGN										
		130175	64	2 1/2	Recessed	Hemi	6x11	3x10	1x10	3F
		130176	64	2 1/2	Recessed	Parabolic	6x11	3x10	1x10	3F
		130191	70	2 3/4	Recessed	Hemi	6x13	3x11	1x10	3F
		130079	76	3	Recessed	Hemi	6x13	3x11	1x10	3F / 1RF
		130074	89	3 1/2	Recessed	Hemi	6x12	3x12	2x10	3F
STRAIGHTRAC SKIRT 6 GAUGE DESIGN										
		140225	64	2 1/2	Flat	Hemi	6x12	3x11	—	3F / 1G
		140060	64	2 1/2	Recessed	Parabolic	6x10	3x10	1x9	3F / 1G
		140035	76	3	Recessed	Hemi	6x11	3x11	2x10	3F / 1G
STRAIGHTRAC SKIRT 8 GAUGE DESIGN										
		140115	64	2 1/2	Recessed	Parabolic	8x9	4x9	1x9	4F / 1G
		140077	76	3	Recessed	Parabolic	8x11	4x11	1x11	4F / 1G

HM38 REAMING BITS

		Part #	Ø (mm / in)		Pilot Ø (mm / in)		Button Profile	Buttons Qty x Size (mm)			Flushing
								Gauge	Face	Center	
PILOT REAMER											
		090019	102	4	48	1 7/8	Hemi	8x12	6x12	3x10	2F
		090026	115	4 1/2	48	1 7/8	Hemi	8x14	6x14	3x10	2F
		090021	127	5	48	1 7/8	Hemi	8x12	6x12	3x10	2F
PILOT REAMER											
		090024	152	6	89	3 1/2	Hemi	9x16	6x16	6x12	3F
		090035	152	6	76	3	Hemi	9x16	6x16	6x12	3F

HM38 RODS



UNDERGROUND EXTENSION RODS M/F

Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile	
		mm	ft in			
210064	●	910	3'	M/F	39R	57 mm
210044	●	1220	4'	M/F	39R	57 mm
210030	●	1520	5'	M/F	39R	57 mm
210031	●	1830	6'	M/F	39R	57 mm
210045	●	2440	8'	M/F	39R	57 mm



UNDERGROUND EXTENSION RODS - RETRAC

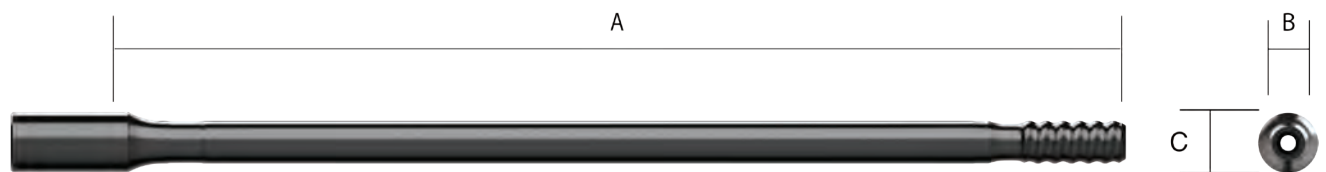
Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210072	●	1220	4'	M/F Retractable	38H	57 mm
210230	●	1220	4'	M/F Retractable	39R	57 mm
210231	●	1520	5'	M/F Retractable	39R	57 mm

HM38 RODS



SURFACE EXTENSION RODS M/M

Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
200365	—	3050	10'	M/M	39R
200604	●	3050	10'	M/M	39R
200366	—	3660	12'	M/M	39R
200367	—	4270	14'	M/M	39R
200417	—	4880	16'	M/M	39R
200509	●	5490	18'	M/M	39R



SURFACE EXTENSION RODS M/F

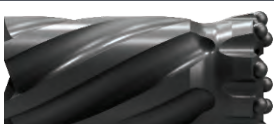
Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210032	●	3050	10'	M/F	39R	57 mm
210190	—	3050	10'	M/F	39R	57 mm
210046	●	3660	12'	M/F	39R	57 mm
210191	●	3660	12'	M/F	39R	57 mm
210112	●	4270	14'	M/F	39R	57 mm



TUBES M/F

Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
270012	●	1220	4'	M/F	55T
270082	●	1525	5'	M/F	55T
270013	●	1830	6'	M/F	55T

HM45 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 6 GAUGE DESIGN										
		111120	70	2 3/4	Recessed	Parabolic	6x11	3x11	1x10	3F / 2G
		110243	70	2 3/4	Recessed	Hemi	6x11	3x11	1x10	3F
		110722	76	3	Recessed	Hemi	6x11	3x11	1x11	3F
		110723	76	3	Recessed	Parabolic	6x11	3x11	1x11	3F
		110661	89	3 1/2	Recessed	Hemi	6x12	3x12	2x12	3F
STANDARD SKIRT 8 GAUGE DESIGN										
		110204	76	3	Flat	Hemi	8x11	4x11	—	2F / 1G
		110716	89	3 1/2	Flat	Hemi	8x14	4x14	—	2F / 2G
		110853	89	3 1/2	Recessed	Parabolic	8x11	4x11	2x11	4F / 1G
		110724	102	4	Recessed	Hemi	8x14	4x12	1x12	4F
		110725	102	4	Recessed	Parabolic	8x14	4x12	1x12	4F
		110924	115	4 1/2	Recessed	Hemi	8x14	4x14	2x14	4F
RETRAC SKIRT 6 GAUGE DESIGN										
		130058	76	3	Recessed	Hemi	6x13	3x11	1x10	3F
		130012	76	3	Recessed	Hemi	6x13	3x11	1x10	3F / 3RF*
		130105	76	3	Recessed	Parabolic	6x11	3x11	1x11	3F
		130080	89	3 1/2	Recessed	Hemi	6x12	3x12	2x12	3F
		130106	89	3 1/2	Recessed	Parabolic	6x12	3x12	2x12	3F
RETRAC SKIRT 8 GAUGE DESIGN										
		130081	102	4	Recessed	Hemi	8x14	4x12	1x12	2F
STRAIGHTRAC SKIRT 8 GAUGE DESIGN										
		140109	76	3	Recessed	Hemi	8x11	4x11	1x11	4F / 1G
		140248	76	3	Recessed	Parabolic	8x12	4x12	1x12	4F / 1G
		140071	89	3 1/2	Recessed	Hemi	8x11	4x11	2x11	4F / 1G
		140072	89	3 1/2	Recessed	Parabolic	8x11	4x11	2x11	4F / 1G
STRAIGHTRAC SKIRT 9 GAUGE DESIGN										
		140176	76	3	Recessed	Parabolic	9x10	6x10	2x10	3F / 1RF*

*Reverse Flushing

HM45 REAMING BITS

		Part #	Ø (mm / in)		Pilot Ø (mm / in)		Button Profile	Buttons Qty x Size (mm)			Flushing
			Gauge	Face	Center						
8 GAUGE PILOT REAMER											
		090020	102	4	48	1 7/8	Hemi	8x12	6x12	3x10	2F
		990074*	102	4	64	2 1/2	Hemi	8x14	4x14	4x12	2F
		090027	115	4 1/2	48	1 7/8	Hemi	8x12	4x12	3x10	2F
		990072	115	4 1/2	64	2 1/2	Hemi	8x14	6x14	4x12	2F
		990092	127	5	48	1 7/8	Hemi	8x14	4x14	3x10	2F
PILOT REAMER											
		990059*	152	6	70	3	Hemi	9x16	6x16	5x12	3F
		090034	152	6	76	3	Hemi	9x16	6x16	6x12	3F
		090023	152	6	89	3 1/2	Hemi	9x16	6x16	6x12	2F
PILOT REAMER											
		990082*	203	8	135	5 1/3	Hemi	10x18	8x18	7x14	2F

*Shoulder drive

HM45 RODS



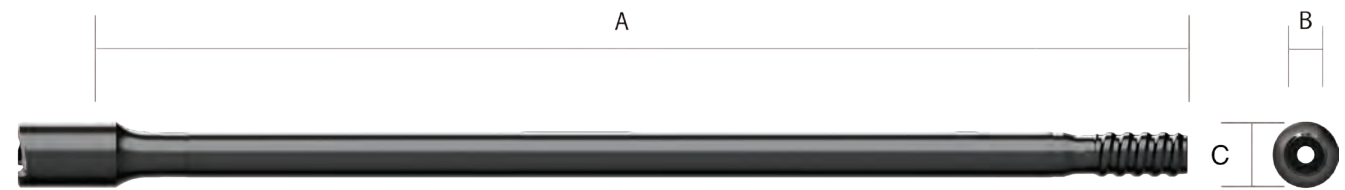
UNDERGROUND EXTENSION RODS M/F

Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210048	●	1220	4'	M/F	46R	66 mm
210035	●	1520	5'	M/F	46R	66 mm
210126	●	1830	6'	M/F	46R	66 mm



UNDERGROUND EXTENSION RODS M/M

Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
200438	—	1220	4'	M/M	46R
200427	—	1830	6'	M/M	46R



RETRAC RODS M/F

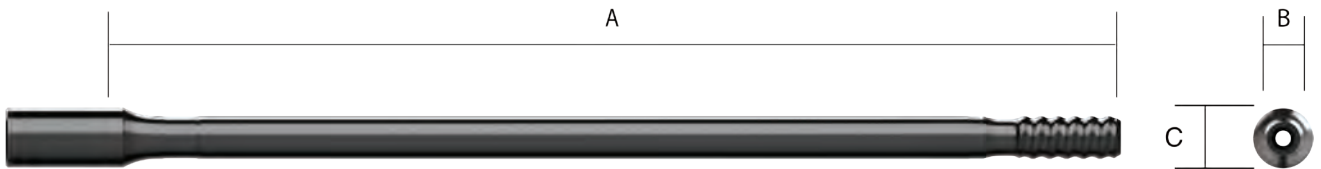
Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210241	●	1220	4'	M/F Retractable	46R	66 mm

HM45 RODS



SURFACE EXTENSION RODS M/M

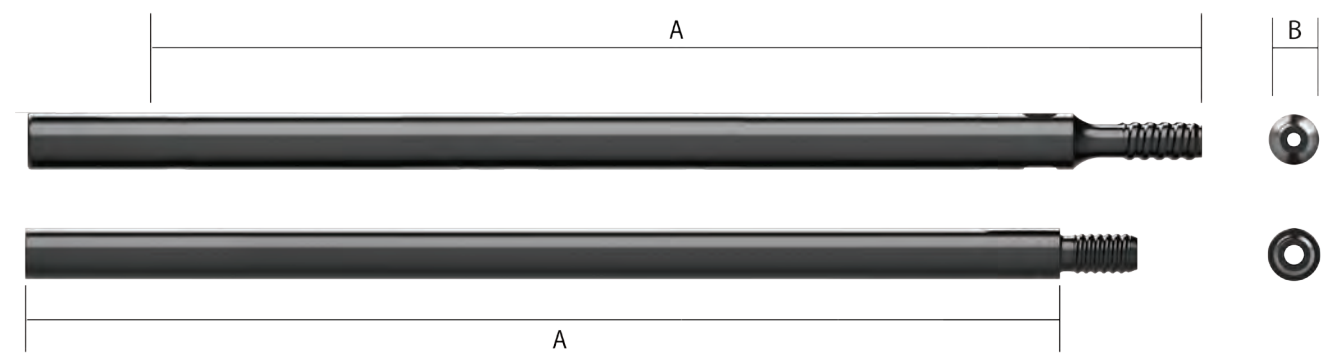
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
200361	—	3050	10'	M/M	46R
200362	—	3660	12'	M/M	46R
200486	●	3660	12'	M/M	46R
200386	—	4270	14'	M/M	46R
200464	—	4880	16'	M/M	46R
200455	●	5480	18'	M/M	46R
200397	—	6100	20'	M/M	46R



SURFACE EXTENSION RODS M/F

Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210037	●	3050	10'	M/F	46R	66 mm
210038	●	3660	12'	M/F	46R	66 mm
210194	—	3660	12'	M/F	46R	66 mm
210082	●	4270	14'	M/F	46R	66 mm
210195	—	4270	14'	M/F	46R	66 mm
210240	●	4880	16'	M/F	46R	66 mm

HM45 RODS



TUBES M/F					
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
270022	●	1220	4'	M/F	66T
270081	●	1525	5'	M/F	66T
270052	●	1830	6'	M/F	66T
270033	●	1830	6'	M/F SD	66T

HM51 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 6 GAUGE DESIGN										
		110663	89	3 1/2	Recessed	Hemi	6x12	3x12	2x12	3F
		110662	89	3 1/2	Recessed	Parabolic	6x12	3x12	2x12	3F
STANDARD SKIRT 8 GAUGE DESIGN										
		111114	89	3 1/2	Recessed	Hemi	8x13	4x13	1x13	4F
		111113	89	3 1/2	Recessed	Parabolic	8x13	4x13	1x13	4F
		110703	102	4	Recessed	Hemi	8x14	4x12	1x12	2F
		110726	102	4	Recessed	Parabolic	8x14	4x12	1x12	2F
		110701	115	4 1/2	Recessed	Hemi	8x14	4x14	2x14	4F
		110702	115	4 1/2	Recessed	Parabolic	8x14	4x14	2x14	4F
		110699	127	5	Recessed	Hemi	8x14	4x14	3x14	4F
		110923	140	5 1/2	Recessed	Hemi	8x16	4x16	3x16	4F
		110950	115	4 1/2	Recessed	Hemi	8x14	6x14	2x14	4F
		110360	89	3 1/2	Flat	Hemi	8x12	6x12	—	2F / 1G
		110141	102	4	Flat	Hemi	8x14	7x12	—	2F / 2G
		110437	102	4	Flat	Parabolic	8x14	7x12	—	2F / 2G
STANDARD SKIRT 9 GAUGE DESIGN										
		110737	89	3 1/2	Recessed	Parabolic	9x12	6x11	2x11	3F

HM51 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
RETRAC SKIRT 6 GAUGE DESIGN										
		130101	89	3 1/2	Recessed	Hemi	6x12	3x12	2x12	3F
RETRAC SKIRT 8 GAUGE DESIGN										
		130146	89	3 1/2	Recessed	Hemi	8x13	4x12	2x12	4F
		130171	89	3 1/2	Recessed	Parabolic	8x13	4x12	2x12	4F
		130082	102	4	Recessed	Hemi	8x14	4x12	1x12	2F
		130195	102	4	Recessed	Parabolic	8x14	4x12	2x12	4F
		130083	115	4 1/2	Recessed	Hemi	8x14	4x14	2x14	4F
		130084	127	5	Recessed	Hemi	8x14	4x14	3x14	4F
		130008	102	4	Flat	Hemi	8x14	7x12	—	2F
		130190	140	5 1/2	Flat	Hemi	8x16	7x16	—	4F
RETRAC SKIRT 9 GAUGE DESIGN										
		130108	115	4 1/2	Recessed	Parabolic	9x13	6x13	3x13	3F

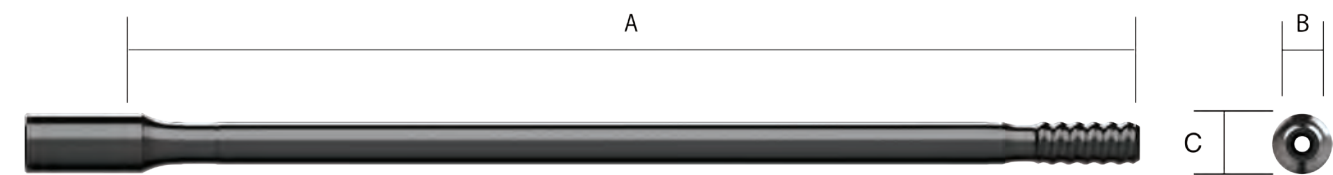
HM51 REAMING BITS

			Part #	Ø (mm / in)		Pilot Ø (mm / in)		Button Profile	Buttons Qty x Size (mm)			Flushing
								Gauge	Face	Center		
PILOT REAMER												
		990083	152	6	89	3 1/2	Hemi	9x16	6x16	3x12	3F	

HM51 RODS



UNDERGROUND EXTENSION ROD M/M					
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
200398	●	910	3'	M/M	52R
200521	—	1000	3' 3-3/8"	M/M	52R



UNDERGROUND EXTENSION ROD M/F						
Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210234	●	1220	4'	M/F	52R	72 mm
210040	●	1525	5'	M/F	52R	72 mm
210154	●	1830	6'	M/F	52R	72 mm

HM51 RODS



SURFACE EXTENSION ROD M/M

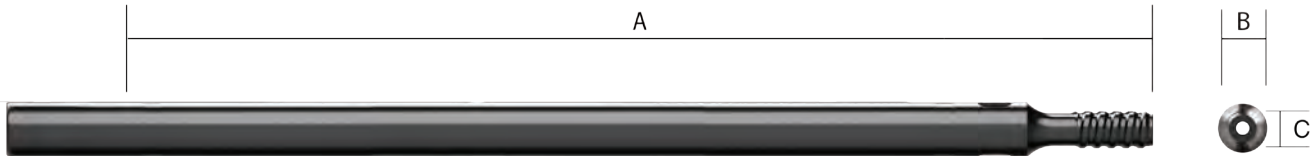
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
200363	—	3660	12'	M/M	52R
200422	—	4270	14'	M/M	52R
200579	—	4880	16'	M/M	52R
200364	—	6100	20'	M/M	52R
200404	—	7320	24'	M/M	52R



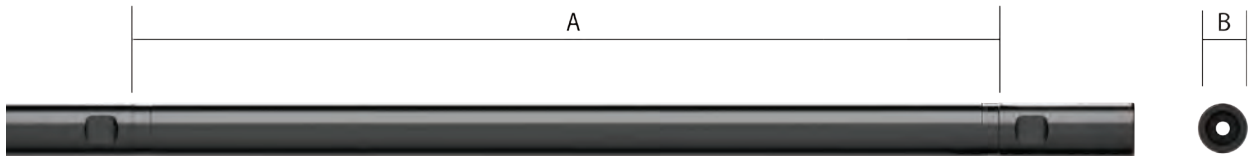
SURFACE EXTENSION ROD M/F

Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210042	●	3660	12'	M/F	52R	72 mm
210296	—	3660	12'	M/F	52R	72 mm
210083	●	4270	14'	M/F	52R	72 mm
210297	—	4270	14'	M/F	52R	72 mm
210278	●	4880	16'	M/F	52R	72 mm
210227	—	5490	18'	M/F	52R	72 mm
210222	—	6100	20'	M/F	52R	72 mm

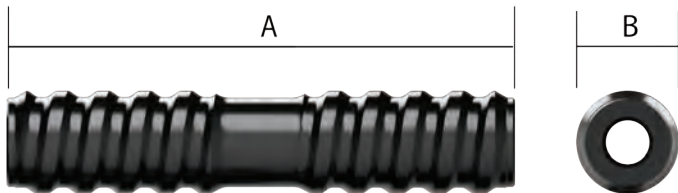
HM51 RODS



TUBES M/F					
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
270095	●	1220	4'	M/F	76T
270018	●	1525	5'	M/F	76T



TUBES F/F					
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
270085	—	3660	12'	F/F WF	76T



ADAPTER M/M					
Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
203010	●	250	9 7/8"	M/M ADAPTER	52R

WF=Wrench Flats

HM60 BITS (GT60)

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 9 GAUGE DESIGN										
		111146	102	4	Flat	Hemi	9x13	6x12	3x11	3F
		111147	102	4	Flat	Parabolic	9x13	6x12	3x11	3F
		111150	115	4 1/2	Flat	Hemi	9x14	9x14	—	3F
		111154	115	4 1/2	Flat	Parabolic	9x14	9x14	—	3F
		111149	127	5	Flat	Hemi	9x16	10x14	—	3F
		111153	127	5	Flat	Parabolic	9x16	10x14	—	3F
		111151	140	5 1/2	Flat	Hemi	9x16	10x14	—	3F
		111155	140	5 1/2	Flat	Parabolic	9x16	10x14	—	3F
		111152	152	6	Flat	Parabolic	9x16	10x14	—	3F
RETRAC SKIRT 9 GAUGE DESIGN										
		130193	102	4	Recessed	Hemi	9x13	6x12	3x11	3F
		130194	102	4	Recessed	Parabolic	9x13	6x12	3x11	3F
		130185	115	4 1/2	Recessed	Hemi	9x14	6x14	3x14	3F
		130180	115	4 1/2	Recessed	Parabolic	9x14	6x14	3x14	3F
		130165	127	5	Recessed	Hemi	9x16	6x14	4x14	3F
		130181	127	5	Recessed	Parabolic	9x16	6x14	4x14	3F
		130197	140	5 1/2	Recessed	Hemi	9x16	6x14	4x14	3F
		130186	140	5 1/2	Recessed	Parabolic	9x16	6x14	4x14	3F
		130187	152	6	Recessed	Parabolic	9x16	6x14	4x14	3F

All HM60 Bits, Rods, and Tubes are Shoulder Drive

HM60 (GT60) RODS



SURFACE EXTENSION ROD M/F

Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210243	●	4270	14'	M/F SD	60R	85 mm
210313	●	3660	12'	M/F SD	60R	85 mm



TUBES

Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
270119	●	1525	5'	M/F SD	87T
270111	●	4270	14'	M/F SD	87T

All HM60 Bits, Rods, and Tubes are Shoulder Drive

EL60 BITS

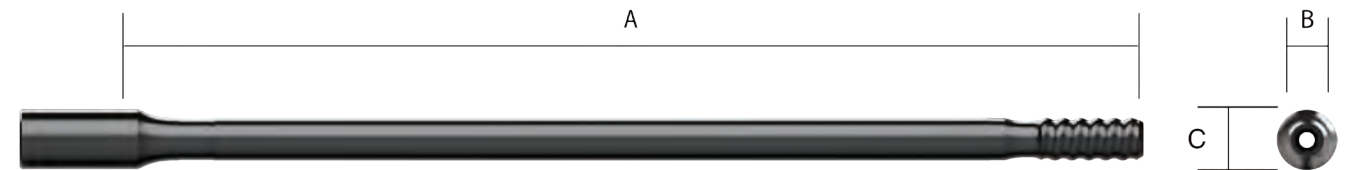
		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 8 GAUGE DESIGN										
		110900	92	3 5/8	Recessed	Hemi	8x13	4x12	1x12	4F
		110887	102	4	Recessed	Hemi	8x14	4x12	1x12	4F
		110888	115	4 1/2	Recessed	Hemi	8x14	4x14	2x14	4F
		111130	115	4 1/2	Recessed	Parabolic	8x14	4x14	2x14	4F
		110918	127	5	Recessed	Hemi	8x16	4x14	3x14	4F
		110890	140	5 1/2	Recessed	Hemi	8x16	4x16	3x16	4F
		110993	102	4	Flat	Hemi	8x14	6x12	—	2F
		111070	102	4	Flat	Hemi	8x16	6x16	—	2F
		110994	115	4 1/2	Flat	Hemi	8x14	6x14	—	4F
		111123	140	5 1/2	Flat	Hemi	8x16	6x16	—	2F
RETRAC SKIRT 8 GAUGE DESIGN										
		130114	102	4	Recessed	Hemi	8x14	4x12	1x12	2F
		130144	102	4	Recessed	Parabolic	8x14	4x12	1x12	2F
		130115	115	4 1/2	Recessed	Hemi	8x14	4x14	2x14	4F
		130145	115	4 1/2	Recessed	Parabolic	8x14	4x14	2x14	4F
		130120	127	5	Recessed	Hemi	8x16	4x14	3x14	4F
		130143	127	5	Recessed	Parabolic	8x14	4x14	3x14	4F
		130116	140	5 1/2	Recessed	Hemi	8x16	4x16	3x16	4F

EL60 RODS



EXTENSION RODS M/M

Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
203011	—	910	3'	M/M	60R
200530	—	4270	14'	M/M	60R
200543	—	6100	20'	M/M	60R
200573	—	7315	24'	M/M	60R



EXTENSION RODS M/F

Part #	Carburized	Length (A)		Rod Type	Profile mm (B)	Coupling Ø (C)
		mm	ft in			
210266	—	3660	12'	M/F	60R	83 mm
210267	—	4270	14'	M/F	60R	83 mm
210269	—	6100	20'	M/F	60R	83 mm



TUBES

Part #	Carburized	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
270086	—	4270	14'	M/F	87T

BE58 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing
							Gauge	Face	Center	
STANDARD SKIRT 8 GAUGE DESIGN										
		111125	89	3 1/2	Recessed	Parabolic	8x13	4x13	1x13	4F
		111044	102	4	Recessed	H/P	8x14	4x12	2x12	4F
		110270	102	4	Flat	Hemi	8x14	7x12	—	2F / 2G
		110272	115	4 1/2	Flat	Hemi	8x14	8x12	—	2F / 2G
STRAIGHTRAC SKIRT 8 GAUGE DESIGN										
		140254	89	3 1/2	Recessed	Parabolic	8x12	4x12	1x11	4F
		140246	89	3 1/2	Recessed	Parabolic	8x13	4x13	1x13	4F
		140239	102	4	Recessed	H/P	8x14	4x12	2x12	4F
STRAIGHTRAC SKIRT 9 GAUGE DESIGN										
		140187	89	3 1/2	Recessed	Hemi	9x12	6x11	2x11	3F

H/P = Hemispherical and Parabolic Buttons

BE58 REAMING BITS

			Part #	Ø (mm / in)		Pilot Ø (mm / in)		Button Profile	Buttons Qty x Size (mm)			Flushing
								Gauge	Face	Center		
PILOT REAMER												
		990063	127	5	48	1 7/8	Hemi	9x14	6x14	3x13 / 3x12	3F	
		990058	152	6	80	3 3/20	Hemi	9x16	6x16	6x12	3F	
		990096	176	7	110	4 1/3	Hemi	9x18	6x16	6x14	3F	
PILOT REAMER												
		990073	203	8	135	5 1/3	Hemi	10x18	8x18	7x14	3F	

All BE58 and BE68 bits are Shoulder Drive

BE58 TUBES



Part #	Carburized H/T	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
TUBES					
270105	●	1220	4'	M/F SD	76T
270099	●	1525	5'	M/F SD	76T
270103	●	1830	6'	M/F SD	76T

Cross Section: H = Hex R = Round T= Tube Rod

SD = Shoulder Drive WF = Wrench Flats

BEG8 BITS

		Part #	Ø (mm / in)		Face Profile	Button Profile	Buttons Qty x Size (mm)			Flushing	
							Gauge	Face	Center		
STANDARD SKIRT 8 GAUGE DESIGN											
		110927	102	4	Recessed	H/P	8x14	4x12	2x12	4F	
		110280	127	5	Flat	Hemi	8x14	9x12	—	2F / 2G	
		110581	152	6	Flat	Hemi	8x16	7x16	—	2F / 2G	
STRAIGNTRAC SKIRT 8 GAUGE DESIGN											
		140195	102	4	Recessed	H/P	8x14	4x12	2x12	4F	
STRAIGHTRAC SKIRT 9 GAUGE DESIGN											
		140174	115	4 1/2	Flat	Hemi	9x14	6x14	—	3F	

Hemi = Hemispherical H/P = Hemispherical/Parabolic

BE68 REAMING BITS

		Part #	Ø (mm / in)		Pilot Ø (mm / in)		Button Profile	Buttons Qty x Size (mm)			Flushing	
								Gauge	Face	Center		
PILOT REAMER												
		090047	152	6	89	3 1/2	Hemi	9x16	6x16	6x12	3F	
PILOT REAMER												
		990076	203	8	135	5 1/3	Hemi	10x18	8x18	7x14	2F	

All BE58 and BE68 bits are Shoulder Drive.

BE68 TUBES



TUBES					
Part #	Carburized H/T	Length (A)		Rod Type	Cross Section (B) Ø mm / profile
		mm	ft in		
270118	●	1220	4'	M/F SD	87T
270101	●	1525	5'	M/F SD	87T
270107	●	1830	6'	M/F SD	87T

Cross Section: H = Hex R = Round T= Tube Rod

SD = Shoulder Drive WF = Wrench Flats

ROCK TOOLS

SHANKS

Manufactured to provide optimal wear resistance, strength, and toughness, the Boart Longyear shank is the number one preferred choice in the industry for maximum energy transfer from the hammer to the drill string.

BOART LONGYEAR
CANNON
CATERPILLAR
EPIROC
FURUKAWA
GARDNER DENVER
INGERSOLL RAND
JOHN HENRY
MONTABERT
SANDVIK
SECAN
SECOMA

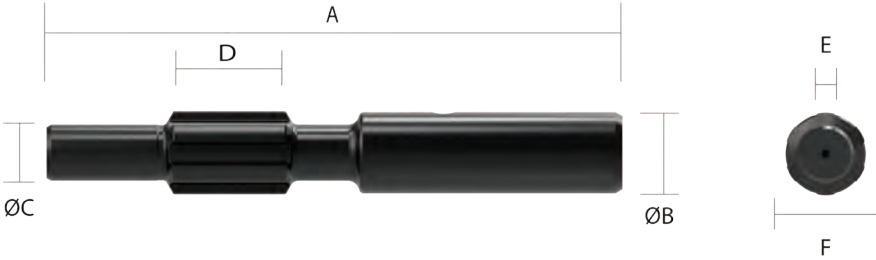
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BOART LONGYEAR

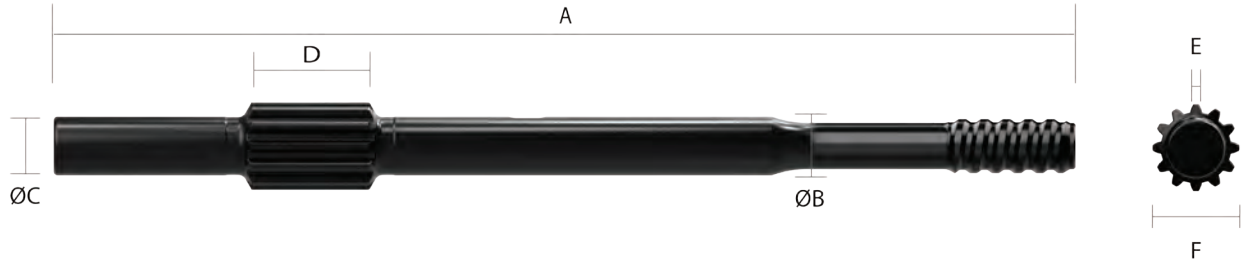
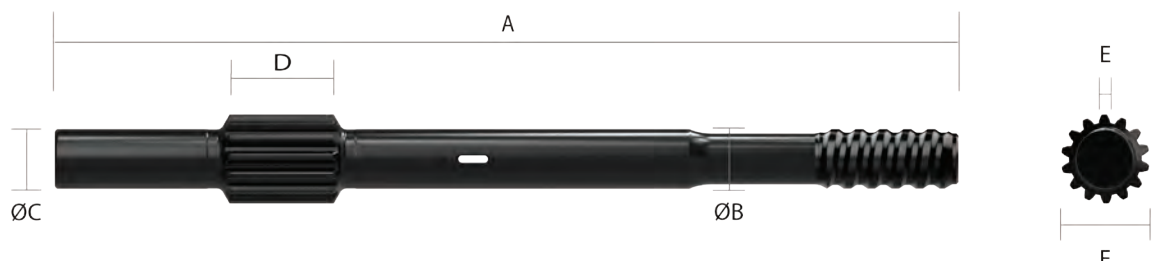
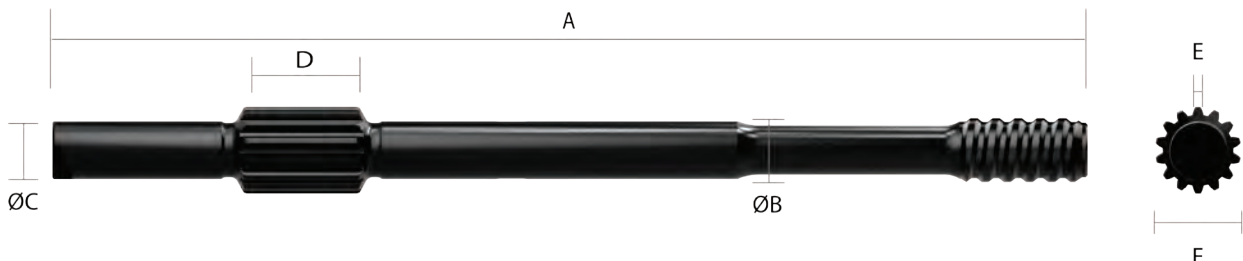
Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450270	HD125, HE125, HE150, HD150	HM38	495	45	38	Regular	64	15	66.8	Male
450500	HD155	HM38	575	55	38	Regular	81	17	70	Male
450565	HD155	HM45	575	55	38	Regular	81	17	70	Male
450212	S36IR	R32	381	44	44	Regular	64	18	56	Male
450266	S36IR	HM38	381	44	44	Regular	64	18	56	Male
450010	S36IR	HM45	381	44	44	Regular	64	18	56	Male

SHANKS

CANNON

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
450855	JH2	R32F	390	55	38	Regular	78	13	56	Female
450454	JH2	HM38F	390	55	38	Regular	78	13	56	Female

CATERPILLAR

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
450760	HPR4519	HM45	770	45	45	Regular	89	9	66	Male
										
450825	HPR5123	HM45	770	51	51	Regular	89	9	76	Male
450824	HPR5123	HM51	770	51	51	Regular	89	9	76	Male
										
450638	HPR5128	HM51	914	51	51	Regular	102	9	76	Male

SHANKS

CATERPILLAR

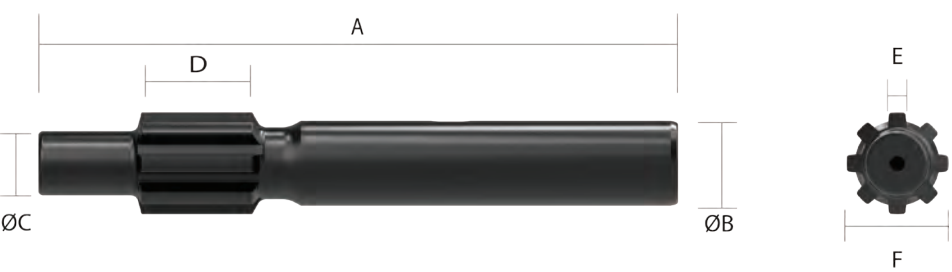
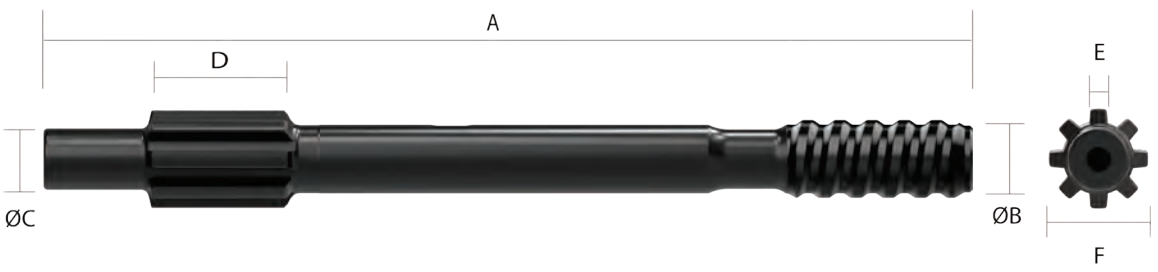
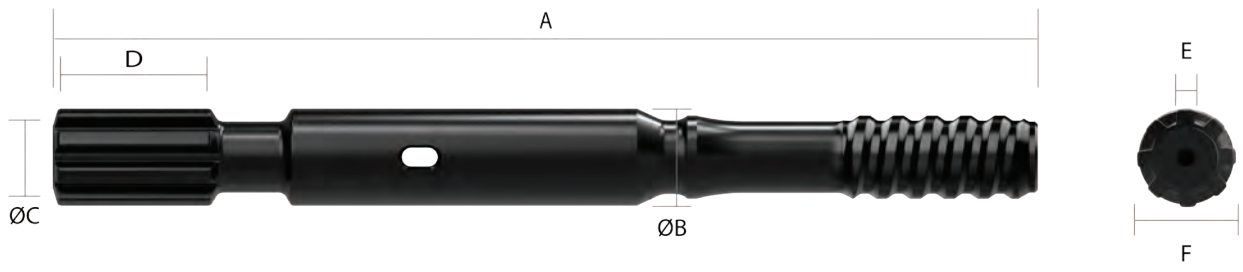
Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450891	HPR6030	EL60	1041	60	60	Regular	102	9	86	Male
451000	HPR6030	HM60	1041	60	60	Regular	102	9	86	Male
450640	HPR6832	HM51	1041	70	64	Regular	102	9	86	Male
451024	HPR6832	HM60	1041	70	64	Regular	102	9	86	Male
450785	HPR6832	EL60	1041	70	64	Regular	102	9	86	Male
450582	HPR6832	EL68	1041	70	64	Regular	102	9	86	Male

EPIROC

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450853	1132, RR11	R32	410	35	25	Regular	79	5	38	Male
450854	1132, RR12	R32	500	35	25	Regular	79	5	38	Male
450940	1135, 1140, 1435	R32	500	35	25	Helical	79	5	38	Male

SHANKS

EPIROC

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
450089	1032HD, 1032HL	R32F	340	45	34	Regular	59	9	54	Female
										
450282	1238ME	HM38	500	38	34	Regular	74	9	54	Male
450284	1238ME	HM38	575	38	34	Regular	74	9	54	Male
450632	1238ME	HM45	575	45	34	Regular	74	9	54	Male
										
450889	1440, 1432, 1532, 1838HD, 1838ME	HM38	525	52	34	Regular	84	9	54	Male
450713	1440, 1432, 1532, 1838HD, 1838ME	HM45	525	52	34	Regular	84	9	54	Male
450539	1440, 1432, 1532, 1838HD, 1838ME	HM51	525	52	34	Regular	84	9	54	Male

SHANKS

EPIROC

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450965	1838MUX, 1838HUX	HM35	730	52	34	Regular	84	9	54	Male
450857	1838MUX, 1838HUX	HM38	730	52	34	Regular	84	9	54	Male
450856	1838MUX, 1838HUX	HM45	730	52	34	Regular	84	9	54	Male
450614	1838T	R32	435	38	36	Regular	84	10	54	Male
450631	1838T	R32	525	38	36	Regular	84	10	54	Male
450550	1838T	HM38	435	38	36	Regular	84	10	54	Male
450551	1838T	HM38	525	38	36	Regular	84	10	54	Male
450548	1840ME	HM45	565	52	35	Helical	126	10	53	Male
450634	1840ME	HM51	565	52	35	Helical	126	10	53	Male
450939	2150/2550 EXT	HM45	770	60	35	Helical	134	10	53	Male

SHANKS

EPIROC

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450927	2150/2550 EXT	HM51	770	60	35	Helical	134	10	53	Male
450858	2160EXT, 2560EXT	HM51	770	63	37	Regular	156	8	61	Male
450966	1240EX, 1640EX, 1840EX, 1850EX, 2550UX	HM51	770	60	35	Helical	134	10	53	Male
450988	1240EX, 1640EX, 1840EX, 1850EX, 2550UX	BE58	770	77	35	Helical	134	10	53	Male
450951	3060MEX	HM51	840	60	50	Regular	181	7	75	Male
450981	3060MEX	EL60	840	60	50	Regular	181	7	75	Male
450985	3060MUX	BE58	745	90	50	Regular	172	7	75	Male
450931	3060MUX	BE68	745	90	50	Regular	172	7	75	Male

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EPIROC

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450878	4050ME	EL60	700	70	46	Helical	109	9	68	Male
450935	4050MUX, 4050EX	BE68	835	90	46	Helical	134	9	68	Male
450139	56/57	HM38	448	44	44	Regular	80	13	64	Male
450979	MD20	HM38	470	38	35	Regular	125	9	53	Male

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EPIROC

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
451016	RD22U, RD 18UP	HM38	525	45	37	Regular	80	7	61	Male
451015	RD22U, RD 18UP	HM45	525	45	37	Regular	80	7	61	Male

FURUKAWA

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450443	HD260, HD300	HM45	654	44	44	Regular	80	13	64	Male
450525	HD609	HM45	690	45	36	Regular	75	10	57	Male
450576	HD612	HM45	710	51	42	Regular	92	12	65	Male

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FURUKAWA

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450842	HD709	HM38	622	45	44	Regular	93	10	63	Male
450793	HD709	HM45	622	45	44	Regular	93	10	63	Male
450795	HD712	HM45	790	51	50	Regular	100	12	72	Male
450801	HD712	HM51	790	51	50	Regular	100	12	72	Male
450743	HD712R	HM45	780	51	50	Regular	164	12	72	Male
450913	HD712R	HM51	885	51	50	Regular	164	12	72	Male
451018	HD715	HM45	787	58	58	Regular	100	12	80	Male

SHANKS

FURUKAWA

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450794	HD715	HM51	787	58	58	Regular	100	12	80	Male
450823	HD715RP	HM51	882	58	58	Regular	164	12	80	Male
450771	HD90	R32	515	40	32	Regular	54	11	49	Male

GARDNER DENVER

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450629	HPR1H	HM45	744	44	44	Regular	89	10	66	Male
450002	PR1000	R32	499	44	44	Regular	64	18	55	Male
450014	PR1000	R32	510	32	44	Regular	64	18	55	Male

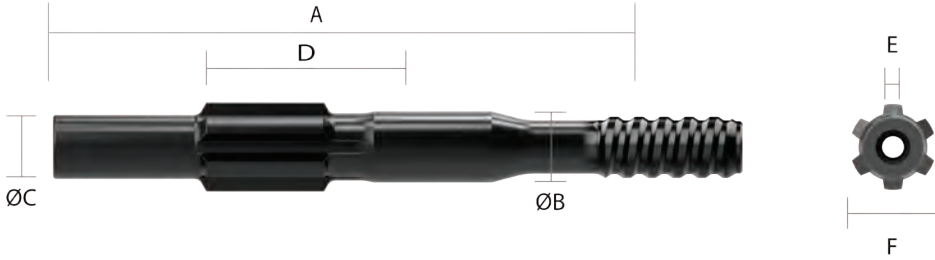
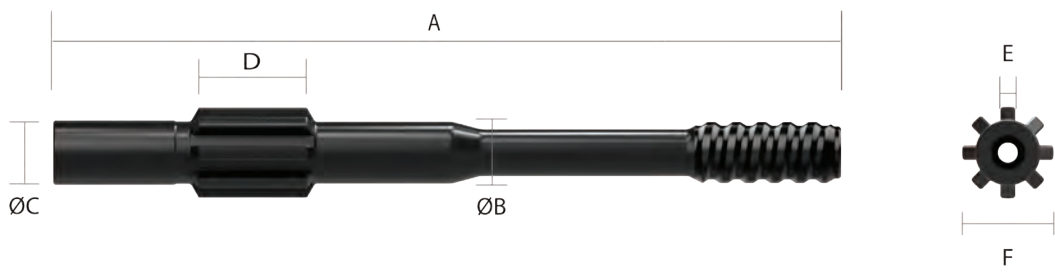
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INGERSOLL-RAND

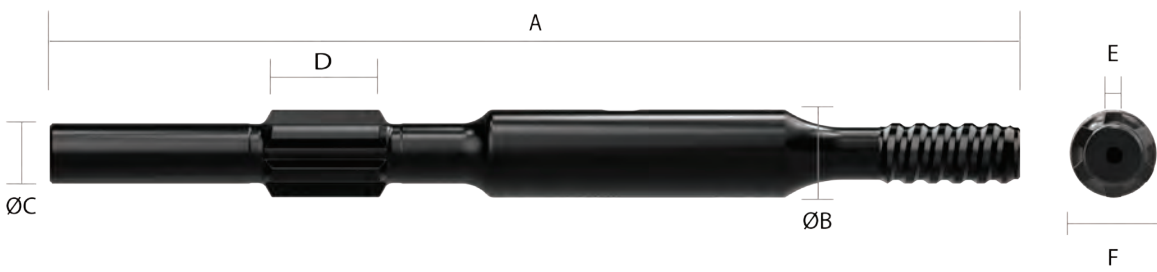
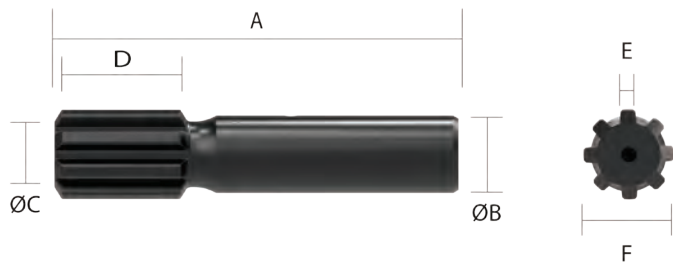
Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450013	URD475, URD 550, VL120, EVL 130, VL140, F16	R32	381	44	44	Regular	64	18	55	Male
450568	YH110	HM51	727	55	53	Regular	110	12	74	Male
450375	LM500, YH65, YH70, YH80	HM45	500	45	46	Regular	85	13	64	Male
450468	YH65RP, 70RP, 75RP, 80RP	HM45	700	45	46	Regular	145	13	64	Male

SHANKS

INGERSOLL-RAND

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
450735	YH65 RP, YH80A, YH80A RP	HM45	500	51	46	Regular	84	13	64	Male
										
451038	YH95	HM45	625	51	53	Regular	89	12	74	Male

JOHN HENRY

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
450559	JHRD1	HM45	711	64	44	Regular	79	12	64	Male
450989	JHRD1	HM45F	540	64	44	Regular	79	12	64	Female
450506	JHRD1	HM51	711	64	44	Regular	79	12	64	Male
										
450847	HV32	R32F	233	45	38	Regular	77	9	54	Female

SHANKS

MONTABERT

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450958	HC109	HM38	460	45	39	Regular	97	9	60	Male
450941	HC110	HM38	415	45	38	Regular	95	9	61	Male
450750	HC120	R32	490	45	39	Regular	97	9	60	Male
450613	HC120	HM38	490	45	39	Regular	97	9	60	Male
450612	HC120	HM45	490	45	39	Regular	97	9	60	Male
450426	HC120 RP, HC 150 RP, HC 155 RP, HC 158 RP	HM45	667	51	39	Regular	102	9	60	Male
450753	HC120 RP, HC 150 RP, HC 155 RP, HC 158 RP	HM45	670	45	39	Regular	102	9	60	Male
450491	HC120 RP, HC 150 RP, HC 155 RP, HC 158 RP	HM51	667	51	39	Regular	102	9	60	Male
450623	HC120 RP, HC 150 RP, HC 155 RP, HC 158 RP	HM51	771	51	39	Regular	102	9	60	Male

SHANKS

MONTABERT

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
451025	HC160, HC170	HM51	808	60	44	Regular	135	10	69	Male
451026	HC160, HC170	HM60	808	60	44	Regular	135	10	69	Male
450930	HC25	R32F	202	45	34	Regular	38	8	53	Female
451037	HC28	R32	550	45	34	Regular	58	8	53	Male
450975	HC28	R32F	272	45	34	Regular	58	8	53	Female

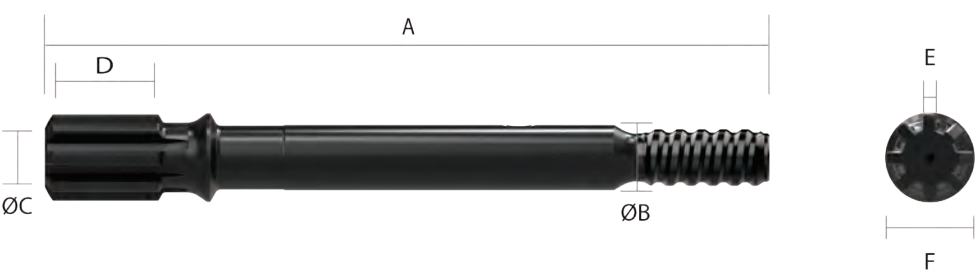
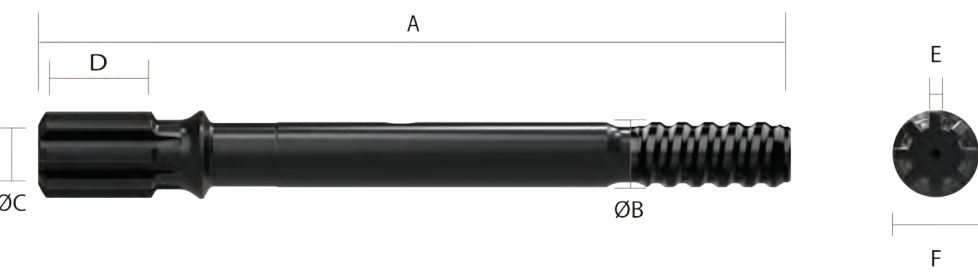
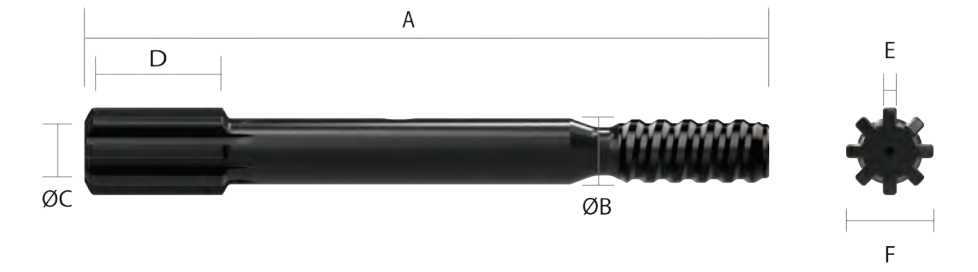
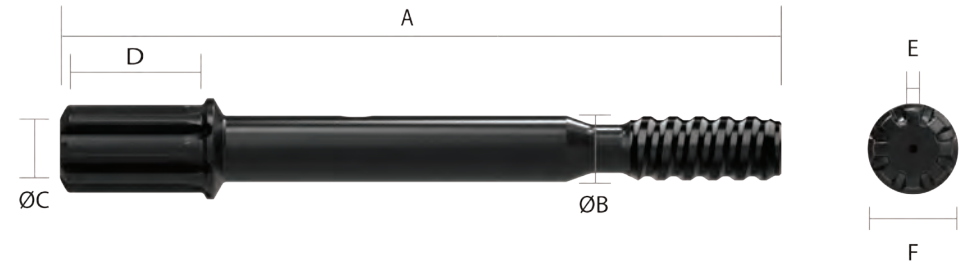
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MONTABERT

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450455	HC40, HC50	R32	447	38	38	Regular	58	8	53	Male
450862	HC40, HC50	R32F	270	45	35	Regular	58	8	53	Female
451027	HC40, HC50	HM38	390	38	38	Regular	58	8	53	Male
450928	HC40, HC50	HM38	370	38	38	Regular	58	8	53	Male
450438	HC40, HC50	HM38	447	38	38	Regular	58	8	53	Male
451028	HC50PLUS	HM38	392	45	34	Regular	69	8	55	Male
450485	HC80, HC90, HC105	R32	440	38	38	Regular	97	9	53	Male
451009	HC95LHR	R32	500	45	40	Regular	79	9	60	Male

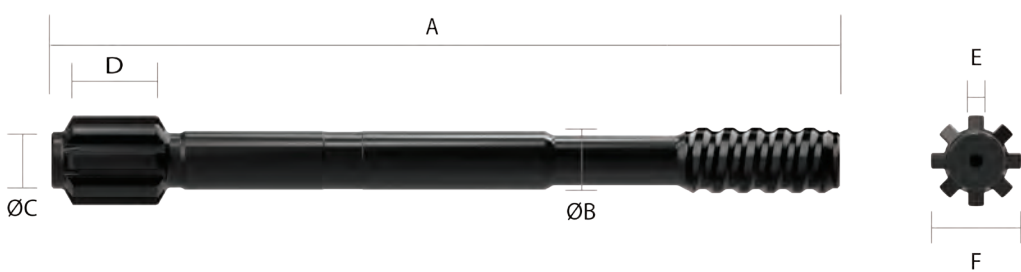
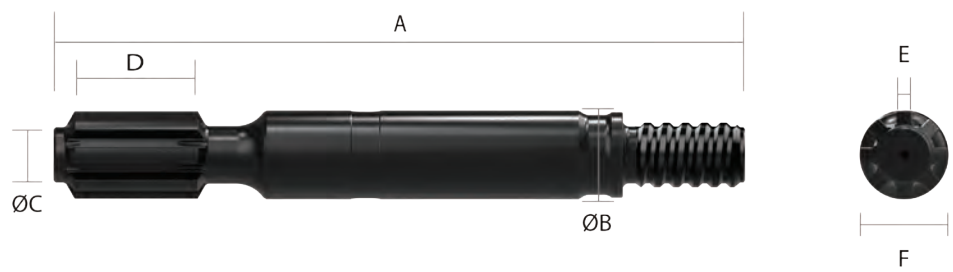
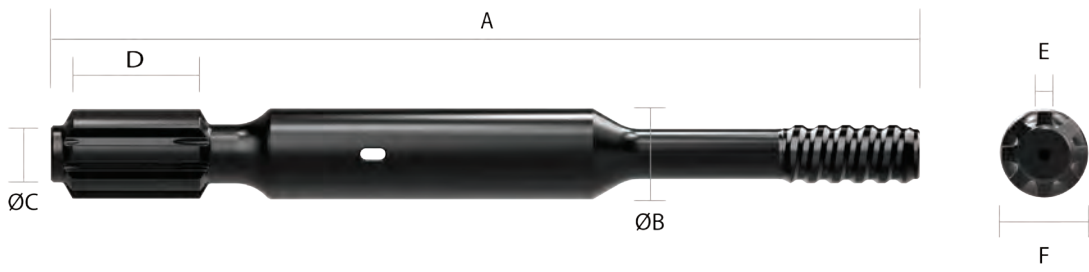
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MONTABERT

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
450716	HC95LMR	R32	505	45	40	Regular	73	9	60	Male
450955	HC95LMR	HM38	505	45	40	Regular	73	9	60	Male
										
451002	HC95LQ	HM45	520	45	40	Regular	79	9	60	Male
										
451008	HC95SA	HM38	440	45	40	Regular	94	9	60	Male
451007	HC95SA	HM38	500	45	40	Regular	94	9	60	Male
										
451022	HC95SA	HM38	468	45	40	Regular	105	9	60	Male

SHANKS

SANDVIK

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
450111	HL1000, HL1000S, HL1010, HL1010S	HM51	670	52	50	Regular	75	14	79	Male
451014	HL1000, HL1000S, HL1010, HL1010S	HM60	670	60	50	Regular	75	14	79	Male
										
450998	HL1500	BE58	614	80	50	Regular	111	14	79	Male
450837	HL1500	BE68T	643	90	50	Regular	161	14	79	Male
										
450841	HL1560	HM51	760	80	50	Regular	112	14	79	Male
450873	HL1560	HM51	760	65	50	Regular	112	14	79	Male
451019	HL1560	HM60	760	80	50	Regular	112	14	79	Male
450990	HL1560	HM60	760	65	50	Regular	112	14	79	Male
450840	HL1560	EL60	760	80	50	Regular	112	14	79	Male

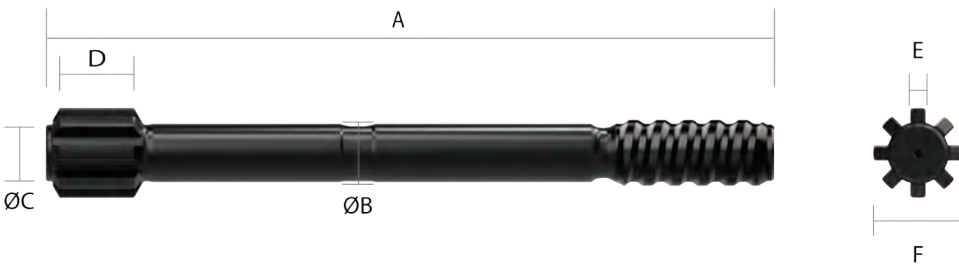
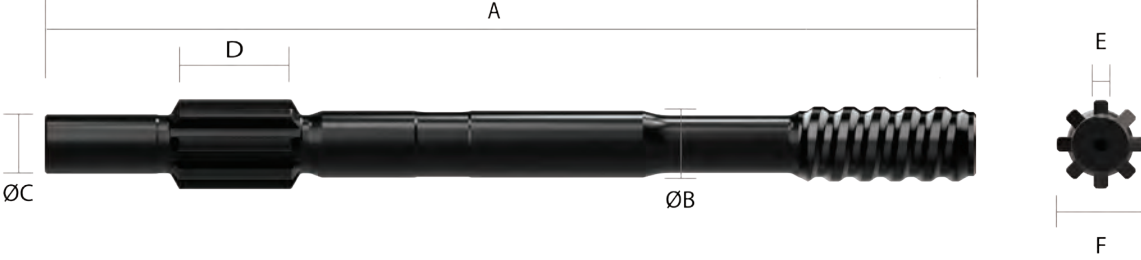
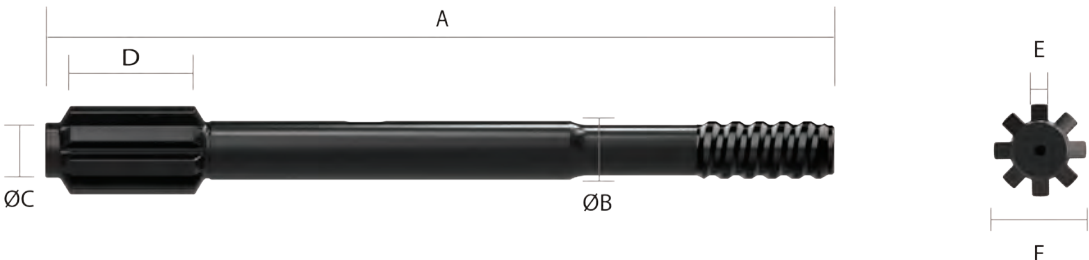
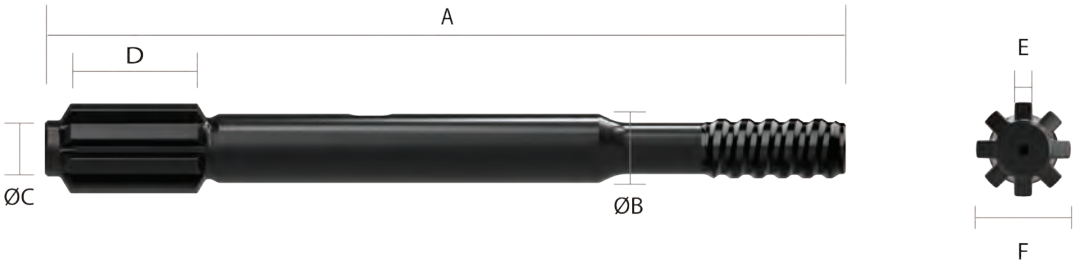
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SANDVIK

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450846	HL1560T	EL60	760	65	50	Regular	112	14	79	Male
450869	HL1560T	BE58	760	65	50	Regular	112	14	79	Male
450654	HL300	R32	400	32	37	Regular	39	10	59	Male
450475	HL300S	R32F	245	45	37	Regular	39	10	59	Female
450871	HL500, HL550S	HM35	460	45	38	Regular	49	10	59	Male
450546	HL500, HL550S	HM38	550	45	37	Regular	49	10	59	Male
450537	HL500, HL550S	HM45	550	45	37	Regular	49	10	59	Male

SHANKS

SANDVIK

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
450405	HL500S	HM38	460	38	37	Regular	49	10	59	Male
										
450383	HL600S	HM45	600	45	40	Regular	75	10	60	Male
										
450868	HL650	HM45	600	45	42	Regular	95	13	69	Male
										
450700	HL700, HL710, HL800T, HL810T, HF810T, HL820T, HF820T	HM38	600	52	42	Regular	95	13	69	Male
450575	HL700, HL710, HL800T, HL810T, HF810T, HL820T, HF820T	HM51	600	52	42	Regular	95	13	69	Male

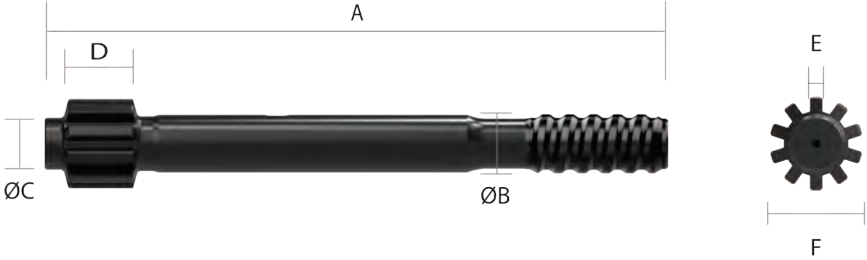
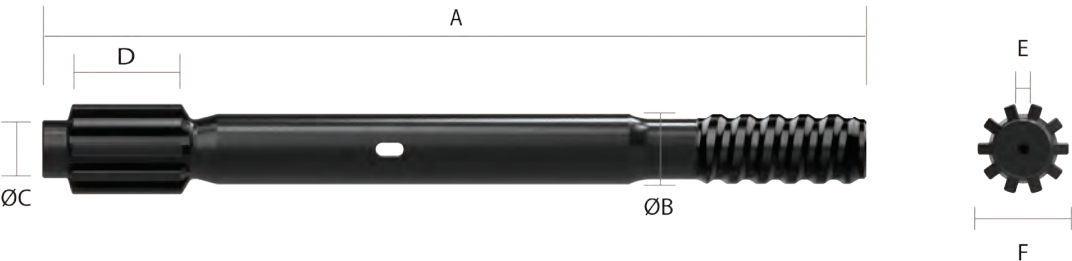
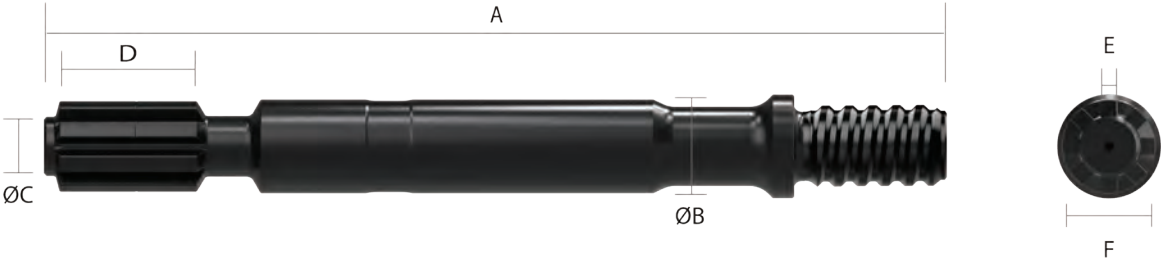
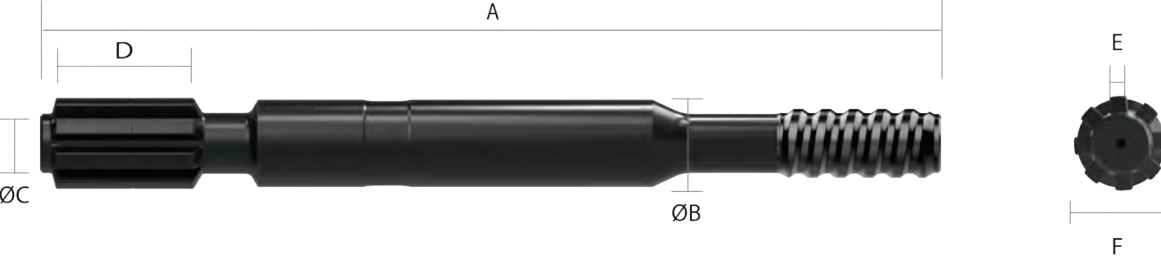
SHANKS

SANDVIK

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450923	HL710PE	HM38	600	52	42	Regular	95	13	69	Male
450922	HL700PE	HM45	600	52	42	Regular	95	13	69	Male
450767	HLX1	R23	235	28	24	Regular	25	5	39	Male
450886	HLX1	R25	255	28	24	Regular	25	5	39	Male
450756	HLX5, HLX5T, HFX5T, RDX5	R32	500	45	37	Regular	49	8	59	Male
450963	HLX5, HLX5T, HFX5T, RDX5	R32	575	45	37	Regular	49	8	59	Male
450851	HLX5, HLX5T, HFX5T, RDX5	HM38	500	45	37	Regular	49	8	59	Male
450816	HLX5, HLX5T, HFX5T, RDX5	HM38	575	45	37	Regular	49	8	59	Male
450917	HLX5, HLX5T, HFX5T, RDX5	HM45	500	45	37	Regular	49	8	59	Male
451001	RD1635CF-80	HM60	760	80	50	Regular	112	14	79	Male

SHANKS

SANDVIK

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
										
451010	RD308/RD314/RD414	R32	410	38	34	Regular	42	8	59	Male
450969	RD314/RD414/RD308	R32F	205	45	34	Regular	35	8	59	Female
451034	RD308/RD314/RD414	HM38	410	38	34	Regular	42	8	59	Male
										
450872	RD520/525	HM38	525	45	37	Regular	70	8	59	Male
450932	RD520/525	HM45	525	45	37	Regular	70	8	59	Male
										
451035	RD900	BE58	670	70	44	Regular	114	13	69	Male
										
451036	RD900	HM51	670	65	44	Regular	114	13	69	Male

SHANKS

SANDVIK

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
451033	RD900PE	HM51	670	65	44	Regular	114	13	69	Male
451031	RD900PE	EL60	670	65	44	Regular	114	13	69	Male

SECAN

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450860	S36	HM38	510	45	45	Regular	63	17	55	Male

SECOMA

Part #	Drifter Model	Thread	A (mm)	B (mm)	C (mm)	Spline Type	D (mm)	E (mm)	F (mm)	Thread Type
450747	HYDRASTAR 200	R28F	370	45	34	Regular	91	9	56	Female
450335	HYDRASTAR 200	R32F	350	45	34	Regular	91	9	56	Female

ROCK TOOLS

ACCESSORIES

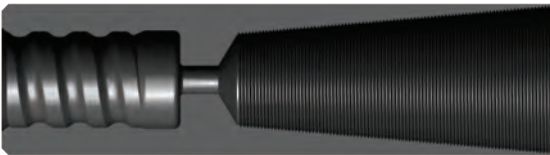
COUPLINGS

	Part #	Description	Ø	Length	Thread	
			(mm)	(mm)		
SEMI BRIDGE						
	350054	Semi Bridge Coupling	33	150	R25	
	350005	Semi Bridge Coupling	35	150	R25	
	350067	Semi Bridge Coupling	42	150	R32	
	350011	Semi Bridge Coupling	45	150	R32	
	350060	Semi Bridge Coupling	52	191	HM38	
	350002	Semi Bridge Coupling	55	191	HM38	
	350034	Semi Bridge Coupling	63	210	HM45	
	350012	Semi Bridge Coupling	66	210	HM45	
	350013	Semi Bridge Coupling	72	235	HM51	
	350014	Semi Bridge Coupling	76	235	HM51	
	350063	Semi Bridge Coupling	83	280	EL60	
	350064	Semi Bridge Coupling	96	330	EL68	
FULL BRIDGE						
	350050	Full Bridge Coupling	45	168	R32	
	350045	Full Bridge Coupling	55	187	HM38	
	350046	Full Bridge Coupling	66	213	HM45	
	350048	Full Bridge Coupling	76	251	HM51	
ADAPTER, FULL BRIDGE						
	360029	Adapter Coupling, Full Bridge M/F	45	168	R32	R25
	360056	Adapter Coupling, Full Bridge M/F	55	165	HM38	R25
	360018	Adapter Coupling, Full Bridge M/F	55	177	HM38	R32
	360053	Adapter Coupling, Full Bridge M/F	58	180	HM45	HM38
	360049	Adapter Coupling, Full Bridge M/F	61	185	HM45	R32
	360035	Adapter Coupling, Full Bridge M/F	76	235	HM51	HM45

BIT ADAPTER

	Part #	Description	M Thread	F Thread
	370022	Bit Adapter M/F	R32	R25
	370009	Bit Adapter M/F	HM38	R32
	370059	Bit Adapter M/F	R25	R32
	370062	Bit Adapter M/F	HM38	DM35
	370058	Bit Adapter M/F	HM38	HM35
	370014	Bit Adapter M/F	HM45	HM38
	370037	Bit Adapter M/F	R32	HM38
	370015	Bit Adapter M/F	HM51	HM45
	370031	Bit Adapter M/F	HM38	HM45
	370049	Bit Adapter M/F	HM45	HM51
	370056	Bit Adapter M/F	HM51	EL60

BELL TAPS

	Part #	Description	Thread
	630004	Bell Tap	R32
	630014	Bell Tap	HM38
	630007	Bell Tap	HM45
	630008	Bell Tap	HM51
	630013	Bell Tap	EL60
	620013	Bell Tap	EL68

SPEARS

	Part #	Description	Thread
	620037	Spear, Female	R25
	620038	Spear, Female	R32
	620034	Spear, Female	HM35
	620033	Spear, Female	HM38
	620020	Spear, Female	HM45
	620031	Spear, Female	HM51
	620032	Spear, Female, Universal	BE58
	620030	Spear, Female, 2-stage	EL60
	620036	Spear, Female	HM60
	620025	Spear, Female	BE68T

ROCK TOOLS

DTH HAMMERS AND BITS

IMPORTANT SAFETY INFORMATION

Use appropriate eye protection, gloves, masks, and ventilation when using our tools.



Use caution when breaking the chuck using the bit removal tool combined with reverse rotation. The shaft of the tool could turn with high force when breaking the chuck if the shaft of the tool is not locked or touching the edge of the feed beam. Use proper breakout tools (wrenches, chain wrench, and bit basket) when removing the bit and backhead from the casing.



Use care at all times when handling drill bits. Drill bits may become hot during operation and remain hot after drilling has stopped. Avoid direct skin contact with hot bits to avoid burns or other injuries.

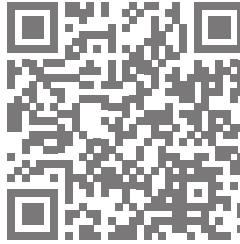


Refer to our **Bit Grinding Safety Data Sheet** for safely grinding bits.



OVERVIEW

Boart Longyear's BT Hammer series offer less maintenance and increased reliability with minimal moving parts. 100% tubeless, no troublesome foot-valves!

**1. TOP SUB**

Back reaming buttons protect the top sub against wear when pulling out of the hole.

2. SOLID PISTON

Most productive piston concept, maximizing penetration rates.

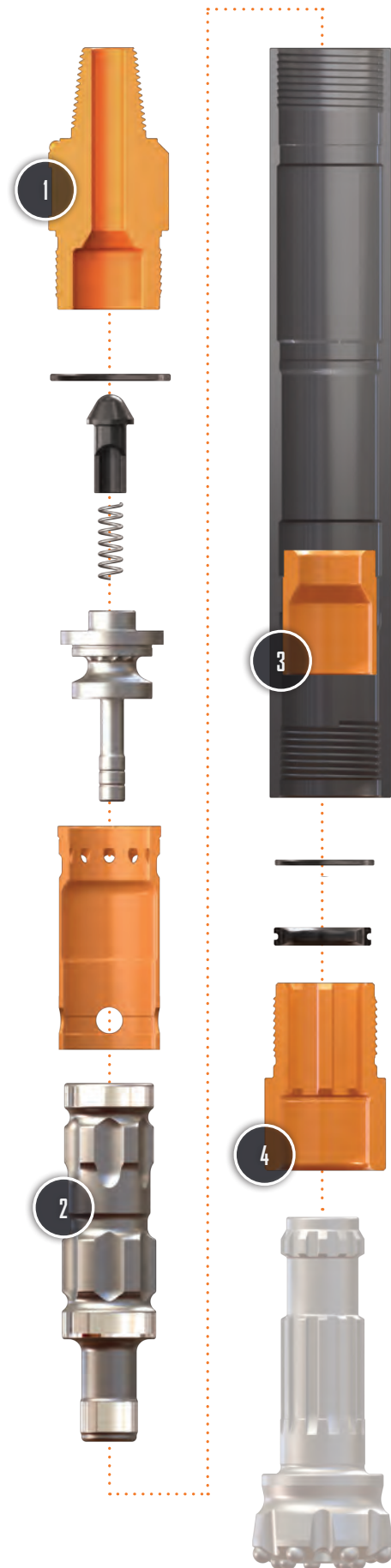
3. GUIDE SLEEVE

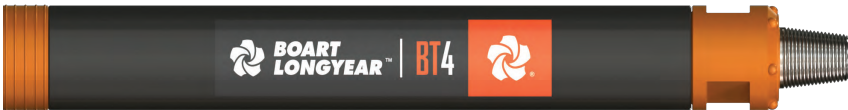
Serves the same function as the plastic foot valve, but is a much more reliable solution.

4. DRIVE CHUCK

Hard facing protects the drive chuck and extends the life of the hammer.

COMPLEXITYsimplified.





BT4 - 4" DTH HAMMERS (TUBELESS - NO FOOT VALVES)

Part No.	Description
155078	BT4 HAMMER DTH 4T CUBEX 24
155058	BT4 HAMMER DTH 4T API 2-3/8 REG



BT5 - 5" DTH HAMMERS (TUBELESS - NO FOOT VALVES)

Part No.	Description
155037	BT5 HAMMER DTH 5T API 3-1/2
155059	BT5 HAMMER DTH 5T CUBEX 24



BT6 - 6" DTH HAMMERS (TUBELESS - NO FOOT VALVES)

Part No.	Description
155060	BT6 HAMMER DTH 6T CUBEX 28
155038	BT6 HAMMER DTH 6T API 3-1/2

OVERVIEW

Boart Longyear bits are optimized for drilling results in challenging ground conditions. Each design strikes a balance of flushing, gauge- and face-button wear, life, and rate-of-penetration.

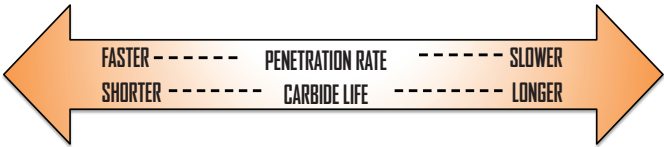
- Convex for higher penetration rates.
- Concave for straighter holes.
- Flat for easy sharpening and maintenance.

Diameters range from 110 to 172 mm (4.3 to 6.8 in).

FEATURES

- Industry Preferred Shanks
- QL/QLX 12-spline shanks. Make the switch to the most solid and wear-resistant in the market.
- Tubeless - No Foot Valves.
- Bits for the BT hammers 100% without foot valves. Maximizes reliability by eliminating a plastic weakness. 5” and 6” bits provided with an optional foot valve to fit traditional tubed hammers.
- Premium Carbide Inserts.
- Fine-tuned hardness and toughness to increase carbide life. Supports multiple re-sharpenings to amplify bit life. Choose between ballistic and hemispherical inserts.

PENETRATION RATE/CARBIDE LIFE



ROCK HARDNESS/ABRASIVENESS



INSERT GEOMETRY



FACE GEOMETRY



PART #	DESCRIPTION		
920623	BIT DTH 110 QLX4T BF8H14/4H12/2H12 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Flat	Spherical		
Diameter	Weight		Gauge Button/Diameter
110 mm (4-3/8 in)	8.24 kg (16.9 lb)		8/14



Flat face provides easy resharping.

PART #	DESCRIPTION		
920600	BIT DTH 115 QLX4T BF8H14/7H14 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Flat	Spherical		
Diameter	Weight		Gauge Button/Diameter
115 mm (4-1/2 in)	9.3 kg (19.07 lb)		8/14



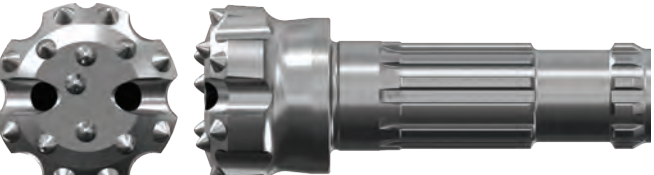
Flat face provides easy resharping.

PART #	DESCRIPTION		
920620	BIT DTH 115 QLX4T BC8H14/4H13/3H13 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Concave	Spherical		
Diameter	Weight		Gauge Button/Diameter
115 mm (4-1/2 in)	9 kg (18.45 lb)		8/14



Recessed face provides increased hole straightness

PART #	DESCRIPTION		
920602	BIT DTH 115 QLX4T BD8B14/4B13/3B13 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Convex	Ballistic		
Diameter	Weight		Gauge Button/Diameter
115 mm (4-1/2 in)	9.12 kg (18.7 lb)		8/14

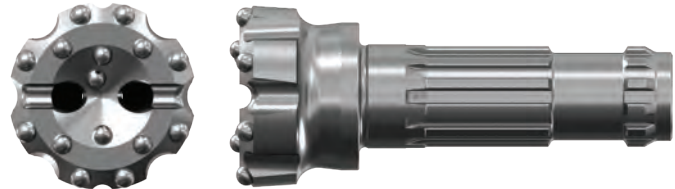


Convex face with ballistic buttons for increased penetration rate

PART #	DESCRIPTION		
920611	BIT DTH 121 QLX4T BF8H14/4H14/3H14 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Flat	Spherical		
Diameter	Weight	Gauge Button/Diameter	Flat face provides easy resharpener.
121 mm (4-3/4 in)	9.58 kg (19.64 lb)	8/14	



PART #	DESCRIPTION		
920603	BIT DTH 121 QLX4T BC8H14/4H13/3H13 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Concave	Spherical		
Diameter	Weight	Gauge Button/Diameter	Recessed face provides increased hole straightness
121 mm (4-3/4 in)	9.35 kg (19.17 lb)	8/14	



PART #	DESCRIPTION		
920612	BIT DTH 121 QLX4T BD8B14/4B13/3B13 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Convex	Ballistic		
Diameter	Weight	Gauge Button/Diameter	Convex face with ballistic buttons for increased penetration rate
121 mm (4-3/4 in)	9.42 kg (19.32 lb)	8/14	



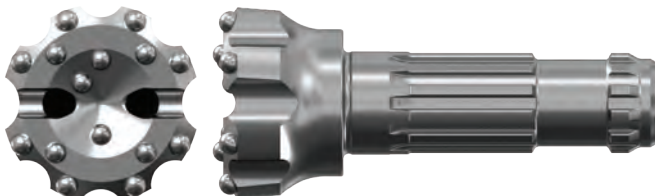
PART #	DESCRIPTION		
920606	BIT DTH 127 QLX4T BC8H14/4H13/3H13 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Concave	Spherical		
Diameter	Weight	Gauge Button/Diameter	Recessed face provides increased hole straightness
127 mm (5 in)	9.69 kg (19.87 lb)	8/14	



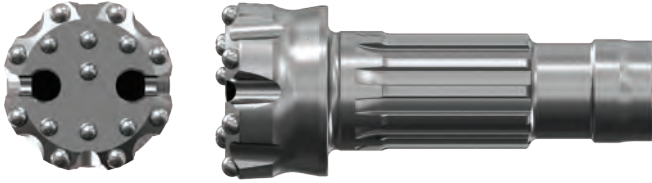
PART #	DESCRIPTION		
920621	BIT DTH 127 QLX4T BD8B14/4B13/3B13 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Convex	Ballistic		
Diameter	Weight	Gauge Button/Diameter	Convex face with ballistic buttons for increased penetration rate
127 mm (5 in)	9.42 kg (19.32 lb)	8/14	



PART #	DESCRIPTION		
920609	BIT DTH 130 QLX4T BC8H15/4H14/3H14 2F0G		
Shank Type	Flushing		
QLX4T/TD40	2		
Face Type	Button Type		
Concave	Spherical		
Diameter	Weight	Gauge Button/Diameter	Recessed face provides increased hole straightness
130 mm (5-1/8 in)	10.16 kg (20.83 lb)	8/15	

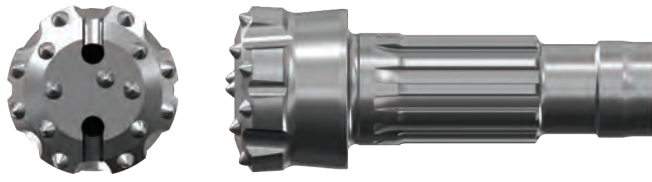


PART #	DESCRIPTION		
920608	BIT DTH 133 QL5T BF8H16/7H14 2F0G		
Shank Type	Flushing		
QL5T	2		
Face Type	Button Type		
Flat	Spherical		
Diameter	Weight		Gauge Button/Diameter
133 mm (5-1/4 in)	14.46 kg (29.65 lb)		8/16



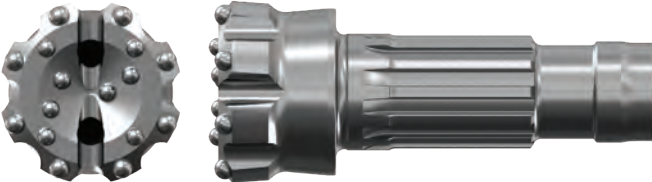
Flat face provides easy resharpening.

PART #	DESCRIPTION		
920622	BIT DTH 133 QL5T BD8B14/4B14/3B14 2F0G		
Shank Type	Flushing		
QL5T	2		
Face Type	Button Type		
Convex	Ballistic		
Diameter	Weight		Gauge Button/Diameter
133 mm (5-1/4 in)	15.66 kg (32.11 lb)		8/14



Convex face with ballistic buttons for increased penetration rate

PART #	DESCRIPTION		
920615	BIT DTH 140 QL5T BC8H16/4H14/4H14 2F0G		
Shank Type	Flushing		
QL5T	2		
Face Type	Button Type		
Concave	Spherical		
Diameter	Weight		Gauge Button/Diameter
140 mm (5-1/2 in)	15.99 kg (32.78 lb)		8/16



Recessed face provides increased hole straightness

PART #	DESCRIPTION		
920616	BIT DTH 140 QL5T BD9B14/6B14/4B14 3F0G		
Shank Type	Flushing		
QL5T	3		
Face Type	Button Type		
Convex	Ballistic		
Diameter	Weight		Gauge Button/Diameter
140 mm (5-1/2 in)	15.92 kg (32.64 lb)		9/14

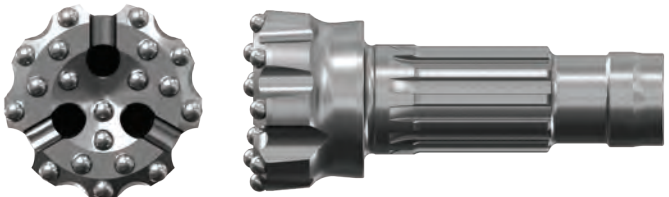


Convex face with ballistic buttons for increased penetration rate

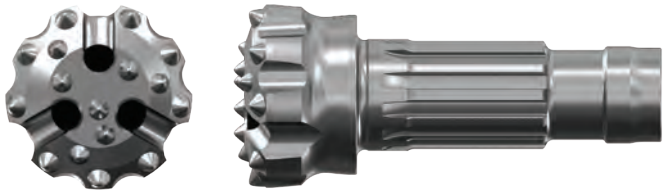
PART #	DESCRIPTION		
920614	BIT DTH 146 QL5T BF9H19/6H16/4H14 3F0G		
Shank Type	Flushing		
QL5T	3		
Face Type	Button Type		
Flat	Spherical		
Diameter	Weight	Gauge Button/Diameter	Flat face provides easy resharpening.
146 mm (5-3/4 in)	16.88 kg (34.61 lb)	9/19	



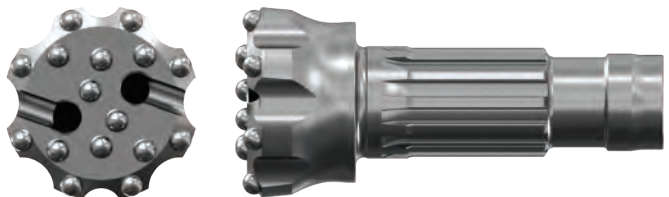
PART #	DESCRIPTION		
920610	BIT DTH 146 QL5T BC9H16/6H16/4H16 3F0G		
Shank Type	Flushing		
QL5T	3		
Face Type	Button Type		
Concave	Spherical		
Diameter	Weight	Gauge Button/Diameter	Recessed face provides increased hole straightness
146 mm (5-3/4 in)	16.57 kg (33.97 lb)	9/16	



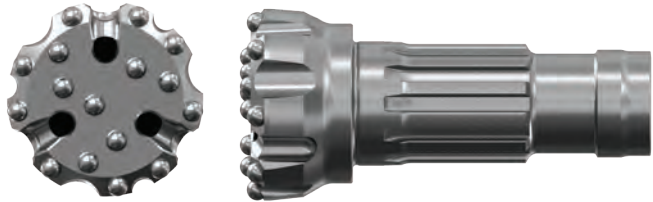
PART #	DESCRIPTION		
920613	BIT DTH 146 QL5T BD9B18/3B16/4B16 3F0G		
Shank Type	Flushing		
QL5T	3		
Face Type	Button Type		
Convex	Ballistic		
Diameter	Weight	Gauge Button/Diameter	Convex face with ballistic buttons for increased penetration rate
146 mm (5-3/4 in)	16.33 kg (33.48 lb)	9/18	



PART #	DESCRIPTION		
920607	BIT DTH 152 QL5T BF8H18/8H18 2F0G		
Shank Type	Flushing		
QL5T	2		
Face Type	Button Type		
Flat	Spherical		
Diameter	Weight	Gauge Button/Diameter	Flat face provides easy resharpening.
152 mm (6 in)	16.97 kg (34.79 lb)	8/18	

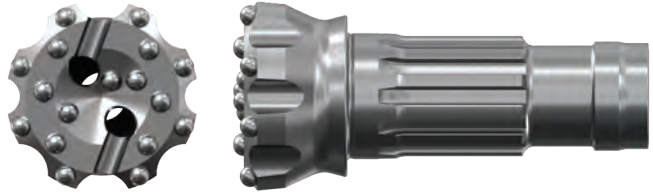


PART #	DESCRIPTION		
920618	BIT DTH 165 QL6T BF9H18/3H18/4H18 3F0G		
Shank Type	Flushing		
QL6T	3		
Face Type	Button Type		
Flat	Spherical		
Diameter	Weight		Gauge Button/Diameter
165mm (6-1/2in)	22.74 kg (46.62 lb)		9/18



Flat face provides easy resharpening.

PART #	DESCRIPTION		
920604	BIT DTH 165 QL6T BC8H18/6H18/3H18 2F0G		
Shank Type	Flushing		
QL6T	2		
Face Type	Button Type		
Concave	Spherical		
Diameter	Weight		Gauge Button/Diameter
165mm (6-1/2in)	21.99 kg (45.08 lb)		8/18



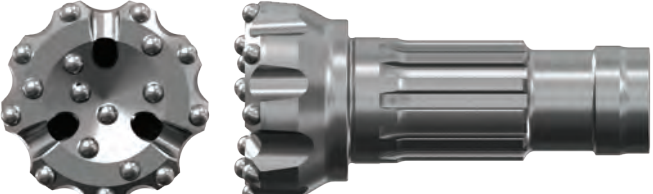
Recessed face provides increased hole straightness

PART #	DESCRIPTION		
920617	BIT DTH 165 QL6T BD9B18/6B18/4B18 3F0G		
Shank Type	Flushing		
QL6T	3		
Face Type	Button Type		
Convex	Ballistic		
Diameter	Weight		Gauge Button/Diameter
165mm (6-1/2in)	23.53 kg (48.24 lb)		9/18



Convex face with ballistic buttons for increased penetration rate

PART #	DESCRIPTION		
920619	BIT DTH 172 QL6T BC9H18/3H18/5H18 3F0G		
Shank Type	Flushing		
QL6T	3		
Face Type	Button Type		
Concave	Spherical		
Diameter	Weight		Gauge Button/Diameter
172mm (6-3/4in)	23.4 kg (47.97 lb)		9/18



Recessed face provides increased hole straightness

PART #		DESCRIPTION	
920605		BIT DTH 172 QL6T BD9B18/3B18/6B18 3F0G	
Shank Type		Flushing	
QL6T		3	
Face Type		Button Type	
Convex		Ballistic	
Diameter		Weight	
172mm (6-3/4in)		23.53 kg (48.24 lb)	



Gauge Button/Diameter		Convex face with ballistic buttons for increased penetration rate
9/18		

BT-4 SPARE PARTS

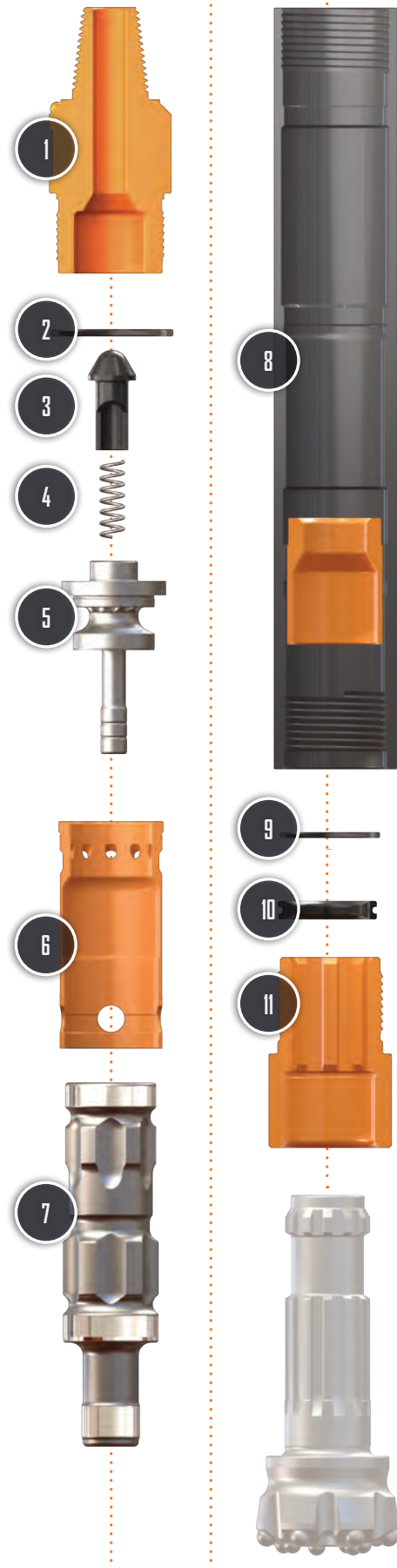
#	Part No.	Description
1	155076	Cubex 24 Top Sub BT-4
1	155033	API 2 3/8 Top Sub BT-4
2	155007	Top Sub O-Ring BT-4
3	155008	Check Valve BT-4
4	155009	Check Valve Spring BT-4
5	155010	Air Distributor BT-4
6	155011	Inner Cylinder BT-4
7	155012	Piston BT-4
8	155013	API Casing with Sleeve BT-4
8	155077	Cubex Casing with Sleeve BT-4
9	155015	Bit Retainer O-Ring BT-4
10	155016	Retainer Ring BT-4
11	155017	Chuck BT-4

BT-5 SPARE PARTS

#	Part No.	Description
1	155043	Cubex 24 Top Sub BT-5
1	155044	API 2 3/8 Top Sub BT-5
1	155045	API 3 1/2 Top Sub BT-5
2	155046	Top Sub O-Ring BT-5
3	155047	Check Valve BT-5
4	155048	Check Valve Spring BT-5
5	155049	Air Distributor BT-5
6	155050	Inner Cylinder BT-5
7	155051	Piston BT-5
8	155052	Casing with Sleeve BT-5
9	155054	Bit Retainer O-Ring BT-5
10	155055	Retainer Ring BT-5
11	155056	Chuck BT-5

BT-6 SPARE PARTS

#	Part No.	Description
1	155019	Cubex 24 Top Sub BT-6
1	155020	API 2 3/8 Top Sub BT-6
1	155021	API 3 1/2 Top Sub BT-6
2	155022	Top Sub O-Ring BT-6
3	155023	Check Valve BT-6
4	155024	Check Valve Spring BT-6
5	155025	Air Distributor BT-6
6	155026	Inner Cylinder BT-6
7	155027	Piston BT-6
8	155028	Casing with Sleeve BT-6
9	155030	Bit Retainer O-Ring BT-6
10	155031	Retainer Ring BT-6
11	155032	Chuck BT-6



ROCK TOOLS

TROUBLESHOOTING

This section outlines common problems faced when operating rock tools and offers recommended actions to resolve them.

COLLARED AND TAPERED RODS

THREADED RODS

TUBE RODS

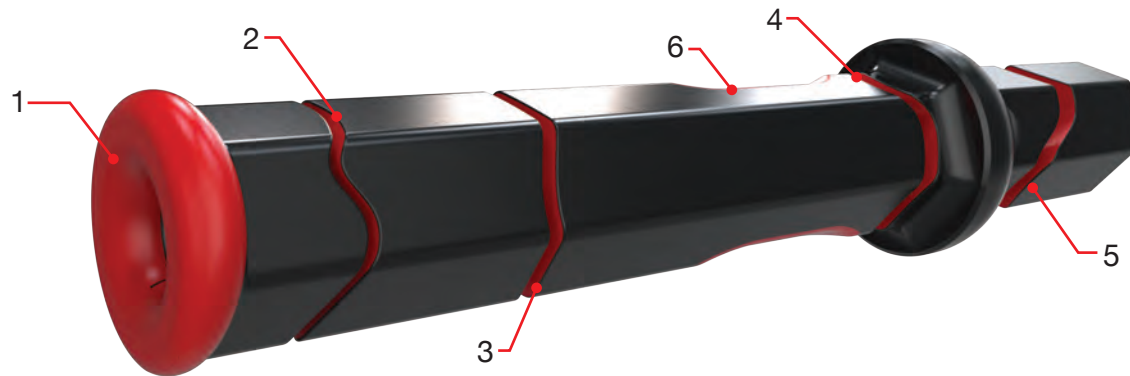
BITS

COUPLINGS

SHANK ADAPTER

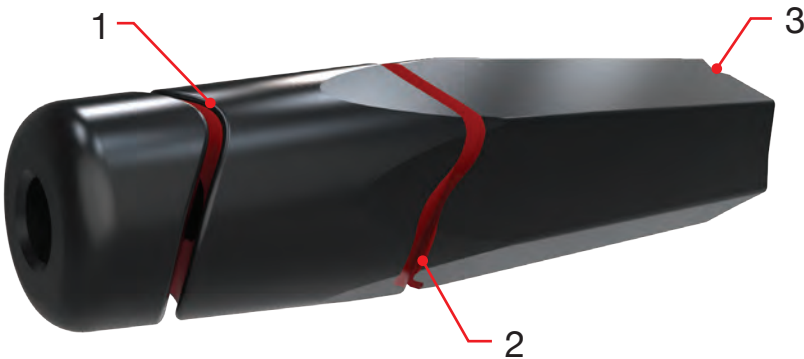
DRILL STEELS

COLLARED AND TAPERED RODS



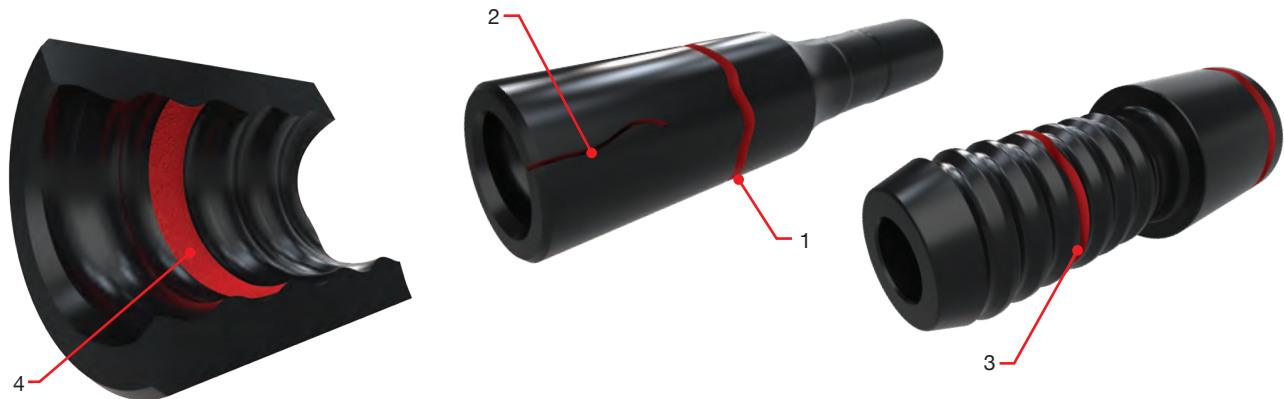
	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Mushrooming of striking end	Worn chuck bushing	Replace worn bushing
		Worn and damaged piston	Replace worn piston
POSITION 2	Failure at beginning of shank end	Worn chuck bushing	Replace worn bushing
POSITION 3	Failure mid-shank	High polish generated by chuck bushing. Lack of lubrication or excessive feed pressure	Check operation pressures - lubrication, water and air pressure
		Worn bushing	Replace worn bushing
POSITION 4	Breakage at beginning of collar radius	Poor chuck bushing radius causing indentation of the collar	Replace worn bushing
		Overheating due to lack of lubrication	Proper lubrication
		Misalignment due to excessive play in bushing	Replace worn bushing
POSITION 5	Broken in rod section	Normally associated with rod alignment	Keep rod alignment as close as possible
		Surface damaged by Nick or dent	Inspect the rod regularly for surface damages
POSITION 6	Shank wear or coke bottle wear	Worn chuck bushing	Replace worn bushing

COLLARED AND TAPERED RODS



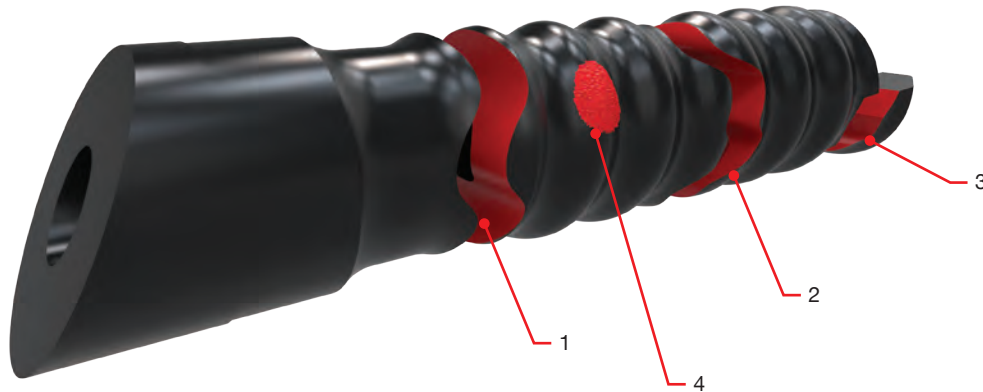
	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Breakage at beginning of taper radius	Worn bit socket	Discard bit
		Improper reconditioning of rod taper	Replace or recondition drill steel
		Using a damaged bit with a ridge or lip within the socket	Discard bit or ream out ridge
POSITION 2	Breakage at end of taper radius	Worn bit socket	Discard bit
		Improper reconditioning of rod taper	Replace or recondition drill steel
		Using a damaged bit with a ridge or lip within the socket	Discard bit or ream out ridge
		Worn bit with excessive gauge wear	Resharpen the bits at recommended interval (when wear flats are greater than 1/3 button diameter)
POSITION 3	Breakage at rod section	Normally associated with rod alignment	Keep rod alignment as close as possible

THREADED RODS



	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Female end is chipped, cracked and/or flared	Loose contact between the threads - rod not coupled firmly with the shank or other rod	Ensure threads are tightened before applying percussion
		Rod not coupled firmly with shank or other rod due to mismatch or threads/ mixing of old and new one	Do not mix old and new rods
		Misalignment of feed	Align rods before applying percussion, service affected equipment
		Starting percussion or rotation when the end of the mating shank or rod hitting female end shoulder	Do not engage percussion or rotation when end of shank or mating rod is not aligned inside female end / coupling
POSITION 2	Split coupling / longitudinal crack in female end	Drilling with worn threads	Do not use rod with worn threads, replace worn out rods
		Misalignment of drill string parts	Align rods before applying percussion
		Hole deviation	Use necessary alignment tools for drilling straighter holes - e.g. retrac bits, guide rods
		Drilling with loose threads	Ensure threads are tightened before applying percussion
POSITION 3	Failure across threaded section	Hole deviation or misalignment of the feed in relation to the hole direction	Employ straight hole drilling devices - e.g. retrac bits, drop center bits, guide rods
		Low feed pressure	Monitor feed force and tune it to drilling conditions
		Heavy rotation loads for drilling with dull bits	Resharpen bits when the wear flats appear 1/3 dull or discard when carbide profile height is compromised
		Surface layer of steel compromised by nick or dent	Avoid hammering on the joints to break connections. Use proper wrench to loosen joints.
POSITION 4	Pitting or galling in threads	Drilling with dull bits	Resharpen bits when the wear flats appear 1/3 dull or discard when carbide profile height is compromised
		Empty hammering	Do not engage full percussion unless bit is in contact with rock firmly
		Improper collaring	Used reduced percussion and rotation when collaring. Ensure bit is contacting the rock firmly
		Unused blow energy being reflected and absorbed	Adjust percussion and feed pressure to rock conditions

THREADED RODS



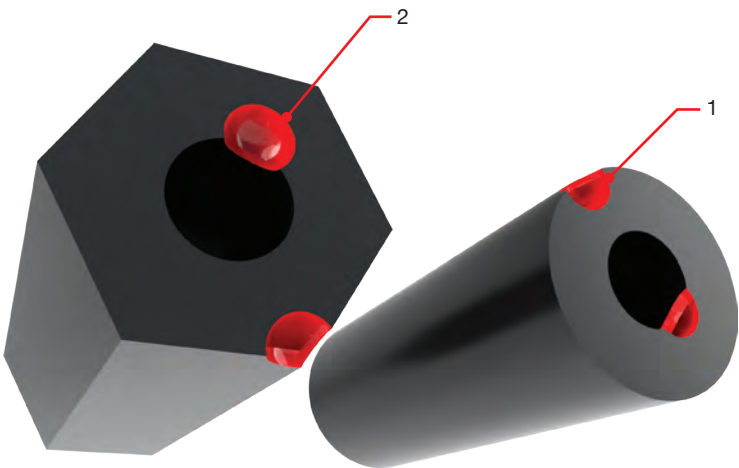
	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Failure occurs where coupling ends or above the thread radius. Typically a sudden failure	Wandering or drifting hole	Employ straight hole drilling devices or systems
		Worn threads and/or coupling. Migrating coupling (bridge worn out)	Replace worn components. Do not put a worn coupling on a new rod. Change out your couplings with new rods
		Bending due to overfeeding	Monitor feed force and tune to rock conditions
		Bending due to misalignment	Utilize alignment tools to monitor hole orientation once the hole has been collared. Replace wear pads on feed
		Excessive rotation during rod retraction	Adjust drilling pressures
		Heavy rotational loads caused by drilling with a dull bit and increased reflected stress	Resharpen bits when the wear flats appear 1/3 dull or discard when carbide profile height is compromised
		Drilling in voids, seams and/or broken conditions	Adjust drilling pressures and tune to rock conditions
		Continued percussion when drill steel jams in void or seam	Use drill with anti-jam features. Reduce feed and percussion pressure
POSITION 2	Fatigue through high surface tensile or shear stress, occurring 1/3 the way into the threads	Worn threads or surface galling	Replace worn components
		Surface layer of thread damaged by a nick or dent caused by improper care and handling	Store rods in a rod rack when retracting drill string. Do not drop rods
POSITION 3	Chip broken off end of drill steel	Too much play in coupling. Drill steels improperly joined in coupling as a result of a thread or bridge wear	Replace worn components
		Hammering end of steel on coupling	Use a breakout plate to loosen joints
POSITION 4	Galling in the threads and excessive heat (color change to blue)	Unused energy from percussive blow being reflected backwards to the drilling machine	Adjust drilling pressures and tune to rock conditions
		Drilling with dull bits	Resharpen bits when the wear flats appear 1/3 dull or discard when carbide profile height is compromised

TUBES



	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Failure across threaded section	Hole deviation or misalignment of the feed in relation to the hole direction	Employ straight hole drilling devices e.g. retrac bits, drop center bits, guide rods
		Corrosion caused by acidic flushing fluid	Replace corroded parts frequently
		Surface layer of steel compromised by a nick or dent	Avoid hammering on the joints to break connections. Use a proper wrench to loosen joints.
POSITION 2	Failure across midbody	Hole deviation or misalignment of the feed in relation to the hole direction	Employ straight hole drilling devices - e.g. retrac bits, drop center bits, guide rods
		Rubbing caused by worn out centralizer jaws	Replace centralizer jaws
		Surface layer of steel compromised by a nick or dent	Avoid hammering on the joints to break connections. Use proper wrench to loosen joints.
POSITION 3	Pitting or galling in threads	Drilling with dull bits	Resharpen bits when the wear flats appear 1/3 dull or discard when carbide profile height is compromised
		Improper collaring	Used reduced percussion and rotation when collaring. Ensure bit is contacting the rock firmly
		Unused blow energy being reflected and absorbed	Adjust percussion and feed pressure to rock conditions

DRILL STEEL



	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Characterized by a fatigue crack origination from the outer surface. Surface layer of steel compromised by a nick or dent	Surface damage caused by worn out centralizer bushings or steel bushings	Replace centralizer if diameter is 5 mm (1/2") larger than the drill steel
		Using a hammer on a stuck steel	Use a rod wrench to twist the stuck steel to loosen
		Improper care and handling	Store rods in a rod rack when retracting drill string. Do not drop rods
POSITION 2	Characterized by a fatigue crack originated in the bore	Corrosion	Evaluate proper storage practices are being followed
		Corrosion caused by brine and other corrosive flushing agents	Change out components more frequently or neutralize flushing agent
	Failure in mid-body from 1" to 8" from friction weld region in surface rods	Sustained higher loading than intended use i.e., tensile overload	Reduce overloading or switch over to carburized rods

BUTTON BITS



	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Body wash	Inadequate flushing	Ensure that optimum flushing is employed. If flushing appears to be inadequate, try cleaning holes thoroughly after drilling each steel length. Continued drilling with optimize flushing will wear bit bodies excessively
		Excessive flushing volume	Excessive flushing can remove material from bit body and around the buttons
		Drilling and excessive hole cleaning in loose and fractured material	Do not use new bits in these applications. Use bits approaching the end of their usable life. Bits with missing buttons unsuitable for regular drilling can still be suitable for soft or broken ground conditions
POSITION 2	Split skirt	Bit loose on rod	Do not engage percussion until bit is seated on rod
		Hammering on bit to break connection	Loosen bit while seated firmly on face or at bottom of the hole
POSITION 3	Skirt ring off	High rotation torque applied to stuck bit	Apply minimal amount of hammer pressure to free bit before increasing rotation pressures
		Corrosion	Inspect thread socket for pitting and rust
		Breaking connection by hammering on bit	Loosen bit while seated firmly on face or at bottom of the hole
POSITION 4	Lost gauge button	Dry firing (free hammering)	Do not engage full percussion unless the bits are seated firmly against solid material. Use reduced percussion when collaring on uneven surfaces if the bits hang up in the hole and when ratting the drill string to loosen connections
		Excessive bit body reduction through erosion from excessive flushing or excessive bit body grinding	Ensure the drill cuttings are adequately flushed out. Remove only the amount of body required to restore proper button protrusion while grinding
		Scaling with bit	Use proper scaling tools

BUTTON BITS

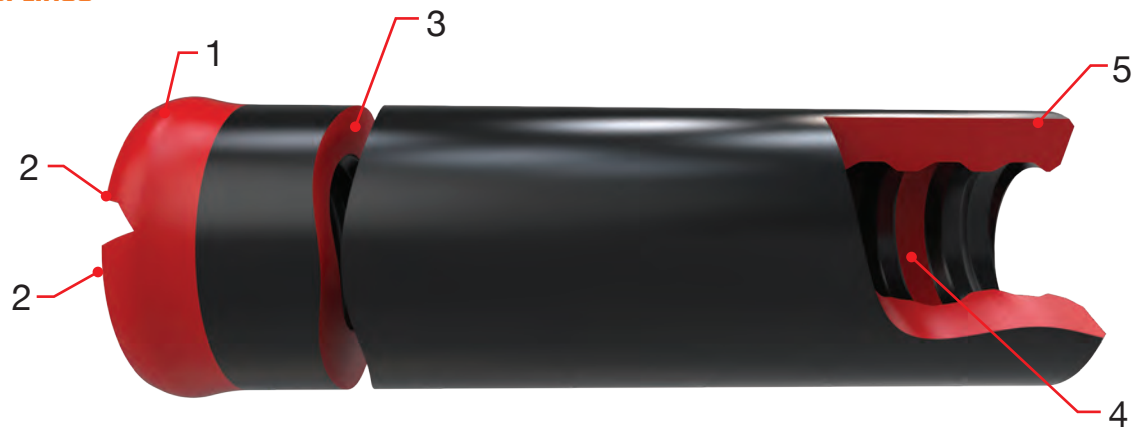
	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 5	Shattered buttons	Overdrilling	Most button failures are the direct result of continuing to drill with excessive wear flats on the buttons! Remove and service bits once the wear flat on any button reaches 1/3 of the face button diameter. Restore the button profile and protrusion as recommended in the bit sharpening guide before continuing use
		Drilling into metal	Even new buttons will break when encountering foreign material like stuck steel, bits, rebar or any other metals trapped in the rock
		Forceful rotation in undersize holes, in broken material or through voids in the rock	Check that bit diameters are smaller than the hole before attempting to clean or deepen a hole under these conditions. Do not force bits if jamming occurs. Retract until rotating freely then advance slowly with moderate rotation. If this fails, use a scrapped bit or grind down the gauge buttons of the bit to reduce the diameter sufficiently to pass or remove the obstruction
		Snake skin fatigue from extended drilling in non-abrasive material	Over drilling in soft non-abrasive material leaves a shiny surface on the buttons. Under magnification, a network of microscopic cracks can typically be found. Regularly inspect the bits and re-profile the buttons to remove these cracks from the surface of the carbides once the skin on the carbides starts to show
POSITION 6	Sheared buttons above or below the bit body	Forceful rotation against intrusions, in broken material or through voids in the rock	Jerky rotation and stalling indicates obstructions in the hole. Do not force bits if this occurs. Retract the string until free rotation is restored. Then advance slowly with moderate rotations until obstacle is passed or removed. If this fails, use scrapped bits, a smaller diameter bit or grind down the gauge buttons of the bit to reduce the diameter sufficiently to pass or remove the obstruction
		Poor collaring	First, ensure mast is secure. Start collar then full pressure once bit is embedded 300 mm (12.0") in the rock
		Excessive button protrusion through incorrect sharpening	Protrusions greater than 3/4 of the button diameter will not provide sufficient support to resist the tensile forces that the buttons may encounter

BUTTON BITS

	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 7		Deformation of the upper portion of the button hole. Possible overheating of the bits through improper use	Increase flushing to lower the temperature
	Split button	Overdrilling	Most button failures are the direct result of continuing to drill with excessive wear flats on the buttons. Remove and service bits once the wear flat on any button reaches 1/3 of the face button diameter. Restore the button profile and protrusion as recommended in the bit sharpening guide before continuing use
POSITION 8	Button wear 1/3 diameter	Normal button wear	Resharpen button and restore to original profile
POSITION 9	Snake skin, shiny-polished appearance	When drilling in non-abrasive rock, microfractures develop in carbide	Resharpen bits frequently even if no visible wear is evident

ROCK TOOLS

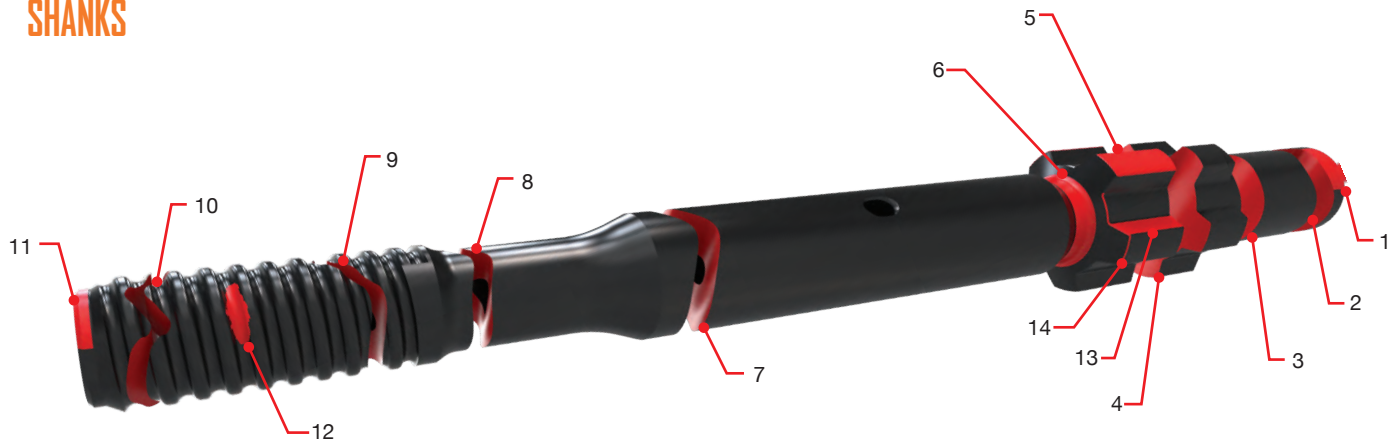
COUPLINGS



	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Mushrooming of end	Hammering on the centralizer	Utilize a breakout plate
POSITION 2	Coupling end is chipped, cracked and/or flared	Drill rod not firmly seated into the coupling from mismatch of threads	It is important to standardize on single source supplier for components to ensure proper thread tolerance. Do not "mix & match"
		Mixing old thread components with new	Install new couplings with new drill steels
		Misalignment of feed	Service affected equipment
		Previous overheating of coupling	The maximum running temperature for couplings is 182° C (276° F)
		Dropping steel when retracting on upholes	Use rockdrill with shank thread engaged to lower steel
		Starting percussion or rotation with end of the shank resting against the end of the coupling	Do not engage percussion or rotation if shank thread end is not aligned inside coupling
POSITION 3	Failure across thread section	Hole deviation or misalignment of the feed in relation to the hole direction	Employ straight hole drilling devices
		Inadequate feed pressure	Monitor feed force and tune to conditions
		Heavy rotational loads from drilling with dull bits	Resharpen bits when the wear flats appear 1/3 dull or discard when carbide profile height is compromised
		Surface layer of steel compromised by a nick or dent	Avoid hammering on connection. Use a breakout plate to loosen joints. Employ proper care and handling
POSITION 4	Pitting or galling in the threads	Unused blow energy being reflected and absorbed	Adjust percussion and feed pressures to rock conditions
		Drilling with dull bits	Resharpen bits when the wear flats appear 1/3 dull or discard when carbide profile height is compromised
POSITION 5	Split coupling	Drilling with worn threads	Replace couplings more frequently
		Excessive feed pressure	Monitor feed force and tune to conditions

ROCK TOOLS

SHANKS



	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 1	Impact marks, chipped corners, mushroomed end	Misalignment due to worn bushings	Replace worn components
		Damaged piston	Replace worn components
POSITION 2	Failure approx 25 mm (1.0") from strike face	Worn chuck driver	Replace worn components
POSITION 3	Failure at top of splines	Lack of lubrication	Grease rockdrill regularly
		Excessive feed force	Monitor coupling temperatures and adjust feed pressure according to recommendations
		Worn chuck driver or front bushing	Replace worn components
POSITION 4	Failure across splines	Worn chuck driver	Replace worn components
		Heavy rotational torque	Adjust drilling pressures
		Lack of lubrication	Grease rockdrill regularly
		Overdrilling bits excessive wear flats and insufficient button protrusion	Resharpen bit when the wear flats appear 1/3 dull or discard when carbide profile height is compromised. Inspect and select only bits with adequate protrusion and proper button profile for the most cost effective drilling.
		Inadequate feed force	Monitor coupling temperatures and adjust feed pressure according to recommendations
POSITION 5	Wear on bottom of spline shoulder	Excessive rotation while retracting string	Adjust drilling pressures
POSITION 6	Failure at bottom of splines	Excessive rotation while retracting string	Adjust drilling pressures
POSITION 7	Failure at fronthead	Misalignment from worn front bushing	Replace worn components
		Lack of lubrication	Grease rockdrill regularly
POSITION 8	Failure in threads	Misalignment of drill feed while drilling	Use alignment tools to monitor hole orientation once the hole has been collared. Replace wear pads on feed
		Hole deviation	Employ straight hole drilling devices or systems
		Excessive feed force	Monitor coupling temperatures and adjust feed pressure according to recommendations

SHANKS

	FAILURE	PROBABLE CAUSE	RECOMMENDED ACTION
POSITION 9	Failure in main body of threads	Mismatched threads	Use only certified original Boart Longyear component from authorized or licensed manufacturers
		Lack of lubrication	Grease rockdrill regularly
		Too much play in coupling. Shank Adapter improperly joined in coupling as a result of a thread wear	Replace worn components. Do not put a worn coupling on a new rod. Change out couplings with new shank adapters
		Excessive rattling	Avoid extensive rattling. Boart Longyear threads are designed for easy uncoupling. If connectors do not loosen freely, inspect the threads. Probably causes of tightly threaded connections are: (1) dull bits; (2) worn or tight-fitting threads on steel or couplings; (3) incorrect or tight-fitting threads; and (4) insufficient or ineffective thread grease
POSITION 10	Failure close to bottom of thread	Excessive percussive pressure	Monitor coupling temperature during drilling; adjust percussive pressures
		Broken drill steel	Replace drill steel
		Worn coupling	Replace worn components. Do not put a worn coupling on a new rod. Change out your couplings with new rods
POSITION 11	Chipped thread end	Shank Adapter not properly coupled to drill steel	Replace damaged or worn couplings
		Broken drill steel	Replace drill steel
		Shank Adapter dropped into coupling	Inspect feed for misalignment
POSITION 12	Pitting and galling on threads	Overdrilling bit. Excessive wear flats and insufficient butt protrusion	Resharpen bits when the wear flats appear 1/3 dull or discard when carbide profile height is compromised. Inspect bits and select only bits with adequate protrusion and proper button profile for most cost effective drilling
		Lack of lubrication	Grease rockdrill regularly
		Inadequate feed force	Monitor coupling temperatures and adjust feed pressure according to recommendations
POSITION 13	Pitting and galling on splines	Lack of lubrication	Grease rockdrill regularly
		Excessive rotation in soft or broken ground	Adjust drilling pressures
POSITION 14	Excessive wear on top of spline shoulder	Excessive feed force	Monitor coupling temperatures and adjust feed pressure according to recommendations
		Lack of lubrication	Grease rockdrill regularly

CARE AND HANDLING

Bit Wear Overview

Bit Wear Patterns

Product Servicing

Recommendations



BIT WEAR OVERVIEW



Sharp Bit

The percussive energy transferred into the rock is optimized, large rock chips are produced and the penetration rate is maximized.



Flats Developing

As flats develop on the buttons (tungsten carbide inserts), energy utilization is no longer optimized, leading to a lower penetration rate and reduced productivity. As buttons wear, the bit is less effective at fracturing the rock and the energy is dispersed over a larger surface area. Instead, rock is ground, rather than cut, producing smaller cuttings and energy (no longer used for breaking virgin rock) is reflected back up the drill string. This reflective energy contributes to increased loads on the tooling, drifter, and rig. As a general guideline, refurbishing the buttons before the flats reach 1/3 of the button diameter will maintain penetration/productivity, provide maximum bit utilization and help extend the life of all drill string components.



Excessive Wear

If the button flats are allowed to develop further to where they are considered over-drilled, productivity and the rate of penetration deteriorates. In this situation, much of the rock in contact with the buttons is re-drilled and the steel bit face may make contact with the bottom of the hole. Fewer and smaller rock chips are produced and much of the energy is reflected back up the drill string. This sacrifices the life of all the drill string components, is a major contributor to hole deviation, increases wear and tear on drill rig components, and results in higher operational costs overall. Top hammer button bits that are over-drilled exhibit broken buttons and impact drilling productivity.

BIT WEAR PATTERNS



Gauge Wear

If drilling through hard materials such as sandstone and quartzite, drilling with excessive rotation, the wear tends to be greater on the bit circumference. Thus, when the buttons are sharpened, the diameter across the gauge is less than or equal to the diameter of the bit body. In this situation, the bit tends to bind (gauge-out) in the hole. Drillers should consider bit replacement or restoring the gauge button-to-body gap to the original (new) condition.



Body Wash

When drilling in non-abrasive materials, carbide wear is minimized and drilling intervals are possibly longer. This allows for continued chip removal around the bit and wears away the bit body quicker than the carbides also referred to as body wash. Similar wear occurs in fractured and loose formations where constant hole cleaning and re-drilling of the materials is required for stabilizing the hole and to keep the hole open during retraction. To prevent button loss or shearing under these conditions, the protrusion should be reduced to the original height by scheduling grinding intervals.



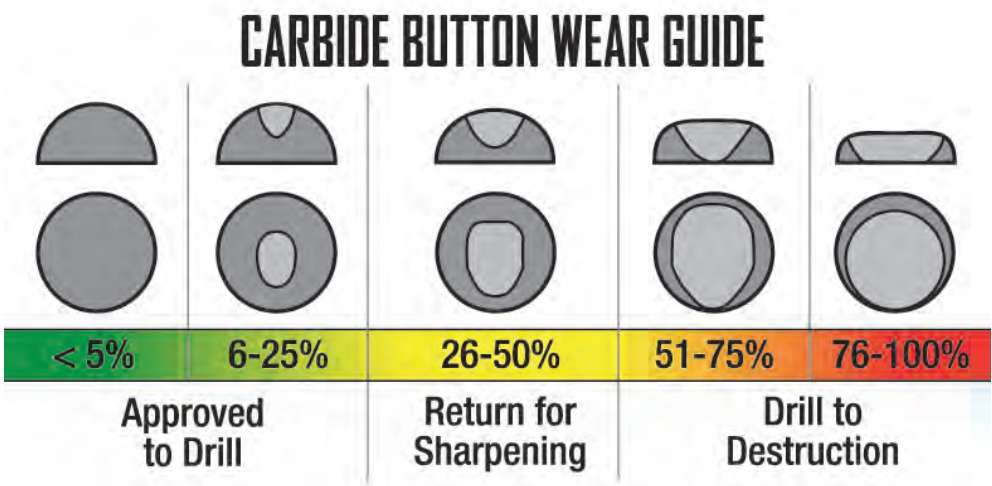
Over Drilling

The detrimental effects of over drilling button bits may not be immediately apparent. However, running dull bits not only slows down drilling rates but escalates costs by reducing the life of the drill string components, the rock drill and the rig components. Premature button bit insert failures are substantially reduced when over drilling is eliminated and correct sharpening procedures are performed. Premature button bit insert failures are substantially reduced when over drilling is eliminated and correct sharpening procedures are performed.

PRODUCT SERVICING

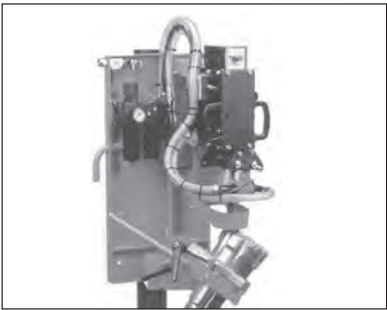
Product Servicing - Button Bits

Large wear flats or the presence of snakeskin on the surfaces of buttons can lead to button failure. Similarly if the protrusion of the buttons above the level of the steel becomes reduced, penetration rates will drop and wear flats will develop rapidly. Under these conditions it is necessary to redress the bit to restore it, as near as possible, to its original geometry.



Button Reshaping

If button protrusion is adequate, satisfactory resharpener can be achieved by use of a performed diamond faced tool. Sharpening is effected by holding the tool firmly against the button and orbiting the machine in a circle to achieve a uniform surface finish. Diamond faced tools are designed to cut carbide and not steel. It is therefore essential that ample protrusion of the button exists before the diamond tools are used.



RECOMMENDATIONS

To get the most out of top hammer button bits, training drillers and mining management on bit care, maintenance, and identifying excessive wear can increase the return on investment.

1. Inspect the Bit Frequently

Understanding the ground conditions and regular inspections of a button bit are necessary to prevent over drilling. To ensure optimal performance and life, bits require sharpening before the flat exceeds 1/3 of the button diameter. Working with a technical representative is recommended to establish specific guidelines since the maximum suggested wear before reshaping will depend on the button profile.

Drilling in non-abrasive ground can give rise to 'snakeskin' (small cracks) on the button surface. If it is not removed by grinding, button fatigue failure occurs.

2. Grind Protruding Inserts

Drilling in non-abrasive rock results in the bit face wearing faster than the inserts. Excessive insert protrusion, lacking sufficient steel support, can easily break while drilling and when retracting the bit from the hole. To prevent this from occurring, grind the buttons to restore the protrusion height.

3. Button Sharpening and Reshaping

If button protrusion is adequate, satisfactory re-sharpening can be achieved by use of a preformed diamond faced tool ('cups'). Sharpening is performed by holding the tool firmly against the button and orbiting the machine in a circle to achieve a uniform surface finish. Diamond faced tools are designed to cut carbide and not steel. It is therefore recommended to have enough protrusion of the button from the face to avoid damage to the cup, bit or grinding machine.



NOTE: Use appropriate eye protection, masks and ventilation when grinding drilling bits. Grinding wheels and tungsten carbide inserts contain: Tungsten Carbide; Cobalt; Tantalum; Chromium; Nickel; Aluminum and Silicon. Grinding tungsten carbide inserts releases particles containing these elements that can irritate skin, eye, nose, throat and can result in lung damage.

ROCK TOOLS

WARRANTY

Please refer to our up-to-date warranty available on our website, <https://www.boartlongyear.com/warranty>.



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