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Information®

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targets off-road



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cranes improve
jobsite safety



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Illustrated: lock-
out/tagout tips



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November 2009

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Dream The Improbable

Operator says Topcon's
speedy machine control
delivers **p. 18**

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CONSTRUCTION EQUIPMENT

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FEATURES



COVER STORY: FIELD REPORT

18 Fast Times at California Testing Site

When it comes to what Topcon's 3D-MC² machine control system can do, seeing is believing, says equipment operator Spartakoos Valverdi. He urges anyone who moves earth to check out the system first-hand. Senior editor Mike Anderson explains the benefits of the 3D-MC² system, which adds new sensor technology that calculates and updates such information as blade tilt, machine position in every direction, and instant change in direction, at a rate 10 times quicker than before.



HANDS-ON TRUCKING

45 Western Star 6900XD Proves A Real Rocker

Western Star says its 40-ton dump truck is a lower-cost alternative to traditional haul trucks, and time will tell if it's as tough and long-lasting. The extra-heavy-duty vehicle was introduced in 2008 and is based on a 6900XD with a commercial-style on-road cab. It includes a standardized power train and integrated dump box. Truck editor Tom Berg gives you his driving impressions.

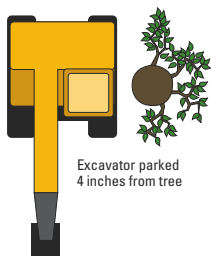


BUYING FILE

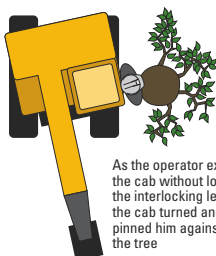
28 Providing a Lift For Jobsite Safety

With the service and utility industries gathering this year for the biennial International Construction & Utility Equipment Exposition (ICUEE), suppliers of service cranes have been busy introducing new and updated models. The truck-mounted cranes themselves, however, aren't the only shiny new products that can boost jobsite efficiency and productivity for service-crane users. Senior editor Mike Anderson reports on service cranes as well as supporting equipment designed to make work more efficient, productive and safe for mechanics.

The Dangers of Not Locking Out



Excavator parked 4 inches from tree



As the operator exited the cab without locking the interlocking lever, the cab turned and pinned him against the tree



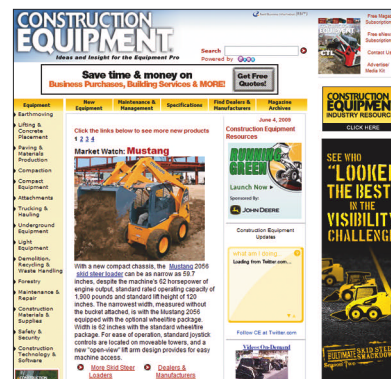
To release the operator, the company owner reached into the cab to engage the joystick but ended up getting pinned on the opposite side

SAFETY ILLUSTRATED

32 Lockout/Tagout: The Key to a Safe Fleet

Good engineering and advancing technology continue to make construction equipment safer for those who work in and around it. Sometimes, however, the smartest way to prevent an equipment-related accident is to avoid potentially dangerous situations altogether. One way to do that is through lockout/tagout. With lockout/tagout, you essentially tell other workers that a piece of equipment, in its current state, is too dangerous to operate. Compliance with lockout/tagout safety procedures prevents about 50,000 injuries each year, according to OSHA. Associate editor Andrew Baltazar gives you tips to put into practice.

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*Kevin Primmer,
Kelston Sparkes Earth Moving*

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The Cost of Compliance

Stimulus money is not reaching the majority of equipment fleets, according to just-concluded research we did for the *Construction Equipment/Case Construction Equipment 2010 Annual Report & Forecast*. Eighty-four percent of respondents have not seen any money from the stimulus package.

Although 1.5 percent of managers said stimulus money allowed them to upgrade machines for emissions compliance, that number falls woefully short of the need. Even with last month's announcement of a joint call upon Congress to fund emissions compliance on federally funded transportation projects, equipment managers continue to struggle with the most onerous burden in fleet management many of them have ever faced.

From a budget standpoint, any organization that owns and operates a fleet of heavy equipment is heading into 2010 wondering how much capital to invest in new iron and how much to invest in emissions compliance. Based on other research we've conducted, more budgets are leaning toward maintenance than are leaning toward new-machine purchases.

For them, emissions compliance becomes even more of a challenge. Instead of replacing machines with those powered by higher-Tiered diesels, these fleets must consider alternative methods of ensuring emissions compliance. And as we've reported, those costs add up quickly.

Emissions compliance continues to default to the equipment manager. In March 2008, we determined that more than half of fleets did not have anyone officially responsible for compliance. That has dropped to about one-third, but the offsetting growth in responsibility has fallen on the equipment manager: 29 percent in 2008 to about 40 percent today.

Fleet budgets must expand to cover these compliance-related costs. The responsibility for making that case, however, now rests squarely with the equipment manager. They must continue to make the case to their CFOs and budget committees for the cost of compliance.



Rod Sutton, Editor in Chief

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Rod

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A summary of the month's primary machine introductions and model changes

By KATIE WEILER, Managing Editor



▼ Sakai

Featuring a three-position, 180-degree rotating operating console with instrument panel and seat, the operator's station for Sakai's new 67-inch-wide 700 Series vibratory double-drum asphalt rollers has been enhanced to minimize vibration to the operator, says the company. The SW770 offers one frequency at 3,000 vpm and two amplitude settings of 0.012 to 0.025 inches; the SW770HF offers three frequency settings up to 4,000 vpm with the same two amplitude settings.

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▲ Ditch Witch

Built with a compact footprint and an 83-horsepower turbo-charged diesel engine, the RT80 utility-based hydrostatic trencher can dig trenches in tight spaces while performing well when digging long, deep trenches. The RT80 offers four combinations of torque and speed, and is able to reach up to 9.9 mph. Standard on Ditch Witch's trencher is cruise control and a 30-gallon fuel tank.

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◀ Caterpillar

Cat redesigned the tractor for its 613G scraper with a C6.6 engine, delivering 3 percent more horsepower and a new torque converter increasing rim pull. With faster elevator and travel speeds, the 613G can load material as much as 13 percent faster than its predecessor. It has an 11-cubic-yard heaped capacity. Safety updates include an articulation neutralizer, and all daily service check points are at ground level.

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Market Watch



Caterpillar

Four towed-scraper models acquired with E-Ject Systems purchase have been integrated into Cat's product line. The TS180 and TS220 are two-wheel units with heaped capacities at 19 cubic yards, and the TS185 and TS225 are four-wheel pans with walking-beam suspension and heaped capacity of 23.5 cubic yards. All of the towed scrapers come standard with dry-disc brakes. The center-lift bowl eliminates the large draft arms and saves weight.

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Astec Underground

Adapted from Astec's HDDs, a dual rack-and-pinion design drives the EarthPro Geothermal 4550 drill rig, available in a truck- or track-mounted version. Three-speed drive motors provide 45,000 pounds of pull up and 22,000 pounds of pull down for quick cycles in the installation of geothermal systems, says Astec. With an automated pipe loading system, a single operator can drill and trip out up to 600 feet of pipe without winch assistance. Dual multi-function joystick controls are mounted on a console.

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Komatsu

Komatsu increased the net engine output in its D375A-6 crawler dozer by 85 horsepower to 610 horsepower at 1,800 rpm. A variable-displacement piston pump replaces twin gear pumps in the hydraulic system for more efficient use of engine horsepower. An updated full-U blade shape carries more material – 28.8 cubic yards – for improved production without increasing blade width or reducing digging force. A new LCD color multi-monitor offers self-diagnostic functions.

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Gradall

With the new XL 4300 III wheeled excavator, maximum digging depth has been extended to 21 feet 3 inches and boom reach at groundline is stretched to 30 feet 4 inches. The work capabilities of the XL 4300 III, powered by a new 173-horsepower Detroit Mercedes engine, is complemented by the 43,000-pound machine's stability with front axle oscillation locks, says Gradall. The entire boom tilts, rather than only a boom-end accessory. The tilting boom is able to place attachments in precise position from any direction.

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Roadtec

Cutter-drum design changes will provide users of Roadtec's line of cold planers with a milling pattern enhancing the bonding of the new asphalt layer to the existing base, says the company. The lacing pattern was adjusted to provide a better texture on the milled surface, as well as a more balanced impact when the cutting tools strike the surface.

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Caterpillar

The 793F is targeted to go into full production in fall 2009, with other mining trucks in the new F Series to follow. The 16-cylinder version of the C175 delivers 2,650 horsepower in the 793F. Cat says the C175 "promises longer life between rebuilds, lower sound levels, improved altitude capability, and improved fuel consumption compared to the 3500 Series engines it replaces." The F Series will usher in the first Cat electric-drive mining trucks, making Cat the only manufacturer of 200-ton and larger mining trucks with both mechanical and electric drive systems.

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JET Co.

The side-dump trailer has a truck capacity of 22 cubic yards in a 34-foot-long tub. The rounded tub improves capacity by replacing a center divider with external supports, and angled internal tub corners promote controlled load release. JET says its side dumps have a trunnion-mounted, inverted lift cylinder that reduces tub acceleration and improves trailer stability. The trailers have maintenance-free tub pivots and cylinder bushings.

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Load Lifter

The 842-G Reach is an 8,000-pound-capacity telehandler with maximum lift height of 42 feet and reach of 28 feet 3 inches. Load Lifter says that with the high-mounted boom level in the load-carrying position, the operator has 360 degrees of visibility, including an unobstructed view of the right rear tire. The new cab's ergonomic controls include a telescoping, tilting steering console. A 4.4-liter Perkins 1104C-44T diesel drives the unit with 99 horsepower through an all-Dana drive train.

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Caterpillar

Cat refined its 150-horsepower D6N crawler dozer by making electro-hydraulic controls standard equipment and upgrading the instrument panel, climate controls and air-ride seating. Signals between the tiller bar, blade and ripper control levers and the corresponding hydraulic systems are now communicated through a simple wiring harness. Electronic controls reduce the cost to add AccuGrade grade controls.

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RUNNING GREEN

HUSS Verified with EGR

The California Air Resources Board (CARB) extended its verification of the Huss FS-MK diesel particulate filter to include 2009 and older off-road diesel engines and 2006 and older on-road diesel engines, including select engines having internal exhaust gas recirculation (EGR). Currently, it is the only Verified Diesel Emission Control Strategy for working with any kind of EGR.

The Huss MK system, approved for use on Volvo engines utilizing V-ACT technology with internal exhaust gas recirculation, meets California's CARB Level 3+ requirements. Volvo equipment owners can utilize the system to help comply with the "In-Use Off-Road Diesel Vehicle Regulation," or to provide the best available control technology (BACT) for the newest machines in owners' fleets. Before CARB's extension of the HUSS verification, engines using any type of EGR had been excluded from applying exhaust retrofit technology in California.



Volvo entered a partnership with Huss to provide exhaust retrofits for Volvo equipment that significantly reduce diesel emissions.

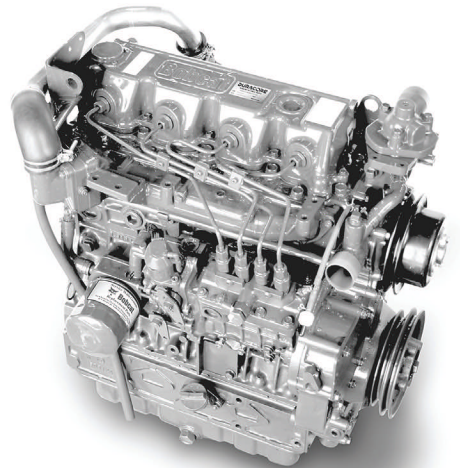
MANUFACTURER NEWS

Bobcat Expands Reman, OEM Products

As equipment manufacturer Bobcat continues to roll out new machines, the availability of company-backed remanufactured parts is also being expanded.

First introduced in 2007, the Duracore product line offers remanufactured engines, starters and alternators. Now also available are turbos, injection pumps and injectors. Along with providing customers with cost savings, remanufacturing removes Bobcat parts from the disposal stream, the company says.

Bobcat, which recently introduced the M-Series of compact loaders and excavators, has announced the availability effective September of additional models at local dealerships. The S650 skid steer loader and T650 compact track loader join the previously introduced S630 and T630 models.



Bobcat is expanding the types of products available in its Duracore remanufactured parts line.

TRUCKING NEWS

Titan to Build Trailers Overseas

After years of testing the waters in the United Kingdom's haulage industry, Canadian-based Titan Trailers is setting up assembly for the European Union market at a facility near the British seaport of Teesside.

In prominent use throughout North America, Titan's trailers are recognized for their Thinwall extruded aluminum body construction, developed by company president Mike Kloepfer in the mid-1990s. Titan also enjoys a working relationship with Walking Floor self-unloader systems creator

Keith Manufacturing.

Titan trailers seen on the roads of Great Britain today were fully manufactured in Canada, then freighted over the Atlantic. However, Kloepfer explains, many of the components on those trailers actually had to make two such trips, since Titan has been importing EU-standard running gear and other parts into the Canadian manufacturing facility to ensure service support would be available locally for British customers.

Managers Digest

For more headlines: ConstructionEquipment.com

MANUFACTURER NEWS

Doosan Concept Targeted for 2018

Doosan recently showed the concept design for a futuristic excavator, the CX, which the Korean company says is targeted for release in 2018.

The excavator is powered by a hybrid system, and features articulated independent suspension. Motors mounted in the four crawler modules allow each crawler to hang on an articulated swing arm. The tracks oscillate around a single mounting point.

The cab can extend forward on an arm to improve operator visibility into excavations, and the counterweight can be extended to maintain balance under heavier loads.



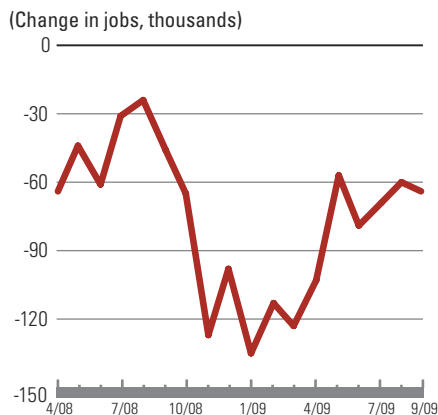
Doosan's CX concept excavator rides on four swing arms with independent tracks.

Laser proximity sensors scan the space around the machine to identify people or objects in the excavator's swing path. A terrain scanner facilitates unmanned, automatic operation.

STATUS & FORECAST CONSTRUCTION EMPLOYMENT

Contractors laid off 64,000 workers in September, which is about the same number of workers laid off in the previous four months, and half the number of workers who lost their jobs late in 2008 and early in 2009. Expect several hundred thousand more layoffs into the winter. A slow recovery in construction jobs will begin when residential jobsite hiring picks up enough to offset continued job cuts in other sectors. Construction wage growth stalled during the summer, but will be near 1 percent through the spring.

— JIM HAUGHEY



Source: U.S. Department of Labor

MANUFACTURER NEWS

Terex to Exit Excavator Business?

"We've never really demonstrated an ability to be meaningfully profitable and successful in this [construction equipment] business," Ron DeFeo, chairman and CEO of Terex, admitted to a J.P. Morgan investor conference on Sept. 16. "This segment of our business reached nearly \$2 billion [in revenue] in 2007 and 2008 and only produced a modest operating profit."

With the goal of becoming "the most profitable construction equipment manufacturer in the world," DeFeo pledges to analyze Terex construction machines by product type and pick some to sell by "early in 2010."

The painful comparison is with the Terex aerial-work-platform, crane, materials-processing, and mining product segments, which DeFeo says generate revenue similar to that of construction equipment but at much better profit margins.

More of DeFeo's comments, and some likely sale and buyer prospects can be found at <http://www.constructionequipment.com/blog/1200000720/post/200049020.htm>.

READERS RESPOND

Fall-Protection and Scissor Lifts

In the September 2009 issue of *Construction Equipment*, we put together a Safety Illustrated article about fall protection. In the article, we provided a graphic of an operator tethered to a scissor lift to illustrate the Occupational Safety and Health Administration's national standards for fall protection.

Bill Hindman, president of Industrial Marketing Systems, read our safety article and pointed out that OSHA does not require workers to use fall-protection equipment in scissor lifts. OSHA, however, does require using fall protection in boom-type lifts.

"The reason for this is that a boom lift can catapult a person out of the lift whereas a scissor lift cannot," Hindman says.

The International Powered Access Federation argues that fall-protection lanyards create a tripping hazard in scissor lifts, and if a tethered operator were to fall out of a scissor lift, the force of the fall could tip the lift over and on top of the operator.

Still, some scissor-lift manufacturers provide an anchor point to which an operator can tie off, and various businesses and local regulation agencies require operators to tie off to both boom lifts and scissor lifts.

SUPPLIER NEWS

DeWalt Drops NASCAR Sponsorship in 2010

The DeWalt logo will not don the side of a high-profile NASCAR entry in 2010. In light of economic issues facing the construction industry, the tool manufacturer announced it will redirect marketing resources away

from the motor sports program it has sponsored for the past 12 years.

Highlights of the sponsorship



of driver Matt Kenseth include winning the 2000 top rookie award and 2003 series championship.

MANUFACTURER NEWS

Farm Family Wins With Gehl

Beef farmers Fred and Ann Kendall vow they'll always have a Gehl skid steer working at their Mineral Point, Wis., operation. Thanks to a fortuitous visit to the Gehl booth during Wisconsin Farm Technology Days, they've got those plans well covered.

Attracted by a chromed-out 150th anniversary commemorative Gehl Model 7810E on display, the Kendalls stopped by the Gehl booth and each filled out an entry for a chance to win free use of a 5240E. Back home, they already keep a Gehl Model 4835 busy. When Ann's entry was drawn, the family farm's fleet instantly expanded.

"We'll never be without a Gehl skid loader on the farm," she says. "Once we got one, we learned what an important tool it was."



Already happy Gehl skid-steer loader users, Fred, left, and Ann Kendall now have free use of a 5240E for their beef farm. They are joined by dealer Fritz Aschliman of Farmer's Store in Mineral Point, Wis.

TOP 25 Rental Giants

Company	Fleet-Replacement Value (millions)	Giants Rank
1. The Cat Rental Store	\$6,019	1
2. Hertz Equipment Rental Corp. (HERC)	\$2,800	7
3. United Rentals	\$2,620*	8
4. Sunbelt Rentals	\$2,129*	12
5. RSC Equipment Rental	\$1,696	15
6. GE Commercial Finance	\$1,200	21
7. NES Rentals	\$1,000	27
8. Maxim Crane Works	\$840*	33
9. H & E Equipment Services	\$799	35
10. F & M Mafco	\$700	37
11. All Erection & Crane Rental	\$596*	41
12. Neff Rental	\$594	42
13. Finning International	\$576*	43
14. Ahern Rentals	\$474	54
15. Volvo Rents	\$461	58
16. Ring Power	\$456*	60
17. Essex Crane Rental Corp.	\$450	61
18. AmQuip Crane	\$440*	62
19. Sunstate Equipment	\$430	64
20. Milton CAT	\$400	67
21. Morrow Equipment	\$332	83
22. Aggreko North America	\$318*	88
23. Barnhart Crane & Rigging	\$220	126
24. Kirby-Smith Machinery	\$205	135
25. Battlefield Equipment Rentals	\$204	136
26. Laramie Crane & Equipment	\$141	189

* Construction Equipment estimate

Source: Construction Equipment Giants list, 2009

See the complete Giants list at www.constructionequipment.com/community/862/Giants/23402.html

✦ CORRECTION

Essex Crane Is a Giant

In creating September's Construction Equipment Giants list, a clerical error resulted in excluding Essex Crane Rental from the list. Not only is the Chicago-area crane specialist among North American firms that own more than \$100 million worth of equipment, but with a fleet-replacement value of \$450 million, Essex owns the 17th largest equipment rental fleet. Our apologies for any confusion this mistake may have caused.



TOPCON 3D-MC² MACHINE CONTROL

Cover Story **FIELD REPORT FIELD REPORT FIELD**

By MIKE ANDERSON, Senior Editor

Fast Times

At California Test Site

Topcon's 3D-MC² machine-control system may seem a dream, but this operator quickly becomes a true believer

When it comes to what Topcon's 3D-MC² machine control system can do, seeing is believing, says equipment operator Spartakoos Valverдини. He urges anyone who moves earth to check out the system first-hand. But, for the central California-based admitted speed demon himself, even a day on a jobsite with a 3D-MC²-equipped dozer didn't provide quite enough seeing.

"I was here yesterday, and the reason I came back out here today is because I was thinking this was a dream," says Valverдини, a veteran finish blade operator and member of the International Union of Operating Engineers. "It's not a dream; it's true. It is very impressive how much different this system is compared to other systems.

"Construction companies need to come here personally and see how much production, how much difference, this system offers."

Leveraging the established Global Positioning System (GPS) technology for location, the 3D-MC² system introduced at Conexpo-Con/Agg 2008 adds new sensor technology – a combination of inertial sensors and gyros – that calculates and updates such information as blade tilt, machine position in every direction, and instant change in direction, at a rate 10 times quicker. The result is what Topcon Posi-

tioning System has touted as an increase of 200 percent or more in smooth grading speed for dozers. It earned Topcon not only a *Construction Equipment* Top 100 Product award in 2008, but also an Editor's Choice award.

This year, officials with Topcon have been welcoming site-prep contractors to do a little fine dozing with 3D-MC² at a site near the company's North American headquarters in Livermore, Calif.

"We had an owner-operator out there on the John Deere 750," says Tony Vanneman, Topcon's construction products marketing manager. "He had it in automatic, he was cutting pretty good grade, but I kept encouraging him, 'You've got to go faster, my man: drop it out, speed up, increase your rpm!' The next couple of passes, he finally did, and it ended up that literally you could see the shiny spots on the grade it was so smooth. And the operator was just grinning like a Cheshire Cat.

"It's been a lot of fun just to see the reactions of people when they get in the seat and see it for themselves. Looking at videos and testimonials is great, but for a guy who's used to moving dirt for a living to get to experience this, it makes all the difference in the world."

Sure enough, on his second day with the 3D-MC² system, Valverдини was more than

200%
INCREASE IN
GRADING SPEED

100+
BLADE-POSITION
CHECKS PER SECOND

REPORT FIELD REPORT FIELD REPORT FIELD REPORT

Seeing the reaction of machine operators and managers trying out Topcon's 3D-MC² machine control system, as Spartakos Valverдини (below) did in Livermore, Calif., is "a lot of fun," says Topcon's Tony Vanneman. "For a guy who's used to moving dirt for a living to get to experience this, it makes all the difference in the world."

Photos: George Smith





Grading at a high speed with a dozer? Spartakoos Valverdi didn't think it was possible, but he does now after spending a couple of days on a John Deere 750J equipped with Topcon's 3D-MC² machine control system.

pleased to show what the 33,000-pound, 145-horsepower Deere 750J could do. While grading at full machine speed, something he never imagined a mid-sized dozer not particularly heavy doing in the first place even with the most veteran of blade hands, he proceeded to raise both his hands for a couple of hundred feet, showing it was not his touch leaving the smooth grade behind.

"The automatic system told me, 'You're good with your hands; I'm better,'" says Valverdi, a retired U.S. Marines colonel and former Apache helicopter pilot. "I made a couple of passes with my hands and then later I used the automatic system, and I saw how much different the finish is. A good operator to put down a grade like that needs to make six, seven passes; with that system, it's only one pass and you're finished." He had no intention of looking around for a grader. "With that machine,

you don't need a blade."

During a walk-around display for potential customers, John Dice says that 3D-MC² turns a dozer from a reactive to a proactive earthmover.

"The bulldozer by its own nature is kind of difficult to operate, from the perspective that you have a cutting edge that's out in front," says Dice, Topcon senior training manager. "Having that cutting edge in front, and then the machine itself walking on top of the dirt, makes it a little bit more of a challenge for an operator to actually cut a very nice, smooth grade. It's not a grader."

Dozers equipped with standard GPS technology for three-dimensional machine control, by which the exact cutting edge position is determined via an antenna on the moldboard and sent back to the operator's control box where the job design is housed, must relinquish machine speed for any work finer than rough grading, he says. With updates 100 times per second, "by the time we get a measurement position and it gets up to our control box, this blade has moved several inches potentially, before it actually reacts. Because of the nature of the dozer, that's really too late." Hence, standard machine control, while offering accuracy advantages, may force work speeds not all that different from a machine being operated manually.

With 3D-MC², the system's compass works with three inertial sensors measuring motion movement and three electronic gyroscopes measuring position to update, "at a rate of a hundred times a second," says Dice. "So, basically instantaneously we are measuring the roll, pitch and yaw, and the acceleration rates of the movement of this cutting edge. We're going to use GPS to give a position, but once this knows its position, then any immediate movement that happens, this can instantaneously measure that accurately. We're really not using GPS to control the machine; it is the primary sensor that controls the machine."

The impression may be, he says, "this is the way it ought to work. Well, it is not the way that traditional GPS works."

"Especially on the dozer," explains Vanneman, "because of the physics on the machine, because of the update rate of their regular GPS machine control and because of their

previous slope sensor technology, we couldn't often get good grade at a higher operating speed. Now we get the superior grade at a much higher operating speed with the new inertial sensor technology."


Representing the Pavex Construction Equipment division of San Jose-based Graniterock, Dan Enachioaie was on site the same day as Valverдини to check out 3D-MC², not so much however from an operating perspective, but rather a management one. His employer's fleet has machines equipped with other makes of machine control systems, and he needs to know 3D-MC² is economically viable before he can recommend further consideration. Much of his focus was on the control box in the operator's station, "and the ease of use is a plus for me," he says. "I like the way they set up this machine from an ease-of-use perspective. When it comes to the finished product, meaning the grade that this machine

cut, it's very, very good."

"There are many other factors that would determine the success or failure of a system, but it is something we will probably consider."

Machine control allows the operator to "start managing his material," says Dice. "He doesn't have to worry about the grade positioning at the speed and the rate of whatever it is he is doing." In a non-digging application like spreading stone, for instance, the question now becomes, "How fast can this machine go?"

That's really what sets 3D-MC² apart, says Vanneman. "Until you hear a contractor say that it's twice as fast, it's five times as fast, and these guys are spending their hard-earned money on it, it's almost hard to believe," he says. "It almost sounds too good to be true, but it's not. This is the real deal."

Valverдини says he has seen enough: "This is amazing." 



See our exclusive video report in the online version of this article at ConstructionEquipment.com. You can also view other videos produced by CE's editorial staff.



Topcon describes the effect of its 3D-MC² system as a "countdown for a rocket launch: 4 – four times faster than a standard dozer; 3 – three times smoother than any machine control; 2 – two times the speed of any 3D dozer; and 1 – one dozer doing the work equal to two 3D dozers."

Western Star 6900XD Proves a Real Rocker

Integrated Dump aims at tasks mainly done by off-road haul trucks, but at much lower cost

Western Star says its 40-ton dump truck is a lower-cost alternative to traditional haul trucks, and time will tell if it's as tough and long-lasting. The extra-heavy-duty vehicle was introduced in 2008 and is based on a 6900XD with a commercial-style on-road cab. It includes a standardized power train and an integrated dump box.

Aimed at quarry and dirt-haul operations with well-maintained roads, the three-axle 6900XD can carry the same loads as 35- to 40-ton rigid and articulated dump trucks but uses 35 percent less fuel, says Western Star, since 2000 a part of the Freightliner family. Fuel consumption of 7.13 gallons per hour has been recorded on hauls of more than 12 miles, representatives said.

The truck's stated top speed is 43 mph, though it feels like it could go faster.

But there wasn't room for fast truckin' at the site of this recent demonstration, a rock quarry operated by Meckley's Limestone Products about an hour north of Harrisburg, Pa. The demo was staged in a corner that included an active pit and a climb up a quarter-mile grade that was as steep as 9 percent in one spot. I drove the 'Star maybe a dozen times up and down that grade, both empty and loaded, and found that it's pretty easy to handle.

The truck's J&J steel dump body is 128 inches wide, so the truck is too beamy for legal on-highway travel except aboard a flagged lowboy, which is how it got here. But it's a couple of feet narrower than the Cat and Euclid trucks that appeared briefly during the day. Compared to on/off-highway dump trucks, the 6900XD felt almost ponderous when loaded – after all, gross weight was close to the 138,000-pound ratings of its three axles – but rather agile when empty.

The 500-horse Detroit Series 60 propelled it well, and the 4500 series Allison 6-speed automatic smoothly sent power to the ground. While climbing the grade, the engine usually hovered at 1,500 to 1,600 rpm, right about at its “sweet spot” for power and economy, but revved to 2,000 rpm in the first few gears when starting the truck from a dead stop on the

Off-road dumper rides rather smoothly, even empty, and is very easy to drive. Just remember that it's top heavy with 40 tons aboard and you're good to go.





Stout J&J body is made of Hardox steel, and hoist tips it in 25 seconds at 1,000-rpm engine speed, according to specs. Tailgate stays stationary during dumping.

steepest part of the grade. The Detroit was an off-road EPA Tier 3 engine with no particulate filter, so there is some visible smoke. But it was nothing like the coal-black clouds emitted by diesels of yore.

AxleTech rear axles are double-reduction types that, with differential and hub gears, provide an overall ratio of 11.23 to 1, which is needed to move the truck loaded or empty. The Chalmers mechanical rear suspension rode fairly well, and the cab's rear is air mounted; that and the air-sprung driver's seat filtered out most shock.

Inside the tall cab it's fairly quiet, and any driver should be pleased with the appointments. Seat upholstery was a tough-looking but comfortable fabric, and most steel surfaces were covered with padded panels. The cab is wide enough to seat three people, and this demo truck had a two-man bench next to the driver's perch. Real-world work trucks would dispense with the extra seating except for training, but new drivers should need very little of that.

Instrument-wise, the usual speedometer and tachometer were flanked by an electronic display panel that housed warning lights, while an array of small analog gauges showed what was happening in the engine, transmission and axles. On the dash were rocker switches for everything that needed to be switched on or off, including the Jacobs Engine Brake. There was also an almost dainty lever to run the Allison's retarder.


So the 'Star has three means of deceleration: the Jake, the retarder and the service brakes. I list them in that order because that's how they're best used. On that steep downgrade, leaving the Allison in Drive would let the Jake cut off at 10 mph, but punching the autotranny into 1st gear would make the Jake slow the truck to about 4 mph. The Allison's



Cab is from 4900 series and its gauges and controls are similar. Controls include switches for Jake Brake and a lever for the Allison's hydraulic retarder.

retarder then almost stopped the truck, and could bring it to a halt on the level. So I seldom needed to step on the air-brake treadle, and linings should last a long time if the truck's driven that way.

The truck was painted bright yellow, just like any haul truck, but will it truly do the job and last as long as the Cats and Ukes of the world? Laverne Smeltz, who manages Meckley's fleet, thought so, and was considering the purchase of two of them. He said a 6900XD dump would cost "about half" what a comparable Cat does. And it should be much cheaper and easier to maintain because so many parts, such as the drum brakes and the Allison automatic, come from on/off-road trucks and can be bought in the aftermarket. So operators aren't confined to specialty parts from the haul-truck's builder.

The 6900XD is not unique, however, as it does face at least one similar model, Kenworth's C500, though Smeltz said no one from KW had ever called on him. Late next year Cat itself will have a new, similar sized truck, probably based on the International 5000i Paystar, a vehicle that's among the fruits of the recently inked alliance between Cat and Navistar International. So as the economy improves, watch your local quarry or big excavation site for signs of more competition among builders of these specialty vehicles. 

SPECIFICATIONS

Truck: Western Star 6900XD 40-Ton Dump, conventional-cab off-road 6x4 hauler, GVW 138,000 pounds

Engine: 14-liter Detroit Diesel Series 60, Tier 3 emissions certified, 500 hp @ 1,800 rpm, 1,550 lbs.-ft. @ 1,350 rpm, with Jake Brake

Transmission: 6-speed Allison 4500RDS fully automatic, with hydraulic retarder

Front axle: 28,000-lb Sisu-Fabco FSND 12G on flat-leaf springs

Rear axles: 110,000-lb AxleTech SPRC 1927 double-reduction, 11.23:1 overall ratio

Brakes: Meritor S-cam drum

Tires & wheels: Michelin 14R25 on 25x10-inch compactor rims and 25-inch 12-spoke centers

Body: J&J Dyna-Hauler/OTR, Hardox 400 and 450 steel construction, capacity 40 U.S. tons, 24 cu. yds. struck, 30 heaped

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Spotlight

By ANDREW BALTAZAR, Associate Editor

Mini Excavators

HITACHI

The 38.1-horsepower engine in Hitachi's ZX50U-3 mini excavator meets EPA Interim Tier-4 emissions requirements. With a dig depth of 11 feet 8 inches, the machine also has 25 degrees of adjustment to both the left and right side of the blade for more efficient trench backfilling. Automatic shifting between high and low travel speeds also make operation easier.

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TEREX

Offering a stable, zero-tail-swing platform, the TC50 excavator was designed to work in constricted environments, able to avoid swinging into nearby structures or landscaping, or out into oncoming traffic during operation. Ideal for landscape, plumbing, septic, electrical and utility installations, the TC50 has a 39.4-horsepower Yanmar 4TNV88 engine, and a load-sensing and load-independent flow division hydraulics system that are matched to the machine's size. It weighs in at 11,067 pounds and offers a maximum dig depth of 12 feet 1 inch.

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GEHL

The Gehl 283Z compact excavator features zero-tail-swing maneuverability, allowing the machine's superstructure to rotate entirely within the tracks and operate close to walls and obstructions without risk of contact. Weighing 5,681 pounds with a canopy and 5,886 pounds with a cab, the excavator is small enough

to maneuver on congested sites without obstructing traffic, Gehl says. The Yanmar diesel engine runs at 20.4 horsepower, and the excavator can reach a dig depth of 9 feet.

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KOMATSU

With a horsepower of 38.2, Komatsu's PC55MR-3 mini excavator has an operating weight of 11,378 pounds and maximum dig depth of 12 feet 6 inches. The excavator comes with the company's KOMTRAX technology, which sends machine operating information to a secure Web site wirelessly for service monitoring. The optional Power Angle Blade allows the operator to tilt the blade 25 degrees to the right or left, increasing the excavator's productivity.

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CASE

Featuring a Tier-4-certified Yanmar engine at 21.3 horsepower, the Case CX27B compact excavator comes in at 5,566 pounds and boasts a dig depth of 9 feet 2 inches. It features a bucket digging force of 6,351 pounds. The unit has a zero-tail-swing design and a small footprint, Case says. All models are also equipped with a hydraulically controlled backfill blade for added stability and light dozing work.

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KUBOTA

Equipped with a four-cylinder, 40.5-horsepower diesel engine, Kubota's KX121-3 compact excavator can dig up to 11 feet 6 inches deep. It features a performance-enhancing, load-sensing hydraulic system that provides optimum oil flow to each cylinder, making operation under any load easier and smoother. Optional is the 6-in-1 hydraulic blade, which an operator can angle 25 degrees and tilt 10 degrees for greater efficiency.

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BOBCAT

Bobcat extends its M-Series mini excavators with the 3-metric-ton E32 and the 4-metric-ton, zero-tail-swing E35. Both are powered by 33.3-horsepower diesels and dig 10 feet 2 inches deep. The mini excavators are completely re-engineered to reduce weight. A new load-sensing piston pump and closed center-valve system is said to not only deliver smoother function control, but also increase arm breakout force by 10 percent over heavier models they replace. Auto-Shift travel takes the machines out of high range and back automatically, delivering a power boost on demand, and the E35 offers an optional angle blade (with bolt-on replaceable cutting edge) that provides simultaneous up/down and angle adjustment.

Auto-Shift travel takes the machines out of high range and back automatically, delivering a power boost on demand, and the E35 offers an optional angle blade (with bolt-on replaceable cutting edge) that provides simultaneous up/down and angle adjustment.

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WACKER NEUSON

The 2.8-metric-ton Wacker Neuson 2823 mini excavator features a compact zero-tail-swing design. The 2823 is powered by a Yanmar 3-cylinder, 20.4-horsepower engine and allows for maximum digging depth of 9 feet. Options include either a cab or canopy work station, and standard or long dipperstick. The excavator comes with rubber tracks, dozer blades, boom-mounted working lights and a control pattern selection switch.

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Buying File: Service Cranes

By MIKE ANDERSON, Senior Editor

Providing a Lift For Jobsite Safety

New service cranes and supporting equipment designed to make work more efficient, productive and safe for mechanics

With the service and utility industries gathering this year for the biennial International Construction & Utility Equipment Exposition (ICUEE), suppliers of service cranes have been busy introducing new and updated models. The truck-mounted cranes themselves, however, aren't the only shiny new products that can boost jobsite efficiency and productivity for service-crane users.

Miller Electric recently introduced the truck-integrated EnPak Mechanic Series compressor/pump/generator that eliminates the need for a power take-off (PTO) unit commonly used to operate hydraulic cranes and other equipment on service trucks. With the EnPak, mechanics can run a 10,000- to

12,000-pound crane with the truck itself turned off. This, says Miller Electric, can cut fuel costs up to 30 percent, truck engine hours up to 60 percent, and truck noise by as much as 10 dB. Additionally, the unit's vertical exhaust system diverts fumes up and away from the work area. "Fleet managers appreciate its costs savings," says Rick Beeson, director of business development with Miller Electric's power products group, "and mechanics like that it allows them to work without worrying about the output from the truck's engine and PTO."

EnPak combines a rotary screw air compressor, hydraulic pump and generator in a single unit. EnPower real-time load monitoring automatically matches engine speed to the load requirement put on the machine, offering additional fuel savings by only ramping up engine rpm to the level needed to complete the task and then back down to idle. "The fact that it is a self-contained, purpose-built machine with components from Miller, Kubota and Eaton makes it a reliable and cost-saving alternative to PTO systems," says Beeson. Truck bed space is maximized with a self-contained unit that can be mounted as a side-pack or in the load space. Since it can be operated by remote, EnPak does not require a cut-out in one of the truck's storage compartments for front panel access. Service components are accessible via hatches at the front and top of the unit.

EnPak's 27-horsepower Kubota diesel engine shares the truck's fuel supply, meaning mechanics only have one tank to fill. EnPak not only uses the truck's battery, but also will provide the 12 volts of power and 60-amp charge to the battery to ensure peak battery performance and extended life. The integrated

Cost of Ownership

Size	List Price	*Hourly Rate
Articulating Cranes (PTO Powered)		
Up to 8,000 lb.	\$22,255	\$7.66
8,001 - 18,000 lb.	\$37,148	\$10.51
18,001 - 24,000 lb.	\$60,309	\$16.73
24,001 - 30,000 lb.	\$99,413	\$26.44
Telescopic Cranes (Hydraulic Powered)		
Up to 8,000 lb.	\$13,808	\$5.90
8,001 - 18,000 lb.	\$46,422	\$13.18
18,001 - 24,000 lb.	\$47,908	\$14.72
24,001 - 30,000 lb.	\$57,445	\$17.96
30,001 - 36,000 lb.	\$70,160	\$21.95
36,001 - 42,000 lb.	\$88,743	\$25.64
42,001 lb. and up	\$142,655	\$38.66

* Hourly rate is the monthly ownership costs divided by 176, plus operating costs. Unit prices used in this calculation are mechanic's wage at \$46.29 per hour and money costs at 4.875 percent.

Source: EquipmentWatch.com, phone 800/669-3282

A field mechanic with McAninch Corp. uses an IMT Dominator IV mechanics truck equipped with an IMT 8025 telescopic crane to perform maintenance during site prep for the new airport in Branson, Mo.



control design allows the operator to use the crane remote with which they are already familiar.

“The EnPak lets me use both air and hydraulics at the same time without slowing down,” says Carlos Pineda, heavy equipment service technician with California-based Caterpillar dealer Peterson Tractor Co. “Sometimes I need to use my crane to support a piece while I’m using my impact gun to remove fasteners, and that all comes into play when you are disassembling a large machine.”

At the same time, the selection of cranes available for use by Pineda and other technicians is growing.

New cranes

Manufacturers including Stellar, IMT and Jomac have been busy updating and expanding their truck-mounted crane lines, offering new opportunities for users of telescopic and articulating service cranes alike.

Visitors to ICUEE had the first glimpse



of Stellar’s new line of telescopic cranes equipped with Crane Dynamics Technology (CDT), a proprietary collection of features that control, power and monitor the cranes, providing communication with the operator via multiple sensory indicators engaged when the crane is approaching maximum capacity. For service cranes ranging in lift capacity from 6,000 to 14,000 pounds, CDT is

IMT is one of the service-crane manufacturers busy updating and expanding its product lines.

Buying File: Service Cranes



With the EnPak from Miller Electric, mechanics can operate a hydraulic crane as well as air and electrical tools, all with the service truck itself turned off. Eliminating the need for a PTO, the diesel-driven EnPak combines a rotary screw air compressor, hydraulic pump, and generator into a single self-contained, truck-integrated unit.

correctly. With the crane boost, operators who encounter an overload situation can increase crane capacity to nearly 120 percent with the press of a button on the handheld device, for long enough to either finish the lift or get out of the overload situation. "By having the ability of knowing the weight of a load and boosting crane capacity to nearly 120 percent of normal operating capacity without compromising the equipment is a huge step in increased productivity," says Tim Davison, Stellar product manager.

On the articulating crane side of the business, Iowa Mold Tooling (IMT) Co. Inc. has revamped its wide product line. Of IMT's 22 articulating crane models, 17 are new or updated, most notable being the introduction of


comprised of a two-way communications and feedback system, an enhanced safety monitoring system, and a crane-boosting feature.

Described by Stellar Industries as the first in the mechanics crane market to offer integral capacity alert incorporated into the handheld controller, the two-way communications system indicates to the operator when the load being craned is increasing the load moment of the crane. Color-coded LED lights and varying cyclical vibrations are built into the Stellar handheld controller. As part of the enhanced safety system, the crane will enter a safe mode at reduced speed, should a capacity monitoring device fail to operate correctly.

eight mid-range cranes with single-link (SL) or dual-link (DL) options. SL and DL versions are available for models ranging from the 13/88 to the 24/169, covering a maximum lift capacity range of 6,290 to 11,640 pounds. Suited for loading/unloading tasks at a low height far away from the vehicle, the Single Power Plus Link Arm System provides high lifting capacity when the boom system is fully extended. This system features high speed in extreme positions at the column, which makes it ideal for "fast-grab" work, says IMT. The Dual Power Plus Link Arm System offers the best lifting capacities under all conditions, and it is particularly well suited for long reaches and lifting in high positions with demanding equipment, such as fly-jib and winch, says the company.

Other new developments offered by IMT include the RCL 5300 rated capacity limiter and an "over-bending" feature. RCL 5300 not only monitors the crane's load moment, operation and function during loader operation, but also loader position during transport. In an overload situation, the system warns the operator and interrupts the distribution of oil for crane functions, yet allows functions that reduce load moment to continue. With "over-bending," the working area between the main boom and jib is no less than 195 degrees, providing greater flexibility when working through narrow passages and under overhead power lines, but also allowing maximum load lift in all boom positions. "We recognize that the customer wants as many crane choices as possible," says Steve Fairbanks, president of IMT, which on the telescopic crane side additionally offers 10 hydraulic and five electric models.

Jomac recently has added one mid-sized model to each of its telescopic and articulating service crane families, now totaling seven and five in base model sizes, respectively. Another industry supplier, Palfinger North America, says it will have a "huge" announcement regarding its service crane product line in March 2010.

As the utility industry picks back up, service-crane manufacturers are indeed ready to lend a lift. 

STELLAR

New Line of Cranes Controlled by CDT



Introduced in October at the ICUEE show, Stellar Industries offers a new line of telescopic service cranes controlled, powered and monitored by the trademarked Crane

Dynamics Technology (CDT). With models ranging in lifting capacity from 6,000 to 14,000 pounds, Stellar's CDT-equipped cranes communicate with the operator by using multiple sensory indicators, including LED lights and pulsating vibrations, when approaching maximum capacity. The control system has a boost mode that will temporarily provide almost 120 percent of normal operating capacity.

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IMT

Overhaul for Articulating Product Line

Updated this spring, Iowa Mold Tooling's articulating crane product line features, among 22 total models, 17 new or improved cranes ranging in maximum rated lifting capacity from 1,740 to 35,405 pounds at a radius of 14 feet 5 inches. Included is the addition of eight mid-range cranes with single- or dual-link configurations. Another new feature, "over-bending" provides greater flexibility, says IMT, by ensuring the working area between the main boom and jib is no less than 195 degrees. On the telescopic crane side, IMT also offers 10 hydraulic and five electric models.

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AMCO VEBA

Italian Line Represented by Fischer Crane

Distributed in the U.S. by Fischer Crane Co., the Italian-made Amco Veba crane product line includes knuckleboom and telescopic models often used on service vehicles.



Featuring full power extension with no manual pull-outs, the SC telescopic series features double rack-and-pinion rotation for increased precision and durability. All SC models use hexagonal boom sections for improved weight ratios, says Fischer Crane. The photo shows an Amco Veba 946/4S knuckleboom crane equipped with a specialized bucksaw attachment suited for storm cleanup jobs.

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PALFINGER

Service Crane Line Holds Its Place



Topping Palfinger North America's PSC line of service cranes, the PSC 6000 has a maximum capacity of 6,600 pounds and a hydraulic reach to 21 feet. Radio remote control is standard on the PSC 6000, which features a control valve offering true crane controls as a manual override option. Standard features on all PSC cranes include a two-part snatch block that is convertible to a single part line, as well as a bar-type anti-two block device, worm drive winch and 12-volt power pack. A "huge" announcement regarding the product line is expected from Palfinger North America early in 2010.

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MANITOWOC

Market Defines National Focus

Two new service crane models join Manitowoc's ever-growing National Crane product line. With a maximum capacity of 45 tons, the NBT45 is one of three models in the new NBT40 Series.



Also on hand in Louisville was the 50-ton-capacity NBT50, the smaller of two models in the new 50-ton-class NBT50 Series. This size class is a growing focus for customers, says Manitowoc, and one National Crane will continue to develop. Along with improved hydraulic systems, the newly launched Nationals have the Grove common cab.

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JOMAC

Telescopic, Articulating Models Expanding



A model size has recently been added to each of Jomac's telescopic and articulating crane product lines. In a family of seven base STC telescopic models ranging in lift capacity from 6,000 to 14,000 pounds, the new STC-85 has a lift capacity of 8,500 pounds. On the five-model-size articulating side, the new HFC-4500—rated at about 45,000 foot-pounds in capacity—fills a gap between the HFC-3000 and HFC-6500 series. Updates to the U.S.-made Jomac crane lines include true 360-degree rotation and a hydraulic-activated anti-two block system.

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Lockout/Tagout:

The Key to a Safe Fleet

Compliance with lockout/tagout safety procedures prevents 50,000 injuries each year, according to the Occupational Safety and Health Administration

Good engineering and advancing technology continue to make construction equipment safer for those who work in and around it. Sometimes, however, the smartest way to prevent an equipment-related accident is to avoid potentially dangerous situations altogether.

One way to do that is through lockout/tagout. With lockout/tagout, you essentially tell other workers that a piece of equipment, in its current state, is too dangerous to operate.

Tagout is the practice of leaving a label on a machine, warning other employees that it should not be touched or activated. Lockout takes the extra step by providing a physical barrier that prevents the activation of a machine or equipment component. The two practices should be used together to maximize safety.

In an accident just a few years ago, a skid-steer-loader operator died when he was pinned between the loader's hydraulic tilt cylinder housing and the frame, according to the Center for Disease Control and Prevention. After the operator exited the skid-steer, he reached down to the foot pedals – which control the loader arms – in order to clean off snow that had accumulated. According to the CDC, the operator may have improperly lowered the safety seat bar in order to raise the bucket for better access to the pedals. As a result, the interlocking mechanism was not enabled. When the operator applied pressure to the foot pedals while he was cleaning them, the lift arms moved and crushed him.

Lockout

“Many accidents are due to people getting caught in pinch points,” says Ray Peter-

son, founder of Vista Training, which produces safety videos and training resources related to lockout/tagout and other heavy-equipment dangers. “They would raise something up in the air, for example, and then fail to adequately block it off from potential movement, and something would slip or fall. You can imagine the potential for fatality or severe injury.”

In many skid steer loaders and track loaders, the interlocking mechanism is the seat bar. When the seat bar is raised, the liftarm and bucket are locked into place, no longer able to move. When an operator enters the cab and lowers the seat bar onto his or her lap, motion to the liftarm, bucket and other moving parts is re-enabled. In excavators and some other heavy equipment in which an operator enters the cab through a side door, the interlocking mechanism in several models is a lever attached to the armrest. Hydraulic motion is activated when the lever is down and locked when it is in the up position.

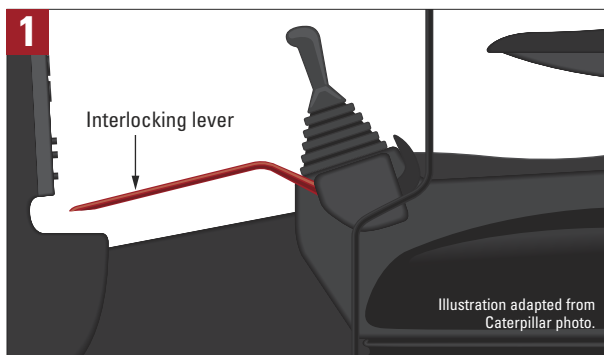
The lift arm of a vehicle is designed to be lowered whenever the cab is vacant. But during service, the maintenance engineer sometimes requires that the lift arm be raised. In this scenario, a lift-arm support must be installed to completely block the arm from falling.

“You raise the arm up and there is a tube that goes over the exposed hydraulic cylinder and pin that goes through it that can be locked in place,” Peterson says. “Now, these supports are built in so it simplifies the process.”

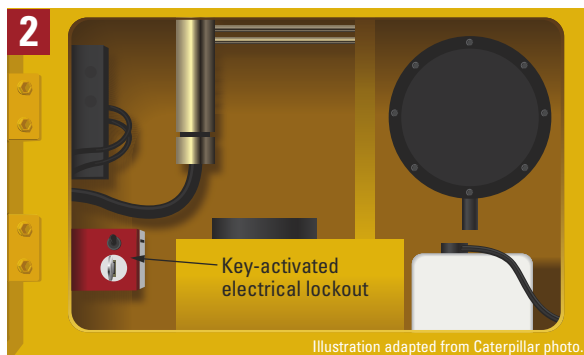
There is also a potential for electrocution when fleet staff do maintenance work on a vehicle.

“I remember a mechanic showing me a

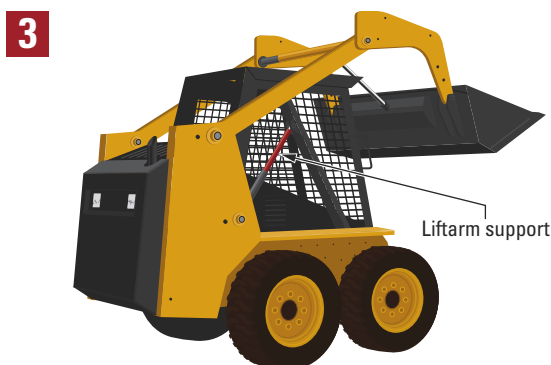
Forms of Lockout/Tagout



Hydraulic Lockout: Interlocking lever located in the cab locks to prevent movement of the vehicle, liftarms, attachment, swing motion, and other moving parts.



Electrical Lockout: A key-activated electrical-system disconnect switch in the maintenance compartment cuts off electrical current to the machine.

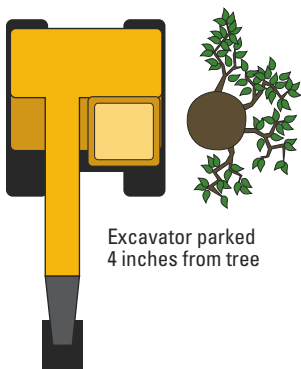


Gravitational Lockout: Liftarm supports block the liftarm and attachment from being lowered accidentally if the liftarm needs to remain raised for maintenance.



Tagout: Durable, waterproof tags placed on a specific control, switch or other machine component, notify other employees that the component should not be touched or activated.

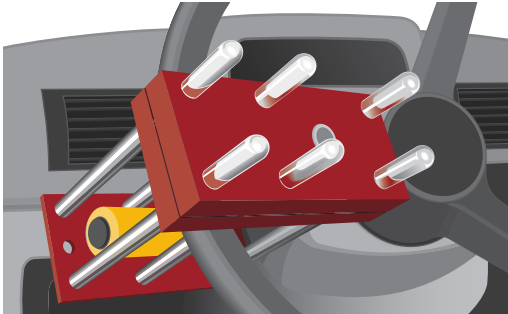
The Dangers of Not Locking Out



In 2006, an equipment operator left the cab of his excavator only to have cab turn and pin him to a nearby tree, according to a case study by the Center for Disease Control and Prevention. The operator was found minutes later by the company owner, who reached into the cab and engaged the controls to release the pinned operator. It worked, but the cab turned too much and the back of the cab pinned the company owner to the tree. The operator died and the company owner obtained serious injuries. According to the CDC, the entire situation could have been avoided had the excavator's interlocking lever, which locks the movements of the boom, arm, bucket, and cab swing, been activated.

Illustration adapted from CDC graphic

Aftermarket Lockout Options



Backhoe-Loader Steering Wheel Lock



Stabilizer Lock



Skid-Steer Joystick Lock

For older machines that lack built-in lockout mechanisms, Peterson encourages fleets to take advantage of aftermarket alternatives, such as those offered by The Equipment Lock Co.

scar the size of a silver dollar on his wrist," Peterson says. "His wrist watch caused an electrical short of a 24-volt battery, and he lost some function in one of the fingers of that hand as a result of the depth of the burn. The whole thing could have been avoided by removing a single cable."

In older equipment, "you can remove a cable from the battery post and there is also a cap that is designed to go over it," Peterson says. "There is often a padlock that can go over it." Consult your machine's manual for the appropriate procedures.

Some equipment manufactured in the last few years has a built-in electrical-disconnect switch that cuts off all electrical power to the machine. Because it is key activated, only the key holder can return power to the machine.

For older equipment that doesn't have lockout mecha-

nisms built in or for fleet managers who want added protection, aftermarket devices can be used.

"Our products for the most part are anti-theft devices," says Bryan Witche, vice pres-

ident of sales and marketing at The Equipment Lock Co. "But they are also able to be used in conjunction with OSHA's lockout/tagout safety procedures."

The company's aftermarket locks, which are available for skid steer loaders, excavators, and other types of equipment, immobilize the drive controls of a piece of equipment so that it cannot be stolen by a thief or used by another employee during service or repair.


Tagout

But lockout devices, whether integrated or aftermarket, are only part of the overall solution. Tagging out is an important communication tool and should be done whenever a machine is off limits. For instance, if you are doing machine maintenance, you should write on the tag a brief description of why the machine is out of order. Maintenance employees must place tags on areas of a machine in which a component was removed, as well as on the cab door or drive controls. When maintenance is complete, the person conducting the repair should sign his or her name on the tag, Peterson says.

"Many of the lockout devices that go on these machines also come with a tag designed to be filled out by the person who put it on," Peterson says. "They should be the only ones who have the key and should sign the tag when they take the device off."

Tags must connect to the equipment using a strong piece of wire, durable enough to withstand harsh, wet or dirty environments.

Communication really is the key, Peterson says. That includes educating and reminding your operators, engineers and other fleet staff about lockout/tagout and reminding them about related safety procedures. Fleet employees often are familiar with lockout/tagout, but they sometimes adopt a false sense of security when work becomes routine.

Lockout/tagout actually is quite simple, Peterson says. The challenge is making those safety practices an integral part of your company's culture. 

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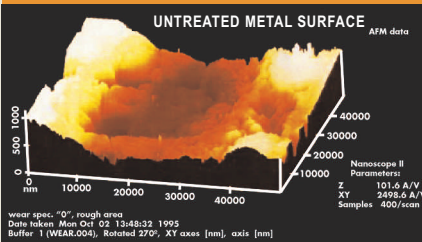
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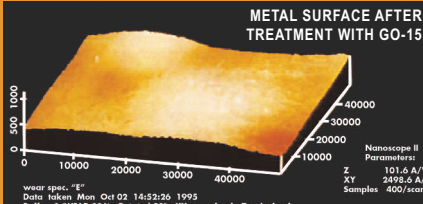
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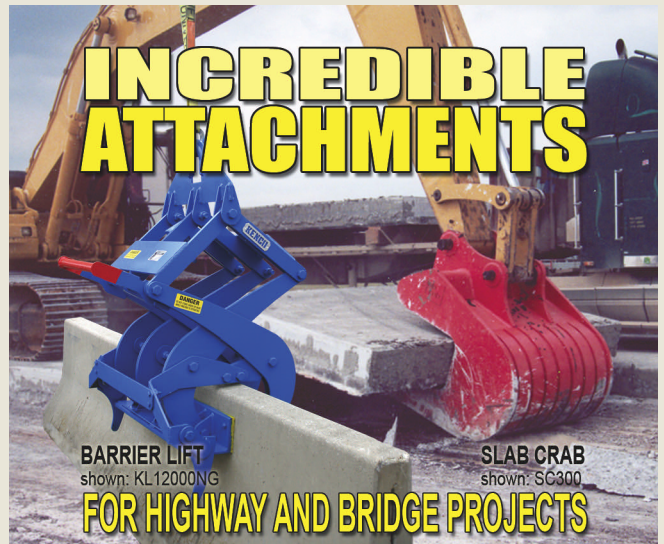


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Rebates: Not So Much

Discounts beat rebates seven different ways

I don't like rebates. Sure, they're great to get, and I've gotten my share of them over the years. And getting 3 percent, 5 percent, or even 10 percent is a big chunk of change. Some rebates come deal by deal, but most are based on an upward sliding scale. The more you buy with one vendor, the higher the rebates.

I strongly prefer discounts that I get on today's deal, and here are seven good reasons why. Let me explain from the perspective of the vendor. If I give you a volume rebate for purchases over a year's time, I'm a happy salesman.

1. I get the order and your check today. I don't have to share the profit margin until a year from now, or at least to the end of the rebate evaluation period, so the vendor gets the benefit of time value of money. That's real cash.

2. Once I sell you the first widget, you are semi-committed to buy the second widget from me to improve your sliding-scale rebate. I don't necessarily have to give you my absolute best deal on that second or third deal. All I have to do is match the price on the first deal.

3. You may not be in business a year from now. Your purchasing agent or buyer (or you) may have moved on. Your company may have merged with another company. If the right people in your company aren't around or following up, the earned rebate check simply doesn't get written.

4. Who keeps track of the rebates? Usually it's me, the seller. So maybe you got credit for all the oil you bought from me, but the grease purchases somehow didn't get in-

cluded. Or maybe your company's branch in another state goes by a different name and no one realizes they are a part of your company. Most errors are not intentional. Most vendors are honest. But most errors will be in the favor of the seller.

5. All vendors don't live forever. What if we, the vendors, are not in business next year? That rebate check will never be written.

6. Vendors like rebates because they are time-specific. The rebates in place in 2008 may not be repeated in 2009. It allows me to hold my discounted price up while coming

down during a competitive environment such as what we have today.

7. If you buy a tractor today for \$100,000 and receive a \$5,000 rebate at the

end of the year, where does that \$5,000 go in your company's accounting system? The \$5,000 check probably gets to your company, but you will probably already have the tractor on the books for \$100,000 as a basis for the internal rates. And that's not good or fair to the equipment-owner group or the construction-using group. For the next 10,000 hours of that tractor's life, you need to base all decisions on an upfront purchase price of \$95,000.

Instead of a rebate with seven chances of going south, I want my discounts in each deal and at the time of purchase. If necessary, use this year's purchase volume as a guide to establish the expected volume for next year.

Rebates are a mixed bag, but mostly the seller gets the best deal.

Think about it.



Andrew Agoos

has spent more than 40 years in the equipment, service and maintenance side of heavy equipment. He has held senior management positions with Neff Rentals, Hubbard Construction Co., Austin Industries, and Caterpillar. He has strong opinions about equipment management: Some are based on facts; some are intuitive; some are anecdotal. He doesn't ask that you agree with him.

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Skid-Steer Emissions Upgrade Brings Benefits

Case 400 Series 3 loaders get more power, bigger cabs and pilot controls

Case upgraded each of the eight models in its 400 Series 3 skid steers with horsepower and torque increases along with Tier-3-certified engines. As is often the case with emissions upgrades, horsepower and torque were bumped up for all of the models, but net horses jumped 16 percent in the 410 and a whopping 23 percent in 420. Cabs were redesigned to add some convincing features, and a couple of the models made impressive leaps over their predecessors' capabilities.

Case's eight 400 Series 3 machines span rated operating loads (half of tipping load) of 1,500 to 3,000 pounds, and are powered with net horsepower from 57 to 83. An ISM 2.2-liter turbocharged engine drives the 410, and Case 3.2-liter turbo diesels are in models 420, 430, 435, 440, 445, 450 and 465.

The 420 Series 3, with its prodigious net power increase to 69 horsepower, also increased rated operating capacity 100 pounds to 1,850 pounds. Tipping load increased 200 pounds to 3,700 pounds. Maximum height to the bucket pin is 6 inches higher, and dump height (that's clearance with the bucket tipped to discharge angle) jumped nearly 7 inches to just over 96 inches.

Impressive increases in arm-lifting forces on opposite ends of the product line – the 410, 420, 450 and 465 – are most pronounced in the 420 (+17 percent) and 465 (+12 percent).

If you tend to push skid steers to their limits, look closely at the 435's tipping load. It actually decreased a couple of hundred pounds to 4,400 pounds.

The 440 Series 3 now mixes with the Gehl/Mustang offering at 83 horsepower and 6,200 pounds of bucket break-out force in a skid steer rated at 2,200 pounds. Only Cat's 246C offers more bucket-curl force.

Case pilot controls for all models are available from the factory in either Case's "H" pattern, with control of the right drive motor in the right joystick and control of the left drive motor in the left joystick, or the more conventional ISO control pattern. Factory accessory kits can permanently change the control pattern from H to ISO or vice versa.

The new 400 Series 3 cabs increase headroom 7 percent across the line. Lap bars are padded now, and 6 percent

wider. The 435, 445, 450 and 465 Series 3 models offer a 20-percent increase in front glass area, while the 410, 420, 430 and 440 Series 3 units demonstrate an 81-percent increase in front glass. The air-ride seat is now standard equipment. A standard overhead window with more punch-outs than previous models provides outstanding visibility to the loader arms when the bucket is raised. The foot throttle is also now standard on all models, allowing operators to easily control rpms. The hand throttle was relocated on the 410, 420, 430 and 440 to the same location as the larger models.

Case was the first manufacturer to make exterior side lighting standard equipment on skid steers so that operators can better see the space into which their machine is turning after dark.

Wide-fin side-by-side radiator and oil coolers resist clogging and are easier to clean. A no-maintenance fan belt on the 420, 430, 435 and 445 Series 3 models is a plus, while an automatic belt tensioner on the 440, 450 and 465 requires no adjustment.

The standard 1,125-cold-cranking-amp battery is 32 percent more powerful than previous standard equipment. And a grid heater to aid cold starting is standard equipment on all models except the small 410, which comes with glow plugs.

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400 Series 3 Specs

	Net Horsepower	Rated Load (lb.)*	Arm Lifting Force (lb.)
410 Series 3	57	1,500	3,751
420 Series 3	69	1,850	4,200
430 Series 3	77	2,000	4,304
435 Series 3	77	2,200	4,400
440 Series 3	83	2,200	4,576
445 Series 3	77	2,500	5,000
450 Series 3	83	2,450	5,689
465 Series 3	83	3,000	6,500

* 50% of tipping load

Source: Spec-Check.com



Arm-lifting force increased on four of the eight Case 400 Series 3 skid steers, including a 12-percent boost for the 3,000-pound-rated 465.

Truck Report

By ANDREW BALTAZAR, Associate Editor

Caterpillar Revamps Its 793 Mining Truck

Cat's F-Series mining trucks boast a stronger engine, enhanced safety features and a more operator-friendly cab

Originally introduced in 1991, Caterpillar's model 793 mining truck, one of the company's largest, is getting another upgrade. Cat, which says it has sold more than 3,000 units of its 250-ton truck, has bumped up the mining truck's performance, safety and serviceability features. The fifth generation – branded the 793F – features a new engine with more horsepower than that of its predecessor, the 793D, as well as a faster top speed.

Replacing the 2,415-horsepower Cat 3516B engine used in the 793D, Cat's new C175-16 diesel engine powers the 793F at a horsepower of 2,650. The C175-16, which meets Tier-2 emissions requirements, has a 20 percent torque rise, allowing the 793F to climb steep grades more easily, according to Caterpillar.

"It delivers more power to the ground, which gives the truck more speed on grade," says David Rea of Caterpillar's Global Mining division. "The 793F is faster on grade, and because mining trucks spend the majority of their time on grade, it can travel faster, move more tons, and deliver to the customer a lower cost per ton."

Despite an increase in machine weight to 851,000 or 860,000 pounds depending on body type, top speed has been boosted to 37 miles per hour from the 793D's 34. On 12 percent grade, the 793F can reach up to 8.5 miles per hour.

For operator and mechanic safety, Cat increased the width of the truck's walkways; the upper deck is now a single flat level, eliminating tripping hazards; and the ladder access is 600-millimeters wide – 50 percent greater than the industry standard. The 793F also has a three-way lockout/tagout box mounted on the bumper where it's quickly accessible.



Spec Comparison: 793D vs. 793F

	793D	793F
Engine	3516HD EUI	C175-16 ACERT
Horsepower	2,415	2,650
Payload (tons)	250	250
Gross Machine Weight (lb.)	846,000	860,000
Top Speed (mph)	34	37
Speed on 12%		
Effective Grade (mph)	7.5	8 - 8.5

Caterpillar's 793F mining truck has more horsepower, higher top speed, and a more ergonomic cab than the 793D.

Performance and safety aren't the only areas of the 793 that have seen improvement. Caterpillar has redesigned the cab, shifting the instrument panel to the middle of the cab to increase visibility, and angling the center console toward the operator's seat to make manipulating the controls less straining.

"In previous generations of this truck, the way for the operator to hoist the body was to reach down to the floor on the left-hand side and pull a switch down there to raise and lower the body," Rea says. "We've moved that to the center console on the right-hand side at a 45-degree angle."

"We made the cab quieter inside for the operator, and we are now at 76 dBA. In some applications, we've minimized vibration," he says.

Options on the 793F include an electric-drive-train version, which has a higher top speed than its mechanical-drive counterpart, and fits the needs of contractors that rely mainly on an infrastructure designed for electric-drive machines, Rea says. Also offered is the additional-retarding option, which increases attainable speed and stopping power in steep downhill hauls.

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Doosan Infracore Portable Power

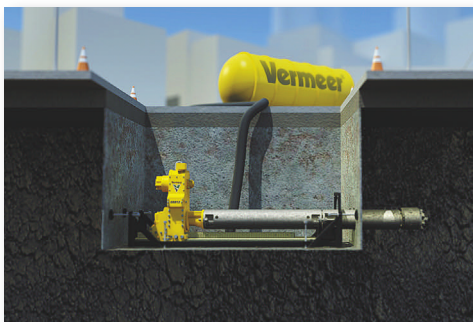
The Ingersoll Rand XXHP1250/XHP1450FCAT open-frame air compressor measures 15 feet 6 inches long and 89 inches wide. It has a free air delivery of 1,450 cfm at 350 psi and 1,250 cfm at 500 psi, providing a small footprint with high power density. It is powered by a 700-horsepower Cat C-18T six-cylinder diesel engine, and the package comes standard with an aftercooler.

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Vermeer

A pit-launched, laser-guided tool to install 10- to 14-inch-diameter pipe, the AXIS boring system from Vermeer offers underground contractors a new option for trenchless installation of water and sewer lines. With the ability to push or pull product pipe in place, the system consists of a power unit, rack, vacuum pump and vacuum tank. The guided boring system can complete bores up to 350 feet in length.

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Trimble

Trimble says new firmware for its GPS receivers will speed initialization and improve receiver performance in areas with limited satellite reception to benefit contractors using GPS receivers in the Trimble Site Positioning Systems (SPS) series. When real-time-kinematic correction signals are intermittent or marginal, the new RTK engine improves estimate precision. It allows a Trimble GPS receiver to continue working at reduced accuracy even after an RTK signal is interrupted.

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Indeco

Indeco designed the new Multi 1000 pulverizer specifically to meet the large-equipment preferences of the American market. It is suited for large-scale demolition work mounted on carriers from 79,500 to 132,500 pounds. Cylinders activating the pulverizer jaws require 66.5 to 79.5 gallons of oil flow per minute, and the rotator calls for 4.5 to 7 gpm.

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BorgSolutions

Borg Fleet, a telematics-enabled fleet-management software platform, will be offered for free in its Starter Edition form to small-fleet owners with 20 assets to track or fewer. Borg claims that the true value of its Borg Fleet software, formerly known as Astral, is in its proprietary technology. It provides artificial intelligence that facilitates predictive maintenance, streamlines work orders, manages fuel and inventory, and helps schedule repair and maintenance work using real-time fleet data and analytics.

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Market Watch Lite

Bri-Mar Mfg.

Bri-Mar says it adapted its dump-trailer design for strictly off-road applications by trimming the lights, brakes, on-board hydraulics and pricing. The AG-510 Series is available with 5- by 10-foot bed and a choice of either a single axle rated at 5,000 pounds GVW or dual walking-beam suspension rated at 10,000 pounds GVW. A 4-inch dump cylinder offers a 45-degree dumping angle.

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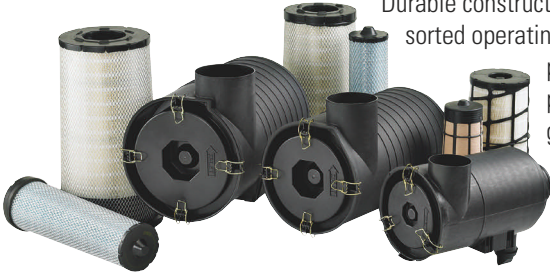


Donaldson

The XRB radial-seal, two-stage air cleaner maintains similar airflow operating ranges for use in off-road equipment operating in medium-dust conditions.

Durable construction enables filter installation in assorted operating environments, working in temperatures ranging from minus-40 to plus-82 degrees Celsius with engine airflow ranging 265 to 630 cubic feet per minute.

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Atlas Copco

Designed for tunneling, horizontal drilling, micropiling and several other applications, Symmetrix is a concentric drilling system from Atlas Copco with retrievable pilot bits for casings 3 to 48 inches. The system can drill in any direction and in any type of ground condition, including sandy or rocky terrain, to depths beyond 100 meters. Compatible equipment includes DTH and top-hammer rigs.

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Marrel Corp.

As part of the Ampliroll product line, Marrel introduces a 3.5-cubic-yard concrete mixer attachment for on-site small concrete needs. The self-contained, diesel-powered mixer can be hoisted within a minute onto a "multi-tasking" truck equipped with an Ampliroll HookLift.

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Morbark

Responding to customer feedback, Morbark offers the M6R as a 6-inch-capacity rotary chipper. Now trademarked the Beaver M6R, what once was the Clipper 6 chipper has been transformed with a two-knife machined rotor, direct drive with belt power transfer, larger tires and 180-degree silo swivel discharge. Reduced space between the rotor and feed wheel minimizes the risk of material lodging or turning sideways.

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▶ Parker Hannifin

Push-Lok Plus general-purpose hose is compatible with HY Series Parkrimp fittings and 82 Series field-attachable fittings, making it a very versatile choice where low-pressure media is used. Available in sizes from -4 to -16, the hoses are rated to handle up to 350 psi.

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▶ Pitts Trailers

The NSB-141 nitrogen spreader bar and NST-141 nitrogen stinger combine the classic 14-foot-1-inch booster axle spread with a nitrogen accumulation system and hydraulic cylinders. This

system allows the operator to set the exact weight desired on the booster axle and maintain that setting through varying road conditions. Outfitted with a gas-powered pony motor, the hydraulic settings and adjustments can be made quickly.

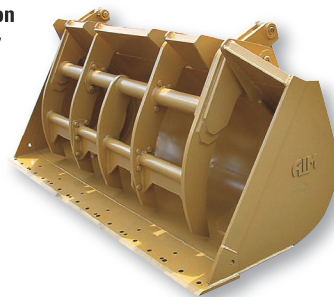
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▶ AIM Attachments

GPL line of heavy-duty loader grapple buckets for wheel loaders are made with AR400 steel cutting edges. Thick wear straps build abrasion resistance into the bucket bottom. Hydraulic clamps feature a bolt-on middle design that allows the clamps to be used in dual and single configurations. The sloped bottom design provides maximum dump clearance and maintains the machine's breakout forces.

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F. Total Distribution (Sum of 15c and 15e)	70,362	69,626
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H. Total (Sum of 15f and g)	70,859	69,877
I. Percent Paid/Requested Circulation (15c/15f x 100)	98.88%	97.92%

16. This Statement of Ownership will be printed in the NOVEMBER 2009 issue of this publication.

17. I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties). Simon Young (signed), Group Audience Marketing Director.

DIGITAL CIRCULATION:	12-month Average	September
Printed Circulation as reported on PS Form 3526, line 15a	70,859	69,877
Digital Circulation	6,568	8,132
Total Circulation	77,427	78,009

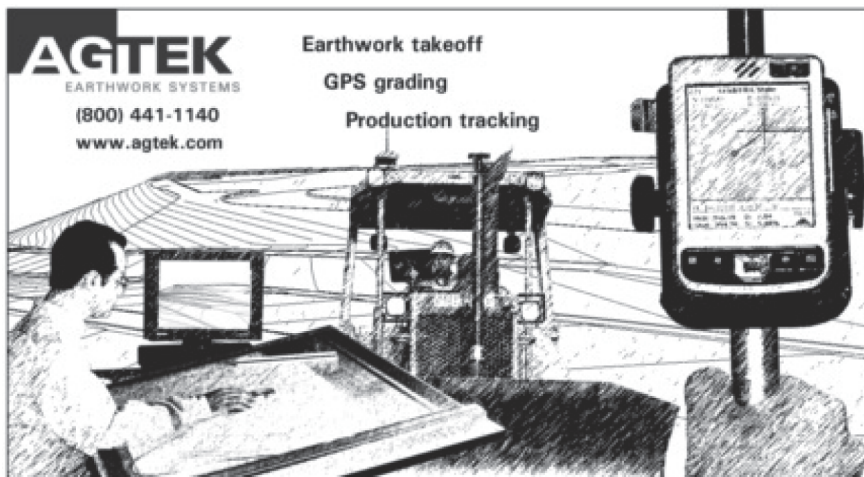
▶ AIM Attachments

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First Look at New Machines Unveiled at ICUEE

Construction Equipment editors headed down to Louisville, Ky., for the 2009 International Construction & Utility Equipment Exposition and brought back footage of new equipment, including John Deere's D-Series skid steer loaders, Freightliner's Coronado SD severe-duty vocational truck, Ditch Witch's RT115 quad-track trencher, and Vermeer's S800TX mini skid-steer.

Watch video walk-arounds of the new machines and read senior editor Mike Anderson's blog posts on Deere and JCB's equipment introductions.

Cat Intros New Mining Trucks



Caterpillar has revamped its largest mining trucks. Introduced at a Cat mining event in October, the 250-ton 793F and 400-ton 797F mechanical-drive trucks are powered by the company's new C175 diesel engine, which runs at 2,650 horsepower for the 793F and 4,000 horsepower for the 797F. Cat also previewed the electric-drive 795F as well as a remote-control-driven D10T dozer.

Watch them operate at ConstructionEquipment.com/Digest.



Komatsu Sets Its Sights On Caterpillar's D10T



Taking aim at Caterpillar's D10T dozer, Komatsu increased the net engine output in its D375A-6 crawler dozer by 85 horsepower to 610 horsepower at 1,800 rpm. A variable-displacement piston pump replaces twin gear pumps in the hydraulic system for more efficient use of engine horsepower. How does the D375A-6 dozer perform? See it for yourself at ConstructionEquipment.com/Digest.

Latest Big Iron Blog Posts

- Larry Stewart describes efforts to suspend diesel-emissions regulation in California.
- Mike Anderson blogs about new products introduced at ICUEE.
- Rod Sutton urges contractors to continue to buy new equipment even in this rough economy.

More Digital *Digest*

Construction Equipment Takes a Close Look at Bobcat's M-Series Loaders



Which Retrofits Comply with Emissions Rules?

Trimble Creates a Community for Contractors



JCB Product Manager Discusses EasyControl Servo System



A man's profile is shown in a blue denim shirt, looking upwards. On top of his head is a miniature yellow construction vehicle, specifically a skid steer loader with a bucket, which appears to be weighing him down.

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