CAT MAGAZINE

ISSUE 3 2013 WWW.CAT.COM

FOUR YEARS IN THE MAKING

THE FIRST EVER CAT® 336E HYBRID HAS ARRIVED

CUSTOMERS ARTICULATE THEIR THOUGHTS

CAT® 740B AND 740B EJECTOR

BEAUTIFUL BEIRUT

HOW AVERDA IS KEEPING THE CITY CLEAN

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Where do many ideas for Cat® equipment adaptations and innovations come from? You might be surprised. They come from the Cat Customer Panel and people like you!

Available in nine languages, the Cat Customer Panel is a group of customers, including company owners, operators, fleet managers and service managers. Exclusive to Cat Customers, panel members share their opinions about Cat machines to help guide our product specialists in the development of solutions that, ultimately, will maximize the customers' return on investment.

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- wheel loaders
- track-type tractors
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- wheeled excavators

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Contents

DEAR READER,

If I could sum up this issue of Cat Magazine in one word, it would be unprecedented. From Antarctic exploration to autonomous machine operation and the only hybrid excavator in its class, the stories on the following pages are nothing short of remarkable.

However, one remarkable story not featured in this issue, but that is still worth mentioning, is the Caterpillar sponsorship with OCEARCH. OCEARCH is a world leader in shark research, particularly great white sharks. Their innovative methods and dedication have captured groundbreaking information on shark biology, health and migration. The world is beginning to understand some of the longstanding mysteries of these "lions of the ocean".

Finding answers to tough questions using the latest technology is exactly the type of challenge we like to be part of and we are delighted to help make their important research and sustainability studies possible. And, I am proud to say that Cat equipment helps drive and power the team's 38-meter-long vessel.

I've been lucky enough to get a sneak preview of all this issue's stories. Our feature article details how Cat equipment is helping the largest environmental solutions provider in the Gulf Cooperation Council, Middle East and North Africa regions. We take a look at how three 775G are proving their worth at a quartzite quarry in remote, northern Norway. And, we take an inside look at the new Caterpillar Middle East Distribution Center.

As they would say in Antarctica, that's just the tip of the iceberg. I hope you enjoy reading this third issue of 2013 as much as I did.

Nigel Lewis,
Vice President, Caterpillar

COLOPHON:
Above is just a taste of what's in this issue – you'll find plenty more news and views inside. If you have an idea for a story for a future issue, contact our publishers at CatMagazine@cat.com

Cat Magazine is distributed by Cat dealers in Europe, Africa, the Middle East and CIS three times per year. Please send your editorial correspondence to Cat Magazine, Caterpillar S.A.R.L. 76, Route de Frontenex, PO box 6000, 1211 Geneva 6, Switzerland. Catmagazine@cat.com.

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BEAUTIFUL BEIRUT

HOW AVERDA IS KEEPING THE CITY CLEAN

Beirut, a city of around 2 million inhabitants, in a country of 4.4 million, used to have a chronic problem with garbage. In the summer of 1996, the streets were overflowing with household waste, and temperatures in the high 30s produced a lingering stench made worse by the slow smoky fog drifting from the vast heaps of burning garbage just outside the city. Plastic, bottles, cans and paper were all thrown together, and as Hani Wazzan, averda's Supply Chain Director, says, "The city was throwing money away. Burning it. They were wasting good waste."

The Lebanese government introduced the “Integrated Solid Waste Management Plan”, and set out a tender asking for companies who could create, manage, and ultimately fill a 400,000m² landfill on the outskirts of the city.

Today, averda trucks climb the tree-lined roads heading towards the South of Beirut until they reach a hidden valley. Interlinked with a state-of-the-art gas management system, it is the full stop at the end of a story being told every hour of every day in the city streets below. A story of collection and sorting, recycling and renewal, the story of averda, and Cat® dealer Jallad of Lebanon.

THE SORTING STATION

Moustafa Al-Zoughbi is the Mechanical Engineer in charge of the 962H wheel loader in Amroussieh sorting plant. Brought into service in February 2012, it runs 22 hours a day in one of averda’s two sorting plants. Its job, to handle the collected garbage from Beirut’s inhabitants, each of whom generate an average 2kg daily. Night and day, 350 city trucks rumble through the doors, empty their 6 tonne loads of garbage, and disappear back onto the streets to continue collecting.

The 962H has clocked 6,800 hours so far without issue: “the only problem we had was a broken water pump, which was fixed in under 4 hours, which is a proof of reliability that speaks for itself” says Moustafa.

The problem with the garbage isn't its stench since averda has an odor control solution in place. The problem with garbage is its effect on the tires and the operating floor, making it one of the most abrasive environments a vehicle can operate in. "The 962H has L5 tires," Moustafa says, "they're the thickest rubber available, 44cm from rim to top. Under normal use, the tires last an average of a year and a half. These were fitted around 3 months ago," he explains, pointing to the wheels.

The tires are now as smooth as something from Formula One. "Waste and the resulting waste water eats the rubber, stripping the tires of their grip. That adds to the challenges for the operator, but the limited slip differential really makes a difference to the work, really helps."

The limited slip differential (LSD) is a special spec for machines in floor/stockpiling applications. As the machine pushes material into the stockpile, the front axle becomes light and relies on the rear axle to transfer the drive, thereby reducing unnecessary wheel spinning that shortens the life of the tires.

For Wael Ibrahim, averda Account Manager, and Ghassan Dbouk, Service Operations Manager at Jallad, the customary harsh working conditions of the sorting plant are an opportunity to show the power and reliability of Cat loaders.

"I spend a lot of time with the customer," says Wael, "and before they brought in the 962H, there was an issue with slippage, with loaders not getting traction on the slippery floor. We fitted a limited slip differential to the 962H, and I have heard from many people the difference it has made. That's why we continued by offering the 950H loader with LSD as well as many other useful options."

The success of the 962H led Jallad to propose a full-option 950H loader for another sorting plant in Karantina, which as well as the limited slip differential, was fitted with rear view camera, auto lubrication, reversing fan and high-lift arms.

Tony Saade, Plant Manager at Karantina, describes the results: "Operators appreciate the fact that they can do their job without being interrupted by the wheels. And the rear view camera gives them an extra set of eyes to navigate easily through the piles of waste from the garbage trucks to the sorting lines."

A CUSTOMER'S WELCOME RETURN

Tarek Jallad is the Sales and Marketing Director of Cat dealer Jallad, and his customer dedication is something that is shared by his entire team. "About ten years ago, averda chose to partner with another supplier for their equipment," he explains, "and that was a great disappointment.

Reliability and support, the cornerstones of a solid partnership.

Rebuilding the relationship has taken substantial effort, time and follow up at all levels from both organizations.

When you supply a customer with reliable, efficient equipment, it is just the beginning: sales are not the end of the story. We all know that product support is the real priority. Working again with averda enabled Jallad to step-up to a higher standard of customer service.

One of the first actions we took was asking Caterpillar's Waste Application Specialist to join us on an intensive week of meetings with key averda personnel, at the company's different sites, to clearly identify the most optimal fleet specifications needed. In particular, our aim was to give value-added suggestions to both the operations and maintenance teams of averda, and engage as trusted consultants. From then on, we were able to fulfill all averda's requirements.

First, in 2011, a 962H waste handling loader was brought into the averda sorting plant fleet, together with a 950H standard loader for municipal collection. Then in 2012, averda showed their growing faith in both Jallad and Cat equipment with an order for a 950H high lift, a 950H waste handler, a D6R landfill bulldozer, a 963 Certified Used landfill track loader, and two 216B3 skid loaders. In 2013 we again received an order for

With its high-lift arms and rear-view camera, the 950H is a vital part of the averda fleet in the Karantina plant.

1. Operators appreciate the power and control of Cat® loaders.
2. Hani Wazzan, averda Supply Chain Director, raising standards throughout MENA.
3. Tarek Jallad, Sales & Marketing Director at Cat dealer Jallad.
4. Mohammad Akil, Plant Manager, oversees the 24/7 operations at Amroussieh.

another 962H loader for the landfill. We hope to continue growing this partnership in the months and years ahead."

"These machines run around the clock, on a 3-shift basis, and are serviced by a dedicated technical team from Cat dealer Jallad," says Ghassan Dbouk, Service Operations Manager. "When we say we are available around the clock, we mean it. If the call comes in, it´s answered, and engineers are on the way."

TREMENDOUS GROWTH IN AN UNREGULATED CLIMATE

The Middle East/ North Africa region (MENA) has little or no regulation when it comes to recycling. "We are setting benchmarks in this industry," explains Hani Wazzan, averda Supply Chain Director.

"A 24/7 system of collection, sorting, treatment, recycling and disposal is only possible with the combined efforts of our employees, suppliers and customers. And because there is currently no real culture of recycling in Lebanon, we have also introduced a program of education, teaching children the importance of using resources carefully. The philosophy of averda is protecting the planet, and we believe that it starts with the children who will grow to be the decision makers, who will one day be responsible for the world."

Maysarah Sukkar founded averda in 1965, as part of Sukkar Engineering. When the company recognized the need for efficient waste and resource management, averda soon specialized in the sector, quickly growing to become the largest environmental solutions provider in the Gulf Cooperation Council (GCC) and MENA regions. With more than 7,500 employees, averda now operates throughout Lebanon, Saudi Arabia, the United Arab Emirates, Oman, Qatar, Iraq, the United Kingdom, France, Ireland and Morocco. So why the return to Caterpillar after such a long absence?

"We have a beautiful city that we plan to keep beautiful, and that means we need reliability and support," says Mr. Sukkar. "The story never ends, so we have to make sure we never stop." ■

See more at: www.cat.com/waste/products-and-applications

FOUR YEARS IN THE MAKING

THE FIRST EVER CAT® 336E HYBRID HAS ARRIVED

INNOVATION AWARD WINNER

The Cat® 336 has long been recognized around the world as a high-performance workhorse in high-production applications. It's the "go-to" machine for swing-intensive operations ranging from trenching to truck loading. Now, with the introduction of the 336E H, that virtually unparalleled level of performance comes with another benefit – industry-leading fuel economy, thanks to innovative Caterpillar hybrid technology.

It all boils down to a simple formula, and as Cédric Masson, Product Application Specialist for Track Excavators says, “The more you swing, the more efficiency you get out of the machine.” While most people connect the word “hybrid” to an electric power source, Cédric adds that, “In fact, hybrid really defines a system working from two different power sources that collects, stores and re-uses energy.” And, it’s that simple formula that earned the Cat 336E H a coveted Edison Award, which recognizes innovations and ingenuity that create a positive impact on the world. It should also be noted that in addition to an Edison Award, the 336E H was also given an Innovation Award from Equipment World magazine.

PATENTED POWER, PERFORMANCE AND PRODUCTIVITY

That’s how Caterpillar engineers looked at it. The result is the less complex, less costly and significantly more efficient hydraulic hybrid system. The concept is straightforward and uses three technology building blocks:

1. an hydraulic hybrid swing system
2. an Electronic Standardized Programmable (ESP) pump
3. an Adaptive Control System (ACS) valve

The ESP pump is electronically controlled. Its job is to deliver a smooth transition between the excavator’s two power sources, the engine and the accumulators. And it provides the same hydraulic flow at lower engine operating speeds, which means better efficiency.

On the other hand, the hydraulic swing system captures swing brake energy. For example, each time the operator brakes toward the end of a swing, the kinetic energy charges accumulators, which then re-use that power for the swing in the opposite direction.

The keystone that brought it all together was the development of the new Cat ACS valve. “It’s literally at the center of the 336E H concept,” says Cédric. “Our new ACS valve

SA-Anlegg is the purchaser of the first 336E Hybrid worldwide.
Ceremony at Bauma with Inge Stensland, MD Pon Norway; Sten Antonsen, Owner of SA Anlegg; Doug Oberhelman, Caterpillar Chairman & CEO; Per Gunnar Hanssen, Salesman, Pon Equipment Norway; Rob Charter, Caterpillar VP Excavator Division.

Meet the only hybrid excavator in its class.

is the brain that optimizes the system and really makes the whole conserve, optimize, re-use concept work."

Of course, while the concept is straightforward, developing the technology to control the system was a considerably more complicated task. Caterpillar filed more than 300 patents for technology used in the 336E H.

ECONOMICALLY SMART, ECOLOGICALLY SAVVY
The new hybrid has a long pedigree of high performance in its weight class. A 36- to 38-metric tonne machine (depending on its configuration), the 336E H effectively has no peers in productivity and fuel efficiency. It's a true heavyweight ideally suited to

Caterpillar filed more than 300 patents for technology used in the 336E H.

the production-intense operations of large-scale construction, quarry work, trenching and high-volume truck loading duties.

In fact, the 336E H delivers the same high productivity with significantly lower fuel costs. This is thanks to the three technologies (the ESP pump, ACS valve and the hybrid swing system) that work in synergy with each other.

It's anticipated that the majority of 336E H adopters will be customers replacing 336D L machines. "Just moving from the D to the E series offered better fuel efficiency, greater lift capabilities, lower maintenance and, with a 4 dB noise reduction in the cab, enhanced operator comfort," Cédric added. "Starting with all those plusses, we're reducing fuel consumption and the carbon footprint even further. Compared to a 336D L, our new 336E H burns about 33 percent less fuel in a typical truck-loading application. Even compared to a 336E in the same application, the 336E H burns 25 percent less fuel. That's significant, knowing that there is absolutely no trade off in productivity or performance."

A SMART BUY
The first customer to purchase a 336E H was Sten Antonsen, the Owner of SA-Anlegg in Norway. His first order was placed just two days after the press release was issued announcing the 336E H – even though pricing wasn't yet available. Speaking to Per Gunnar Hanssen at Pon Equipment Norway, Sten said, "Low fuel consumption is important and my company strives to be environmentally aware. Let's make a deal." Sten then ordered a second 336E H in January 2013.

So, in terms of return on investment, what's the bottom line? The 336E H is always a good bet in a high-production environment, but a precise answer depends on local fuel prices and, of course, the specific application. According to Caterpillar, the payback period can be as little as two years – even less in some circumstances. In any case, the more you swing, the more you save. It's that simple.

The official introduction of the 336E H at Bauma (Germany) in April of this year was the culmination of a four-year development program. Now available in Europe, Japan and North America, the excavator is Tier IV Interim/Stage IIIB compliant and is intended especially for highly regulated markets. ■

Additional details at: www.uk.cat.com/336EH

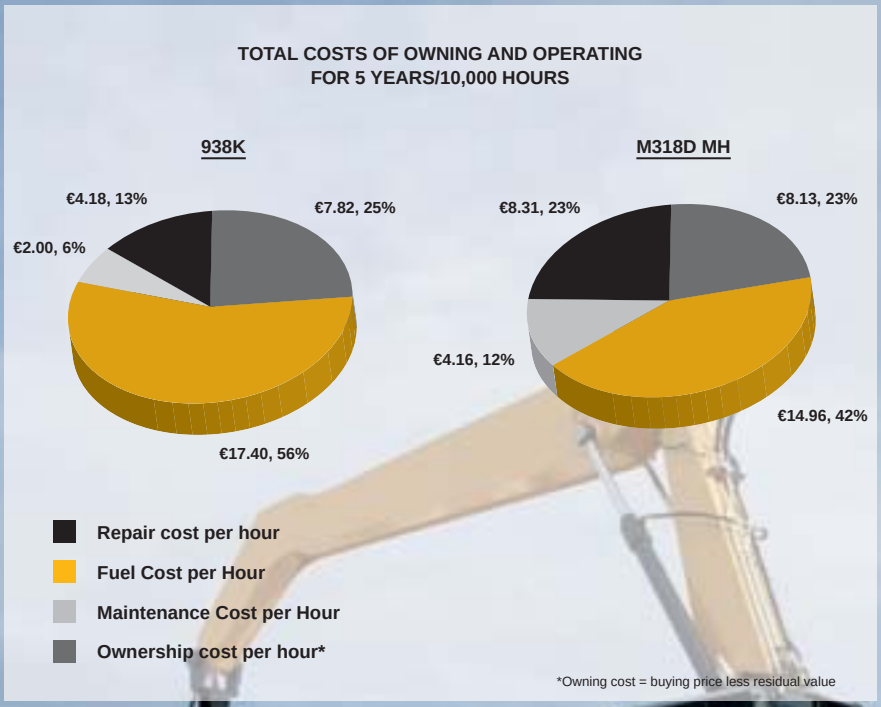
Cutting waste
in waste management applications

Profitability in waste management means controlling operational costs of human, land and mechanical resources. This holds true for collection and hauling as well as landfill planning and management.

From operator skills, to maintenance schemes and fuel efficiency, Cat® machines are helping companies realize substantial savings in every area. And, because there's so much to talk about, we at Cat Magazine decided to create a series of short "case studies" to show you just how Cat equipment is doing it.

Let's start by taking a look at the total owning and operating cost of two pieces of equipment frequently used in waste handling applications: the Cat 938K, a 16-ton wheel loader, and the 20.5-ton M318D material handler.

What is immediately obvious is that in both examples, close to or more than half the total owning and operating expense is fuel. So, our first cost-management consideration is clear. How to reduce fuel costs.



FUEL CONSUMPTION

Advances in engine technology in the past 15 years have responded to tight EPA and European emission regulations. But Caterpillar has also focused on significantly reducing fuel consumption through major developments in transmission technology. For example, in benchmark tests, a Cat D7R with a Stage IIIa engine and traditional powershift transmission burned an average of 37 liters of fuel per hour. By comparison, a D7E with a Stage IIIb engine and a new Cat electrical transmission burned less than 25 liters per hour in a similar application. Over five years at 2,000 hours per year (assuming a fuel price of €1.10 per liter), that's a 33 percent reduction in consumption and a saving of €132,000.

In another test measuring fuel efficiency in standard operations (stockpiling, load-and-carry, and truck loading), a new 966K XE with a Stage IIIb engine and advance powertrain transmission used three liters less fuel per hour (21 percent) than a 966H wheel loader with a Stage IIIa engine and powershift transmission. That rolls out to a saving of €33,000 over five years.

OPERATOR INFLUENCE

Just as a skilled motorist can travel further on less fuel than an average driver, machine operator skills have a big impact on fuel consumption and the operating costs of a waste treatment plant.

That's why Caterpillar and Cat dealers developed the Eco Operator Training program, for example. The goal is to "tune" operators in to the exact machines they use. And, as a result, give them the skills to optimize fuel consumption while meeting production requirements, improve operation and assure the best use of the equipment capacities, which also helps lead to more machine uptime.

On top of that, fleet managers can remotely monitor and review machine and operator performance. This way, operator-training needs can be identified and the appropriate equipment can be dispatched to optimize fuel consumption and equipment use. Caterpillar equips machines with the Product Link™ system, a remote telemetric system that gathers machine data such as fuel consumption, machine use and component condition. The data is then sent via satellite or GSM to fleet managers who can with VisionLink® make timely, cost-effective decisions that have a positive effect on your bottom line.

RIGHT MACHINE FOR RIGHT APPLICATION

For this example, a machine is loading trucks that are 4 meters high, 2.55 meters wide and 12.5 meters long. At about 0.2 kg per cubic meter, the density of the material is not an issue. The goal, however, is maximum volume per truck to reduce transport costs. So is this set up optimal? Here are three options.

Option A) 20.5-ton Material Handler
Versatile for working at various heights, a machine like the M318D MH is quite fuel efficient in many applications. However the grapple is not ideal for a big loading production.

Option B) 20-ton Wheel Loader
A large wheel loader with a high lift arm is needed to reach the four-meter height with enough clearance to optimize capacity. It has better loading capacity than an excavator or material handler and more suited for loading production.

Option C) 16-ton Wheel Loader
In this case, the best solution is to use a loading deck to lower the dump height. It makes a smaller machine with the same sized loading tool more efficient. There's a smaller cost of entry, improved cycle times and less fuel consumption. Fuel savings could amount to €2.42 per truck, compared to the material handler solution.

CHOOSING TIRES

Waste management materials are not tire friendly. But which tires are right for you?

Pneumatic tires are good for longer travel cycles. They offer handling and operator comfort, but can cut or puncture, increasing downtime plus maintenance and repair costs. Foam-filled pneumatic tires decrease the potential for punctures, but reduce handling and operator comfort. Plus, they can cost about €1,000 more per tire.

Solid tires, though more costly initially, are often the optimal choice. In the past, solid pneumatic tires made the ride hard for operators and rough on machine frames and axles.

Cat Flexport™ tires are an excellent solution. These solid tires are engineered with holes for flexibility and cushioning for a better ride and stability. After more than 10,000 hours of operation, a cost-per-hour analysis showed a saving of €2.92 per hour, compared to heavy-duty, foam-filled pneumatic L5 tires and a €5.92 saving over heavy-duty pneumatic L5 tires. That's a saving of €29,200 and €59,400, respectively.

Flexport tires also provide superior durability and can have a life of 6,000 to 9,000 hours – about two to three times longer than heavy-duty standard or radial tires in waste application.

CAB FILTRATION

As bad as what's on the ground, what's in the air can be equally hazardous. Airborne dust and dirt make pressurizing and filtering cabin air crucial. We can compare the effectiveness – and the impact on operational costs – of two popular solutions.

Standard PFP (Precleaners + Filtration + Pressurizers) systems normally rely on air passing through multiple layers of filters to remove particulate matter. The cyclonic pre-cleaning system on Cat equipment, however, uses centrifugal airflow to eject 90 to 95 percent of airborne particles even before they reach the filtration stage. Only one filter is required where previously, three were needed. Plus, the useful life of that one filter is much longer.

An analysis made over 10,000 hours (or about five years of real-world of operation), indicated that the use of a Cat pre-cyclonic cab filtration system saved about €18,000 compared with a conventional PFP filtration system.

THE BOTTOM LINE

Waste management applications are different than any other heavy equipment arena. Every waste management operation has its own unique set of challenges.

There can be no single, standard "most productive" or "most economical" solution. Maximum operational efficiency is the product of tailoring equipment choices to the site and production requirements.

While initial cost matters, it's a small portion of the total owning and operating cost over the life of the equipment. That's why Caterpillar has resources and experts to help make the big-picture analyses, case by case, across the spectrum of waste management applications.

Depending on your operation, using the right equipment for each application, providing operator training and focusing on the right attachment will lower fuel and overall operating costs as much as the purchase price of the machine. ■

Learn more: www.cat.com/waste/products-and-applications

Delivering reliability

at the top of the world

Welcome to the Austertana quartzite quarry. It's not so conveniently wedged into a mountainside about 450 kilometers inside the Arctic Circle. Even with its remote location, in northernmost Norway, the quarry is one of the largest in the world.

MAKING THE GRADE

Removing the incredibly hard quartzite is difficult enough. One of the most demanding challenges, however, is transporting the quartzite three short kilometers from the quarry to the crusher. "Carrying 65 tonnes downhill at almost an 18 percent grade is extremely tough on our machines – especially the brakes," said Odd-Einar Utsi, Construction Manager for Leonhard Nilsen & Sønner AS (LNS).

Per Olav Listou, Key Account Manager at Cat® dealer Pon Equipment AS, agrees. "The material LNS is working with here is tough, but hauling it to the crusher is even tougher. But even with no real major modifications, the 775G used to haul the ore are up to the task."

The quarry currently uses a 95-ton Cat 390D L excavator that works virtually non-stop from 6:00 until after midnight. It loads quartzite into three Cat 775G off-road trucks. The 775G put their 63.5-ton capacity to the test hauling material down to the crusher, and then return for another load. Each 775G repeats the round trip about 40 times a day.

EQUIPPED FOR THE JOB

All Cat machines in Norway are delivered with a heavy-duty starting system including more robust batteries, cables and a bigger starter motor. "Other than that, no real major modifications were made," said Per.

From left to right: Ørjan Dervola, Stig Almar Smelror, Ketil Ingilæ, Odd-Einar Utsi (Construction Manager), Jørn FrodeJessen, Steinar Mietinen and Arnt Dervola.

(extreme duty) bucket and Cat J800 teeth are also needed. "It was normal for LNS to get as little as 15 hours from the former K170 bucket tips, the J800 teeth improve that up to 140 hours," Per went on to say.

PROVEN RELIABILITY

It was reliability and durability that drew LNS to Cat. During a visit to the US, they saw a demonstration of a 775F using a compression brake and decided that the trucks could be a viable solution.

As a result, LNS tried out a 775F. After 13,000 hours of operation they were almost without any kind of problems related to brakes and brake performance. In fact, during a brake inspection at 8,000 hours, we found the brakes had only worn about 25 percent. "We tried using a competitor's machines and had several for about seven years. We were constantly going through brakes. It was a complete disaster," says Odd-Einar. "The 775F performed very well for us and now we have three 775G.

> "Carrying 65 tonnes downhill at almost an 18 percent grade is extremely tough on our machines…"
>
> Odd-Einar Utsi, Construction Manager, Leonhard Nilsen & Sønner AS

The three 775G do, however, have heavy-duty carbon fiber brake discs, traction control, an auto-retarder and an engine compression brake. "These components are really what make the machines last," added Per. "When you're fully loaded and headed downhill to the crusher, operators can put their 775G in fifth gear and then just watch the oil temperature and steer. That three-kilometer challenge becomes a nice easy ride down the mountain."

The 390D L also has some added protection such as track guiding guards and heavy-duty track shoes. An XD

The original plan at the site was to keep the F series truck and add two new G series trucks. But once LNS began working with the 775G, they decided not to do a Cat Certified Rebuild and purchase another new 775G. "The G series is nearly 10 percent more productive and uses 10 to 15 percent less fuel. From a performance point of view, I've never seen such improvement from one model to the next," exclaims Odd-Einar.

HARD WORK IN A HARSH WORLD

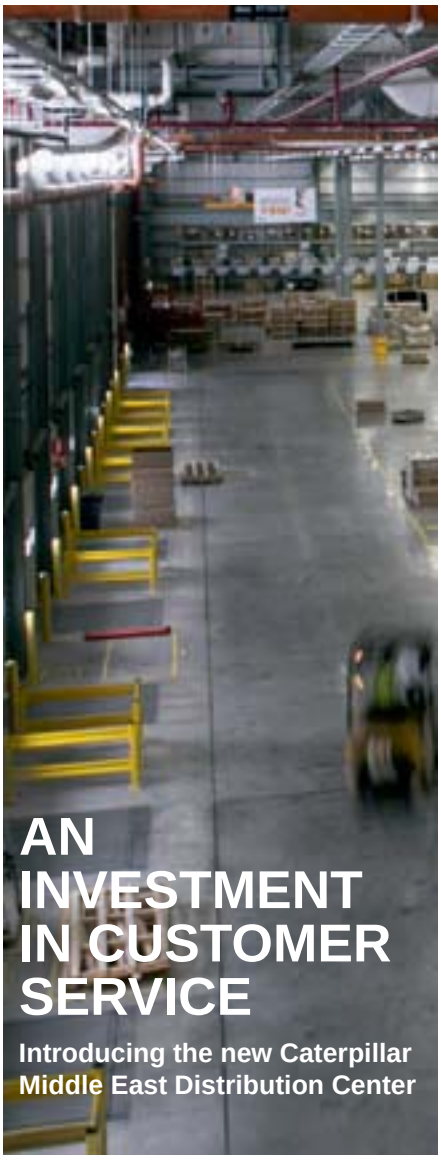
When it comes to maintenance, Caterpillar logistics savvy makes the challenge of service and replacement parts in such a remote area a well-choreographed dash through the Northern Lights. "From our warehouse in Oslo, parts can be on site in five hours," said Per.

LNS has a full tool, maintenance and repair contract for the life of the current four machines. "We use our own people and provide full service," says Per. "Thanks to the reliability and durability of the machines, we don't need to be on-site full time."

LIVING UP TO THEIR POTENTIAL

LNS began using Cat equipment about five years ago. The new 390D L and the three 775G, were delivered and put into service between May and September of 2012. They are used to help deliver the approximately 1.2 million tonnes of high-quality quartzite across the globe. Quartz from the mine can be found in 50 percent of our computers around the world. ■

Read more at: www.uk.cat.com/quarry-aggregates-and-cement



AN INVESTMENT IN CUSTOMER SERVICE

Introducing the new Caterpillar Middle East Distribution Center

“Caterpillar Logistics has truly reinforced its trust in us and in Dubai as the region’s premier business and logistics hub.”

Those are the words of Her Excellency Mrs. Salma Ali Saif Bin Hareb, Chief Executive Officer of Economic Zones World & Jafza, on the opening of the new Caterpillar 46,450-square meter Middle East Distribution Center (MEDC) in Jafza. “This state-of-the-art facility underlines the Caterpillar vision and commitment to the region.”

The MEDC is a direct result of planning that began less than six years ago. The vision of supporting and developing industry in the Gulf, however, is a commitment that dates back more than 60 years to the exploration of the area’s newly discovered oil fields and operation of the world’s largest oil refinery.

Later, throughout the 1960s, Cat® equipment was instrumental in dredging the Dubai creek and building the infrastructure that gave Dubai an advantage over Sharjah, the region’s other dominant trading center at the time.

By the turn of the century, Cat machines were at the heart of the Saudi Railways Expansion Program – the Saudi Land Bridge, the North South Railway, and the Haramain High Speed Rail Project – and Caterpillar Power Systems were powering some of the world’s tallest skyscrapers and mega-projects such as Burj Khalifa and Dubai Metro.

Today, the new MEDC facility is a game-changing addition to the Europe-Africa-Middle East (EAME) network. It substantially increases the Cat parts capacity already provided by distribution centers in Grimbergen, Johannesburg and Moscow.

Calling it a crucial link in the Caterpillar global chain, Nigel Lewis, Caterpillar Vice President with responsibility for EAME distribution, says, “As impressive and important as the MEDC is, it’s only the first of a number of investments in the

The first phase of the MEDC as it stands today. When complete, the Center could cover 82,000 square meters.

region to improve parts and component availability as well as the delivery process to our dealers and customers."

AN IDEAL LOCATION

Virtually adjacent to both the port at Jebel Ali and Maktoum Airport between Dubai Center and Abu Dhabi, the facility is ideally situated for distribution. All vitally important to customers, the MEDC provides key customer benefits, including:

- stronger customer-centric, order-to-delivery metrics
- shorter lead times
- a ready supply of parts strategically near end-users
- increased machine uptime

Looking ahead – true to the global-distribution commitment – this prime logistics space assures that Caterpillar will continue to be central to the region's ever more prosperous future.

GLOBAL EFFECTIVENESS

Employing about 130 people, the new facility is central to the Jebel Ali Free Zone, about 40 km from downtown Dubai. This free zone is an industrial area that, together with the Dubai international seaport and the new Al Maktoum international cargo airport, creates the largest logistics zone in the Gulf region and one of the biggest in the world. It's an ideal hub location for parts distribution. In addition to strengthening Caterpillar aftermarket support, this strategic location will also allow the MEDC to serve as a regional office for employees from other Caterpillar service groups.

The MEDC is an important part of an overall global plan to optimize the Caterpillar distribution network, improving the speed and optimizing the efficiency at which parts are delivered to dealers and customers. Since the plan's implementation eight years ago, worldwide distribution capacity has been added in every region with the opening of Caterpillar distribution centers in Shanghai (2006), Moscow (2007), Texas (2009), Ohio (2011) and California (2012).

"...it's only the first of a number of investments in the region to improve parts and component availability..."

Nigel Lewis, Caterpillar Vice President

At start-up, only about one-third of the new facility's potential footprint of approximately 82,000 square meters is in play, but already stocking 78,000 part numbers (SKU). Within five years, that inventory is anticipated to nearly double to about 132,000 SKU.

Since January 2013, the MEDC has been processing orders from throughout the Middle East. That includes the Emirates, Kuwait, Qatar, Bahrain, Oman, Yemen, Saudi Arabia, Afghanistan, Iraq and Pakistan. East African Cat dealers in Egypt, Kenya, Tanzania, and Uganda will also have their orders processed from the MEDC.

The debut of the MEDC in Dubai foreshadows the opening of under-construction distribution centers in Queensland (Australia) and San Luis Potosi (Mexico). ■

ALL VITALLY IMPORTANT TO CUSTOMERS

The MEDC means:

- stronger customer-centric, order-to-delivery metrics
- shorter lead times
- a ready supply of parts strategically near end-users
- increased machine uptime

No Such Thing as a Typical Day

This is the third article in a series covering The Coldest Journey On Earth. And, despite years of planning and extensive training from some of the world's best cold-weather experts, the Ice Team's resolve and their ingenuity were put to the test, even before embarking on their trek.

TEAM LEADER SIR RANULPH FIENNES WITHDRAWS

In late February, expedition leader Sir Ranulph Fiennes took a fall while skiing near the Antarctic base camp. He was able to fix his ski binding, but in whiteout conditions at -30º C, he suffered a serious case of frostbite. This meant that Sir Ranulph Fiennes, with the support of the team doctor, had to make the difficult decision to withdraw from the expedition. The episode served notice to the remaining team members that nothing could be taken for granted.

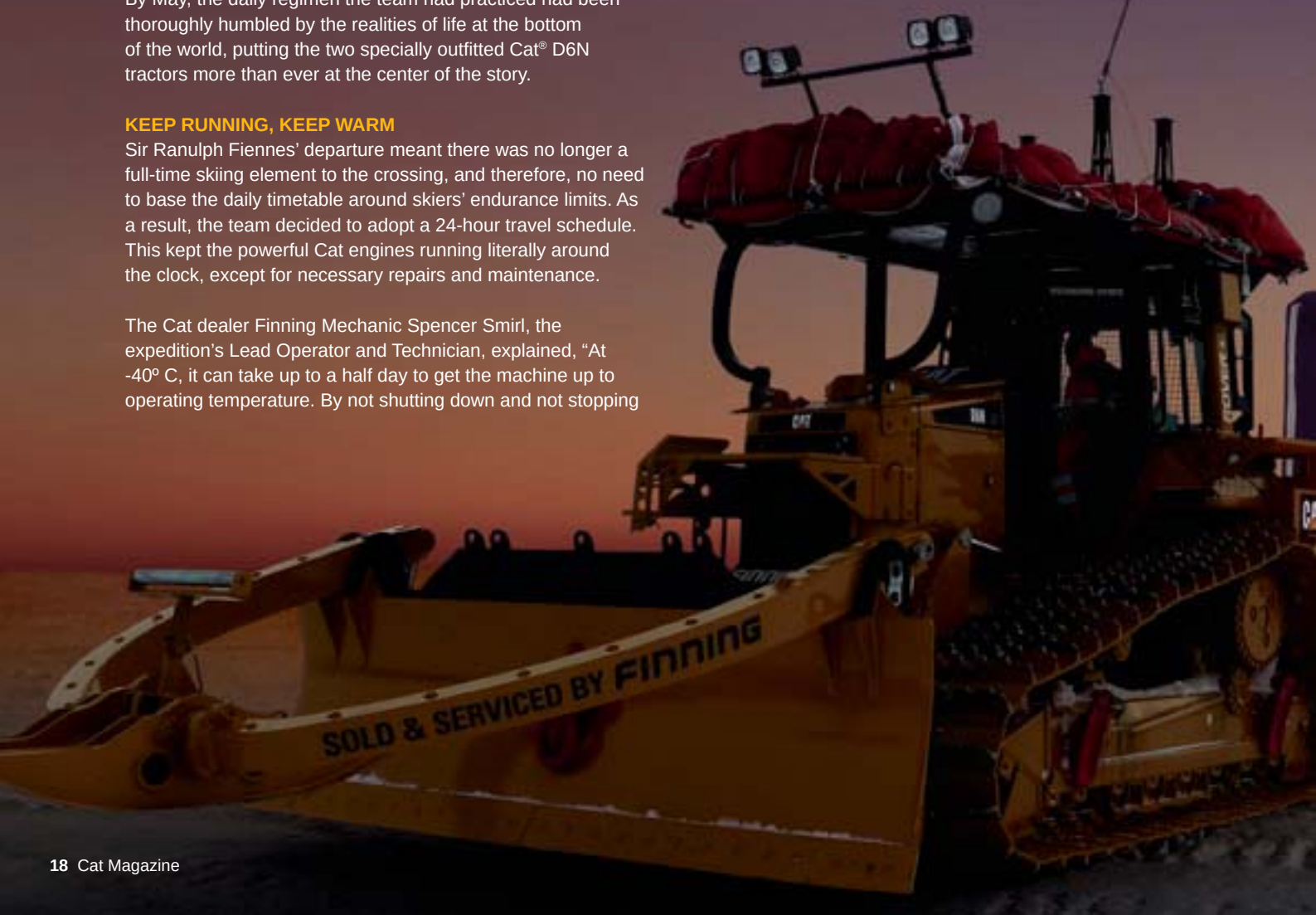
By May, the daily regimen the team had practiced had been thoroughly humbled by the realities of life at the bottom of the world, putting the two specially outfitted Cat® D6N tractors more than ever at the center of the story.

KEEP RUNNING, KEEP WARM

Sir Ranulph Fiennes' departure meant there was no longer a full-time skiing element to the crossing, and therefore, no need to base the daily timetable around skiers' endurance limits. As a result, the team decided to adopt a 24-hour travel schedule. This kept the powerful Cat engines running literally around the clock, except for necessary repairs and maintenance.

The Cat dealer Finning Mechanic Spencer Smirl, the expedition's Lead Operator and Technician, explained, "At -40º C, it can take up to a half day to get the machine up to operating temperature. By not shutting down and not stopping for extended periods, we retain all this heat and eliminate the thermal shift the D6N would be subject to day in and day out. The elimination of this constant expansion and contraction of all the materials that assemble our bulldozers will help keep them in one piece over the next five to seven months."

This change of routine would also prove helpful in keeping the expedition from falling behind its schedule. Expedition plans had allowed for plenty of bad weather. But unexpectedly large stretches of difficult blue ice and



more potentially deadly crevasses than anticipated cost the team hours per day in reconnaissance and detours. Increasing the caravan's speed was not an option.

According to Spencer, "We were successfully pulling more than twice the recommended draw bar load, but we were limited to about 3.5 kilometers per hour doing it. We needed to run longer hours to accumulate greater daily distances and take better advantage of decent weather when it came."

DRIVING SCHOOL ON ICE

Changing the daily routine came with challenges of its own, however. Only two of the five Ice Team members had any real operating experience on the two D6N.

The unforgiving Antarctic environment is hardly ideal for on-the-job training. But, not for Spencer. Luckily, there was a break in the weather and terrain.

As the team returned from the fuel depot toward Crown Bay, each D6N towed about 25 tons. Spencer leaned through the left side

…easier to navigate in the dark with the headlights casting useful shadows.

window and gave condensed operating clinics to each of the three inexperienced drivers in turn. "They each spent nearly four hours listening to me be extremely thorough about operating a bulldozer in extreme conditions with limited spare parts," recalls Spencer.

But even with five "certified" D6N operators and a round-the-clock workday, the only thing predictable about any day on the ice was unpredictability. In a video recorded on May 8, after many hours of trying to break a route through the next patch of blue ice, Ian Prickett, Ice Team Member, painted a clear picture of the daily uncertainties. "Yesterday we got over halfway through it (blue ice field) by taking both Cat machines – but just the Cat machines on their own – and just trying to prove a route through zig-zagging in between huge, two-meter-high ice uprisings to get into some good terrain, some good snow, or what looks good, anyway. Then we can get all the kit winched through, re-made up on the other side and, hopefully, get moving again."

THERE GOES THE SUN

About 48 hours after Ian's report, only one more thing became predictable during the team's 24-hour workdays. That was the darkness.

With temperatures falling close to -90º C, severe crevassing was being exposed in all directions. And, with no sunrise to look forward to for at least three months, the Ice Team has continued to take each day as it comes. As of mid May, the team was making extensive use of the ground-penetrating radar and forging a trail lit only by the powerful bank of D6N headlights.

According to reports relayed through The Coldest Journey on Earth's Operations headquarters in London, that's not a bad thing. The team has reported that the terrain is easier to navigate in the dark with the headlights casting useful shadows. ■

More details about the expedition, along with images and video, can be found at www.thecoldestjourney.org and www.uk.cat.com/coldest-journey

CATERPILLAR CUSTOME
ARTICULATE THEIR THOU

THE CAT® 740B AND 740B EJECTOR

RS
UGHTS

In the earthmoving industry, productivity matters. And to get the production you're looking for, it doesn't get much better than the Cat® 740B and 740B Ejector articulated trucks. Both offer proven reliability and durability and are designed to improve cycle times, safety and operator comfort. In fact, the 39.5-tonne 740B and 38-tonne 740B Ejector are considered the industry's standard.

TRUE AUTOMATIC TRACTION CONTROL
The trucks' traction control system is fully proportional through four, multi-disc clutch differentials. Six sensors monitor wheel-slip on each wheel. And, the system instantly and automatically (while on-the-go) selects the best combination of differential lock to maximize traction. That means:
- no buttons or switches
- inexperienced operators are more productive
- reduced operator fatigue
- reduced driveline damage

EFFICIENT, DURABLE POWERTRAIN
The seven-speed, electronically controlled powertrain is built to last. In addition to industry leading durability, the B Series transmission features the APECS control strategy, which includes part throttle

"Our five 740B help haul a half-million cubic meters of rock."

Erik Spilling, Civil Engineer and Project Manager with TT Anlegg

shifting and shift torque management. These features significantly improve machine performance over the previous models. The B Series powertrain:
- provides a 5 percent power and 4 torque increase
- increases productivity and reduces fuel consumption
- improves operator comfort through smoother shifting

NEW STYLING, ADDITIONAL SAFETY
Improved safety features include, wider-set headlights and indicators to increase illumination and visibility. Front-end durability has also been improved with a single piece bumper design. Other external features include:
- fully enclosed belly guard
- industry-leading platform and handrails

Of course the main difference between the 740B and the 740B Ejector is the ejection feature. Ideally suited for carrying wet and sticky material, the Ejector increases stability and safety by pushing the load with a high-strength steel blade, instead of having to raise the dump body. Other key benefits of the Ejector system are:
- easily spreads material, reducing the need for support equipment
- can eject material on the go to greatly reduce cycle times
- virtually eliminates carry-back and increasing productivity.

CUSTOMER THOUGHTS

We spoke with two customers, one operating in Norway, and the other in Germany, and asked them their opinions on the Cat 740B and 740B Ejector.

ERIK SPILLING ON THE 740B

Using the 740B, TT Anlegg specializes in road building, hydropower projects and industrial sites. The company is currently upgrading the Svartevatn hydropower dam – the highest in Norway.

Q: How are your Cat 740B used?
ERIK SPILLING: "Our five 740B help haul a half-million cubic meters of rock. The trucks work 70-hour weeks moving about 300 cubic meters of rock per hour."

Q: How do the 740B help?
ERIK SPILLING: "There are many benefits. One of the most important is that they help us move a lot of material in a short amount of time."

Q: Is traction control helpful?
ERIK SPILLING: "The automatic differential and traction control are very important. In snowy and icy conditions, it's far better to have the articulated truck with traction control. We transport material along a narrow, steep one-kilometer route. But, these Cat trucks just keep going. This new Cat system also helps prevent tire wear, so we do the job efficiently and safely, and control costs."

Q: How do you tackle maintenance and service in such a remote place?
ERIK SPILLING: "We have a very good relationship with Pon Norway. They fix problems quickly and are always helpful, especially for service and maintenance. We have a service contract on newer machines but take care of the older machines ourselves. With Cat machines, we know what we're getting. These machines are good value for the money."

FRIEDRICH KÖNEN, CEO OF ADOLF SCHUMACHER ON THE 740B EJECTOR

The 740B Ejector are being used by RWE Power, a German utility company based in Essen, North Rhine-Westphalia that supplies electricity to 20 million customers and gas to 10 million customers.

Q: What tasks do your Cat 740B Ejector perform on site?
FRIEDRICH KÖNEN: "We have five ejector trucks here. They are mainly used to transport clay.

Q: How does the ejection feature help?
FRIEDRICH KÖNEN: "The landscape here is very sloped. Tipping would be impossible. The ejector allows us to control unloading with out raising the body and it is much safer."

Q: Was the automatic traction control a deciding factor in choosing 740B Ejector?
FRIEDRICH KÖNEN: "In bad weather, there is little stable ground here. Conditions quickly turn and some areas are almost impassable. Thanks to their all-wheel drive system and articulated body, the 740B Ejector are ideal." ■

Learn more at: www.uk.cat.com/equipment/articulated-trucks

◂◂ (From right to left) Adolf Schumacher CEO, Friedrich Könen; Commercial Director, Frank Könen; Zeppelin Sales Director, Kay-Achim Ziemann; Gerald Jaschinsky Superintendent, Adolf Schumacher; Zeppelin Branch Manager, Stefan Lanio; Caterpillar Technology Officer, Martin Haber Berger.

▴▴ Wet, heavy material is hauled at the Inden site, Germany, where the average ratio of the slope is 1:3.

▴ A specially designed body uses a hydraulically powered steel blade for the controlled unloading of material.

THINKBIG HELPS BARLOWORLD THINK LONG-TERM

A big risk to customer support is a lack of trained technicians who can maintain and service Cat® machines. Understanding that fact, Barloworld Equipment South Africa became the first dealer in Africa to take part in the Caterpillar ThinkBIG program.

The idea behind the program is to ensure there are always highly skilled service technicians to meet growing market and customer demands. “Because of technology developments, we need people with real analytical troubleshooting skills,” said Tienie Viljoen, Barloworld Equipment Operational Performance Manager - Service LoB.

Partnering with the University of Johannesburg, Barloworld Equipment’s ThinkBIG program began February 21, 2013. This intensive, three-year university-level curriculum combines classroom work with hands-on learning in the field and in state-of-the-art labs. It gives students the practical and technical education needed to become expert technicians. The focus is on servicing Cat equipment using cutting-edge diagnostic, maintenance systems, advanced technologies and high-tech tools.

“When our students graduate, they’ll have earned their National Diploma for Mechanical Engineering Technology,” added Tienie. “Over each of the next two years, we hope to double the number of students participating.”

Barloworld Equipment has a training center and nearly 600-square-meter workshop (that’s run over two shifts) with 12 bays that can accommodate 144 students. There are also 12 lecture rooms and 120 on-campus student residences.

Dominic Sewela, CEO, Barloworld Equipment Southern Africa (left), and Prof. Tshilidzi Marwala, Executive Dean, Faculty of Engineering at the University of Johannesburg sign a memorandum of understanding.

The ThinkBIG program is now offered at 20 colleges and universities around the world and the program boasts nearly a 100 percent job-placement rate among successful graduates. Since its inception in 1997, ThinkBIG has educated more than 3,100 students. ■

Learn more: www.caterpillar.com/careers/americas/dealer-technician/thinkbig-technician-education

GOING BACK TO BASIC
THESE EXCAVATORS RE

"Even though our customers are happy with the current models, we received feedback asking for a simpler engine design. So, we wanted to take that extra step and give customers what they were looking for," said Jérome Claret, Excavator Product Application Specialist. "As a result, customers will burn less fuel and have dependable equipment that also saves them money on service and maintenance."

The engine is the heart of every Cat® machine. So before the new Cat 320D2 L and 318D2 L were introduced in Africa and the Middle East (AME) and CIS (Commonwealth of Independent States), Caterpillar performed what you could call a heart transplant and equipped them with a mechanical, low-pressure injection system. The advantages are many – reliability, less fuel consumption, easier to maintain and low-cost service. They even have an updated, fresh modern look. Plus, the engines and overall systems are better suited to handle lower quality fuel.

HANDLING FUEL CONTAMINATION

Fuel contamination in less regulated countries, and particularly in the AME and CIS regions, is high. In fact, sampling analyses have determined that, on average, there are five times as many particles larger than four microns in fuel from AME and CIS than in Europe.

Fuel can become contaminated for any number of reasons. In the AME and CIS regions, that mostly has to do with the way fuel is stored and transported and unclean machine fuel tanks. To protect engines from fuel contamination, Caterpillar currently uses ultra-high-efficiency fuel filters. With the 320D2 L and 318D2 L, however, they take it one step further. Each is equipped with an engine that uses a low-pressure injection system. The result is an engine that's much less sensitive to contamination and cheaper to service.

RUNNING SMOOTH ON DIRTY FUEL

Besides the ability to reliably operate using what Jérome calls "dirty fuel," these two excavators also have improved fuel efficiency – 3 percent for the 320D2 L and 4 percent for the 318D2 L, when compared to the previous engines. Plus, there's no sacrifice in productivity. "Even with the less complex engines, hydraulic power remains similar to previous models. And, in the case of the 320D2 L, there's even higher displacement and torque," Jérome said.

DESIGNED FOR DEPENDABILITY

Creating a more reliable machine was certainly what Caterpillar had in mind with the D2

...designed to get the job done, inside and out

CS MAKES EACH FURTHER

L Series. “In AME/CIS, 20-tonne excavators are working in a wide range of applications and are rarely used in applications that focus on productivity. With a bucket size of up to 0.91 m³, the 318D2 L can allow customers to perform the same kinds of tasks 20-tonne excavators can do while limiting owning and operating costs,” explained Jérome. “In addition, there is also the Flexible Power Mode. This gives operators the ability to work in high power mode or to save fuel using the Eco-Mode setting.”

A FRESH, NEW LOOK

On the surface, the two excavators will display a new Cat trade dress scheme that’s closer to the E Series excavator being sold in Europe. Of course the machines will still be cloaked in the traditional yellow and black, but in the case of the D2 Series, they will be painted mainly black toward the front and yellow to the back.

For dependability, fuel efficiency and lower service and maintenance costs the 320D2 L and 318D2 L are straightforward excavators, designed to get the job done, inside and out. Plus, their ability to run efficiently on dirty fuel makes them ideal and indispensible machines for the AME and CIS regions. ■

See more at: www.middleeast-africa.cat.com

SPOTLIGHTS

The Caterpillar Visitors Center

If you've ever wanted to operate a Cat® dozer and excavator, or stand next to the largest tire in the world (a 4.028 meter tall tire from a Cat 797), start planning your trip to the Caterpillar Visitors Center.

The center opened in October 2012 and is located on the historic Riverfront in Peoria, USA – where Caterpillar is headquartered. Those who visit the interactive facility can see the past, envision the future and do everything in-between. For example, visitors can:

- Take a virtual ride into a mine in the bed of a massive Cat 797F off-road truck
- Operate a Cat machine using state-of-the-art simulators
- Design their own Cat machines and email their designs
- Climb aboard an antique D8 tractor from the 1930s
- See how Caterpillar designs and builds machines, engines and factories using 3D technology
- See the Caterpillar No. 31 NASCAR

The new facility is an intriguing look inside the world of Caterpillar. From the company's first tractor to the latest, high-tech machines, if you want to see how one of the world's foremost equipment manufacturers helps make sustainable progress possible (or if you're just a Caterpillar fan), this is the place for you. Get ready for some heavy-duty fun and excitement. ▲

Start your experience and learn more at: www.caterpillar.com/visitors-center

Safety drives push toward autonomous machines

Keeping operators safe is priority number one. That's why Caterpillar is developing machines that can be operated remotely or autonomously.

Elements that make autonomous operation possible include:

- Perception: sensors such as LIDAR, radar and HD cameras are combined and processed so machines can "see" their environment
- Positioning: a machine's knowledge of where it is and how it's oriented
- Navigation and work flow: on-board intelligence, often combined with office software, give signals to the machine on how to navigate the site and the work it needs to complete, including hauling assignments, drill pattern execution and excavation plans.

Three examples of current Caterpillar autonomous or semi-autonomous operation projects are:

- Planetary Infrastructure Development with the National Aeronautics and Space Administration (NASA). The goal is to develop tele-operation (remote operation from Earth) and semi-autonomous blade control on Cat equipment. One application could be exploratory planetary missions and construction. Caterpillar and NASA have been working together for about three years on this project.
- In Western Australia, Caterpillar and Cat Dealer WesTrac are in the process of deploying 12 autonomous trucks at the Fortescue Metals Group Solomon mine with plans to expand the fleet in the near term.
- Caterpillar and WesTrac are also working with BHP Billiton to launch a Cat Command for a hauling production trial at their Jimblebar site in Western Australia later this year.

The goal of autonomy is to leverage existing resources to satisfy ever-expanding global resource demands and to keep people out of potentially hazardous environments. ▼

Learn more at: www.mining.cat.com/command.

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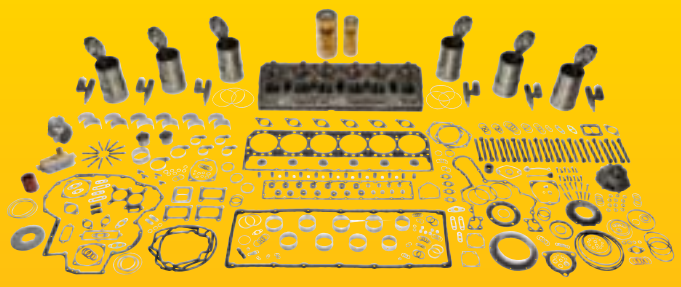

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