TRBH

THROOP ROCK BIT

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Throop Rock Bit A Tradition of Service

Throop Rock Bit (TRB) has a long and proud history in the drilling tools market. In 1947, TRB began serving local oilfield and related markets with machining services, tooling, and related components. In 1961, TRB manufactured its first roller cone rock bit. We quickly became the world's largest manufacturer of small diameter roller cone bits, with sizes as small as 1 7/8" in diameter. Although we have steadily increased our size range, one thing has never changed; Throop Rock Bit remains committed to its goal of offering quality prod- ucts, unparalleled service, and competitive prices.

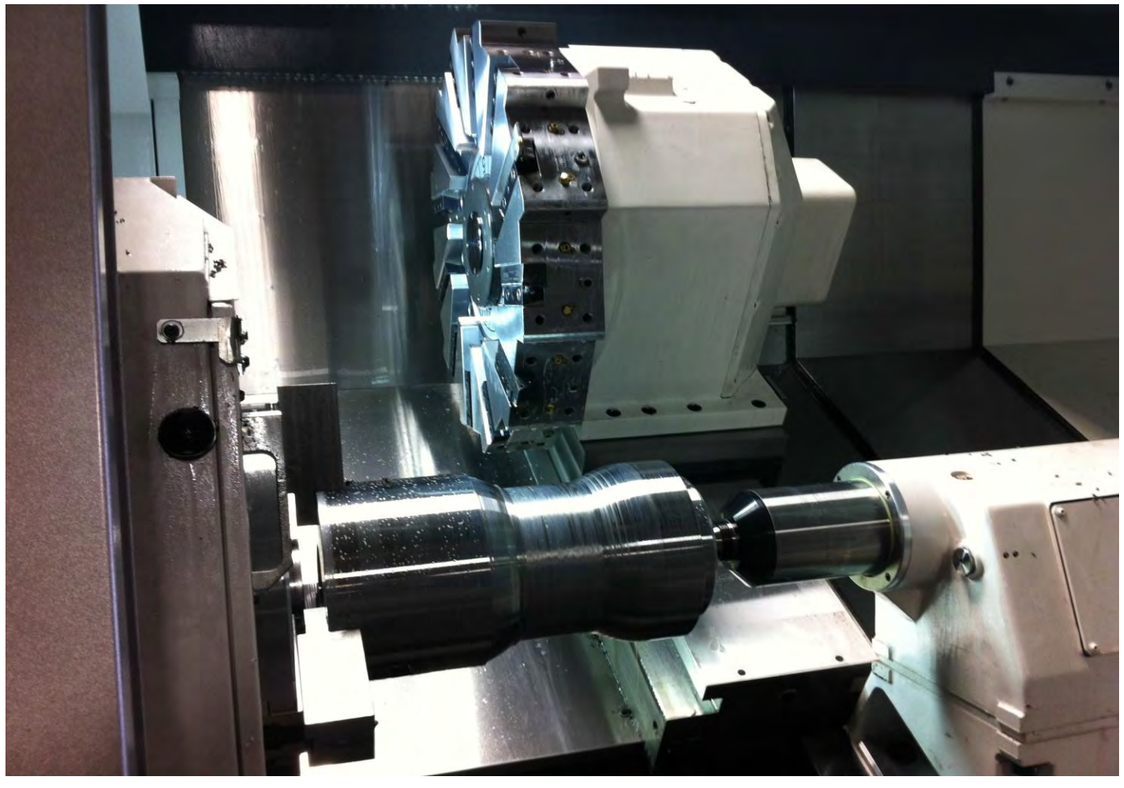
Throop is headquartered in Tonkawa, OK USA and takes great pride in being a U.S. owned and operated manu- facturer in an age when many companies have chosen to have products manufactured overseas. Throop is committed to the local economy and has a dedicated work force of highly skilled machinists, welders, assembly personnel and seasoned veterans in manufacturing and design. Serving the drilling industry for over 60 years Throop rock bit is dedicated to quality; devoted to customer service; delivering to the world.

Construction Technology

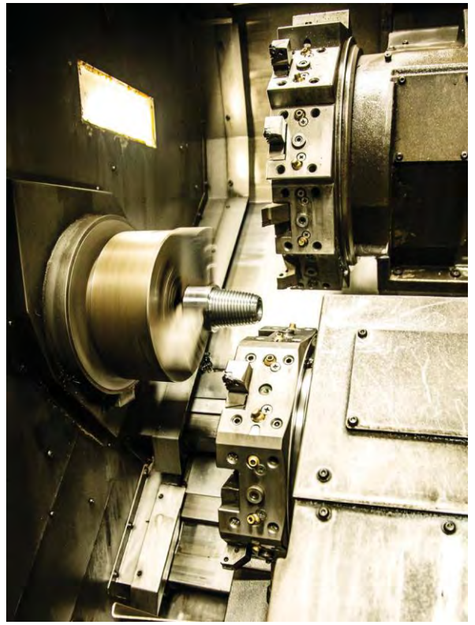
In the bit business, success is measured by quality and delivery time. ThroopRock Bit (TRB) has developed a manufacturing technique that shortens delivery times and increases quality.

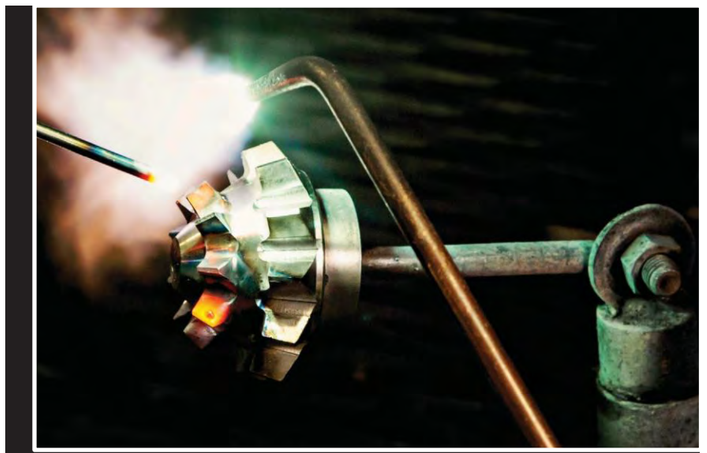
Each of our bits is constructed from body section that is machined from one solid piece of material. This construction technique ensures proper pin and body alignment. Three leg sections are then fitted into machined pockets incorporated in the body section, and welded into place. This process significantly reduces machining time, inventory levels and provides a very consistent product. No other rock bit manufacturer builds bits in this way.

Utilizing this revolutionary construction technique TRB has been able to deliver higher quality bits in much faster delivery times than our competitors. Many of our customers are surprised to learn that TRB retain minimum finished stock levels, but does retain a high level of finished componets in inventory which allows us to custom make every order - exceeding expectations for quality and delivery.



Our machinery and equipment includes the latest Model CNC machine tools, such as five-axis machining centers, as well as an impressive lineup of lathes, speciality and inspection equipment. Auto CAD and Auto Desk Inventor Suite are our featured software for design and drafting, while MasterCam software is used for programming on the machining side.





STEEL TOOTH ROCK BITS

TR3 (IADC 1-2-1)
SOFT TO MEDIUM FORMATIONS

The TR3 is the fastest drilling bit produced by Throop.
•Long “A” teeth, widely spaced and fully hard faced from crest to root.
•Maximum penetration rates in formations that range from moderately soft to medium soft.
•Best for shale, clay, red bed, medium limestone and unconsolidated formations.
The TR3 also features the absence of deletions on the gage side of the teeth on the heel row of the number two cone. This insures maxi- mum gage life along with tooth life in more abrasive formations.
Effective operating weights are from 1,000 to 3,000 pounds per inch of bit diameter with corresponding rotary speeds of 50 to 200 RPM.

TR1 (IADC 3-1-1)
MEDIUM HARD TO HARD FORMATIONS

The TR1 works best in hard, abrasive formations.
•Short “A” Shaped Gage Row
•Best for hard sandy limestone, limestone with cherty streaks, broken shale, dolomite, granite, and abrasive sand.
•Balanced bearing design and extra thick cone walls.
There are no interruptions on the heel row teeth and the inner row teeth are short and closely spaced for maximum strength. The most economical bit performance is obtained with weights of 3,000 to 8,000 pounds per inch of bit diameter. Corresponding rotary speeds should range between 40
and 100 RPM. It is a recommended practice that the rotation speed should decrease when increasing drilling weight.

TR2 (IADC 2-1-1)
MEDIUM TO MEDIUM HARD FORMATIONS

The TR2 offers the combination actions of chipping,/crushing, and gouging/scraping because of reduced cutter offset.
•Medium Length “A” teeth, closely spaced
•Long crests in the outer row teeth have self-sharpening hard facing, for maximum penetration and bit life.
This design will most economically drill medium and medium hard formations and was designed to replace the softer formation bits in strata where shale alternates with streaks of limestone and sandstone or where gypsum tends to ball up between the teeth. The most ef- fective weight range varies from 1,000 to 5,000 pounds per inch of bit diameter, while rotary speeds of 50 to 150 RPM give best perfor- mance. Rotary speed should be decreased as weight is increased.

TR1H (IADC 3-2-1)
VERY HARD FORMATIONS

The TR1H is the bit for hard, abrasive formations requiring maximum resistance to gage wear.
•Inner row teeth are short and closely spaced to withstand maximum stress.
•This bit provides the necessary chipping and crushing action on bottom and drills efficiently in formations such as: siliceous limestone, dolomite, sandstone, and granite.
•The gage surfaces of the cones have webs joining adjacent heel teeth, which insures great resistance to wear.
This bit is designed to drill most efficiently in hard formations with weights ranging from 3,000 to 8,000 pounds per inch of bit diam- eter. Rotary speeds should decrease from 100 to 40 RPM as weight is increased.

TUNGSTEN CARBIDE INSERT BITS

TR51 (IADC 5-1-1)
SOFT FORMATIONS

The TR51 is designed for soft, low strength formations.
•Soft shales, sands, clays, soft limestones and other unconsolidated formations.
•Maximum cone offset and long chisel inserts for effective gouging and scraping formation removal. Ample hard facing is applied along with flat TC inserts on the gage of the cone.
These features provide maximum protection against abrasion and add additional bearing life. Suggested operating weights are from 1,000 to 3,000 pounds per square inch of bit diameter with corresponding speeds of 50 to 200 RPM.

TR53 (IADC 5-3-1)
MEDIUM SOFT FORMATIONS

The TR53 design utilizes the same cone structure as the TR51 but with all conical shaped inserts for efficient drilling in medium soft formations.
•Shale, sandstone, and alluvial deposits.
•Same maximum offset as the TR51; in addition, the conical shaped inserts provide greater wear resistance in the harder formations.
Ample hard facing is applied to the shirttail providing maximum protection against abrasion and insures the longest possible bearing life. The most effective wight range varies from 1,500 to 5,000 pounds per inch of bit diameter, while rotary speeds of 50 to 175 RPM give best performance, speed should be decreased as weight is increased.

TR61 (IADC 6-1-1)
MEDIUM FORMATIONS

The TR61 is designed for medium formations with harder streaks.
•Limestones, sands, dolomites, and medium to hard shales.
•Short to medium extension chisel inserts throughout and moderate cone offsets, provide for very high penetration rates while maintaining excellent durability in the varied formations.
Ample hard facing is applied along with flat TCI insert protection on the gage of the cone. These features provide maximum protection for added bearing life. Suggested operating weights are 1,000 to 3,000 pounds per square inch of bit diameter with cor- responding speeds of 40 to 180 RPM.

TR63 (IADC 6-3-1)
MEDIUM HARD FORMATIONS

The TR63 is designed for medium hard formations that are semi-abrasive.
•Hard sandy limestone, shale, dolomite and limestone with cherty streaks.
•Conical shaped TC inserts on the gage rows to inhibit gage wear.
•Chisel shaped inserts on the inner rows to get maximum penetration.
Gouging/scraping action is provided by the cone offset. Ample hard facing on the shirttail provides maximum protection against abrasion and insures the longest possible bearing life. Suggested operating weights are 1,500 to 6,000 pounds per inch of bit diameter with corresponding speeds of 55 to 140 RPM. Bit stabilization recommended.

TR64 (IADC 6-4-1)
MEDIUM HARD TO HARD FORMATIONS

The TR64 is similar to the TR63 but with dome shaped TC inserts on the gage rows and chisel shaped inserts on the inner rows for best performance in tight and well cemented medium hard to hard formations.
•Abrasive limestone, sandstone and dolomite where maximum gage wear resistance is required.
Shirttail hard facing provides maximum protection against abrasion and insures the longest possible bearing life. Suggested operating weights are 1,500 to 6,000 pounds per inch of bit diameter, while rotary speeds of 55 to 140 RPM give best performance, decrease speed as the weight is increased. Bit stabilization recommended.

TR74 (IADC 7-4-1)
MEDIUM HARD TO HARD FORMATIONS

The TR74 features a minimum offset cutting structure design and all dome shaped TC inserts. Designed for hard and abrasive formations.
•Quartzite, granite, cherty iron ores, and copper porphyry
Shirttail hard facing for maximum resistance to bearing wear. The drilling weights should range from 1,500 to 8,000 pounds per inch of bit diameter. As drilling weights are increased the rotational speed which ranges from 50 to 120 RPM should be de- creased. Stabilization near the bit is highly recommended for maximum bit life and pull down drills should be equipped with shock absorbers.

STEEL TOOTH ROCK BITS

BICONE
Model & IADC Code Range

TR2
211 - 231

TR2
211 - 231

TR1H
321

TR3
111 - 131

Bit Size Inches	Bit Size MM	Stnd. Pin Size Inches
1 7/8	48	A - AW ROD
1 15/16	49	A - AW ROD
2	51	A - AW ROD
2 1/8	54	A - AW ROD
2 1/4	57	A - AW ROD
2 3/8	60	A - AW ROD
2 1/2	64	A - AW ROD & 4 THD N ROD
2 5/8	67	A - AW ROD & 4 THD N ROD
2 3/4	70	A - AW ROD & 4 THD N ROD
2 7/8	73	4 THD N ROD
2 15/16	75	4 THD N ROD
3	76	4 THD N ROD
3 1/8	79	4 THD N ROD
3 1/4	83	4 THD N ROD
3 1/2	89	2 3/8 API
3 5/8	92	2 3/8 API
3 3/4	95	2 3/8 API
3 7/8	98	2 3/8 API
4	102	2 3/8 API
4 1/8	105	2 3/8 API
4 1/4	108	2 3/8 API
4 1/2	114	2 3/8 API
4 5/8	117	2 7/8 API
4 3/4	121	2 7/8 API
4 7/8	124	2 7/8 API
5	127	2 7/8 API
5 1/8	130	2 7/8 API
5 1/4	133	2 7/8 API
5 1/2	140	2 7/8 API
5 5/8	143	3 1/2 API
5 3/4	146	3 1/2 API
5 7/8	149	3 1/2 API
6	152	3 1/2 API
6 1/8	156	3 1/2 API
6 1/4	159	3 1/2 API
6 1/2	165	3 1/2 API
6 5/8	168	3 1/2 API
6 3/4	171	3 1/2 API
7 3/8	187	3 1/2 API
7 5/8	194	4 1/2 API
7 7/8	200	4 1/2 API
8 3/8	213	4 1/2 API
8 1/2	216	4 1/2 API
8 3/4	222	4 1/2 API

TCI BITS

BICONE
Model & IADC Code Range

TR53 531 - 541

TR74
711 - 741

TRICONE
Model & IADC Code Range

TR51 511 - 521

TR53
531 - 541

TR61
611 - 621

TR63
631

TR64
641

TR74
711 - 741

TR1
311

Most models are available in air and fluid circulation, with removable jet nozzles or open center. Please specify the type of circulation you need, when you place your order.

Bit Size Inches	Bit Size MM	Stnd. Pin Size Inches
2 3/8	60	A - AW ROD
2 1/2	64	A - AW ROD & 4 THD N ROD

Bit Size Inches	Bit Size MM	Stnd. Pin Size Inches
2 1/2	64	A - AW ROD & 4 THD N ROD
2 5/8	67	A - AW ROD & 4 THD N ROD
2 3/4	70	A - AW ROD & 4 THD N ROD
2 7/8	73	4 THD N ROD
2 15/16	75	4 THD N ROD
3	76	4 THD N ROD
3 1/8	79	4 THD N ROD
3 1/4	83	4 THD N ROD
3 1/2	89	2 3/8 API
3 5/8	92	2 3/8 API
3 3/4	95	2 3/8 API
3 7/8	98	2 3/8 API
4	102	2 3/8 API
4 1/8	105	2 3/8 API
4 1/4	108	2 3/8 API
4 1/2	114	2 3/8 API
4 5/8	117	2 7/8 API
4 3/4	121	2 7/8 API
4 7/8	124	2 7/8 API
5	127	2 7/8 API
5 1/8	130	2 7/8 API
5 1/4	133	2 7/8 API
5 1/2	140	2 7/8 API
5 5/8	143	3 1/2 API
5 3/4	146	3 1/2 API
5 7/8	149	3 1/2 API
6	152	3 1/2 API
6 1/8	156	3 1/2 API
6 1/4	159	3 1/2 API
6 1/2	165	3 1/2 API
6 5/8	168	3 1/2 API
6 3/4	171	3 1/2 API
7 3/8	187	3 1/2 API
7 5/8	194	4 1/2 API
7 7/8	200	4 1/2 API
8 3/8	213	4 1/2 API
8 1/2	216	4 1/2 API
8 3/4	222	4 1/2 API
9	229	4 1/2 API

SEALED ROLLER BEARING BITS

Sealed Roller Bearing Bits

Throop Rock Bit Company manufactures a line of sealed roller bearing bits for use in a variety of applications where, historically, bearing life has been the limiting factor in bit performance. Throop sealed roller bearing bits offer extended bearing life with a fully sealed roller bearing system. This sealed bearing system provides continuous lubrication and prevents drilling fluid and debris from entering the bearing assembly, which can lead to shortened bit life and failure. Sealed roller bearing bits are available in a wide variety of sizes and types.

Sealed Roller Bearing

- Available in both Steel Tooth and Tungsten Carbide designs

SEALED JOURNAL BEARING BITS

Sealed Journal Bearing Bits

Our premium line of sealed bearing bits include a silver plated journal bearing and thrust washer for increased durability. A pressurized grease reservoir, designed to maintain constant pressure inside the bearing assembly, keeps the bearings cool and lubricated throughout the drilling process. This also keeps out debris and foreign material that can lead to premature bearing failure. Tungsten carbide hard facing and inserts on the leg and shirttail offer increased wear protection in the most abrasive formations. A wide variety of carbide jet nozzle sizes and a number of other features can be included upon request.

Journal Bearing

- Available in both Steel Tooth and Tungsten Carbide designs

[2] STYLES

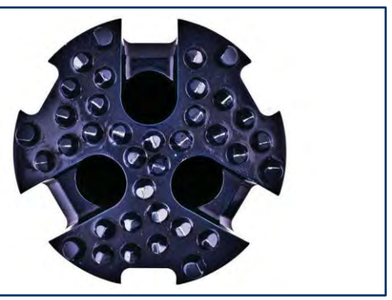
TWISTER - TRADITIONAL -
SOFT FORMATIONS

The XG TWISTER is designed to be run with traditional jet type flu- id flow, in a work-over application, drilling cement, cast iron bridge plugs and retaining rings. The XG Twister features five jet type ports for high pressure fluid flow to break up and clean the bottom of the hole. Aggressive tungsten carbide chisel inserts provides an excep- tionally fast drilling rate and added cutting structure durability. All of these features lead to increased bit life and shorter drill out runs. Suggested operating weights are 4,000 to 6,000 pounds per inch of bit diameter, and high rotary speeds give best performance in most applications.

BADGER - REVERSE -
SOFT FORMATIONS

The XG BADGER is specifically designed to be run in a reverse circulation, work-over application, drilling cement, cast iron bridge plugs and retaining rings. The Badger features three large circula- tion ports that provide the maximum amount of fluid flow when used in a Reverse Circulation application. Aggressive tungsten carbide chisel inserts provides an exceptionally fast drilling rat
and added cutting structure duraility. All of these features lead to increased bit life and shorter drill out runs. Suggested operating weights are 4,000 to 6,000 pounds per inch of bit diameter, and high rotary speeds give best performance in most applications.

[3] CUTTING STRUCTURES
Both Twister and Badger come in all three cutting structures



XG, Shown in Badger

XYG, Shown in Twister

YG, Shown in Twister

BIT WEIGHT CHART — Steel Tooth & TCI

STEEL TOOTH

Bit diameter		Standard Pin connection	Weight	
in.	mm	inches	lbs.	kg
1 7/8 - 2	48 - 51	A ROD DRAW ROD OR 1" NPT Box	5	1.8
2 1/8 - 2 5/8	54 - 67	A ROD DRAW ROD	3.5	1.5
2 3/4 - 2 7/8	70 - 73	4-THREAD N ROD	4	1.8
2 15/16	75	4-THREAD N ROD	4.5	2.04
3 - 3 1/8	76 - 79	4-THREAD N ROD	5	2.2
3 1/4 - 3 3/8	83 - 89	4-THREAD N ROD	6	2.7
3 1/2 - 3 5/8	89 - 92	2 3/8 API	8	3.6
3 3/4	95	2 3/8 API	9	4.09
3 7/8	98	2 3/8 API	9	4.09
4 - 4 1/8	102 - 105	2 3/8 API	10	4.5
4 1/4 - 4 3/8	108 - 111	2 3/8 API	11	5
4 1/2	114	2 3/8 API	12	5.45
4 5/8	117	2 7/8 API	17	7.7
4 3/4 - 4 7/8	121 - 124	2 7/8 API	18	8.1
5 - 5 1/8	127 - 130	2 7/8 API	20	9.09
5 1/4 - 5 1/2	133 - 140	2 7/8 API	22	10
5 5/8 - 5 7/8	143 - 149	3 1/2 API	26	11.8
6 - 6 1/4	152 - 159	3 1/2 API	28	12.7
6 1/2 - 6 3/4	165 - 171	3 1/2 API	32	14.5
7 3/8	187	3 1/2 API	38	17.2
7 5/8	194	4 1/2 API	48	21.8
7 7/8	200	4 1/2 API	60	27.2
8 1/2	215.9	4 1/2 API	91	41.3

TUNGSTEN CARBIDE INSERT

3 1/2 - 3 5/8	48 - 51	2 3/8 API	8	3.6
3 7/8 - 4 1/8	98 - 105	2 3/8 API	9	4.09
4 1/4 - 4 3/8	108 - 111	2 3/8 API	11	5
4 1/2	114	2 3/8 API	12	5.4
4 5/8	117	2 7/8 API	17	7.7
4 3/4 - 4 7/8	121 - 124	2 7/8 API	18	8.1
5 - 5 1/8	127 - 130	2 7/8 API	20	9.09
5 1/4 - 5 1/2	133 - 140	2 7/8 API	22	10
5 5/8 - 5 7/8	143 - 149	3 1/2 API	26	11.8
6 - 6 1/4	152 - 159	3 1/2 API	30	13.6

BIT WEIGHT CHART — Fixed Cutter

TWISTER & BADGER

Bit diameter		Standard Pin connection	Weight	
in.	mm	inches	lbs.	kg
2 1/4	57	A ROD DRAW ROD	3	1.4
2 3/4	70	4-THREAD N ROD	5	2.2
3 1/8	79	4-THREAD N ROD	5	2.5
3 1/4	83	4-THREAD N ROD	5	2.5
3 1/2	89	2 3/8 API	7	3
3 5/8	92	2 3/8 API	8	4
3 3/4	95	2 3/8 API	10	4.5
3 7/8	98	2 3/8 API	12	5.5
4 1/4	108	2 3/8 API	14	6
4 1/2	114	2 3/8 API	14	6
4 5/8	117	2 7/8 API	18	8
4 3/4	121	2 7/8 API	20	9
4 7/8	124	2 7/8 API	20	9
5 7/8	149	3 1/2 API	25	11
6	152	3 1/2 API	28	12
6 1/8	155	3 1/2 API	28	12
6 1/4	159	3 1/2 API	28	12.5
6 3/4	171	3 1/2 API	42	19
7 5/8	194	4 1/2 API	65	29.5
7 7/8	200	4 1/2 API	68	31

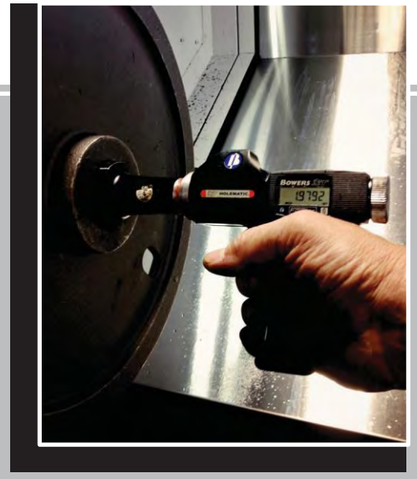
Commitment to Quality

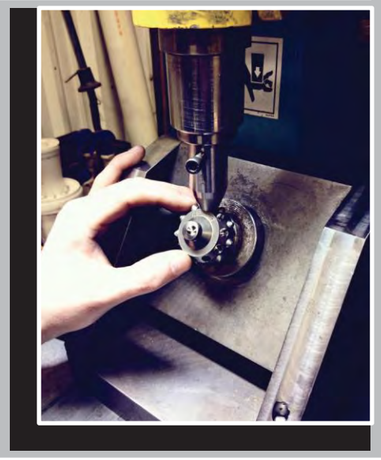
At Throop Rock Bit our quality control system begins with taking the order and continues through final inspection.

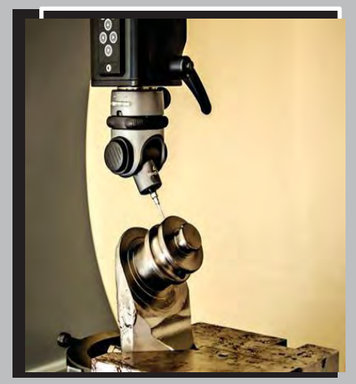
With over 600 pieces of precision equipment ranging from simple measuring tools to multi-axis milling machines, we employ a multi-level quality inspection program that requires constant attention. This attention to detail in our manufacturing and assembly processes ensures machining and assembly accuracy to .0001”

Our quality management system requires that our employees have a minimum number of hours of training at each machining center prior to working unsupervised. Our commitment to properly train and educate our staff, provides a safe work environment and fosters in them a sense of pride in workmanship.

Each of our products is inspected several times throughout the manufacturing process. These inspections are performed by highly qualified inspectors that are independent of the day-to-day manufacturing process. This independent inspection process provides another layer of control, which ensures delivery of the highest quality product to our customers.







We Are A Worldwide Company

Made in the USA and used worldwide

TRB is proudly registered and holds certificates from the International Standards Organization, including ISO 9001:2008 & ISO/TS 29001:2011, for the design and manufacture of rotary drill bits and the manufacture of rotary drilling components and machined goods.

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