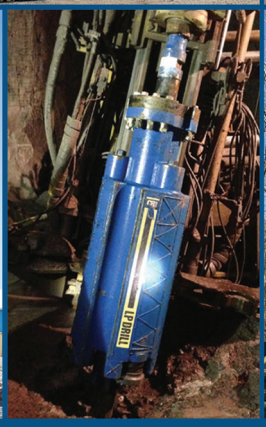
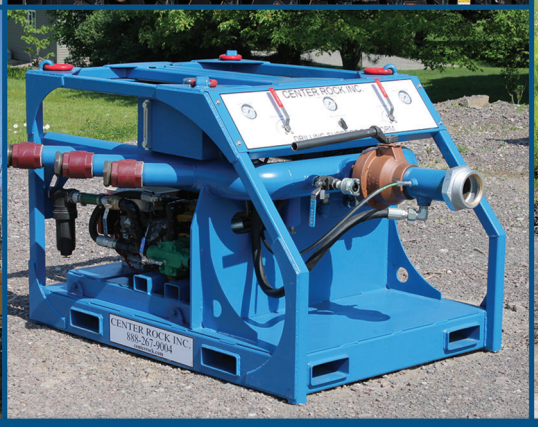
CENTER ROCK INC

DRILL FASTER
RUN HARDER
WORK SMARTER






# CENTER ROCK PRODUCT CATALOG

# INDUSTRIES SERVED

## CONSTRUCTION

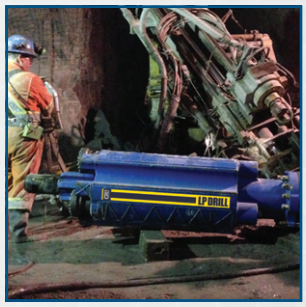
Center Rock Inc. serves the global construction industry by designing, manufacturing, and distributing a complete line of air drilling tools and products including DTH hammers & bits from 3.5”-48” (89-1219 mm) in diameter, LP® canister drills and hole-openers (conventional and reverse circulation) from 24”-144” (610-3658 mm), ROTO LOC® underreamer systems for casing advancement, and other support equipment such as water injection systems, oil injection systems, air manifolds, and Hydro-Jaw® breakout / make-up systems.

## UTILITY AND HDD

Center Rock Inc. provides state-of-the-art drilling products to support the utility industry. Our mono-hammer utility pole drill offerings range from 3.5”-24” (89-610 mm) and include hex connection, side inlet swivel, and all ancillary items. Additionally, only Center Rock offers Utility LP® canister style drills 18” (457 mm) and larger and HDD LP® canister style drills 12” (305 mm) and larger. Multi-hammer canister style Utility LP Drills® boast lightweight construction, low vibration and low air requirements which will ensure success in any drilling condition and are perfectly suited for mounting on any digger derrick unit.

## OIL AND GAS

Since day one, Center Rock has served the Oil and Gas industry with quality DTH hammers and bits ranging from 3.5”-36” (89-914 mm) and specifically designed to meet the rugged demands of deep hole drilling. With available on-site support, a consultative approach and 24/7 customer support, Center Rock is the Oil and Gas supplier of choice. From jet subs to diamond enhanced carbide bits to Hydro-Jaw® breakout / make-up systems, we have a tailored solution for any Oil and Gas drilling application.




## MINING AND QUARRY

When it comes to drilling blast holes, Center Rock has a complete product portfolio of innovative tools and accessories to satisfy any surface or underground application requirement. We have DTH hammers and bits that will drill any size blast-hole. Also available is our Mining LP® canister drill, 20” (508 mm) and larger, for drilling utility/ventilation holes, burn holes, etc. Our mining LPs® are perfectly suited to drill either up, down or any inclination, from vertical to horizontal, in an underground mining environment.

## WATER WELL AND GEOTHERMAL

Center Rock Inc. designs and manufactures DTH hammers from 3.5”-22” (89-560 mm) and DTH button bits up to 36” (914 mm) with various shanks, face styles, and carbide button configurations. For drillers, we offer three lines of hammers; the valveless CR line, the valved Rock Force® (RF) (both utilize QL shank bits), and the Rock Xtreme® (RX) line. The RX® offering is the newest, valved, high frequency hammer developed by Center Rock with it’s own bit shank design and no blow tube. Center Rock has also designed a unique underreamer overburden drilling system, ROTO LOC®, that drills and simultaneously advances casing.

# YOUR DRILLING SOLUTION!

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RF 55 Hammer Cutaway

RX 55 Hammer Cutaway

CR 55 Hammer Cutaway


# CENTER ROCK FORCE® HAMMER SERIES

## CENTER ROCK FORCE® LINE OF DOWN-THE-HOLE HAMMERS

The Center Rock Force® line of high performance down-the-hole hammers and bits are available to suit a broad range of hole sizes and applications. All Center Rock Force® hammers feature a high efficiency and tunable valved air cycle to optimize performance on your compressor. Additionally, most models feature reversible casings so you can get the most footage from your hammer. For high air flow deep hole applications, accessories such as bit retrieval systems and jetted backheads are available.

## FEATURES AND BENEFITS

- Great balance of simplicity and performance.
- Robust and reliable with minimal moving parts.
- Reversible casing.
- Solid piston.
- Industry standard bit shank.


# CENTER ROCK FORCE® HAMMER SPECIFICATIONS

| MODEL | RF35-STD | | RF40-STD | | RF50-STD | | RF55-STD | | RF60-STD | |
|---|---|---|---|---|---|---|---|---|---|---|
| CPN | 91002395 | | 91001602 | | 91001174 | | 91000917 | | 91001065 | |
| DESCRIPTION | RF35 with 2-3/8 API reg pin connection | | RF40 with 2-3/8 API reg pin connection | | RF50 with 3-1/2 API reg pin connection | | RF55 with 3-1/2 API reg pin connection & cutting backhead | | RF60 with 3-1/2 API reg pin connection | |
| APPLICATION SUITABILITY | | | | | | | | | | |
| Geotechnical/Foundation | ✓ | | ✓ | | ✓ | | | | ✓ | |
| Waterwell/Geothermal | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| Quarry/Mining | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| Mineral Exploration | | | | | ✓ | | | | | |
| Oil/Gas | | | | | | | | | | |
| AVAILABLE OPTIONS | | | | | | | | | | |
| Bit retainer system | | | | | | | | | ✓ | |
| Jetted backhead | | | | | | | | | ✓ | |
| Deep-hole design | | | | | ✓ | | | | ✓ | |
| GENERAL SPECIFICATIONS | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric |
| Connection | 2-3/8 API reg pin | | 2-3/8 API reg pin | | 3-1/2 API reg pin | | 3-1/2 API reg pin | | 3-1/2 API reg pin | |
| Bit Shank | DHD 3.5 | | CR40 | | QL50 | | QL50 | | QL60 | |
| Reversible casing | NO | | NO | | YES | | YES | | YES | |
| Outside diameter | 3.19 | 81.0 | 4.00 | 101.6 | 4.75 | 120.7 | 5.00 | 127.0 | 5.44 | 138.2 |
| Length w/o bit, shoulder to shoulder | 30.0 | 762.8 | 36.8 | 934.0 | 42.4 | 1077.7 | 40.1 | 1017.3 | 42.7 | 1083.8 |
| Length with bit extended | 33.9 | 861.8 | 40.8 | 1036.1 | 46.6 | 1184.4 | 44.6 | 1132.6 | 47.8 | 1214.1 |
| Length with bit retracted | 32.6 | 828.5 | 39.7 | 1007.1 | 45.4 | 1153.9 | 43.3 | 1100.3 | 46.4 | 1179.1 |
| Weight w/o bit | 47.7 | 21.7 | 112 | 50.9 | 145 | 65.9 | 153 | 69.5 | 186 | 84.5 |
| Backhead across flats (in) | 1-1/4 X 2-1/2 AF | | 1-1/2 x 3 AF | | 2 x 3-1/2 AF | | 2 x 3-1/2 AF | | 2-1/2 x 4 AF | |
| Minimum bit size | 3.50 | 88.9 | 4.50 | 114.3 | 5.25 | 133.4 | 5.75 | 146.1 | 6.00 | 152.4 |
| Maximum bit size | 4.25 | 108.0 | 5.00 | 127.0 | 6.00 | 152.4 | 6.00 | 152.4 | 6.75 | 171.5 |
| Bore | 2.625 | 66.68 | 3.190 | 81.03 | 3.890 | 98.81 | 4.125 | 104.78 | 4.500 | 114.30 |
| Piston weight | 10.5 | 4.8 | 20.0 | 9.1 | 31.9 | 14.5 | 31.5 | 14.3 | 40.0 | 18.2 |
| Stroke | 4.00 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 |
| Maximum pressure (psig & bar) | 350.0 | 24.1 | 350.0 | 24.1 | 350.0 | 24.1 | 350.0 | 24.1 | 350.0 | 24.1 |
| Maximum choke diameter | 0.25 | 6.35 | 0.25 | 6.35 | 0.50 | 12.70 | 0.50 | 12.70 | 0.38 | 9.53 |
| Make-up torque (ft-lb & N-m) | 3000 | 4062 | 4000 | 5416 | 5000 | 6770 | 5000 | 6770 | 6000 | 8124 |
| AIR CONSUMPTION | | | | | | | | | | |
| 100 PSI/ 6,9 bar (scfm & m^3/min) | 142 | 4.0 | 183 | 5.2 | 202 | 5.7 | 149 | 4.2 | 305 | 8.6 |
| 100 psi (bpm) | 1289 | 1289 | 1226 | 1226 | 1116 | 1116 | 1116 | 1116 | 1122 | 1122 |
| 150 psi/ 10,3 bar (scfm & m^3/min) | 219 | 6.2 | 284 | 8.0 | 310 | 8.8 | 247 | 7.0 | 431 | 12.2 |
| 150 psi (bpm) | 1509 | 1509 | 1353 | 1353 | 1266 | 1266 | 1266 | 1266 | 1301 | 1301 |
| 200 psi/ 13,8 bar (scfm & m^3/min) | 288 | 8.1 | 386 | 10.9 | 422 | 11.9 | 360 | 10.2 | 561 | 15.8 |
| 200 psi (bpm) | 1699 | 1699 | 1479 | 1479 | 1401 | 1401 | 1401 | 1401 | 1453 | 1453 |
| 250 psi/ 17,2 bar (scfm & m^3/min) | 348 | 9.8 | 488 | 13.8 | 538 | 15.2 | 488 | 13.8 | 695 | 19.6 |
| 250 psi (bpm) | 1858 | 1858 | 1606 | 1606 | 1521 | 1521 | 1521 | 1521 | 1576 | 1576 |
| 300 psi/ 20,7 bar (scfm & m^3 min) | 400 | 11.3 | 590 | 16.7 | 658 | 18.6 | 632 | 17.8 | 832 | 23.5 |
| 300 psi (bpm) | 1987 | 1987 | 1733 | 1733 | 1626 | 1626 | 1626 | 1626 | 1671 | 1671 |
| 350 psi/ 24,1 bar (scfm & m^3/min) | 444 | 12.5 | 691 | 19.5 | 783 | 22.1 | 791 | 22.3 | 973 | 27.5 |
| 350 psi (bpm) | 2086 | 2086 | 1860 | 1860 | 1716 | 1716 | 1716 | 1716 | 1738 | 1738 |

| RF65-STD | | RF80-STD | | RF88-STD | | RF100-STD | | RF120-STD | | RF200-STD | | RF200S-STD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 91000912 | | 91001192 | | 91001223 | | 91001593 | | 91001390 | | 91001256 | | 91002141 | |
| RF65 with 3-1/2 API reg pin connection & cutting backhead | | RF80 with 4-1/2 API reg pin connection | | RF88 with 4-1/2 API reg pin connection | | RF100 with 6-5/8 API reg pin connection | | RF120 with 6-5/8 API reg pin connection | | RF200 with 8-5/8 API reg pin connection and jetted backhead | | RF200S with 8-5/8 API reg pin connection and jetted backhead | |
| | | | | | | | | | | | | | |
| ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
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| | | ✓ | | | | | | | | | | | |
| Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric |
| 3-1/2 API reg pin | | 4-1/2 API reg pin | | 4-1/2 API reg pin | | 6-5/8 API Reg Pin | | 6-5/8 API reg pin | | 8-5/8 API reg pin | | 8-5/8 API reg pin | |
| QL60 | | QL80 | | CR88 | | N100 | | QL120 | | QL200 | | QL200 | |
| YES | | YES | | YES | | NO | | NO | | YES | | YES | |
| 5.88 | 149.4 | 7.13 | 181.1 | 7.75 | 196.9 | 9.0 | 228.6 | 11.20 | 284.5 | 15.60 | 396.2 | 15.60 | 396.2 |
| 41.8 | 1060.7 | 57.2 | 1452.6 | 58.9 | 1496.1 | 59.9 | 1520.2 | 72.9 | 1850.6 | 67.2 | 1705.6 | 73.7 | 1872.9 |
| 46.0 | 1169.4 | 63.7 | 1618.0 | 66.8 | 1697.7 | 69.0 | 1753.4 | 83.6 | 2124.5 | 78.5 | 1992.9 | 85.3 | 2166.9 |
| 44.9 | 1141.5 | 61.9 | 1571.5 | 64.9 | 1649.2 | 67.1 | 1704.3 | 81.4 | 2066.5 | 76.2 | 1935.7 | 83.1 | 211.5 |
| 219 | 99.5 | 443 | 201.4 | 518 | 235.5 | 740.0 | 336.4 | 1358 | 617.3 | 2663 | 1210.5 | 3055 | 1385.7 |
| 2-1/4 x 3-1/2 AF | | 2-1/2 x 5-7/8 AF | | 2 x 6-7/16 AF | | 2-1/2 x 7-1/2 AF | | 2-1/2 x 9-1/4 AF | | 1" Holes | | 1" Holes | |
| 6.50 | 165.1 | 7.88 | 200.2 | 8.75 | 222.3 | 9.63 | 244.6 | 12.25 | 311.2 | 17.50 | 444.5 | 28.00 | 711.2 |
| 6.75 | 171.5 | 10.00 | 254.0 | 11.00 | 279.4 | 12.25 | 311.2 | 22.00 | 558.8 | 26.00 | 660.4 | 36.00 | 914.4 |
| 4.875 | 123.83 | 5.875 | 149.23 | 6.410 | 162.81 | 7.54 | 191.52 | 9.25 | 234.95 | 12.25 | 311.15 | 12.25 | 311.15 |
| 45 | 20.5 | 107.2 | 48.7 | 117 | 53.2 | 178.0 | 80.9 | 304 | 138.2 | 610 | 277.3 | 610 | 277.3 |
| 4.00 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 | 4.0 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 |
| 350.0 | 24.1 | 350.0 | 24.1 | 350.0 | 24.1 | 350.0 | 24.1 | 350.0 | 24.1 | 250.0 | 17.2 | 250.0 | 17.2 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.88 | 22.23 | 1.40 | 35.56 | 1.40 | 35.56 |
| 6000 | 8124 | 8000 | 10832 | 9000 | 12186 | 10000 | 13540 | 12000 | 16248 | 18000 | 24372 | 18000 | 24372 |
| | | | | | | | | | | | | | |
| 235 | 6.6 | 358 | 10.1 | 560 | 15.8 | 581 | 16.4 | 909 | 25.7 | 1584 | 44.7 | 1584 | 44.7 |
| 1350 | 1350 | 830 | 830 | 968 | 968 | 950 | 950 | 585 | 585 | 701 | 701 | 701 | 701 |
| 383 | 10.8 | 571 | 16.1 | 826 | 23.3 | 1000 | 28.2 | 1336 | 37.8 | 2470 | 69.8 | 2470 | 69.8 |
| 1456 | 1456 | 947 | 947 | 1050 | 1050 | 1050 | 1050 | 695 | 695 | 807 | 807 | 807 | 807 |
| 543 | 15.3 | 808 | 22.8 | 1092 | 30.8 | 1400 | 39.5 | 1811 | 51.2 | 3389 | 95.7 | 3389 | 95.7 |
| 1561 | 1561 | 1063 | 1063 | 1132 | 1132 | 1150 | 1150 | 805 | 805 | 923 | 923 | 923 | 923 |
| 713 | 20.1 | 1067 | 30.2 | 1358 | 38.4 | 1781 | 50.3 | 2333 | 65.9 | 4341 | 122.6 | 4341 | 122.6 |
| 1667 | 1667 | 1180 | 1180 | 1215 | 1215 | 1250 | 1250 | 915 | 915 | 1049 | 1049 | 1049 | 1049 |
| 894 | 25.3 | 1350 | 38.1 | 1624 | 45.9 | 2143 | 60.5 | 2903 | 82.0 | 5324 | 150.4 | 5324 | 150.4 |
| 1773 | 1773 | 1297 | 1297 | 1297 | 1297 | 1350 | 1350 | 1025 | 1025 | 1185 | 1185 | 1185 | 1185 |
| 1086 | 30.7 | 1656 | 46.8 | 1890 | 53.4 | 2486 | 70.2 | 3519 | 99.4 | 6340 | 179.1 | 6340 | 179.1 |
| 1878 | 1878 | 1414 | 1414 | 1379 | 1379 | 1450 | 1450 | 1135 | 1135 | 1331 | 1331 | 1331 | 1331 |


# ROCK XTREME® HAMMER SERIES

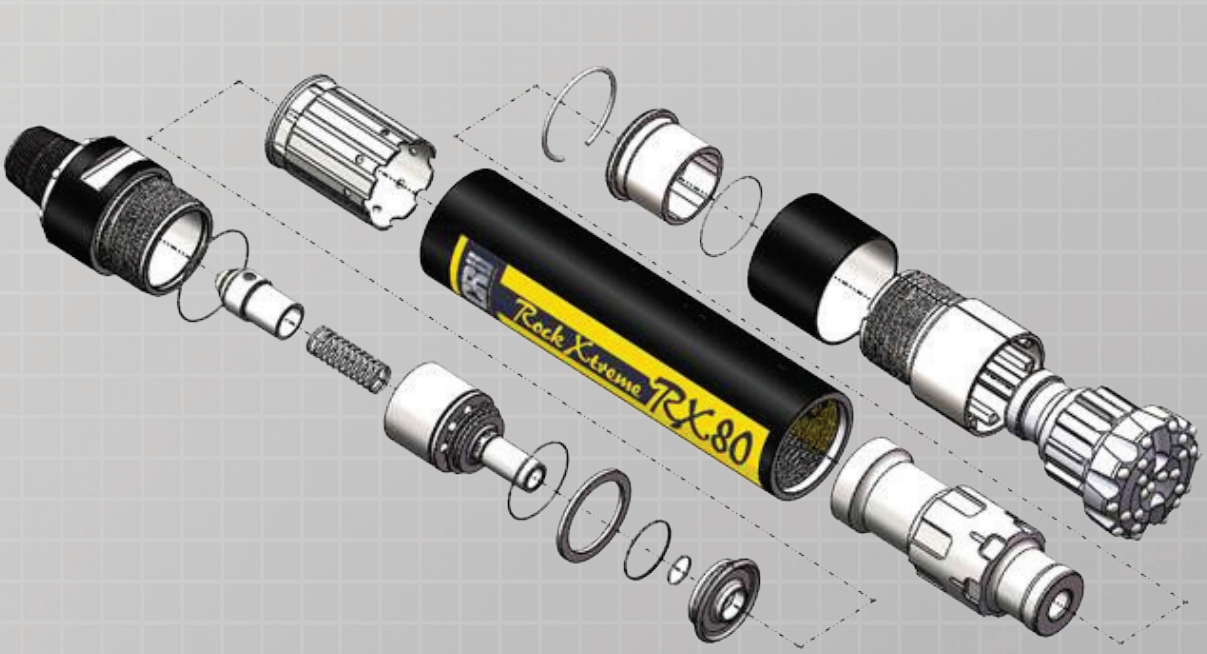
## ROCK XTREME® LINE OF DOWN-THE-HOLE HAMMERS

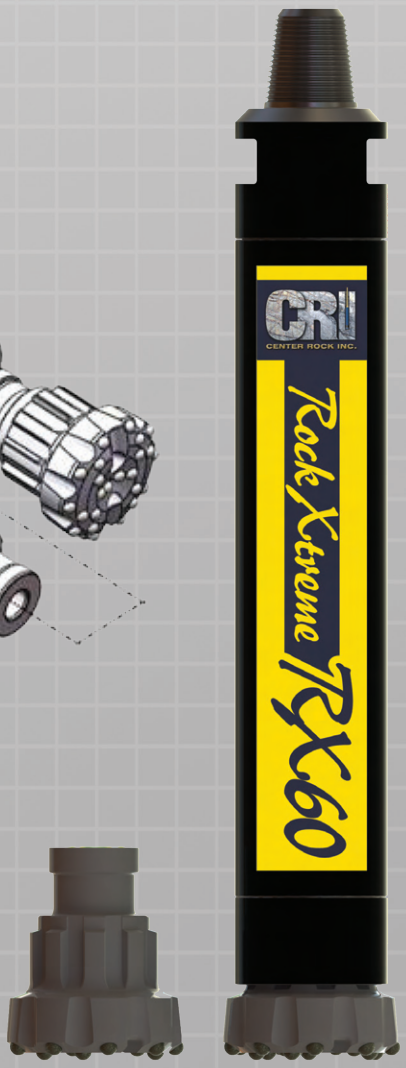
Center Rock's Rock Xtreme® bits and hammers deliver undisputable performance and profitability in even the most challenging operating conditions.

Our bits, with 50% more actual spline area and no exhaust tube, weigh up to 60% less versus competitive offerings. That means optimum economy, reliability, durability and far less rig vibration during drilling, drastically reducing your downtime labor and replacement part costs.

## FEATURES AND BENEFITS

- High performance valved air cycle.
- High frequency low vibration operation.
- No exhaust tube or foot valve.
- Lightweight economical bits.
- Largest shank cross section available.



# ROCK XTREME® HAMMER SPECIFICATIONS

| | RCX45 - STD | | RCX55 - STD | | RX55 - STD | |
|---|---|---|---|---|---|---|
| | 91002323 | | 91001422 | | 91001307 | |
| | RCX45 w/4 Remet Box Connection | | RCX55 w/4-1/2 Remet Box Connection | | RX55 w/3-1/2 API Reg Pin Connection & Cutting Backhead | |
| APPLICATION SUITABILITY | | | | | | |
| Geotechnical/Foundation | | | | | | |
| Waterwell/Geothermal | | | | | ✓ | |
| Quarry/Mining | | | | | ✓ | |
| Mineral Exploration | ✓ | | ✓ | | | |
| Oil/Gas | | | | | | |
| AVAILABLE OPTIONS: | | | | | | |
| Bit Retainer | | | | | | |
| GENERAL SPECIFICATIONS: | Imperial | Metric | Imperial | Metric | Imperial | Metric |
| Connection | 4 Remet Box | | 4-1/2 Remet Box | | 3-1/2 API Reg Pin | |
| Bit Shank | RCX45 | | RCX55 | | RX5 | |
| Reversible Casing | NO | | NO | | NO | |
| Outside Diameter | 4.56 | 115.8 | 5.25 | 133.4 | 5.00 | 127.0 |
| Length w/o Bit Shoulder to Shoulder | 35.2 | 894.6 | 35.2 | 894.3 | 30.50 | 773.9 |
| Length w/Bit Extended | 38.5 | 977.4 | 38.1 | 968.5 | 34.50 | 877.1 |
| Length w/Bit Retracted | 37.1 | 942.3 | 36.9 | 938.3 | 33.40 | 847.1 |
| Weight w/o Bit | 108 | 49.1 | 132 | 60.0 | 124.00 | 56.4 |
| Backhead Across Flats (in.) | 1-3/4 x 3.35 AF | | 1-3/4 x 4-1/4 AF | | 1-3/4 x 4 AF | |
| Minimum Bit Size | 4.75 | 120.7 | 5.50 | 139.7 | 5.50 | 139.7 |
| Maximum Bit Size | 5.50 | 139.7 | 6.00 | 152.4 | 6.00 | 152.4 |
| Bore | 3.960 | 100.58 | 4.500 | 114.3 | 4.125 | 104.78 |
| Piston Weight | 22.1 | 10 | 30 | 13.6 | 29.00 | 13.2 |
| Stroke | 3.25 | 82.6 | 3.25 | 82.6 | 3.25 | 82.6 |
| Maximum Pressure Differential (psig & bar) | 500.0 | 34.5 | 500.0 | 34.5 | 500.0 | 34.5 |
| Maximum Choke Diameter | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 |
| Make-up Torque (ft-lb & N-m) | 4500 | 6093 | 5000 | 6770 | 5000 | 6770 |
| AIR CONSUMPTION: | | | | | | |
| 100 psi/6,9 bar (scfm & m^3/min) | 140 | 4.0 | 155 | 4.4 | 155 | 4.4 |
| 100 psi (bpm) | 1350 | 1350 | 1350 | 1350 | 1116 | 1116 |
| 150 psi/10,3 bar (scfm & m^3/min) | 231 | 6.5 | 257 | 7.3 | 257 | 7.3 |
| 150 psi (bpm) | 1532 | 1532 | 1532 | 1532 | 1266 | 1266 |
| 200 psi/13,8 bar (scfm & m^3/min) | 337 | 9.5 | 374 | 10.6 | 374 | 10.6 |
| 200 psi (bpm) | 1695 | 1695 | 1695 | 1695 | 1401 | 1401 |
| 250 psi/17,2 bar (scfm & m^3/min) | 457 | 12.9 | 508 | 14.3 | 508 | 14.3 |
| 250 psi (bpm) | 1840 | 1840 | 1840 | 1840 | 1521 | 1521 |
| 300 psi/20,7 bar (scfm & m^3/min) | 591 | 16.7 | 657 | 18.6 | 657 | 18.6 |
| 300 psi (bpm) | 1967 | 1967 | 1967 | 1967 | 1626 | 1626 |
| 350 psi/24,1 bar (scfm & m^3/min) | 739 | 20.9 | 822 | 23.2 | 822 | 23.2 |
| 350 psi (bpm) | 2076 | 2076 | 2076 | 2076 | 1716 | 1716 |

| RX60 - STD | | RX65 - STD | | RX70 - STD | | RX80 - STD | | RX120- STD | |
|---|---|---|---|---|---|---|---|---|---|
| 91001245 | | 91001205 | | 91002722 | | 91001332 | | 91002560 | |
| RX60 w/3-1/2 API Reg Pin Connection | | RX65 w/3-1/2 API Reg Pin Connection & Cutting Backhead | | RX70 w/4-1/2 API Reg Pin Connection | | RX80 w/4-1/2 API Reg Pin Connection | | RX120 w/6-5/8 API Reg Pin Connection | |
| | | | | | | | | | |
| | | | | | | | | | |
| ✓ | | | | ✓ | | ✓ | | ✓ | |
| ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| | | | | | | | | | |
| ✓ | | | | ✓ | | ✓ | | ✓ | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | ✓ | | ✓ | |
| Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric |
| 3-1/2 API Reg Pin | | 3-1/2 API Reg Pin | | 4-1/2 API Reg Pin | | 4-1/2 API Reg Pin | | 6-5/8 API Reg Pin | |
| RX6 | | RX6 | | RX7 | | RX8 | | RX120 | |
| NO | | NO | | NO | | YES | | YES | |
| 5.60 | 142.2 | 5.88 | 149.4 | 6.88 | 174.8 | 7.13 | 181.1 | 11.20 | 284.5 |
| 30.90 | 784.9 | 30.90 | 784.9 | 34.30 | 872.0 | 35.50 | 900.4 | 46.7 | 1186.9 |
| 34.40 | 873.8 | 34.40 | 873.8 | 39.00 | 989.3 | 40.20 | 1020.6 | 52.5 | 1333.8 |
| 33.40 | 848.4 | 33.40 | 848.4 | 37.40 | 949.2 | 38.90 | 987.6 | 50.4 | 1280.9 |
| 153.00 | 69.5 | 173.00 | 78.6 | 264 | 120.0 | 289.00 | 131.4 | 933 | 424.1 |
| 2 x 4 AF | | 2 x 4 AF | | 2-1/2 x 5 AP | | 1-3/4 x 5-5/8 AF | | 2-1/4 x 10 AF | |
| 6.13 | 155.7 | 6.50 | 165.1 | 7.88 | 200.2 | 7.88 | 200.2 | 12.25 | 311.2 |
| 6.75 | 171.5 | 6.75 | 171.5 | 8.88 | 225.6 | 10.00 | 254.0 | 22.00 | 558.8 |
| 4.625 | 117.48 | 4.625 | 117.48 | 5.64 | 143.18 | 5.875 | 149.23 | 9.50 | 241.30 |
| 35.00 | 15.9 | 35.00 | 15.9 | 58.1 | 26.4 | 72.60 | 33.0 | 239 | 108.6 |
| 3.50 | 88.9 | 3.50 | 88.9 | 3.50 | 88.9 | 3.50 | 88.9 | 3.50 | 88.9 |
| 350.0 | 24.1 | 350.0 | 24.1 | 350.0 | 24.1 | 350.00 | 24.1 | 350.00 | 24.1 |
| 0.38 | 9.53 | 0.38 | 9.53 | 0.53 | 13.46 | 0.88 | 22.23 | 0.88 | 22.23 |
| 6000 | 8124 | 6000 | 8124 | 7000 | 9478 | 8000 | 10832 | 12000 | 16248 |
| | | | | | | | | | |
| 305 | 8.6 | 305 | 8.6 | 265 | 7.5 | 358 | 10.1 | 804 | 22.7 |
| 1461 | 1461 | 1461 | 1461 | 1068 | 1068 | 830 | 830 | 585 | 585 |
| 431 | 12.2 | 431 | 12.2 | 442 | 12.5 | 571 | 16.1 | 1248 | 35.3 |
| 1576 | 1576 | 1576 | 1576 | 1294 | 1294 | 947 | 947 | 695 | 695 |
| 561 | 15.8 | 561 | 15.8 | 649 | 18.3 | 808 | 22.8 | 1680 | 47.5 |
| 1691 | 1691 | 1691 | 1691 | 1502 | 1502 | 1063 | 1063 | 805 | 805 |
| 695 | 19.6 | 695 | 19.6 | 886 | 25.0 | 1067 | 30.2 | 2100 | 59.3 |
| 1806 | 1806 | 1806 | 1806 | 1690 | 1690 | 1180 | 1180 | 915 | 915 |
| 832 | 23.5 | 832 | 23.5 | 1152 | 32.5 | 1350 | 38.1 | 2508 | 70.8 |
| 1921 | 1921 | 1921 | 1921 | 1860 | 1860 | 1297 | 1297 | 1025 | 1025 |
| 973 | 27.5 | 973 | 27.5 | 1447 | 40.9 | 1656 | 46.8 | 2904 | 82.0 |
| 2036 | 2036 | 2036 | 2036 | 2010 | 2010 | 1414 | 1414 | 1135 | 1135 |

# CR HAMMER SERIES

## CR LINE OF DOWN-THE-HOLE HAMMERS

Center Rock's CR line of down-the-hole drills are reliable drilling workhorses that stand up to the most demanding conditions. A valveless air cycle provides consistent drilling performance and reliability foot after foot and year after year. Some models are available with integrated jetted backheads as well as a bit retainer system for deep-hole drilling applications.

Because we understand the importance of piston to bit weight ratio, we would like to introduce our largest hammer, the CR 360. So whether you are drilling a rock socket with a 36" (914 mm) bit or advancing 48" (1219 mm) casing, the CR 360 has a piston heavy enough to do the job!

## FEATURES AND BENEFITS

- Great balance of simplicity and performance.
- Robust and reliable with minimal moving parts.
- Reversible casing.
- Solid piston.
- Industry standard bit shank.


# CR HAMMER SPECIFICATIONS

| MODEL | CR50 - STD | | CR55 - STD | | CR65 - STD | | CR80-STD | | CR88 |
|---|---|---|---|---|---|---|---|---|---|
| CPN | 91000343 | | 91000726 | | 91000389 | | 91000301 | | 9100 |
| DESCRIPTION | CR50 w/3-1/2 API Reg Pin Connection | | CR55 w/3-1/2 API Reg Pin Connection & Cutting Backhead | | CR65 w/3-1/2 API Pin Connection & Cutting Backhead | | CR80 w/4-1/2 API Reg Pin Connection | | CR88 w/ Reg Pin C |
| APPLICATION SUITABILITY: | | | | | | | | | |
| Geotechnical/Foundations | ✓ | | | | ✓ | | ✓ | | ✓ |
| Waterwell/Geothermal | ✓ | | ✓ | | | | ✓ | | ✓ |
| Quarry/Mining | ✓ | | ✓ | | ✓ | | ✓ | | |
| Mineral Exploration | ✓ | | | | | | | | |
| Oil/Gas | | | | | | | ✓ | | ✓ |
| AVAILABLE OPTIONS: | | | | | | | | | |
| Bit Retainer System | | | | | | | ✓ | | ✓ |
| Jetted Backhead | | | | | ✓ | | ✓ | | ✓ |
| GENERAL SPECIFICATIONS: | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial |
| Connection | 3-1/2 API Reg Pin | | 3-1/2 API Reg Pin | | 3-1/2 API Reg Pin | | 4-1/2 API Reg Pin | | 4-1/2 AP |
| Bit Shank | QL50 | | QL50 | | QL60 | | QL 80 | | CR |
| Reversible Casing | YES | | YES | | YES | | YES | | YE |
| Outside Diameter | 4.75 | 120.7 | 5.00 | 127.0 | 5.88 | 149.4 | 7.13 | 181.1 | 7.75 |
| Length w/o Bit Shoulder to Shoulder | 42.40 | 1077.7 | 40.10 | 1017.3 | 41.80 | 1060.7 | 57.20 | 1452.6 | 58.90 |
| Length w/Bit Extended | 46.60 | 1184.4 | 44.60 | 1132.6 | 46.00 | 1169.40 | 63.70 | 1618.0 | 66.80 |
| Length w/Bit Retracted | 45.40 | 1153.9 | 43.30 | 1100.3 | 44.90 | 1141.50 | 61.90 | 1571.5 | 64.90 |
| Weight w/o Bit | 145 | 65.9 | 153 | 69.5 | 219 | 99.5 | 443 | 201.4 | 518 |
| Backhead Across Flats (in.) | 2 x 3-1/2 AF | | 2 x 3-1/2 AF | | 2-1/4 x 3-1/2 AF | | 2-1/2 x 5-7/8 AF | | 2 x 6-7 |
| Minimum Bit Size | 5.25 | 133.4 | 5.75 | 146.1 | 6.50 | 165.1 | 7.88 | 200.2 | 8.75 |
| Maximum Bit Size | 6.00 | 152.4 | 6.00 | 152.4 | 6.75 | 171.5 | 10.00 | 254.0 | 11.00 |
| Bore | 3.890 | 98.81 | 4.125 | 104.78 | 4.750 | 120.65 | 5.875 | 149.23 | 6.410 |
| Piston Weight | 31.90 | 14.5 | 31.50 | 14.3 | 45.00 | 20.5 | 107.20 | 48.7 | 117.00 |
| Stroke | 4.00 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 | 4.00 |
| Maximum Pressure (psig & bar) | 350.00 | 24.1 | 350.0 | 24.1 | 350.00 | 24.1 | 350.00 | 24.1 | 350.00 |
| Maximum Choke Diameter | 0.50 | 12.70 | 0.50 | 12.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Make-up Torque (ft-lb & N-m) | 5000 | 6700 | 5000 | 6770 | 6000 | 8174 | 8000 | 10832 | 9000 |
| AIR CONSUMPTION: | | | | | | | | | |
| 100 psi/6,9 bar (scfm & m^3/min) | 202 | 5.7 | 155 | 4.4 | 235 | 6.6 | 400 | 11.3 | 548 |
| 100 psi (bpm) | 1116 | 1116 | 1116 | 1116 | 1350 | 1350 | 968 | 968 | 968 |
| 150 psi/10,3 bar (scfm & m^3/min) | 310 | 8.8 | 257 | 7.3 | 383 | 10.8 | 590 | 16.7 | 821 |
| 150 psi (bpm) | 1266 | 1266 | 1266 | 1266 | 1456 | 1456 | 1050 | 1050 | 1050 |
| 200 psi/13,8 bar (scfm & m^3/min) | 422 | 11.9 | 374 | 10.6 | 543 | 15.3 | 780 | 22.0 | 1093 |
| 200 (bpm) | 1401 | 1401 | 1401 | 1401 | 1561 | 1561 | 1132 | 1132 | 1132 |
| 250 psi/17,2 bar (scfm & m^3/min) | 538 | 15.2 | 508 | 14.3 | 713 | 20.1 | 970 | 27.4 | 1366 |
| 250 (bpm) | 1521 | 1521 | 1521 | 1521 | 1667 | 1667 | 1215 | 1215 | 1215 |
| 300 psi/20,7 bar (scfm & m^3/min) | 658 | 18.6 | 657 | 18.6 | 894 | 25.3 | 1160 | 32.8 | 1639 |
| 300 (bpm) | 1626 | 1626 | 1626 | 1626 | 1773 | 1773 | 1297 | 1297 | 1297 |
| 350 psi/24,1 bar (scfm & m^3/min) | 783 | 22.1 | 822 | 23.2 | 1086 | 30.7 | 1350 | 38.1 | 1912 |
| 350 (bpm) | 1716 | 1716 | 1716 | 1716 | 1878 | 1878 | 1379 | 1379 | 1379 |

| - STD | CR100-STD | | CR120 - STD | | CR200 - STD | | CR260-STD | | CR360-STD | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0468 | 91000265 | | 91000492 | | 91004054 | | 91002916 | | 91004267 | |
| 4-1/2 API onnection | CR100 w/6-5/8 API Reg Pin Connection | | CR120 w/6-5/8 API Reg Pin Connection | | CR200 w/8-5/8 API Reg Pin Connection | | CR260 w/8-5/8 API Reg Pin Connection | | CR360 w/ 15" Male Hex Connection | |
| | | | | | | | | | | |
| ✓ | ✓ | | ✓ | | ✓ | | ✓ | | | |
| ✓ | ✓ | | ✓ | | ✓ | | ✓ | | | |
| | | | | | | | | | | |
| | | | | | | | | | ✓ | |
| ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| | | | | | | | | | | |
| ✓ | ✓ | | ✓ | | | | | | | |
| ✓ | ✓ | | ✓ | | ✓ | | ✓ | | | |
| Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric | Imperial | Metric |
| l Reg Pin | 6-5/8 API Reg Pin | | 6-5/8 API Reg Pin | | 8-5/8 API Reg Box | | 8-5/8 API Reg Box | | 15" (381 mm) Male Hex | |
| 88 | N100 | | QL120 | | QL200 | | CR260 | | CR360 | |
| ES | NO | | NO | | YES | | YES | | YES | |
| 196.9 | 9.00 | 228.6 | 11.20 | 284.5 | 15.60 | 396.2 | 22.00 | 559.9 | 34.0 | 864 |
| 1496.1 | 59.90 | 1520.2 | 72.90 | 1850.6 | 67.20 | 1705.6 | 74.3 | 1887.0 | 95.8 | 2433 |
| 1697.7 | 69.00 | 1753.4 | 83.60 | 2124.5 | 78.50 | 1992.9 | 87.00 | 2210.0 | 113.2 | 2875 |
| 1649.2 | 67.10 | 1704.3 | 81.40 | 2066.5 | 76.20 | 1935.7 | 84.80 | 2153.0 | 110.8 | 2814 |
| 235.5 | 740 | 336.4 | 1358 | 617.3 | 2663 | 1210.5 | 5842 | 2655.0 | 17750 | 8068 |
| /16 AF | 2-1/2 x 7-1/2 AF | | 2-1/2 x 9-1/4 AF | | 1" Holes | | 2-1/2 x 21 AF | | 2-1/2 x 32 AF | |
| 222.3 | 9.63 | 244.6 | 12.25 | 311.2 | 17.50 | 444.5 | 26.0 | 660.0 | 36.0 | 914 |
| 279.4 | 12.25 | 311.2 | 22.00 | 558.8 | 26.00 | 660.4 | 38.00 | 965.0 | 54.0 | 1372 |
| 162.81 | 7.540 | 191.52 | 9.250 | 234.95 | 12.25 | 311.2 | 17.150 | 436.0 | 28.0 | 711 |
| 53.2 | 178.00 | 80.9 | 304.00 | 138.2 | 610.00 | 277.3 | 1422.00 | 646.0 | 5165 | 2348 |
| 101.6 | 4.00 | 101.6 | 4.00 | 101.6 | 4.00 | 101.6 | 5.00 | 127.0 | 5.0 | 127 |
| 24.1 | 350.00 | 24.1 | 350.00 | 24.1 | 250.00 | 17.2 | 250.00 | 17.2 | 250.0 | 17 |
| 0.00 | 0.00 | 0.00 | 0.88 | 22.23 | 1.40 | 35.56 | 1.22 | 31.00 | 2.0 | 51 |
| 12186 | 10000 | 13540 | 12000 | 16248 | 18000 | 24372 | 30000 | 40620 | 50000 | 67700 |
| | | | | | | | | | | |
| 15.5 | 581 | 16.4 | 866 | 24.5 | 1541 | 43.5 | 2356 | 66.6 | 5.066 | 143.1 |
| 968 | 950 | 950 | 585 | 585 | 701 | 701 | 676 | 676 | 568 | 568 |
| 23.2 | 1000 | 28.2 | 1292 | 36.5 | 2426 | 68.4 | 3625 | 102 | 7795 | 220 |
| 1050 | 1050 | 1050 | 695 | 695 | 807 | 807 | 838 | 838 | 704 | 704 |
| 30.9 | 1400 | 39.5 | 1715 | 48.5 | 3293 | 92.9 | 5043 | 142 | 10844 | 306 |
| 1132 | 1150 | 1150 | 805 | 805 | 923 | 923 | 991 | 991 | 833 | 833 |
| 38.6 | 1781 | 50.3 | 2135 | 60.3 | 4143 | 116.8 | 6611 | 187 | 14216 | 402 |
| 1215 | 1250 | 1250 | 915 | 915 | 1049 | 1049 | 1135 | 1135 | 953 | 953 |
| 46.3 | 2143 | 60.5 | 2551 | 72.1 | 4972 | 140.2 | N/A | N/A | N/A | N/A |
| 1297 | 1350 | 1350 | 1025 | 1025 | 1185 | 1185 | N/A | N/A | N/A | N/A |
| 54.0 | 2486 | 70.2 | 2964 | 83.7 | 5785 | 163.1 | N/A | N/A | N/A | N/A |
| 1379 | 1450 | 1450 | 1135 | 1135 | 1331 | 1331 | N/A | N/A | N/A | N/A |

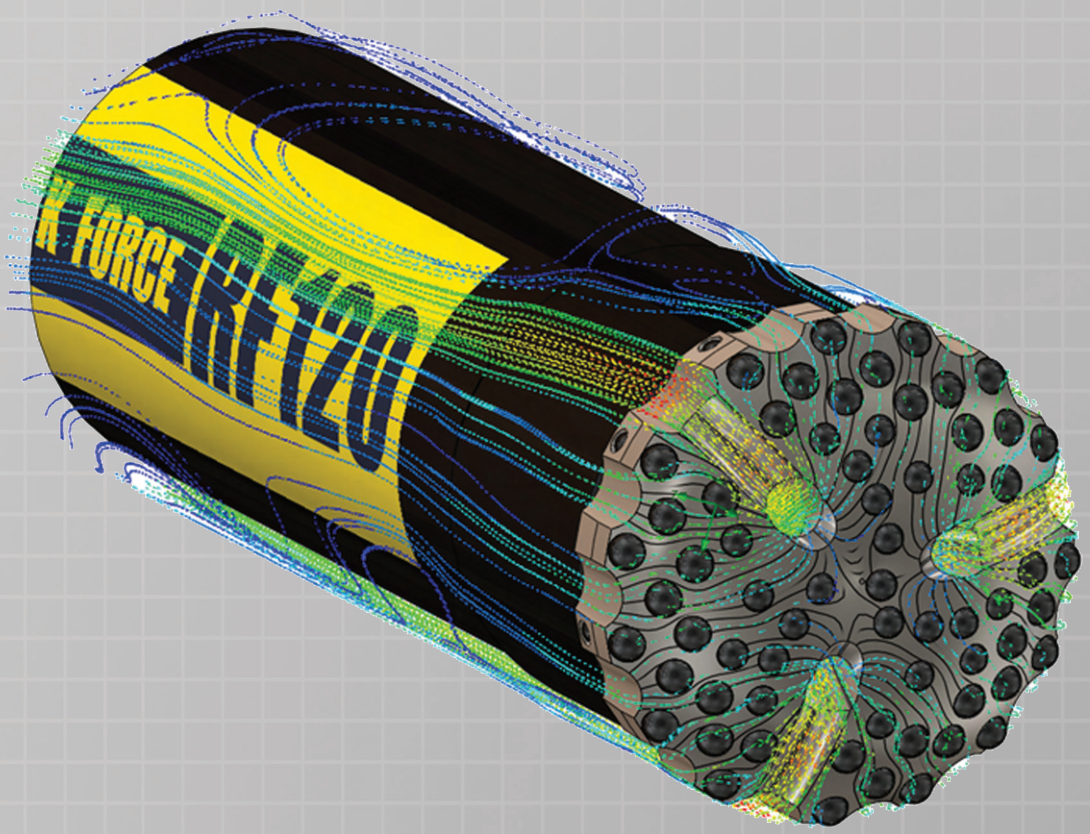

CRI BITS

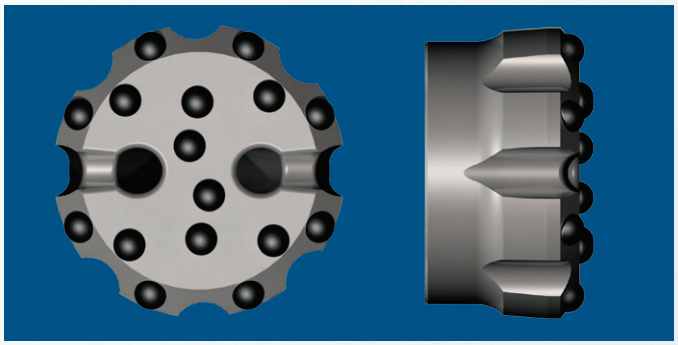
## CRI LINE OF BITS

Nothing is more important to drilling success than drill bits that cut straight and fast through all types of rock. That's why we offer our customers the best value in drill bits. Center Rock has a full range of face designs, button configurations, and shank styles in many sizes up to a 48" (1219 mm) head, to match application and rock they are drilling.

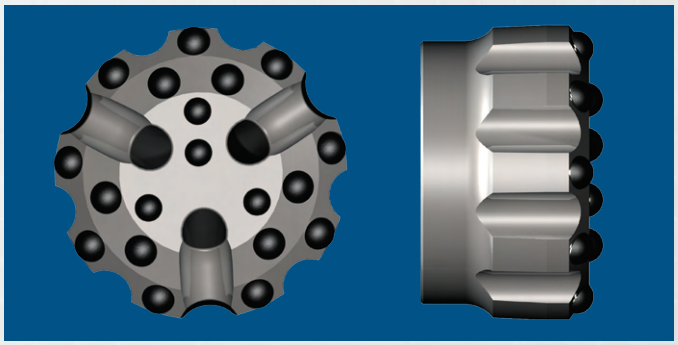
## WHY CRI BITS

- Made from premium alloy steel and high quality tungsten carbide.
- Heat treated and shot peened to deliver a durable and reliable balance of strength and toughness.
- Large bit forgings are individually ultrasonically tested and screened for inclusions and flaws.
- Specially designed bits for any application.
- Multiple varieties of head, face, shank and inserts available.
- Advanced flow simulation (CFD) is used to improve chip removal and air flow.
- Designed and manufactured in the USA.

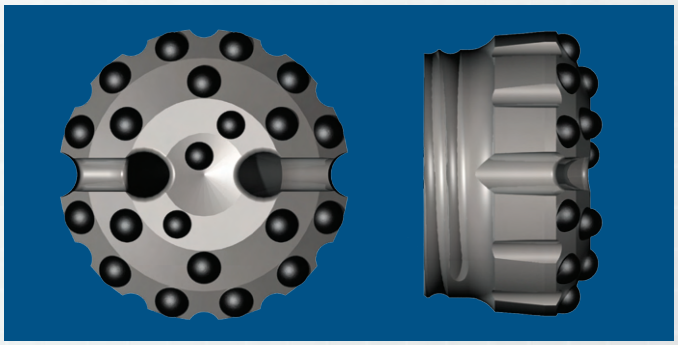




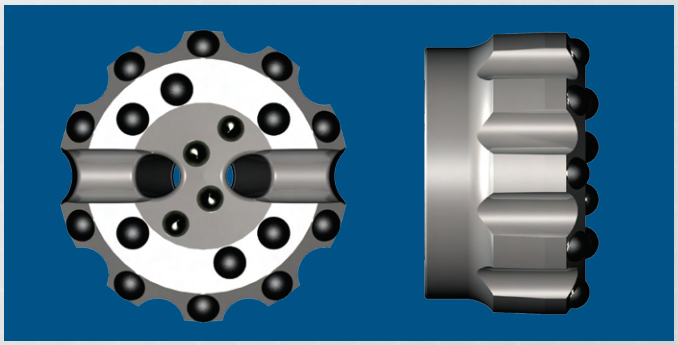
**Flat Face (F)**, design for medium hard to hard formations, good flushing and good penetration rates.



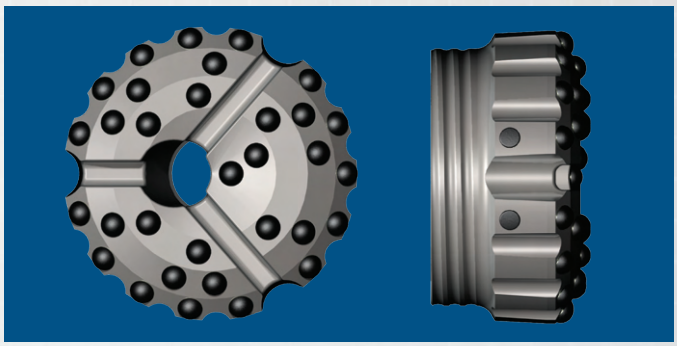
**Convex (V)**, design with double gauge row for medium to hard and abrasive formations, good flushing and good penetration rates.



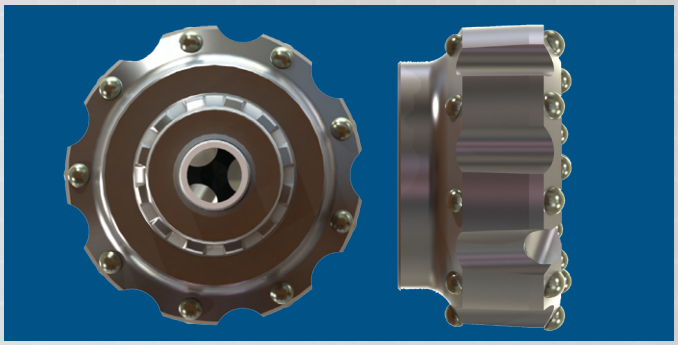
**Concave/Convex (X)**, the best of both worlds with double gauge row and concave center for medium to hard and abrasive formations, straight holes, excellent flushing and excellent penetration rates.



**The All-Purpose Concave (C)**, for soft to medium hard formations, straight holes, excellent flushing and fast penetration rates.



**Cyclops**, unique single port design maximizes bit strength and minimizes the risk of bit head splitting or chunking caused by operational and manufacturing induced fatigue stress.



**Back Reamer**, designed for use in unstable rock drilling conditions where operator has to back ream to remove tools from hole. The back reaming inserts protect the bit body from wear and damage when grinding out of hole.

## CENTER ROCK BIT OPTIONS

| | | | Face Styles | | | | Head Styles | | | Flushing Holes | | | Gauge Carbide Size | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shank | Min dia | Max dia | F | C | V | X | S | T | R | 1 | 2 | 3 | 9/16" | 5/8" | 3/4" | 7/8" | 1" |
| CR40 | 4.50 in/114 mm | 5.50 in/140 mm | O | O | S | O | S | O | N | N | S | N | S | O | N | N | N |
| QL50 | 5.13 in/130 mm | 6.00 in/152 mm | O | S | O | O | S | O | N | O | S | N | O | S | O | N | N |
| RX55/RCX55 | 5.50 in/140 mm | 6.00 in/152 mm | O | S | O | O | N/A | | | O | S | O | O | S | O | N | N |
| QL60 | 6.00 in/152 mm | 8.50 in/216 mm | O | S | O | S | S | S | S | O | S | O | N | S | O | N | N |
| 360 | 6.00 in/152 mm | 8.50 in/216 mm | O | S | O | S | S | S | S | O | S | O | N | S | O | N | N |
| RX60 | 6.25 in/159 mm | 6.75 in/172 mm | O | S | O | O | N/A | | | O | S | O | N | S | O | O | O |
| 380 | 7.88 in/200 mm | 12.00 in/305 mm | O | O | O | S | N | S | S | S | S | O | N | N | S | O | N |
| QL80 | 7.88 in/200 mm | 12.00 in/305 mm | O | O | O | S | N | S | S | S | S | O | N | N | S | O | N |
| RX80 | 7.88 in/200 mm | 9.88 in/251 mm | O | O | O | S | N/A | | | O | S | O | N | N | S | O | N |
| CR88 | 8.75 in/222 mm | 12.00 in/305 mm | O | O | O | S | N | S | S | S | S | O | N | N | S | O | N |
| N100/CR100 | 9.63 in/245 mm | 12.25 in/311 mm | O | O | O | S | N | S | S | S | N | O | N | N | S | O | N |
| SD10 | 9.63 in/245 mm | 12.25 in/311 mm | O | O | O | S | N | S | S | S | N | O | N | N | S | O | N |
| 112 | 11.00 in/279 mm | 17.50 in/445 mm | O | O | O | S | N | S | N | S | N | O | N | N | S | O | N |
| SD12 | 11.00 in/279 mm | 17.50 in/445 mm | O | O | O | S | N | S | N | S | N | O | N | N | S | O | O |
| QL120 | 12.25 in/311 mm | 24.00 in/610 mm | O | O | O | S | N | S | S | S | N | O | N | N | O | S | O |
| QL200 | 17.50 in/445 mm | 26.00 in/660 mm | O | O | O | S | N | S | O | S | N | O | N | N | N | O | S |
| N180 | 17.50 in/445 mm | 26.00 in/660 mm | O | O | O | S | N | S | N | S | N | O | N | N | O | S | S |
| QL200S | 28.00 in/711 mm | 36.00 in/914 mm | O | O | O | S | N | S | O | S | N | O | N | N | N | O | S |

Key Code:
- S - Standard Offering
- O - Optional Offering/Custom Order (Not Stocked)
- N - Not Offered

Face Style:
- F - Flat Face
- C - Concave Face
- V - Convex Face
- X - Concave/Convex Face

Head Style:
- S - Standard Head without Fishing Thread
- T - Fishing Thread
- R - CRI Retainer System

Flushing Holes:
- 1 - Cyclops Single Hole
- 2 - Two Flushing Holes
- 3 - Three Flushing Holes

Optional Carbide Grades:
- Standard (Balanced Toughness and Wear Resistance)
- Premium Grade Carbide (Increased Toughness and Wear Resistance)
- Extra Tough for Hard Rock
- Semi Ballistic (Parabolic)
- Standard Diamond
- Premium Diamond (Increased Toughness and Wear Resistance)

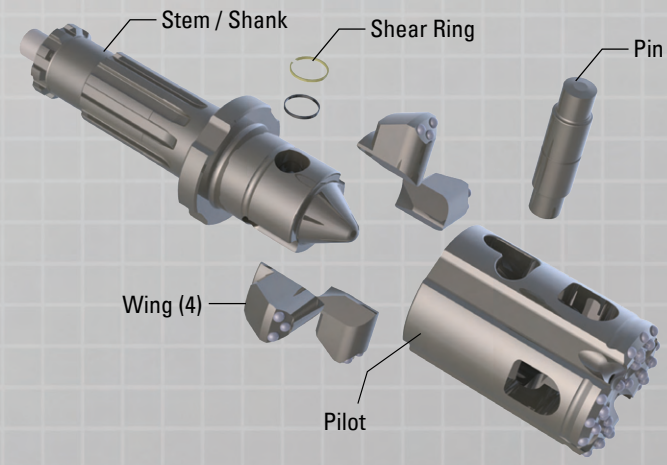
# ROTO LOC® UNDERREAMER

## ROTO LOC® UNDERREAMER

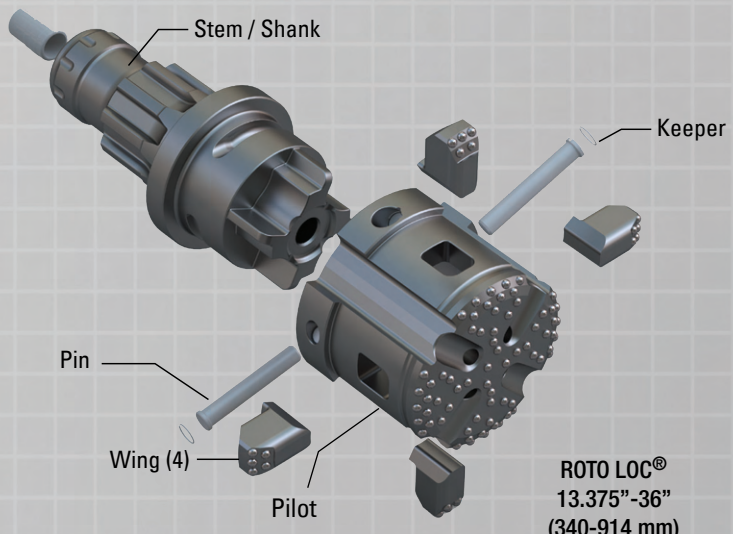
Center Rock's ROTO LOC® is the ultimate underreamer system.  It delivers straighter holes, minimizes casing friction ROTO LOC® is an overburden drilling system for casing advancement, developed by Center Rock. With wings that lock in place and are easily retractable, ROTO LOC® is able to drill straight, full diameter holes through any formation, including pinnacle limestone and karst. ROTO LOC® saves you money because there isn't any expensive starter casing J-teeth or ring bits needed.

## FEATURES AND BENEFITS

- Sizes from 5.5"-36" (140-914 mm).
- Wings lock in place to cut full diameter through any rock formation.
- No expensive starter casing teeth or ring bit left in the hole.
- Easily retractable wings.
- Straight holes in pinnacle limestone and karst, eliminating bent or broken casing.
- Positive locking wings can be used to retrieve casing.
- Simple, quick wing replacement.




ROTO LOC®
5.50"-12.75"
(140-324 mm)




ROTO LOC®
13.375"-36"
(340-914 mm)

As the pilot bit rotates and makes contact with the ground, the drive pin rotates into locked position and the wings are fully extended. While in this position, the wings are positively locked, ensuring that the pilot will drill a borehole to full expanded diameter until retracted. The long nose on the pilot leads/guides the tooling through sloping and karstic formations maintaining the desired angle and minimizing deviation. When the target is reached, with a slight bump backwards, the pin moves to the retract position allowing the wings to collapse in. At that point, the bit is retracted from the casing, leaving the casing behind.

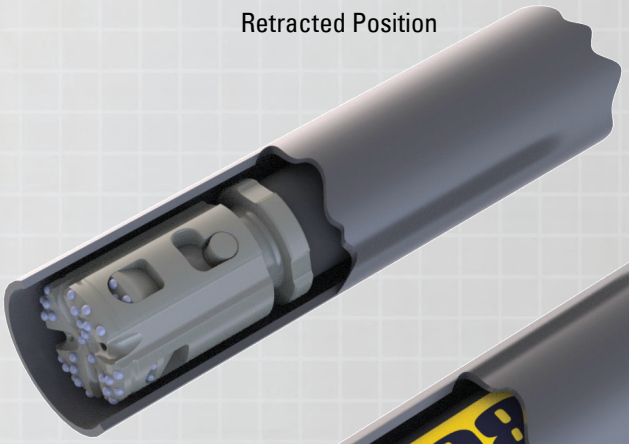
ROTO LOC® is the ultimate under reamer system. It delivers straighter holes, minimizes casing friction which can cause casing failures, requires NO expensive casing teeth, and provides industry-leading penetration rates.

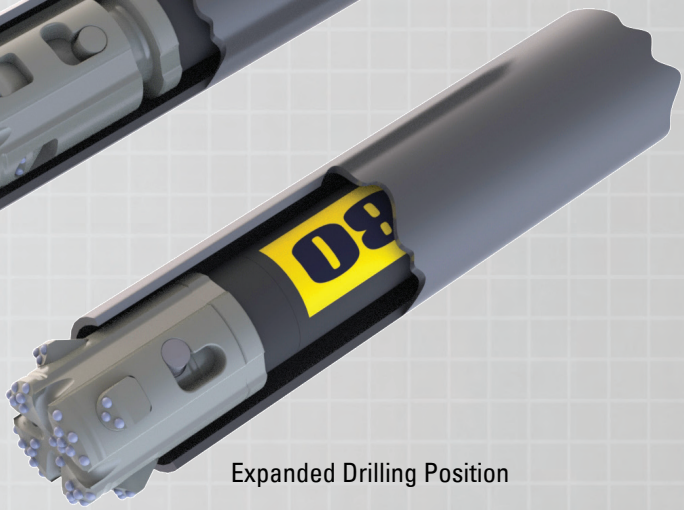
No Shoulder System



Shoulder System

Retracted Position






Expanded Drilling Position

| SYSTEM | SHANK | WINGS | WING DIAMETER | | SHOULDER DIAMETER | APPLICABLE CASING OD | WALL THICKNESS MAX | WEIGHT |
|---|---|---|---|---|---|---|---|---|
| | | | EXPANDED | RETRACTED | | | | |
| | | | IN (MM) | IN (MM) | IN (MM) | IN (MM) | IN (MM) | LBS (KGS) |
| **NO DRIVE SHOE SYSTEM** | | | | | | | | |
| ROC-0550RL | CR40, 340 | 2 | 5.86 (148.8) | 4.38 (111.3) | N/A | 5.500 (139.7) | .500 (12.7) | 47 (22) |
| ROC-0600RL | CR40, 340 | 2 | 6.35 (161.3) | 4.92 (125.0) | N/A | 6.000 (152.4) | .500 (12.7) | 58 (26) |
| ROC-0663RL | QL50 | 2 | 7.16 (181.9) | 5.50 (139.7) | N/A | 6.625 (168.3) | .500 (12.7) | 71 (32) |
| ROC-0700RL | QL50, QL50HD, QL60, 360 | 2 | 7.75 (196.8) | 5.94 (150.9) | N/A | 7.000 (177.8) | .500 (12.7) | 83 (38) |
| ROC-0763RL | QL60, QL60HD | 2 | 8.34 (211.8) | 6.52 (165.6) | N/A | 7.625 (193.7) | .500 (12.7) | 108 (49) |
| ROC-0863RL | QL60, QL60HD | 4 | 9.35 (237.5) | 7.50 (190.5) | N/A | 8.625 (219.1) | .500 (12.7) | 168 (76) |
| ROC-0963RL | QL80, 380 | 4 | 10.37 (263.4) | 8.41 (213.6) | N/A | 9.625 (244.5) | .545 (13.8) | 231 (105) |
| ROC-1075RL | QL80 | 4 | 11.42 (290.1) | 9.45 (240.0) | N/A | 10.750 (273.1) | .595 (15.1) | 250 (113) |
| ROC-1188RL | N100 | 4 | 12.54 (318.5) | 10.17 (258.3) | N/A | 11.875 (301.6) | .750 (19.1) | 444 (201) |
| **DRIVE SHOE SYSTEM** | | | | | | | | |
| ROC-0600RL | CR40, 340 | 2 | 6.35 (161.3) | 4.92 (125.0) | 5.27 (133.9) | 6.000 (152.4) | .250 (6.4) | 58 (26) |
| ROC-0663RL | QL50 | 2 | 7.16 (191.6) | 5.50 (139.7) | 6.25 (158.8) | 6.625 (168.3) | .250 (6.4) | 71 (32) |
| ROC-0963RLS | QL80, 380 | 4 | 10.37 (263.4) | 7.92 (201.2) | 8.75 (222.3) | 9.625 (244.5) | .545 (13.8) | 233 (106) |
| ROC-1075RLS | QL80 | 4 | 11.42 (290.1) | 9.45 (240.0) | 9.90 (251.5) | 10.750 (273.1) | .350 (8.9) | 306 (139) |
| ROC-1275RLS | N100 | 4 | 13.42 (340.9) | 10.87 (276.1) | 11.62 (295.2) | 12.750 (323.9) | .625 (15.9) | 521 (236) |
| ROC-1338RLS | N100 | 4 | 14.07 (357.4)) | 11.50 (292.1) | 12.41 (315.2) | 13.375 (339.7) | .750 (19.1) | 500 (227) |
| ROC-1400RLS | N100 | 4 | 14.49 (368.0) | 11.54 (293.1) | 13.05 (331.5) | 14.000 (355.6) | .750 (19.1) | 510 (231) |
| ROC-1600RLS | QL120 | 4 | 16.88 (428.8) | 14.07 (357.4) | 15.13 (384.3) | 16.000 (406.4) | .500 (12.7) | 848 (385) |
| ROC-1800RLS | QL120 | 4 | 18.80 (477.5) | 15.44 (392.2)) | 17.03 (432.6) | 18.000 (457.2) | .845 (21.5) | 998 (453) |
| ROC-2000RLS | QL200 | 4 | 20.87 (530.1) | 17.63 (447.8) | 19.06 (484.1) | 20.000 (508.0) | .625 (15.9) | 1353 (614) |
| ROC-2400RLS | QL200 | 4 | 24.88 (632.0) | 21.20 (538.5) | 22.81 (579.4) | 24.000 (609.6) | .845 (21.5) | 1868 (847) |
| ROC-3000RLS | CR260 | 4 | 30.87 (784.1) | 26.90 (683.3) | 28.80 (731.5) | 30.000 (762.0) | 1.000 (25.4) | 4887 (2217) |
| ROC-3600RLS | CR260 | 6 | 36.90 (937.3) | 33.88 (860.6) | 34.82 (884.4) | 36.000 (914.4) | 1.000 (25.4) | 5164 (2342) |


# LOW PROFILE (LP) DRILLS®

## LOW PROFILE (LP) DRILLS®

Center Rock's LP Drills® provide a cost effective solution for large diameter rock drilling requirements up to 144" (3658 mm) in diameter. Our LP's have been used by some of the nation's largest foundation contractors, specialty drilling companies, as well as utility and mining contractors, to quickly drill holes to the specified depth and diameter.

## HOW IT WORKS:

Air and rotation are provided to a canister which is outfitted with hammers and button bits that are positioned in a specially designed grid to ensure even cutting across the face of the hole and to promote proper flow of cuttings outward and upward into the calyx basket or into RC collection ports for deephole reverse circulation applications & discharge containment. For very large diameter holes, a pilot shaft is drilled with a full face LP Drill then a larger diameter LP Hole Opener uses the pilot hole as a guide and drills the borehole out to the required diameter up to 144" (3658 mm). Our drills have been used to cut holes up to 2,047 ft (623.9 m) deep and are designed to reach much greater depths.

## LP MODELS:

- Convertible LP Drills (Conventional & Reverse Circulation capable)
  - Standard and custom-built sizes from 24"-144" (610-3658 mm) for all applications
    - Full Face and Hole Opener configurations
    - Direct Circulation with Calyx Basket or Can Rods
    - True Reverse Circulation with dual wall pipe
  - All canisters from 24"-144" (610-3658 mm) utilize the same 6" (152 mm) class hammer
- Utility LP Pole Drills
  - Standard and custom-built sizes from 18" (457 mm) and larger for pole holes
    - Full Face and Hole Opener configurations
    - Direct Circulation with Can Rods
    - Specifically designed to work on Digger Derrick trucks
  - All canisters from 18" (457 mm) utilize the same 4" (102 mm) class hammer
- Mining LP Drills
  - Standard and custom-built sizes from 24" (610 mm) and larger for Raise Bore / Mining
    - Full Face and Hole Opener configurations with "stinger"
    - Direct Circulation with Can Rods
    - Designed with UG mining specific corrosion resistant parts
  - All canisters from 24" (610 mm) utilize the same 6" (152 mm) class hammer and roller stabilizers
- HDD Pull Reamers
  - Push-pull reamers custom-built sizes from 12" (305 mm) and larger for HDD applications
    - Full Face and Hole Opener configurations with "stinger"
    - Direct Circulation with CFA & roller stabilizer ring
    - Specifically designed to work on HDD units
  - All 12" (305 mm) tools utilize 3" (76 mm) class hammer and size up from there

## SHARED KEY FEATURES:

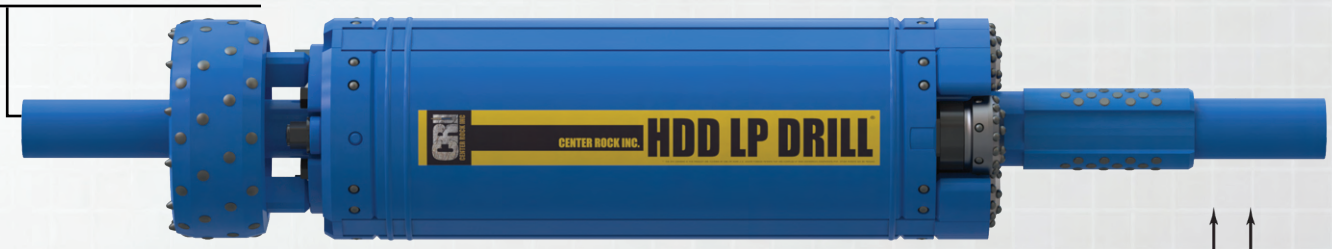
- Bits are free to spin which helps to maintain gauge of bore hole and also reduces wear on bits.
- Cost effective solution for many drilling / hard rock excavation challenges.
- Easy to perform maintenance in the field.
- Reduced bit cost as compared to large diameter hammer bits.
- Low air consumption vs. competitive offerings.
- Easily mounted to any drill rig.
- Customer support service 24/7.
- Designed and manufactured in the USA.

## COMMON APPLICATIONS:

- CONSTRUCTION
  - Pilings
  - Caissons
  - Footers
  - Curtain Walls
  - Drilled Shafts
- OIL / GAS
  - Conductor Pipe
- UTILITY CONSTRUCTION TECHNOLOGY
  - Horizontal Directional Drilling (HDD)
  - Utility Pole Holes
- MINING
  - Access and ventilation shafts
  - Slot raises and burn holes

# MODELS AND APPLICATIONS

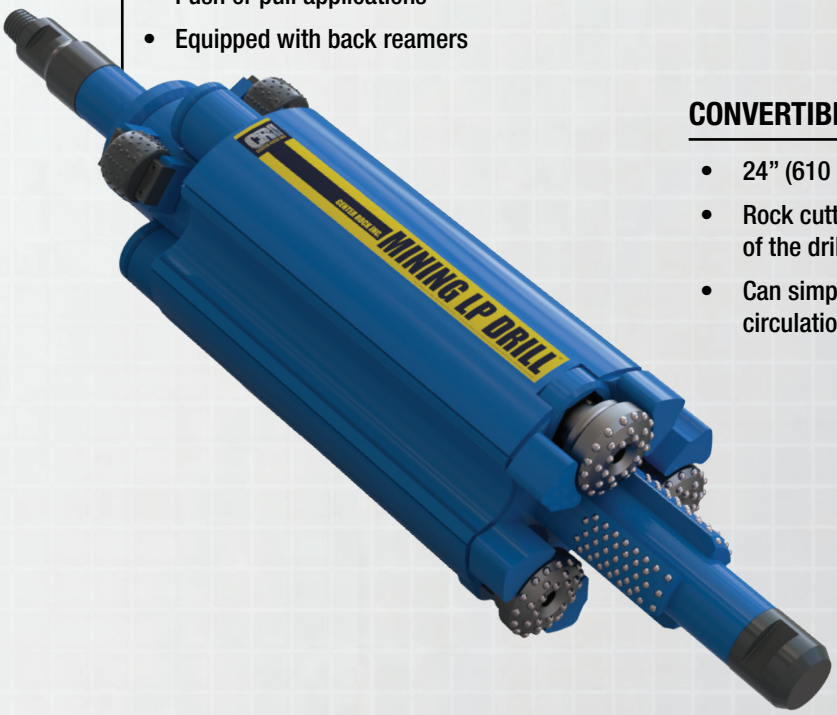
## HDD LP PULL REAMER




- 12” (305 mm) and larger in diameter
- Capable of trailing drill pipe
- Equipped with back reamers
- Side protection carbide buttons for extended wear

## MINING LP DRILL

- 24” (610 mm) and larger in diameter
- Push or pull applications
- Equipped with back reamers




## CONVERTIBLE LP DRILL

- 24” (610 mm) and larger in diameter
- Rock cuttings pickup point is at the base of the drill (yellow arrows)
- Can simply be converted between reverse circulation and direct circulation style


## UTILITY LP DRILL

- 18” (457 mm) and larger in diameter
- Hex pin connection
- Low air consumption
- Shorter length for low clearance
- Lightweight design
- No shock sub required

| STANDARD SIZE LP DRILL SPECIFICATIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LP FULL FACE DRILLS | | | | | | | | |
| SIZE | | NUMBER OF HAMMERS | MINIMUM AIR REQUIRED | | RECOMMENDED AIR REQUIRED | | WEIGHT WITH THE CALYX | |
| INCHES | MM | | SCFM | $M^3$/MIN | SCFM | $M^3$/MIN | LBS | KG |
| 24 | 610 | 4 | 1600 | 45 | 2000 | 57 | 3250 | 1474 |
| 25 | 635 | 5 | 2000 | 57 | 2500 | 71 | 3500 | 1587 |
| 26 | 660 | 5 | 2000 | 57 | 2500 | 71 | 4000 | 1814 |
| 28 | 711 | 5 | 2000 | 57 | 2500 | 71 | 4200 | 1905 |
| 30 | 762 | 5 | 2000 | 57 | 2500 | 71 | 4700 | 2131 |
| 32 | 813 | 6 | 2400 | 68 | 3000 | 85 | 5500 | 2494 |
| 33 | 838 | 6 | 2400 | 68 | 3000 | 85 | 6000 | 2721 |
| 34 | 864 | 6 | 2400 | 68 | 3000 | 85 | 6200 | 2812 |
| 35.5 | 900 | 7 | 2800 | 79 | 3500 | 99 | 6500 | 2948 |
| 36 | 914 | 7 | 2800 | 79 | 3500 | 99 | 6800 | 3084 |
| 41.5 | 1054 | 7 | 2800 | 79 | 3500 | 99 | 8300 | 3764 |
| 42 | 1067 | 7 | 2800 | 79 | 3500 | 99 | 8500 | 3855 |
| 48 | 1219 | 10 | 4000 | 113 | 5000 | 142 | 10700 | 4853 |
| 53 | 1346 | 12 | 4800 | 136 | 6000 | 170 | 12700 | 5760 |
| 58 | 1473 | 13 | 5200 | 147 | 6500 | 184 | 14900 | 6758 |
| 60 | 1524 | 13 | 5200 | 147 | 6500 | 184 | 16500 | 7484 |
| 66 | 1676 | 15 | 6000 | 170 | 7500 | 212 | 17250 | 7824 |
| 72 | 1829 | 17 | 6800 | 193 | 8500 | 241 | 19700 | 8935 |
| 84 | 2134 | 19 | 7600 | 215 | 9500 | 269 | 23000 | 10432 |

*LP Hole Openers: Sizes up to 144" (3658 mm)*

* *Recommended Operating Pressure: 150-250 psi (10.3-17 .3 bars) (NOTE: With a head of water, greater air pressure may be required)*

# OTHER PRODUCTS

## HYDRO-JAW® BREAKOUT SYSTEMS (1200 and 2400)


The Hydro-Jaw® breakout machines use a heavy-duty chain-link jaw design to quickly breakout or make-up bits, DTH hammer joints, and other API tool connections to keep your operation running smoothly. Powered by a Honda 5.5 or 8 horsepower gasoline engine linked to a single-stage hydraulic pump, the Hydro-Jaw® is portable and easily moved around the job site. It is designed to safely operate in the horizontal or vertical position. A lifting eye and forklift slots make it easy to load and unload. Electric units are also available in 230 volt single phase and 230 or 480 volt 3 phase. Both units run quieter, with no exhaust fumes and with less vibration than the gas or diesel models. With its excellent power and adjustability, the Hydro-Jaw® is ideal for breakout / makeup in a wide range of drilling applications.


| HYDRO-JAW® SPECIFICATIONS | | | | |
|---|---|---|---|---|
| | HYDO-JAW® 1200 | | HYDRO-JAW® 2400 | |
| | IMPERIAL | METRIC | IMPERIAL | METRIC |
| Standard Range | 5.5 in. O.D. to 12 in. O.D. | 14 cm O.D. to 30.5 cm | 12 in. O.D. to 16 in. O.D. | 30.5 cm O.D. to 40.6 cm |
| w/Optional Jaw Package | 3 in. O.D. to 5.5 in. O.D. | 7.6 cm O.D. to 30.5 cm | 8 in. O.D. to 12 in. O.D.<br>16 in. O.D. to 22 in. O.D. | 20.3 cm to 30.5 cm<br>40.6 cm to 55.9 cm |
| Weight | 1500 lbs | 680.4 kg | 2400 lbs | 1088.6 kg |
| Shipping Weight | 1900 lbs | 861.8 kg | 2700 lbs | 1224.7 kg |
| Length (without handle) | 51 in. | 129.5 cm | 72 in. | 182.9 cm |
| Length (with handle) | 69 in. | 175.3 cm | N/A | N/A |
| Height | 50 in. | 127.0 cm | 60 in. | 152.4 cm |
| Width | 32 in. | 81.3 cm | 48 in. | 121.9 cm |
| Breakout Torque | 60,000 ft. lbs | 8,295 kg - m | 175,722 ft. lbs | 24,294 kg - m |
| Make-up Torque | 50,000 ft. lbs | 6,913 kg - m | 125,136 ft. lbs | 17,301 kg - m |

## HAMMER HONEY® ECO


Center Rock's specially formulated Hammer Honey® ECO is a readily biodegradable and environmentally friendly, premium rock drill oil. Hammer Honey® ECO provides an excellent balance of tackifiers, emulsibility, and corrosion protection that makes it uniquely suited for demanding down-the-hole applications. Hammer Honey® ECO's unique extreme-pressure additives prevent steel-on-steel galling and burning of hammer parts and bits that can lead to catastrophic failure.

## HAMMER HONEY® ROCK DRILL OIL

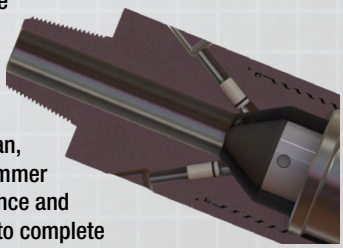

Center Rock's Hammer Honey® is a specially formulated premium rock drill oil. Hammer Honey® provides a great balance of tackifiers, emulsibility, and corrosion protection that makes it uniquely suited to demanding down-the-hole applications. But that's not all, Hammer Honey's® unique extreme-pressure additives prevents steel-on-steel galling and burning of hammer parts and bits that can lead to catastrophic failure. Center Rock stands behind any Center Rock hammer part that fails from a frictional-induced crack when using Hammer Honey®.

## OIL/CHEMICAL INJECTION SYSTEMS

The oil injection system is a self contained, air-actuated, positive displacement system. It comes equipped with either a seven gallon reservoir with sight glass infinitely variable from 0-1 GPH or a 22 gallon reservoir with sight glass infinitely variable from 0-4 GPH.

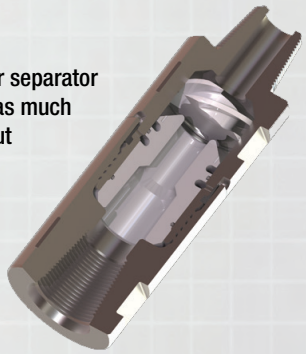

## JETTED BACKHEAD

Center Rock's jetted backhead is one of the simplest and most reliable on the market. Incorporated into the existing check valve system of CRI's CR80, CR88, and CR120 hammers, the jetted backhead does not require additional check valves or over-the-hammer subs that complicate your down-hole assembly. When you need extra air to keep your holes clean, the jetted backhead will maintain hammer power while giving you the performance and flushing requirements and reliability to complete your project.



## HYDRO CYCLONE

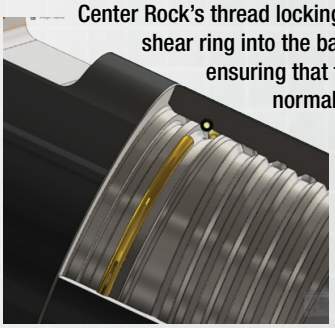
The Center Rock Hydrocyclone is a water separator that allows drilling contractors to inject as much water needed for a clean hole but without the downside of rising pressure and lost productivity. The Hydrocyclone sub separates and expels water from compressed air before it even enters the hammer.



## CAN ROD & HAMMER SHROUD

Center Rock's can rods and hammer shrouds are used to fill the annular space between the hole being drilled and the drill tools to increase up-hole velocity for hole cleaning instead of adding additional air compressors.

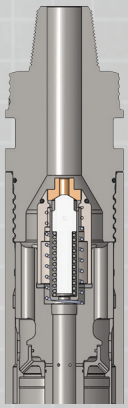
## THREAD LOCKING SYSTEM



Center Rock's thread locking system integrates a non-ferrous shear ring into the backhead and chuck connections, thus ensuring that the threads do not loosen during normal drilling operations. Available on our CR-88 hammer models, the locking ring is sheared off during hammer servicing with a breakout torque of roughly 30,000 ft-lb. This safety feature ensures that the threads loosen only when you want them to, not when the tool is downhole.

## PRESSURE CONTROL CHECK VALVE (PCCV)

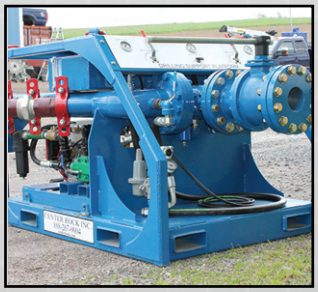
The PCCV allows the hammer setup to be optimized for dry drilling, while also allowing air bypass to be opened as downhole pressure builds. The PCCV opening pressure and opening flow can be adjusted for desired conditions. Therefore, with the PCCV, there is no loss in performance due to bypassing air in dry conditions and no risk of excessive standpipe pressure if water is encountered. The PCCV valve gives you the ability to truly maximize your productivity from spud to TD.



## MOBILE WORK SHOP

Custom designed 20’ and 40’ mobile workshops as an on-site solution for servicing and maintaining your DTH hammers and bits. The mobile workshop offers a comfortable, climate controlled environment with your safety in mind featuring an explosion proof exhaust fan, an overhead bridge crane for safe lifting, and ergonomic work stations.

## DRILLING SUPPORT PLATFORM



Designed with safety and productivity in mind, Center Rock’s Drilling Support Platform has all the accessories to support your onsite drilling program. It includes an air manifold with (6) 3” inlets and (1) 4” outlet, a 20 gallon oil injection system, a water injection system for dust suppression, and pressure gauges.

118 Schrock Drive
P.O. Box 307
Berlin, PA 15530

Phone: 814.267.7100
Fax: 814.267.6382

www.centerrock.com

DRILL FASTER  RUN HARDER  WORK SMARTER

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