

CAT MAGAZINE

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CAT® CONCIERGE

A NEW WAVE OF
CUSTOMER SERVICE

PORT OF ROTTERDAM,
THE NETHERLANDS

CAT® SUPPORT
EQUIPMENT GETS A LIFT

THE NEW CAT® 988K

BETTER MACHINE,
LESS FUEL CONSUMPTION





CAT[®] MACHINES RECEIVE MULTIPLE AWARDS

Cat[®] equipment is tough, reliable and even award winning. Recently, Caterpillar received no fewer than eight different awards for several models and series in the Cat line of products.

TOP 100

The first were awarded by *Construction Equipment* magazine, in December 2012, for the year's 100 most significant new products. Several hundred models from different manufacturers were judged overall. The awards recognize companies that invest in research and development to incorporate innovations and engineering evolutions that create safe and efficient machines. On January 14, 2013, magazine representatives were at Caterpillar headquarters in Peoria, USA to present the awards. Caterpillar received a total of six awards for the following equipment:

- 924K, 930K, 938K wheel loaders
- 994H wheel loader
- Series K2 crawler dozers
- 950K wheel loader
- E Series mini excavators
- F Series backhoe loaders

INNOVATION AWARDS

In January 2012, *Equipment World* honored Caterpillar with two Innovation Awards for the Cat[®] 966K XE wheel loader and the first Cat 336E H hybrid excavator. The 336E H captures energy when the machine slows down or stops, and then releases it as the machine accelerates, which helps it use 25 percent less fuel than the standard 336E.

Caterpillar first won an Innovation Award in 2004 for the ACERT™ engine. Last year, 2012, is the first time Caterpillar has won two awards in one year.

Both the Innovation Awards and Top 100 show that Caterpillar is at the top of its game when it comes to product innovation, lowering customers' owning and operating costs and decreasing the carbon footprint. ■



994H



924K



950K



420F



D6K2



308E

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SPOTLIGHTS

We would like to introduce Nigel Lewis, the new Caterpillar Distribution Services Division Vice President for Europe, Africa, Middle East (EAME) and the Commonwealth of Independent States (CIS). Nigel took over from Paolo Fellin, January 1, 2013.

DEAR READER,

Customers rely on Caterpillar and our dealer partners every day for solutions to the challenges they face. Regardless of location, from the Arctic to Mozambique, our customers trust that these partnerships have the capabilities to help them succeed, often in the most challenging situations. This trust has helped produce many innovations throughout our history. This edition of Cat Magazine highlights several of the latest that we are excited to introduce to you.

As I look forward, I see the demand for innovation growing stronger in EAME. Technology is driving change at a fast pace in every industry we serve. I call it "21st Century Distribution" and I have confidence in how the Cat team is responding. In future editions of Cat Magazine, I look forward to sharing more pioneering products and services that are being created to help our customers succeed in this new world.

In the meantime, my thanks to you all for your partnership and dedication. I wish you every success for the rest of 2013.

Nigel Lewis,
Vice President, Caterpillar



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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

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CAT[®] EQUIPMENT HELPS SYNCHRONIZE PORT OPERATIONS

If you're piloting a mammoth, dry bulk carrier ship full of iron ore or coal toward Europe, you're most likely headed to one place, EMO. EMO, which stands for Europees Massagoed-Overslagbedrijf in Dutch, or European Bulk Transshipment Company, handles coal and iron ore exclusively.

This 160-hectare facility operates 24/7. It's been in operation at Maasvlakte at the port of Rotterdam in The Netherlands since 1973.

THE NUMBERS BEHIND EMO

EMO's state-of-the-art facility welcomes vessels of up to 400,000 tonnes, thanks to the 23-meter-deep waterway that's connected to the North Sea. Here are some other impressive facts and figures about Europe's largest dry bulk transshipment terminal.

- EMO can unload up to 200,000 tonnes of material a day
- Discharge capacity is 42 million tonnes and throughput is 60 million tonnes
- Storage capacity equals 7 million tonnes
- A 47-km conveyor system connects the entire facility
- Two 50-tonne and three 85-tonne unloaders offload ships
- Turnover is about €146 million per year
- EMO employs about 400 people on this site

CONSTANT IMPROVEMENT

Massive throughput and storage capacity mean massive responsibilities. EMO is under constant improvement, whether it's efficiency, safety, cleanliness or capacity.

Some recent, and current, projects include:

Conveyor belt system and operations center

EMO's 47-km conveyor system transports all the coal and iron ore. This one, facility-wide system connects discharge, loading, storage and equipment. A new operations center was created to oversee the workflow and designed to expand when needed.

A fifth unloader

To increase the site's average offload capacity to the current 200,000 tonnes a day, a third, 85-tonne unloader was put to work.





1

1. A Cat® wheel loader compacts coal, to help prevent spontaneous combustion.
2. A skid steer loader cleans up material that has fallen from the conveyor system.
3. One of several track-type tractors that work the EMO stockpiles.
4. Using a modified, reinforced cab exterior, a 966 is hoisted into a dry bulk carrier ship.
5. Aad van Bodegom, EMO Service Manager.



2



3

Coal wagon loader

EMO also added a second, automated coal wagon loader that, together with the first, can fill 16 train cars per day. It provides direct access to the European rail network.

“We always have the latest equipment, software and methodologies. We also talk with clients about what they need,” said Aad van Bodegom, EMO Service Manager. “Then we make sure we have what’s needed to get the job done, including heavy equipment like Cat® machines.”

CAT EQUIPMENT AT EMO

There are 29 Cat machines on site, including large and medium wheel loaders, wheeled excavators, track-type tractors, excavators, dump trucks and skid steer loaders. Each plays an

Cat dealer Pon Equipment, developed an alternative, timesaving method.

First, an enormous unloader, equipped with a 50- or 85-tonne grapple, unloads as much material as it efficiently can. Then, rather than driving a 966 into the ship’s hold to clean up remaining material, the grapple is removed so the wheel loader can be attached to the unloader and hoisted into the ship.

To lift the nearly 35,000 kg machines, cab exteriors were modified and reinforced so

like much, but when you’re offloading 30 million tonnes each year, like EMO did in 2012, the time saved adds up.

Clean up duty

Skid steer loaders clean up material, such as coal, around the conveyor system. A wheeled excavator then loads the coal into a Cat 725 articulated truck. Finally, after screening and washing (up to 3,000 tonnes per day), the coal is transported to the appropriate stockpile.

Working the stockpiles

Track-type tractors, such as the D8 and D8T, handle mountains of iron ore and coal. It’s arduous work. And while the equipment is certainly hearty, modifications were needed. Additional lights were installed for better visibility, steel bars protect radiators and extra filters shield internal machine parts from the extremely dusty conditions.

WORKING PARTNERS

EMO and Pon Equipment have been working together for about 35 years. “I think the reason our relationship has lasted is because of the service Pon provides,” said Aad. “We choose Cat machines because they are reliable,

EMO’s state-of-the-art facility welcomes vessels of up to 400,000 tonnes.

intricate role in day-to-day operations. They keep the facility clean, unload ships, maintain stockpiles and reload trains.

Unloading ships

The ships that dock at EMO can have a 400,000-tonne payload. Unloading that amount of material can take up to three days. So to save time, the innovative port, along with partner and

the 966 could be raised using two lifting points. According to Pon, this is the only method of its kind in the world. Once inside, a 966 thoroughly cleans the ship’s hold and gathers remaining material to the center where it’s picked up by the grapple.

EMO and Pon found this method reduces work time by about 10 minutes per hold, or one hour per ship. That might not sound



easy to service and just all around good machines. Together it's a perfect fit."

And when it comes to servicing machines, Pon has a mechanic on site every day. "All maintenance, service and repairs are done in our five service bays. Caterpillar is tops with service, 24/7. We call and they come. Other manufacturers just don't respond like that. We've tried it, and they are not reactive like Pon," Aad confidently said.

He also went on to say that parts are delivered in 24 to 72 hours, depending on the part and its location. Aad says, "We have very dusty conditions here so we service the machines, filters and fluids every 500 hours. But as far as parts go, we usually need hydraulics, cylinders and hoses. Our machines work hard, with heavy loads and perform a lot of repeat motions." They also work long hours. Operations are non-stop at EMO, and machines can work five shifts a day.

Pon also works with EMO to increase machine reliability and help prevent the need to order new parts. "They think with us, whether it's adding a protective bar or making €50,000 to €60,000 worth of machine modifications. They're more than just a supplier," said Aad.

INDUSTRY CHALLENGES

Perhaps the biggest industrial challenges for EMO are environment regulations. The facility does everything possible to minimize environmental impact. "We've implemented extensive measures to be as environmentally responsible as possible. Cat machines help us because they are fuel-efficient, productive and the

Tier III and IV engines meet emission reduction standards," said Aad.

When asked about growth, Aad says EMO is close to capacity. "We're pulling about 32 million tonnes right now. That's about right for the equipment we have. We'll add a few Cat machines. But what's most important is having the right machines." To create the ideal machine-to-workload ratio, EMO works directly with Pon. "We meet in person and discuss what would be the ideal combination."

The entire EMO operation is a highly complex, yet well-run operation. Thanks to a forward-looking mindset, a supplier that's more of a partner and ongoing customer communications, EMO is a perfect example of how a transshipment terminal of this size can run like a tight ship. ■

Learn more at:
www.uk.cat.com/equipment





THE CAT® 986H, A LEGACY REBORN

FOR THOSE OF YOU WHO LOVED THEIR CAT® 988B OR 988F FRONT LOADER, THERE'S GOOD NEWS. THEY'RE BACK – WITH A DIFFERENT MODEL NUMBER AND IMPROVEMENTS.

The new front loader is called the Cat® 986H. “Our 988 series was very successful. But as the 988 got bigger, we responded to customers who asked for a machine more in line with the original series,” said Todd Tuntland, Product Application Specialist. “So that’s exactly what we did.”

A WARM WELCOME

Caterpillar launched the new Cat 986H during Bauma China 2012. The machine will be available for sale early in the third quarter of 2013 in select regions, including South America, Asia Pacific, Africa and the Middle East (AME) and the Commonwealth of Independent States (CIS).

“SMALL” LOADER, BIG HEART

The 986H is the smallest in the Cat large wheel loader product line. At an operating

weight of 42,225 kg, it’s a lightweight workhorse designed for a variety of applications.

“We wanted to create a machine not limited only to customers who run load-and-carry type operations or who have lower production needs than what a 988K would be for,” said Todd. “The 986H is versatile and dependable. It’s perfect for many applications and will operate over multiple lives.”

Here are some applications Todd mentioned and how the 986H matches up:

- Quarries and aggregates – for smaller benches, a match for the 770G
- Underground mining – excellent turning radius and ceiling clearance, ideal for tight spaces
- Limestone/block handling – fills the gap between the 980 and 988 models

“WE WANTED TO GIVE CUSTOMERS AND OPERATORS A MACHINE THEY WERE FAMILIAR AND HAPPY WITH.”

Todd Tuntland, Product Application Specialist

INNOVATIVE MACHINE MECHANICS

The machine’s innovations are also impressive. For example, a torque converter lock-up clutch, which comes as standard, eliminates converter losses and lowers system heat. The results are improved travel speed, reduced cycle times and significant fuel efficiency gains in load-and-carry operations.

Plus, a best-in-class planetary powershift transmission (with four forward gears and three reverse) provides smooth shifting and efficiency. In conjunction with the transmission, the neutralizer pedal gives operators full power to the implement system while the machine is stationary.

The 986H uses axle shaft, oil-enclosed disc brakes. Made by Caterpillar, the system dissipates heat exceptionally well and is designed for performance, a long service life and serviceability. On conventional brake designs, it’s necessary to break the final drive for service. On the 986H, the final drive and hub are removed intact for easy brake disc replacement.

Z-BAR LINKAGE

The 986H uses a z-bar linkage with two, solid-steel lift arms, similar to the 988K. This was done to increase application flexibility and visibility to the bucket.

The standard linkage, with a rated payload of 10 tonnes, is ideal for trucks such as the 770. On the other hand, the high-lift linkage, with a rated payload of 9.5 tonnes, has greater lift and reach and is best suited with trucks such as the 772.

Both linkages can accommodate different buckets. “We have a variety of buckets available that start out at 5.4 cubic meters and go up to 6.1 cubic meters,” said Todd. “But, if customers want something else, we can build a bucket to suit any application.”

OPERATOR COMFORT

The 986H is hard working on the outside and comfortable on the inside. A redesigned operator station is full of customer-inspired features.

There’s automatic temperature control, a pressurized cab with filtered air and a Cat Comfort Series III seat. A heated seat is available as an option. There’s also a seat-mounted implement pod so

controls move up and down with the seat, low-effort steering and a transmission auto-shift function.

FUEL EFFICIENCY

Another 986H benefit is fuel efficiency, thanks to its lightweight – about 9,000 kg less than the 988K, depending on the configuration. Additionally, features such as the load-sense hydraulic system, torque converter lock-up clutch and efficient C15 ACERT™ engine maximize fuel efficiency and productivity.

GOING TO MARKET

In the AME/CIS region, Cat machines have a reputation for durability and value. Perhaps that’s why many customers have rebuilt their 988 models over and over again. Now, however, there’s the opportunity to acquire a new machine in the same class size. ■

.....
“For those wanting a machine that’s not too big or too small, the 986H is ideal. It’s productive, durable and simple,” said Todd. “We wanted to give customers and operators a machine they were familiar and happy with. I think both will be excited that an improved version of the 988F is back as the 986H.”
.....

[Additional details at: middleeast-africa.cat.com](http://middleeast-africa.cat.com)



CAT[®] CONCIERGE

A CUSTOMER SERVICE ON THE WATER

At luxury hotels, a concierge helps ensure a guest's stay is a pleasant, memorable one. With one call, the concierge can arrange dinner reservations or acquire hard-to-find concert tickets. But what do you do if the Cat[®] marine engine on your 100-foot yacht needs maintenance? You call the Cat Concierge, of course.



Cat[®] Concierge office locations:
Beaufort, USA
Hamburg, Germany
Singapore



THE BUSINESS OF CUSTOMER SERVICE

Cat[®] Concierge started out as a small program run through one dealer and one Original Equipment Manufacturer (OEM). It was launched after the introduction of the Cat C32 diesel marine engine. The goal was simple; improve customer satisfaction for private pleasure craft owners. Today, the service has an impressive list of customers, including Chris Gates, Managing Director of Princess Yachts International, who is an avid believer in the program.

"Like most new product introductions, there were certain challenges. We needed a tool to help maintain customer relationships and sales, and the Cat Concierge was born," said David Shannon, Global Pleasure Craft Manager.

The potential for improved customer loyalty with OEMs, yacht brokers and yacht owners was apparent. As a result, Nigel Parkinson, Managing Director of Caterpillar Marine Power Systems, decided to take the program global. "We recognized that our customer experience has

a knock on effect for OEM dealers, Cat dealers, OEM manufacturers and, naturally, Caterpillar sales," said Nigel.

HOW DOES THE PROGRAM WORK?

Any yacht purchased from a participating OEM that is powered by a Cat marine engine is eligible. It's that simple. The service is free for five years as part of the Caterpillar two-plus-three warranty – a full two-year warranty, plus a three-year limited warranty. It doesn't matter if the vessel is 40 feet long or 120 feet long.

The customer receives a Cat Concierge card with the Cat engine's serial numbers and regional contact numbers on it. This gives owners global access to the service. During the yacht's life, the owner may need to make a general inquiry, report an emergency, resolve a technical problem or schedule maintenance. One call to Cat Concierge takes care of it all.

Caterpillar strategically placed three main locations around the globe (Singapore, Germany and the USA) with a core



team of three people, one in each location. That might seem small, but an extended, dedicated team of specialists helps support each center. Customer service is provided 24/7.

WHAT'S IN IT FOR THE CUSTOMER

As part of Cat Concierge, customers are relieved from having to arrange and manage service appointments or maintenance. "Normally, a customer might make a few calls to schedule and have a service performed. With Cat Concierge, one call takes care of everything from beginning to end," said Shane Wright, Global Concierge Manager. The service also provides regular progress reports, so customers are always up-to-date about the status of their vessel.

Other service benefits are the complimentary First Owner Sea Trial and orientation. During a First Owner Sea Trial, Cat engines are run at different revolutions per minute to measure engine and ship performance

together. With the customer on board and involved with the 2.5-hour trial (for each engine), the owner comes away with a better understanding of the vessel's capabilities.

The First Owner Sea Trial also includes an orientation to familiarize owners with their Cat engine and related equipment. Technicians cover different engine components and systems, which oils to use, maintenance schedules and proper day-to-day operation, among other important topics.



Chris Gates, Managing Director of Princess Yachts International

Cat Concierge is much more than a premier service, however. Even when not taking advantage of its benefits, customers have peace of mind should a need arise – from anywhere in the world and at any time.

CHALLENGES

Cat Concierge has been operating globally since May 2012. "We took a step-by-step approach to establishing





ourselves worldwide. Probably the biggest challenge was understanding different requirements and expectations from customers all over the world,” said Shane.

To help resolve those challenges, the program opted for locations in three different time zones, rather than one, central European location. And when it comes to staff, Cat Concierge prefers to hire local people who have excellent product insight and knowledge. They also need to understand the nuances behind procedures and minimize downtime for customers.

That’s impressive, especially if you consider that the service handled more than 400 projects in 2012 – some of which involved arranging to have parts flown thousands of miles. “When you get right down

“It perfectly reflects our own customer service philosophy...”

Chris Gates, Managing Director of Princess Yachts International

to it, Cat Concierge is all about customer service. Luckily, we’ve had few real challenges when it comes to completing projects,” Shane said confidently.

GOING COMMERCIAL

With the success of Cat Concierge for private pleasure craft, the service is being extended to commercial vessels. “People on the commercial side learned about Cat Concierge and have asked for a program that’s suited for them,” said Shane. “The difference is that we’d be dealing with fleet owners, like a port authority with 100 or 200 vessels, rather than individual, private owners.” Caterpillar just completed a workshop to adapt the process for key accounts in the commercial marine segment. This process will be piloted with two or three key accounts later in 2013.

COMPETITIVE OFFERS

Cat Concierge is the global leader and only supplier with this level and quality of service. It’s also a big differentiator for Caterpillar. With Cat Concierge, OEMs know customers will have outstanding support and a great experience, which equates to additional sales opportunities. “The Cat Concierge programme is something we have been strong



A Cat® marine engine installed on a Princess Yacht.

supporters of since its conception. It perfectly reflects our own customer service philosophy and complements our aftersales operation in all markets,” said Chris.

With high customer expectations, the Cat Concierge team stays busy. During the Global Superyacht Forum 2012 in Amsterdam, Jim Ruffolo, President/CEO of Burger Yachts, stated that the service monitors vessel engines 100 percent of the time. He added that the service has deployed engineers to investigate alarms and fix issues, well before becoming problems.

In fact, in most cases, the service can have a dealer technician on a vessel within 48 hours (or less) of being notified, no matter how remote the location. Cat Concierge is truly a testament to the renowned Caterpillar customer service. ■

Read more at: marine.cat.com

SUCCESS STORY IN GREECE

For a customer in Corfu, Greece, Cat® Concierge received an email from Aqua Marina (an Israeli yacht dealer) about engine problems on a private Princess yacht. Cat Concierge responded by calling Eltrak (the Cat dealer in Greece) to create a service request. The next day, a Caterpillar technician was on location to conduct an inspection. The ship’s owner, however, preferred to postpone the inspection two days as it was more convenient. To perform the necessary repairs, the ship had to be put in dry dock.

Meanwhile, the Cat Concierge team contacted Cat dealer Finning to arrange a parts shipment. Soon, the parts, including a piston cooling jet, arrived in Corfu from the USA. To complete the repair, mechanics worked during a national Greek holiday with Cat Concierge assuring them the extra time would be covered.

Overall, a major engine re-build was completed in 12 days after the email notification of engine problems. Cat Concierge received a thank-you email stating that the service team had, “an impossible mission you made possible.” The customer also ordered his next yacht, including Cat Concierge and Cat engines, after the successful repair.





PAVING MACHINES

OPERATOR

SAFETY TIPS

Even though Cat® equipment can perform hundreds of jobs, our single, most important job is to make sure people go Safely Home. Everyone. Every Day.™ That's why we're committed to providing safe equipment and offer personalized, on-site operator training and certification, jobsite improvement projects and safety culture solutions.

Beyond the job site, Caterpillar Safety Services also has a wealth of free safety resources online at SAFETY.CAT.COM™. There, customers can take advantage of a vast library full of industry- and machine-specific material as well as a multitude of other safety tools, multimedia, guides and training courses. ■

Learn more at: safety.cat.com

TRAPPED HYDRAULIC PRESSURE

- Releasing hydraulic pressure can cause sudden machine or implement movement
- Use extreme caution when disconnecting hydraulic lines or fittings
- Released high pressure can cause hoses to whip violently and spray oil

CLOTHING

- Don't wear loose clothing that can get caught in moving parts and on control levers
- Don't forget, wristwatches and rings can also get caught
- Secure articles in shirt or jacket pockets
- Always wearing proper protective gear, such as eye and ear protection and safety shoes

CLEANING WITH PRESSURIZED AIR AND WATER

- Always wear protective clothing, shoes and eye protection, such as goggles or a face shield
- Maximum air pressure, no more than 205 kPa (30 psi) when the nozzle is deadheaded and used with a chip deflector
- Maximum water pressure, less than 275 kPa (40 psi)

TIRES

- Servicing and changing tires and rims can be dangerous
- Only trained personnel should perform these tasks
- Always follow correct procedures, assemblies can burst with explosive force
- Use nitrogen, rather than air, to reduce the potential for a tire to explode
- Nitrogen helps prevent oxidation, which leads to rubber deterioration and rim corrosion

PARKING

- Always park machines on a level surface
- If a machine must be parked on a slope, position it so the tracks or wheels are at a right angle, compared to the slope
- When operating a screed, lower it to the ground
- For all equipment, ensure the parking brake is on and the control light is illuminated





Danish operator Tom Rasmussen was the first person to use the Cat® AccuGrade™ grade control system in the entire Europe, Africa and Middle East (EAME) region. The system was installed about eight years ago on his D6R. So for this article, we asked Tom, who works at MJ Eriksson, for a testimonial about his unique experience. We also invited Kjeld Jespersen to interview Tom. Kjeld has been the Caterpillar Productivity Solutions Manager over the past six years.



A pioneering experience with AccuGrade™ becomes a passion

MJ Eriksson representatives first learned about the system's benefits at the Caterpillar Demonstration Center in Malaga, Spain in late 2004. AccuGrade™ and its ability to enhance productivity, accuracy and quality of work interested the innovative company. The system was installed in March 2005 on Tom's D6R. As an operator with 25 years' experience, he was asked to be the "test pilot."

KJELD: How do you feel about using EAME's very first AccuGrade™ system?

TOM: It's really quite amazing. I've always been interested in improving performance. When MJ Eriksson decided to try AccuGrade™ and asked me to test it, I thought it was a very good opportunity.

KJELD: How did it change your job?

TOM: I can work much faster. A job like this [spreading sand on a stretch of about 200 meters] would take about a day. With AccuGrade, I can do it in 30 minutes. We used to spread sand over the same area three or four times. Today, we do it once, maximum two times, and the grade is perfect.

We also don't have to slalom around stakes any more and leave piles of material behind. Then the piles had to be graded, which meant the surveying crew had to re-stake again. We don't do that anymore.

KJELD: Were you reluctant to use AccuGrade?

TOM: Yes, I was a bit hesitant. But I wanted to learn. I got good training and support from Pon Denmark and

Caterpillar. They were on site for about a week. It was overwhelming to start with. But, what really helped was playing around with the system and asking questions.

KJELD: Was AccuGrade easy to master?

TOM: I was reasonably proficient after a week or two. After two to three months, I knew all aspects of the system for different applications. Once you overcome that initial hurdle, yes, it was easy to learn.

KJELD: What are your favorite AccuGrade features?

TOM: Automatic blade control is extremely helpful. It means the blade is always on the correct grade. I'm within the given tolerance all the time. In good material, I get accuracy a lot better than 2 cm – it's really fantastic.

Another benefit is that now I have all the information in my cab. The site overview is especially helpful. It means we're all better informed about what's going on.

I like being able to read grade heights from the comfort of my seat, too. Using the old staking system, I had to climb in and out of my machine. For safety and job satisfaction, it's a lot better.

KJELD: What about integration and reliability?

TOM: For me, the whole system makes sense. The way Caterpillar integrates AccuGrade is far superior to other makes. It's been very durable and reliable with only a few connectors and cables that needed changing. Nothing you wouldn't expect.

AccuGrade (and Cat® Grade Control) can be installed on several different Cat models to increase productivity.

- Track-type tractors
- Pavers
- Mills
- Motor graders
- Wheel tractor scrapers
- Excavators



KJELD: You now have a D6T with a new AccuGrade system. What's changed?

TOM: For me, the most notable change is that the new system reacts much faster. I can do fine grading at higher speeds. The display has been moved from the doorpost to the instrument cluster. That's a nice improvement, too.

KJELD: Has AccuGrade helped increase productivity?

TOM: Absolutely. AccuGrade affects more than just dozer operations. Additional people aren't around the machine giving me height indications so it's safer. And, I can direct the trucks coming with sand from my cab because I know exactly where they need to dump it to be most efficient.

KJELD: Compare a day of machine operating before and after AccuGrade installation.

TOM: Before, I would come home from work grumpy and not wanting to talk to anybody, especially if I felt I had not achieved anything at work. With AccuGrade, those days are rare and far apart. The nice thing about AccuGrade is that it helps give me a real good sense of accomplishment at the end of the day. I produce more and have a much more pleasant working environment and home life.

KJELD: Would you recommend AccuGrade to others?

TOM: Yes, of course. AccuGrade is so simple, anybody can learn to use it very quickly and achieve significantly better results.

AccuGrade today

After installation on his D6R, Tom clocked more than 13,000 hours over about seven years. Even though he now operates a D6T (with AccuGrade), the original system is still used on his D6R and has another 1,000 hours on it.

AccuGrade has advanced since it was retrofitted on Tom's D6R. Some major improvements include new generation sensors that greatly improve the system's speed and provide better accuracy in areas with a restricted view to the sky.

For new excavators and motor graders, there is also a precision grading system that can be ordered directly from the factory. It's called Cat® Grade Control. The system has a deeper integration with machine systems and the components are hard mounted.

Whether you choose AccuGrade as an add-on or Cat Grade Control from the factory, both have identical functionality and can be upgraded as needed. ■

See more at:
cat.com/technology/earth-moving-solutions/accugrade-grade-control-system





DESIGNED TO BE AN INDUSTRY BENCHMARK

The Cat® D6K2 track-type tractor has a lot going for it. From the blade to the tracks and cab, every switch, engine component and innovation is designed for efficiency and productivity. The result is a dozer with best-in-class performance.

KEY IMPROVEMENTS

There are four major areas on the D6K2 contributing to its best-in-class performance. Each is directly related to customer needs.

GRADE-A GRADING

Finish grading is difficult to master. Even experienced operators must use all their skills and focus to do the job properly. In response, Caterpillar has made several advances.

Cat® Stable Blade Control is one. It's standard D6K2 equipment, and a revolutionary way of stabilizing the blade. It works using an electronic gyroscope. Located in the C-frame tower, this patented technology senses unwanted blade movement and compensates to complement operator input and provide a smooth, even grade. Even inexperienced operators will find finish grading easy.

The D6K2 also has a new roller frame with two track carrier rollers per side, rather than one. The result is less track vibration and a much smoother ride. Two additional bottom rollers (a total of eight per side) were also added to better distribute track loads. Together, all these improvements make the D6K2 superior any other dozer in its class.

DO MORE WITH LESS FUEL

Several under-the-hood advances help make the D6K2 easy on fuel. Most notable are the new Eco Modes for

forward and reverse. When engaged, the engine runs at lower speeds if the machine is not under load.

As soon as a load is detected, however, engine speed instantly increases to provide the required power. Immediate engine response means the D6K2 can operate in Eco Mode regardless of application difficulty and without affecting productivity.

Even inexperienced operators will find finish grading easy.

At high load factors, fuel use is reduced by 5 percent, compared to the D6K. In light-load applications, Eco Mode can reduce fuel use by up to 22 percent.

WIDER BLADES

Covering more surface area when operating saves time. That's where the two new D6K2 blades come in. The width for the XL VPAT (variable pitch, angle, tilt) blade has gone from 3,077 mm to 3,196 mm. The LGP VPAT blade increased from 3,360 mm to 3,682 mm, a 9 percent increase compared to the D6K LGP.

Transportation was taken into consideration, too. The wider LGP is still available as a folding blade, reducing width to less than three meters.



1. A new roller frame provides a much smoother ride.
2. Eco modes (forward and reverse) reduce operating costs.
3. An improved operator station plus additional, easy-to-read diagnostics.



ENGINE IMPROVEMENTS

The D6K2 also complies with new emissions regulations, thanks to its Tier 4 Interim / Stage IIIB compliant C6.6 ACERT™ engine.

There are two main improvements accounting for this. First, a nitrogen oxide (NO_x) Reduction System (NRS) recirculates some exhaust gases back into the combustion chamber. This results in lower combustion temperature, therefore reducing NO_x.

Then, to reduce soot, the D6K2 uses a low temperature, passive regeneration system through which exhaust gases are directed. Using this type of system is possible because the D6K2 engine creates exhaust temperatures high enough to oxidize soot. Plus, if the machine is idling at a low temperature for an extended period of time, a backpressure valve automatically restricts the exhaust stream. This forces the engine to work harder and increases exhaust temperatures enough to oxidize the soot.

Even in extreme conditions, regenerations will be unnoticeable to the operator, without work interruption. Most competitors in this class size don't have a way to cope with low temperature/idling conditions and require a change in operation, or resuming operation for up to 60 minutes to fully oxidize soot.

EVERYTHING YOU NEED

The bottom line is that everyone will find a reason to like the D6K2. Some will appreciate its reduced fuel consumption. Others will applaud the great finish grading performance or improved operator station. And there are those who will value the reliability and durability. Regardless of your reason, you'll find it in the D6K2. ■

Additional details at: catallday.eu/track-type

KEY NEW FEATURES

- A Hystat™ powertrain matches engine speed to application requirements
- Independent track control for quick acceleration and responsive direction changes
- Traction control reduces slip, saves fuel and reduces operator fatigue
- New seat, heat/ventilation is optional
- Easy-to-read displays, more diagnostic information
- AccuGrade™ Ready Option for quick installation



CUSTOMER FEEDBACK FUELS EFFICIENCY

IN 2013, IT WILL BE THE 50TH ANNIVERSARY OF THE CAT® 988 MODEL. CATERPILLAR FIRST STARTED PRODUCING THE WHEEL LOADER IN 1963. TODAY, MORE THAN 20,000 UNITS HAVE BEEN SOLD. OVER THE PAST DECADE, HOWEVER, LITTLE HAS CHANGED ON THE PLATFORM IN TERMS OF STRUCTURES AND LINKAGE. BUT THE NEW 988K MODEL'S CHANGES ARE SUBSTANTIAL.

If we could only use one attribute to describe the new, streamlined 988K, it would be efficient. "After hearing feedback from our customers, one thing stood clear. They wanted a more efficient machine, especially when it comes to fuel consumption," said Todd Tuntland, Product Application Specialist.

The machine's fuel efficiency is the result of a culmination of modifications made from the bucket's cutting edge to the rear bumper and everything in between.

Z-BAR LINKAGE

Currently, the 988H uses a boom system, which is a box section structure. On the 988K, that will be changed to a z-bar linkage with two, solid-

steel lift arms, similar to the 988F. This was done to increase application flexibility. Going back to the z-bar design shortened the machine, gave it more dump clearance and improved center visibility.

Much more went into that design change than you might think. "We also used software to optimize the linkage pin layout even before iron was cut. The goal was to help decrease fuel burn, enhance fill factors and add to the machine's efficiency," added Todd. "We even carried over the performance series buckets from the 988H to make sure the same profile and volumes will be available on the 988K."

...SIGNIFICANT CHANGES AND IMPROVEMENTS WERE MADE TO DIRECTLY LOWER FUEL CONSUMPTION.

FUEL EFFICIENCY

Efficiency is the name of the game with the 988K, so significant changes and improvements were made to directly lower fuel consumption. In fact, Caterpillar was able to reduce consumption by 15 percent, compared to the latest 988H. In certain applications, that number goes up to 20 percent.

One factor contributing to those numbers is engine speed, or revolutions per minute (rpm). For example, high idle has been dropped more than 200 rpm while still maintaining performance. Low idle rpm was also reduced by 100 rpm.

Another big contributor is Economy Mode. "The great thing about Economy Mode is that an operator can still use throttle lock but achieve the efficiency of manual throttle. The operator controls desired engine speed with the left pedal and implements. That leads to significant fuel savings," said Todd.

The 988K has another fuel-efficiency enabler – hydraulic flow sharing. The system, called Positive Flow Control can produce maximum hydraulic flow at much lower rpm. "Imbedded into the hydraulic system are an implement pump and a steering pump. If the operator isn't using the steering, hydraulic flow is 'borrowed' from the steering pump so lower engine speeds, along with cycle times, can be maintained," said Todd.

FUEL EFFICIENCY VS. THE COMPETITION

When it comes to fuel consumption, Todd admits the 988K has the advantage. Thanks to numerous improvements on the 988K, the machine is just as fuel-efficient as any in its class. "Against the 988H, we're 15 percent better with fuel economy and we've eliminated any of the competition's fuel advantage," Todd said with confidence.

ADDITIONAL IMPROVEMENTS

Many other improvements also grace the new 988K. The cab is quieter and completely

redesigned including seat-mounted controls to decrease operator fatigue and improve comfort.

The overhead controls have been repositioned to the right hand console. "On the control panel, there is a real-time fuel display so the operator can see fuel consumption in terms of liters per hour, or gallons. Or, if using a payload control system, the operator can look at tonnes per liter, or tons per gallon," said Todd.

GRAND INTRODUCTION

The Cat® 988K goes into production in 2013. According to Todd, "We're estimating August is when we would load the line in Aurora, USA and start building the machines. We plan to ship in September." Todd also said Caterpillar had a 988K on display at Bauma 2013 in April. The event was the first true public appearance for the machine and effectively acted as the worldwide launch.

As far back as May 2012, Caterpillar was conducting 988K demonstrations to get exposure and additional customer reaction. "So far customer feedback has been very positive. Operators have said it's quicker, smooth, powerful, fast and quiet," said Todd. With the majority of the 988K improvements coming directly from customer feedback, we're sure the new front loader will be a big hit. ■

.....
The new 988K gets its power from a Caterpillar C18 ACERT™ engine. The six-cylinder, four-stroke design meets US EPA Tier 4 Final / EU Stage IV emission requirements.
.....





EJECTOR TRUCKS PROVE THEIR WORTH

Clay. It's wet. It's heavy. And it sticks to everything – including dump truck bodies. This was the problem Swedish customer Flygts Excavation and Transport AB was having when emptying clay from standard lift-and-tip, 25-ton articulated trucks.

INNOVATION IN MOTION



▲ Peter Flygt, President and Owner, Flygts Excavation.



Flygts excavates and transports natural clay, which is processed to produce Leca for landscaping and house construction. “We were getting a lot of carry-back. Clay is a sticky material, which makes it hard to release a full load. Our trucks were coming back with large amounts of clay still in the body. That didn't help productivity,” said Peter Flygt, President and Owner.

TRY AND BUY THE TRUCK

You'll notice that much of the scenario we just outlined is in the past tense. That's because Swedish dealer Pon provided a solution that solved Flygts' carry-back problem. “Ejector trucks aren't too common in this area, but we offered one as a solution. We suggested

a 'try and buy.' Flygts could try a Cat® 730 Ejector articulated truck for one year as a rental. If they liked it, Flygts could buy it and deduct the rental cost from the

“Eliminating carry-back is especially important during the winter.”

Peter Flygt, Flygts Excavation

purchase price,” said Anders Carlsson, Product Manager, Pon Equipment AB.

After initially having doubts, it wasn't long before Peter saw that the Cat 730 Ejector was performing well and had many



◀ Patrik Eriksson, operator at Flygts Excavation and Transport AB.
▼ Flygts transports clay about 2 km to its client's factory for further processing.



we no longer have to take excavators away from their main jobs to clean out the body of standard articulated trucks.”

Other Cat Ejector truck advantages include excellent stability with no need to raise and lower a dump body. Thus, the risk of overturn is greatly reduced, especially in soft underfoot conditions or on slopes. Plus, material can be ejected while the truck moves forward, even on uneven ground, for faster cycle times.

When it comes to productivity, tests show that the 730 Ejector has up to a 14 percent faster cycle time than standard 30-ton articulated trucks in the same application. Also, the spreading capability of ejector trucks can help customers lower equipment fleet costs, with less need for support machines to spread material.

CUSTOMIZED MODIFICATION

While the Cat 730 Ejector was the ideal solution for Flygts, one modification was needed to get everything just right. Due to the clay's wet consistency, and because the tailgate covers just the bottom half, material was being lost during transport. “The clay moves and floats around a lot, so we were losing much of the load just by going up hill,” said Peter.

So, Pon and Flygts worked together to create a high, hinged tailgate that covers the entire rear. “It took some time to get things right. The factory was helpful in the design and making final adjustments. Now the modification works well and even helps increase capacity,” Anders confidently stated. “Plus, Caterpillar has remained interested in the modifications and other customers have visited Flygts to see the tailgate in action.”

advantages over lift-and-tip trucks.

“Our operators were excited about the new 730 Ejector. I will admit I had my doubts. It was a little outside my comfort zone. But I decided to give it a try. I have no doubts anymore,” Peter said.

EJECTOR TRUCK ADVANTAGES

The main benefit of the 730 Ejector for Flygts is that it can easily release a full load with no remaining material. That's because the ejector blade's shape matches the inside of the body. When it moves toward the back, the entire load is pushed out. Peter added, “Eliminating carry-back is especially important during the winter. Temperatures can drop to -20° C, so loads freeze quickly, creating large amounts of carry-back. Plus,

730 EJECTOR FLEET ADDITION

Flygts now has two Cat 730 Ejector articulated trucks, and three other standard articulated trucks, that transport clay around the clock. Peter says, “Our first one works very well for us, so we decided to buy another.” Their target is to add a third.

Overall, ejector trucks are ideally suited to the construction industry. In earthmoving applications, where there is a requirement to spread material, few machines can match a Cat Ejector in terms of cycle times, productivity, machine stability and reduced support equipment costs. ■

Learn more:

www.uk.cat.com/equipment/articulated-trucks

CAT® REBUILD SOLUTIONS

REJUVENATE CARRIÈRES DE TRAPP QUARRY FLEET

Across the world, recycling is common practice. Restoring Cat® equipment to like-new condition takes a similar approach through Cat rebuild programs. For example, during a Cat Certified Rebuild, about 7,000 parts are repaired, replaced or reconditioned. Even the machine's frame can be recycled so the rebuilt piece of equipment is as tough as the day it rolled off the assembly line.

The three-pronged program offers different rebuild levels:

- Certified Powertrain: a powertrain rebuild only
- Certified Powertrain + (CPT+): a powertrain rebuild, plus additional component rebuilds per the customer's specifications
- Cat® Certified Rebuild (CCR): a complete rebuild from the ground up

CHOOSING THE RIGHT PROGRAM

That brings us to Colas East, a subsidiary of Colas. Even though the company's mainstay is road building, it owns nearly 40 quarries in East France. A fleet of 150 active machines (45 percent of which are Caterpillar) helps to extract more aggregate than any other company in the region, in terms of volume.

"The work is tough, demanding and unforgiving. Our equipment clocks 14 to 16 hours each day," said Bruno Munier, Equipment Manager for the east of France at Colas Group. That's close to 3,300 hours every year. "If one machine goes down, production can completely stop, so we need to proactively replace

our machines." Such was the case for two Cat 777D at Carrières de Trapp quarry, owned by Colas East.

Ideally, the machines would be replaced at the end of their first lives – between 12,000 and 15,000 hours. Caterpillar,

"For all intents and purposes, these are new machines."

Bruno Munier, Equipment Manager for the East of France at Colas Group

however, proposed a much less demanding alternative, in both capital investment and time. It was the second of the three Cat rebuild solutions, a CPT+. "Having the two CPT+ was the perfect solution," said Bruno. "This way we could have the powertrains rebuilt and specify other areas and components we wanted refurbished."

LIKE-NEW PERFORMANCE

"The 777D CPT+ rebuilds were performed for 50 percent of the new price. They had between 20,000

and 22,000 hours on them. Today, they're approaching 25,000 hours. It's like getting two machines for the price of one," Bruno said with a smile. "That's significant when economic conditions aren't ideal. It means we can allocate budget elsewhere."

Not only is a rebuild a much smaller investment over a new machine, equipment that goes through a Cat rebuild program can perform the same duties as when new. And, should it ever come time to sell, having that certification can increase a machine's value. "I'd much rather sell, or buy, a machine with a Caterpillar rebuild certification," Bruno said.

MINIMIZING DOWNTIME

The Carrières de Trapp quarry relies on performance and maximum up time. So opting to implement successive CPT+ rebuilds on two of their four 777D meant machine delivery was no more than three months for each. Bruno agreed. "Having two 777D go through a CPT+, one after the other, meant we could keep three

1, 2, 3. A Cat® 777D during the different stages of a Certified Powertrain + rebuild.

4. Bruno Munier, Equipment Manager, Colas Group for the east of France.



working and maintain productivity while the other was being rebuilt.”

12-MONTH WARRANTY

Besides cost, the most compelling reason for a certified rebuild is the manufacturer-backed, 12-month warranty. An Extended Protection Plan is also available. “It was important for us to have a 3-year/6,000-hour warranty, similar to new machines. We could only get that through Caterpillar. It’s complete peace of mind,” said Bruno.

Caterpillar can guarantee its rebuilt equipment because each is put under extreme scrutiny. There are specific model manuals (developed by Caterpillar), mandatory part replacements, required engineering updates and other compulsory procedures before equipment can become certified. “We value having rebuild solutions fully developed and endorsed by the manufacturer. Cat means quality and certified rebuilds are something the competition doesn’t offer at the moment. We did talk to a different equipment manufacturer about a wheel loader rebuild, but

they weren’t especially convincing and didn’t have a structured solution to offer,” Bruno added.

With the two CPT+ rebuilds complete, Carrières de Trapp received the like-new 777D and dealer representatives went through machine starts with Bruno. “For all intents and purposes, these are new machines. Those rebuilds are ready to run at the exact same intensity and performance level as year one.” ■

Read more at:

www.uk.cat.com/parts-service/parts

THE TWO, 777D CPT+ REBUILDS INCLUDED:

- The powertrain (engine, transmission, torque converter, differential, final drives and axles)
- Hydraulics system and cylinders
- Welding and reinforcement work on frame and body where required
- New cab parts and a new seat

COLAS EAST FACTS:

- A subsidiary of Colas
- Main activity: road building
- More than 3,800 employees
- Almost 40 quarries
- Cat® machines make up 45 percent of the fleet

Spotlights



FROM EXCAVATOR TRACKS TO THE RACE TRACK

Recently, Finning UK partnered with Smiths of Gloucester to sponsor the Smiths Group motorcycle racing team. Smiths is a leader in construction services and waste management in the UK. The sponsorship is for the Motorpoint British Supersport Championships and lasts over the 2012 and 2013 seasons. The 2012 season is now over and the Smiths/Finning team finished first. Congratulations to the winning team and Triumph rider Glen Richards!

Because of their reputation as a high performance team, Finning felt the Smiths Racing partnership would be a perfect match. It reflects the dealer's "trusted by experts" values and commitment to excellence and performance. And it's paid off. Not only did Smiths Racing have a successful year, Smiths Group has seen an upturn in business. You could say it's a triumph for Triumph and the Finning/Smiths partnership, but we're sure someone's already thought of that. ▼



RENTAL BUSINESS ADAPTS TO OUT-OF-THE-ORDINARY ACTIVITIES

If you're going to have a business in Grisons, Switzerland, being a ski lift company, among other services, isn't a bad choice. For the past 30 years, Weisse Arena has been working between 1,800 and 3,000 meters up in the Swiss Alps. Their main task, re-adjusting ski lift pylons, is demanding work. Glaciers can move six meters a year.

As a result, Weisse Arena needed tough equipment. So, they turned to Swiss Cat® Rental Store Avesco Rent. "The Cat reputation certainly helped convince Weisse Arena that our equipment was right for the challenges they face," said Vincent Albasini, Avesco Rent Managing Director.

At first, Avesco Rent began renting 25- to 30-ton excavators to Weisse Arena. Soon, Avesco Rent was also providing generator sets, 3- to 5-ton excavators and multiple Cat 287. Of course, glaciers are not normal jobsites. Delivering and preparing equipment, such as mounting customized tracks, requires logistics flexibility, innovation and service quality – all of which Avesco Rent was able to deliver. ▲

RENTAL GOES SOCIAL

At Cat® Magazine, we can't get enough of the diverse, exceptional stories behind Cat machines. So when we found out The Cat Rental Store expanded its dedicated website and started a Facebook page, we started clicking away.

Our first stop, catrentalstore.com/stories. The site is loaded with videos and stories about how Cat rental equipment is being used for everything from agriculture to waste. Our favorites: transforming a quarry into a stage for a Radiohead concert and the completion of a high-speed railway in Spain.

Over at catrentalstore.com/eame, it's all about information. If you're looking for the closest rental dealer, equipment options or a quote, save this site to your bookmarks.

We also went social at facebook.com/catrentalstories for the latest updates. Be part of the equipment rental social journey. Follow The Cat Rental Store and share your own stories. ▼

 catrentalstore.com/stories
facebook.com/catrentalstories



The second D6N is lowered onto the ice shelf at Crown Bay, Antarctica. The D6N are just under the crane's 25-tonne lifting capacity.



STAGE TWO

THE COLDEST JOURNEY ON EARTH GETS UNDERWAY

This is the second article in a series covering The Coldest Journey On Earth. In the first, we talked about expedition preparations. Now, with the journey already underway, we'll focus on the modifications that will help two Cat® D6N complete the six-month, 2,000-mile crossing as well as maintenance specifics to ensure machine uptime.

THE ADVENTURE BEGINS

March 21, 2013. That was the date The Coldest Journey On Earth's six-person expedition team began the first leg of their courageous journey across Antarctica. Led by Sir Ranulph Fiennes, they began at Russian base Novolazarevskaya and over 84 days will cover close to 1,400 miles to the geographic South Pole. Of those days, 63 will be spent traversing and 21 are planned for rest, research and maintenance or repairs on the two D6N.

Towing the team's supplies and equipment, each D6N started out pulling about 75 tonnes, including a caboose, storage and fuel sled. The machines can

handle the weight, but because temperatures can reach -70°C , specialized modifications were necessary.

THE MODIFICATIONS

Sir Ranulph Fiennes put his trust in Finning UK to make the tractors Antarctic-ready. More than three years and countless man-hours were needed to research, engineer and re-build the two D6N. There are literally hundreds of modifications, including everything from small valves to replacing rubber seals with silicon seals and fitting jackets over hydraulics. Even the smallest malfunction can mean disaster. Here are some highlights.



SOME OF THE MAJOR D6N MODIFICATIONS

- A** **Insulated roof hatch** for both entry and emergency exits, in case doors are unable to be opened.
- B** **Thermal cover**, a heavily insulated “tent” deployed over the D6N at night for maintenance, repairs and refueling. Underneath, a 40 to 50° C temperature difference can be maintained.
- C** **Grouser bars** were increased 60 mm and 260 tungsten-tipped **ice spikes** can be added to each machine for extremely slick terrain.
- D** **Ground-penetrating radar** (not shown) is attached to a forward, nine-meter boom to help detect deadly crevasses.
- E** A first-of-its-kind **crevasse arm** (with a three-tonne lifting capacity) to help the machines cross crevasses.
- F** Each D6N has **four glass mat gel batteries** (opposite side, above and behind the left track), two for ignition and two auxiliaries.
- G** **Four lifting eyes** to hoist the tractors on and off the SA *Agulhas*. The D6N are just under the 25-tonne lifting capacity of the ship’s crane.



When supplied by Caterpillar, each of the Antarctic D6N LGP, with heavy-duty undercarriage, weighed about 17 tonnes and were worth about €185,000. With modifications, additional equipment and man-hours, they are now worth about €1.2 million each and weigh 22.5 tonnes.

TECHNICAL CHALLENGES

Besides modifications, there were countless other technical challenges to tackle, including which spare parts should be taken and how fuel and lubricants would perform in the cold.

The fuel: Each D6N 300-liter tank is refilled, as needed, each day. But even specially treated diesel freezes in Antarctic temperatures. Thus, the machines use Jet A1 FSII, a jet fuel with an ice inhibitor so it can remain liquid down to -75° C.

To complete the crossing, 14 insulated, 8,000-liter, double-walled fuel bladders are needed. That’s 112,000 liters, enough for 280 days. Each bladder takes about 20 days to empty.

Spare parts: Because of weight limitations, lighter parts, such as internal and external hoses, were brought in favor of heavier parts. “We’re bringing 30 oil filters of all types for our

250-hour preventative maintenance regime,” said Spencer Smirl, the expedition’s Lead Operator and Lead Technician.

The list also includes fuel system components. “Aviation fuel lacks lubricity, so some moving components will tend to fail prematurely.” And, since jet fuel burns much hotter than diesel, we included extra exhaust system components.

Hydraulics and fluids: There are also plenty of spare hydraulic valve components, including hydraulic and lubricating oils. “We won’t have the capability to properly remove system contaminants. Having an abundance of these components means the machines can self-flush their systems,” said Spencer.

The Caterpillar recommended DEO 0W-40 synthetic engine oil is expected to perform normally at temperatures down to -40° C. Still, oil lines are insulated and the reservoir is heated. An additional 320 liters of oil and 2,640 liters of Cat® Transmission oil (TDTO 0W-20) are also on board.

Lack of sunlight: Much of the journey is in complete darkness. That’s not worrying Expedition Engineer Richmond Dykes. “It will be just like working a very long



His Royal Highness Prince Charles shares a lighthearted moment with Expedition Leader Sir Ranulph Fiennes in London, December 6.



Expedition Engineer Richmond Dykes (l) and Lead Operator, Lead Technician Spencer Smirl.

DECEMBER 2012

In early December, the SA *Agulhas* left London for Cape Town, South Africa. The ship and team arrived December 28.

JANUARY 2013

The team left Cape Town for Crown Bay, in eastern Antarctica on January 7. At this basecamp, about two months will be spent testing equipment and on other preparations.

MARCH 2013

The official beginning of the traverse was scheduled for March 21. About 84 days later, the Ice Team should reach the Geographic South Pole.

night shift. We'll take vitamin D supplements and use ultraviolet lights to help keep our skin healthy."

THE CABOOSES

The D6N are towing two cabooses. The team eats and sleeps in one, while the other houses scientific equipment and workshops. Even though each can be heated, the team will wear specially engineered and heated clothing. This is vital for survival. And, in case you're wondering, yes, there is a "proper" shower and bathroom.

KEEPING THE D6N RUNNING

Because of the extreme temperatures, the engineers will follow a strict, daily warm up regiment to reduce thermal shock to the machines. The procedure can take two to

...even specially treated diesel freezes in Antarctic temperatures.

three hours, but could save repair time, and very possibly, their lives. "We installed a Wabasto heat exchanger to slowly warm up all our fluid systems before start-up," said Spencer. Several other measures have also been taken.

Inspections/Maintenance: Fan belt tension and battery cable contacts will be checked daily. Each week, Electronic Technician will be used to assess and re-calibrate transmission clutch pressures and detect wear.

System-wide oil changes will be performed as per Caterpillar guidelines. Also, every lubricant filter will be cut open and inspected at 250 hours. "We can determine oil quality by analyzing the smell, color and contamination.

From there, I know how much past the recommended service life we can operate," added Spencer.

Given the possibilities of what could happen, Spencer remains confident. He does have one fear though. "Not being able to successfully reach the finish line with the parts and tools we chose is likely my biggest fear. I'd feel as if I let Finning and Caterpillar down with the world watching. This is a fantastic opportunity to show that a Cat machine with Finning modifications and support can successfully survive any task on the planet. Hopefully, Richmond and I can deliver that result." ■

Read more at: www.uk.cat.com/coldest-journey



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