

CAT MAGAZINE

SUSTAINABILITY ISSUE



GOING UNDERGROUND TO REDUCE POLLUTION

**D7E: FIRST-OF-ITS KIND ELECTRIC
DRIVE TRACK-TYPE TRACTOR**

**RECYCLING WASTE
WOOD INTO ENERGY**

CATERPILLAR®



What's in a name?

Now with the launch of the 329D L and 336D L our excavators' names truly reflect their weight and power. What's more they lay to rest the myth that our excavators are underweight.

www.cat.com



DEAR READER,

COMMITTED TO SUSTAINABILITY

The concept of sustainable development is all about meeting the needs of the present without compromising the ability of future generations to meet their own needs. It's a concept that poses many challenges in the areas where we, and you, operate.

More than ever, Caterpillar® is committed to providing products, services and solutions that make wise use of the world's natural resources and reduce harmful impacts on people and nature. For you this means we help you run your business in a more sustainable way. You are facing stricter regulations – from emissions, to oil disposal, to operator safety – and these will only get tougher.

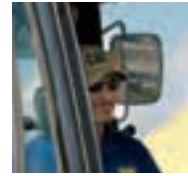
That's why our 2020 sustainability goals are bold and support the challenges you face. These include; reducing customer greenhouse gas emissions by 20 percent; increasing customer energy efficiency by 20 percent; increasing customer material efficiency by 20 percent and leadership in the safety of people in, on and around our products.

The good news is that many products that enhance productivity or reduce costs are also good for the planet. For example, using remanufactured parts keeps millions of tonnes of steel around for a second or third life. AccuGrade® improves your productivity, reduces your fuel burn and lessens your job site emissions. And the new Cat® D7E moves 25 percent more material per litre of fuel, consuming up to 20 percent less fuel per hour, and reducing emissions by the same percent.

At the end of the day, business interests are human interests and none of our businesses will succeed in a failing planet. The challenges are formidable, but we are all in this together, and together we will win.

Best regards,

Paolo Fellin
Vice President
Caterpillar



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PUBLISHER: Jenny Strömbom, Caterpillar S.A.R.L. **EDITOR-IN-CHIEF:** Simone Peter, Caterpillar S.A.R.L. **PROJECT MANAGER:** Karm Saggi **DEALER CO-ORDINATION:** Hoi-Yan Liu **CHIEF WRITER:** William Ward **CONTRIBUTING WRITERS:** Nick Carding, Urs Peyer **ART DIRECTION:** Ron Strik **PHOTOGRAPHY:** Peter Verver, Urs Peyer, Kevin Wright **CONCEPT & REALISATION:** Hunterskil Howard for Caterpillar S.A.R.L. www.hunterskil-howard.com **E-MAIL:** CatMagazine@cat.com

Cat Magazine is distributed by Caterpillar 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. All rights reserved. ©2009 Caterpillar.

CAT IN BRIEF

LIGHTS! CAMERA! ACTION!

South African Cat dealer Barloworld and Caterpillar have teamed up to make a unique TV commercial reinforcing the extensive capability of the Caterpillar product line. Filming at a quarry north of Pretoria was followed with creative editing to produce a dramatic 40-second advertisement that ran on South Africa's DSTV pay channels, watched by millions of viewers across Africa.



CUSTOMER GALLERY



We all know how versatile Cat machines are, but we never thought they could be used as wedding limousines. That's exactly what the wheel loader above was used for when CGT customer Matteo Bogoni in Italy recently married his bride Elisa Bighellini. The machine took the happy couple from church to reception party as watched by surprised onlookers. Please note that special safety measures were taken in this journey.



100% SUSTAINABLE ENERGY FOR CATERPILLAR IN NORTHERN IRELAND

As of May, all electricity for Caterpillar's FG Wilson manufacturing plants in Northern Ireland is supplied by Airtricity, a renewable electricity supplier with onshore and offshore wind farms. This is Caterpillar's first production site to be 100 percent supplied by renewable electricity. The move is part of a plan to use alternative or renewable sources to meet 20 percent of all Caterpillar's energy needs by 2020.



SIX CHANNELS OF PURE CAT – ON THE WEB



The world of tomorrow is under construction. Now, you can watch it progress on the web and discover Caterpillar from a different angle.

Meet the people behind Caterpillar, our dealers and our customers. Learn from their experiences, find out more about their current projects and how we help them solve their business issues. Simply browse through the six different channels on the website.

To see the action, share your own stories and keep up with what's new in the industry go to www.mycattv.com

NEW FOOTBALL PITCH FOR DISADVANTAGED KIDS



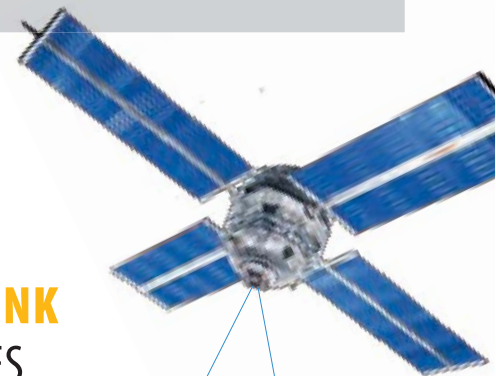
Earlier this year the 1,200 kids of a South African school near Cape Town were presented with a brand new football pitch - made possible thanks to the efforts of our French dealer, Bergerat Monnoyeur (BM), several of its major customers, and the local Cat dealer in South Africa, Barloworld.

It all started when BM organised a client visit to South Africa, during which the idea of doing something for a local school was enthusiastically embraced. On return from Cape Town BM organised a charity auction of the kids' paintings and drawings, which helped raise more than €17,000. Barloworld helped with the logistics of building the football pitch and also loaned free-of-charge the necessary machines.

All in all, a fine example of teamwork and community spirit.

PRODUCT LINK STOPS THIEVES

When thieves stole a Cat 301.8C mini excavator in Stockholm, the local Cat dealer, PON, became a detective. They simply tracked the stolen machine via the machine health monitoring tool Product Link: the onboard monitoring system that wirelessly transmits machine data (including location) to Caterpillar, dealers and customers. After four days of tracking through Sweden, Denmark, Germany, the Netherlands, France, and final destination the United Kingdom, local police working with Interpol swooped to recover the unit. The machine is now back with its true owners and the thieves are behind bars.



SUSTAINABILITY
REDUCING POLLUTION



GOING UNDERGROUND TO REDUCE POLLUTION

It's seven o'clock in the morning and the teams are already at work blasting, loading and moving up to 100 tonnes of rock every hour – that's the target to get the tunnel open on time. It's a familiar routine: blast-crush-move. And to help ensure that all goes according to plan they're using a fleet of Cat machines 18 hours a day, seven days a week.

Meanwhile on the surface, another routine is unfolding. A routine that's all-too-familiar to the hundreds of thousands of people who use the main highway between Pretoria and Johannesburg. "If I'm lucky," says Peter Dietz, a regular commuter, "I'll be in Joburg by nine o'clock - even though it's only a short distance it will take me two hours to cover less than 50 kilometres. And if there are any broken-down vehicles on the way, it could take me up to four hours."

It's a major congestion problem, causing misery and frustration to the drivers and passengers of the more than 300,000 vehicles that use the road every day. Add to that the damage done to the South African economy and you can see why the local government commissioned an ambitious new rapid rail link - one that aims to reduce traffic congestion by up to 20 percent and whisk commuters from Johannesburg to Pretoria in less than 40 minutes.

More ▶

Machine availability: 95 percent
Parts availability: 97 percent

Welcome to the remarkable Gautrain – a project of the Gauteng Provincial Government. A project designed to reduce traffic congestion, reduce noise and help improve air quality in this growing city by giving its people access to affordable, clean, green public transport.

The Gautrain will be a network of ten stations that connect the country's two biggest cities, Johannesburg and Pretoria, as well as the region's international airport. More than 100,000 daily passenger trips are expected, at speeds of up to 160 kilometres/hour. And although the network requires just 160 kilometres of track, the project is expected to cost around €2.2 billion. "That's because we are going through lots of built-up areas, which means either going underground or building viaducts," says Malcolm Robinson of Barloworld Equipment, the local Cat dealer.

BUILDING A RAILWAY UNDER A CITY

"Obviously some buildings were purchased and demolished but you can't tear them all down," says Malcolm. "That's why the Provincial Government decided that whom ever won the contract to build the railway would need to tunnel through the southern section. They asked Bombela to tender on how it could minimise the overall environmental impact. This issue also became the subject matter of the Environmental Impact Assessment (EIA)



Schalk Kotze (left) of Barloworld and Lew High of Bombela meet almost daily to plan where and how the Cat dealer can support operations.

where Bombela described how they were going to do it."

Construction started at the end of September 2006, and the first section, between the airport and Johannesburg, is expected to open in 2010. The rest of the network, including the section to Pretoria is due for completion nine months later. To achieve this schedule, a total of 45 job sites are manned by more than 300 machine operators using almost 100 Cat machines, working up to 18 hours a day seven days a week.

"TOTAL EQUIPMENT SOLUTION" WINS THE CONTRACT

"Bombela Civils Joint Venture's original request was for just 33 machines. But they also wanted highly dependable services to keep the machines up and running," says Malcolm. "With such a tight deadline, it was essential that they avoided unexpected machine downtime – and they said so in their request for tender. That's why we put together a package of products and services that amounted to a Total Equipment Solution" – a solution composed of four key elements:

1: Near-immediate delivery

Unlike other machine suppliers that need at least three months lead-time to deliver units to South Africa, the local Cat dealer, Barloworld, could deliver all the requested machines almost immediately – thanks to

Hundreds of tonnes of equipment had to be lowered into access shafts. The one seen here is the largest and main access shaft.



its massive inventory of rental machines. "We have over 400 machines in our rental fleet, including the big ones such as Cat 740 articulated dump trucks" says Malcolm. "It's a deliberate business decision that works well for our customers and ourselves. Rather than commissioning a new machine and waiting for the factory to fit the required specifications and then having it spend two months on a cargo ship, we can supply a rental machine equivalent almost the same day as the customer wants it. When the new machine arrives, we simply deliver and take back our rental unit."



Cat wheel loaders stepped up to the challenge of rough, flooded ground.

2: Integrated equipment

Another reason why Bombela awarded the contract to Barloworld was the breadth and depth of the equipment offer. In addition to earthmoving machines Barloworld also supplied generators, compressors, lighting masts, and additional rental machines to cope with peak demands. "We even bundled our tender with Avis, the car rental company, to answer the customer's inter-site transport needs," says Malcolm.

3: Training

All 300 operators were given a full day's on-site training by Barloworld's four full-time instructors – no other supplier could

offer this degree of professional training. In addition, all of Bombela's site supervisors attended the Barloworld Academy, where they were given three days theoretical and two days practical training. This helped ensure on-going operator coaching and adherence best practice on the sites.

4: Service and maintenance

"As part of our 'Total Equipment Solution', we handle all the service and maintenance of all Cat equipment, so that the customer can concentrate on getting the job done on time," says Malcolm. "We have the largest field service organisation in South Africa, backed by one of the most

advanced parts centres in the world. This guarantees 97 percent first-pick parts availability." In addition, S-O-SSM (Scheduled Oil Sampling) is deployed on all the 45 job sites. Up to 600 samples are gathered and sent for laboratory analysis each month, the results are then used to plan preventative maintenance strategies.

DIGGING THE TUNNEL

The 15-kilometre stretch of underground railway is being 'dug out' using traditional drill and blast techniques together with a special tunnel boring machine. All of the excavated rock is then relayed back down the tunnel to the lift shaft, where a Cat



“Obviously some buildings were purchased and demolished to make way for the rail link. But you can’t tear them all down.”

345C loads it into a massive 25 cubic metre bucket. This rock is hauled to the surface and then transported to a crusher plant, where it is used in the project’s cement fabrication plant. “The Cat 345 has never failed us,” says Llewellyn High, Bombela’s supervising engineer. “Even though we work it up to 18 hours a day, seven days a week – it’s never failed. It has more than 5,000 hours on the clock, and although it’s gone through three buckets and countless teeth, its undercarriage is still as-good-as-new. That’s because it has never moved from the base of the shaft.”

ACERT™ BETTER THAN PURIFIERS

Since much of the construction work is being carried out in densely populated residential areas, the control of dust, exhaust emissions, and engine noise



were particularly sensitive for this project. Emission control was even more vital in the underground sections. “Bombela originally requested that we fit exhaust purifiers on all Cat machines,” says Schalk Kotze, after sales manager for Barloworld. “However, after initial testing we found that Caterpillar’s ACERT engine technology actually out-performed such purifiers and additional filtration was unnecessary.”

The project is now half way complete and is right on schedule for the rail link to open on time. The cooperation and the problem-solving attitude between Bombela and Barloworld Equipment that has been practiced at every level has not only blurred the boundaries between the two companies, it has actually cemented a true team-spirit with one focus: “Let’s get the job done on time.” ■

NOW IT'S CLEAR TO SEE THE SIZE OF YOUR MACHINE

Caterpillar recently announced that it will be changing the name of its Cat 325D L and Cat 330D L excavators to Cat 329D L and Cat 336D L. This more accurately reflects the actual operating weight of these machines and their expected productivity rates. Moreover, all future or updated Cat excavators will also have names that more accurately reflect their operating weight.



WHY CHANGE THE NAME?

After extensive global market research we found that our customers prefer the excavator model name to accurately represent its operating weight. And since the operating weight is a good indicator of the amount of work a machine can do (along with engine power, lift capability, and bucket size), this misconception could put you at a slight disadvantage when placing tenders. With the new names this is much less likely to happen.

WHY DOES THIS BENEFIT EXISTING CAT MACHINE OWNERS?

To mark this new naming policy, Caterpillar has launched a publicity programme to create awareness that a Cat 325D L machine actually weighs 29 tonnes, and that a Cat 330D L machine weighs 36 tonnes. So your customers need never mistakenly believe that you have smaller machines.

WHY HAVE PREVIOUS NAMES NOT REPRESENTED THE TRUE WEIGHT?

When the 300-Series was first introduced, the operating weights were 25 and 30 tonnes. But with successive upgrades (we're now up to the D-Series) additional equipment and systems have been incorporated and these have added weight. The result is that our original weight-based names have become inaccurate.

WHY WAIT UNTIL NOW TO CHANGE?

This commitment to upgrade names is not simply a matter of changing the decals on the machines, it requires extensive catalogue and related documentation changes. For example, the 225-page operator's manual will need to be changed and reprinted, all the different parts will need new serial numbers, and all the parts ordering procedures need upgrading. And all of this in more than 30 language versions. So it is a sizeable commitment to change names, but one that we think will help you, our customers. ■

SAFETY – HOW WE BUILD IT IN

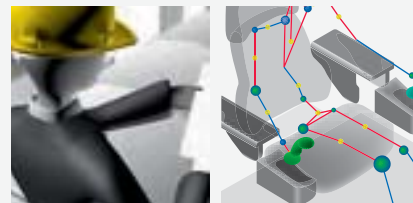
Health and safety is a cornerstone of Caterpillar's sustainable development programme. We provide leadership in the safety of people in, on and around our products. And we do this, in part, by providing our customers with products that are among the safest and most reliable in the marketplace.

We build in safety at the very earliest stages of new product development. Caterpillar research scientists use advanced computer 3D modelling to simulate how a new cab design, for example, will be experienced by an operator. They can test how different control panels and seat layouts will impact on biomechanical factors such as the operators' joint movements and muscle usage. This helps to identify and eliminate possible stress areas.

Comfort also has an important role in health and safety, it helps to keep the operator alert and error-free. And here too Caterpillar scientists use computer models with digital humans to look at how best they can optimise design features such as adjustability, reach, control and visibility. To ensure that Cat machines meet or exceed sound regulations many cabs are built with extra sound suppression technology.

But Cat cabs aren't just comfortable they are built for safety, with Roll Over Protection Systems, Falling Object Guards and Tip Over Protective Structures. Additional safety features are also available such as rear-view cameras, heated windows, and floor-to-ceiling windows. It all helps ensure a healthy and safe working environment.

And when your new Cat machine is built and delivered, your Cat dealer can help ensure it remains safe and productive throughout its life, with planned service and maintenance. ■



Advanced computer 3D modelling simulates how a new cab design will be experienced by an operator.

DEDICATED SAFETY WEBSITE

To further promote health and safety Caterpillar has launched a new website. As the theme "Safely Home. Everyone. Every Day." suggests, it focuses on creating a culture where everybody works safely, so that they can all return home to their families at the end of the day.

Safety.Cat.com is available in English, French, Spanish and Portuguese. You can browse safety checklists and read special articles on the world of safety in motion. There are also videos on walk-around inspections and plenty of operating tips.

Take a look today – your family will thank you for it.

www.safety.cat.com



REMAN

IT'S GOOD FOR YOUR BUSINESS AND FOR THE ENVIRONMENT IT'S CAT REMAN

Most people know that Cat remanufactured parts and components are great value for money - costing between 35 and 70 percent of an equivalent new system. But did you know that they are also extremely good for the environment? Cat Magazine spoke to Richard Snodgrass of the Caterpillar Reman Division to find out why.

"Our reman products are clearly one of our greatest contributions to environmental good practices and sustainability," says Richard. "It is perhaps the highest form of recycling. Our reman programme returns more than two million components into productive use every year. These would otherwise be simply thrown away. Moreover all the individual parts which we cannot remanufacture are reprocessed into base material for other new parts. So you can see it is quite a major contribution to sustainability, and it involves 65 million kilograms of core material every year."

HOW TO TAKE ADVANTAGE

A reman engine, transmission or any other part in the reman programme performs "same-as-new" and comes with the same warranty as a brand new part – but at a fraction of the price. To buy a remanufactured part or system all you need to do is take your old part to your Cat dealer, who exchanges the used part as partial credit toward the reman replacement. He can then supply a remanufactured replica. The 'exchange' is essential to ensure Caterpillar has a constant supply of parts to recycle. The programme offers complete engines, short and long blocks, electronic control units, heads, turbochargers, starters/alternators,

air compressors, oil/water pumps, fuel injection pumps and injectors, transmissions, major final drives, hydraulic pumps/motors, hydraulic cylinders and rods and a number of other component parts.

This breadth of offering enables your Cat dealer to offer a very fast availability with most remanufactured parts in stock. It also enables your dealer to customise its offer to your individual needs. For example, you may prefer a complete, dyno-tested, engine assembly which can be quickly installed. In other cases the dealer can use individual reman components such as piston packs, heads and turbos when he reconditions a customer's engine. Alternatively customers who perform their own maintenance can also take advantage of the benefits of reman components through direct purchase."

HOW DO WE KNOW THAT IT IS AS GOOD AS NEW?

"Well they all come with the same warranty as a brand new part, so it is certainly in our interest to ensure all reman parts conform to original performance specifications. That's why we use a wide variety of technologies based on the nature of the materials and the inherent value of the part," continues Richard. "For example,

in addition to conventional chemical and mechanical cleaning processes, we use a molten salt bath for cleaning iron based parts, and glass slurry and soda blast for aluminium. We also use puddle-welding and re-casting technology for restoration of iron parts, high precision laser cladding and both hot and cold flame spray resurfacing - this can be performed on both flat and cylindrical surfaces and utilises a variety metal alloys to precisely control the characteristics of the finished parts. It all adds up to a highly advanced operation. Not surprisingly, Caterpillar is one of the largest remanufacturers in the world."

More info? Visit www.catreman.cat.com ■



D7E TRACK-TYPE TRACTOR



FIRST-OF-ITS KIND ELECTRIC DRIVE TRACK- TYPE TRACTOR

INNOVATIVE POWER TRAIN SETS NEW STANDARDS

“Caterpillar has a long history of revolutionising the track-type tractor industry,” says Ian Laidler, Caterpillar’s track-type tractor specialist. “And this is another of those revolutionary milestones, because the new D7E has no mechanical transmission or torque convertor. Instead we’ve put in an electric drive, which delivers engine power to the ground extremely efficiently - without any power - draining gears, friction clutches, or drive belts. This means it can move 25 percent more material per litre of fuel, while at the same time prolonging component life in the drive train by up to 50 percent.”

“Quite simply it moves more material per litre of fuel while costing less to maintain and service”

Ian Laidler, Caterpillar’s track-type tractor specialist

Removing the transmission and torque convertor also means that there are



The concept of an electric drive system has been made feasible thanks, in part, to today’s smaller, more cost-efficient semiconductors that can convert heavy-duty-drive voltage to Alternating Current.

60 percent fewer moving parts in the drive train – fewer to wear or break down. Moreover, the parts that it does require have less servicing. So there are even more savings in terms of less servicing and fewer part replacements.

HOW IT WORKS

The C9 ACERT™ engine is coupled to a power generator, creating Alternating Current electricity through heavy duty cabling to a Power Inverter. This powers the drive motors using Alternating Current electricity, whilst at the same time providing Direct Current electricity to power heating, ventilation, airconditioning, and water pump systems. Traditionally these systems are belt driven - no belt on the engine means no loss of power and exceptional performance even when the engine is idling.

ANSWERING SPECIFIC INDUSTRY NEEDS

“The key thing nowadays is manoeuvrability,” says Ian. “More and

more, we’re seeing track-type tractors in cut-fill-grade projects, especially in site preparation. Previously, D7s were typically used in projects where material is simply pushed from A to B. But construction projects require a mix of straight-ahead dozing power and tight-quarters manoeuvrability. With the electric drive train and infinitely variable engine speed, Caterpillar has developed an all-new class of tractor that delivers the best possible balance of heavy-dozing and fine-grading performance.”

SAFETY IN MIND

Safety has been a priority from the start of the design process. Forward visibility is exceptional thanks to an uninterrupted line of sight - the single cab post, the exhaust stack, and lift cylinder are all in-line to deliver 35 percent better visibility than the D7R Series II. Even the single GPS mast of AccuGrade is in-line and out of sight. There is also safety when servicing: the cab hydraulically tilts to enable excellent access to mechanics.



SUSTAINABILITY FUEL EFFICIENCY

25% MORE

MATERIAL MOVED PER LITRE OF FUEL

10 - 30% LESS

FUEL CONSUMED PER HOUR

35% MORE

VISIBILITY

50% LESS

NOISE

50% LONGER

DRIVE TRAIN LIFE

60% FEWER

MOVING PARTS IN THE DRIVE CHAIN

10% MORE

PRODUCTIVE THAN THE D7R

WHERE IS THE ELEVATED SPROCKET?

The D7E maintains all the benefits of an elevated sprocket undercarriage with its oval track. Firstly, service access to the propulsion modules require less servicing than traditional transmissions. When servicing is required, the tilting cab provides easy access, this is much simpler and much safer. Also, the roller frames are redesigned to transmit shock loads through the roller frame - not the final drives. In addition, the final drive bearings and seals are now the same size as those of a D10 size tractor to increase durability.

WHAT NEXT FOR ELECTRIC DRIVE?

Caterpillar will be introducing an electric drive system on its large mining trucks, and other machines could also benefit in the near future. ■

It is also easier to operate: with ergonomic, low-effort controls and no gears to shift. The single cylinder retains the power and stability of a dual-cylinder system but with less than half the parts for reduced maintenance.

It is more comfortable: the cab is larger and noise levels are half those of the D7R. The self-contained electric air conditioning system is mounted outside the cab. It is also easier to service, thanks to the tiltable cab which can be locked at 30 degrees or 90 degrees, or completely removed.

And it is prepared for the future: the C9 engine with ACERT Technology meets U.S. Tier 3 emissions standards, and the tractor has been designed with Tier IVa in mind.

SUSTAINABILITY
RENEWABLE ENERGY



RECYCLING WASTE WOOD INTO ENERGY

Surprisingly to most people, using waste wood to fire a power station is extremely environment-friendly. First of all it's a renewable resource, it's also a by-product that would not be used otherwise and best of all it is completely CO₂ neutral. Tegra, a Swiss energy company uses it to produce 350,000 megawatt hours of energy annually. For their ground-breaking initiative, they won Switzerland's prestigious Watt d'Or award. And as you would expect, Cat machines are part of the success-story.

Tegra was founded in 2004 and already two years later the first boiler of their wood-waste-fired steam-electric generating station went online. In 2008 a third one started to produce energy. On average, the three boilers generate 128,000 megawatt-hours of electricity (corresponds to the annual consumption of 27,200 houses) and 220,000 megawatt-hours of heating energy (corresponds to the annual consumption of 23,000 houses). The plant delivers processing steam and electricity to a nearby sawmill and a chemical plant and helps them to minimise their use of fossil fuels.

More ►



CAT WHEEL LOADER FUELS BOILER

The whole plant burns about 260,000 tonnes of waste wood annually. Tegra runs a fleet of trucks and trailers to transport wood-chips, bark and sawdust from different locations to the plant. 800 tonnes or 2100 cubic metres of waste wood are processed every day in three shifts between 05.00 hrs. in the morning and 23.00 hrs. at night.

To fuel their first boiler Tegra bought a Cat wheel loader. The 962H proved to be a reliable tool with an excellent availability. "Service and customer-support by the local Cat dealer Avesco is great", says Klaus Aulbach, logistic coordinator for Tegra.

Recently they bought a Caterpillar M322D MH material handler and a waste wood grinder for processing low quality logs, pallets and unpainted construction timber.

With all three boilers being online and 2100 cubic metres of fuel being processed

Tegra's logistics coordinator Klaus Aulbach checks the vast "fuel" storage area, where waste logs are piled up with the Cat M322D MH.



The wood-chip bucket, supplied by local Cat dealer Avesco, has a capacity of 12 cubic metres – it's so huge that a camera – similar to a submarine periscope – is needed to safely operate the loader.

every day, it was soon time to get a second wheel loader. "Never change a winning team", was Klaus Aulbach's comment on the acquisition of a Caterpillar 966H.

Supplied by Avesco, the loader is equipped with a giant 12 cubic metres wood-chip bucket. For safety reasons, Tegra developed a camera-system for the 966H wheel loader. What looks like a submarine periscope on the canopy, is a stick with two cameras on top. If the driver shifts backwards the small

"Never change a winning team", says Klaus Aulbach of the Tegra Company. That's why he got a second Cat wheel loader.

screen in the cab shows everything that is happening behind the loader. As soon as the machine rolls forward the screen switches to front view.

The main purpose of the wheel loaders is to blend and stockpile wood-chips, bark and sawdust. But they are also used for fuelling the boilers by dumping blended material onto the feeder hoppers.

The satisfying fuel consumption and the first class support by Avesco are some of the reasons why Tegra will stick to Cat machinery for future thermal power station projects in Switzerland. ■



OPERATOR TIPS TO MAXIMISE PRODUCTIVITY AND SAVE FUEL



Motor graders are among the most difficult machines to operate efficiently. The three tips below are more like golden rules, stick to them and prosper.

1. KEEP IT SLOW

Grade at a speed of 6 to 10 Km/h. Amazingly, this will result in:

- Higher productivity
- Less fuel consumption
- Longer blade life

Why? Because keeping it slow means you can be sure of doing the job right – first time. You don't need a second pass. Remember, every second pass is a productivity reduction of 50 percent.

Also, keeping it slow consumes less fuel to cover 100 metres than it would at a faster speed – up to 14 percent less.

Keeping it slow ensures that the blade does not overheat and deform. Excessive speed is one of the most common causes of overheating, which softens the blade metal and results in high-wear and deformation.

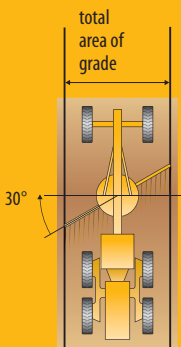
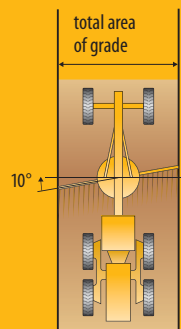
In addition, going fast makes the machine bounce, resulting in an uneven grade and the need for a second pass.

And finally, keeping it slow means less overall machine wear caused by impacts on an uneven surface. You will prolong your tyre life, your axles, your cab mount joints and all other components that wear with each impact.

2. BLADE ANGLE AT 10°

Use the broadest blade angle you can – ideally at 10 degrees or less. (See diagram below). This will increase your productivity because you will grade a wider band of ground than at 30 degrees, for example. It's also important to have full blade contact to optimise productivity.

Ten degrees or less is the most productive angle, but you may need to increase the angle if material flows around leading edge.

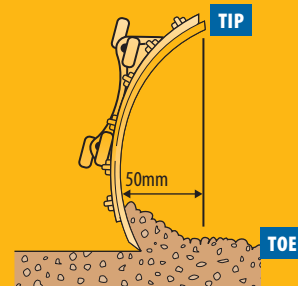


3. TIP BEFORE TOE

Keep the tip (top) of the blade ahead of its toe by 50 to 100 mm. (See diagram below).

This will maximise your productivity because this is the most effective cutting edge for the blade and you can move earth more efficiently.

In addition, you should aim to penetrate the earth between 25 to 38 mm.



Remember, high productivity in motor grading is not achieved by doing it faster – it's more about avoiding a second or even third pass
First time right is best.

MOVING THE EARTH FOR MILLIONS OF PRAWNS

In the scorching heat of the Saudi Arabian desert more than 100 Cat machines are moving 20,000 cubic metres of sand every day. Their mission: to help create an incredible in-land prawn farm. They have already built 300 growing ponds (each the size of ten full-sized football pitches) and there are another 480 ponds planned. Cat Magazine took a closer look.

“Tonight we’ll harvest the northern-most pond and collect 50,000 kilograms of prime-quality prawns,” says operator Tony DaSilva. “Within an hour, each and every one of them will be processed, packed and frozen - ready for shipment to customers across the globe.”

Tony is one of the 3,500 workers at Saudi Arabia’s National Prawn Company (NPC), the world’s largest fully-integrated Aquaculture project. Every 24 hours the farm produces 50 tonnes of prawns, and soon, when phase II of the project is completed, that harvest will increase to more than 200 tonnes... every day.

What’s even more remarkable about this huge operation is that it is all totally sustainable: it uses land that is unsuitable for agriculture or housing, and water from the Red Sea, which is in abundance. It has no negative impact on the environment, and importantly, there is no destruction of mangrove areas, which are the traditional locations for prawn farms. Also, the prawn species that are farmed at NPC are indigenous to that part of the world (the Red Sea) and they are grown naturally, without antibiotics or hormones.

WHY CATERPILLAR?

“In addition to Cat’s proven reputation for quality and reliability, the expert service and support from our local Cat dealer made it an obvious business decision to go



100 percent Cat," says Rao Ganeswara, earthworks manager at NPC.

"Zahid Tractor has been integral to the resource planning right from the start - their team of mechanical engineers conducted a site survey and compiled an earthmoving needs audit. They gave us a complete case study, with machine recommendations and benefit analysis – all free of charge."

As you would expect from a project of this size NPC has its own team of highly competent service technicians. "But for the articulated dump trucks, Zahid Tractor sends its own engineers to look after the advanced electronics in these machines," says Rao. "They also give us a free

parts delivery service and a dedicated application engineer visits us once a week to check on overall machine health and performance. On top of all that, Zahid Tractor provides a full-day's training (with follow-up) for all our new machine operators."

A FULLY-INTEGRATED OPERATION

The NPC farm is totally self-sufficient. It includes its own breeding stock and hatcheries. It has its own feed mill and desalination plants as well as its own 21 megawatt power plant (and four mobile Cat generator sets). It has also become one of the foremost Research & Development centres for Aquaculture. "In building this prawn farm we've had to research and develop our own hydro dynamic concepts, our own mechanical harvesting methods,

and our own high-saline feed formulas," says Ahmad Al-Balla, general manager NPC.

"What's more we've developed our own, highly-rigorous bio-security regimes – as you can imagine the health and hygiene of our product is absolutely our main concern. And we are proud that we have never had a single prawn rejected." As a result of all this expertise, NPC intends to extend its activities into in-land fishfarming – which also promises to be totally self-sufficient and 100 percent sustainable. And when that happens, Cat Magazine will again be there to take a closer look. ■



Battle-scarred and beaten, Cat machines continuously work uninterrupted in highly demanding conditions.



CAT MACHINES TAKEN TO NEW HEIGHTS

At more than 1,000 metres high Mount Snowdon is one of the United Kingdom's highest mountains, it's also an area of outstanding natural beauty. Each year it attracts thousands of visitors who walk the path to the summit. Soon there will be a new €10 million visitors centre to greet them. It's being built by the Carillion Construction who say that the freezing temperatures and the more than five metres of rain every year make conditions extremely challenging... for men and machines. Not surprising then that they chose Cat excavators to do the site preparation. ■



Five metres of rain every year make for tough conditions, fortunately the crew have Cat machines on their side.

PEOPLE

SUSTAINABILITY A JOURNEY NOT A DESTINATION

John T. Disharoon is Caterpillar's sustainable development manager. Based in our corporate headquarters in Peoria, in the USA, he works with Caterpillar employees, customers, suppliers, government bodies and voluntary organisations around the world – all in the pursuit of helping Caterpillar and its customers make sustainable progress possible. Cat Magazine asked him "why?"



JOHN T. DISHAROON

WHAT IS A SUSTAINABLE DEVELOPMENT MANAGER?

Our team of four professionals works closely with all groups within Caterpillar. We advise the various business units on strategies that effectively pursue Sustainable Development as a profitable area of growth for the company. We also help customers to understand the impacts of sustainability. It's a journey that will never end, and while we are well on our way, we have much further to go.

WHAT IS SUSTAINABILITY?

Sustainable Development is all about ensuring that our business activities have the maximum positive impact (and the minimum negative impact) on people, profit and planet. We do this by identifying areas for improvement and developing initiatives to realise those opportunities. This includes our own operations where, for example, we have significantly increased our recycling efforts and use of renewable energy. It also includes our aspirational customer goals where we aim to help our customers become more efficient in their operations through the use of technology and innovation, with initiatives such as remanufactured products, certified rebuilds, job site solutions, Eco Operator training, etc.

ARE WE DOING THIS BECAUSE WE WANT TO OR BECAUSE GOVERNMENTS INSIST?

It is true that government regulation, such as emissions controls, forces some of our actions, but there are many other activities that we have made priorities ourselves. For example, our new D7E (electric drive track-type tractor), our extended life fluids and lubricants, our Combined Heat and Power (CHP) business, - to name just a few - are all examples of business initiatives designed to help make our customers more sustainable in their own businesses.

We're convinced that a sustainable company provides its customers with sustainable products – products that allow the job to be accomplished in the most efficient manner.

HOW ELSE ARE WE SUPPORTING SUSTAINABILITY?

Through our products and services, we help societies improve living standards for their people. Through our operations, we also help people and communities acquire skills and resources to maintain sustainable livelihoods. By providing meaningful employment, often with access to healthcare and educational opportunities, and by establishing consistent expectations for behaviour,

through our Worldwide Code of Conduct, we enable people to make choices and decisions that ultimately have an impact on their livelihoods, the communities in which they live and the environment we share.

FINALLY WHAT'S THE BEST THING ABOUT YOUR JOB?

Knowing, that at the end of the day, we are helping make the world a better place; one tractor, one engine, one turbine, one service solution at a time. Caterpillar truly helps make sustainable progress possible. ■

"We're convinced that a sustainable company provides its customers with sustainable products"



1995

CAT FLASHBACK

Back in 1995 the new 966F Series II environmental version wheel loader was a powerful example of Caterpillar's commitment to sustainability. Its 20 percent reduction in emissions - over the standard 966F Series II - went substantially further than the predicted 1997 legal requirements.

Photo courtesy of Caterpillar Inc. Corporate Archives.

Other notable events of 1995



Steve Fossett lands in Canada to become the first person to make a solo flight across the Pacific Ocean in a balloon.



The DVD (Digital Versatile Disc) is announced. It has the same dimensions as a CD but can store more than six times as much data. Later versions were to store even more.



eBay the online auction and shopping website is founded. In 2008 their turnover was reported more than US\$ 1 billion.

RESOURCEFUL. In more ways than one.



Introducing the New Cat® D7E with Electric Drive

Protecting the world's resources while maximizing your own is good for business, your people and the environment as a whole. And the new Cat D7E track-type tractor with electric drive maximizes efficiency and productivity while conserving our natural resources. Its highly advanced yet mechanically simple electric drive delivers twice the service life of conventional drives, and it has fewer parts to service or replace, so it costs less to own and operate.

And its streamlined, efficient hydraulics use less hose and fewer connectors, which helps improve reliability and cut service costs. In fact, the new D7E is designed to use less fuel, produce less noise and consume fewer resources over its long working life than any other track-type tractor in its class. The new D7E is one more example of how you can count on Cat to be a resourceful partner for your business and the world.

To find out more about the Cat D7E, contact your Cat Dealer or visit www.cat.com