



# MINING & CONSTRUCTION

MECHANIZED ROCK EXCAVATION WITH ATLAS COPCO - NO. 1 / 2014

A close-up photograph of a man wearing safety glasses and a dark t-shirt, looking intently at a large, highly reflective metal component. The lighting is dramatic, highlighting the textures of the metal and the worker's face.

## Good as new

- Atlas Copco remanufacturing brings used components back to OEM specifications

ANCHOR DRILLING \* LINE DRILLING \* CONEXPO-CON/AGG

*Atlas Copco*

“

You can be confident that we will provide a quality product”

## Reman, Service Exchange, Repair & Return



In this issue of **M&C**, you will read about something I'm particularly proud of—our approach to the aftermarket opportunity commonly referred to as “reman” or “remanufactured.” In my 25 years in the industry, I've noticed many different approaches to reman, and I think we excel in our approach.

At Atlas Copco, we refer to reman as a fixed-price, off-the-shelf component that has been rebuilt by a certified, trained technician to new OEM specifications using genuine OEM parts. The customer is required to provide the replaced/failed component, or “core,” to recover a core charge and complete the transaction.

In addition to reman we offer a slightly different option called Service Exchange. We provide the customer a replacement reman component, and the customer pays only the actual cost of repairing the returned core.

Finally, we have the more common Repair & Return service, which may range from a total OEM remanufacture of the failed component to a repair process in which some parts can be reused.

Why is the availability of these offerings important? At Atlas Copco, we have listened to our customers. That's why we offer different models of reman solutions.

You can be confident that we will provide a quality product, as an original equipment manufacturer. We are constantly tailoring our product portfolio to meet our customers' needs, and our extensive research ensures we are properly positioned from a price point perspective.

Please call one of our helpful customer service reps at a local company-owned store or an authorized independent distributor. Or call 800-732-6762 to see how we can meet your surface or underground application requirements.

Thanks for your business.

**Dave Pietrzykowski**  
VP Parts & Service

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## M&C USA A MAGAZINE FROM ATLAS COPCO MINING, ROCK EXCAVATION AND CONSTRUCTION LLC

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## INTRODUCING A NEW 18-METRIC TONNE LHD WITH BEST-IN-CLASS VISIBILITY

■ The Atlas Copco Scooptram ST18, an 18-tonne capacity underground load-haul-dump rig for development work and production mining, is now available. The Scooptram ST18 works well with the 60-tonne Minetruck MT6020 and completes Atlas Copco's range of underground LHDs in this segment.

The optimized bucket and unique boom design with load-sensing hydraulics and variable displacement pumps increase capacity and speed. Combined with the

Atlas Copco Rig Control System that monitors, supports and controls all aspects of the operation, the ST18 provides better muck pile penetration, less wear and tear on the machine and an overall faster and more productive loading cycle.

- Automatic ride control and automatic declutch increase the lifespan and reduce spillage
- Automatic traction control reduces tire wear and fuel consumption
- Soft stops on the boom, bucket and steering reduce daily wear and tear
- Safety features include an automatic brake test, protection guards, three-point access system, boom lockup, fire suppression systems and a machine protection system
- Visibility is best in class even toward the rear
- Radio remote control or semi-autonomous control available

## REVERSE CIRCULATION KIT FOR THE DM45 AND DML MID-RANGE BLASTHOLE DRILLS

■ Atlas Copco continues to expand its blasthole product offering with the addition of the reverse circulation (RC) kit for the DM45/50 midrange blasthole drill. The RC kit is designed to meet the demands of today's expanding mining market by offering the added dimension of in-pit grade control.

A number of components are included with the optional kit, which can also be retrofitted on drills currently in the field.

The cyclone arm allows for sampling from the ground or platform level, with a vertical raise and lowering function. A 17-gallon dump box, with a steep cone for limiting sample hang up, is part of the sample collection feature. The primary and duplicate ports can easily be adjusted from 4 to 15 percent. The Reverse Circulation Carousel has four 4 ½-inch rod cups and offers a 145-foot maximum onboard capacity.

The DM45 and DML RC drill diameters range between 4 ½ inches to 5 ¾ inches, and also offers a 145-foot depth onboard capacity.

## WHERE TO FIND US

Please contact your nearest Atlas Copco Customer Center. Visit the store website to see regional news and product information focused to its location.

STATE	CITY	PHONE	WEBSITE
GA	Atlanta	888-762-3745	<a href="http://www.atlascopco.us/atlanta">www.atlascopco.us/atlanta</a>
MD	Abingdon	410-485-3366	<a href="http://www.atlascopco.us/abingdon">www.atlascopco.us/abingdon</a>
PA	Clarks Summit	800-950-1049	<a href="http://www.atlascopco.us/clarkssummit">www.atlascopco.us/clarkssummit</a>
CO	Denver	866-466-9777	<a href="http://www.atlascopco.us/denver">www.atlascopco.us/denver</a>
NV	Elko	775-777-2204	<a href="http://www.atlascopco.us/elko">www.atlascopco.us/elko</a>
TN	Knoxville	888-339-0344	<a href="http://www.atlascopco.us/knoxville">www.atlascopco.us/knoxville</a>
MA	Ludlow	413-589-7439	<a href="http://www.atlascopco.us/ludlow">www.atlascopco.us/ludlow</a>
FL	Miami	954-977-1041	<a href="http://www.atlascopco.us/miami">www.atlascopco.us/miami</a>
WI	Milwaukee	414-760-1193	<a href="http://www.atlascopco.us/milwaukee">www.atlascopco.us/milwaukee</a>
TN	Nashville	615-641-3000	<a href="http://www.atlascopco.us/nashville">www.atlascopco.us/nashville</a>
AZ	Phoenix	623-780-0200	<a href="http://www.atlascopco.us/phoenix">www.atlascopco.us/phoenix</a>
CA	Sacramento	877-236-0415	<a href="http://www.atlascopco.us/sacramento">www.atlascopco.us/sacramento</a>
CA	Temecula	760-599-9299	<a href="http://www.atlascopco.us/temecula">www.atlascopco.us/temecula</a>
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# *As good as* **NEW**



## Remanufacturing meets a need to lower operational costs and gives new life to used components

In multiple locations around the world, Atlas Copco's Mining and Rock Excavation Service division (MRS) has been investing in both new and existing service centers focused on providing remanufactured components for customers.

At a time when mining companies are looking to increase rig availability and lower total operation cost, this is an excellent way to maximize assets and provide cost flexibility to customers.

Atlas Copco's Reman Center Garland (RCG), located in Garland, Texas, is the flagship location for remanufacturing equipment components. Processes and procedures developed in Garland are a model for the new standardized processes around the world.

RCG is the main North American facility for remanufacturing Atlas Copco Drilling Solutions machine components. Elko, Nevada, and Sudbury, Ontario, also have remanufacturing facilities to provide multiple services for Atlas Copco machines.

**THE GARLAND FACILITY** has come a long way since its startup in 2009. After a 24,000-square-foot expansion in 2012, the Center's current 40,000-square-foot facility is now equipped with state-of-the-art tools and testing equipment, including Atlas Copco's industrial tools and hydraulic testing tools. In its five work bays, RCG remanufactures rotary heads, air ends, pumps, motors and cylinders. Customers benefit from high off-the-shelf availability of these components.

RCG also allows customers to bring in their own components for repair as needed, or customers can send their idle components back to get credit. These flexible



**SYLVIA HAVRE-CARTER**  
*Reman Center Garland  
Operations Manager*



**BILL XUAN**  
*Marketing Manager,  
Atlas Copco Reman Solutions*

business models make it easier for customers to choose the service that best fits their needs.

Components sent to RCG are first evaluated for their suitability as remanufacturing candidates. Each component that qualifies for reman goes through a specific 15-step process that includes inspection, disassembly, cleaning, upgrading, parts replacement, assembly and testing. Each component leaving the RCG will have an OEM quality certificate and traceable information, including serial number, parts numbers and inspector signatures.

Each component stays in the Atlas Copco system throughout its life. RCG Operations Manager Sylvia Havre-Carter said, "We've had components come in here multiple times. As long as we have a quality core, we can return it to original condition with our highly qualified technicians following our strict processes."

The RCG remans each component to its latest engineering specifications, ensuring the component is brought up to current OEM specifications with the latest factory upgrades.

The RCG uses high-end Tensor electronic assembly tools along with barcode-embedded work orders. Interactive software tracks and controls specifications of work performed, ensuring that everything meets OEM specifications, even how each bolt is tightened.

**ONCE ASSEMBLED**, products are rigorously tested on state-of-the-art test benches. Havre-Carter said, "With knowledgeable OEM-certified technicians using advanced

This rotary head from a Pit Viper 351 drill rig will be completely restored and reassembled using new genuine parts and applying the latest engineering specifications and factory upgrades.



**(left) The remanufacturing process begins with cleaning all components before moving through the five work bays. The procedures and processes developed in Garland set the standard for Atlas Copco Reman Centers worldwide.**



teed remanufactured components along with continued service creates harmony in using Atlas Copco equipment.”

Remanufacturing Solutions is an effort to offer customers smart and sustainable options for service. Service is flexible and can be tailored to each customer’s needs, whether it is 24-hour tech support, routine maintenance, repairs, remanufacturing or service programs that use Atlas Copco’s expertise to manage equipment fleets.

“Our goal is to be flexible in how we help customers and share knowledge,” Xuan said. “Atlas Copco understands customer operations and their industry, and how to maximize performance of their equipment. Atlas Copco’s technicians at the mine can monitor the part’s life from installation to removal. Scheduled replacement means there is no downtime outside routine maintenance. We can look ahead for optimum planning for the customer or just provide service as needed.”

Havre-Carter said that the customer can realize 30 to 50 percent savings using remanufactured components versus new components. Considering labor, fuel consumption, logistics and inventory costs, customers realize more value from Atlas Copco remanufactured components.

“We are continually focusing on improvements to our processes. Each technician has years of experience working on these components, and the step-by-step processes we’ve put in place only make us better as a team,” Havre-Carter said.

Havre-Carter wanted customers to know Atlas Copco cares about the process every step of the way. “Our team takes ownership of each component, and we are committed to the quality we send through the door.” ■

equipment, along with our assurance processes, we certainly deliver quality. We guarantee genuine OEM parts will be used on remanufactured components while offering a warranty that exceeds the Atlas Copco standard warranty.”

Bill Xuan, who is the product manager responsible for Atlas Copco Reman Solutions, oversees the global roll-out process. He pointed out the greatest cost related to customers’ productivity is downtime. “Being down greatly out-

weighs the cost of the component itself, and a remanufactured component is even more cost effective with at least the same quality level as new. Having remanufacturing solutions for our customers allows them the peace of mind that major components are always available off the shelf.”

That is only the start of the benefits, Xuan said. “Having a single-source supplier and OEM-guaran-

# HARD ROCK

Paving company uses Atlas Copco  
**Powercrusher PC3** to ramp up  
recycled asphalt stockpiles

# *to rap*

**F**or decades asphalt has been one of the most commonly recycled materials, with reclamation rates as high as 95 percent. The Hoover Inc. paving division of LaVergne, Tenn., likes to keep plenty of reclaimed asphalt pavement (RAP) on hand and will stockpile several years' worth in advance to keep it

readily available. A paving company's investment cost in processing RAP from waste to a salable commodity assures regulators that it is destined for reuse. Therefore, Tennessee regulations will allow an asphalt company to stockpile 10 to 20 percent more RAP material, depending on the plant's mix ratio, when the asphalt is first consistently crushed

and screened to a maximum acceptable reduction, which in this case was  $\frac{3}{8}$  inch minus.

Hoover has its own crushers at its Lebanon plant and quarry, but it wanted to expand its capabilities with a portable crusher to help tackle a scheduled 14-month surge in RAP production for its stockpiles. ▶





Salesman Stacy Lynn of the Atlas Copco–Nashville store connected Hoover with a portable [Atlas Copco Powercrusher PC3](#) impact crusher and Atlas Copco HCS 5515 screen.

In the first four months, the setup had already contributed 120,000 tons to Hoover's RAP reserves without a hitch.

Hoover maintenance technician Jessie Carney was impressed that the Powercrusher PC3 was doing so well: "I'm surprised it could go through all that we've fed it."

Eric Amberson, Atlas Copco's product line manager for Powercrushers in the U.S., said the PC3 does well with abrasive material such as RAP because it was designed as a primary crusher.

However, its high throughput rate begins before the box, at the vibratory hopper and conveyor feed. Fines are sifted down to the bottom and through its grizzly onto the main conveyor, significantly decreas-



**ERIC AMBERSON**  
*Powercrusher Product Manager*



**THOMAS LOVVORN**  
*Hoover Paving Superintendent*



**TOM HOOVER JR.**  
*Hoover Paving Manager*

ing the volume of abrasive material entering the chamber and bypassing the crusher box altogether.

The geometry of the box itself, Amberson said, is that of a primary crusher. The PC3 crushing chamber's capacity is created by its swing beams' relationship to its rotor, which allows for larger feed sizes. The feed inlet is 4 feet by 2 feet 4 inches.

These factors combine to make the PC3 an effective crusher of highly

abrasive RAP. Amberson said, "It has a 250-ton per hour throughput rating, even at the reduction ratio an asphalt plant needs: for instance,  $\frac{3}{8}$  inch minus."

The rating is based on actual 100 percent reduction throughput, not just an input rate or free-flow output rate, which Amberson noted should be considered during manufacturer comparisons.

At the Lebanon site Hoover is





keeping RAP to less than  $\frac{3}{4}$  inch by running the PC3 with a  $\frac{5}{8}$ -inch top screen and  $\frac{9}{16}$ -inch bottom screen. Thomas Hoover Jr., grandson of founder Ephraim Hoover and the paving division operations manager, said Hoover was seeing a production average of 200 tons an hour, though he added, “At times we’ve seen 350 tons an hour. That’s the difference between wet and dry. Moisture slows it down. It has been really wet the past few weeks.”

Asphalt also has an inherent tendency to cake on the screens, which worsens with heat and moisture. The HCS 5515 screen is adjustable to accommodate these material characteristics. Thomas Lovvorn, Hoover’s paving superintendent has occasionally run a batch of rock from the quarry through the PC3. “Cleans it right up,” he said.

He spread his hands about 2 feet apart to indicate the size of stone that was

dropped in the hopper. “It will take big rocks. Whatever you put in it is going to get ground,” he said. This gives Hoover the versatility to produce aggregate as well as RAP.

The PC3 is powered by a 385 hp engine. Though diesel fuel had been in the \$4 range, Hoover and Lovvorn believed the cost of operating the crusher to be reasonable. The PC3 consumed about 12 gallons per hour totaling 75 gallons per 10-hour shift. The screener ran on 20 to 30 gallons of fuel per shift.

Hoover planned to have the Powercrusher PC3 for about 14 months, during which time Atlas Copco would provide preventive maintenance and be on call if a problem should arise. Hoover said the stockpile is expected to last them up to five years, depending on future project demands. ■

## ABOUT HOOVER INC.

**EPHRAIM HOOVER JR.**, a freight transportation provider, established Hoover Inc. in 1955. At that time President Eisenhower’s vision of an interstate highway system was just getting started. Ephraim’s company had all the orders it could fill. In the beginning, these were crushed stone orders for concrete, asphalt paving and grading. The crushed stone operation continues today but is joined now by Hoover’s own paving division. The paving division and its 300 employees provide municipal, state and federal construction services such as grading, drainage, asphalt paving, base and surface construction, pavement marking and striping from five locations in three states. Hoover also serves its commercial and industrial customer needs with building, mechanical, electrical, demolition, sewer and water line installation services.

Three of Hoover’s hot mix asphalt plants are located in Tennessee and have their own quarries. Two more plants are located in Mississippi and Alabama.

# DRILLING IN A *new direction*

Repair of flood damage at Cumberland River Park calls for creative application of a Hütte 504 drilling rig's unique ability to drill 45° beneath itself



“

**The Hütte 504 was the only drill its size with the power we needed, and it was the only drill we could find that could drill at this great an angle under its own tracks.”**

Eric Snyder, GeoFirma Owner



**T**ennesseeans know it as Nashville's Thousand Year Flood, the deluge brought on by a saturated weather front when it stalled over Central and Western Tennessee in early May 2010. It dropped up to 20 inches of rain in the span of only a few days.

It took weeks for the region's affected watersheds to drain themselves. Rivers such as the Cumberland hit all-time records for cresting and flooding. Downtown, along what had been the Cumberland's steep banks, railroad tracks lay more than 6 feet under. And in Nashville the Grand Old Opry's famous stage was 46 inches underwater.

Three years later, some restoration projects were still dealing with the damage. One was the retaining wall repair for Cumberland River Park, a new visitor site and playground along the shoreline between Titans Stadium and the Korean War Veterans Memorial Bridge. The wall had been pushed out and now

was leaning over the river. The ground it had been holding back to support a scenic overlook was sinking into the gap. To fix it, general contractor Blakley Construction Services, of Brentwood, Tenn., teamed up with GeoFirma, a Nashville-based contractor specializing in municipal and commercial geotechnical projects.

Michael Thomas, co-founder of Blakley Construction Services, explained GeoFirma's role in the repair. Blakley had installed new sheet piling, but before cutting away the damaged retaining wall, GeoFirma was to drill and grout three stranded cable anchors 105 to 120 feet in drilling length, at 45 degrees into the bank, ensuring at least a 20-foot socket in the bedrock for additional stability in the new retaining system.

**GEOFIRMA OWNER** Eric Snyder found a way to avoid the substantial time and cost that would have been invested in building a drilling platform in the river. If he could locate a compact yet pow-

erful crawler drill rig, he could drive it onto a temporary deck that would bridge the gap between the old and new piling.

Sales rep Stacy Lynn of the Atlas Copco-Nashville store matched up Snyder with a Hütte HBR 504 hydraulic crawler drill and a 7 5/8-inch [Atlas Copco Symmetrix simultaneous drilling/casing advancement system](#) with Secoroc QL 60 down-the-hole hammer. An Atlas Copco XRVS 1000 portable compressor fed air to the hammer at 1,000 cfm and 180 psi.

Snyder said: "The Hütte 504 was the only drill its size with the power we needed, and it was the only drill we could find that could drill at this great an angle under its own tracks. We wanted to work from a bridge between the old sheet piles and the new. If we had tried to mount a drill to an excavator, we would easily be over 50,000 pounds. We'd have had to build a platform in the river to work from. The cost on that would have been exorbitant." ▶

From its perch atop a 20-foot-long platform spanning the gap between new and old sheet piling on the banks of the Cumberland river, the Hütte HBR 504 sits ready to drill the first of three 105-foot anchors. It was the only drill in its size with the power GeoFirma needed for the job—as well as the only drill GeoFirma found that could drill at a 45-degree angle back under itself.



Although the Hütte weighs only 33,000 pounds and measures just 6 feet 9 inches wide, it still has 11,500 pounds of crowd force, 22,500 pounds of extraction force and more than 21,000 foot-pounds of torque.

**SOIL CONDITIONS BEHIND** the sheet piling consisted of river rock and pebbles of various sizes the first 85 feet. After cutting a hole in the old piling at the entry point, GeoFirma covered it temporarily with plywood to prevent cavitation. Snyder and his crew then went to work.

GeoFirma used the Symmetrix system to drill 7 5/8-inch threaded casing through 85 feet of unconsolidated ground and then 20 feet into bedrock. Then GeoFirma inserted stranded anchors into the socket and cemented them with neat Portland grout simultaneously with casing withdrawal. Snyder explained that he kept a 10-foot head on the cement in the casing as he withdrew it.

The unusual drilling angle made the casing and rod connections a unique challenge. In vertical drilling, Snyder said, he would simply have used the

winch to position sections of rod and casing. Instead, Snyder and Lynn devised a sling system to put each nested pair of 6.5-foot 3 1/2-inch drill pipe and 7 5/8-inch casing in place.

“We knew going in it was an ambitious project,” Snyder said. “There was concrete to go through, man-placed river gravel fill, then saturated silt and ultrafine flowing sands before hitting rock. Not to mention, between the pilings, you have that 20 feet of unsupported drill string before you start drilling.”

Snyder said that without a simultaneous drilling and casing advancement

system he would have either put a roller cone or drag bit in front of the casing, “but using Elemex or Symmetrix made the most sense. We’re penetrating the unknown without significantly disturbing it.”

As for choosing Atlas Copco over competitive versions of Elemex and Symmetrix, he said, “We did consider similar systems, but truthfully, I didn’t think they’d hold up.”

Snyder had started with Elemex and probably would have finished with it, he said, but Symmetrix was faster due to its slightly different configuration. Symmetrix’s bit protrudes farther than the ring bit. Elemex, which is designed for ultimate control of air, has its bit tucked back inside the ring bit.

When Atlas Copco representatives suggested he try Symmetrix, Snyder found that Symmetrix worked best for him in the complicated ground conditions, and he appreciated having that choice.

**SYNDER EMPHASIZED** that his confidence to take on such difficult projects comes from customer support. Snyder first met Lynn four years ago. “I was looking for a local source for all my geotechnical equipment and supplies: top hammer drills, hollow MAI bar, everything. That’s when I met Stacy. Atlas Copco has been integral in the growth of our company. They’ve introduced us to new drilling techniques. On jobs where it was questionable which technique would be the best choice, they acted as consultants.

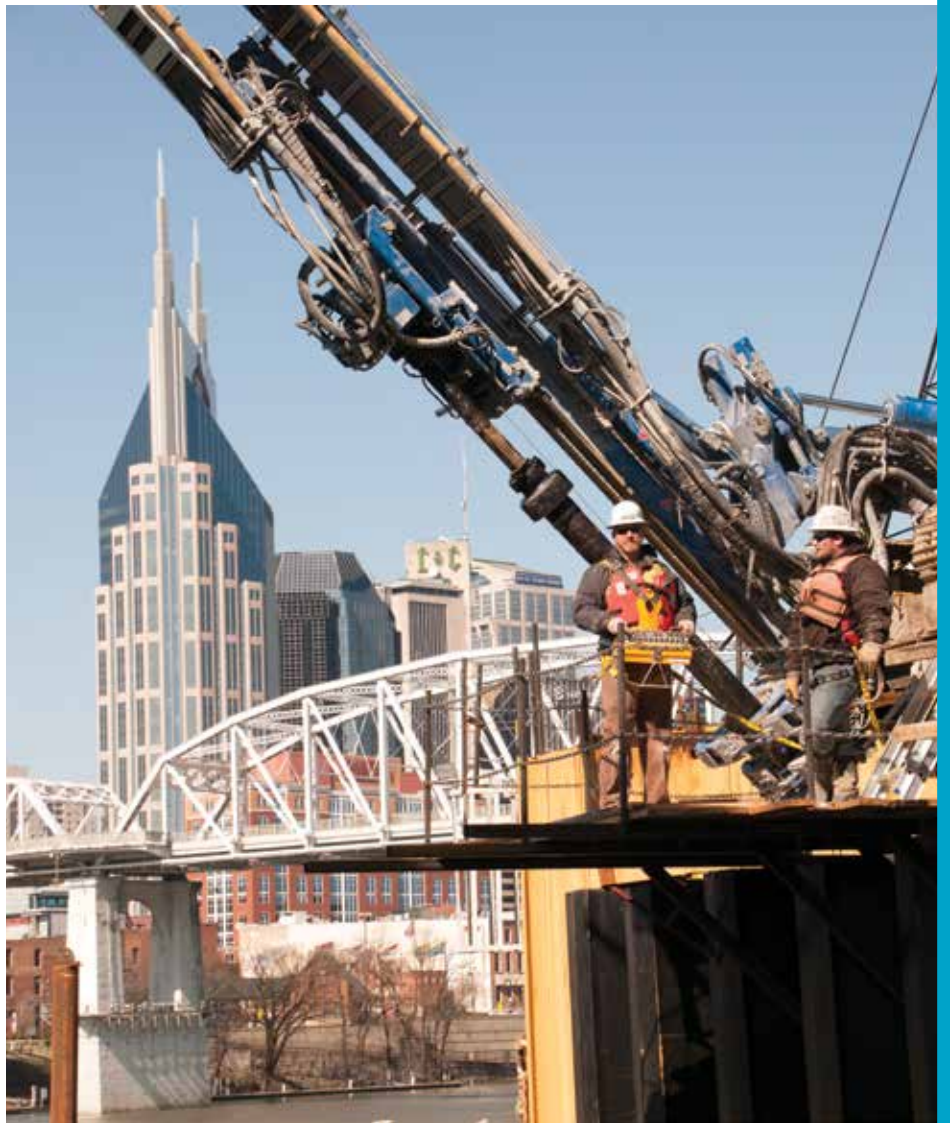
“Support from Atlas Copco is second to none. In this day and age, in this economy, customer service is everything. When I needed hammer service, I just dropped it off at the end of the day. They stayed late, tore it down, cleaned it and had it back together ready for me in the morning. And it wasn’t just local support. Due to the difficulty of this job, they flew in a Symmetrix expert twice, as well as the top Hütte representative.”

Snyder said GeoFirma bought the Symmetrix system and QL 60 hammer and he was impressed enough with Hütte to purchase one. ■



(above) Stacy Lynn, of the Atlas Copco–Nashville store, is on site as GeoFirma owner and driller Eric Snyder begins the first of three 105-foot anchors. The anchors consist of stranded cable grouted into a 20-foot rock socket in the Cumberland River Park Stabilization Project at the park’s scenic overlook.

(below) The morning sun greets both the Music City skyline and the Hütte 504.





# Rock *star*

Rock Buggy line drills famous Stony Creek granite in Stony Creek, Conn.

**A**fter more than 150 years of operation, Stony Creek dimensional stone quarry has become just as famous as the sites that bear its stone. In fact, its distinctive granite, sought for its attractive appearance and robust characteristics, can be found at Grant's Tomb, Grand Central Terminal, the Statue of Liberty, the Smithsonian Institute, the Brooklyn Bridge and countless corporate headquarters and government buildings, libraries, colleges, landmarks and memorials. The West Point Battle Memorial was carved from a single seamless slab 20 by 50 feet long. At 150 tons, it is regarded as the largest single granite monolith in the Western Hemisphere.

Although it is used for new construction, the stone is also used for matching to existing repairs and additions to buildings and bridges. Richard Atkinson, Stony Creek's quarry superintendent, said it is one of the best features of using the quarry's product. "Take the Bulkeley Bridge project in Hartford, where some of the original stone was quarried in the early 1900s. During a recent rehabilitation project of the bridge, remnant blocks were found in the river that sat below the water for many years and were incorporated into a current project along with stone quarried just a year ago. You can't tell the difference."

**WITH TODAY'S MODERNIZED** machinery and stone-cutting techniques, Atkinson said the company has the capacity to supply as much

**Quarry staff include (from left) Richard Atkinson, Stacy Mancini, Tom Hixon and Darrell Petit.**

stone in one month as would have taken the original quarrymen three years to supply. One of those is a quarry-specialized mobile rock drill called the Rock Buggy.

In addition to its drill mast, it has an 11-foot drilling rail to ensure perfectly spaced holes required for precision line drilling, with the goal of having perfectly squared product, yielding minimal waste.

Stony Creek acquired it from Perfora, the original manufacturer, as ownership changed back in 2007. When Atlas Copco announced its acquisition of Perfora, which is called Stonetec in the U.S., he said he felt relief. During his 31 years with the quarry, Atkinson said Stony Creek was using Atlas Copco's manual rock drills. He knew they had local customer centers and could provide immediate technical support.

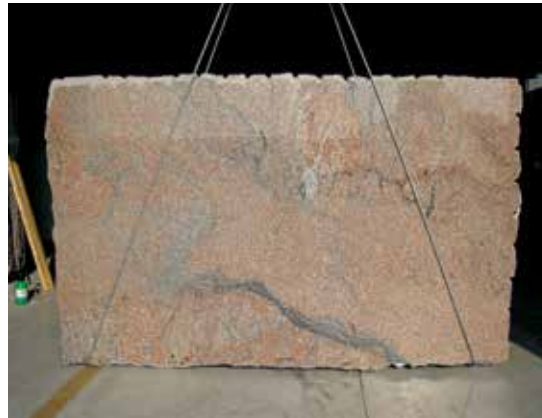
**STONY CREEK COUNTS** on the Rock Buggy for the second and final stages of dimensional stone production: bench and block dressing, though it is also involved in primary cutting as well.

The first operation is to separate out a section of the bench about 100 feet long, 15 to 18 feet high and 21 to 25 feet deep. This is initiated the same as it has been done for years, by fire-blasting a groove at the ends of the 100-foot-long block with a rock-cutting torch.

The granite, which was formed in a molten state, flakes away under the torch's force. This technique may soon give way to an Atlas Copco diamond wire cutting machine the quarry just finished demoing, the SpeedCut. "Just about everyone is going to wire sawing," Atkinson said. "They're a lot more fuel efficient, a lot quieter, and dust control is much better."

Then the block is vertically and horizontally drilled. For the most part the only time Stony Creek uses blasting is to split the stone from the formation, also known as the primary shot.

Blastholes are charged with primacord that provides the energy required



**Stony Creek granite slab**



**Stony Creek granite block**

to pop the webbing between holes in the rock but also provides some cushion, Atkinson said. "We're talking very controlled blasting here. It's not like blasting to move overburden."

A comparison might be the tap given to scored glass to get a quick, clean separation along the burn. The bump to the granite must be hard enough to get a clean break but light enough not to cause any fractures in either the block or the rest of the bench.

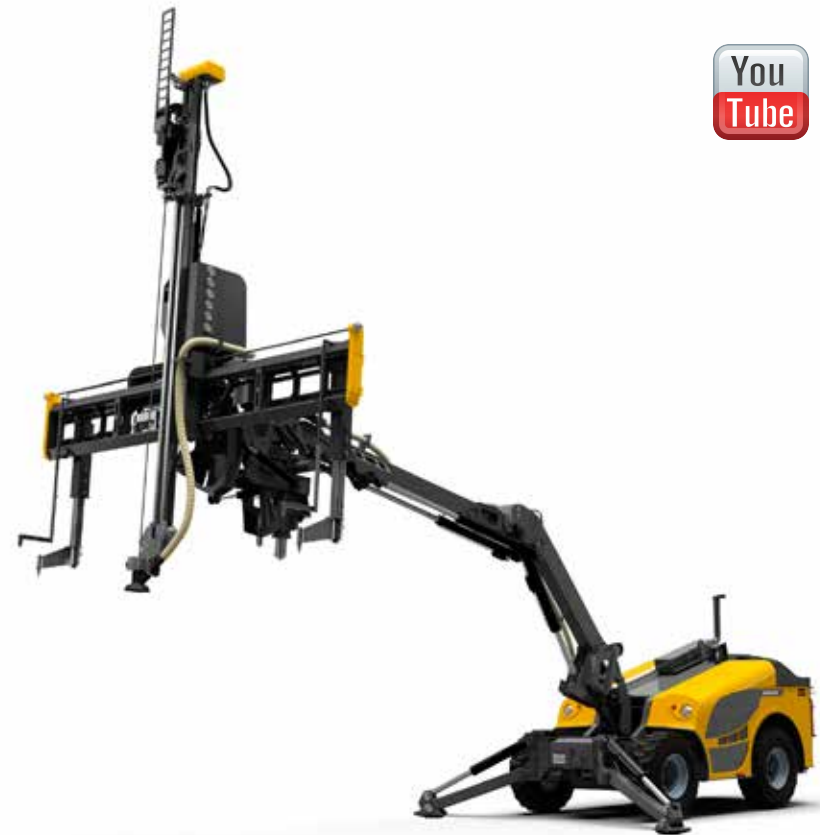
**ONCE THE BLOCK** has been separated, it's time to perforate and separate. "We still use feathers and wedges," Atkinson said. "The same way it's been done to

snap the blocks for thousands of years."

Atkinson said a typical example of drilling might be a line of 8-foot holes drilled every 3 inches along the 11-foot rail. "We used to use cumbersome pneumatic channel drills. The beauty of the Rock Buggy is how it moves around. It's self-contained. We can use it for both blasting and for splitting."

The target dimension is a 48,000-pound block, 11 by 6 by 4 feet in size, perfectly square. This is how it ships to customers.

**NOT ONLY HAS THE** stone been used throughout the U.S., but it is routinely sent to projects abroad. In the past ship- ▶



(Above left) Stony Creek granite is shown here on the Northwest Corner Building in Columbia University, New York City. (Design Architect: Rafael Moneo, Design Architect & Moneo Brock Studio, Design Project Architect; Executive Architect: Davis Brody Bond)

(Left) A Rock Buggy sets up for drilling at Stony Creek.

## ABOUT THE ROCK BUGGY

**THE ROCK BUGGY'S** maneuverability comes from two steering axles and four-wheel drive. It can be front-wheel or all-wheel steered, and it is capable of sideways and diagonal travel. A closed circuit Sauer Danfoss hydrostatic transmission gives soft starts and stops. It travels to and from the bench at up to 5.9 mph under power of its four-cylinder, 85 hp Cummins B 3.3 turbo-charged diesel engine.

Drilling operations are CAN-bus controlled, electronic over hydraulic. The operator works with a joystick and graphic display and has data recording capabilities. A remote control panel means the operator can distance himself from the noise and dust of the immediate drilling environment, though dust collection is well managed by a hydraulically operated 206 cfm vacuum and auto-cleaning filter system.

Both vertical and horizontal drilling of 1 1/8- to 1 3/4 -inch holes are accomplished by 10-foot rods driven by a chain-fed choice of hydraulic drills, which slide on hardened steel inserts of an independent aluminum column attached to a 15-foot-9-inch articulated boom. Atlas Copco's own drill offering for the Rock Buggy is its COP 1132.

ments have included Singapore, Germany, and Australia.

Atkinson said operations at Stony Creek have made little more than a dent in the formation accidentally discovered 150 years ago while preparing a railroad bed. The current operation is a 50-acre parcel surrounded by 400 acres of additional property. Today the property is owned by the town of Branford, Conn., which leases it to the Stony Creek Quarry Corporation.

Of his company's relationship with Atlas Copco, Atkinson said he expects a lot. For one, Matt Peterson, who is Atlas Copco's Di-

mensional Stone Industry product line manager, used to work in the quarry himself. Atkinson laughed, "Yes, I'm expecting top quality service and tech support."

But he added that he has faith in Atlas Copco. "Perfora didn't have a strong U.S. support base," Atkinson explained. "I'd never heard of Perfora, but I've known Atlas Copco my whole career. They've been in drilling forever."

With plenty of product and reliable equipment to keep up with demand, Stony Creek's future of continued production is written in stone. ■



Product Manager Eric Amberson talks to ConExpo attendees about the virtues of the Powercrusher PC3 and HS1 screen.



# *If it's new,* **IT'S HERE**

Atlas Copco at ConExpo-Con/Agg 2014

**T**he March 2014 ConExpo-Con/Agg show in Las Vegas hosted nearly 130,000 registered attendees representing 170 countries, up from 159 in 2011. Held every three years, the show is one of the largest in the construction and aggregates industry.

Atlas Copco, using the theme “Sustainable Productivity,” showcased its products in surface crawlers, crushing, tooling... and much more. ▶



Atlas Copco invited Kurt Busch to the show to test out his “driving” skills on a ROC drill simulator. Atlas Copco sponsors Busch as part of the Stewart-Haas race team. Atlas Copco Mining and Rock Excavation Service saw a lot of action on their simulator, which was open for anyone to try. Shown with Busch is trainer Wesley Stivers.



ConExpo attendees were interested in the fuel-saving features of the FlexiROC T45.

**A**tlas Copco showcased its drilling expertise at ConExpo.

There was much to see in rock drilling tools: from geotechnical core drilling options when a project starts to the many foundation drilling options and tooling options for blasthole drill rigs both on the surface and in tunneling. Atlas Copco presented a full package of rock drilling tool options at ConExpo.

Bigger impact in a condensed package was certainly visible in the rock drilling tools display. The introduction of the new Secoroc COP 66 down-the-hole hammer was a featured product because

of its complete redesign and greater efficiency. And in the top hammer offering, the T-WiZ line grew with the T60 class expanding the threaded line to 6 inches.

Shorter than its predecessor, the COP 64 Gold, the new Secoroc COP 66 penetrates 15 percent faster, translating to less time over the hole and decreased fuel consumption. The hammer has fewer parts yet features the ability to rebuild the hammer twice in its life under normal drilling conditions. This all equates to a lower cost per foot over the life of the product.

The bit design is also unique because the COP 66 has no exhaust tube. The solid bit design features no center-flushing hole, making it easier to operate. ▶





## LATEST PRODUCT RELEASES FROM ATLAS COPCO AT CONEXPO



### FLEXIROC T45 TOP HAMMER DRILL RIG:

- Powerful 40 hp COP 3060, COP LOGIC Drill Control system that adjusts impact, feed and rotation pressures depending on the ground conditions to insure straight holes
- Fuel efficient—Consumes energy only as needed and with adjustable air flow
- Equipped with reverse camera
- Onboard diagnostics to assist in troubleshooting
- ROPS and FOPS certified cabin with great visibility in all directions without changing positions in the chair



MAX DEPTH	ENGINE	HOLE SIZE	AIR
118 ft	325 hp	3½–5½ in	472 cfm

### SECOROC COP 66 DOWN-THE-HOLE HAMMER:

- 15 percent faster penetration than its predecessor COP 64 Gold, more easily adjustable for feed force and rotation
- 30 percent shorter and lighter than earlier models
- No exhaust tube, no center flushing hole
- Longer service life – higher reliability
- Less wear and tear on the hammer
- E-kit allows two rebuilds with sustained performance in normal abrasive conditions
- Easily adjustable for feed force and rotation, making life easier for the operator
- Reduced air consumption and fewer parts

DRILLING PARAMETERS	
ROTATION SPEED	MAX. PRESSURE
15–70 rpm	435 psi

### SECOROC GM RH HYDRAULIC GRINDER:

- Fully hydraulic powered – designed to be mounted on a surface crawler
- Simple to use, low noise levels

AIR PRESSURE	AIR CONSUMPTION	SPEED SPINDLE
87–100 psi	40 L/min	14,900 rpm



The increased drill capacity and longer service life of Atlas Copco drilling tools drew interest at ConExpo.

Business Line Manager of Rock Drilling Tools Gene Mattila said it best: “We have every tool a contractor would need to be more efficient on his project. Our engineers are constantly working on better and faster ways to drill a hole — of any size in any formation. We are a total solution source with a team of support to back up the products.”

**THE FLEXIROC T45** drill rig was an attractive fixture at the booth because of its fuel efficiency. Field studies prove that the Tier 4 FlexiROC T45 with fixed boom uses half as much fuel as its predecessor using the same rock drill, depending on rock conditions. Additionally, the new rock drill COP 3060 mounted on a fixed boom and aluminum feed manages large diameters using the T60 drill string with outstanding performance and reliability.

During operation, the operator can adjust the airflow and the dust collector fan speed according to actual working demands. The speed of the engine and compressor are then adjusted automatically.

The FlexiROC T45 has 50 percent fewer hoses and 70 percent fewer couplings compared to similar rigs on the market. The hydraulics and electrical components are positioned close to their

functions, making them easier to service and maintain and reducing the risk of leakage.

Maurice Hunter, business line manager of Surface and Exploration Drilling Equipment, said, “I’m excited about this new rig with its performance, reliability and mind-blowing fuel economy.”

Mario Santillan, product manager at Atlas Copco Surface Drilling, added: “It’s an incredible accomplishment to increase productivity and drilling capacity while reducing fuel consumption so dramatically. Everybody wins when there’s less environmental impact, a better working environment and higher profitability.”

Accompanying the FlexiROC T45 was the Secoroc T60 T-WiZ threaded tooling. With a bit diameter range from 3.6 to 6 inches, the T60 increases drilling capacity by offering up to 30 percent longer service life and boosts productivity by drilling more holes per shift. The T-WiZ product line improves reliability by wearing out before breakage and enhances utilization by reducing rod and shank changes.

Also on display for foundation drillers was the cluster drill, which is built with drilling diameters up to 120 inches, and the Secoroc QL 300 down-the-hole hammer.

Atlas Copco also featured its Power-crusher PC3 impact crusher with the



HS1 screen. This one-two punch combination was a hit with customers looking for the perfectly-sized crushed material in one unit. Adding less than 4 tons to the PC3’s operating weight, which is ideal for crushing recycled material, the HS1 screen sends larger material back to the hopper until it’s minimized to the desired size. This crush-screen combination is a perfect example of how Atlas Copco can really put power to work and offer sustainable productivity. ■



Powercrusher PC3



Atlas Copco Dynapac rollers such as the CA2500 soil roller and the CT3000 tamping compactor are intelligent additions to mine and quarry fleets where roads, berms and pits need efficient compaction.

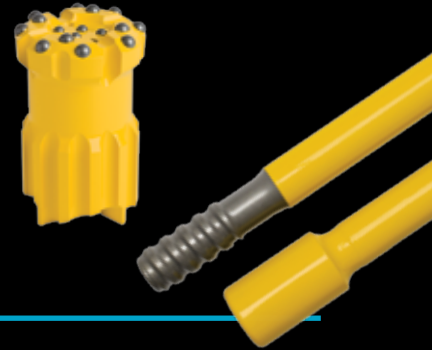
Atlas Copco's Construction Equipment offerings also include handheld and hydraulic attachment breakers, pumps, compressors, generators, light towers and many more tools and pieces of equipment for aggregate and mining operations.

## LATEST PRODUCT RELEASES FROM ATLAS COPCO AT CONEXPO



### SECOROC T60 T-WIZ TOPHAMMER EQUIPMENT:

- Up to 30% longer service life
- Easy uncoupling
- Faster penetration rates
- Tough thread system with greater stability
- Fewer rod changes
- Pair T-WiZ with Secoroc top hammer bits
- More holes per shift
- Available sizes: 3.6" – 6"



### SECOROC 17 1/2 BIT THIRD BI62C (PRV):

- Hard rock cutting structure
- Drills faster and stays in the hole longer
- Longer cutting structure and bearing life
- Pressure-compensated lubrication system
- Random cutting structure
- Proven bearing and seal packages

DIAMETER	MAX. CUTTING RADIUS	MODELS AVAILABLE
17 1/2 in	8 in	6 3/4-17 1/2 in

### SECOROC DIRT DIGGER PDC DRILL BITS:

- Smoother drilling operations and increased penetration rates
- Force-balanced PDC cutter locations minimize bit whirl and drill precise holes
- Asymmetric blade design reduces harmonics
- Longer bit life
- Designed with economical steel
- Optimized cutter distribution
- Sizes: 3"-12 1/4"



### SECOROC REVERSE CIRCULATION BIT:

- Sizes available: 5 3/8", 5 1/2", 5 5/8", 5 3/4", 6", 6 1/2"

### SECOROC KLAW-STYLE HOLE OPENER:

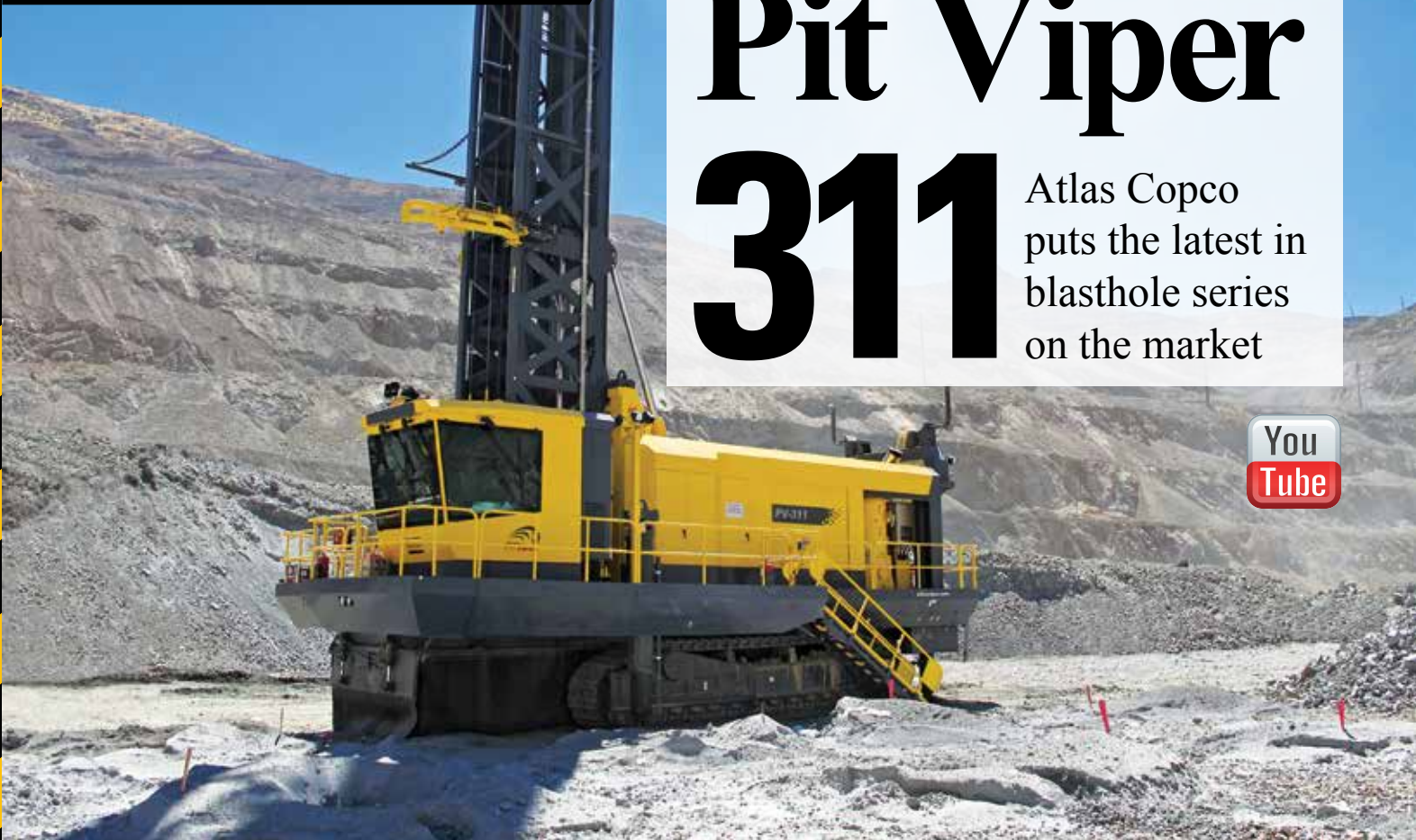
- Utilizes random cutting structure bit thirds for precisely positioned load distribution
- Maximize cutter count for hard applications
- Forward/rear taper if required
- Wide range of manufacturer threads in variety of shaft diameters



# LAUNCH PAD

# Pit Viper 311

Atlas Copco puts the latest in blasthole series on the market



**A**tlas Copco continues to innovate with the release of the **Pit Viper 311** large range rotary blasthole drill. The PV-311 has the capability to drill 9- to 12 ¼-inch holes with a clean hole, single-pass depth of 65 feet.

The single-pass PV-311 incorporates many qualities of the rest of the Pit Viper line with new innovations that further lower the cost of drilling. The proven Rig Control System (RCS) gives the PV-311 a strong technology foundation to bring serviceability and drilling accuracy to the front lines of the mining process.

The single-pass Pit Viper 311 is the first of the 310 series. The Pit Viper 316, a multi-pass version of the Pit Viper 310, will be released later in 2014. The Pit Viper 316 will drill to a depth of 295 feet

using a five-rod carousel with 50-foot drill pipe.

Existing models in the Pit Viper lineup include the PV-235, PV-271, PV-275 and PV-351. The new series of 310s signifies the optimal hole size—310 millimeters (or a 9- to 12 ¼-inch range).

The new PV-311 rig's single-pass depth capacity is 65 feet or 135 feet with two additional 35-foot rods in the standard internal carousel.

The Atlas Copco marketing and design team focused on maintainability and high productivity by keeping proven systems from other Pit Vipers, while improving some features.

Project Manager Iain Peebles said, "Our design plan targeted lifespan savings for the customer with everything from fuel to maintenance."

At the project's beginning, Atlas Copco

listened to the customers who wanted lower costs and high production capacity. "We build a new rig from the tower down. We design to capacity, depth and hole size, then match to the length and size of the tower and work down to balance and tracks," said Peebles.

**TOWER DESIGN** changes will benefit customers in many ways. Product Manager for Large Blasthole Drills Maureen Bohac pointed out changes in the new PV-311 tower that benefit the customer, specifically the maintenance departments. "Because we have a deeper tower we can increase the size of the sheaves, which incorporates sealed bearings and operates with our auto-tensioning feature. All that adds up to increased cable and sheave life, plus this system requires less maintenance," said Bohac.

Bohac said the new rotary head now operates with larger 7-cubic-inch motors that offer better lubrication for increased spline and main bearing life. Through the use of a variable displacement pump and motors, the operator has an infinite selection (over the system's range) of rotation speeds at variable torque values, up to 13,000 ft-lb of torque.

Service work around the new tower will be easier, too. Technicians will have the benefit of an access hatch that fully encloses the fiber-grate catwalk along the length of the tower. Although there are no open floor spaces in the grating, technicians have the benefit of a full restraint system that allows them to clip their harnesses to the cable and walk freely throughout the tower area without having to disconnect for cable fasteners.

**THE PV-310 SERIES** offers several options in its single- and multi-pass versions, starting with the engine offering. To match a mine's preference for brand and regulatory demands, Tier 4 engines are available with the Cat C32 and MTU 16V2000, and the Tier 2 options are Cat C32, MTU 16V2000 and Cummins QSK38.

In the future both electric and diesel options will be available.

Air compressors are available in low pressure models. "PV-310 comes standard with low pressure 3,000 cfm air compressors," said Bohac.

An optional feature first developed for the PV-235 is also available on the new PV-311. An Atlas Copco engineering team at Drilling Solutions developed and co-patented a revolutionary power control clutch system focused on saving energy. The system allows the operator to turn off the compressor with the push of a button when not in use. To engage the clutch, the operator hits a button on the chair's control panel to switch the air off as he begins to trip out of the hole.

Other optional features include auto-level, auto rod changing and tele-remote operation. Additional packages are available including auto-drilling and GPS hole navigation.

Productivity is improved with low-tech



The Pit Viper 311 has easy access to ground level service.

features, too. The PV-311 holds up to 1,400 gallons of fuel (with 1,200 gallons of water) and 1,900 gallons of water (when optioned with 700 gallons of fuel). A mine can maximize its service crew schedules because a rig can operate a full 24 hours before fluid replenishment.

**THE CAB** is the result of a year and a half of engineering that incorporates utility and comfort with high-tech control.

The operator commands the drill rig in quiet comfort. In the center of the cab under a wall-to-wall heavy duty removable mat and shaded windows, the operator's seat offers a full view of the platform and work area.

Peebles said, "We put a lot of time and creature comforts into this new cab, but it is funny how many drillers have commented on something as simple as the integrated shades."

High-tech features include color touchscreens that feed drilling data to the operator while additional safety monitors show movement from a ground surveillance system and video feeds from closed-circuit television cameras.



**IAIN PEEBLES**  
Project Manager



**MAUREEN BOHAC**  
Product Manager, Large  
Blasthole Drills

Operators will enjoy the convenience of an optional refrigerator and microwave while they hum along to their favorite music fed through the USB connection. They will stay cool even in the world's hottest mines with the 3.5-ton air conditioner.

The cab's central electronics cabinet offers benefits to the maintenance technician. Service access doors open from floor to ceiling, giving full access to all electronics. The well-lit cabinet allows open spaces for technicians to maintain the existing equipment and add technology as needed.

Bohac said the new PV-311 will be a great fit for mines all over the world in both coal and metal applications. ■

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