

CAT MAGAZINE



REAL BENEFITS FROM A VIRTUAL WORLD

PRECISION PERFORMANCE MEETS
PRODUCTIVITY: THE ROTOTILT STORY

POWERING UP FOR A MORE
SUSTAINABLE FUTURE



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POWERING UP FOR A MORE SUSTAINABLE FUTURE
Cat solutions support offshore wind farms.



GETTING IT RIGHT ON TIME IN AFRICA
Helping Jean Jaques Le Moal connect people across Africa.



WHEN PRECISION PERFORMANCES MEETS PRODUCTIVITY
Rototilt makes excavators more efficient.



TOUCHING INNOVATION
Touching innovation immersive visualization improves design.



Dear reader,

It's been a busy, groundbreaking year already. Caterpillar is in high gear innovating and making great strides in all the usual areas as well as a few that might surprise you – like on the water. For 80 years Cat Marine has been powering the world's biggest ships. Whether commercial or pleasure crafts, Cat and MaK have been a driving force in the marine industry around the world. Now, with ever-increasing energy demands, both Cat and MaK are providing specialized solutions for vessels serving offshore wind farms.

Just as you'd expect from Caterpillar, we never stop innovating. Our new Rototilt component is a perfect example. This ruggedly engineered attachment gives excavators an incredible level of precision right where it's needed – at the business end. With 360-degree rotation and 40-degree tilt, digging, tilt and rotation takes just a single move.

In this issue, you can also take an insider's look at the Caterpillar Technical Center. Here, along side other incredible innovations and developments, is where our state-of-the-art Immersive Visualization Center is housed. This remarkable technology allows people to interact in a true 3D environment and on a 1:1 scale while products are still being engineered. As a result, development is faster and more efficient.

The Caterpillar Technical Center is truly amazing. But when you get right down to it, our business depends on strong relationships with our customers and dealers. Find out how building and civil engineering projects throughout Africa are helping shape the continent and why one company uses Caterpillar as the standard by which all equipment should perform and how dealer/customer relationships should work.

Finally, everyone knows Caterpillar builds tough, dependable equipment. However, when it's finally time to transform well-used equipment into like-new condition, Cat Certified Rebuild (CCR) and Certified Power Train (CPT) options are the perfect, cost-effective way to give your Cat a second life.

We hope this issue finds you hard at work and taking advantage of the entire Cat product line and industry-leading innovations. Wherever you are and whatever your business, you can count on Caterpillar to be there when needed.

Paolo Fellin,
Vice President Caterpillar

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Galen and Abhishek virtually inspecting the undercarriage of a large excavator.

TOUCHING INNOVATION



The Caterpillar Technical Center has a history of expertise in immersive visualization technology – state of the art tools are achieving unprecedented speed and efficiency in product design.

‘Driving product development excellence’ reads the phrase chosen to represent the Caterpillar Technical Center’s reason for being. So just how do you design and develop the best possible products at optimum cost over the tightest possible timelines? It is a question that has occupied researchers, technologists and designers at the Mossville, Illinois-based Tech Center in the USA for the whole of the center’s existence.

The answers, of course, have changed over the years as the possibilities have expanded, but it is possible to read some of that history and progress by taking a look inside some of the facility’s buildings – as visitors did during an open day held in September last year to mark the Tech Center’s 50th anniversary.

The facility’s seven buildings are dedicated to research and development of machine systems, power systems, components and manufacturing processes that touch every one of Caterpillar’s 300+ products. Building L, for instance, has been home to Cat engine testing since the Tech Center opened in 1961. Here 106 test cells accommodate experimental engines from 100 hp to 9000 hp for rigorous durability and emissions testing. Building K is home to advanced structures research and manufacturing process validation, while Building D – the Tech Center’s newest – houses the large payload structural dynamics lab, commonly known as the shake tables. Using state-of-the-art technology, the shake tables replicate 20 hours of machine damage in a single hour of testing.

But it is in Building F that you can perhaps get the clearest picture of the direction in which technology at Caterpillar is headed.

More ►



Find out more about:
<http://www.caterpillar.com/innovation>



From left to right: Galen Faidley, Valerie Wiest and Abhishek Seth.

BUILDING F – A SIGNPOST TO TOMORROW

Tech Center Building F is home to many different applications of virtual product development – using simulation instead of actual materials to develop and validate new technologies and product designs. Among other activities, Building F is home to engine research. It houses one of only three high temperature spray vessels available worldwide, which can reproduce the engine combustion process accurately in a laboratory bench environment. Caterpillar scientists use this simulation to analyze the impact of fuel spray on engine materials with the goal of reducing engine emissions, increasing fuel efficiency, and improving the durability of Cat engine products.

Building F is also host to one of Caterpillar's newest, most innovative virtual product development facilities – the state-of-the-art Immersive Visualization Center.

Valerie Wiest, division manager for virtual product development deployment, holds a Ph.D. in Theoretical & Applied Mechanics and has been involved with virtual product development since she joined the company in 1994. "Computer simulation as a design aid began back in the 1970s, and we've been employing virtual reality type technology to enhance design engineering since the 1990s," Wiest told a visitor to the new lab recently. "But our new immersive visualization technology represents a big step forward because it allows human interaction with a virtual product or environment on a larger scale much earlier in the development process."

FACTORING IN THE HUMAN ELEMENT

So just what is immersive visualization, and how does it enhance the product development process?

Galen Faidley, team leader for immersive visualization at the Tech Center, holds a masters degree in computer

engineering and has specialized in the application of virtual reality technology to the design of new machines since his arrival at Caterpillar in 2004. Together with Senior Research Engineer Abhishek Seth, who holds a Ph.D. in mechanical engineering and human-computer interaction, he is closely involved in developing both the tools and applications of immersive visualization at Caterpillar. "Until now in virtual product development," he states, "everything was done on a computer monitor – desktop visualization. For this you create a digital model of your design on a computer, where you can see it on screen, rotate it and manipulate it as necessary. This is actually a 2D presentation rather than a true 3D one. Immersive visualization adds the true third dimension, and on a 1:1 scale, not just on a small scale on a computer screen."

Abhishek adds: "It places the live human being – whether that's an operator, technician or product designer – actually into the virtual environment

"Immersive visualization adds the true third dimension, and on a 1:1 scale..."

along with the machine, subsystem or component under development, and allows him or her to interact with the computer generated world. It's a bit like 3D cinema, except that you can actually be surrounded by the product or environment you're creating."

In physical terms, the immersive visualization system consists of a collection of screens and projectors arranged around the user. "Imagine a cube in which all the sides are a screen," says Abhishek, "and you get the idea. The user is wearing sophisticated 3D glasses. The system

Valerie, Abhishek, and Galen walk through a future Caterpillar factory.



uses optical cameras to track the user's movements and positions in relation to whatever's being shown on the screens. The individual hardware components are, in fact, relatively simple – screens, computers, projectors. It's getting them to work as a single system with the computer model that's complex. We've now spent 10 years developing this. The turning point came when we were able to package the complexity into a robust and easy to use system. We deployed it so engineers can start using it to get practical results right away."

"Using immersive tools is very different from studying the design on a computer screen," adds Galen. "The human body and its actions are very difficult to simulate. But with immersive visualization you don't have to simulate that; you can actually have real human beings interact with your virtual design."

"NOW WE CAN DO MORE"

Caterpillar's first immersive visualization environment was built at the Tech Center in 1998. Intensive development followed and the technology began to be used on a larger scale in 2007. Now Caterpillar has a number of immersive visualization systems in design facilities around the globe.

So what benefits are being seen? Valerie Wiest states there are many. "Quite simply, now we can 'touch' more products, and do it more effectively and quickly than before. It's not just a great new toy for our designers to play with – though I admit they do tend to rub their hands and say 'wow' when they're first exposed to it. It's primarily our customers who benefit.

"For instance, in any Cat machine predicting operator visibility has always been a challenge. How do you make sure, when a machine design or shape is changing that

the operator can still see what he needs to see? Now it's easy, you just put operators in the virtual machine, have them interact with it and adapt the design accordingly. All without having to actually build a machine prototype, so you save on development time and cost, and the customer gets a better machine, faster. There are a hundred examples like that, and as we continue to refine the technology and extend its uses, there'll be hundreds more – all of them helping our customers to do more.

"At the Cat Tech Center, that's what Driving Product Development Excellence is all about." ■



The world class immersive visualization facility allows engineers to naturally interact with their virtual design.





“Reduces labor, increases efficiency, accuracy and profitability – simultaneously.”

WHEN PRECISION PERFORMANCE MEETS PRODUCTIVITY



Minimum weight, maximum versatility: easy interface with grapple modules and a range of quick couplers.

“With the Rototilt we have basically extended the functionality of an already flexible machine range,” says Per Norell, Indexator marketing communications manager. “Excavators become more efficient, as they can dig, tilt and rotate with a single movement, allowing operators to work over, under and around all types of obstacles. Operators no longer have to reposition the excavator to get the right angle for their bucket or grapple – the Rototilt gives them a new level of precision right where they need it.”

Located in Vindeln, Sweden, the family-owned Indexator factory has 230 employees, producing a twin range of machine accessories for customers across Europe and beyond. Caterpillar is its biggest customer in Norway, and recently announced the Allied Vendor Agreement that means Rototilt is now part of the Cat Work Tools portfolio.

The Rototilt goes a step further than Indexator’s basic rotators for forest machines, truck cranes and material handling. The Rototilt is a technical solution with a powerful hydraulic worm gear with endless rotation (360°) in both directions, and a 40-degree tilt flexibility.

Brushes, asphalt cutters, forks, buckets and grapples can all be attached to the excavator in seconds with the Rototilt’s integrated quick coupler. Available in five sizes, 90 percent of excavators from 3 to 30 tonne with the smallest costing around €10,000 and the largest €25,000, the Rototilt reduces labor, increases efficiency, safety, accuracy and profitability – simultaneously.

CULTURAL SPREAD

“The Rototilt is already an important part of the Scandinavian excavator landscape. Operators in this region are specifically trained in construction work and the required machine handling skills at government approved industry schools,” say Per. “And for excavator training the tilt rotator is part of the required standard equipment. Culturally, we are early adopters, and eager to use anything that will help us become more efficient. As such we have 20 years’ experience in the Rototilt work tool.”

In recent years, Indexator has seen sales steadily increase, and in Norway many contracts now actually specify the use of Rototilt: when operators



y, safety,
ltaneously.”

enter a tender for work, they will typically only be considered if they can bring a Rototilt to the job.

EASY ACCESS TO MULTIPLE BENEFITS

Indexator supplies the Rototilt to dealers such as PON, which then fit them to machines for customers like Johan Rognerud AS, the construction company that has enjoyed the benefits of Rototilt for 14 years.

Johan Rognerud runs a fleet of 40 Cat machines, including Cat D6s, D11s, a D10, D8, 771D, two 772s, four 775s, twelve excavators 307 to 385, three M316s, two 329s and a brand new M140. His father started the company as a farming operation in 1953 with two backhoe loaders, and Johan expanded its scope in 1975 when he bought an old D6 for 7,000 NOK (around €900) from local dealer PON. “There were many reasons why we chose Cat,” says Johan, “good second-hand price, good service and very good spare parts.” When the company started to bring in big construction projects, a D9H was added to the fleet in 1978, and in 1983 the first excavator, a 215, was brought in.

Today Johan’s company is part of the AF Group, the third largest contractor in Norway, employing 105 people. “We work throughout Norway, and in to Greenland,” says Johan, “where the work takes us, we follow.” This has included runways for Norway’s airports, preparing and finishing sites for factories and housing complexes, and one particular constant: the E6.

More ►

LOCATION:
OSLO,
NORWAY



Learn more about the Rototilt and Caterpillar Work Tools:
www.uk.cat.com/worktools

Johan Rognerud (left) discusses the merits of the Rototilt with Per Norell, marketing communications manager.



WHAT THE OPERATORS SAY

Vetle Bergman Nyborg is working at Fuglåsén in Langhus, Norway, on a Rototilt-equipped Cat 324DL excavator. The task at hand for the crew at the 300,000 square meter site is to shift one million cubic meters of granite. By October they will have changed what now looks like a quarry into a level site for construction of a new logistics center. "Without the Rototilt I would have to constantly reposition the excavator, check, move, check, to do the same work. Now I just keep the machine in one place and concentrate all the movement at the bucket. I'd say it makes things around 95 percent faster, easily."

Atle Sandnes is working on a new housing project with a new M316D. "It took around 200 shifts to be able to use the Rototilt without thinking," he says. "But that's pretty normal. Now I can work about 100 percent faster, and I have to say, if I had to work without it, it would be a handicap."



"HOW MUCH HAS IT IMPROVED MY WORK? I'D SAY AROUND 100 PERCENT"

"The E6 is the main highway here in Norway," explains Johan, "stretching north to south some 2,400 kilometers. I helped my father build parts of it when I was first starting out, 37 years ago. And last year we finished working on that same stretch of road, to widen it to two lanes. For two years we worked with 60 machines, to lay 25 km of road. Without the Rototilt, it would have taken a lot longer." Johan first used the Rototilt 14 years ago. "It's hard to say how much faster it has made our work," he says, "but maybe 100 percent." And with operators working on up to 15 sites across Norway, he certainly has enough experience to make the claim.

MEETING CONSTANT DEMAND FOR PRECISION PERFORMANCE

PON's Vilmundur Theodorsson, product manager excavator core, has a theory. "About 90 percent of the excavators we sell are equipped with Rototilt, because it brings the machine to a totally new level. One operator can do the work of three or four people, basically. A bucket or grapple that can rotate 360 degrees, tilt 40 degrees – our customers here really treat the Rototilt as standard, because of the exceptional benefits it brings to their work. It takes less time to mount Rototilt on a Cat machine than other machines, because they come standard with proportional auxiliary hydraulics. And it's also the lightest and strongest tilt rotator there is, delivering up to 200 kN digging force with a 1.6 meter bucket.

"In Scandinavia, this market will only grow. We are currently moving around 200 excavators a year, the majority with Rototilt pre-fitted. For my customers, it is simple economics, with 20 years of proof, and a product that has the same levels of reliability as Cat equipment. One of Johan's 16-tonne excavators worked with a Rototilt for 8,000 hours, and the only maintenance needed was a change of seals."

"Precision and manoeuvrability are the key buying triggers," says Vilmundur. "When you're digging a trench, you can be digging around the pipes, you can clean around the tubes without moving the excavator. Or if you're grading, or landscaping, you can almost use the bucket as a blade, it's extremely accurate and wonderful to watch experienced operators at work, doing the work that would normally take two or more people to complete." ■



Operators at work: Atle Sandnes (top) and Vetle Bergman Nyborg.



BUILT TO BE REBUILT

Caterpillar has been building tough, industry-leading equipment since the 1920s. And, since 1985, Cat Certified Rebuild (CCR) and Certified Power Train (CPT) have been transforming old, worn equipment into machines that are as new as the day they arrived.

Today, CCR and CPT have successfully rebuilt more than 5,000 machines to like-new condition for a fraction of the cost of new equipment. "Put it this way," says Marcus Pitt, Finning's product manager for Power Train & Customer Support Agreements, "a new machine costs 100 percent. A CCR typically costs about 60 percent. Over the machine's two lives, you've only spent 160 percent rather than 200 percent."

Hamza W. Zahid, Zahid Tractor's parts and service sales manager, Western Region, agrees. "We generally do CPTs at roughly 35 to 50 percent of the cost of a new machine, and CCR's at nearly 60 percent the cost of a new machine. It's a huge advantage and selling

"I also think the Caterpillar 12 months warranty is one of the key factors in selling the CCR/CPT concept."

point for our customers because they are getting a near complete refurbishment for a fraction of the cost of what a new machine would cost them."

ATTENTION TO DETAILS

Caterpillar's stringent quality requirements make it the only manufacturer with a rebuild program that guarantees like-new performance. "We get regular requests to carry out CPT rebuilds, especially from customers who are satisfied with the quality and outcome of previous rebuilds" says Hamza Zahid.

Another driving factor is the availability of new equipment. "We're looking now at 777 mining trucks, the staple of the extraction industry in the UK. The lead time on those can be eight months to a year. So some customers choose a rebuild to ensure they can keep working," says Marcus.

Depending on the equipment, a CCR takes a fraction of the time it does to order a new machine. It's a long-term strategy customers can take advantage of to maximize profits and productivity.

A 12 MONTHS WARRANTY WITH EVERY CAT CERTIFIED REBUILD

When should owners/operators look into a Certified Rebuild? Hamza Zahid says, "We have rebuilt D11Rs with 38,000 hrs on the clock. Our CPT rebuilds typically have been between 10,000 to 25,000 hrs, while CCR's are done at +30,000 hrs. I also think the Caterpillar 12 months warranty is one of the key factors in selling the CCR/CPT concept. With Cat Certified Rebuilds, customers get benefits similar to new machines' 12 months warranty, with the possibility to extend the warranty at an additional small cost. Our customers like to know Caterpillar guarantees their machines. We've already had customers clock 10,000 hrs on rebuilt machines without issues."

A REBUILD BUILDS PROFITS

The bottom line is that a Cat Certified Rebuild or Certified Power Train has become a smart, popular business decision across the globe. Peter Sergeys, workshop manager at Bergerat Monnoyeur Belgium sees continued interest. "From a purely economic standpoint, it makes sound business sense to profit from the second life of a machine," he says. "You get new machine performance for a fraction of the cost of buying new". ■



Marcus Pitt, product manager at Finning and Peter Sergeys, workshop manager at Bergerat Monnoyeur Belgium.

CCR = total machine rebuild
CPT = rebuild of the power train
CPT + = rebuild of the powertrain + any other component you want to include



The latest updates on certified Rebuild:
www.parts.cat.com/parts/cat-certified-rebuild



ACTIONS SPEAK LOUDER THAN



The Marseille landfill in France is a large one in Europe.

For some it might seem like a strange dichotomy. Why in the world would Caterpillar host a demonstration of its waste handler line of machines in the south of France? The answer is simple. The Marseilles landfill is a large one in Europe at 56 hectares and France is a major market all the big brands are fighting for. And, to be honest, hosting the event in Marseille during October doesn't hurt either.

Even though Caterpillar has hosted construction equipment demonstrations in Malaga, Spain for many years, this one was different. Caterpillar wanted an event that follows the company's strategy of "enabling customers to see the machines in the iron." 'Waste & Recycling Days' was the perfect solution. After all, the demands of the waste and recycling industries are much different than that of the construction industry – and so is the equipment.

So, what better way to highlight new equipment designed specifically for the waste and recycling industries than to give people a first-hand look at live demonstrations in a real working environment? The goal was to give both current and potential customers the ability to see Cat machines in action as well as to show them just how dedicated Caterpillar is to providing the waste and recycling industries with dependable, hard-working machines.

Plus, the Marseille 'Waste & Recycling Days' demonstration was the perfect opportunity for Caterpillar to differentiate themselves from the competition, whose machines are typically built for construction, mining or agriculture, not for waste and recycling.

In fact, Caterpillar has been producing industry specific equipment for about 40 years. Now, the company is pushing along the launch of their waste sector models, including several new Cat offerings. During the event, two live demonstrations took place featuring several different models. One at a landfill operated by SITA Méditerranée, and another at a materials recovery facility (MRF) managed by Veolia.

At the SITA Méditerranée location, a combination of Cat landfill compactors, a D7E tractor with electric drive and a track type loader were put to the test.

"The goal was to give both current and potential customers the ability to see Cat machines in action..."

During the MRF demonstration, participants could see in action the M322D MH, a hydraulically raised cab materials handler that weighs up to 22,700 kg, stabilizing the cab during high winds and rough surface. 226-Series compact skid steer loaders that used Cat attachments to feed crushers, shredders and balers along with refuse bulkers for dispatch as well as a 930H wheel loader were also on stage.

CATERPILLAR 'WASTE & RECYCLING DAYS' INCLUDES WHEELED LOADERS

Caterpillar was also proud to introduce its latest version of wheeled loaders, the 966K WHA, at the Marseille 'Waste & Recycling Days' event. And, to show just how serious Caterpillar is about producing equipment

COMMON APPLICATIONS:

- Transfer stations
- Sorting & recycling
- Green waste & composting
- Landfill
- Energy from waste

WORDS



purposefully built for the waste sector, the 966K WHA was the first machine to be showcased in Europe.

Some of the new features on the 966K WHA include a new four-post Rollover Protective Structures (ROPS) and high specification cooling with engine/radiator bulkhead sealing, a wide-core radiator and a reversing fan.

Another key improvement is the supply of flexport tires. Why? Sam Buckley of Cat Flexport in Ontario, Canada explains. "In scrap and recycling picking operations, we think the added stability and flexibility of Flexport tires will aid site safety, improve tire life and eliminate downtime caused by punctures."

The inaugural model of the 966K WHA, with a 24,289 kg operating weight, is powered by the 296 hp Cat Tier-4 Interim/Stage IIIB C9.3 Acert™ diesel, coupled to a Powershift transmission. Coming over the next six months are the 21,000 kg (operating weight) 950K WHA and the smaller 930K WHA. The 950K WHA key feature is also the optimized bar linkage, which offers parallel lift.

CLEARING THE AIR

Among the displays shown by Caterpillar during the event, one featured dust filtration solutions. Currently, Sy-Klone self-cleaning filters are used in Caterpillar machines that work in dusty conditions. However, a pressurization system that helps keep the cabs of wheel loaders free of dust and pollutants for those working in covered materials recycling facilities is the next big thing.

Caterpillar is strongly committed to the environment. Caterpillar gas gensets convert waste gases into

valuable electricity and heat. Caterpillar has delivered thousands of gensets fuelled by landfill gas and this has generated 1600 MW of renewable electricity worldwide, enough energy to power 600,000 homes.

MORE 'WASTE & RECYCLING DAYS' TO COME

Clearly, the most recent event was a success. Caterpillar is proud to provide hard-working equipment that helps landfills, like the one run by SITA Méditerranée, operate their facilities more effectively so they can capture naturally produced biogas efficiently and convert this increasingly important resource into clean energy that can provide electricity to homes and businesses.

Where the next event will be held is still unknown. But one thing is for sure. Caterpillar is committed to the waste and recycling industries and more 'Waste & Recycling Days' programs are in the works for the near future. ■

From left to right the new K-series wheel loader on display, MRF managed by Veolia, dozers in action and wheeled material handler on display by SITA Méditerranée.

COMMON MACHINES USED IN THESE APPLICATIONS:

- Landfill compactors
- Waste handling dozers
- Waste handler track loaders
- Waste handling material handlers
- Scrapers
- Articulated trucks
- Motorgraders
- Excavators
- Backhoe loader
- Wheel loaders
- Waste handlers
- Track loaders
- Wheel excavators
- Telehandlers
- Skid steer loaders
- Generator sets



Find out more on
www.cat.com/waste





LOCATION:
HAMBURG,
GERMANY



POWERING UP FOR A MORE SUSTAINABLE FUTURE

MARINE MARKET SEGMENTS:

- Offshore
- Tug & Salvage
- Cargo
- Inland Waterway
- Dredge
- Fishing
- Pleasure Craft
- Cruise
- Ferry
- Government / Military

As the world's leading manufacturer of industrial equipment, Caterpillar drives change around the globe through the legendary yellow Cat® brand machines. While Cat machines have played an integral part in shaping the world's land-based infrastructure, Cat marine power solutions have been providing the power for the world's shipping industry for the past 80 years, increasing the speed and efficiency of the global marine industry.

Headquartered in Hamburg, Germany, Caterpillar Marine Power Systems (CMPS), provides premier marine solutions and services for customers worldwide.

Manufacturing facilities around the globe produce propulsion units, auxiliary power and power generator sets for ocean-going, commercial and pleasure craft vessels. CMPS has evolved into an innovative market leader by providing customers with a broad spectrum of power offerings through its two brands: Cat and MaK. The Cat product line covers propulsion engines from 93 to 5,650 kW, auxiliary engines from 162 to 5,420 kW, and generator sets from 11 to 5,200 kW. The MaK medium-speed product line includes propulsion and auxiliary engines, as well as generator sets in the power range from 1,020 to 16,000 kW. This range of products allows CMPS to meet the needs of various vessel

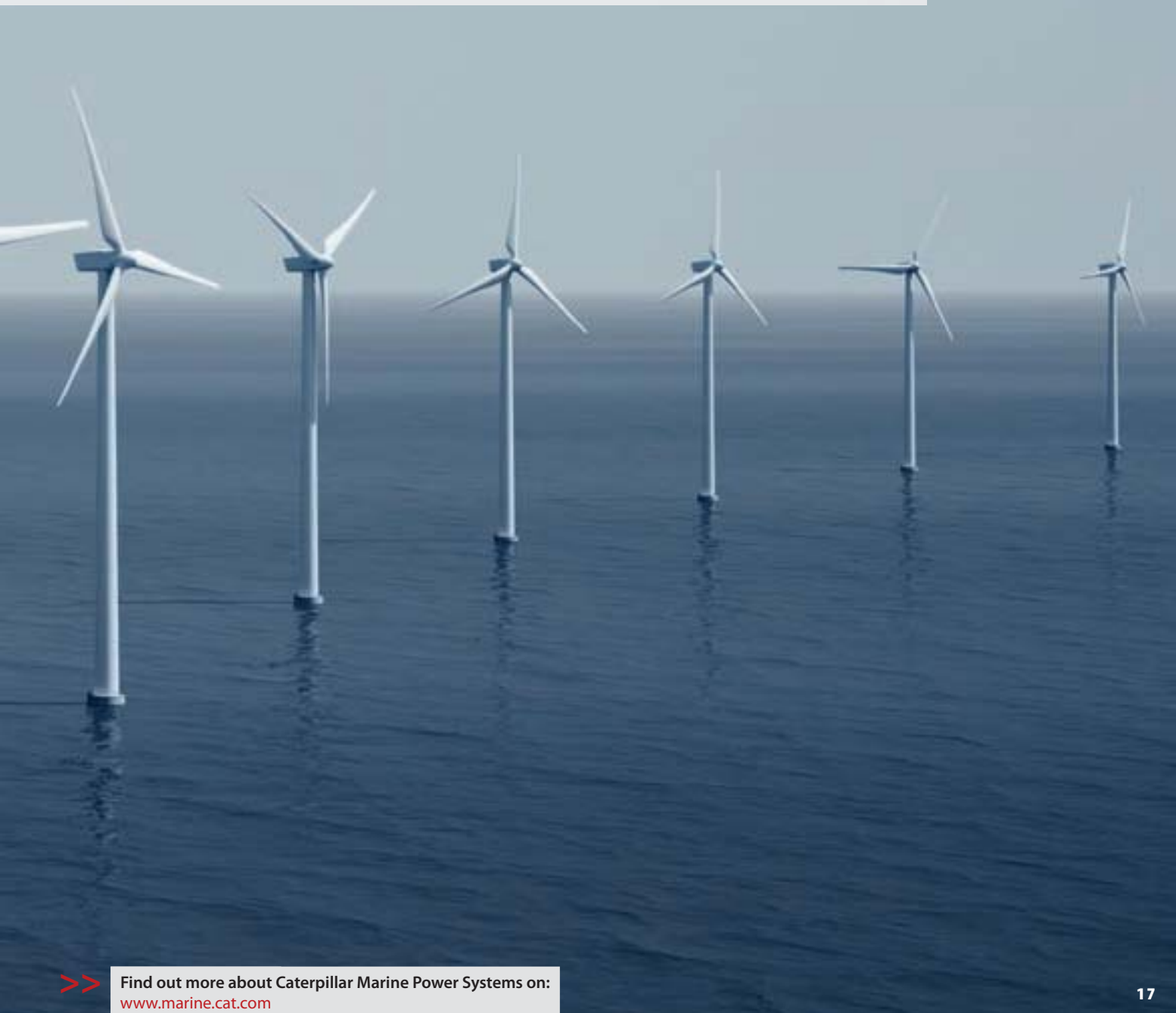
segments, from pleasure craft to military and inland waterway, from fishing to dredge, from tug & salvage to offshore and cargo and from ferries to cruise.

SYSTEMS AND SOLUTIONS, MORE THAN ENGINES

Through the course of the past 80 years, the complexity of customers' operations has increased, which has led CMPS to diversify offerings to meet the needs of the industry. David Surroca, CMPS regional sales manager for Europe, Africa, Middle East and CIS, notes that CMPS has evolved from selling traditional diesel engines to complete system solutions. As an example, he mentions the offshore segment, which includes the more traditional oil and gas marine services, but also the fairly new offshore wind power generation area. "Offshore wind turbine installation vessels are extremely complex designs with high power requirements. The complexity and sheer size of such projects often require CMPS to provide complete integrated systems, including everything from diesel generator sets, the diesel electric power plant, propeller systems to all on board navigation and communication systems," said Surroca. "This is

what our customers value. In addition to providing MaK medium speed products for large commercial vessels, we also provide system solutions for support vessels such as cable layers, crew boats and maintenance vessels. For these applications, we usually provide our high speed Cat branded products and respective systems."

More ▶



Find out more about Caterpillar Marine Power Systems on:
www.marine.cat.com

CMPS regional EAME headquarter is located in Hamburg, Germany.



Engineers and mechanics from all production sites have the knowledge and drive to bring innovative products to the market.

The product offerings are not the only adjustment CMPS has engaged in to account for a changing marine market. Surroca notes that CMPS now approaches the heterogeneous marine business with segment-specific strategies and dedicated segment teams. "We recognize that not one of our customers is identical to another. Our customers operate in many different environments and we want to ensure every customer, even with the most specialized requirements, receives tailored, custom products and support," Surroca said. "To guarantee that our customers can always expect the highest level of expertise and service, we have taken the step to incorporate true segment experts in our teams around the globe. Experts that understand what we need to deliver to our customers, to make them even more successful."

SUPPORTING THE QUEST FOR CLEAN ENERGY

Surroca's reference to the growing Offshore Wind Energy segment is no coincidence. In Europe this upcoming industry represents one of the fastest growing segments within the marine environment, especially in the United Kingdom and Germany, where government approvals for new offshore sites have accelerated the pace of construction.

"The offshore wind energy market is an exciting new segment with innovative new technology being utilized and one big goal – to develop sustainable power solutions," Surroca noted. "Our segment-

"We offer assistance, expertise and infrastructure from design to after-sales support."

specific approach to the marine industry has allowed us to develop best-in-class solutions that enable our customers to successfully navigate challenging emission regulations and improve the overall sustainability of their offshore wind farm operations."

A MAJOR PLAYER IN AN EXPANDING BUSINESS

Initially established as a one-man business in the year 2000, Danish company A2SEA was among the first to offer transport, installation and servicing solutions to the offshore wind farm industry. The company has grown to become a major player in the segment, maintaining and operating its own fleet of specially designed vessels and equipment: Sea Power, Sea Worker, Sea Energy and Sea Installer. Their latest vessel, 'Sea Installer' is a next-generation installation vessel, currently being built in China and due to enter service shortly. Designed by Dutch company GustoMSC, it will carry out wind turbine installations in the challenging conditions encountered further offshore and in deeper water. The power for the vessel is

provided by six MaK 9 M 25 C Diesel Electric Propulsion Generating Sets, each with 2,880 kW power rating.

"In a project like this, we work with the customer from the early design stage. We provide our support during the feasibility study, understand the key vessel performance criteria and offer a customized solution that is tailored to fit the vessels' specific requirements," said Alexander Kohse, offshore wind segment manager. "Typically this will involve 6 to 12 months of project management, coupled with application and installation support towards the finalization. Designing and building such vessels is a truly global operation, making such projects well suited to the global network of team Caterpillar and our Cat marine dealerships. We can offer our support, expertise and infrastructure in everything from design and construction through to delivery and after-sales support."

Kohse noted, Caterpillar has quickly established itself as one of the industry leading solution suppliers in the offshore wind sector. "Currently we are engaged in a number of such projects per year plus many more projects for smaller type vessels – such as crew boats that take staff to and from the wind farms."

FUTURE TRANSITIONS

Although today the core business of CMPS is still in marine diesel propulsion engines and generator sets, Kohse notes that a change is already under way, specifically with the more sophisticated vessels for the offshore segment. "In terms of power, we are looking at diesel electric propulsion systems, with four to eight interconnected diesel generator sets providing the power the vessel needs for all operation modes. And in the mid-term, our customers will expect and value even more our transition to becoming a total systems provider. Always with the aim of maintaining our position as a leading technology supplier to the industry, and as a company committed to providing our customers with sustainable solutions that make them successful while protecting the environment." ■

Online Community:

caterpillar.lithium.com
facebook.com/caterpillarmarine
youtube.com/caterpillarmarine
twitter.com/caterpillarinc



*“For installation vessels high power
MaK engines are the best solution.”*



In service since 2002, installation vessel Sea Power carries up to three turbines in the 2.3 MW to 3.6 MW range and operates in water depths up to 24 metres.

SEA INSTALLER, POWERED BY MaK – SUPERIOR PERFORMANCE, RELIABILITY AND COMFORT

Thony Askjaer, A2SEA, Sea Installer chief engineer says: “The new vessel is fitted with six MaK 9 M 25 C Diesel Electric Propulsion Generating Sets. They will generate electrical power not simply for propulsion, but for all the vessel’s many different operational functions. The MaK units operate at only 750 rpm, giving an impressive combination of high power output, high reliability – helped by the fact that they have 40 percent fewer moving parts than conventional diesel engines – and low vibration and noise. As a result, the vessel will offer a very high level of performance, combined with significantly improved accommodation comfort for installation crews. Add to that the fact that the vessel’s clear-deck design allows us to carry and install up to 10 complete wind turbines at a time, and you can see that ‘Sea Installer’, once it comes into service this summer, will represent a significant step forward in productivity for our offshore wind farm customers.”



The 5110B awaits further disassembly at Bergerat Monnoyeur in Belgium.



A HEAVY-DUTY PROJECT FOR HEAVY-DUTY EQUIPMENT

The Geneva-based Caterpillar Used Equipment Services, Inc. (CUESI) piloted a new rebuild project in the Europe/Africa/Middle East (EAME) region. The goal was to refurbish a piece of heavy equipment that has logged a multitude of miles. In December of 2010, the team found just what they were looking for, a 2002 Cat 5110B 125-ton excavator with 15,000 hours on it.



The 5110B was a particularly good choice because Caterpillar had identified opportunities to provide this piece of equipment to the mining industry.

FINDING THE RIGHT REBUILD PARTNER

The next step was to find a partner that could perform the rebuild. So in early 2011, the CUESI team chose Bergerat Monnoyeur Belgium because of their reputation, experience and portfolio in rebuilding equipment.

Soon, the 5110B was delivered to Bergerat Monnoyeur Belgium and the rebuilding project was seriously underway. More than 2,000 hours were spent

“Caterpillar can work together with different partners to deliver equipment efficiently.”

refurbishing the excavator with strict attention being made to ensure the high standards of quality were met for Caterpillar and the dealerships.

The machine received a heart transplant as a new engine was installed. Swing bearings, the stick protection plate and cab plastics were also installed and even a new driver seat and floor mats were put in. Next, the radiators, hydraulic pumps, fan motor, valves, swivel group and final drive were overhauled. And finally, the stick cylinders and frame boom holes were bored and re-welded.

THE REBUILT 5110B GOES ON THE MARKET, BUT NOT FOR LONG

After another comprehensive and meticulous inspection by CUESI, the 5110B was put on the market. Immediately, PON Sweden showed interest on behalf of a quarrying customer. Although their customer was already operating a 5110B excavator, the company’s goal was to purchase an additional 125-ton excavator to expand business.

To complicate matters, PON Sweden’s client was already in negotiations with Komatsu for a PC-1250. However, thanks to the reliability of their current 5110B, and the immediate availability of the refurbished 5110B, PON Sweden was able complete the sale of

the refurbished 5110B over the Komatsu PC-1250. Plus, the sale of the refurbished 5110B also helped PON Sweden sell a 740B articulated dump truck and a 336HDHW excavator to the same customer.

WORKING TOGETHER FOR SUCCESS

The success of the rebuild is unquestionable. The ability to take a well-used machine and restore it to like-new condition is a testament to how Caterpillar can work together with different partners to deliver equipment efficiently with effectively zero lead-time.

Not only did the rebuild of the 5110B meet and exceed expectations, the internal support from parts marketing and Cat Insurance helped make this pilot project possible. And, with a 12-month, 3,000-hour warranty from Cat Insurance that covers the power train and hydraulics, PON Sweden’s customer can be ensured their rebuilt Cat 5110B will run reliably well into the future.

This pilot project was the model for future rebuilds with high-hour, heavy equipment. There are currently plans in place to rebuild a D10 and 988s to help extend their lifecycles. ■

Technicians at Bergerat Monnoyeur prepare one of the 5110B’s massive Earth-grabbing tracks for refurbishing.



A complete inspection is given to everything including SOS Fluid analysis, attachments and service records.



Learn more about the 5110B Rebuild:
www.parts.cat.com/parts/cat-certified-rebuild

LOCATION:
BORDEAUX, FRANCE



GETTING IT RIGHT ON TIME IN A

HELPING JEAN JACQUES LE MOAL CONNECT PEOPLE ACROSS AFRICA



Cat Motorgrader in action in Chad levelling the road.

Sogea Satom, part of the French Vinci Group, is a leading international building and civil engineering company operating across Africa. Through their passion for the African continent Managing Director Philippe Chavent and his team have built up a company with unrivalled experience in road construction and infrastructure development. They are a longstanding user of Cat machines, so what work do they undertake, what roles do Cat machines play, and how do Cat dealers help contribute to Sogea Satom's efficiency and success? We ask Sogea Satom Logistics Director and Fleet Manager, Jean Jacques Le Moal.

FIRST, TELL US ABOUT SOGEA SATOM AND ITS INVOLVEMENT IN AFRICA.

"The company began operations there in the 1930s with the opening of the Sidi Bouknadel plant in Morocco and the delivery of the first water supply pipes for Rabat. In 1948 we began operations in Gabon, and in 1951 we signed the first contracts for roadworks in Niger and Chad.

"We operate in four business sectors: roadworks and earthmoving, civil engineering, building, and hydraulic and environmental engineering. And we cover four major zones: North Africa, West Africa and Madagascar, equatorial Africa, and Central and East Africa. In 2011 we operated in 22 African countries and had a turnover of 870 million Euros. Around 53 percent of that comes from

roads and earthworks, with civil engineering generating just under 30 percent. We employ nearly 10,000 people."

WHAT IS YOUR OWN BACKGROUND, AND WHAT ROLE DO YOU PLAY IN SOGEA SATOM?

"I'm an engineer by training. I've spent most of my career in the construction industry in France. With the company Chantiers Modernes, for instance, I was responsible for all installations on the company's sites, including workshops, facilities for concrete processing, living accommodation, a whole range of facilities. More recently my emphasis

"We know that with Caterpillar we will find consistent high quality."

has been on international projects, particularly with Sogea Satom. As logistics manager I'm responsible for a range of activities and facilities over large geographical areas throughout Africa. It's not like Europe where a major road project will be split into 'lots', each handled by a different contractor. In Africa you're responsible for the entire project, and that makes the logistics critical. The distances are greater and the supply chains longer. So you need to get it right first time, every time. So I travel a lot; around 18 trips a year, over long distances."

WHAT IS YOUR EXPERIENCE WITH CAT MACHINES IN AFRICA?

"80 percent of our fleet consists of Cat machines, and that's no accident. Quite simply, Caterpillar is the



FRICA

reference. When we compare equipment we always use Cat machines as the measure of how a machine should perform. We know that with Caterpillar we will find consistent high quality, whether it's in a wheel loader or an excavator. We cannot always rely on that elsewhere.

"Also, it's important that Caterpillar offers a complete product line backed by good service. We have service points, for example in Bamako, Gabon, and we need competent people on hand. We need training to be available too. We cover 33 million square kilometers, and we have to be mobile. A jobsite gets born, lives and then dies. This is different from, for example, a mining customer, who may be in one place for 20 years. So it's important to be backed by dealerships that can always be on hand to complement our own competencies."

SO WHAT IS YOUR EXPERIENCE WITH CAT DEALERSHIPS?

"We work with a number of Cat dealers throughout Africa – Tractafric, JA Delmas, Mantrac-Unatrac, Henri Fraise and others. They know which machines to offer, which can be adapted to suit our purposes, and how to do it. We have always found that they react quickly and adapt their thinking and strategies to meet our needs. An example was in Mali where, because of certain issues, the jobsite had to be brought to a halt. Planned orders for new machines had to be put on hold, and machines had to be moved from one country to another. To do things like that successfully you need flexibility and concessions from both us and our dealers – and that's what we get from our

Cat dealers. It is particularly valuable to us, too, to have – as well as our in-country dealers – one single Caterpillar intermediary. For us that's Vincent Migeotte, Caterpillar global accounts manager. He speaks as the single voice of Caterpillar and works closely with Cat dealers.

"Also, we know that when we deal with Caterpillar, they will conduct business in an orderly, logical manner, with wise decisions at every step. We benefit from the tight relationship between Caterpillar, its dealerships and the customer base."

[More ▶](#)



Vincent Colleu, general construction sales manager, Joel Mikaelian, general manager JA Delmas, Jean Jacques Le Moal, Sogea Satom director and Richard Ruspil, Construction & Quarries executive manager.

AT THE MOMENT THERE'S CONSTANT MACHINE EVOLUTION GOING ON. HOW IS THIS IMPACTING ON YOUR WORK IN AFRICA?

"For us, the process of electronic evolution has been smooth and progressive. It has been made in a progressive manner and the changes have been mastered for use in the field. Some African countries have no norms or legislation for things such as emissions, but Caterpillar will make sure their equipment is Stage III certified. Accugrade has been used in Burundi on a Cat 14M motor grader, and of course it can be retrofitted. It works very well for us, with our operators trained at the Cat Demonstration Centre in Malaga, Spain, so that they can fit the equipment to the machines themselves."

HOW DO YOU SEE THE FUTURE FOR YOUR BUSINESS IN AFRICA?

"Competition from the Chinese is very strong, but we see that Caterpillar and Cat machines offer us two important assets; innovation in the way we work and the ability to react effectively to specific local conditions. In those

"We expect to continue to see a 10 or more percent growth in business."

respects, to use a football analogy, we play in a different league from our competitors. With Sogea Satom, backed by Caterpillar quality and dealers, customers know they will get quality, delivered on time. So, we expect to continue to see a 10 to 15 percent growth in business."

SUSTAINABILITY IS IMPORTANT TO YOUR OPERATIONS. HOW DO YOU ACHIEVE IT?

"In a number of ways. For instance, we contribute to local communities. When we build a camp we build prefabricated structures. These are subsequently turned into schools and/or hospitals to serve the local community. And our machines are often reconditioned locally. In Bamako, Equatorial Guinea, for example, we have workshops that do repairs and engine rebuilding. Around 25 percent of our machine fleet is transferred between countries as necessary, and those machines that are not relocated are repaired then resold either locally or worldwide via used equipment markets.

"With 90 percent of our staff being of African origin, we depend on local training and learning. So we form partnerships with local schools and universities. Operators and technicians can be trained in four months, but operator training really needs to be ongoing, since operators come and go. Technicians are with us more for the long term and they will move from one jobsite to another. So Cat dealer technicians will often come on-site to train local technicians. And dealer operators may be seconded to work on our jobsites."

FINALLY, WHAT IS IT THAT YOU LIKE MOST ABOUT THE JOB YOU DO?

"The fact that I'm often working in remote areas, which means I have to handle every logistical step, from beginning to end. The variety is stimulating in a way you would never find in Europe. I love that diversity. You simply can't beat that."

Mr. Le Moal has now passed on his work to Mr. Lahuppe and in his new challenges he is focusing on providing technical support in Africa and managing material in the French Overseas Departments and Territories (DOM/TOM). He is also gradually working towards his retirement. ■

FLEET OF CAT MACHINES

- Track-type tractors: 153
- Track-type loaders: 3
- Wheel loaders: 149
- Motor scrapers: 29
- Motor graders: 171
- Tracked excavators: 116
- Wheeled Excavators: 16
- Trucks: 23
- Articulated trucks: 8
- Backhoe Loaders: 41
- Compactors: 31
- Wheeled compactors: 44
- Generator sets: 654

EXAMPLES OF FUTURE PROJECTS

- Bamako airport
- Port of Cotonou
- Port of Togo
- Burkina Millennium development
- Port of Conakry



UNFOLD THE SECOND LIFE OF YOUR CAT ENGINE

Whether your site is in the middle of a desert or next to an urban center, doing an engine rebuild can be a difficult job. A diesel engine contains hundreds of parts, each with specific parts numbers. Identifying these part numbers, quantities and ordering all the individual replacement parts can be a time-consuming process. Cat Precious Metals Kits are the solution.

COST-EFFECTIVE KITS WITH GENUINE CAT PARTS

Your Cat machine's engine is built for a second, even third, life. Now, it is easier than ever to give extra lives with our engine rebuild kits. The parts you need to rebuild your engine right are available in an easy-to-order, cost-effective kit that gets you back to work fast. With the top performance and long life that genuine Cat parts can deliver. Four different levels of kits are available. Whichever option you choose – Bronze, Silver, Gold or Platinum – each self-contained kit in combination with the related parts include the required components to complete an overhaul, for your specific needs. You save time and money and get extra peace of mind. Each kit is backed by a Caterpillar warranty – no matter who does the work.

CAT D8 TRACTOR, USED TO TEST 3406 PRECIOUS METALS KITS, GETS NEW LIFE AFTER QUARRY ROLLOVER

Caterpillar engineers have developed these kits to simplify your engine rebuild. To make sure they contain everything necessary for a specific engine model overhaul, Caterpillar pilots kits in the field.

For instance, a newly designed Cat 3406 Precious Metals Kit recently went to a customer in Poland. It not only simplified an engine overhaul, it saved a D8 track-type tractor from the scrap heap. The D8 had been involved in a punishing roll-over accident in a Slovakian quarry and stored outside, untouched, for several years. The engine had a bent camshaft and contained 60 liters of water that had rusted a lot of the components.

Lukasz Klukowski, of Caterpillar's Prague district office says: "the customer, Shvedurski purchased parts that were not part of the rebuild kit, like the camshaft. However, the kit included pretty much all of the other needed pieces. It was well organized and everything arrived ahead of time, which was a big plus." And the D8? "It has practically a brand-new engine, ready for another life." Shvedurski now plans on using the D8 to expand his operation. ■



The new Cat 3406 engine rebuild kit used for an engine overhaul in Poland.

YOU CAN PURCHASE PRECIOUS METALS KITS OVER THE COUNTER OR THROUGH SERVICE AT ANY AUTHORIZED CAT DEALER LOCATION.

Platinum is a more complete engine rebuild option designed to maximize the built-in second or third life of your engine and includes:

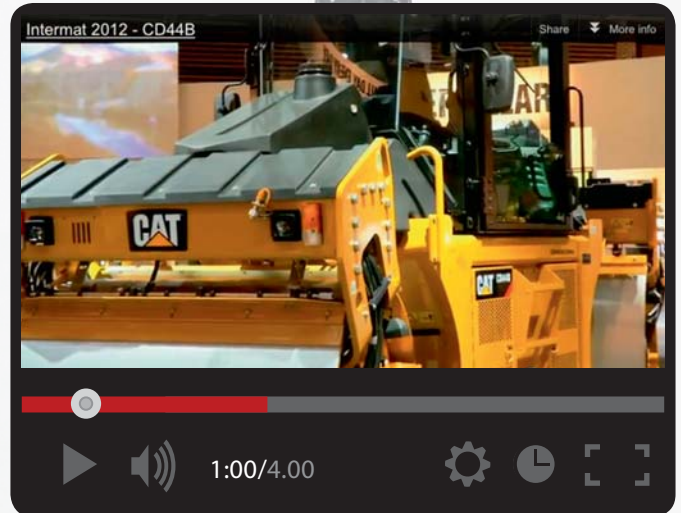
- Everything in the Bronze Kit.
- 6 Cat Reman cylinder packs preassembled to save labor hours.
- 6 Cat Reman injectors.
- Cat Reman complete cylinder head preassembled to save labor hours.
- Cat Reman fuel and oil pumps.
- Choose the kit that's right for you based on engine sales model and serial number.
- Additional components can be ordered as needed (refer to the related parts list).



Detailed information of all Cat Precious Metals Kits:
www.parts.cat.com/rebuildkits

AT INTERMAT 2012, WE ROLLED OU

Committed to your success. All day. Every day. That was the Caterpillar theme at this year's Intermat 2012 in Paris, France. If you couldn't make it, or just want another look at the line of Cat equipment on display and the innovations that go along with them, head to www.youtube.com and use these keywords: Caterpillar Intermat 2012.



CD44B

The innovations roll on with the latest in the line of Cat tandem rollers, including the CD44B. Built in is ease of operation, lower operating costs and even an eco-mode that optimizes engine RPMs based on the functions being used.



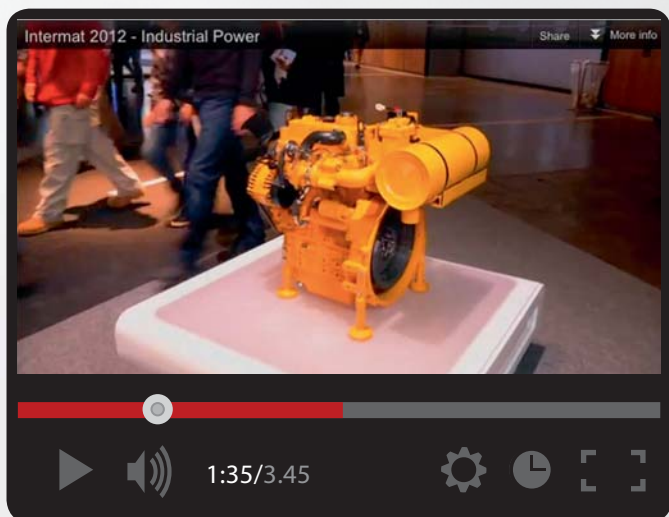
966K XE

The 966K XE is a new concept in medium wheel loaders that's designed from the ground up to help customers significantly reduce operating costs. See how the new 966K XE's innovative, variable transmission helps give you 25 percent fuel savings with 100 percent of the power.

T THE YELLOW CARPET

INDUSTRIAL POWER

The latest and greatest Cat industrial engines were on display at Intermat, such as two new Tier IV Final Stage IV industrial engines as well as a C13 ACERT Power Unit that is a drop-in configuration for easy installation and everything in between.



CONNECTED WORKSITE

You want technology? We've got it. At Intermat, Caterpillar launched Cat Grade Control on two different machines that can be used with 3D GPS. Our Cat Product Link solution also has a new version so users can measure project-specific productivity on site in real time.



PAVING PRODUCTS

Cat paving equipment followed the road to, and into, Intermat 2012. The theme of this year's paving display, "It's a great year to connect with Cat paving" was certainly appropriate as 25 of the 70 Cat paving models were on display – most of them new.

MOVING AHEAD

ALL DAY. EVERY DAY.

NEW CAT® K SERIES™ WHEEL LOADERS

Get to know the Cat® 966K, 972K and 980K.

- New cab, curved glass, rear camera and no steering wheel mean better visibility in all directions
- Low-effort, speed-sensitive joystick allows fast, efficient loading
- Compact, durable engine and high-efficiency drive train move more material with every litre of fuel

What else is new? Get an inside look. Visit [\[YourDealerName\]](#) or [\[DealerName.com\]](#).

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The CAT logo, featuring the letters "CAT" in a bold, black, sans-serif font with a yellow triangle pointing upwards from the bottom of the letter "A".