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June 2009

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Compact, but Fully Loaded

Small horsepower, but these wheel
loaders have full-size features **p. 26**



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June 2009 • Vol. 112, Issue 6

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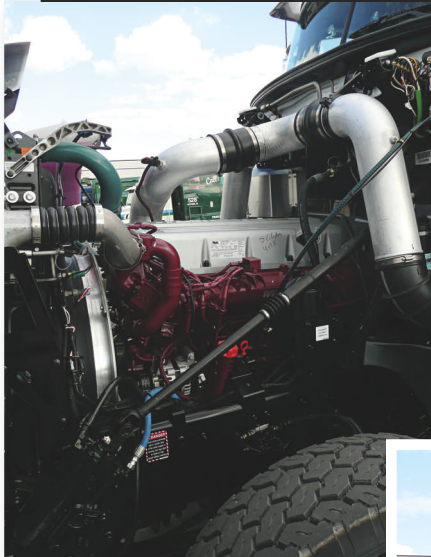
FLEET MASTERS

19 Fleet Masters Outsmart the Recession

The Association of Equipment Management Professionals' 2009 Fleet Masters are applying equipment information to the limits of their ability to provide excellent equipment service when it counts most: during today's economic downturn.

Fleet Masters, like Barriere Construction and Manatee County Fleet Services, save money on machines whose history suggests low risk if they rebuild rather than replace. And Fleet Masters watch the numbers weekly to be sure their calculated risks pay off. They extend component lives but watch repair costs and replace units as necessary to be sure their operations can respond nimbly to unpredictable work demand. Executive editor Larry Stewart gives you the secrets to their success.





HANDS-ON TRUCKING

24 Mack's Biggest Engine Powers Mack's Biggest Truck

Titan is surprisingly quiet, comfortable and civilized, confirming that it's a modern machine that's little like the heavy haulers of 20 or 30 years ago. Titan is built only with a big engine, the 16.1-liter MP10 diesel, an adaptation of Volvo Trucks' D16. Truck editor Tom Berg loves the ride.



BUYING FILE

26 Sizing up the Market For Compact Wheel Loaders

According to EquipmentWatch.com, list prices for the largest compact wheel loaders have increased up to 8.6 percent, although hourly rates to work those machines have actually gone down. Senior editor Mike Anderson says model upgrades could explain part of the bucking of the economic-spiral trend, but there may just be more at play than that.



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The Future's Still Bright

With a daughter in college and another job-seeking, it's easy to let current economic and political times cloud one's vision for the future. The last thing a parent wants is children facing challenges greater than one's own.

In the construction-equipment business, we're anxiously awaiting the effects of stimulus spending on actual construction project starts. Reports surfacing this spring indicated that little of the money has actually made it into projects using construction equipment.

Economic data, especially construction-related, continues uncertain. Homebuilding seems to be bouncing along the trough like a stone skips across a lake. Nonresidential is shaky, and equipment OEMs posted another quarter of negative news.

The automobile and banking industries struggle with government oversight designed to protect the financial stability of the nation, yet the tactics worry more than a few concerned citizens. Many wonder about the long-term changes in our capitalistic underpinnings.

Yet, as my children exemplify, optimism and hope continue to bloom in the young. In our business, that's seen with a group of students heading into the technician field.

As a trustee of the AEMP Education Foundation, we look forward to this time of year when applications come in for the Foundation scholarships. Each year, more students apply, and each year the Foundation is able to increase the number of scholarships awarded.

Reading these applications fuels our hope in the future. These young people are excited; they have an aptitude for mechanical problem-solving and a love for heavy equipment and diesel technology.

For most, a scholarship to attend a technical school will open the door to their future, a future they see as bright indeed.

Want to help fund that future? The number of scholarships given is directly proportional to the donations the Foundation receives. Learn how to support the AEMP Foundation at aemp.org.



Rod Sutton, Editor in Chief

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Rod

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

By KATIE WEILER, Managing Editor



◀ Putzmeister

Putzmeister claims its 70Z-Meter is the world's largest truck-mounted concrete boom pump, with 227 feet of vertical reach and nearly 213 feet of horizontal reach. Standard on all models 52Z-Meters and larger, including the 70Z-Meter, the maker's Ergonic control technology allows the operator

to set parameters that control the pump, the five-section Z-Fold boom and other functions, and facilitates real-time remote diagnosis of the unit in the field. The boom can be deployed in Z positions or A-frame configuration.

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▲ Mustang

Billed as a super-compact model, the 2012 skid steer loader weighs less than 2,900 pounds, measuring 3 feet wide and 6.25 feet tall. Powered by a 24-horsepower Yanmar diesel, it has a rated operating capacity of 850 pounds and lift height of 96 inches. Features include spring-applied, hydraulic release brake system; ROPS/FOPS Level II; auxiliary hydraulic couplers and universal-style, quick-attach attachment bracket.

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◀ Volvo

Volvo's new class of milling machines round out the company's road machinery product line. The compact MT2000 features a four-track, front-load, half-lane system powered by a 610-horsepower Tier-3 Cummins engine. It offers three engine and drum cutting speeds selectable from the operator's panel. The MW500 is a four-wheel, rear-loading, utility-class milling unit with a cutting width of 19.69 inches. It has a 7.87-inch turning radius.

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▶ John Deere

K-Series wheel loaders span a size range from 2.5 to 7.75 cubic yards and 115 to 330 horsepower. The 644 and larger models are available with an optional five-speed transmission with lock-up torque converter, which Deere claims will improve fuel efficiency 15 to 20 percent in load-and-carry and ramp-climbing work. Loaders come with lockable front differentials and offer optional locking rear differentials. Diffs lock on the roll (video), and an auto-diff-lock option locks when it senses wheel slip. Joystick steering, an option only on the 844J, is now standard equipment on the 844K and an option on the 544, 644, and 744K models. Cab upgrade added 3.5 inches of leg room.

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Kenworth Truck

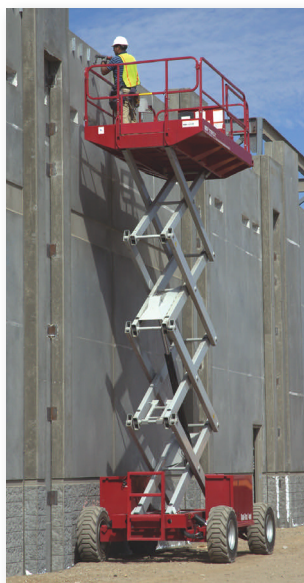
Kenworth offers an after-market crew cab conversion by Bentz Transport Products for T170, T270 and T370 medium-duty conventionals. The crew cab adds 52 inches of interior length, up to 61 inches of interior height, and is 84 inches wide at the rear. BBC is 157 inches. It uses a one-piece fiberglass roof with an aluminum cab structure, and is standard with DayLite doors, grey Vinyl interior trim, and DuPont Imron Elite single stage paint. Many options are available, including bench and bucket seats.

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Case

The CX800B upgrade includes increased fuel efficiency, thanks to its common rail fuel injection system combined with redesigned hydraulic system. Case says the machine offers regenerative hydraulics on the boom and arm, as well as bucket curl, which speeds cycle times. Weighing 178,575 pounds, it is powered by a 532-net-horsepower Tier 3 Isuzu engine. Isolation-mounted cab with reinforced tubular structures has among the lowest sound levels in the industry, and the operator's seat adjusts independently of the joystick controls.

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MEC

The "91ES" Series — MEC's large-deck, all-electric rough terrain scissor lifts — boast working heights of up to 47 feet and gradeability of up to 40 percent. Because electricity is often provided for free on jobsites, powering the scissor lifts, which use eight 6-volt 375-amp hour batteries, is inexpensive. Other features include full-height drivability, fast cycle speeds for lift and drive, and rear oscillating axles.

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Caterpillar

Caterpillar announces the release of the CB54, CB54 XW and CB64 tandem vibratory rollers. The 23,818-pound CB54 (with 67-inch-wide drums) and CB54 XW (with 79-inch-wide drums) competes in the 8- to 11.3-metric-ton class of asphalt compactors. The 30,291-pound CB64 has 84-inch-wide drums. The new frame design provides a clear view to the drum surfaces and spray bars, allowing the operator to easily monitor water spray performance. The 137-horsepower C4.4 engine complies with U.S. EPA Tier-3 emissions requirements.

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Terex

The TH19-55 telehandler will lift a maximum capacity of 5,500 pounds and reaches max lift height of 19 feet. The 9,800-pound machine is powered by a 63-horsepower diesel engine, and it offers three-mode steering — two-wheel, four-wheel and crab — with a turning radius of 11 feet. The Terex unit pumps 18.5 gallons per minute of reversible auxiliary-hydraulic flow. The hydraulic Quick Attach system comes standard on the TH19-55.

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Bobcat

Bobcat extends its M-Series excavators (inaugurated with the E80 at World of Concrete) 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.

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 the heavier models they replace.

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Komatsu

A prototype of Komatsu's 23-ton D65-16 crawler dozer, with the SIGMA Dozer blade, made its world premier at Intermat 2009. Komatsu says fuel consumption can be reduced up to 10 percent by the dozer's computer, which monitors power demands to automatically engage the torque converter when high torque is needed or to lock it up for direct drive during lower demand. The blade's effective capacity and rolling characteristics have been improved, while it continues to combine aggressive penetration with a flat grading edge.

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Sany

Not to be left behind in the concrete-pump height race, Sany claimed at Intermat a new record with the SY5650THB 72 pump truck capable of reaching 72-meter heights (more than 237 feet). The Chinese maker had not published specifications at press time, but if the 72-meter pump truck is based on its 66-meter truck's technology, it theoretically should deliver on the order of 260 cubic yards of concrete per hour. Sany says the pump's open hydraulic circuit, with electro-hydraulic proportional buffering, reduces reversing shock and oil temperature.

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Manitowoc

The GSK55 combines a Grove GMK3055 all-terrain-crane upper with a specially designed chassis that acts as a trailer. Customers then use the truck tractor of their choice to transport the crane.



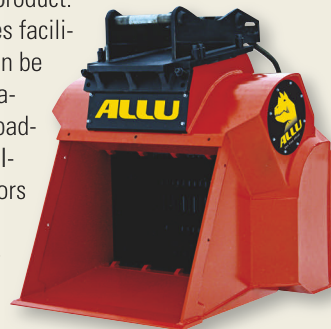
The chassis has its own 139.5-horsepower Iveco engine that provides full power to the GSK55, operating all the crane's functions, including the outriggers. With two axles on the tractor and three on the trailer, loadings do not exceed 10 tons on any single axle when the crane is traveling with a counterweight of 12.75 tons. GVW is under 46 tons. Lifting specifications for the crane match the GMK3055, so maximum capacity is 60.5 tons and it has a 142-foot main boom.

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Allu

D-Series from Allu includes 12 different screening bucket attachments ranging in weight from 3,600 to 7,300 pounds that can produce either ½- or 1-inch end product. Changing drums to different disc sizes facilitates the choice. The attachments can be mounted on 16- to 40-metric-ton excavators or 6- to 25-metric-ton wheel loaders, and the dual adapter mounting allows them to be mounted to excavators in either the shovel or pick position. The screening buckets operate on either 34 or 44 gallons per minute of the carrier machine's auxiliary flow.

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Dromone

Dromone says its cast-steel, hydraulic quick coupler weighs about 30 percent less than excavator quick couplers with fabricated steel bodies.



A range of sizes to fit everything from backhoes to large hydraulic excavators offers designs to minimize extension of the bucket-curl radius and preserve digging force. A hydraulic circuit locks the coupler from the cab, and the locking mechanism is always visible from the cab allowing the operator to visually confirm that the coupler is fully engaged. The coupler is sized for a 16-metric-ton excavator, weighs 360 pounds, and carries a MSRP of \$4,000.

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Jimmy King, King Trucking and Excavating

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THEFT PREVENTION

Cat Machine Security Stops NC Thieves

When Alex Barnard, equipment manager for a North Carolina-based contractor, lost five machines in three years to theft, he knew something had to change. Prevention wasn't working, and the insurance carrier had taken notice.

Barnard's Caterpillar dealer recommended the Cat Machine Security System (MSS) and Barnard gave it a try on two multi terrain loaders.

Soon after, the MSS proved itself. Over a weekend another piece of equipment was stolen, and even though thieves had attempted it, the two compact track



Caterpillar Pocket Tec programs access codes into MSS keys. Machines with MSS won't start unless the chip in the key carries the right code.

loaders with MSS were still on the job.

"There's no question as to the value of MSS and the money it saves," said Barnard. "There are a lot of companies out there that have lost thousands of dollars. They should consider this system."

MANUFACTURER NEWS

Hybrid Excavator Will Save On Bottom Line, Too

As part of the ongoing development of a full-sized hybrid excavator, equipment manufacturer Doosan is now projecting a cost savings of \$10,000 per month for future users of the machine.

Slated for a North American launch in 2012, the 22-ton Doosan hybrid excavator will be equipped with a diesel engine, electric swing motor, electric converter, and an ultra-capacitor that will store excess energy during turning and light-duty operations. The reserve electricity will then be used to assist the power of the engine during heavier work, allowing the engine to maintain low revolutions and high-efficiency combustion during acceleration.

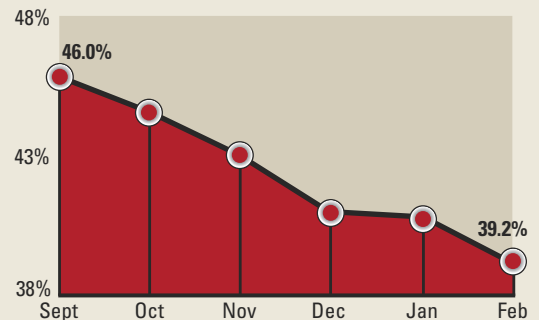
Compared to the standard DX225 model, the hybrid excavator will generate approximately 35 percent less carbon dioxide and fuel consumption, says Doosan Infracore America.

USED EQUIPMENT

March Values Decrease

The Rouse Value Index

(Avg. orderly liquidation value as % of cost)



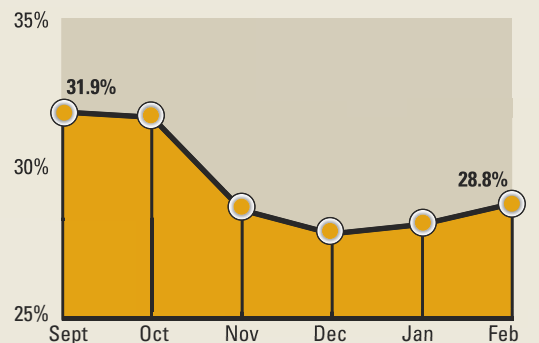
Note: Orderly liquidation value is expressed as a percentage of replacement cost (average cost paid for a new unit by large rental companies and dealers) for the average age of equipment within that category.

Includes 10 categories of equipment common to rental fleets.
Source: Rouse Asset Services

Orderly liquidation values continued to drop in March, down 4.2 percent compared to February. Values are down 18.3 percent over the past six months, and 17.2 percent compared to March 2008. All 10 categories showed value declines for both one- and six-month periods.

Telescoping Boom AWP's

(Avg. orderly liquidation value as % of cost)



Values of skid steer loaders dropped in March, down 1.6 percent from February. The six-month trend is down, too, with values 17.2 percent off of October. Average selling age is 54 months.

GREEN NEWS

Komatsu Hybrid to Be Sold Internationally

From June 2008 through March 2009, Komatsu sold about 30 diesel-electric hybrid excavators — the PC200-8 Hybrid — in Japan. At Intermat 2009, Komatsu announced that this first commercially available hybrid construction machine will go international with the launch of marketing in China this spring.

The Komatsu Hybrid System uses an electric motor/generator to turn the upper structure. Capacitors store energy generated during swing braking and discharge that energy during high-demand functions. The excavator's main power source — the diesel engine — continues to run in a very narrow, efficient power band. Komatsu says the hybrid uses an average of 25 percent less fuel than a standard PC200-8 excavator, and customer tests have shown up to 41 percent fuel savings.



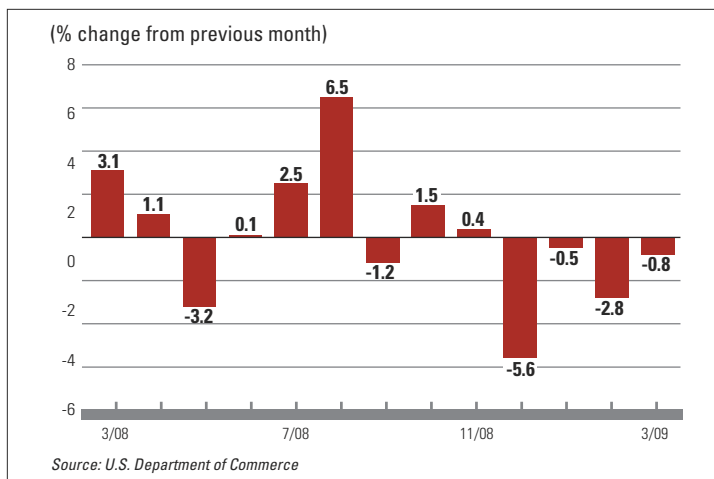
Capacitors store slewing energy to assist diesel power, cutting fuel consumption 25 percent.

STATUS & FORECAST

TOTAL CONSTRUCTION SPENDING

Construction spending will keep falling, albeit at a slower pace, until late 2009. The 0.3% spending rise in March will not be immediately sustained. All sectors are likely to be declining in the spring and early summer. Cheap credit and tax credits for first-time buyers will start housing growing by the end of summer. Stimulus funds will start heavy construction growing by the end of the year. Commercial construction will be the weakest sector for most of 2009.

For more analysis, visit Economic Outlook at ConstructionEquipment.com. — Jim Haughey



INDUSTRY NEWS

Air Force-Managed GPS at Risk of Failure

Contractors using GPS-guided asset management equipment could begin experiencing service outages beginning next year.

According to a report by the U.S. Government Accountability Office, the Air Force-managed global positioning system is aging, and the current GPS satellite program has surpassed cost estimates by nearly \$1 billion and delayed the launch of replacement satellites by several years. However, a new satellite program, dubbed GPS IIIA, aims to pick up the slack.

"If the Air Force does not meet its schedule goals for development of GPS IIIA satellites, there will be an increased likelihood that in 2010, as old satellites begin to fail, the overall GPS constellation will fall below the number of satellites required to provide the level of GPS service that the U.S. government commits to," the GAO report reads. "Such a gap in capability could have wide-ranging impacts on all GPS users, though there are measures the Air Force and others can take to plan for and minimize these impacts."

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RUNNING GREEN

Engine Makers Prepare for 2012 Emissions Requirements

Diesel-engine manufacturers continue to refine their product offerings in preparation for EPA Tier 4 Interim emissions requirements.

On the day John Deere Power Systems announced the technology solutions it will use to meet the stringent regulations, as well as a new naming convention for its engines, Cummins Engine Co. announced its four-cylinder QSB3.3 and QSB4.5 engines will also meet the 2012 EPA Tier 4 Interim/EU Stage III B standards. Required is at least a 90-percent reduction in particulate matter and up to a 50-percent reduction in nitrogen oxides (NOx) from previous Tier 3/Stage III A requirements.

For all of its engines 75 horsepower and above, John Deere Power Systems will start with its Tier 3/Stage III A PowerTech Plus engine platform — which includes cooled exhaust gas recirculation (EGR) for NOx control — and will add an exhaust filter for reducing particulates. Displacements in this power range include the 4.5-, 6.8-, 9.0- and 13.5-liter in-line, four- and six-cylinder engines — all of which feature a four-valve cylinder head, high-pressure fuel system, turbocharging and an air-to-air aftercooling system.

“After much evaluation and testing, we found that an exhaust filter and the use of cooled EGR, coupled with our proven Tier 3/Stage III A PowerTech Plus engine platform, is the best Interim Tier 4/Stage III B solution for meeting emissions and for delivering

the performance, reliability, durability and low operating costs our customers have come to expect from John Deere engines,” says John Piasecki, director of worldwide marketing, sales and support, explaining why the avoidance of a selective catalytic reduction (SCR) system. “The single-fluid approach of cooled EGR means the technology will be easy for operators to use, and they won’t have to incur the cost of diesel fuel plus the urea required by SCR systems. We are using the most operator-friendly technology available today. We chose to take the route of cooled EGR because we believe it’s the right technology at this point in time.”

The new Deere engine names will capitalize on the PowerTech brand, but add a three-letter suffix that designates the engine’s technology package. Examples of the new names are the PowerTech PVX 6.8L (pictured) and PSX 6.8L. The three letters define the engine’s technology platform, turbocharger and exhaust filter. All of the John Deere Interim Tier 4/Stage III B engines with ratings 174 horsepower and above are designated “P” indicating the Tier 3/Stage III A PowerTech Plus technology platform. These engines use either a variable geometry turbocharger (designated “V”) or series turbochargers (designated “S”); and they also feature an exhaust filter (designated “X”).

The next-generation four-cylinder Cummins QSB engines retain the

same 3.3- and 4.5-liter platforms as their predecessors and will be supplied as a fully integrated air-intake-to-exhaust system. Low emissions are achieved by using cooled EGR for NOx control and exhaust aftertreatment for removing particulate matter, says the company.

Both the cooled-EGR system and the particulate aftertreatment unit have been specifically developed for the four-cylinder platforms as a more compact and simplified version of the Tier 4 Interim technology previously announced for the six-cylinder QSB6.7 engine. A high-pressure common-rail fuel system employed on the Tier-3 QSB3.3 and QSB4.5 is already capable for Tier 4 Interim and will require no major change, says Cummins. An upgraded turbocharger with electronic control will be utilized to manage EGR flow across the entire engine-rpm range.

“Our four-cylinder development program for Tier 4 Interim was driven by the need to avoid the complexity of increasing displacement or overloading the engines with complications such as dual turbochargers,” says Hugh Foden, executive director, Cummins Off-Highway Business. “We have instead focused on minimizing the installation impact for our OEM customers with space-saving solutions such as the Cummins Direct Flow air filtration system, and we’ve scaled down the EGR and aftertreatment technology appropriately for these compact engines.”

QSB3.3 ratings extend from 75 to 110 horsepower for Tier 4 Interim, retaining “best-in-class” power output for this size of engine, says Cummins. The QSB4.5 occupies the 110- to 160-horsepower band and will offer “the same or improved torque delivery” as the Tier 3 version.





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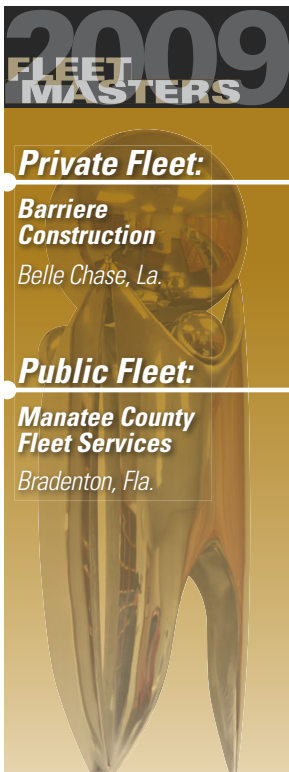
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Fleet Masters

Outsmart Recession

Disciplined data gathering allows AEMP's best fleet managers to shave costs without sacrificing productivity



Those who demonstrate mastery over the unrelenting challenges to running construction equipment efficiently develop remarkable and varied skills. None is higher priority than gathering machine operating data and compiling information that measures how cost effectively you practice the other skills. The Association of Equipment Management Professionals' 2009 Fleet Masters are applying equipment information to the limits of their ability to provide excellent equipment service when it counts most: during today's economic downturn.

No doubt getting the most out of vendors, getting the right machines and support onto jobs at the right time, and effectively buying equipment and supplies are key components of managing a fleet. But those are the basics — the blocking and tackling — that any equipment-using organization has to do well in order to survive. Fleet Masters measure how well they do those and many other things in dollars and cents.

Equipment information is never more crucial than during tough economic times. Fixed costs kill a company when revenue dries up. Equipment is the largest fixed cost in so many construction operations, and simply freezing machine spending is not the same as managing that cost.

Firms that refuse to replace machines, or that shortcut necessary major repairs, are spending unrecognized depreciation. You don't write a check for depreciation charges every month. It comes due when you sell machines at values below what you estimated in their hourly rates. Worse yet, it comes due when machines break down at the height of production on projects.

Fleet Masters, like Barriere Construction and Manatee County Fleet Services, save money on machines whose history suggests low risk if they rebuild rather than replace. And Fleet Masters watch the numbers weekly to be sure their calculated risks pay off. They extend component lives but watch repair costs and replace units as necessary to be sure their operations can respond nimbly to unpredictable work demand.

Manatee County uses CCG System's highly developed fleet-management software, called Faster, to create and manage repair work orders. Barriere maximizes the equipment work-order system built into a module of Enterprise's construction-business software. Barriere has no mechanics. Manatee County's staff of 33 includes 18.

The following pages detail how Barriere and Manatee County — very different organizations with very different objectives — use the same basic machine information to trim costs with surgical precision. Measuring success along the way, and adapting to make the most of it, ensures they will emerge from this recession leaner and meaner than when they went in.

If you know of an organization that should be considered for the next Fleet Masters competition, please go to www.aemp.org to find out how to submit a nomination. All equipment-managing organizations are welcome to enter the competition.

Manage Machines Rather Than People

With no shop, Barriere makes equipment decisions that manage costs with precision



**Ben Tucker, Fleet Director,
Barriere Construction**

Barriere Construction's Ben Tucker, CEM, is finding that predetermined machine lives are not only a key to cost-effective fleet management, but they reduce the risk of downtime when cutting costs in hard times.

Some will not be impressed once they discover that three years and 5,000 hours is not uncommon for the planned life of some Barriere machines — milling machines, in fact. Tucker replaces pavers and vibratory rollers at 4,500 hours, about every 3 to 3.5 years. But before you scoff that there is plenty of life left in machines at that stage of their lives, remember that Tucker manages Barriere's fleet of 190 machines with a staff of just seven, and no shop.

Major pieces in the Barriere fleet are purchased with full service contracts. Tucker negotiates a guaranteed buy-back price at an agreed-upon age.

"Factors affecting the sweet spot (the replacement point) include depreciation and market residual values — on the ownership side," says Tucker. "Then you look at your spikes in maintenance cost. You have to know about when failures tend to happen — when components start to fail."

Detailed knowledge of real reliability — reliability the firm can reasonably expect with minimal investment in staff maintenance expertise — is the heart of what makes the Barriere organization a Fleet Master. The information infrastructure is fairly simple — a digital work-order function that's part of the equipment-management module of Explorer

Software's Contract Manager construction-enterprise management system. Disciplined use of work orders since 2000 has developed a base of knowledge from which Tucker and his equipment coordinators can make decisions that shave costs with accuracy.

Tucker says it took the first four years of issuing work orders and coding them by priority (on a scale from 1 to 5, with 1 being an emergency, 2 being something to address within 24 hours, and 3 a priority for sometime in the next three days, etc.) for him to develop effective sweet spots for each of Barriere's 30 major machine categories.

The most important statistics for evaluating the sweet spot: mean time between failures (average time from one failure to the next, by machine class), mean time between corrective repairs, and actual component lives.

Fast-developing technology in some key machine types also influences when Tucker plans to replace asphalt pavers, excavators and other earthmovers.

"With some of the information you can get out of excavators, they're faster than the operator can react now," Tucker says. "And I know my efficiencies and productions are up with automated machine controls on graders and dozers. The machines are working much harder than in the conventional method."

"We see major changes during the life of some of our major pieces of equipment," he adds, "And we don't want to put a B model out on a job when there's a D model available. You don't want to be behind in two series."

As Barriere recorded experience and

Tucker analyzed the numbers, the company settled on some machine lives — including three-year, 5,000-hour intervals for some critical machines like pavers and milling machines. Between 2000 and 2004, average fleet age fell from 7.5 to 5 years. Percentage of work orders that required emergency response fell from 60 to 11.

In the rush of new business pre-Hurricane Katrina and the triage months after the disaster, average fleet age dropped to three years. As if to prove that you can't buy reliability, though, emergency work orders climbed to 17 percent of the total.

"After Katrina, we lost a lot of people and equipment," Tucker says. "We replaced people and equipment but we didn't go through our training processes. We weren't doing our auditing processes. Fleet age was lower, but we were having more breakdowns."

Being able to audit the work-order system, and backing it up with some oil analysis and failure analysis, quickly identified over-application and other operating problems that were cutting reliability. Operator training and auditing work orders resumed. Average fleet age has extended about a year even as the percentage of emergency work orders has fell to unprecedented lows.

Scrutiny of emergency work orders will redouble in the coming months, as Tucker recently increased expected machine lives in most categories by at least a year. Barriere's owners came to him last fall when the economy headed definitively south, looking for significant savings in the equipment budget.

"Using historical data, I'm learning that I can keep machines a little bit longer without problems," Tucker says. "It has allowed me to start extending life."

He committed to a 25-percent reduction in the 2009 capital budget, even though the recession has yet to slow fleet use. Unless they see drastic increases in the frequency of repairs — measured as mean time between failure with the work-order system — he plans to stay with the modified sweet spots for two to



Heavy-equipment operator Murphy Martin (right) was recognized for his TPR participation at Barriere. Ongoing efforts to reward positive behavior have helped improve equipment cleanliness and operator-inspection compliance.

PROFILE: Barriere Construction

Headquarters: Belle Chase, La.

Specialty: Asphalt and concrete paving, asphalt production, general contractor

Fleet Value: \$28 million

Fleet Makeup: 266 major pieces, including 145 off-road units and 121 licensed (90 trailers)

Equipment Staff: Seven — one equipment director, three coordinators, three support personnel

Market Range: Louisiana

three years.

"But I'll revisit the decisions at least every year, and I may have to re-adjust," Tucker says. "It all depends on maintenance cost. We have to decide if this was worth it or not (whether it actually saved money, or just shifted cost to maintenance and downtime)."

"I'm still working on putting a value to the maintenance end of the savings right now," Tucker says. He renegotiated specific aspects of his maintenance contracts to reduce labor costs, selecting some types of repairs for which vendors should send mechanics on Level B or Level C pay scales.

"I don't want to pay a Level A mechanic to change a lightbulb," he says, "but I'm keeping a Level A guy on preventive maintenance (PM) work."

"PM's the most important kind of work — it overrides everything," Tucker says. "I live and die by that."

Reasons to Restore TPR

Year	PM	Corrective	Emergency	Avg. Fleet Age
2000	15%	25%	60%	7.5 years
2004	40%	50%	11%	5.0 years
2006	38%	45%	17%	3.0 years
2008	50%	46%	4%	4.0 years

Source: Barriere Construction FleetMasters entry

Tucker knew he had to shift priority back to preventive maintenance and training when, despite fleet age dropping between 2004 and 2008, emergency work orders increased.

Lifecycle Stretch Cuts \$3.8 Million from Capital Budget

Unit-by-unit analysis shrinks the Manatee County fleet
and extends the life of existing machines

In 2008 the Manatee County Fleet Services Division evaluated the utilization and expected lifecycle of each unit in its 1,400-vehicle fleet at the behest of county management and eliminated 53 underutilized vehicles (including three quarters of the authorized take-home vehicles). The effort extended the average life of the fleet one year, culminating in an annual budget reduction of \$431,000 and saving \$3.8 million in capital for replacement equipment.

“Our fleet reduction followed the reorganization of several departments,” says Michael Brennan, CEM, fleet-services-division manager. “Direction from the administration was to increase efficiency, identify cost savings, and eliminate unnecessary or excess tasks and equipment. We consolidated some services and some vehicles and equipment were now no longer required.”

The 53 underutilized vehicles eliminated were split pretty evenly between on-road vehicles and off-road equipment of all sizes and types. Some were re-assigned or saved as pool vehicles, but most were

obsolete or unnecessary, so the county disposed of them on the used-equipment markets.

“The take-home-vehicle authorizations took place over a long period, and we let all the drivers know what was going on with plenty of time before any action was taken,” says Brennan. “For the most part all those who were affected understood the impending economic downturn created the need to reduce costs, and that made the transition fairly smooth.”

The utilization study required extensive coordination with the staffs of Manatee County’s equipment-using departments — Fleet Services’ customers — to determine which machines were essential to operations.

“Acquisition costs, replacement costs, operating and capital expenses, and residual values are all required to accurately determine average lifecycles,” says Brennan. “We’ve had most of the equipment data in our maintenance-management system for years, but obtaining accurate residual value required an extensive research project. It was the first comprehensive study of its kind here in Manatee County.”

Fleet data review specialist Wendy Pin-tozzi identified the current market value of vehicles and equipment by class, manufacturer, model and year, by averaging Black-Book values and data from online publications and Internet auction results. Florida-specific resale data formed the core of



Michael Brennan, CEM, analyzes equipment data with fleet operations chief Ron Kennedy, CEM, to fine-tune lifecycles for fleet units.



Manatee County's new shop at the county's landfill doubles the location's fleet-service capacity.

the assessments, and those results were verified compared to regional and national values.

"Lifecycles really should be reviewed at least biannually," says Brennan. "Technological and economic changes directly affect lifecycles creating a need for routine updating. We took a look at the individual lifecycles first, created an average or 'economic replacement point' for each vehicle or equipment class, then reviewed the data over several replacement cycles."

Comparing the results of different life expectations over the long term helped reveal how timely machine replacement minimizes the county's expenses and maintains production. Detailed, unit-by-unit lifecycle analysis held some benefits for equipment that remained in the fleet.

"In some cases we were able to extend our contract term agreements on heavy equipment," says Brennan. "Purchasing a higher-quality dump truck, for instance, added three years to the lifecycle and, by rotating them to lower-use assignments as we bring new units on, we'll maintain reliability in all areas. This is true also with some of the construction equipment. Expected lives of skid steers, loaders, and some classes of track machines were extended in the same ways.

"Once we identified an average-age tar-

PROFILE: Manatee County Fleet Services

Headquarters: Bradenton, Fla.

Scope: Supporting 16 county departments including public works, emergency services, landfill operations, transit services


Fleet Makeup: 1,344 rolling-stock items in 136 classes, including 473 off-road units and 1,001 licensed units

Replacement Value: \$80 million

Staff: 33 — including nine management, 18 technicians, three materials specialists and three support personnel

get for the various classes of machines, we needed to factor in specific site equipment — I call them 'yard dogs' — that may not experience high mileage or hourly use, but are required daily or run many short trips," he adds.

Ultimately, when unnecessary equipment was identified, the best machines were rotated to another county service area if needed, and the oldest or most-used units were sold. The change opened opportunity for the three-shop Manatee County Fleet Services operation to take on more work.

In April 2009, Manatee County Fleet Services assumed maintenance responsibility for nearly 300 machines and a service facility assigned to turf maintenance for the county parks department. County Fleet Services will handle the additional equipment with no additional staff or investment other than computers to network into their CCG Faster equipment-operations-management network and some parts-room organization. 



Michael Brennan, CEM,
Division Manager,
Manatee County Fleet-
Services

Mack's Biggest Engine Powers Mack's Biggest Truck

Titan's well-named but mild mannered, and its MP10 is about the strongest diesel available

In Greek mythology, Titans were powerful deities who ruled the earth until overthrown by Zeus and his Olympians. In Mack Trucks terminology, a Titan is a big hauler of large and dense loads. This Titan is surprisingly quiet, comfortable and civilized, confirming that it's a modern machine that's little like the heavy haulers of 20 or 30 years ago, although Bulldog fans might think it's as strong as the ancient Greek gods.

Titan is built only with a big engine, the 16.1-liter MP10 diesel, an adaptation of the D16 offered by Volvo Trucks, Mack's sister company. In a bit of one-upmanship, Mack gives its top rating 5 more horsepower and 10 more pounds-feet than Volvo's

version. Like other current Mack and Volvo diesels, the 984-cubic-inch MP10 is made by Volvo Powertrain in Hagerstown, Md., while the Titan itself is assembled at Macungie, Pa.

Titan's predecessor was the long-nose CL, which used only Cummins' 15-liter ISX, because Mack had not had a big-bore engine since dropping the 998-cubic-inch E9 V-8. It sure does now, so the Cummins is gone. No Maxidyne version of the MP10 is yet available, so this one was in Maxi-

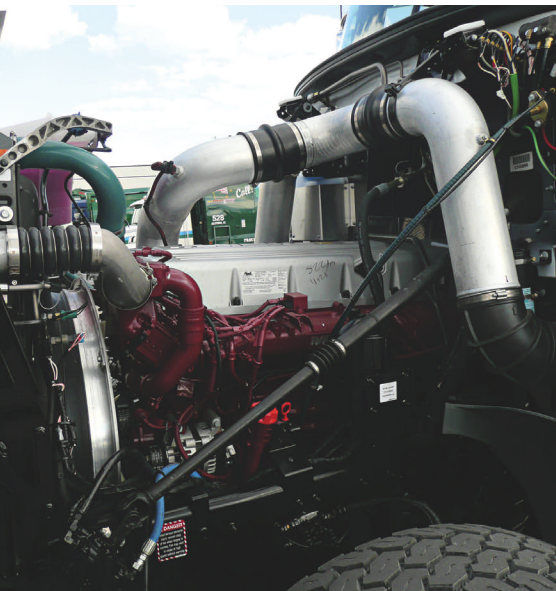
Cruise tune, with a flatter torque curve.

Almost a year after its introduction, Mack made a Titan available for driving during an industry meeting in Orlando, Fla. Hosts were Dave McKenna, director of powertrain sales and marketing, and spokesman John Walsh. We met on a Saturday afternoon at Nextran Truck Center, the Mack dealer in the region. I quickly noticed that a Titan is both big and tall, for it's a long climb to the cab — three big steps totaling 61.5 inches, according to a tape measure. The cab sits high on the frame partly to aid air movement over the sometimes-hot engine just ahead.


Indeed, the chassis sits high to allow plenty of ground clearance as it trundles over bare earth at jobsites and rough logging and mining trails. Those are Titan's primary intended duties, and the first ones produced went to a coal hauler in Kentucky, McKenna said. The big tractor was shined up and hitched to a three-axle lowboy toting a Volvo front-end loader, because heavy-equipment hauling is another intended vocation.

A Titan can be built for gross combination weights of 300,000 pounds, but anything over 80,000 means oversize and/or overweight permits, which the Mack folks wanted to avoid on this drive. So our GCW was a mere 72,800 pounds. That was almost no weight for the 605-horse MP10, and I was hardly aware of the load, except of course for our overall length and watching where the trailer's wheels were during turns. This was on nearby highways, through the congested Disney World area, then a return to the dealership on Landstreet Road in Orlando, about 100 easy miles. McKenna was in the shotgun seat.

The gearbox was an Eaton Fuller RT-LO20918B, an 18-speed that operated smoothly. I generally drove it like a 13, ignoring Low gear and



Central Florida's flat highways and demo rig's 72,800-pound GCW were no match for the big MP10 diesel. This one makes up to 605 horsepower; other ratings are 565 and 515 horsepower.



Titan's big and chrome, and it's got an extra strong frame and running gear. With high ground clearance it can step over off-road obstacles, but it's comfortable enough to cover long highway miles. The tall hood's edges are rounded, so the view to the right is OK.

shifting through 1st to 4th, then splitting 5th through 8th in High range, or like a 9-speed, ignoring the splitter switch. I tried to upshift progressively, below 1,500 in Low range and by 1,700 or 1,800 in the top gears.

The lever was a little rubbery going into the 4th/8th position, but I got used to it and then enjoyed it, floating the gears without the clutch some of the time. The tach said top-gear (18th-ratio) cruise speed was a lazy 1,360 rpm at 60 mph and 1,460 at 65, where hefty torque (as much as 2,060 pounds-feet) kept us rolling.

With the windows up the cab was very quiet — much more than I expected for a work truck. Engineers had spent a lot of time attending to noise, vibration and harshness, McKenna explained. I'd like to have heard more sounds from that big diesel, but cracking open a window let in some of the tunes from the exhaust stacks. There was enough weight on the fifth wheel to settle down any jouncing, and the cab's rear sat on a pair of air bags and shock absorbers. That and generally smooth pavement made for a smooth ride.

The galvanized-steel cab comes from the Granite vocational series. Its interior was nicely appointed in grey tones contrasted with faux wood facing on the instrument panels. All gauges and controls were well laid out and easy to see and use. The steering column was multi-adjustable and, along with multiple settings available in the comfortable driver's seat, I easily found the right positioning for me.

The high-mounted cab and large windows gave a good view of the road. I expected the tall, wide hood to block my view to the right, but it didn't. That's

SPECIFICATIONS

Tractor: Mack Titan TD713, conventional-daycab, BBC 128 in., for heavy-haul applications, GVW 66,000 lbs.

Engine: Mack Power 10, 16.1 liters (984 cubic inches), 605 hp @ 1,600-1,800 rpm, 2,050 lbs.-ft. @ 1,200-1,500 rpm, w/Mack engine brake

Clutch: Eaton 15.5-in. ceramic

Front axle: 20,000-lb. Mack FXL on taperleaves

Rear axles: 46,000-lb. Mack S462 w/3.94 ratio, on Mack SS462 multi-leaf

Wheelbase: 255 inches

Brakes: Meritor S-cam drum, 16.5x6-in. front, 16.5x7-in. Q-Plus rear, w/Bendix ABS

Front tires & wheels: 425/65R22.5 Bridgestone M844F on Alcoa polished aluminum discs


Rear tires & wheels: 11R24.5 Bridgestone M711 on Alcoa polished aluminum discs

Fuel tanks: Polished aluminum, 72-gal. left, 93-gal. right

Trailer: Load King 48-foot tri-axle lowboy

because the hood's edges are rounded, McKenna said. Each mirror had two panes, one of them with a convex surface, so I could effectively peer downward and to the rear. This was a daycab with a large window in the rear wall, so to run over something you almost have to do it on purpose. A short 42-inch compartment is the only sleeper option now offered.

This Titan had a 20,000-pound steer axle and beefy wide-base tires and wheels which, with the long 255-inch wheelbase, limit wheel cut. So tight turns must be planned for or maneuvered through with a series of ups and backs, as I found out while doing a U-turn. This is a tradeoff presented by any heavy hauling truck or tractor with this type of front end.

Titan was Mack's entry in the American Truck Dealers' first annual Truck of the Year contest. Its specialized design limited the points it could win in the judging, so another tractor (International's Lone-Star) won. But Titan will rule the road for anyone who hauls lots of logs, coal, dirt or rock and will spend a lot of time off the pavement, and wants a Bulldog on the nose. 

Buying File: Compact Wheel Loaders

By MIKE ANDERSON, Senior Editor

Sizing up the Market *For Compact Wheel Loaders*

When compact models load up with full-sized-machine features, the market continues to churn

In the past year, list prices for new compact wheel loaders and average costs to put those machines to work have slipped . . . with one exception. According to EquipmentWatch.com, list prices for the largest models, those in the 80- to 99-horsepower and 100- to 109-horsepower ranges, have increased by 8.2 and 8.6 percent, respectively, although hourly rates to work those machines have, as with all compact wheel loaders, actually gone down. Model upgrades could explain part of the bucking of the economic-spiral trend, but there may just be more at play here with the largest of the compacts. Actually, it may just be that – the size of the machines – that is weighing heavily on the equation.

The WA150-6, rolled out in March, is

Komatsu America's first Dash-6 loader under the industry-recognized 109-horsepower threshold for full-sized wheel loaders, competing against such formidable models as the Volvo L45F and John Deere 344J in the 1.7- to 2.2-cubic-yard market. But the 98-horsepower WA150-6 is a compact in industry classification only, says Mike Gidaspow, Komatsu America product manager.

"The way that we categorize our wheel loaders, the 150 is actually the smallest of our construction-type loaders. It gives you all the bigger-loader features in a little bit smaller package," says Gidaspow. "The 150-6 received a lot of the features that the 200-6, 250-6 and 320-6 had received when they came out, and have currently. The biggest improvement is refinement with the hydrostatic transmission." Engine power is transmitted hydraulically to a transfer case, then mechanically to the differentials and four driving wheels. By adjusting automatically to tractive efforts demands, Komatsu's hydrostatic transmission provides aggressive drive into the pile, as well as fast travel response. The Dash-5 predecessor had "an on-off traction control system," but users wanted more variability within the system to better fit jobsite conditions, says Gidaspow.

A Komtrax fleet monitoring system was available on earlier-generation WA150 wheel loaders, but an updated version is standard on the Dash-6 units. "Our other construction wheel loaders will start receiving the upgrade," he says, "but the 150 is our first to have it from the start. All 150s will have the upgraded Komtrax, where you can see fuel consumption per day. We're finding more and more customers are finding value to Komtrax, and it's our challenge to make it more valuable for those customers, giving them more



Equipped here with an auger, the 304J is the mid-sized of three John Deere compact wheel loaders designed specifically with clear lines of sight from the operator's seat to the coupler and attachments. When cycling is required, a standard return-to-dig feature allows the bucket or other applicable attachment to be returned to a set position.



Terex designed its compact wheel loaders, including the TL100, with a single-pin articulation joint for improved alignment and less need for adjusting. This, says Terex, is in contrast to machines with upper and lower mounting pins, which double the front- and rear-end mounting points and introduce stability-threatening alignment variables.

tools that they can put to use. We're adding features to Komtrax that will help our customers make their businesses more efficient."

Similarly, the 98-horsepower L45 is the first machine in Volvo's extensive compact loader range to be upgraded to the F-Series designation, joining the 115-horsepower L50F in matching the styling of the 10 larger Volvo loaders, topped off by the 532-horsepower L350F. "The hallmarks for the F-Series are the Volvo Care cab and the instrumentation being on the right pillar, the comfortable climate control inside, improved serviceability across the board, and the good ol' faithful coupler up front," says Joel Powell, Volvo Construction Equipment North America's product specialist group manager, compact equipment. "There are some definite characteristics that the family shares. You'd be able to look at the L45, and it just goes up from there. There's no distinction between the big ones and the small ones; they all look, feel and smell the same."

The L45F is particularly suited to government agencies including municipalities, as well as material-handling companies in the ornamental landscaping sector, says Powell. "It's a good middle-of-the-road loader," he says. "It's kind of the best of both worlds – it

can fit in some tight areas, but has some large-loader characteristics as far as productivity is concerned. It's also very popular in some aggregate and quarry situations in order to get around conveyor belts where you couldn't get a larger machine. It's not large productivity as far as the actual amount of material you're going to be moving, but the utility and versatility is what makes it productive and popular."

While not the highest specified on the market according to figures from Spec-Check, the new Komatsu WA150's breakout force remains at above 16,000 pounds, "and that is one of the things that we really focus on with all of our wheel loaders," says Gidaspow. "Up and down the line, you'll see that we're the leader or pretty close to the leader in breakout force. We focus on breakout force, tipping load, and try to make sure our machines have good tractive effort, because those are the real good parameters of how well a wheel loader can dig.

"The older idea of thinking of a machine as far as horsepower and weight gives you an idea of how big it is or how it's going to perform," he says, "but the heavier the machine is, the more fuel it's going to burn. If you can

Cost of Ownership

Size Class	List Price	*Hourly Rate
Up to 39 hp	\$43,248	\$17.24
40 - 59 hp	\$62,787	\$22.68
60 - 69 hp	\$63,730	\$23.78
70 - 79 hp	\$77,069	\$27.45
80 - 99 hp	\$103,651	\$33.29
100 - 109 hp	\$105,816	\$35.60

* Hourly rate is the monthly ownership costs divided by 176, plus operating costs. Unit prices used in this calculation are diesel fuel at \$2.25 per gallon, mechanic's wage at \$45.39 per hour, and money costs at 5.625 percent.

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

Buying File: Compact Wheel Loaders

Compact-Wheel-Loader Specifications

Model	Net Engine Output (hp)	Operating Weight (lb.)	Bucket Capacity (cu. yd.)	Breakout Force (lbf)	Full Turn Tip Load (lb.)	Dump Clearance	Bucket Linkage
Wacker Neuson WL 18	25	4,057	0.26	2,792	1,640	6'9"	Parallel
Boxer 726DT	26	1,874	0.481	2,513	2,248	n/a	n/a
TCM E804-2	29	6,380	0.52 - 0.65	6,170	3,660	7'0.8"	Z-bar
Power Trac PT-1430	30	2,560	0.30 - 0.67	n/a	2,400	n/a	Inverted Z-bar
Power Trac PT-2430	30	3,350	0.30 - 0.67	n/a	2,400	n/a	Inverted Z-bar
Yanmar V3-6	30	6,801	0.52	5,400	3,924	7'0"	Z-bar
Boxer 732DT	32	2,271	0.1481	3,197	2,976	n/a	n/a
Wacker Neuson WL 25	33	5,556	0.45	4,471	2,952	6'8"	Parallel
Swinger 1200	36	4,780	0.33 - 0.85	2,765	2,400	6'6.2"	Parallel
Komatsu WA50-3	37	8,200	0.75	6,720	5,073	7'0"	Z-bar
Gehl 280	39	7,055	0.85 - 1.44	6,137	5,181	7'7"	Parallel w/bellcrank
Mustang ML28	39	7,055	0.85 - 1.44	6,137	5,181	7'7"	Parallel w/bellcrank
Yanmar V4-6	40	8,058	0.65	6,085	5,158	7'11"	Z-bar
TCM E806-2	41	8,260	0.78 - 0.92	7,500	5,030	8'2.4"	Z-bar
Coyote C5C	42	6,834	0.94	6,614	5,512	7'2.6"	Z-bar
Kubota R420S	43	7,450	0.50	6,550	3,850	7'4.4"	Z-bar
Power Trac PT-1445	45	3,920	0.44 - 0.89	n/a	3,600	n/a	Inverted Z-bar
Power Trac PT-2445	45	4,260	0.44 - 0.89	3,500	3,600	n/a	Inverted Z-bar
Wacker Neuson WL 30	48	6,857	0.60	9,089	3,648	7'11"	Z-bar
Boxer 749DT	49	3,440	0.1481	5,512	4,520	n/a	n/a
Wacker Neuson 280	49	7,055	0.85 - 1.4	6,137	4,409	7'7"	Inverted Z-bar
Kubota R520S	49	8,980	0.75	7,425	4,410	8'9.2"	Z-bar
Terex TL60	50	8,595	0.45 - 1.53	8,325	5,456	8'3"	Parallel
Terex TL65	50	9,040	0.45 - 1.53	8,325	5,788	8'3"	Parallel
Coyote C8	50	9,149	0.9	8,818	5,577	8'4"	Parallel
New Holland W50BTC	50	10,173	0.92 - 1.0	8,386	6,489	8'3"	Inverted Parallel
Case 21E Series 3	50	10,207	0.92 - 1.05	7,801	6,457	8'2.2"	Inverted Z-bar
Takeuchi TW50	51	8,708	1.05 - 1.11	8,992	5,975	8'4.4"	Parallel
Coyote C6	52	8,377	0.75	7,100	4,520	7'4"	Parallel
Caterpillar 904H	52	9,900	0.8 - 1.3	8,003	5,511	7'10"	Z-bar
Volvo L20B	54	9,945	0.85 - 1.25	6,970	6,175	8'3"	Parallel
Waldon 5100	57	7,100	0.41 - 1.0	5,000	3,500	8'3.7"	Z-bar
Volvo L25B	57	10,650	1.0 - 1.6	8,320	7,495	8'2"	Parallel
JCB 406 Tier III	58	10,870	1.0 - 1.8	9,420	7,275	8'2"	Parallel
Gehl 480	59	9,921	1.11 - 1.83	7,868	7,496	8'2"	Parallel
Mustang ML48	59	9,921	1.11 - 1.83	7,868	7,496	8'2"	Parallel
Takeuchi TW65	59	10,362	1.05 - 1.11	11,600	7,143	8'2.4"	Z-bar
John Deere 244J	59	11,552	1.0 - 1.4	10,792	7,718	8'4.4"	Z-bar
TCM E820-2	59	11,600	1.18 - 1.3	10,470	7,980	8'2.4"	Z-bar
Gehl 480T	59	11,684	1.11 - 1.83	11,016	6,746	13'1"	Telescopic, Extended
Mustang ML48T	59	11,684	1.11 - 1.83	11,016	6,746	13'1"	Telescopic, Extended
Power Trac PT-1460	60	5,620	0.56 - 1.11	n/a	4,800	n/a	Inverted Z-bar
Power Trac PT-2460	60	5,980	0.56 - 1.11	4,000	4,800	n/a	Inverted Z-bar
Gehl AWS36	60	9,921	1.11 - 1.83	7,868	7,054	8'2"	Parallel
Mustang ML360	60	9,921	1.11 - 1.83	7,868	7,054	8'2"	Parallel
Wacker Neuson 850	60	9,921	1.11 - 1.83	7,868	7,055	8'2"	Parallel
Case 121E Series 3	60	10,893	1.05 - 1.18	9,337	6,795	8'4.3"	Inverted Z-bar
Terex TL80	60	11,240	0.90 - 1.60	10,128	7,563	8'4"	Parallel
Komatsu WA80-5	60	12,434	1.04 - 1.63	10,164	8,135	7'11"	Z-bar
Waldon 4500B	61	6,920	0.43 - 0.78	5,950	2,800	7'8"	Z-bar
Takeuchi TW60	61	10,251	1.05 - 1.11	11,600	7,055	8'1.4"	Z-bar
Swinger 2K	65	8,000	n/a	4,752	5,000	8'0.4"	Parallel
Volvo L30B PRO	68	12,040	1.2 - 2.1	13,710	8,490	8'4"	Z-bar
Case 221E Series 3	69	11,976	1.18 - 1.31	9,723	8,002	8'6.3"	Inverted Z-bar
Caterpillar 906H	70	12,412	0.98 - 1.6	9,442	6,962	7'10"	Parallel Z-bar
JCB 409 Tier III	72	12,830	1.2 - 2.03	12,095	8,628	8'7"	Parallel

THERE'S POWER IN NUMBERS



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Buying File: Compact Wheel Loaders



As OEMs such as Caterpillar not only welcome, but in fact encourage via their own lines of attachments, compact wheel loaders can be just about any type of working machine in addition to a loader. The smallest model in the new Caterpillar H-Series wheel loader line, this 904H is equipped with an angle broom.

make a machine lighter, but have weight in the right places and have hydraulic power for breakout force, you can have a machine that's just as productive and burns less fuel because it's more efficient."

Below the WA150-6, Komatsu America currently offers the 37-horsepower WA50-3, 60-horsepower WA80-5, and 82-horsepower WA100M-5 models. Volvo has the L20B, L25B, L30B Pro, L35B and L40B.

Meeting needs

When it comes to sizing, the matching of a compact wheel loader to a customer's needs is naturally a more intricate equation, says Case Construction Equipment's Jim Hughes. There are no full-yard or even half-yard round-offs, unlike in the full-sized loader market. As part of its E Series 3, Case offers the 21E, 121E, 221E and 321E, ranging from 50 to 77 horsepower.

"You look at the 21 with its 50 horsepower and it's got a pretty small footprint," says Hughes, "and then you go up to the 121, 221 and 321, and they all grow in size just a little bit. If a guy has got a particular need from a size or a horsepower perspective, or a bucket-capacity perspective, he wants to be able to make sure he has that machine that will work exactly for him, as opposed to making something that may not be perfect for him have to work for him."

The Case compact wheel loader has a standard-flow hydraulic quick coupler system compatible with skid-steer attachments such


as forks, augers and tree spades, "but it gives you a little bit bigger footprint than a skid steer, so it has a little bit more stability; it's got a higher travel speed, especially with the two-speed option on it; and it's got more reach for landscape operations, stacking and even truck loading," says Hughes. "You're certainly seeing more contractors realizing the versatility of these machines as they become more popular in North America."

Skid-steer attachments add to machine versatility, but when leveraging the breakout force and stockpiling ability of a wheel loader, concurs New Holland Construction's Mike Murphy. "The new mono-boom linkage allows the best of both worlds," says Murphy, global product marketing manager - wheel loaders. "You can get quite a range of attachments, you can get nearly parallel lift, but you can also get the breakout force. We know that the skid steer loader is a Swiss Army Knife, and the compact wheel loader can be a Swiss Army Knife with some advantages over the skid steer. The benefit of the compact wheel loader is lifting capacity for one thing, and the reach and the ability to stockpile, which a skid steer loader can't do."

Murphy points out the reduced danger in waste-handling operations with a carrier that has increased spacing from the operator to the load. The availability of enclosed, pressurized cabs further suits compact wheel loaders to working in more extreme conditions.

Products of the same parent company, New Holland's compact wheel loader offering has half the number of models as Case's. New Holland's W50B TC and W80B TC, incorporating a Tool Carrier designation emphasizing attachment friendliness, are 50 and 77 horsepower, respectively.

"The model offering is based on what the market demands," says Murphy. "It looks like there is a gap in there, but our experience has been that there really isn't. We respond to what the market is specifically asking us for."

With 20-plus brands of wheel loaders serving the 25- to 109-horsepower market, there would appear to be, as Hughes suggests, a fit for every need. 



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Gallery of Compact Wheel Loaders



KUBOTA

Loaders Boast Traction, Versatility

A load-sensing transmission automatically adjusts the speed and torque of Kubota R-Series wheel loaders in response to load conditions. An electric shuttle shift lever allows on-the-go directional change of the 43- and 49-horsepower R420S and R520S models without clutching or braking. Standard four-wheel drive, limited slip differential, and rear-frame oscillation contribute to machine traction and stability, says Kubota.

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NEW HOLLAND CONSTRUCTION

Universal Link Design Up Front

Upgraded with Tier-3 New Holland engines from Fiat Powertrain Technologies, the W50B TC and W80B TC compact wheel loaders are rated at 50 and 77 net horsepower, respectively. A new boom design featuring one lift cylinder and one bucket cylinder enhances both visibility and breakout force, says New Holland. The standard hydraulic quick coupler is compatible with all skid-steer attachments. The W80B TC has a high-speed option.

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WACKER NEUSON

Choice Extends to Model

Bringing to North America models established in Europe, Wacker Neuson actually markets two styles of compact wheel loaders here. In addition to the WL 18, 25, 30 and 50 articulated loaders, the company offers the 280 and 850 rigid-frame all-wheel-steer models suited for stable work on steep grades. The rigid frame means the operating capacities do not change when the machine turns. Most articulated models are equipped with an on-demand differential lock for traction.

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YANMAR

V-Series Models Do More with Less

At 30 and 40 horsepower, respectively, the Yanmar V3-6 and V4-6 wheel loaders are designed with a lower profile, which not only improves center of gravity for stability, but suits enclosed-carrier loading. Lifting capacity, with single-lever bucket operation, is 5,760 and 7,451 pounds, respectively. Driving force is transmitted evenly to the ground courtesy of rear-axle oscillation. An optional mechanical quick coupler fits most skid-steer attachments.

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TEREX

High-Flow Option for Larger Units

A high-flow auxiliary hydraulics option has been added to the largest two of four Terex compact wheel loaders. This extends, with the use of continuous-flow attachments, the work application options for the 60-horsepower TL80 and 73.5-horsepower TL100 models. A four-wheel-drive, limited-slip differential hydrostatic drive system on each Terex model provides a 90-percent availability of maximum torque at start-up; and rapid starting, stopping and reversing.

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TAKEUCHI

Center-Pivot Articulation Cuts Required Space

The first line of wheel loaders offered by Takeuchi, the four-model TW family features center-pivot articulation, allowing the rear tires to follow the path of the front for greater confined-area control. Standard-equipped with hydraulic quick-attach, Takeuchi loaders articulate 40 degrees left and right and oscillate 10 degrees in the front and rear. Momentary push-button control of 100-percent front and rear differential lock provides additional traction in harsh terrain.

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Gallery of Compact Wheel Loaders

JOHN DEERE

Tight-Turning Trio Forms Family

With three models in its "Compact 4WD Loader" line, defined as up to 2 cubic yards in bucket capacity, John Deere leverages stereo steering for a tighter turning radius. Simultaneous rear-wheel steering reduces the amount of required loader articulation, keeping the center of gravity and ballast in line for better full-turn tipping load capacity. Two-travel-speed transmission and return-to-dig are standard for the Tier-3 304J and 344J models and the interim-Tier-4 244J.

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CASE

Versa-Boom Allows Fork-Tip Visibility

Having repowered and reintroduced its four E Series compact wheel loaders with a 3.2-liter, Tier-3-certified, Case-branded engine in early 2008, Case continues to offer the Versa-Boom design for operator visibility to the skid-steer-compatible quick coupler and attachments throughout the lift cycle. The parallel lift has a variance of less than 1 degree throughout the cycle. A high-speed option and return-to-dig feature boost machine productivity.

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CATERPILLAR

H-Series Models Hit Market

With the 914G/IT14G model established, Caterpillar introduced H-Series versions of the smaller 904, 906 and 908 compact wheel loaders. The completely redesigned 906H and 908H feature a standard skid-steer-style coupler, differential lock and Z-bar linkage. The 904H, compared to its predecessor, has a new engine, operator's station, axles and styling. H-Series compact loaders offer such options as ride control, high-flow hydraulics, and a high-speed configuration.

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VOLVO

Family's Big Brother Moves Up

The largest Volvo wheel loader in the compact jurisdiction, the 98-horsepower L45 has been introduced recently as an F-Series model, incorporating characteristics of Volvo's larger loaders. The L45F has a Volvo Care cab, Volvo D5D engine, hydrostatic drive, enhanced exterior styling, and a hydraulic reversible fan option. On the five B-Series models ranging from the L20 to the L40, an oscillating front axle provides comfort, load retention and stability over rough terrain.

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KAWASAKI

Model Adopts Larger-Machine Options

KCMA Corp., which brings Kawasaki loaders to market in North America, offers one model within the industry-established compact range. The updated 96-horsepower 50ZV has options found on larger models that will match demands for this particular machine size in waste and recycling, extreme applications and agriculture, including high-lift arms and anti-corrosive features. An automatic power-shift transmission has three forward and three reverse speeds.

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KOMATSU

Dash-6 Upgrade for Large Model

The newest Komatsu wheel loader, the Dash-6 version of the 98-horsepower WA150 falls under the industry-established compact threshold, but has many of the changes recently made to the larger WA200, WA250 and WA320 models. The WA150-6 has variable traction control with S-mode to reduce wheel spin, as well as the Komtrax fleet monitoring system as standard. For more compact needs, Komatsu currently offers the WA50-3, WA80-5 and WA100M-5.

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Gallery of Compact Wheel Loaders

DOOSAN INFRACORE

Cab Offers Big-Machine Comfort

As part of the full DL Series of wheel loaders, Doosan Infracore offers one model under 109 horsepower. The DL 160 has been updated with a cab design accommodating operators of all sizes, thanks to a tilting and telescopic steering column, fully automatic climate controls, an adjustable armrest for the joystick, and an adjustable, lumbar-supported, air-suspension seat that is 15-percent larger than the predecessor Mega Series loader's is.

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JCB

Upgrades for Each Machine

Each of the three compact wheel loaders in the JCB product family has undergone significant changes. The 406 and 409 transitioned from Perkins to Deutz engines, and from Z-bar to parallel-lift geometry, gaining increased visibility along the way. The 411HT model, in addition to transitioning from a Perkins to JCB engine, has an upgraded cab. JCB loaders have, as options, both a skid-steer adaptor plate and quick-hitch.

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GEHL

All-Wheel-Steer Models Have Intelligent Drive System

Introduced by Gehl in 2008, the 60- and 75-horsepower AWS36 and AWS46 all-wheel-steer loaders feature an intelligent drive system, which automatically adjusts speed and pushing power based on the resistance applied to the work tool. The hydrostatic pump is directly coupled to the Deutz Tier-3 engine, providing oil flow to high-torque, radial-piston, hydraulic motors. A continuously variable, hydrostatic, axial-piston gearbox is coupled to the front and rear axles.

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MUSTANG

Hydrostatic System Drives Loaders

The Gehl-owned Mustang brand offers two new all-wheel-steer loader models, the ML360 and ML460, featuring a combination of steerable axles with a rigid frame to create a fixed center of gravity that maintains rated operating loads throughout turns. Without the need to change gears, the Mustang all-wheel-steer loaders use hydrostatic drive to automatically adjust speed and pushing power while lifting and loading.

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COMPACT POWER

Three Models Make Up New Line

A new product line for Compact Power's Boxer Equipment brand, the DT Series of articulating compact wheel loaders has three models ranging 2,248 to 4,520 pounds in tip capacity. The telescoping boom extends from nearly 9 feet on the 26-horsepower 726DT to 12 feet on the 49-horsepower 749DT. Ground speed for the top-of-line 749DT reaches 13.7 miles per hour. Boxer loaders have steering wheels for drive and joystick controls for boom and bucket use.

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AGCO WILLMAR

Oscillation Keeps Wheels On the Ground

An AGCO product, the Willmar Wrangler 4550 articulating loader leverages an 83-horsepower Deutz engine with single-speed, hydrostatic, four-wheel drive. Electronic shuttle-shift and foot-pedal speed control enhance smooth operation, and a 16-degree frame oscillation keeps all wheels on the ground in rough terrain. The universal tool carrier accommodates most skid-steer attachments, with joystick control providing easy lift and tilt.

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Buying File: Attachments

CEAttachments

For use on compact wheel loaders, the Edge roto tiler features bi-directional shaft rotation for under-cutting and topcutting in both forward and reverse. Hardened, replaceable tines will cut up to 6 inches deep, and the off-set mount allows the heavy-duty attachment to be worked right up to obstacles, suiting it for seedbed prep, compost mixing and home-site tilling. A direct-drive hydraulic motor minimizes maintenance, says the company.



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General

Clamping to loader buckets up to 2.5 cubic yards in capacity, General Equipment's 130C Cut-R-Tach asphalt cutter requires no special tools, modifications or adaptors. The patented, twin-screw pivot clamp conforms to differences in bucket shapes and sizes, and can be used in forward and reverse cutting. A 13.5-inch-diameter cutting blade is machined from a heat-treated alloy steel and yields a maximum asphalt cutting depth of 5 inches.



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Compact Power

Equipped with a universal mini-skid mount plate, the Boxer-branded grapple bucket turns compact articulating wheel loaders into quick worksite clean-up machines, says Compact Power. Maneuver the carrier through obstacles with ease, extend the telescopic boom into piles of brush and refuse, and grab a load with the hydraulic jaws. Retract the boom, transport the hard-to-handle materials to a waiting dump truck, and simply offload.



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Caterpillar

Operating on standard-flow hydraulics, Caterpillar's BA22, BA25 and BA30 angle brooms offer sweeping widths from 87 to 118 inches. A suspension system elimi-



ates the need for support wheels and allows the broom to float freely over the surface. Constant ground pressure from the polypropylene/wire convoluted brushes is maintained through a range of vertical motion. A hydraulic angling option allows the broom angle to be controlled from the operator's seat.

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Premier

With an expanded range of speeds and torques increasing utilization, Premier Auger drive units are well suited for use on compact wheel loaders, says the company. Featuring in-line drive planetary gear reduction, the design of the Premier Auger product allows the drive unit to follow the auger bit into the ground, adding to overall digging depth. Wear life is extended by greaseable pins located at pivot points on the heavy-duty mounts.



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Skid Steer Solutions

Identifying a market need for smaller carriers including wheel loaders to be able to side-mow, Skid Steer Solutions has introduced the Terra Boom as part of its Edge Series of mowers, for use on any machines able to accommodate skid-steer attachments. Designed for contractors or municipal



crews requiring the extra reach to be able to mow areas off to the side of the carrier, the Terra Boom extends 12 feet from the boom centerline to the outer edge of the mower.

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Spotlight

By ANDREW BALTAZAR, Associate Editor

Lubricants

CONOCOPHILLIPS

Formulated with liquid-titanium technology that provides enhanced engine wear protection, reduced bearing corrosion, and increased oxidation stability, Guardol ECT is one of ConocoPhillips' latest API CJ-4 diesel engine oil product. The synthetic blend diesel engine oil is made from an advanced, low SAPS (sulfated ash, phosphorus and sulfur) technology, and it has been approved under the latest heavy-duty engine-oil specification from major engine builders.

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SHELL

Rotella T 15W-40 with Shell's Triple Protection technology meets the API CJ-4 service category for heavy-duty diesel engine oils. According to Shell, Rotella oil provides significantly lower

wear, increased deposit control, and engine cleanliness for both pre-2007 engines and the latest performance and emissions systems technology found on new diesel-powered truck engines built after Jan. 1, 2007.

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PETRO-CANADA

A new addition to its line of API CJ-4 heavy-duty engine oils, the Duron-E 10W-30 from Petro-Canada is formulated for both on- and off-road fleets. Performance benefits include improved soot dispersancy, extended drain capabilities, low-engine wear, and good top-up and cold start-up performance. The engine oil is suitable for four-stroke diesel, gasoline and natural gas applications where SAE 10W-30 is recommended, and is compatible with engines equipped with exhaust after-treatment devices.

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EXXONMOBIL

Designed to handle the lubrication requirements of both industrial and mobile high-pressure hydraulic systems, Mobil DTE 10 Excel Series hydraulic oil is ideal for numerous industrial and off-highway applications, including construction, energy/power, mining, general manufacturing, machine shops, plastics, and pulp/paper. According to ExxonMobil, the DTE 10 Excel oil delivers high levels of hydraulic efficiency, resulting in measurable decreases in fuel consumption and cycle times. It also has high viscosity index and shear stability.

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CATERPILLAR

Caterpillar's HYDO Advanced represents a significant performance breakthrough in hydraulic oil technology. A combination of unique additives and two premium base oils delivers drain intervals of up to 6,000 hours when Cat SOS Fluid Analysis is used. The hydraulic oil also provides long-lasting anti-wear protection across a wide temperature range and is backwards compatible.

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CHEVRON

Specifically formulated for new low-emission engines using ultra-low sulphur diesel, the Delo 400 LE SAW 10W-30 oil extends the life of diesel particulate filters for less frequent downtime and cleaning. Its improved soot dispersancy and wear control mean cylinders, pistons, rings and injectors are protected against wear and corrosion. The high level of ashless dispersants keeps fuel soot in suspension and helps avoid filter plugging, heavy cylinder head sludge, abrasive polishing wear, high viscosity increase, and oil gelling.

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AMSOIL

Amsoil has upgraded its 15W-40 viscosity diesel-engine oil, now reformulated for the 2007 CJ-4 specifications without sacrificing extended service life. The new emissions-compliant oil is backward compatible, offering maximum protection in all diesel applications including those with exhaust-treatment devices. Its heavy-duty detergent/dispersant additives and high 10.4 TBN control soot thickening from exhaust gas recirculation (EGR) and blow-by to protect against corrosion, cylinder bore polishing (wear), and varnish/sludge deposits. The oil is shear stable and provides exceptional oxidation stability to resist heat and breakdown from continuous operation and high load.

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KANO

Engineered to loosen frozen metal parts and provide additional lubricating characteristics to keep parts moving, Silikroil combines the penetrating properties of Kroil and the lubricating properties of silicone. Kroil's high-solvency penetrating oils first penetrate to spaces one-millionth of an inch to break the bond of rust and to provide lubrication at the first molecular level. This frees the frozen metal part. The dimethyl silicones then provide extra long-lasting lubrication to keep the parts moving.

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The Right Way to Recover Overhead Costs

Distributors and end-users both may operate shops, but the strategies used to recover overhead costs can cause some controversy



Mike Vorster

David H. Burrows Professor of Construction Engineering and Management at Virginia Tech. See ConstructionEquipment.com for full archives of "Equipment Executive."

Every now and then, you must be controversial and address a subject where your beliefs run counter to common practice. Overhead and overhead-cost recovery is one of these subjects.

The controversy has its roots in the difference between a dealer's shop and a contractor's shop. These are two different organizations with different objectives. True, there are similarities. Both use expertise, facilities, skilled management, trained labor, and expensive parts and supplies as inputs to maintain, repair and rebuild equipment. Both serve their customers by producing high-quality and timely work, and both profess commitment to reliability in the machines that pass through their hands.

They differ, however, in their outputs and the way they are paid. A dealer's shop is paid and balances its books by selling parts and labor marked up to cover indirect costs, overhead and profit. The more parts and labor sold the better, and the only limit is defined by competitive pressures and

the wish to render "value to the customer." A contractor's shop is paid and balances its books by selling machine hours at pre-agreed internal rates. The more machine hours sold and the more completed construction produced by the machines the better. The performance of the machines is crucial to success; and the objective is to reduce parts, labor and overhead costs to the lowest possible level consistent with

achieving required availability, utilization and reliability.

Two principles are important when deciding how to account for and manage overhead costs associated with running an equipment fleet.

1. Overhead cost must be reduced to the absolute minimum. Every cost should be assigned to direct codes when-

ever possible. Fuel trucks can form a part of the direct cost of fueling, and lowboys can be charged to jobs benefiting from their service. Classifying cost as overhead should be seen as an absolute last resort.

2. Mechanisms for generating overhead

Mechanisms for generating overhead cost recoveries must be tied to easily identified, measurable and desired outputs.

How Shops Differ

	Dealer's shop	Contractor's shop
Inputs	Expertise, facilities, management, skilled labor, parts and supplies.	Expertise, facilities, management, skilled labor, parts and supplies.
How the customer is served	High quality, timely work. Uptime and reliability in equipment maintained, repaired or rebuilt.	High quality, timely work. Uptime and reliability in equipment maintained, repaired or rebuilt.
Outputs, how are you paid	Cost of parts and labor marked up to cover direct and indirect costs, overhead and profit.	Revenue or cost recovery based on hours worked. Availability and utilization of equipment in the field is critical.
The work order's role	Records work done and marked-up cost of parts and labor. Forms the basis of payment.	Records work done and cost of parts and labor. Forms the basis of the machine's history.

Work orders play different roles in the types of shop. They form the basis for payment in a dealer's shop; they simply record data in the contractor's.

Labor vs. Work Produced

	Dealer's shop	Contractor's shop
Base overhead cost recovery on the cost of labor and/or parts used to maintain, repair or rebuild a machine.	The normal way of doing it. Parts and labor are outputs: the more sold, the more likely you are to recover your annual overhead and be in a position to lower your overhead rate.	A frequently found way of doing it. Overhead recovery is incorrectly based on an input. The lower parts and labor cost, the worse overhead recovery becomes and the higher the overhead recovery rate must be set.
Base overhead cost recovery on equipment revenue as an output measure for the value of work done by the machine.	Seldom done. Dealers could charge the direct cost of parts and labor and warrant their work by using a variable percentage based on reliability and availability to recover overhead and margin.	Overhead recovery based on an output. The better utilization and availability, the more hours worked, the lower the overhead recovery rate can be set.

The difference between basing overhead recovery on the cost of parts and labor as opposed to the value of work produced is summarized for both a dealer's shop and a contractor's shop. It clearly shows the advantage of basing overhead cost recovery on outputs and shows how important it is to break with the traditional way of accounting for and managing overhead when running a contractor's shop. It also raises an interesting question.

cost recoveries must be tied to easily identified, measurable and desired outputs. An output such as shop labor makes sense for a dealer's shop where labor sold is the output. It doesn't make sense in a contractor's shop where labor is an input. Contractor shops should instead tie overhead recovery to outputs such as total equipment revenue so that improvements in utilization, availability and reliability result in corresponding improvements in overhead cost recovery.


The difference between tying overhead cost recovery to either labor or equipment revenue is best explained by the example in the accompanying table. Total annual cost for owning and operating the fleet is \$5.6 million with an anticipated gain of \$70,000 based on the assumption that the fleet will work 95,000 hours at an average rate of \$65 per hour. Labor cost is based on 16,200 labor hours at a rate of \$47.54. The \$320,000 in overhead covers rent, facilities utilities, indirect labor and miscellaneous supplies.

Recovering overhead as a percentage of labor, as is done in dealer shops and in many contractor shops, is a simple process. Overhead costs is recovered at a rate of \$19.75 per labor hour ($\$320,000 \div 16,200$), which when added to the \$47.54 labor rate, results in a rate of \$67.29 per hour.

Tying overhead to equipment revenues can be done in a number of ways. For our purposes, let's calculate overhead cost recovery at a flat rate of \$3.37 per machine hour ($\$320,000 \div 95,000$) with the balance of \$61.63 ($\$65 - \3.37) available to recover the direct owning and operating costs.

In the labor scenario, let's assume that training and technology have enabled the company to improve labor efficiency and to reduce the required labor hours from 16,200 to 14,200. There will be an immediate gain of \$95,080 (2,000 hours saved at \$47.54 per hour) in direct labor, but the overhead budget will be short by \$39,500 (2,000 hours saved at \$19.75 overhead recovery per hour). It is counter-intuitive to have an improvement in training and technology result in a negative impact on overhead recovery. Not the situation you want to encourage.

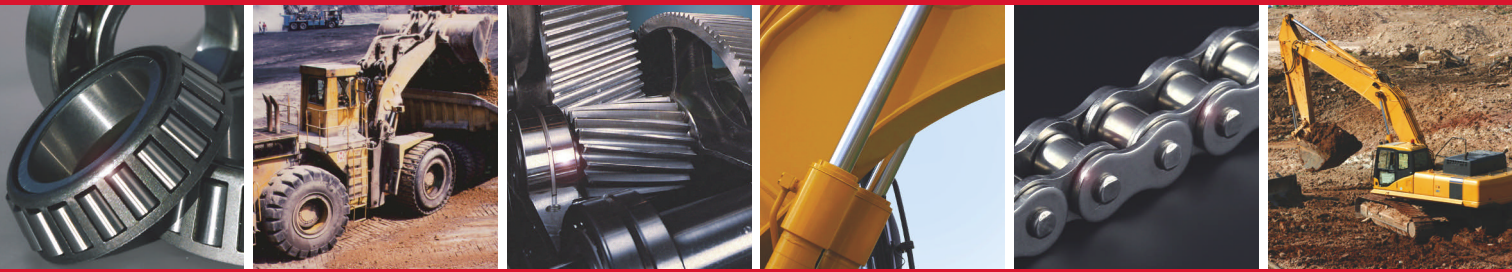
In the equipment scenario, let's assume that efficiencies, training and technology have enabled the company to increase availability and obtain an additional 5,000 work hours. Revenue will go up by \$325,000 (5,000 x \$65 per hour), and more importantly, overhead recovery will improve by close to \$17,000 (5,000 x \$3.37) to help pay for the overhead costs associated with the training and technology. Exactly the situation you want to encourage.

So here's the controversy. Why would dealers who believe that reliability and performance are outputs arising from action taken to maintain, repair or rebuild a machine charge the direct cost of parts and labor plus a variable percentage based on reliability and availability to cover their overhead and margin? 

Cost-Recovery Example

Owning Costs	\$1,500,000
Operating Costs	
• Parts	\$1,940,000
• Labor	\$770,000
• Fuel	\$1,100,000
Total	\$3,810,000
Overhead	\$320,000
Total cost	\$5,630,000
Revenue	\$5,700,000
Anticipated gain	\$70,000

Total annual cost in our example is based on 95,000 hours of fleet utilization and 16,200 hours of shop labor.



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Ahhh! The Joy(stick) of Loader Operation

To the relief of shoulder-sore operators, Case offers joystick-steering option on wheel loaders from 2-cubic-yard model up

The benefits of joystick steering are enjoyed every working day by operators of large wheel loaders in mining and quarrying applications, says Case Construction Equipment's Mitch Blake. Why, the former operator has often wondered, should his brethren driving smaller full-sized loaders on construction jobsites not have the same opportunity?

Well, Case is making joystick steering available as an option on all wheel loaders from the 2-cubic-yard 521E up. This will, says Case, cut operator fatigue and boost machine productivity in repetitive-cycle operations such as scrap and recycling, agriculture, utilities and material handling. "It's a more effective and efficient way of steering for those short cycles," says Blake, Case brand marketing manager. "It puts the flow much quicker through the steering system to allow that machine to steer a lot faster."

Case's joystick steering can be used in all gears and work modes, operating at full response with the loader traveling at under 12 miles per hour and, for controllability, at 80 percent when over 12 miles per hour. Activation of joystick steering is not recommended for roading.

Housed in the left armrest of Case's full-sized E Series

Case E Series Wheel Loaders

Model	Net Engine Output (hp)	*Operating Weight (lb.)
521E/XR/XT	118	23,069
621E/XR/XT	146	27,406
721E/XR/XT	172	30,644
821E/XR	198	37,844
921E/XR	274	50,622
1221E	320	66,930

* Operating weight for basic model configuration

wheel loaders, the optional feature includes a joystick lever; a forward, neutral and reverse switch; and a transmission kick-down switch. It will, says Blake, be a welcomed feature for shoulder-sore operators who have had to rely on the steering-wheel knob. "That knob helps," says Blake, "but you're always moving that arm, elbow and shoulder in a circular motion. You do that a couple of hundred, even a thousand times a day while you're loading a machine, and

it aches after a while. Well, this brings all that steering function, forward-neutral-reverse function and kick-down function into one hand, at rest, with very low-effort controls — basically fingertip controls."

Joystick steering is designed to complement, not eliminate, the steering wheel of Case's E Series loaders, says Blake. "If for some reason you bump the steering wheel when operating the joystick steering, automatically the priority of the steering takes back over at the wheel," he says. "And if you lift up the armrest for any reason, it deactivates the joystick steering for safety reasons."

Joystick steering is being made available as an option immediately on the five wheel-loader-model sizes ranging from the 118-horsepower 521E up to the 274-horsepower 921E. It will eventually be available for the 320-horsepower 1221E also.

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Now available as an option on Case's full-sized E Series wheel loaders from the 118-horsepower 521E on up, joystick steering can be used in all gears and in all work modes.

Technology Report

By ANDREW BALTAZAR, Associate Editor

Track Your Fleet Via the Web with Tierra

With Topcon's Tierra, fleet managers can track equipment locations on an online map, view instrument panels remotely in real-time, and more

Developed by California-based Topcon Positioning Systems, Tierra is a Web-based asset mobile management tool that helps fleets track equipment location, manage jobsite security, and transmit real-time machine-performance data.

To enable bidirectional communication and data sharing with a central database and remote computers, each monitored piece of machinery, whether it be an excavator, motor grader, paver, or even an SUV, must be equipped with a wireless device, such as the Topcon AM10, AM25, AM50, or ADL100.

Once equipped with the device, each vehicle's location will be visible on a digital map. Using either the AM50 or ADL100, equipment with built-in CAN-bus functionality can also remotely provide data on fuel levels, engine hours, oil pressure, idle time and maintenance requirements, and the instrument panel can be viewed from a remote location.

"Remote location or remote office, it makes no difference," says Mark Bittner, senior vice president of Topcon telematics. "With Internet connectivity, you see working machines on the jobsite in a wide variety of ways and get information that is important to creating the maximum productivity from your heavy iron."

"Topcon Tierra also provides an array of advanced analyses designed to provide the most meticulous data to companies interested in maximizing productivity and drastically reducing unexpected and unnecessary equipment maintenance," Bittner says.

To help prevent theft, Tierra's geofencing feature sends an alert either by e-mail or text message when a machine goes outside a pre-designated area plotted on an online map. It can



Tierra shows machine locations via GPS, engine performance, as well as real-time machine speed and fuel status through the virtual instrument panel.

Inset: When installed in a vehicle, the AM50 allows that vehicle to be seen by the Tierra network, allowing managers to view its location, maintenance needs, performance and other data.

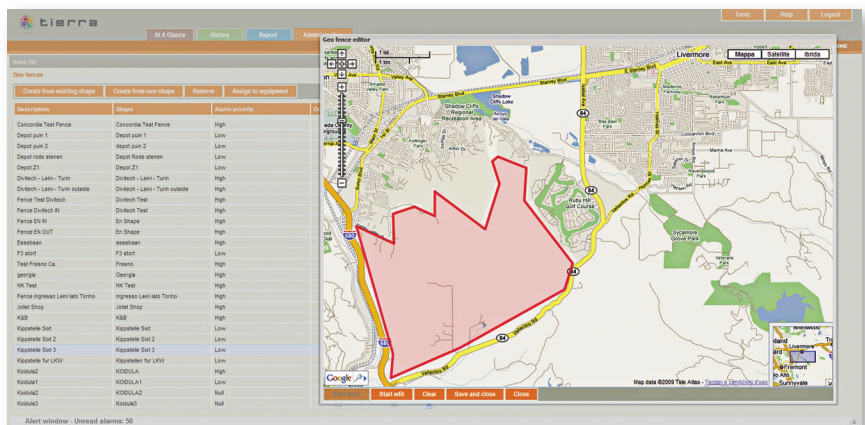
also show the run-paths of each vehicle, illustrated by "trails" on the online map, as well as reproduce real-time or cached video from a worksite.

The diagnostics feature updates fleet managers on the status of individual machines and their maintenance needs, downtime and productivity; and the report feature provides data on path run, engine-on time, and medium, minimum or maximum telemetry status.

"Simply put, Topcon's system lets you monitor every piece of equipment regardless of location, regardless of make or model," Bittner says. "And it provides you with instant documentation on the jobsite information you want to receive."

Because Tierra is a Web-based tool, no additional software is needed to access its features. Fleet employees can simply log into the Tierra Web site from any Internet-enabled computer around the world.

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The geofencing feature, which lets fleet managers create a virtual "fence" on an online map, will send an alert when a machine goes outside the fence borders.

Fleet Management Quiz

My off-road mixed fleet:

- ☐ Meets all emissions standards
- ☐ Has integrated telematics
- ☐ Operates safely
- ☐ Operates at peak utilization
- ☒ **Could use a little help**

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A man's profile is shown in a blue denim shirt, looking upwards. A small yellow toy excavator is balanced on his forehead, with its arm and bucket resting on his brow. The background is white.

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Baghouse Walk Keeps Plant Project Moving

Crane balance and operator skill carry near-capacity loads to work through a maze

Abington Group hired The Smedley Co. to bring its Link-Belt 298HSL crawler to its power-plant retrofit job because the 230-ton crane's offset jib options would allow the contractor to lift and turn large modules for easiest assembly at controlled heights. They discovered that the crane's stability and agility transporting heavy loads would save their production schedule at a critical juncture.

The contract calls for upgrading the 150-megawatt power plant in Holyoke, Mass., with a new emissions-control system called a Turbosorb. The system binds power-plant flue gases with powdered carbon and hydrated lime, then removes the dust with 12 baghouses mounted 145 feet above the ground.

Turbosorb sections are engineered with weights up to 100,000 pounds so the 298HSL can lift and turn them for fabricators to work at heights no more than 40 feet off the ground.

"The crane (during one time period) had a 30-foot-long jib with a 5-degree offset that is capable of 39,000 pounds for a single line pick," says Abington superintendent Don Leavitt Jr. "This jib length also puts the whip line out at a good distance from the main block. So, instead of two cranes to turn over a (25- by 13- by 55-foot) module that may weigh up to 75,000 pounds, we use just the 298HSL crane main block and jib. You see, often times, the fit-up and welding is easier if the piece is in a different position than its final placement. Sometimes we may have to flip it twice."

Abington ran into a snag last winter when the temporary construction roads proved inadequate to support a flatbed trailer carrying the heavy modules from the assembly yard to the site. They enlisted the 298HSL to walk several of the huge loads more than 700 yards to the plant.

The 298HSL's capacity at a 60-foot radius is about 83,100 pounds. Each baghouse plus rigging weighs up to 72,000



The 700-yard walk took these 13-foot-wide, 72,000-pound baghouses down 24-foot paths.



Operator Mark Tidwell

pounds, so it was decided the load radius for the 25-minute walk would remain at 52 feet.

Passing through the crowded site would take the 52½- by 22½- by 13-foot funneled boxes down 24-foot-wide paths freshly paved with 6 inches of 1½-inch stone over snow and ice. Crane operator Mark Tidwell was guided along the way by a team on the ground, positioned around the baghouse.

"Turn it a little," sounded clear over the radio, as the 298HSL started to pirouette, the tracks counter rotating. The baghouse swung over snow-covered insulation and siding and lowered back into the pathway with the funnel pointing to the plant.

The looming baghouse hovered smoothly along the path while the crane maneuvered and turned to avoid obstacles or changes in grade, Tidwell keeping an eye on the crane's level bubble all along.

At the end of the walkway, for the fourth time in a day, a congratulatory voice crackled from the speaker: "You are one smooth operator."

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Link-Belt 298HSL Basics

Capacity	Boom	Max. Boom + Jib
230 tons	Tube: 300 feet	270 feet + 90 feet

Source: Link-Belt

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▶ JRB

A two-cylinder design allows the JRB Multi Pick-Up coupler to accommodate any number of "quick-hitch" front-end loader attachments. These include JRB 416, JRB ISO, Deere 416 and Deere Hi-Viz attachments, as well as front-end tools from Volvo and JCB. In a few seconds, a wheel-loader operator can switch from a bucket to a boom, forklift, or broom without leaving the cab or requiring the assistance of additional personnel.

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▶ Chicago Pneumatic

For the powering of hydraulic tools for construction, demolition and maintenance projects in confined or remote spaces, Chicago Pneumatic's new compact hydraulic power packs are built with foldable handles and large wheels. The largest model in the PAC product family measures only 27.6 inches wide, 28.3 inches long and 29.3 inches tall. Available are both gas- and diesel-powered units, ranging from 143 to 256 pounds in service weight.

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▶ The Equipment Lock Co.

E-Series Skidsteer Lock immobilizes one drive lever of any skid steer loader, and the maker says it will work on machines with enclosed cabs as well as open ROPS. The E-Series lock comes with barrel-style keys, and any number of locks can be keyed



alike. It is also available with a changeable combination lock, rather than a key lock.

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▶ Atlas Copco

At a service weight of 7,940 pounds, the Atlas Copco HB 3600 hydraulic breaker is suitable for carriers in the 35- to 63-metric-ton weight class, filling a gap among classes previously available. With PowerAdapt, AutoControl and StartSelect features as standard, the HB 3600 accepts maximum hydraulic flow of 79 gpm at 2,610 pounds per square inch. Delivering an impact rate of up to 560 bpm, the breaker leverages an energy recovery system that prevents damage from piston recoil on hard materials.

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Market Watch Lite

▶ **Paladin**

A side-discharge bucket designed specifically for skid steer loaders is available from Paladin Light Construction in two types, each with two models sizes. A product of Paladin's FFC brand, the bucket's sand version comes in widths of 60 and 72 inches, and is capable of right or left discharge. A removable belt cover keeps the weight off the belt and reduces stalling. The saw-dust version is available in widths of 72 and 84 inches, and features a material agitator.

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▶ **Kohler**

Kohler's Global Power Group entered the diesel engine business with seven air-cooled models from 6.7 to 34.9 horsepower and six liquid-cooled models from 16.8 to 64.4 horsepower. Single- and multi-cylinder models are EPA- and CARB-emissions compliant and available throughout North America and the Asia Pacific region. Kohler's new diesel line is said to feature advanced fuel efficiency and low sound levels, with many air-intake and oil-filtration system options.

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▶ **Genesis Attachments**

Genesis Demolition Recycler is designed for third-member use on excavators weighing 45,000 pounds and larger. Pulverizing attachment has 115 tons of crushing force at the tip, a jaw 32 inches deep and opening to 35 inches, and a 5.1-second cycle time. It can be custom-configured with as few as five pulverizing teeth and 16-inch blades to 19 teeth and 4-inch blade.

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▶ **Case**

To facilitate the switching of attachments from the seat of the cab, Case 521E, 621E, 721E, 821E wheel loaders and their various configurations are now available with a new Case-branded hydraulic quick coupler as a factory-installed option. Along with brooms, forks, jib booms and assorted other buckets, the coupler is compatible with Case rapid-fill buckets. The coupler is also available as a dealer installation for the retrofitting of machines already in the field.

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► Terex Roadbuilding

Terex foamed asphalt system allows producers to mix water and hot liquid asphalt (AC) in the exclusive expansion chamber, which eliminates the need for additives, according to Terex Roadbuilding. System consists of an expansion chamber and a programmable logic control (PLC) skid package. Once the hot AC and water combine in the chamber, the foamed asphalt is injected into the drum. For field installations, the PLC unit comes complete in a water skid package.

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◀ Paladin

A parallel-arm floating suspension allows Sweepster CS high-dump collector sweepers to follow the ground contour independent of the carrier. The attachments, available in models featuring 26- or 32-inch-diameter brushes, operate on hydraulic systems with flow of 14 to 50 gpm. The CS26 model is available with total sweeping widths of 84 or 96 inches for use on backhoe loaders and compact wheel loaders. The CS32, with sweeping widths of 96 and 108 inches, is designed for wheel loaders in the 1.5- to 3.0-cubic-foot size range.

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▼ E2 Systems

E2 Systems' Portable Conveyor attaches to 2.5-cubic-yard wheel loaders and the maker claims the 60-inch conveyor has outperformed standard material-transfer placer systems by two to one at about one-fourth of the cost. It is said to have placed 300 cubic yards of concrete per hour on road grade when supplied by dump trucks hauling 11-cubic-yard loads. The conveyor is operated from inside the cab of the machine using the hydraulic controls and the power of the wheel loader.

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Market Watch Lite

▶ Radmeister

Radmeister says its solid, air-cushioned rubber, skid steer tires will keep working even if a large hunk is cut out of them, and they can handle 30 percent more weight than pneumatic tires. A set weighs 250 to 400 pounds more than pneumatic tires, which the company claims will add machine stability. The flat-proof tread has deep lugs, and the body uses many deep holes placed close together to provide tire suspension and significantly reduce vibration.

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▶ Leica Geosystems

Three lasers have been added to the Rugby series of automatic, self-leveling grade lasers from Leica: Rugby 420DG, 410DG and 320SG rotating lasers. DG designates dual grade; SG single grade. Features include on-the-fly remote control operation and extended range. The 420DG has an operating range of up to 3,600 feet diameter; 420DG operates up to 2,600 feet; and 320SG operates up to 3,000 feet. Lasers work with MC200 Depthmaster for excavators and MC1200 for graders.

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▶ Atlas Copco

DrillAir range of portable air compressors provides high air volume at high air pressure with low specific fuel consumption for the air delivered, the company says. Four models deliver 1,284 to 1,335 cfm at 365 psi and

1,198 to 1,252 cfm at 435 psi. Units are available as skid-mount, support-mount, tandem or wagon-wheel versions. They are powered by Caterpillar C18 Acert T3 diesel engine with a rating of 575 horsepower.

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▶ Radmeister

Radmeister designed its jointless cable rubber tracks with higher tensile strength and minimal stretching to prevent track failure in the event of over-torque. The manufacturer says its heat-treated, forged links replace what are normally cast-iron links, so they can handle greater drive torque without distortion. Deep tread patterns provide traction and long wear life.

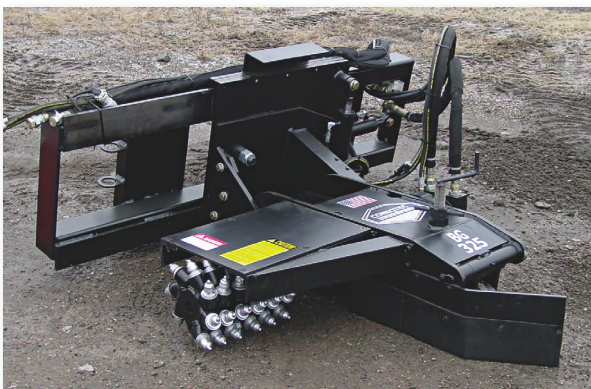
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▶ Coneqtec

Coneqtec/Universal berm grinder attachment for skid steers removes berms and curb while leaving the guard-rail intact with an offset design and low-profile drum and housing. Center pivot design places the force of the skid steer directly over the cutting drum. Side shift is available, which allows drum to reach under guardrails and obstructions.

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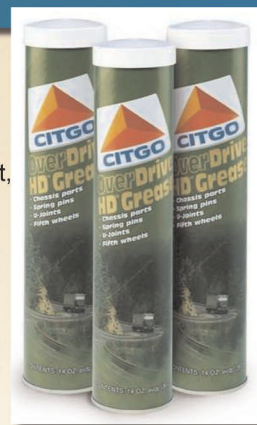
CITGO Lubricants HD Greenway program is an excellent solution for fleets with diverse power units searching for economic and environmental savings. By using Greenway, fleet managers can improve fuel efficiency, extend lubricant service intervals and component life, avoid seasonal change outs, reduce their carbon footprint, and save up to \$4,000 per unit annually.

The CITGO HD Greenway program is comprised of a family of synthetic products and the company's LubeAlert® oil analysis management tool. Using one high performance grease, designed for both on and off road equipment, combined with an oil analysis program that allows fleet managers to check on all components, manage data electronically and generate summaries for the entire fleet, streamlines both fleet performance and maintenance.

The CITGO HD Greenway program includes:

- 🛢 CITGARD® SynDurance® HD Engine Oil
- 🛢 QuatraSyn® Synthetic Automatic Transmission Fluid
- 🛢 LubeAlert Oil Analysis Program

- 🛢 OverDrive HD® Greases
- 🛢 Synthetic Automotive Gear Oils
- 🛢 CITGARD® 700 Plus



To implement the program, CITGO Lubricant experts partner with fleet managers to create a detailed cost analysis of their fleet to show potential savings for their units, including how effectively using lubricant products can align economic goals with good corporate stewardship.

For more information, visit www.hdlubes.com.



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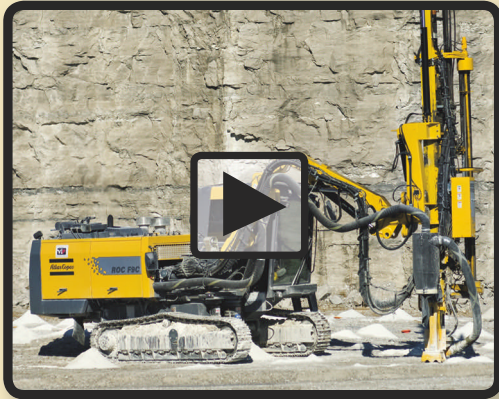
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Atlas Copco put a unique and potent weapon in the hands of quarries and other rock drillers interested in cutting drilling and blasting costs when the company combined its Rig Control System (RCS) with its Global-Positioning-System-driven Hole Navigation on surface drills. The SmartRig configuration for surface drills debuted in Europe in 2007 and finally made it to North America last year, onto Conco quarries in Springfield, Mo., aboard a ROC F9C, where they're saving enough to recoup the high-tech surface drill's \$100,000 price premium in less than three years.

Watch Larry Stewart's report on the SmartRig at ConstructionEquipment.com/Digest.

Watch Morbark's Upgraded Grinders

At its Demo Days event in May, wood-grinder manufacturer Morbark showed off its freshly upgraded units, including a tub grinder and Wood Hog that now have tracks; a whole tree chipper; and quick conversion kit that turns the company's horizontal grinders from a mulching machine to a chipping machine in a matter of hours.

Topcon Talks Telematics

Listen to Mark Bittner and Dick Savage, members of Topcon's telematics team, discuss features and applications of the positioning-equipment company's Web-based jobsite-management tool, Tierra.

Tierra lets fleet employees track equipment on an online map, view vehicle instrument panels remotely, create a virtual jobsite fence to enhance security, and more.



Latest Big Iron Blog Posts by CE Editors

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- Rod Sutton writes about the fury among contractors sparked by EPA's greenhouse-gas reporting rule
- At a recent auction, Mike Anderson stumbled upon an old excavator: a 1965 Hy-Hoe Backhoe Model 3300TT

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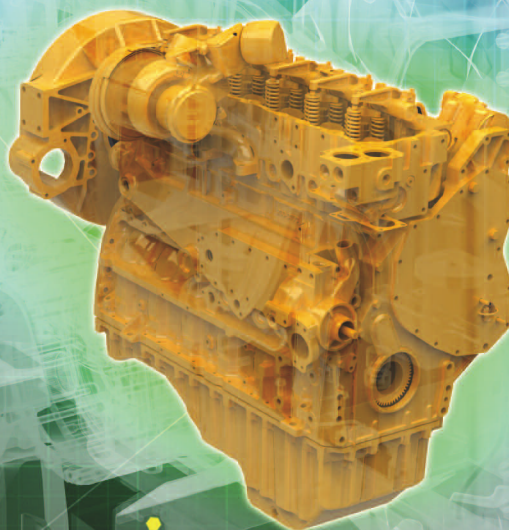
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