

Reed Business  
Information®

**32** Emissions put  
squeeze on values



**42** Our editor  
is humbled by  
driving test



**71** Bobcat  
adds to compact  
tractor line



# CONSTRUCTION EQUIPMENT®

April 2008

ConstructionEquipment.com

49

Ideas

Equipment Pro

## Big Guns Produce

**Largest skid steers  
handle more with  
sophisticated features  
p. 48**

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## FEATURES



## RUNNING GREEN

### 32 Market Tries to Turn Used Yellow Into Green

As California Air Resources Board (CARB) regulations drive off-highway equipment ultimately to Tier-4 compliance — and agencies in other jurisdictions watch on with varying degrees of interest — equipment owners are often faced with the dilemma of divesting themselves of or repowering equipment they own and operate. Senior Editor Mike Anderson recently attended a Ritchie Bros. auction in Perris, Calif., where the ideals of environmental friendliness run smack into the reality of tough business decisions for equipment users. Anderson reports on not only the regulations facing California fleet managers, but also some real-life examples of struggling contractors in attendance.



## HANDS-ON-TRUCKING

### 42 Truck Editor Humbled by 'Challenge'

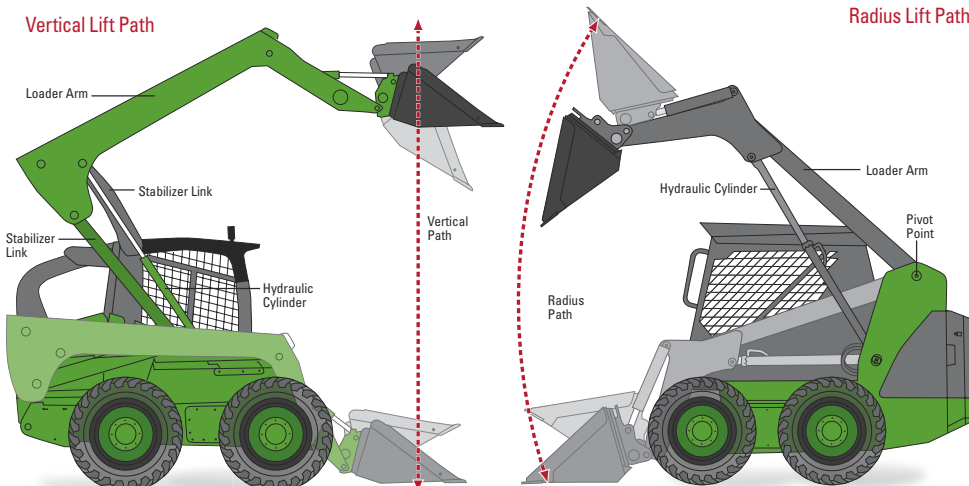
Tom Berg participated in Mack Trucks' Driving Skills Safety Challenge, which was held during the World of Concrete show in Las Vegas. The Challenge required competing drivers to find the mechanical "bugs" in a Granite mixer truck, then maneuver another truck through a maze of stations marked by orange cones and red tape on a parking lot. Although Berg didn't win, he enjoyed the experience.



## BUYING FILE

### 48 Big Skid Steers Bid for Production

The newest generation of big skid steers is capable of shaking off its utility-machine mantle and competing aggressively for production tasks with electronic-over-hydraulic joysticks and steadily more-refined cockpits. Most sophisticated features are optional, though, and buyers looking to save money on big loaders can still get simpler machines for utility work. Executive Editor Larry Stewart reports on the trends in that niche.



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## Leaving Las Vegas

Conexpo-Con/Agg 2008 scored as one of the most exciting exhibitions in recent memory, if not in its history. Leaving Las Vegas, we had several reasons to consider the previous 10 days some of the best the equipment industry has ever experienced.

**1) Upbeat attitudes.** Although the residential markets continue soft and headline-grabbing, overall market expectancies were anticipatory rather than retreating. More than one attendee wondered if all the national concern about recession were nothing more than a 24/7 electronic-media creation. The verdict's still out, but more end-users were anticipating increased activity than were not.

**2) Innovative machines.** We saw some ground-breaking innovation unveiled this year. In the North Hall alone, three major earthmoving developments were on display.

**3) Overall size.** It's always a challenge covering Conexpo-Con/Agg, but the 2008 version severely tested endurance. This edition included not only a great collection of new iron, but also more exhibits including the Safety Zone and expanded outdoor lots. The industry responded in record numbers, with attendance blowing past expectations and previous records.

**4) Global marketplace.** International visitors have thronged to Conexpo-Con/Agg for several shows now, but the level of participation from international exhibitors was noticeably higher this year.

**5) Youth in our future.** AEM's inaugural Construction Challenge brought 30 teams of high school students to Las Vegas to compete and to experience what this industry has to offer. Hundreds of young people walked the show floors; saw innovative machines; and met and talked with manufacturers, distributors, end-users and all others associated with this great industry.

Several hundred of us packed into the Hilton Pavilion on Friday morning for the awards ceremony, and we saw an encouraging future. Hats off to AEM for pulling off a wonderful contest that brought the equipment industry into our high schools.

There was no better way to cap one of the most fulfilling shows in recent memory than with the confidence that the industry is in good hands.



Rod Sutton, Editor in Chief

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*Clarence Gianarelli, Ideal Concrete, Inc.*



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# MARKET WATCH

By KATIE WEILER, Managing Editor

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## Caterpillar

With the B2 Series, Cat has rolled out six updated skid-steers ranging from 1,400 to 2,500 pounds in rated operating capacities. Three vertical-lift machines (232B2, 242B2 and 252B2) are joined by three radial-lift models (216B2, 226B2 and 236B2), the largest of which boasts an 11.4-percent increase in rated operating capacity. In addition to the skid-steers, the B2 Series includes two "multi-terrain" track loader models, the 247B2 and 257B2.

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## Case

Case upgraded to Tier-4, Stage-1-certified Isuzu engines with 54 net horsepower in its CX75 minimum-swing-radius excavator and CX80. The CX75 has a maximum dig depth of 13 feet 7 inches, while the CX80 has a dig depth of 13 feet 9 inches. The CX75's offset boom pivots at a joint between the arm and boom, allowing the bucket to be placed off center for parallel digging beyond the edge of the machine's own tracks. The CX80 features a center-swing boom.

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## Hitachi

The reduced-tail-swing ZX135US-3, replacing the 135US, is powered by a Tier-3 engine. It features the CRES II cab, which includes a wider seatback, more legroom and more right-side glass for improved visibility. Low-effort, short-throw levers reduce operator fatigue; and a multilingual, wide-screen LCD color monitor provides maintenance, attachment and operational information. The new ZX220W-3, also Tier-3-compliant and using the new CRES II cab, incorporates improvements common to all Hitachi Dash-3 excavators.

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## Volvo Construction Equipment

Volvo promises that the L220F Hybrid wheel loader will offer 10 percent fuel savings as well as performance and environmental gains when deliveries begin late in 2009. Volvo unveiled a pre-production prototype hybrid at Conexpo-Con/Agg. The heart of the parallel-hybrid system is an ISG, Integrated Starter Generator, fitted between the Volvo D12 engine and transmission. The ISG allows the diesel engine to be turned off when stationary, and then almost instantly restarted by rapidly spinning the engine up to optimum working speed using a burst of energy from the high power battery. The ISG can also deliver a massive electric torque boost — up to 700 Nm and 50 kW of instant mechanical energy — to overcome the diesel's low torque at low engine speeds.

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# Market Watch

## Stone Construction Equipment

Groutzilla places grout and masonry mortar using a mechanical delivery system. The PTO-driven unit, working with a telehandler or forklift, can place grout in blocks, walls, forms and foundations. It handles 20 cubic feet of material of almost any slump, filling multiple courses of block spanning 20 feet or more. The self-wiping Talet auger system controls discharge flow and simplifies cleanup for minimal wasted material.

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## JLG

With the G5-18A model, JLG is offering its smallest telehandler model yet. Measuring 146 inches long by 71 inches wide by 77 inches tall, the telehandler weighs less than 11,000 pounds. Powered by an 84-horsepower Perkins engine, it has a maximum lifting capacity of 5,500 pounds and can carry a 1,850-pound load at the fully extended forward reach of 10 feet 10 inches. With a maximum lift height of 18 feet 4 inches, the unit comes with three operator-selectable steering modes.

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Deere says it will bluetop to 1/8 inch at up to 6 miles per hour, and travels at 18 miles per hour. The 764 HSD weighs in at 32,000 pounds and is powered by a Deere PowerTech 6.8-liter engine rated at 200 horsepower.

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## Indiana Phoenix

A new rear-discharge, concrete-mixer package is designed, says the company, to be lighter in weight than other mixer packages and to handle larger loads. The mixer features an aggressive fin design and fusion treatment in the drum for longer wear, a remote-control option, and 120-psi wash-down system. The hydraulic tag axle provides capacities of 13,200 pounds and features adjustable pressure to compensate for loaded weight.

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## John Deere

Just announced at Conexpo-Con/Agg, the brand new 764 High-Speed Dozer (HSD) is an articulated, rubber-tracked dozer that combines the speed of a grader with the flotation of a crawler dozer. It will grade and push moderate dozing loads at about double the speed of a similarly sized crawler.

## Allen

HDX 600 hydraulically powered trowel is a double, 4-foot-diameter rider. First in the new Hydra-Drive-Extreme (HDX) series, the trowel features all-hydraulic drive and steering, plus a 44-horsepower Kubota diesel engine. The HDX 600 uses two, 46-inch-diameter, five-blade overlapping rotors and provides rotor speeds to 135 rpm. Other features include an electrically powered spray system for retardant application and a flip-up seat and removable screens.

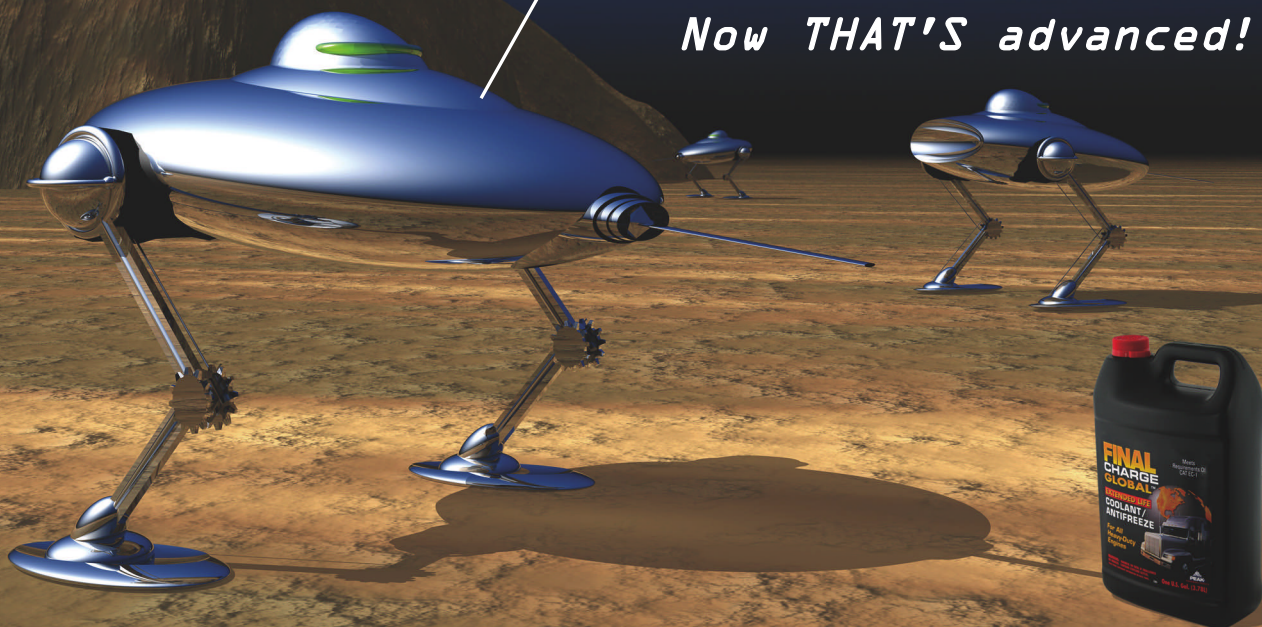
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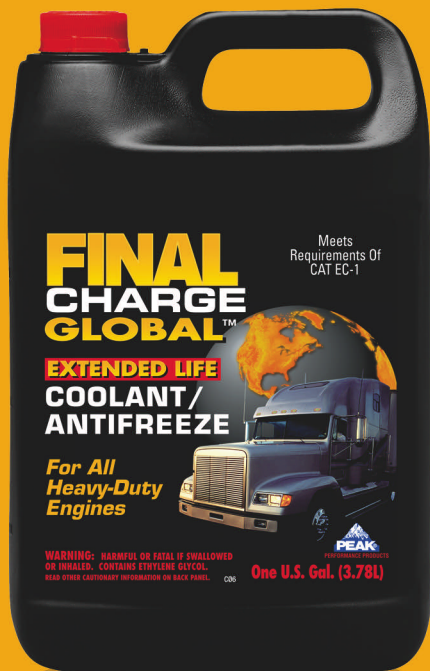
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# Market Watch

## Tel Smith

Tel Smith introduced its track-mounted Quarry-Trax TJ3258 primary jaw crusher with larger gape and a 58-inch-wide crushing chamber at Conexpo-Con/Agg 2008. The manufacturer claims its larger



size will boost crushing capacity by up to 15 percent. In the automatic mode, the crusher feed is maximized by monitoring engine load, crusher load, and feed bin level in order to maintain a consistent choke feed.

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## Vermeer

McLaughlin engineers and manufactures for Vermeer the industry's first trailer-mounted combination air-and-water vacuum excavator, the V300AWSD, providing contractors with one machine that can pothole utilities with either air or water. A power pack added to the 500-, 800-, and 1,200-gallon units make the air/water combination possible. An 85-horsepower turbocharged Kubota diesel engine powers the 150-cubic-feet-per-minute rotary compressor and a 3,000-psi water system.

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## Kobelco

The SK260LC Acera Mark 8 excavator, weighing 57,300 pounds, uses a Tier 3 six-cylinder, 181-horsepower Iveco diesel and digs to 23 feet. It uses the company's Intelligent Total Control System, which recognizes the operator's moves and provides appropriate hydraulic response. Four power modes include those for heavy digging, standard digging/fuel conservation, breaker use (one-way flow) and crusher use (two-way flow).

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## Case

The CX135 and CX225 excavators have been upgraded to Tier 3 certification with 95- and 153-net-horsepower Isuzu engines, which Case says deliver improved fuel economy and productivity. With operating weights of 29,631 and 53,223 pounds, respectively, the machines dig to maximum depths of 17 feet 11 inches and 22 feet.

Dig radii range is 26 feet 6 inches and 31 feet 11 inches.

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## Terex Roadbuilding

The E275P counter-flow drum mix plant offers 275-ton-per-hour production capabilities, but can still be completely relocated in only five loads. Featuring no-crane setup, with fewer connections than traditional portable plants, the E275P is designed to be transported and back up and running over a weekend. At a diameter of 84 inches and length of 39 feet 5 inches, the drum is capable of making a wide variety of mix designs.

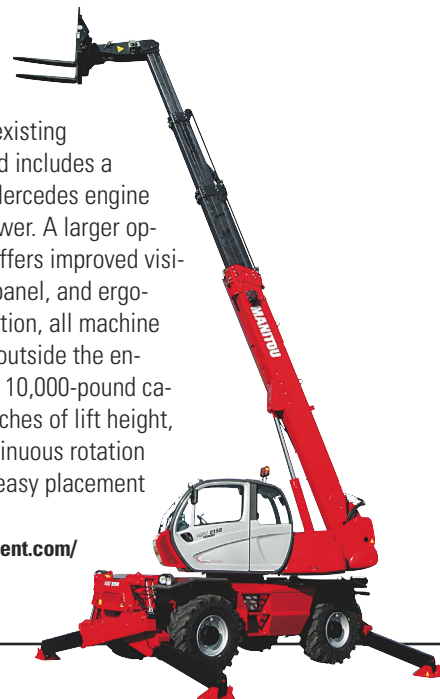
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## Manitou

"Privilege" telehandler series stems from the existing MRT product range, and includes a more powerful Tier 3 Mercedes engine delivering 150 horsepower. A larger operator's compartment offers improved visibility, new instrument panel, and ergonomic joysticks. In addition, all machine fluids are now located outside the enclosed cab. Featuring a 10,000-pound capacity with 67 feet 7 inches of lift height, the MRT 2150 has continuous rotation and frame leveling for easy placement of loads.

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# Market Watch

## ► Wacker

CRT 48 ride-on trowel series includes three models with a torsion assist steering system that the company says provides easy steering and operation and reduces the amount of pounds of force needed to operate by 75 percent. The 48-inch units have three engine options. Trowel speeds range from 20 to 165 rpm. Units have a two-year, complete bumper-to-bumper warranty.

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## ◀ Compact Power

The 700-Series includes three models, the 726DT, 732DT and 749DT. These articulated-frame compact loaders feature a hydrostatic transmission, four-wheel drive and a telescopic loader arm. With the loader arm at full extension, the three

models provide, respectively, 105, 117 and 146 inches of lift height under the hinge pin. Horsepower ratings are 26, 32 and 49; and rated operating capacities (at 50 percent of tip load) are 1,124, 1,488 and 2,260 pounds.

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## ◀ Komatsu

Powered by a Tier-3 Komatsu engine generating 126 net horsepower, the WA200-6 wheel loader offers a heaped bucket capacity



ranging from 2.2 to 3.1 cubic yards. The WA250-6, with a 138-horsepower engine, has a 2.5- to 3.5-cubic-yard bucket capacity range. Replacing corresponding Dash-5 models, both wheel loaders incorporate a hydrostatic transmission system that allocates only the power needed for a given application.

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## ► Extec

At Conexpo-Con/Agg 2008, Extec marked its first worldwide exhibition as a division of Sandvik with the U.S. launch of the largest model in Extec's S Series — the S-7 mobile screen. It features the Doublescreen design used in the S-4, S-5 and S-6, but incorporates a triple-deck configuration and an additional side conveyor. Two independently adjustable screen boxes each measure 5x10 feet. The unit weighs 85,142 pounds.

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## ▼ Haulotte

With an outreach of 75 feet 6 inches, the HB86 TJ+ "big boom" aerial platform combines an oscillating axle, narrow fixed-width frame, differential wheel lock, and self-leveling for operation in a variety of conditions. The 86-foot straight boom is enhanced by a telescopic jib measuring 16 feet 5 inches. The jib, with a hexagonal cross-section of highly elastic modulus steel, is powered by proportional controls for access to hard-to-reach areas.

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## ▼ Case

Case increased the horsepower in the transition to Tier-3 certification for all four models in its new 400 Series 3 compact track loaders. The 420CT and 445CT Series 3 models feature Case 3.2-liter turbocharged engines, while the 440CT and 450CT Series 3 models are powered by a 4.5-liter turbocharged Case engine. Pilot controls are now standard for all four machines. The cabs feature increased headroom, a suspension seat and side lighting.

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# Vision. Innovation. Right equipment.

Tackling a part of a \$190 million project when your bread-and-butter has been jobs that run one to three days is not for the weak-at-heart. But it's all in a day's work for Slurry Pavers of Glen Allen, Virginia. For Slurry it's a matter of vision, innovation and the right equipment. The Slurry Road Reclamation and Soil Stabilization crew is a key contractor in the mammoth Dulles International Airport Runway 4 project.

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**Frank Nash**  
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## CONTRACTOR NEWS

### Henkels & McCoy Buys Hybrid Diesel/Electric Trucks

Henkels & McCoy, a utility contractor based in Blue Bell, Pa., purchased two hybrid diesel/electric trucks using Eaton's patented hybrid solution to continue reducing emissions and fuel usage. The vocational trucks work as medium-duty personnel lift/material handlers and will be



Hybrid basket trucks convert braking energy into stored battery power, and the engine can recharge batteries during extended use of the personnel lift.

used to install power lines. The hybrid trucks are assigned to Henkels & McCoy's operations in eastern Pennsylvania and southern California.

The hybrids convert energy generated through braking into stored battery power. The stored battery power is used to assist the truck's power train. The hybrid system is also used to power the hydraulic system of the

personnel lift. During the personnel lift operation mode, the batteries are recharged by the diesel engine. The system will decrease fuel usage, emissions, and maintenance for a lower lifecycle cost. The system also reduces noise to enhance the public's satisfaction, and it is capable of supplying up to 25 kilowatts of auxiliary power.

## MANUFACTURER NEWS

### Cat Rental Stores Mark 10 Years

Caterpillar is celebrating the 10th anniversary of The Cat Rental Stores brand in 2008 by revealing some indications of the network's growth. Owned and operated by Caterpillar's independent dealer network, The Cat Rental Store network consists of over 1,400 stores with combined rental revenue in 2007 of more than \$4 billion. The aggregated fleet includes \$8 billion worth of Cat machines at first cost, and about \$2 billion in allied equipment. Cat says the average fleet age is low — about 19 months — because dealers typically sell out of their rental-fleet inventories.

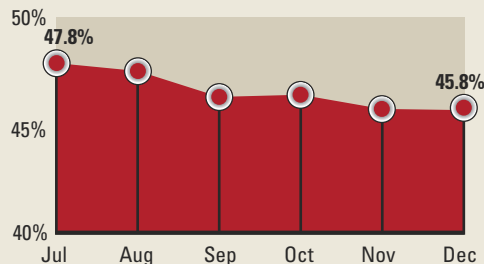
Colorado Caterpillar dealer, Wagner Equipment, established the first rental outlet 10 years ago. "Our plans are to support Caterpillar dealers in growing The Cat Rental Store network in every region of the world to reach 2,000 outlets in the 3- to 5-year time frame," said Jim Johnson, Caterpillar's manager of global rental and used equipment.

## USED EQUIPMENT

### Average Values Even Out

#### The Rouse Value Index

(Avg. orderly liquidation value as % of cost)



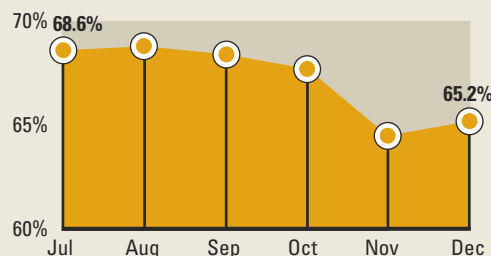
Note: Orderly liquidation value is expressed as a percentage of replacement cost (average cost paid for a new unit by large rental companies and dealers) for the average age of equipment within that category.

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

Orderly liquidation values leveled off in December, increasing 0.2 percent from November after dropping 4.8 percent since July. Largest declines were in high-reach forklifts: 3.1 percent for the month; 4.9 percent for six months.

#### Backhoe-Loaders

(Avg. orderly liquidation value as % of cost)



Backhoe-loader values picked up in December, selling at an average of 65.2 percent of replacement cost and an average age of 53 months.



# Managers Digest

For more headlines: [ConstructionEquipment.com](http://ConstructionEquipment.com)

## WORKFORCE ISSUES

### AEMP Names Two Technicians of the Year

The Association of Equipment Management Professionals (AEMP) and the AEMP Foundation named Craig Donor and Brian Ganson the 2008 Technicians of the Year last month during AEMP's annual conference in Las Vegas.

Donor, named public fleet winner, works for the Virginia Department of Transportation.

He was part of a committee that developed and introduced laptop diagnostic equipment to VDOT repair shops statewide, and was part of the pilot Fleet-Cross website, for which he is now an instructor and administrator. He also came up with a modification to field-service trucks that free the bed of the truck for supplies and spare

parts, a change being implemented statewide.

Ganson is the private fleet winner, and he works for George J. Igel & Co. In his 14 years in the profession, Ganson has become a highly respected member of a team of 20, even as the youngest of his company's field mechanics. He is on the firm's safety commit-

tee, and he coordinated the purchase and installation of a GPS fleet monitoring system, suggesting system modifications to the vendor that were incorporated and introduced at Conexpo-Con/Agg 2008.

Each winner received a \$1,000 scholarship from the Foundation and a large toolbox provided by John Deere. Qualcomm sponsored the awards event. The AEMP Foundation funds technician scholarships for the children of AEMP members and their employees attending accredited two-year technical education programs in pursuit of careers as equipment technicians. Scholarship funds cover tuition and books for recipients. The AEMP Technician of the Year Award is sponsored by John Deere and the AEMP Foundation. The awards luncheon was sponsored by Qualcomm.

The AEMP Technician of the Year Award, established in 1989, is sponsored annually by the AEMP Foundation to spotlight the increasingly complex skill sets required of today's professional technician and to raise awareness of the critical shortage of technicians that now exists. Award winners are selected based on professionalism, technical skills, innovative troubleshooting and diagnostics, and for exemplary contributions to the equipment-technician profession.

## INDUSTRY NEWS

### More Capability for Local 150

Local 150's Apprenticeship and Skill Improvement Program is now headquartered in a new facility near Wilmington, Ill. The new facility, located on a 300-hundred-acre site about 50 miles southwest of Chicago, has many well-equipped classrooms, a complete soils lab, an auditorium that accommodates earthmoving machines on its stage, an indoor operating arena, and large shops for training welders and service technicians. In the facility's immense paving bay (right photo), students place mats of sand to gain paving skills.



## MANUFACTURER NEWS

### Volvo and Editors Dig Habitat for Humanity

In January, Volvo Group affiliate companies — Volvo Construction Equipment, Mack Trucks and Volvo Rents — joined the effort to clear, grade and excavate a six-home tract for Habitat for Humanity in North Las Vegas. Volvo and its partner companies organized a one-day work event that drew "expert volunteers" from members of the nation's industrial press. Editors and reporters from trucking, construction-equipment and building-trades media came together with Habitat engineers and Volvo equipment specialists to "get 'er done" in a single workday. Habitat estimates the job would have normally required more than a week at significant cost.



Volvo-Group equipment operated by trade editors, with help from some pro operators, cleared a six-home tract for Habitat For Humanity in a single day.



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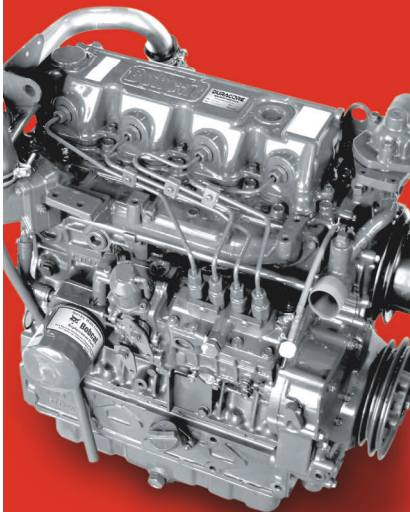
\*Source: Michelin Research Center. Compared with XM27 tire.  
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# Reporting for Duty



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## Managers Digest

### INDUSTRY NEWS

## Women of STIHL Firefighter Champions

In only their second season of competition, the Women of STIHL firefighter relay team earned their second Firefighter Combat Challenge World Championship title with a time of 2:05 through the obstacle course, just 4 ½ seconds faster than the second-place team. The team consists of female firefighters from the Virginia Beach Fire Department, the Newport News Fire Department, and the Hampton Fire Department.

Outfitted in full firefighter turnout gear, Amy Bielinski, VBFD; Mary Colasanto, VBFD; Abby Harms, HFD; along with Katie Hodge, NNFD; and Stacy Carrol, NNFD; competed in a five-event relay including climbing a five-story tower, hoisting and dragging hoses, using a sledge hammer, and rescuing a life-sized, 175-pound "victim" as they race against themselves, their opponent, and the clock.

The Firefighter Combat Challenge was



**Women of STIHL Firefighter Combat champions are (left to right): Abby Harms, Mary Colasanto, Kate Hodge, Amy Bielinski and Stacy Carroll.**

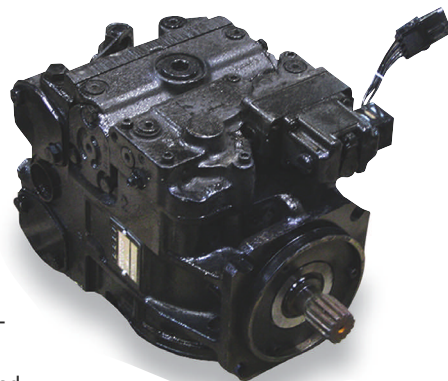
developed more than 10 years ago as a competition for firefighters to encourage fitness and demonstrate the profession's rigors. STIHL is the official sponsor of the Women of STIHL World Champion Firefighter Combat Challenge relay team, as well as Team STIHL men's relay team.

### MANUFACTURER NEWS

## Terex Remanufactures Paver Pumps and Motors

Terex Roadbuilding's Remanufacturing Program is making hydraulic pumps and motors for all of the manufacturer's concrete and asphalt paving and production equipment available restored to factory-new specifications at a fraction of their new cost. Every core returned for remanufacturing goes through an eight-step inspection process to ensure product quality.

Only 100 percent genuine OEM parts are used, and the Terex reman process replaces major wear parts including the complete seal kit, slipper retainer, valve plates, front shaft bearing, slipper retainer hold downs, charge pump bushings, rear shaft journal bearing, piston rings, T-bar inserts, and other parts as required. All reman components are fully performance tested to factory specifications and warranted to be free from defects in materials and workmanship for 12 months from the date of sale.



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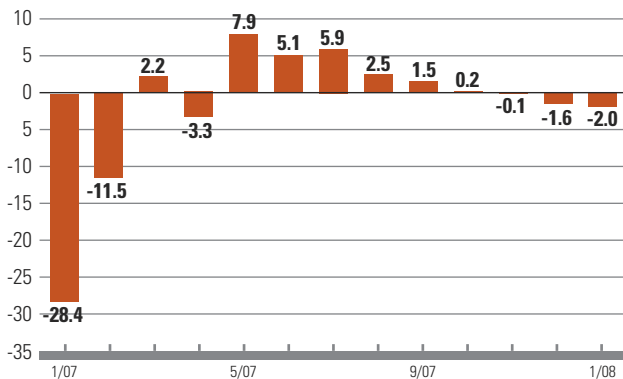
©2008 The Charles Machine Works, Inc.



## CONSTRUCTION EQUIPMENT SHIPMENTS

Construction equipment shipments from U.S. factories have been steady at about \$2.3 billion per month since July, as rising exports offset small declines in domestic sales. This trend is expected to continue into early 2009. Although equipment manufacturers have experienced a rise in their inventories and a cut in their order backlogs, equipment price inflation has risen to an annual 2.0-percent pace, and will accelerate with the just-beginning 15- to 20-percent surge in steel prices.

(% change from previous month)

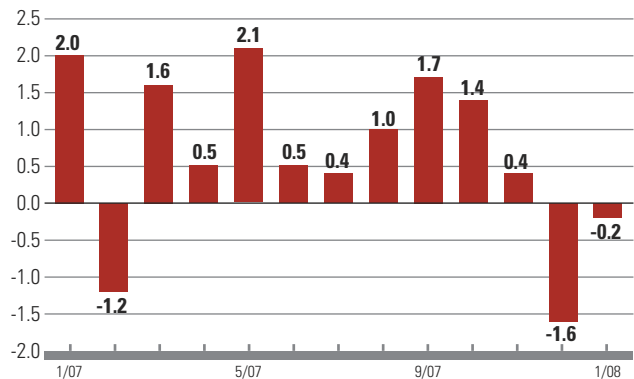


Source: U.S. Department of Commerce

## PUBLIC CONSTRUCTION SPENDING

Public construction spending is up 6.6 percent from a year ago. However, this reflects little volume gain after accounting for rising project costs. The nominal value of public construction spending has not increased since late last summer, when the subprime mortgage collapse caused funding difficulties for other construction projects. Expansion of nominal spending growth will resume this summer as the financial turmoil settles, but spending gains will only cover higher project costs through '09.

(% change from previous month)

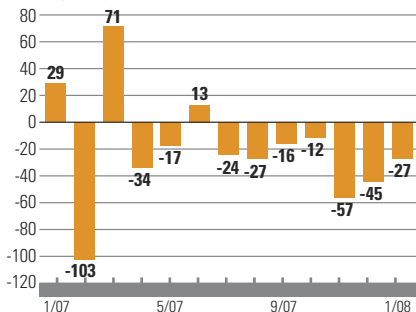


Source: U.S. Department of Commerce

## CONSTRUCTION EMPLOYMENT

Contractors have cut 331,000 jobs since September 2006, and at least 40,000 to 50,000 more job cuts are projected for the next few months. Nonresidential contractors have started cutting jobs in the last few months, but spot shortages of skilled workers still persist. This has been accompanied by slower wage gains for construction workers. The year-to-year wage rate gained hit its peak of 5.4 percent in May 2006, but has now fallen to about 4.0 percent, and more decline is likely well into 2009.

(Change in jobs, thousands)

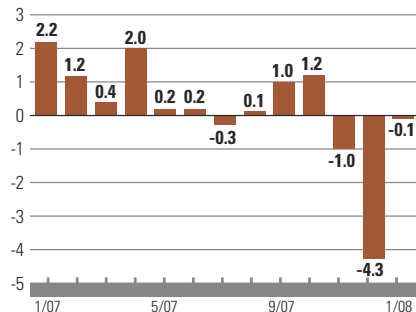


Source: U.S. Department of Labor

## COMMERCIAL CONSTRUCTION SPENDING

Commercial construction spending is now 5.3 percent below the peak level of October 2007, and will weaken further well into 2008. Unlike those previous, the current slowdown/recession originated in the consumer market and not the investment market. As a result, inflation-adjusted consumer spending is now declining. Commercial development is being restrained by both very slow demand growth for retail space and difficulty arranging construction financing.

(% change from previous month)

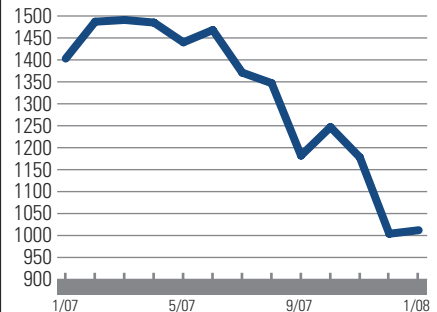


Source: U.S. Department of Commerce

## HOUSING STARTS

Housing starts dropped from 2.3 million to 1.0 million since January 2006, and overall will drop slightly more early in 2008, but will continue even more so in the Southeast and Southwest through the year. Shrinking real income and recession level consumer confidence are now the major causes of declining housing starts. Only about one-third of the recent decline is expected to be recovered by the end of 2009. Housing starts will remain below the underlying demographic trend of 1.85-1.90 million into 2010.

(Annual rate, thousands)



Source: U.S. Department of Commerce

For the full text of this month's economic analysis, check Economic Outlook at [ConstructionEquipment.com](http://ConstructionEquipment.com).





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# RUNNING GREEN

By MIKE ANDERSON, Senior Editor

## **Market Tries to Turn Used Yellow into Green**

Regulatory squeeze leaves frustrated contractors scrambling  
to recoup what value remains in their equipment

### **FOURTH**

*In A Series*

A man of faith, outgoing equipment owner Arnie Richter smiles, extends his hand, and immediately offers a comfortable seat to a visitor. As he deliberately discusses what has brought him to a heart-wrenching crossroads in his life's work, his face remains pleasant and he speaks with grace and humility.

He hails from a family of contractors, for whom the blue skies on this morning represent the optimism of a day's work that most every single morning prior has brought. Hey, it's California after all.

But as the big iron continues to rumble across the auction ramp below, surrounded by the fast-paced pitches that envelope every Ritchie Bros. sale anywhere in the world, Richter's eyes briefly shift downward and his voice momentarily tails off.

"I am," he manages, "just disappointed."

Others around him would be and are angry; still others disillusioned, frustrated, panicked or even distraught. But, in this case, "just disappointed" seems entirely appropriate.

It's California, indeed.

Long at the fore of environmental concerns, the state for which warmth and sunshine are synonymous has sent a chill through the construction-equipment industry — and nowhere is that more sobering than with the contractors, at least many themselves believe.

As California Air Resources Board (CARB) regulations drive off-highway equipment ulti-

mately to Tier-4 compliance — and agencies in other jurisdictions watch on with varying degrees of interest — equipment owners are often faced with the dilemma of divesting themselves of or repowering equipment they own and operate.

For Richter, a contractor for 27 years including 20 as a partner with his father, his own Ontario, Calif.-based Richter Engineering was admittedly a small player with less than 20 total pieces of assorted earthmoving and transportation equipment, and annual business of \$2 million or less. "Just enough to poke along," he says.

With the current economic slowdown coupling the increasing costs of just doing business, most notably for insurance, the equipment-compliance issues ultimately just wore him down.

"I tried to sell my fleet, because I had a nice fleet, to several larger contractors," he says. "Nobody would buy it, even though it was late-model equipment — in fact, I was still paying on it. It was going to throw them over on their counts on the emissions, so I was forced to selling here to get rid of it."

Here, is the Ritchie Bros. Auctioneers permanent auction facility in Perris, Calif.

"I'm keeping track — some of it's going to Mexico, some of it's going to other states. But I'm going to lose maybe \$400,000 in value on my equipment on what it would have been worth a year ago. Nobody wants it here," he says.



## Engine Tier Time Line

Following are California ARB and U.S. EPA off-road compression-ignition (diesel) engine standards (NMHC+NOx/CO/PM in g/bhp-hr unless otherwise indicated). When ARB and EPA standards differ, the standards shown represent the more stringent.

Maximum Horsepower	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015+															
<11	See footnote <sup>a</sup>					7.8/6.0/0.75					5.6/6.0/0.60			5.6/6.0/0.30 <sup>a</sup>																						
11<25						7.1/4.9/0.60					5.6/4.9/0.60			5.6/4.9/0.30																						
25<50					7.1/4.1/0.60					5.6/4.1/0.45				5.6/4.1/0.22					3.5/4.1/0.02																	
50<75						-/6.9/-/- <sup>b</sup>					5.6/3.7/0.30				3.5/3.7/0.22 <sup>c</sup>					3.5/3.7/0.02 <sup>c</sup>																
75<100															3.5/3.7/0.30					0.14/2.5/3.7/0.015 <sup>b,c</sup>			0.14/0.30/3.7/0.015 <sup>b</sup>													
100<175															4.9/3.7/0.22				3.0/3.7/0.22																	
175<300	1.0/6.9/8.5/0.40 <sup>b</sup>								4.9/2.6/0.15			3.0/2.6/0.15 <sup>c</sup>					0.14/1.5/2.6/0.015 <sup>b,c</sup>			0.14/0.30/2.2/0.015 <sup>b</sup>																
300<600									4.8/2.6/0.15																											
600<750																																				
Mobile Machines > 750						1.0/6.9/8.5/0.40 <sup>b</sup>					4.8/2.6/0.15					0.30/2.6/2.6/0.07 <sup>b</sup>			0.14/2.6/2.6/0.03 <sup>b</sup>																	
Generators 750<1,200																						0.14/0.50/2.6/0.02 <sup>b</sup>														
Generators > 1,200																																				

(a) The PM standard for hand-start, air-cooled, direct-injection engines below 11 horsepower may be delayed until 2010 and be set at 0.45 b/bhp-hr.

(b) Standards given are NMHC/NOx/CO/PM in g/bhp-hr.

(c) Engine families in this power category may alternately meet Tier 3 PM standards (0.30 g/bhp-hr) from 2008 to 2011 in exchange for introducing final PM standards in 2012. The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.

Source: Justice & Associates, Long Beach, Calif.

■ Tier 1 ■ Tier 2 ■ Tier 3 ■ Tier 4 Interim/Final

Source: Justice & Associates

"I got dirt for it, but oh well, I can't control that. It is what it is. I'm stuck."

Upon reflection, that resignation does turn to frustration: "I shouldn't be penalized," says Richter, "for having a late-model fleet of equipment that is not even paid off yet that is in non-compliance with current regulations."

His grandfather, an immigrant father of 12, turned over a bakery business into his own roller and pick-up truck, and began paving driveways in Sierra Madre, Calif. From those humble beginnings, F.W. Richter became a major multi-divisional contractor.

"Because I come from a contractor family history, I have to convince myself it's OK not to do it anymore. You just have that worker mentality," says Richter, whose own sons have worked hard day in and day out for him, he says, but do not want the headaches of owning and operating the business. When he told one of his own uncles he was packing it in, Richter heard what he has always known: "You can't — this is what we do."

But he recalls his dad telling him that most contractors, despite how hard and how well they work, do not go out on top. Rather, they are driven out.

"Right now, I'm living that."

For those contractors not at that point, it's still time to act, says Richard Aldersley, Ritchie Bros. regional manager, based in Perris, Calif.

"Generally we're trying to tell people, 'take action now, because you need to.' It's not going to get any better," says Aldersley. "It's going to happen, so 'get used to it, guys.'"

That doesn't mean that Aldersley is at all impressed with the official approach to dealing with environmental concerns surrounding off-highway equipment.

**These Caterpillar wheel loaders about to cross the Ritchie Bros. auction ramp in Perris, Calif., may not look all that different than those elsewhere in the United States, but a Tier-0 description (inset) leaves them at a decided disadvantage for their soon-to-be-ex owners.**







# RUNNING GREEN

"For sure, one needs to clean up the environment, and we certainly don't want everything polluted," he says. "But I think that the way they're going about it is onerous, and it's going to take a lot of these guys out of business. It's going to require huge amounts of capital investment for these guys to be able to comply. And the official approach is, 'well, just pass that cost through to the guy you're doing the work for.' That's not feasible.

"From the EPA's point of view, they are believing, 'oh, well you just have to ship it to Arizona.' Ethically, how does that really solve the world's problem? In addition to that, you've got a number of states and jurisdictions that as soon as California enforces it are going to follow suit."

The fact that, only a few yards away, one of about 2,000 pieces of equipment up for bids at this particular auction was still rolling off the ramp into the hands of a new owner is "heartening" from a market standpoint. Locally, work has slowed down, and "apparently" the equipment is all bad, but there's still a market, says Aldersley.

To help buyers, equipment descriptions in

Ritchie Bros. auction catalogs are increasingly including engine Tier compliance, where and when applicable.

"We've tried to be as thorough as much as one can be," says Aldersley. "Obviously, if you have a California customer and it's a Tier-0 piece, he's probably going to sit on his hands."

Much of the California equipment "is going to other states in the U.S., as well as to Mexico and the South Pacific," says Nick Nicholson, Ritchie Bros. senior vice president, U.S. Central and Latin America. "You see it scattering around as if we're breathing different air."

The construction market worldwide is booming — something that Ritchie Bros. with 122 offices in 29 countries can tap into for its California customers, says Nicholson.

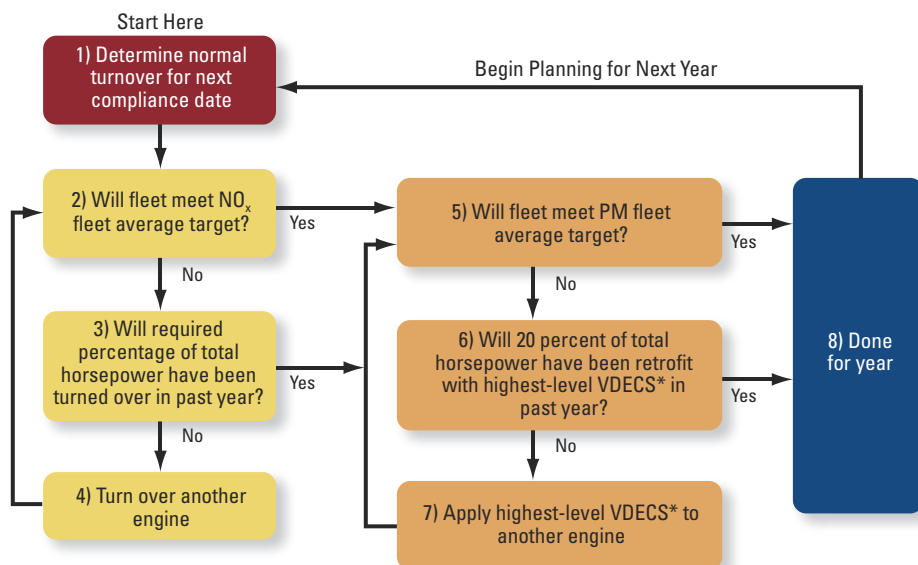
At the Perris, Calif., auction, which attracted in excess of 2,000 on-site registered bidders, off-site Internet bidders typically fared well, securing or finishing runner-up in about one-third of items available to them. Bidders were registered from 40 U.S. states and 25 countries and, of the more than \$24 million in gross auction proceeds, more than half was accounted to buyers from outside California.

This effect is a known commodity at IronPlanet, the California-based global equipment auctioneer that conducts its events entirely via the Internet. IronPlanet's Jan. 31 auction, the company's largest at that time by a whopping 38 percent over the previous high in gross sales, attracted a shade under 15,000 "visitors," more than 12,000 bids, and international buyers for about 25 percent of the total gear up for offer.

"You need to keep moving that equipment, and IronPlanet gives you the ability to easily do that with auctions every two weeks," says Andy Betts, territory manager. "No matter how much you tell that to equipment owners, many still decide to wait, which affects

## The Path to Compliance

Here's how it's all supposed to work for large- and medium-sized fleets



Source: Justice & Associates, Long Beach, Calif.

Source: Justice & Associates



equipment values substantially.

“But there’s an advantage to moving the equipment quickly as CARB rules give credit to equipment owners retiring older equipment early, which helps ensure better values.”

There are national motivators, also, to acting sooner rather than later, says John McClelland, American Rental Association (ARA) vice president, government affairs. The recently announced economic stimulus program provides “tremendous” tax opportunities to write off purchases of new equipment.

“If I was a fleet owner in California and I was looking at my replacement schedule, I’d definitely see if there is an opportunity for me to move some of that schedule forward.”

But just how many of those fleet owners are paying attention is anyone’s guess.

“From one contractor to the next, no matter what size, each has different requirements and deadlines for fleet compliance that are quickly approaching, and many are hoping that something will change, which is not likely,” says IronPlanet’s Betts. “There may be some small changes in regulations, but many will still face difficult decisions.

“Some contractors are deciding to roll their entire fleet out, and go to strictly rental gear. Others will simply sell off their older equipment and operate from a smaller fleet of new equipment.”

At Ritchie Bros., Aldersley has observed a wide range of compliance preparedness and emotion from his customers, ranging from the fleet owner who bangs his fist on the desk defiantly, to the contractor who is in full panic mode, to the one who’s “solidly” in the middle and trying to efficiently move his assets.

## Caught in the squeeze

Steve Pokrajac isn’t exactly banging his fist on the desk in defiance.

But the San Jacinto, Calif.-based contractor is more than willing to express his views on “the squeeze” he feels is being unfairly placed on small- to mid-sized contractors in his state.

“It’s going to be disastrous to lose the middle to small contractors,” says Pokrajac. “We live so close to the bone that it’s really hard every time you make new rules for us. We’re



not lawyers, and we’re not politicians. We’re just hard-working guys, and it takes almost 100 percent of our time just to devote to our jobs to make sure they’re safe, efficient, the quality of work’s there, and we can turn enough money that’ll pay our bills. And with anything else you add to us, it’s all just going to collapse.

“That’s why I kind of feel betrayed by the manufacturers that sell us equipment. They’re the ones that have persuaded the rules to be as they are, so that all of the burden comes back on the contractor. C’mon, and this is the key here: Is it easier to get a handful of manufacturers on board, have them work through the rules and regulations, and get us compliant? Or do we have to educate and give tons of rules and regulations for all these thousands of contractors to weed through? Which is easier to implement?

“They made these machines and they sold them to us and, with that, is a chain of custody and an obligation to make it right.”

The environment may be the focus of equipment-emissions requirements, but it’s far from being alone in being damaged, says Pokrajac.

“The whole economy benefits by contractors working close to the bone and keeping things economical. The system works. But when you change the rules, and you say all of a sudden, ‘now, all of your assets — all the things you’ve worked for all your life — are going to be devalued dramatically because a sweeping new law comes into effect,’ then you have to totally rethink whether you even want to stay in this business or not.

**Thanks to the Internet, IronPlanet customers like Mark Domeier can easily access equipment up for bids from California from the convenience of his office at Caterpillar dealership Patten Industries in Elmhurst, Ill.**





# RUNNING GREEN

"I can tell you for a fact that buying new equipment is not cost-effective. We can't compete with the guys who are running the older stuff and keeping it running, because the market never has supported new equipment. The government can buy new equipment, but we certainly can't, because the cost of moving dirt basically hasn't changed in the last 50 years relatively. Even look at the price of buying a hamburger compared to what it cost 50 years ago,



**When it comes to moving equipment for which a local market may have been eradicated, Ritchie Bros. Auctioneers offers a global market. "You're trying to get the best return you can get on the asset," says Nick Nicholson, "and with the international demand as it is now, you're going to turn to whoever can bring you the most international attention."**

as opposed to what we're moving dirt for today."

Taking in the Ritchie Bros. auction in Peris, Calif., fellow heavy-equipment contractor Tony Crisalli cringes all too knowingly.

"You can get a 30-year-old scraper and a brand-new one," he says, "and the rental rate's exactly the same.

"You just can't turn over a scraper I bought here for 25, 30, 50 or \$100,000, and then buy a million-dollar one that makes the same amount of money. It doesn't make economic sense," says Crisalli, of Riverside, Calif. "It's a bad pun, but when the smoke clears, we're going to have only a few guys left."

Pokrajac compares their situation to that of the "mom-and-pop" retail stores that are growing scarcer by the day: "They played by the rules, and the rules changed. Well, the rules are changing with us, and the result will be, as Tony said, you're going to have a handful of guys who can do it, and then what's the price going to be?

"And that's not what this country is all about: It's all about competition and it's all about free enterprise, but that's what makes things better. It improves the economy and the quality of things, and you have choices," says

Pokrajac. "Look, we are the salt of the earth and we work hard for our money, and most of us still go broke. But there is benefit to the economy of all this, because we do provide service and products of good quality at a very economical price. We're very efficient and hard-working, and we have to be."

## Wait and see?

It's just California, right? So it is that much of the rest of the nation shrugs.

Well, urges the ARA's McClelland, understand what the Clean Air Act says.

"If California puts these rules into place and EPA gives them a waiver to enforce these rules, then other states can adopt California's rules," he says, "but they have to adopt California's rules including California's enforcement. So, they can't say, 'well, you know, we like California's concept on off-roads, but we're going to do off-roads this way instead of the way they did it.' They wouldn't be allowed to do that."

Admittedly, McClelland doesn't know what the chances of that are. California's established Portable Equipment Registration Program, which covers non-self-propelled diesel and non-diesel equipment of more than 50 horsepower, has not been picked up by other jurisdictions. Then again, it's relatively minor compared to California's off-road diesel equipment legislation, covering roughly 20,000 smaller pieces compared to "we hear a couple of hundred thousand" in the state alone.

The rental industry in general, and ARA in particular, have been credited by other sector associations as being more out in front on these issues. This came out of concern that the existence of a certain-Tiered piece of equipment on a specific date could deem an entire fleet as "outlaw," says McClelland.

"That's the reason why we proposed to them the idea of fleets being able to meet the emissions targets by averaging their fleet so that they could have a mix of years. It would be very difficult for any fleet to meet some of those targets on, if you will, a machine-by-machine basis.

"Our interpretation of the rule right now is that if you have a fleet that is younger than 66 months on average, then you're probably



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# RUNNING GREEN

going to meet the averaging requirements. So, you can have 11 model years in your fleet. That gives a lot of leeway.”

As it is, rental fleets tend to be young, in some cases averaging less than 30 months, he says.

This can be positioned in relation to the onerous effects of entire fleet replacement as estimated by the construction industry at large.

“The Air Resources Board’s retort to that

was: ‘Well, you don’t necessarily have to replace the entire fleet. There are other things you can do and one of those is, in fact, rental,’” says McClelland. “Are there potentially enhanced opportunities for the rental market in California vis-à-vis the in-house construction fleet? I

think the answer is yes, but I have no way of estimating really what that is going to be, because I don’t know what the in-house contractor fleets are going to do and what their strategy for compliance will be.”

At the Association of Equipment Manufacturers (AEM), the assumption is that their OEM and supplier members are dealing with this as they deem appropriate.

“Our phones haven’t been ringing off the hook, and our e-mail box has not been jammed full with queries related to this,” says Darrin Drollinger, AEM vice president of statistics, safety and technical services. “Precisely how an equipment manufacturing collective will be able to respond is probably still in question.

“For the companies that have been thinking about this and have people on their payroll that do nothing but this, they’ll pick and choose how much and in what areas they want to help those companies that haven’t done a thing. We have to balance that in the association world all the time.”

For an OEM, achieving EPA requirements is not so much the problem, says Eric Wilde, Komatsu America vice president of product marketing.

“The challenge is where we have local municipalities or agencies that stipulate something else, and those aren’t necessarily being consistent with each other,” he says. “From an OEM’s

perspective, that’s a big challenge, because we’d like to dedicate our resources to come up with a standardized solution. Like our diesel oxidation catalyst project: When we first started working on it, we thought that it was going to be received and approved by all legislation . . . and it wasn’t. It’s not considered best-alternative technology by New York standards.”

The idea of acting locally to be responsible globally is difficult to navigate for OEMs whose markets are increasingly larger as the world itself draws closer, says Wilde.

This is where the OEM’s local representatives come in, says the president and chief executive officer of the Associated Equipment Distributors (AED).


“Equipment owners do have a dilemma,” says Toby Mack, “and the most probable, not to mention responsible, solution is to consult with the nearby AED factory-authorized dealership for engine repowering or retrofitting — even if the machine’s going to be retired from the contractor’s fleet.”

Likewise for a rental organization like RSC, the solution is to “partner with leading equipment manufacturers who design and engineer equipment to be compliant with applicable federal regulations, so we are able to provide customers with access to the latest product offerings,” says John McVeigh, vice president of product management. “Obviously, equipment manufacturers must work to design and supply applicable product in advance of the designated implementation dates.”

## A new start

Back in Perris, Calif., Arnie Richter’s faith allows him to reconcile the disappointment of having to sell off the assets of his contracting business.

Having a heritage of construction means having a heritage of working, and so it is a new endeavor and not retirement that awaits him.

As his equipment rolls off the auction ramp, Richter discusses his plans for a partnership in a Texas company that offers propane injection for on-highway diesel engines. And, he notes, the injection procedure not only boosts engine horsepower and saves on fuel costs. It burns a little cleaner, too. 

**“It’s a bad pun, but when the smoke clears, we’re going to have only a few guys left.”**

— California contractor Tony Crisalli





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is going to localize itself to fit into this market and ensure the parts supply and service availability.

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## Truck Editor Humbled by 'Challenge'

Competing in Mack's driving contest wasn't entirely foolish, but "winner" he wasn't

**T**his is the April issue, so it'd be appropriate for me to begin by admitting how I made a fool of myself in Mack Trucks' Driving Skills Safety Challenge, held during the recent World of Concrete show in Las Vegas, but I didn't. I got a halfway decent score, and while half is not enough to win, I did enjoy the experience.

The challenge required competing drivers to simulate the pre-trip inspection each is supposed to perform every morning. They had to

find the mechanical "bugs" in a Granite mixer truck, then maneuver another truck through a maze of stations marked by orange cones and red tape on a parking lot. The red tape was literal, not figurative, because entering was easy.

We showed up at a tent outside the Las Vegas Convention Center (which was bustling with thousands of attendees looking at hundreds of exhibits inside and outside the halls). We each filled out a simple form and presented a commercial driver's license to staffers, who issued score cards and instructed us to wait a bit. Some of us read an instruction booklet and watched a how-to video, then strode into the arena and attempted to grab some glory.

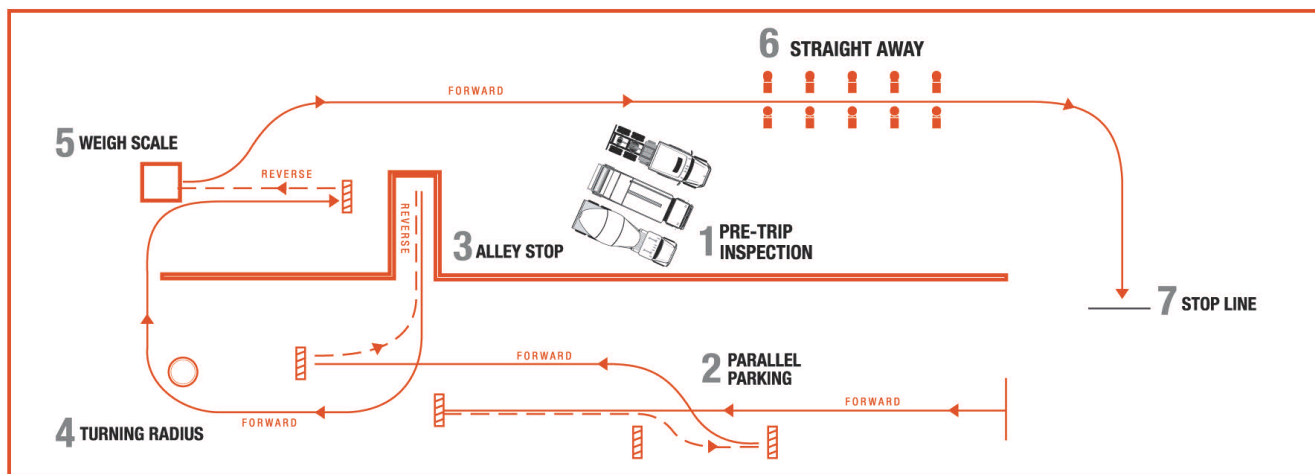
About 150 people entered, making this the "best year ever" for the contest that was in its third year here, according to Derik Beck, Mack's manager for marketing projects who was in charge of the event. It's also held at the annual Waste Expo, using trash trucks. Using mixer trucks here, nine people finished in first, second and third places in individual and team categories. They and others shared some \$10,000 worth of merchandise and gift-card prizes.

First place winner was Curtis Schuur, of Schuur Concrete in Chandler, Minn. He ended with a score of 325 out of a possible 350. Everyone started out with 350 points and lost 25 to 50 points for each foul-up. The second and

**Non-triumphant editor poses after his unremarkable performance at Mack's Driving Skills Safety Challenge at Las Vegas Convention Center. The contest was trickier than it looked.**







#### COURSE EVENTS

- 1 PRE-TRIP INSPECTION
- 2 PARALLEL PARKING
- 3 ALLEY STOP
- 4 TURNING RADIUS
- 5 WEIGH SCALE
- 6 STRAIGHT AWAY
- 7 STOP LINE

#### LEGEND

WEIGH SCALE	
TENNIS BALLS	
BARRELS	
BARRICADES	
FORWARD	Solid line drive forward
REVERSE	Dotted line drive in reverse

Stations 1 through 7 started with a pre-trip inspection and ended at the stop line. Maneuver stations were marked with cones, tape and golf balls. Drivers had to put trucks as close as possible to boundaries without running over them.

third place individual winners each got 300 points, and the first and second place winners in the team category each finished with 575 points out of 700. Ties were broken by adding up all the deviations from ideal placement of the trucks at the six maneuvering stations, with the lower number of total inches deciding who was the better driver or team. You follow that?

Station 1 was the pre-trip. Most “bugs” on the waiting Granite mixer chassis were obvious — loose caps on the radiator surge tank and windshield washer reservoir, for instance, along with a missing tail light and a loose lug nut. Each contestant had to find at least five defects, and I spotted seven or eight. The judge indicated that I could’ve stopped at the required five, but just smiled tolerantly as I kept walking smugly around the truck pointing out the additional bugs while he marked a 50 on my scorecard.

The maneuvering was harder. All trucks had Allison automatics, so there was no clutch and shift lever to complicate things. But we had no chance to practice the events or to jockey a truck to see how it turned. Guys who didn’t drive often or who weren’t familiar with Granites were at a disadvantage, but that was probably most of us. An exception was Steve Ozga, a salesman at Penny’s Concrete, an all-Mack fleet in Olathe, Kan., who said he has



The “alley” (marked by tape) proved a bust for our editor, who couldn’t judge the rear limit well enough to stop so the truck’s rear bumper was within a foot of the red tape.

driven a lot of hours in Granites. Yet he finished with just 25 points more than I. Tough luck, Steve.

Each contestant was assigned a judge who followed him through the six maneuvering exercises. Mine was Stacey Olson, a marketing staffer at Mack’s Allentown headquarters, who explained that she’d be in touch by two-way radio with instructions. This speeded things because she could easily tell me, “OK” or “Go





# Hands-On Trucking



**Above: Turning-radius test required the driver to go around the barrel while getting the right-rear wheels as close as possible without hitting it.**



**Can you see the defect? A tail light is missing — one of many “bugs” planted on this truck for the pre-trip inspection test.**



**Judge Stacey Olson decreed that the bumper was right on the stop line, as required, and gave Berg 50 points. He finished with 225 out of a possible 350. First place winner got 325.**

wheels onto a simulated scale (5) without going over its red tape. And I ran the truck's right wheels through the straightaway (6), a narrow gauntlet of golf balls, without bumping or running over any. So I kept 50 points for each of them.

ahead to the next station,” and I didn't have to lean out the window and yell, “What?!” I climbed into a waiting truck, buckled up, released the parking brake, punched D for drive, and moved a few feet to the first maneuver station.


This was the Parallel Park (number 2 on the schematic), which looked easy because the red taped “curb” was on the truck's left side, in plain view. But I had to back into the parking slot without pulling forward to adjust, and stop before crossing a perpendicular line at the truck's rear. I ended up putting the tires 15 inches away from the curb — 3 inches more than the preferred 1 to 12 inches, but still under the 18-inch outer limit. You keep just 25 points, Mr. Berg, Judge Stacey could've sneered over the radio but didn't, because she was much more pleasant than TV's Judge Judy.

Next was the Alley Stop (station 3), where I had to back the truck into a taped stall and stop within a foot of the rear line. When I was driving trucks many years ago, I noticed when I was 20 that I began losing my rearward depth perception, and this old weakness has stayed with me. Since then I've never done well in such backing tests. I didn't here, either; I stopped too far from the line and lost another 50 points.

But I passed the Turning Radius test (station 4), where I had to do a right-hand turn and put the tandem's right-side wheels as close as possible to a barrel without touching it. Then I successfully backed the right-rear

proach and halt without putting the truck's bumper over it. Judge Stacey measured it and decreed that I was right on the line, and gave me the 50 points (I think this was a gift, as the bumper looked a bit beyond the line, but I gratefully took the last 50 points). So, I ended up with 225 points — not bad, but not real good, either. I knew from being at the previous day's awards presentations that it seemed to take 300 points to win anything, so I didn't bother returning later this day, and no one called to tell me to come fetch a prize. Yes, I was a loser.

Yet it was fun, and I got to reacquaint myself with the Mack Granite's features, which included good comfort, excellent outward visibility and a tight turning radius, at least with the set-back front axle that the contest trucks had. They also had EPA '07-spec Mack Power diesels that were quiet and powerful — not that much power was needed during these maneuvers — and whose emissions control equipment really cleansed the exhaust gases.

We were told to leave the engines idle when we got done, and with several engines running, there was no smoke and no odor to stink up the premises. I remark on this every time I write an article about one of the new diesels because I think it's amazing. And clean exhaust is, after all, the point of this expensive technology. Still, when I got done with my “run” at the Challenge, I shut off the engine, partly to be contrary and partly to save fuel. Hey, it's getting precious. 





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## Buying File: Skid Steers

By LARRY STEWART, Executive Editor

# Big Skid Steers Bid for Production

Loaders rated to handle 2,200 pounds and more can compete for production work, but keeping sophisticated features optional holds prices in line with utility machines

**T**he newest generation of big skid steers is capable of shaking off its utility-machine mantle and competing aggressively for production tasks with electronic-over-hydraulic joysticks and steadily more-refined cockpits. Most sophisticated features are optional, though, and buyers looking to save money on big loaders can still get simpler machines for utility work.

Options may come into play when outfitting large-frame loaders for production. But fundamentals such as the distribution of weight

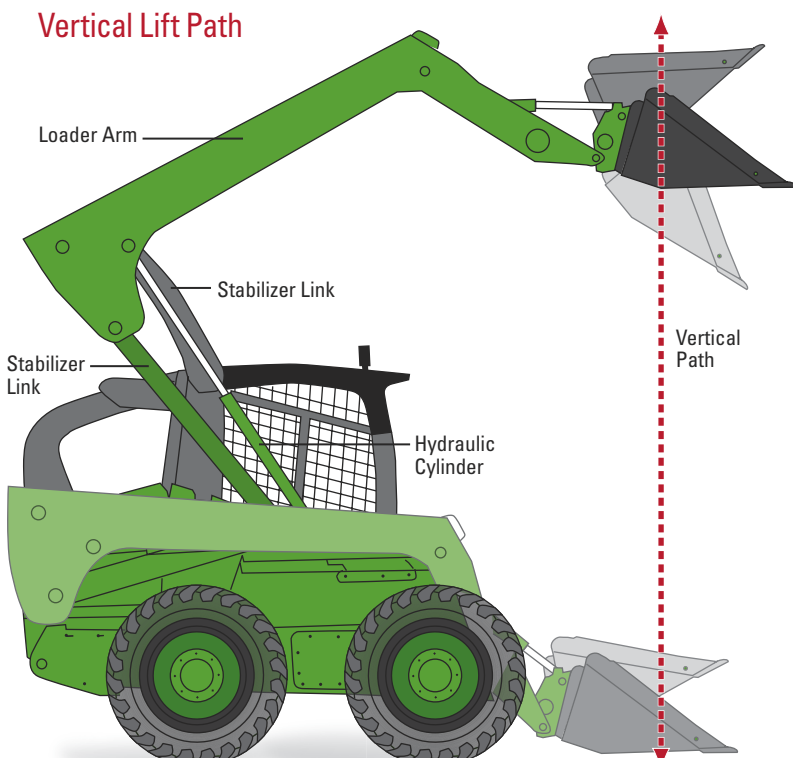
between front axle and rear and the choice of radial- or vertical-lift-path still determine the best machine for a given job.

All skid steers come from the factory weighted disproportionately on the rear axle. The machine is more maneuverable and tire wear slows when the front and rear are unequally weighted. Manufacturers' designs vary, but the basic objective is for the skid steer to pivot around the rear wheels when it is unladen, and the front wheels when the loader is handling rated capacity.

Carrying half of a skid steer's gross vehicle weight on the front axle and half on the rear will make it hard to steer, and tire wear will accelerate. Shifting too much unladen weight to the rear axles reduces the down pressure the machine can generate when digging and using attachments like a dozer blade or landscape rake.

Most Bobcats carry about 70 percent of their weight on the rear wheels, although longer-wheelbase, vertical-lift-path machines shift more toward 65/35. Caterpillar and Case tend to design with similar weight distributions. John Deere and New Holland build machines with weight distribution more in the 60/40, front-to-rear, range.

Variations in design offer buyers balance choices to suit their specific applications. If tire



**Vertical lift linkage mounts the boom in a four-point scissor configuration. It makes the loader more stable throughout the lift path for precise pallet work, and can add 300 pounds of operating capacity.**



wear or precise maneuvering is a problem for users of machines with 60/40 weight distribution, it may be worth trying one that carries 70 percent of its weight on the rear wheels. If inadequate down force is a challenge to users of machines with 70/30 weight distribution, there may be benefits in machines that put more of their load on the front.

Choosing a vertical-lift-path machine will influence how much the loader can lift.

"No matter how you slice it, a machine with vertical lift path will have higher rated operating (ROC) capacity than a similar machine with radial lift path," says Mike Fitzgerald, Bobcat loader specialist. "Our S220 compares to an S250 when you go with the vertical lift path configuration. It's a 300-pound gain in ROC."

For about an \$1,800 premium (adding vertical lift to the roughly \$34,000 purchase of a Bobcat S220), vertical lift linkage frees the loader arm from a fixed rear pivot and mounts it in a four-link scissor configuration. Manufacturers mount stabilizer links and cylinders differently, but the object remains: Convert the radius lift path — where the load rises in an arc and is farthest from the skid steer's center of gravity at mid lift, right where the operator needs maximum stability for loading pallets on flat-bed trailers — to a straight vertical lift.

Electro-hydraulic controls, currently available as an option on Bobcat, Cat, and John Deere skid steers, also promise refinement in how the loader lifts loads. But initial advantages of the technology have been more limited to improving travel. Electronic-over-hydraulic controls convert joystick movement into digital signals received by an on-board computer that communicates with the hydraulic system.

The power of the computer, mysterious as it may seem to some, is prodigious. Bobcat and Caterpillar offer speed management with their electronically controlled machines. The opera-

tor can select a maximum speed setting on a dial and the machine will not exceed that speed no matter how far the operator moves the ground-drive lever. The operator no longer has to hold the joystick at a precise intermediate angle to move at a desired speed.

Trying to crowd too much asphalt into a cold planer or cut too much trench by traveling too fast can stall the engine and damage the tool. "Speed Management allows you to set the loader's maximum travel speed to achieve the sweet spot — the speed where both the attachment and the loader perform most efficiently," says Fitzgerald.

Bobcat's Speed Management mode offers a choice of settings that represents a percentage of the skid steer's 7-mile-per-hour top speed. If you choose 50 on the dial, "no matter how far you move the joystick, the loader won't travel faster than around 3.5 miles per hour, which is

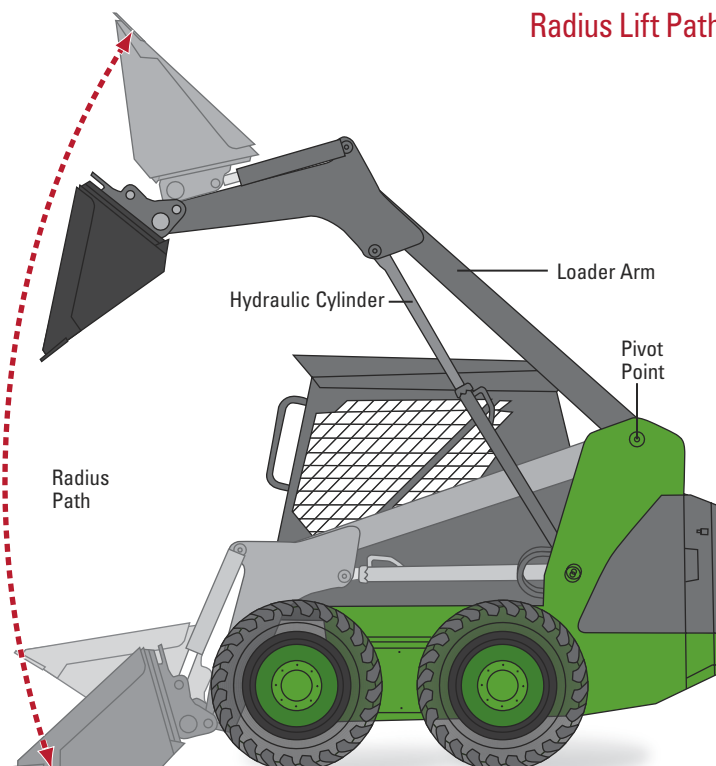
## Big Skid-Steer Costs

Size	List Price	Hourly Rate
2,201 to 2,500 lb.	\$33,401	\$30.41
> 2,500 lb.	\$39,810	\$35.20

Source: "Contractors Equipment Cost Guide" by Equipment Watch - 800/669-3238

**Hourly rates start with monthly ownership cost divided by 176 (hours per month) and add hourly operating cost. Inputs used to derive the costs include diesel fuel at \$3.38 per gallon, mechanic's labor at \$44.79 per hour, and interest rate of 4.75 percent.**

## Radius Lift Path



**Radius-lift loaders mount the boom at a fixed pivot, typically on top of a rear tower. The elimination of links reduces wear points and cost. It's a good choice for earthmoving and handling attachments close to the ground.**



# Buying File: Skid Steers

about 50 percent of full speed,” Fitzgerald says. “This allows you to maintain maximum drive-line torque to power the wheels or tracks and full hydraulic power to operate your attachment.”

In Speed-Management mode, moving the joystick a given distance results in a smaller speed change than throwing the lever the same distance in standard mode. Precise control of machine movements becomes much easier, which can add fine control for loading the machine on a trailer, hooking up attachments,

working in confined areas, or other such jobs.

Caterpillar’s Selectable Work Speed Control comes with the Advanced Machine Information Control System (AMICS). Another AMICS feature is the Selectable Implement Control. The system offers three levels of loader control, giving the operator the ability to adjust how quickly loader functions respond to joystick movement. Control can be tailored to match the operator’s preferences.

Cat’s Speed Sensitive Ride Control (SSL) is

## Big Skid-Steer Specifications

Model	Rated load, standard (lb.)	Bucket breakout (lbf)	Net horse-power	Pump flow (gpm) standard/optional	Operating weight (lb.)
Mustang 2076	2,200	5,820	84	21.5/36	7,480
New Holland L180	2,200	6,034	59	19.3/34.7	7,095
Bobcat S220 K-Series	2,200	6,550	74.9	20.7/40.5	7,470
Case 440	2,200	6,198	82	21/31	6,980
Gehl 5640E Turbo	2,200	5,900	82	23/36	7,380
Bulldog B8250	2,204	--	80	28/na	8,267
Doosan 460 Plus	2,250	4,678	65	21.7/32.3	7,174
Case 435	2,300	6,000	72	21/32.1	6,830
Caterpillar 256C	2,350	7,328	82	22/33	7,566
Volvo MC110B	2,400	6,460	80.5	20.3/27.4	7,480
JCB 1110 Wheel Robot	2,425	4,630	82	20/32	8,214
Case 450	2,450	6,200	82	22.1/37.2	8,830
Caterpillar 252B Series 2	2,500	5,508	70	22/na	7,861
John Deere 325	2,500	7,500	70	22/34	8,390
New Holland L185	2,500	7,670	72	19.3/34.7	7,100
Case 445	2,500	5,100	74	21/33.7	7,677
Bobcat S250 K-Series	2,500	6,840	74.9	20.7/41.4	7,723
Thomas 250	2,500	4,450	83	21/40	8,000
Thomas 255	2,500	7,000	83	21/40	8,000
Mustang 2086	2,600	5,640	84	21.5/36	7,860
Gehl 6640E	2,600	5,900	82	23/36	7,800
Komatsu SK1026-5	2,650	5,400	84	21/34	8,068
Caterpillar 262C	2,700	7,315	82	22/33	7,968
John Deere 328	2,750	10,500	76	22/36	8,580
New Holland L190	2,800	7,670	74	21.9/37.3	7,755
Bobcat S300 K-Series	3,000	6,840	81	20.7/40.5	8,140
Bobcat A300 K-Series	3,000	7,150	81	20.7/37	8,673
Case 465	3,000	6,175	82	22.1/37.2	8,910
John Deere 332	3,175	11,600	85	24/41	9,160
Caterpillar 272C	3,250	7,315	90	22/33	8,292
Bobcat S330	3,300	5,800	83.7	20.7/36.7	9,185
Gehl 7810E	3,850	8,340	99	29/41	10,520
Mustang 2109	3,850	8,340	99	29/41	10,520



another option made possible by AMICS. It is a ride-control system much like that used on Cat's large wheel loaders, applying the lift cylinders to cushion the load, prevent spillage, and give the operator a smoother ride.

Of course, other skid steers are available with the hydraulic ride-control, but because SSL is an electronic system, its performance can easily adapt to changing ground speed. At high speeds, Cat's ride control automatically engages and allows the loader arms to float. The system turns off at low speed so the boom is rigid for digging and load-placing stability. The end result is faster cycle times.

John Deere is relatively new to using electronic joysticks in skid steers, announcing availability of E-H controls on its large-framed loaders and compact track loaders in January of 2008. But Gregg Zupancic, skid steer product manager with John Deere, promises the company will quickly match feature offerings of the technology's earliest adopters.

One great advantage of electronic controls is that systems already in the field can be upgraded with new features simply by changing software. A service technician can plug a portable computer into the machine's on-board computer and download a programming change. Machine owners get the latest features without paying for new hardware.


Making electronic controls optional features allows buyers who prize simplicity, such as rental fleets, to continue to save money on simpler hydraulic controls. Manufacturers such as Case and New Holland, Gehl/Mustang, Volvo, and JCB continue to offer manual controls (levers connected directly to the spools on hydraulic valves that regulate main-system flow) as standard equipment, with the option to upgrade to pilot-hydraulic controls to reduce lever effort. Pilot hydraulics employ a low-pressure hydraulic circuit between the control lever and valve. The pilot circuit acts on the valve's spools, assisting the operator's lever pressure.

All manufacturers are racing to market skid-steer cockpits that will offer operators a uniquely comfortable place to work. Size of the entry, and expanse of clear glass or grid to look through on the sides and top of ROPS continue

to grow. Suspension seats are becoming standard equipment in many lines, and even heated air-ride seats are now offered as options in a couple of makes' enclosed cabs. This generation of operator-restraint bars is becoming ergonomic, with wider bars designed to offer operators more room and arm rests.

"Operator comfort is a big factor in productivity," said Jim Hughes, marketing manager with Case. The goal is not to coddle operators, but to keep them fresh and productive over more time in the seat. "That's why Case is always striving to improve the operator's platform when designing and upgrading models."

Manufacturers aren't neglecting reliability as they focus on skid steer productivity. Case's new Tier-3 skid steers come with oversized, wide-fin radiator and oil cooler (sized for high-flow auxiliary hydraulics) mounted side by side rather than stacked to improve air flow. Bobcat's largest Model S330 (introduced in January 2007) incorporates what the company calls SmartFan — a thermostatically controlled, variable-speed cooling fan driven by a hydraulic motor that only turns as fast as necessary to maintain optimum coolant temperature. Noise and horsepower drain are both reduced.

As skid-steer capacity creeps up, a refined evaluation of large-frame loaders can help buyers carve new revenue streams with machines rated to handle 2,200 pounds or more. Nine machine models (from Bobcat, Case, John Deere, Caterpillar, Gehl and Mustang) can work with loads from 3,000 to 3,850 pounds. They will reach over sideboards 125 to 142 inches high, and drive hydraulic attachments with auxiliary flow rates of 33 to 41 gallons per minute. These big machines can compete with small wheel loaders for some production work. Buyers who want to wring productivity out of their over-\$50,000 loaders can maximize their investments with any number of high-end options. 

## Web Resources

Specifications	ConstructionEquipment.com
Bobcat	<a href="http://www.bobcat.com">www.bobcat.com</a>
Bulldog	<a href="http://www.bulldog-usa.com">www.bulldog-usa.com</a>
Case	<a href="http://www.casece.com">www.casece.com</a>
Caterpillar	<a href="http://www.cat.com">www.cat.com</a>
Gehl	<a href="http://www.gehl.com">www.gehl.com</a>
JCB	<a href="http://www.jcb.com">www.jcb.com</a>
John Deere	<a href="http://www.deere.com">www.deere.com</a>
Komatsu	<a href="http://www.komatsuamerica.com">www.komatsuamerica.com</a>
Mustang	<a href="http://www.mustangmfg.com">www.mustangmfg.com</a>
New Holland	<a href="http://www.newhollandconstruction.com">www.newhollandconstruction.com</a>
Thomas	<a href="http://www.thomasloaders.com">www.thomasloaders.com</a>
Volvo	<a href="http://www.volvoce.com">www.volvoce.com</a>

Source: [www.Spec-Check.com](http://www.Spec-Check.com)



# Gallery of Skid Steers

## CASE

### Power and Comfort Boost Performance

At January's World of Concrete, Case unveiled its new 400 Series 3 line of skid steer loaders with Tier 3 engines, a redesigned cab and improved serviceability. Engine horsepower and torque increased on each model, including the 435, 440, 445, 450 and 465 large loaders, with Case engines ranging from 72 to 82 horsepower. A 7-percent increase in cab headroom allows installation of a standard

suspension seat. Side lighting provides full visibility along the sides of the machine during night operation.

**Number of models:** 5

**New models:** 435, 440, 445, 450, and 465

**Product-line features:**

The wide-fin side-by-side radiator and oil cooler are sized for high-flow auxiliary hydraulics and operating in ex-

treme temperatures. A no-maintenance fan belt on the 435 and 445 Series 3 models is a plus, while an automatic belt tensioner on the 440, 450 and 465 eliminates the need for belt adjustments. Improved oil and fuel-filter access and remote oil drain help avoid spills and speed service.

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## CATERPILLAR

### New Top Cat Offers Computer Control

Cat refined the positioning of hydraulic cylinders to improve lift and tilt forces of all its large skid steers compared to the equivalent B-Series models, and added the 256C and 272C to the range. At 90 net horsepower, the 272C (3,250 pounds rated capacity) is the most powerful

Caterpillar skid steer. Electronic torque management maximizes power to the ground and prevents the engine from stalling in tough digging and heavy lifting.

**Number of models:** 5

**New models:** 246C, 252B Series 2, 256C, 262C and 272C

**Product-line features:** C-Series skid steers offer an optional performance package that includes a speed-sensitive ride control. At high speeds, ride control automatically engages and allows the loader arms to float. Loader arms act like a shock absorber, allowing for higher operating speeds with better load retention and more comfortable operation.

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## BOBCAT

### New Biggest of the Bobcats

The newest model in Bobcat's K-Series large-framed loaders is its top-of-the-line S330 introduced in January 2007. With rated operating capacity of 3,300 pounds, it moved Bobcat over the 3,000-pound mark and placed a model within reasonably competitive range (550 pounds) of the behemoth Gehl 7810E/Mustang 2109. Perhaps more importantly, its 6,720-pound tipping load is larger than anything except the Gehl/Mustang monster.

**Number of models:** 4

**New models:** S330

**Product-line features:** All Bobcat K-Series skid steers with rated capacity of 2,200 pounds and more now come with a variable speed, hydraulically driven cooling fan that senses engine temperature and can be 30 percent quieter. Bobcat upgraded large-frame loaders' drive chains size to 120 HSOC (high strength oval chain) from 100 HSOC on K-Series, making the bowtie-style drive chains 38-percent stronger.

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# Gallery of Skid Steers

## MUSTANG

### Proportional Auxiliary-Hydraulic Control

Mustang swapped the Cummins engine in the 2076 and 2086 skid steer loaders for the Tier-3 Yanmar turbo-diesel engines, moving up from 80 to 84 net horsepower. Conventional hand-and-foot controls are improved with pilot-hydraulic foot pedals and a new proportional auxiliary-hydraulic control. The joystick pilot control option remains with built-in proportional control, as well as a ride control feature. Customers who prefer the dual-hands control pattern can change the joysticks to provide for that control pattern.

**Number of models:** 3

**New models:** 2076, 2086, and 2109

**Product-line features:** Mustang and Gehl segregate their 2,200- and 2,600-pound-rated-capacity skid steers by engine choice. Mustang's Yanmars contrast with the Deutz engines Gehl chooses. All the engines are rated at 82 or 84 horsepower.

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## VOLVO

### Big Power in a Light Package

The B Series increased room in Volvo's skid-steer cockpit, and brought with it a deluxe, high-back standard seat and one of the largest entry and exit openings in the industry. There's only one skid steer lighter than the Volvo MC110B in the range from 2,300 pounds to 2,500 pounds rated operating capacity, yet Volvo's 2,400-pound machine delivers more bucket breakout force than half of the 2,500-pound units in the market. Volvo offers a choice of pilot operated joysticks or mechanical hand-and-foot controls.

**Number of models:** 1

**New models:** MC110B

**Product-line features:**

Volvo builds the 16-valve D3.4A turbo diesel that delivers 80.5 net horsepower to the MC110B skid steer. The oil cooler tilts away from the radiator for easy cleaning.

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## GEHL

### Pilot Controls Manage More Capacity

Gehl increased the operating capacities of its large-framed skid steers with introduction of the E-Series, taking the 5640E to 2,200 pounds (from 2,000 pounds), the 6640E to 2,600 pounds (from 2,400 pounds), and the 7810E to 3,875 pounds (from 3,675 pounds). The company claims enhanced reliability and drive performance from Poclain's refined radial-piston drive motors, while reducing sound levels. The new models got pilot-operated joystick controls and finger-tip, proportional control of auxiliary hydraulics.

**Number of models:** 3

**New models:** 5640E, 6640E, 7810E

**Product-line features:** The low-profile Power View lift arm improves operator views to the left and right over the lift arm and lifts loads in a nearly vertical path. Gehl boosted rated operating capacity of the industry's largest skid steer, the 7810E (and Mustang 2109), to 3,850 pounds.

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## THOMAS EQUIPMENT

### Fast Powerhouse

Thomas uses the Kubota V3300-T turbo-diesel rated at 83 horsepower in its 250 and 255 skid-steer models, which is at least 10 percent more power than any other skid steer rated at 2,500 pounds operating capacity.

The 250 moves briskly around jobsites at 7.5 mph — faster than any other 2,500-pound skid steers. The two-speed-equipped 255 fairly sprints at 12.3 mph — 2 mph faster than any other large-framed loader.

**Number of models:** 2

**Product-line features:** Only two skid steers with rated capacities under 3,000 pounds — Bobcat's S220 and S250 — offer as much auxiliary hydraulic flow as the 40 gpm delivered by the high-flow 250 and 255.

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## JOHN DEERE

### Digital Joysticks Extend Control Choice

John Deere made electro-hydraulic joysticks an optional control choice on its large-framed 325, 328 and 332 skid steers. With addition of the drive-by-wire option, which Deere calls E-H controls,

the company now offers the most skid-steer control patterns on the market, including hand-and-foot controls; Case-style H hand controls or ISO pattern using pilot hydraulics; and the new E-H, ISO-pattern hand controls. About two

years ago, Deere applied an electrical motor to its optional Power Quik-Tatch, taking advantage of the relatively easy-moving, patented system for retaining attachments.

**Number of models:** 3

**Product-line features:** Deere added a few notable standard features to its large-framed loaders in the past few years, including an anti-theft system, a 12-volt receptacle and storage, interior dome lighting, a cup holder, and enhanced engine and hydraulic sound deadening.

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## KOMATSU

### Anti-Stall Comes Standard

Komatsu strives to distinguish its SK1026-5 skid steer with a few standard features that are commonly options on large-frame loaders. Two speed travel motors with a top speed of 10 mph, self leveling bucket, two-way auxiliary hydraulics, and anti stall Automatic Power Control are all standard equipment. It delivers the greatest height to the bucket pin (128.3 inches) and dump reach (36.8 inches) of any skid steer from 2,500 to 2,700 pounds rated operating capacity. In fact, you have to go up to a machine with 3,250 pounds rated capacity to get more load-over height, and all the way to 3,850 pounds capacity to get more dump reach.

**Number of models:** 1

**Product-line features:** Komatsu eases maintenance with special bronze bushings and dust seals in the loader linkage that stretch the pin-greasing interval to 250 hours. Komatsu allows the same grade of multi-viscosity oil to serve as engine oil, hydraulic oil and chain-case.

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## NEW HOLLAND

### Bigger Engines and Better Cooling

The list of updates to New Holland's large-framed loaders reads much like that of their Case counterparts in the CNH family. In 2008, New Holland Construction will finish reintroducing its Super Boom skid steers with

a new Tier-3 certified FPT (Fiat Power Technology) engine that will boost horsepower. More-powerful batteries (30 percent more cold cranking amps), starters and standard grid heaters will improve cold starts. Larger cabs with convex glass door, more headroom and elbow support, and standard suspension seat were introduced last June.

**Number of models:** 3

**New models:** Super Boom L180, L185, L190

**Product-line features:** New Holland continues to distinguish its skid steers from Case, and most other models on the market with longer wheelbase — putting the 2,800-pound ROC L190 within range of Cat's 3,250-pound 272C, and its scissor-style vertical-lift boom.

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## JCB

### Lower Boom, Better View

JCB recently lowered the single, right-side loader arm of its Robot 1110 skid steer to improve the operator's view over the boom. Side-door entry remains an exclusive JCB feature in skid steers, eliminating the need for operators to climb over attachments to enter the loader.

**Number of models:** 1

**Product-line features:** The Robot 1110 skid steer is powered by JCB's 82 net horsepower 1104C-44T diesel engine. Hydraulic self-leveling is an available option for pallet work.

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# Buying File: Attachments



## Caterpillar HM315 Mulcher

Caterpillar added the HM315 mulcher to its lineup to maximize production with Cat skid steers and multi-terrain loaders equipped with XPS hydraulics. The 57-inch cutter head is driven by an axial-piston-pump hydraulic motor. The dynamically balanced rotor has three sets of counter-rotating knives — 34 tungsten-carbide teeth — and Cat says it will process brush up to 8 inches in diameter. A hydraulically operated front hood accommodates trees and dense vegetation, and the adjustable pusher bar helps control falling trees.

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## Genesis Versi-Pro

Modular jaw sets — grapple, shear and concrete cracking jaws — for Genesis Attachments' Versi-Pro System (GVP) allow varied processing capabilities from a single attachment. Versi-Pro is designed for use on 65- to 80-horsepower skid steers and mini excavators weighing 10,000 to 15,000 pounds. Additional jaw sets are currently being designed. The 360-degree rotation feature is standard equipment. Fast jaw changes and field maintenance can be conducted with nothing more than a standard set of hand tools. Genesis says changing jaws can be completed in as little as 10 minutes.

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## Bobcat Expands Breaker Line

The HB280 and HB2380 expand Bobcat's line of hydraulic breakers up and down. The HB280, in the 59 foot-pound energy class, is a smaller version of current Bobcat hammers and the HB2380

is a 700 foot-pound model. The HB280 weighs 127 pounds and delivers 1,120 to 1,290 blows per minute with a hydraulic flow of 3.4 to 6.1 gallons per minute. The HB2380 provides 600 to 950 blows per minute with a hydraulic flow range of 19.8 to 33 gallons per minute. They feature auto power and an automatic pressure regulator that ensures maximum performance of the breakers, regardless of tool carrier hydraulic flow variations or changes in outdoor temperature.

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## Bradco Tree and Brush Mulchers

Five models of the Magnum line of brush-cutter heads range from 165 horsepower up to 500 horsepower and outfit skid steers, loaders, and excavators with tools for clearing

land, remediation, reforestation and more. The fixed-tooth cutter/mulcher head features a patented hammer design. Configured to mount close to the base machine, the low-profile mulcher is intended to improve the operator's view of the work, and is credited with improving overall machine balance.

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## McLaren Dig-&-Grab Grapple Bucket

McLaren Industries' Dig-&-Grab heavy-duty digging bucket with grapple attachment combines the loading and leveling functions of a standard bucket with the grabbing abilities of a grapple. The Dig-&-Grab is available in three sizes — 66, 72 and 78 inches wide — and is constructed of manganese-and-chromium steel alloy. All buckets are 20 inches deep, with a thick, 6-inch-deep leading edge. The hydraulic cylinder opens the four heavy-duty grapple tines up to 35 inches wide. Tines are 5/8-inch thick, rivaling 1/2-inch-thick tines on many competitive units, according to McLaren.

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# Buying File: Attachments



## Case/Bradco Cold Planers

For its 400-Series skid steers, Case brands five models of Bradco high-flow cold planers that range from 16 to 40 inches wide with cutting depths to 5 inches. Case says the HP Series planers can take on high-density concrete and asphalt. Depth, tilt and sideshift control are located in the cab. An independent pivoting head tracks contours, and independent self-leveling depth adjustment allows for precise overlapping and taper cuts. A hinged cover permits easy access for maintenance and pick replacement.

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## Meyer Snow Plow

Meyer says its Diamond Trip-Edge moldboard is designed for optimum snow rolling action and has large capacity for snow stacking. The lift path of a skid steer allows you to stack snow high and accurately. The Meyer skid steer mounting can be used with Meyer Diamond Edge 6- to 7½-foot moldboards.

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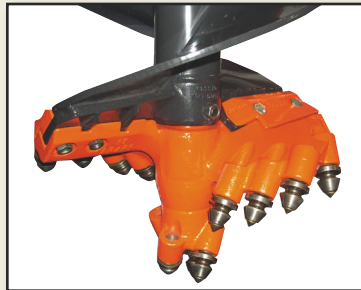


## Thomas Rumble-Strip Grinder

Thomas Grinding's new SS-200 Rumble Strip Machine for skid steers is able to grind shoulder rumble strips, center line

rumble strips, transverse rumble strips, and also does small road planing and line removal. The technology behind the new SS-200 has been field tested for more than 15 years and more than 35,000 miles of actual rumble strip grinding operation.

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## Pengo Bolt-On Rock Head

Pengo designed its new Bolt-On Rock Head (BoRH) to transform the maker's general-purpose Aggressor into a rock-ready auger. The BoRH locks into place using wear

caps — which provide a smooth transition and protect the general purpose head — and existing pilot bit. The wear caps' lugs interface with recesses in the Aggressor head, allowing unobstructed removal of spoil from the hole. The BoRH features the new P21-RR carbide tooth, with its enlarged shoulder to protect the holder during drilling.

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## The Shoe

The Shoe cuts trench about 12 inches deep and leaves the trench ready for repaving because it shaves the soil, rather than scarifying like a backhoe bucket. The trench is ready to pave in one pass, without compaction, according to the manufacturer. The Shoe mounts easily with a wrench on any general purpose or four-in-one loader bucket. The skid steer, backhoe loader, or wheel loader bucket handles lots of material compared to using a backhoe bucket. The Shoe is available in 12-, 18-, 24-, 36-, and 48-inch standard sizes, and can be custom ordered to accommodate specific widths or depths of cut.

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A man's profile is shown in a three-quarter view, looking upwards and to the left. On top of his head, a small yellow excavator and a grey skid steer loader are balanced. The background is white.

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## Four Ways to Manage Fixed Costs

Fixed costs expose organizations to risk as contract volume changes, but those changes need not affect fleet revenue



### Mike Vorster

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

*Variable costs do not add to risk when utilization changes: The more work you do, the more costs you incur, and the more revenue you generate.*

Equipment managers struggle to recover fleet costs when utilization and fleet revenue fall below expected values. The problem arises because many fleet costs are fixed and independent of utilization, while cost-recovery mechanisms (especially those based on hourly use rates) rely on utilization to recover those same monthly fixed costs as well as the hourly variable costs. This creates a complex and high-risk balance between the fixed costs of own-

ing the fleet, the variable costs of operating it, and the revenue generated by charging jobs for the equipment they use.

The manager's struggle is best understood by drawing a classic break-even chart (at right). Analysis of each component will show what can be done to reduce the risks of fleet utilization on cost recovery.

Fixed costs exist whether or not the fleet works. Many ownership costs, such as interest, financing and lease payments, are incurred every month regardless of whether a machine works or not. Others, such as depreciation charges, overhead and indirect labor, vary a little from month to month but can, for all practical purposes, be considered as fixed. The fixed-cost line, shown in red on the chart, therefore runs fairly flat and does not change much when plotted against fleet revenue.

Estimating and plotting the fixed-cost line is not difficult as historical records for the appropriate cost categories can be aggregated and plotted against fleet revenue. Fixed costs can also be calculated by determining what it costs to own and administer the fleet — even if it does no work at all. This is not complex as every purchase, financing or lease decision gives rise to a known stream of future fixed costs that can be estimated and projected into the future.

Variable costs are directly related to fleet activity. The majority of operating cost categories, such as fuel, ground-engaging tools, field labor, repairs and maintenance, are proportional to the number of hours worked. They make up the variable-cost component of the total fleet costs and form a line that slopes steeply from the origin when plotted against fleet revenue. The variable costs, shown in black on the chart, do not add to risk when utilization changes: The more work you do, the more costs you incur, and the more revenue you generate.

As with fixed costs, variable costs can be relatively easily estimated using historical data for the fleet overall. The line is easily plotted by drawing a best fit line from the origin through the given data points.

The fleet-cost line, shown in blue, is simply the sum of the fixed and variable costs. The revenue line, shown in green, slopes up from the origin at 45 degrees and makes it possible to compare total cost on the vertical axis with the equivalent fleet revenue also on the vertical axis. Whenever the blue total cost line is above the green revenue line, the fleet is not producing enough revenue to recover both fixed and variable costs. When revenue exceeds the break-even point, where the green and blue lines meet, utilization is high enough to recover total fleet cost.

Our chart uses data from an actual fleet. Winter weather caused utilization and, therefore, fleet revenue to drop to less than \$1,500,000 in the worst of times. Yet it was possible to grow utilization and fleet revenue to more than \$2,750,000 in the best of the summer periods. The fleet only operated beyond the break-even revenue of about \$2,200,000 and "made money" for four of the 10 periods recorded. Clearly, the relationship is out of balance and at risk. Either our break-even point is too high or our cost



structure is too sensitive to changes in utilization.

The chart enables us to see what we can do to manage the high-risk balance between a cost profile that contains a substantial fixed component and a revenue profile that is almost entirely driven by utilization.

Instinct tells us to look first at fleet revenue. Data show that there is a good correlation between the self-performed portion of contract revenue (total contract revenue minus subcontracts and materials) and the fleet revenue generated from doing the work. Clearly, the more contract revenue we self-perform, the more equipment revenue we generate. If the company in our example has a ratio of self-performed contract revenue to fleet revenue of 7:1, then it needs to perform \$15,400,000 worth of work per period to reach the break-even point.

But there is more to generating fleet revenue than simply doing more work. Equipment managers must be actively involved in the finances to ensure the jobs are properly billed for all the assets they use and that management systems accurately and appropriately record all the fleet revenue due. Unrecorded equipment revenue has a negative impact on cost recoveries.

Focusing on fleet revenue will help achieve the break-even point, but it will not reduce the risks associated with weather, economic downturn or other factors that restrict ability to produce work and generate revenue. To reduce this risk, we must look at fixed costs. High fixed costs equate to high risk, and fixed costs expose a company to changes in contract revenue. There are four things to be done to reduce the risk.

First, ensure that your fleet is the right size and deployed on site where it can generate revenue. Costs cannot be recovered if machines are too old,

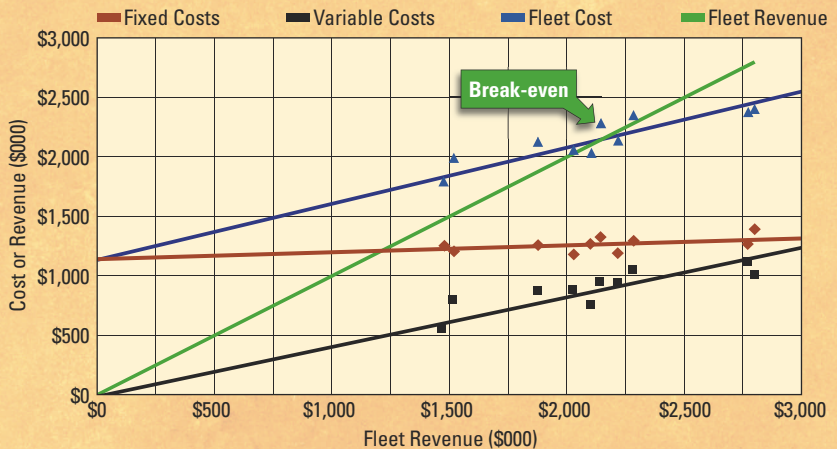
unused or underutilized. Hording equipment that is not earning its keep and not helping with fixed cost recovery doesn't help either. The fleet must work.

Second, ensure that the average age of your fleet is well balanced. Increasing average age lowers investment and reduces fixed costs. On the other hand, higher age increases variable costs and impacts productivity. The two must be balanced.

Third, look carefully at financing and lease commitments. These are, in many ways, the ultimate expression of non-negotiable, fixed monthly charges. If utilization is a problem or if construction volumes are expected to fluctuate, then stay flexible by using your own money or by entering into short-term flexible acquisition or rental agreements.

Fourth, analyze, plan and understand the dynamics. It is easy to determine and track the relationship between self-performed contract revenue and fleet revenue for your company. A large contract with lots of material and lots of subcontracts may be good for the business, but it is not likely to do much for fleet utilization and fleet revenue. Know and understand the break-even chart for your fleet and tie it to estimates of self-performed contract revenue. Seasonal swings in construction activity and rollercoaster work loads are part of our business. Their impact on our ability to recover fleet costs should not come as a surprise.

## Fixed and Variable Fleet Costs



The blue line represents total fleet cost, the sum of the fixed and variable costs. The point at which the blue cost line meets the green fleet revenue line is the break-even point for cost recovery. At that point, utilization is high enough to recover total fleet cost.

***Managers must ensure that jobs are properly billed for all the assets they use and that systems accurately and appropriately record all the fleet revenue due.***



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## CE Advisors Spend 55 Percent on Dozer Repairs

**Aggressive fleet managers get about 28 percent of their original investment back when selling used crawler dozers**

Most aggressive managers of crawler-dozer costs spend 25 to 49 percent of their machine's original purchase price on repairs before replacing them, and get 20 to 34 percent of their purchase price back at resale. *Construction Equipment's* Reader Advisory Board, a hand-selected a group of contractors who've invested in accurate control of equipment costs, tell us that residual values are likely to run as high as half of first cost.

This reader survey, co-sponsored by Case Construction Equipment, focused on the reader advisory panel's experience with crawler dozers. Responses were evenly dispersed throughout the country, and more than 70 percent were highway-and-heavy-construction contractors. All firms on the advisory panel have fleet values greater than \$5 million, and overall the median fleet value is about \$40 million.

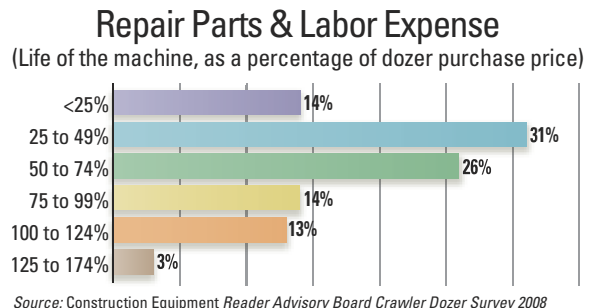
Half of *CE* advisors explain that the most common causes of premature undercarriage failure had to do with operator error, or poor daily maintenance. It's not uncommon to blame equipment problems on operators, but it is significant that even among this conscientious group of equipment managers, 21 percent specifically point out improper track-chain tension or running tight, packed track as the primary reason for premature undercarriage failure. Because track-chain tension changes with underfoot conditions, dozer operators are considered to be the only people close enough to a tractor's operations to properly maintain chain tension.

Less than 11 percent of reasons for premature track failure suggest dry pin-and-bushing joints.

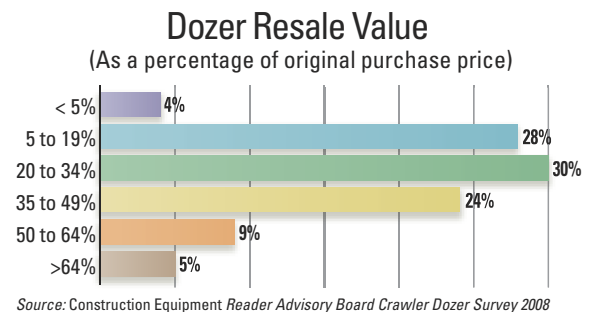
Not surprisingly, nearly two-thirds (59 percent) of *CE* advisors say the most effective method they've used to extend undercarriage life had to do with improving preventive maintenance, most commonly keeping tracks clean and maintaining proper chain tension. Several of these answers specifically mentioned using a vendor's on-site track service.

Only 16 percent of responses indicated that spending more money on undercarriage — buying sealed and lubricated track, rock guards, severe-service parts, or turning pins and bushings or replacing parts more frequently — was their key to extending undercarriage life. Of course, there's no way to tell how many *CE* advisors invest in these premium undercarriage parts, but named something else as their most effective weapon against premature track wear.

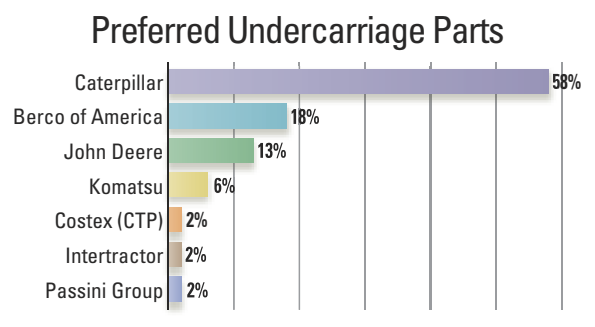
*Reader Advisory Board research is co-sponsored by Case Construction Equipment.*



**Twenty-eight percent of owners of dozers from 260 to 520 hp spend more than the dozer purchase price on repairs over the life of machines. Most of those (19 percent) spend between 100 and 124 percent of first cost.**



**Owners of smaller dozers (75 to 129 hp) are equally likely to sell their machines at 20, 35 or 50 percent of original purchase price. Thirty-six percent of dozers in the 130- to 259-hp range are sold at 5 to 19 percent of first cost.**



**More than 80 percent of managers turn undercarriage pins and bushings, but only about 59 percent of track chain is replaced when pin-and-bushing wear is close to track-chain wear.**



# Earthmoving Report

By LARRY STEWART, Executive Editor

## Caterpillar's D7E Electric Drive Redefines Dozer Productivity

Replacing the powershift with electric motors promises to move 25 percent more material per gallon of fuel than the D7R

Caterpillar's D7E crawler dozer is the first electrically driven dozer using modern alternating-current (AC) technology, and Cat claims it will move up to 25 percent more material per gallon of fuel than the D7R Series II. The drive system takes advantage of today's small, less-costly semiconductors that can rectify heavy-duty-drive voltage to AC, eliminating brushes. The drive is developed by Caterpillar specifically for crawler tractors.

A 235-horsepower Cat C9.3 diesel drives a generator to produce electricity that runs to a power module where it is inverted to AC current. The current powers two AC drive motors arranged in series, which drives a differential steering system much like that used on other Caterpillar dozers.

The electric drive train has 60 percent fewer moving parts than the drive in previous D7s. And because power flows from the generator to the electric drives through cables, rather than a hard drive shaft, the tractor's heaviest components can be positioned optimally in the frame for ideal machine balance.

The C9.3 engine is smaller and achieves rated power at 1,700 rpm, compared to the D7R's 240-horsepower Cat 3176.



Electric drive is not the D7E's only innovation. A center-post cab broadens the view to each half of the blade, and oval track will replace the D7R's elevated sprocket.

Smaller displacement is responsible for some of the up-to-20-percent fuel savings, but the biggest efficiency gains come from eliminating the torque converter and keeping the engine running in a much more narrow range of speeds.

The 3176 diesel coupled to a powershift transmission in the D7R normally operates in a speed range from 1,200 to 2,100 rpm, whereas the C9 and electric drive operates more efficiently near peak torque, staying between 1,450 and 1,700 rpm, according to Mike Betz, Caterpillar engineering manager for track-type tractors.

Electric drive eliminates gear shifting, and is said to perform much like a hydrostatic drive, albeit with a much faster response to load demands. Electric-over-hydraulic joysticks control propulsion and blade. Steering performance is improved 50 percent, partly due to use of a dedicated steering pump equal to that used in the D8's differential steering system. With no mechanical link between the D10-sized final drives and the electric motors' refined power, the D7E can lock one track for pivot turns, and even counter-rotate to turn within a diameter no greater than the machine's overall length.

Efficiency is also gained by eliminating

### D7E Competitors

Model	Engine	Net HP	Track on ground	Blade cap. (cu. yd.)	Operating wt. (lb.*)
Caterpillar D7E	Cat C9	235	9' 11"	8.98	59,000
Caterpillar D7R Series 2	Cat 3176C	240	9' 5"	8.98	62,000
Dressta TD-20H	Cummins M11-C	225	9' 5"	8.1	51,124
John Deere 950J	Liebherr D936 LA6	247	9' 10"	9.4	56,361

\* With blade, without ripper

Even with a smaller engine, the D7E can move 10 percent more material per hour than the D7R courtesy of the electric drive's faster response and more-nimble steering.



parasitic engine load. There are no belts on the D7E's engine. The cooling fan is powered by a thermostatically controlled hydraulic motor. (The generator, inverter, and electric motors are liquid cooled.) Twenty-four-volt current is drawn from the generator and diverted to run the water pump, charge the batteries, and power the self-contained air conditioning unit mounted on the cab roof.

"We evaluated all of the current applications for the D7R and purposely set out to build an electric-drive machine that can do all of the same things, and work in all the same environments, that the powershift machine currently can do," says Dave Nicoll, commercial manager in Cat's tractor products department.

Electric-drive components are sealed much the same as Cat seals transmissions and electrical components. Field trials have proven that the system operates reliably submerged to just below the fan, which is as deep as Cat allows any tractor to wade.

Caterpillar turned product developers loose with a clean sheet of paper, so it's no surprise that the differences between the D7E and D7R extend beyond the innovative drive train. Most obvious may be the fact that the D7E crawls with a low-sprocket undercarriage.

"We carefully evaluated all of the kinds of work that a D7 does, and decided the low-drive undercarriage configuration is the best choice for the job," Nicoll explains. "You get the greatest value out of elevated-sprocket undercarriage when it is suspended, and only the D8 and larger sized elevated sprocket undercarriages are suspended. Certainly we will continue to use the elevated-sprocket undercarriage on the D8 and larger tractors."

Nicoll said Cat would rigorously evaluate applications of smaller dozers before it decided whether or not to eliminate elevated sprockets from D6 and smaller units. It's not certain if that question is truly on the table at the moment, but the 2007 introduction of the D6K, bringing an oval-track D6 option back to North America, suggests that Peoria acknowledges demand for broader application of low-drive undercarriage.

Cat also developed a unique center-post cab, which uses a single A post to support the front of the cab and ROPS. The intake pre-cleaner, exhaust stack, and a single, D9-sized, blade-lift cylinder are aligned with the center post. A center mast is available to hold a

grade-control receiver (D7E can come from the factory Accugrade-ready or with Accugrade installed). This cleared sight lines to both halves of the blade and allowed the doors to be made wider. Noise at the operator's ear has been cut in half.

Cat retained 500-hour oil-change intervals for the C9.3, but distinguished the D7E by doubling hydraulic-oil change intervals to 2,000 hours and quadrupling drive-train oil changes to 4,000 hours. The D7E marks the first availability of Caterpillar's SystemOne undercarriage on D7-sized tractors. SystemOne has been proving to extend undercarriage life by 35 to 70 percent on smaller tractors for more than three years.

Caterpillar estimates that the D7E, with SystemOne undercarriage, will operate at about 10 percent lower overall life-time cost than the D7R.

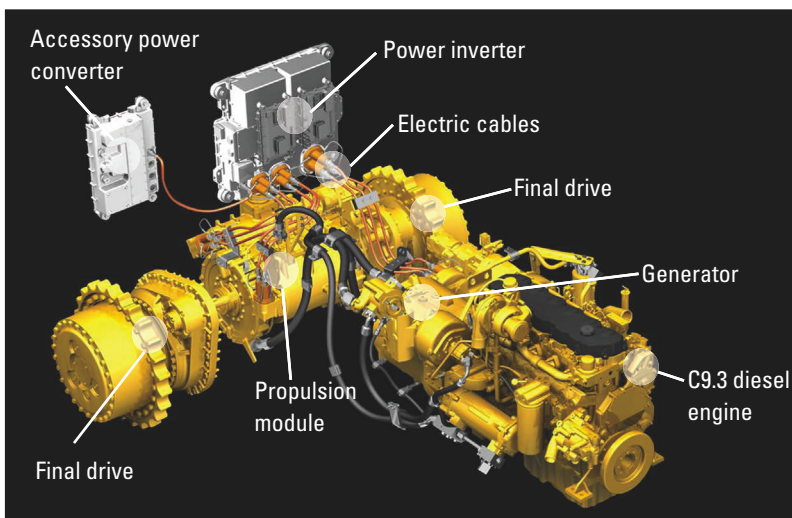
The D7E is expected to be commercially available in 2009. Its production will initiate what Nicoll calls a "ramp-down" of D7R production. Caterpillar intends to replace the R model in North America with the electric-drive innovation.

Just as elevated-sprocket undercarriage debuted on the D7H back in 1977 and spread to other Cat machines, it appears electric drive will migrate into Peoria's extensive machine selection. Electric-drive trucks are almost surely coming, but the technology Cat acquired there is most likely limited to incremental, 3 to 5 percent, efficiency improvements.

Cat believes the greatest opportunities for spreading its newly developed electric-drive technology are on hard-pulling machines that currently use a torque converter. The minds behind the technology hint that there is enormous potential to add batteries (as they improve) and energy regeneration systems to an electric drive train and create ultra-low-emissions hybrid earthmovers in the future.

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**The propulsion module contains two electric motors in series and the differential steering system. The generator and the propulsion module are sealed and liquid cooled.**







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## Compact Tractors New in Bobcat Range

These versatile machines are able to work powerfully in small spaces

Bobcat recently added three new compact tractors — CT120, CT225 and CT230 — to its product range, and the company promises to add six similar models during 2008. These new tractors, says Bobcat, are sized and powered to be utility performers in a wide diversity of applications.

The new machines feature hydrostatic drive (two-speed on the CT120, three-speed on the CT225 and CT230) and front-wheel assist to provide four-wheel drive in rough going. Maximum forward travel speed is 9.3 mph for the CT120, and 13.1 mph for the two larger models. Brakes are the wet-disc type, and a rear differential lock is standard.

All three of the new machines use three-cylinder, Tier-4-compliant diesel engines, with cubic-inch displacements of 56.6, 85.4 and 91.5, respectively, and horsepower ratings of 20, 27 and 30. Operating weights are 2,055, 3,021 and 3,056 pounds, respectively, and tire options include general purpose, turf and agricultural types.

Each tractor is equipped with a three-point, category I hitch at the rear, and the hitch on the two larger models features telescopic lower link ends, telescopic stabilizers, and crank-type tie rod. All models also are equipped with a shielded rear PTO (540 rpm), and a mid-PTO (2,000 rpm) is

optional. Rear PTO horsepower ratings are 14.5, 19.5 and 22.0, respectively. Total hydraulic-pump flow is 7.7 gpm for the CT120 and 12.7 gpm for the CT225 and CT230.

A loader attachment for the front of the new compacts has a rated capacity of 830 pounds for the CT120, and 1,225 pounds for the larger models. Lift heights are 73.5, 84.3 and 84.3, respectively, and bucket widths range from 48 to 68 inches. A backhoe attachment for the trio provides a 77-inch dig depth, with a choice of bucket widths ranging from 9 to 18 inches. Other work tools available include an angle blade, auger, box blade, tine rake, finish mower and seeder.

The roll-over protective structure (ROPS) for these new compacts folds down to make transportation and storage of the tractors more convenient. A fully retractable seat belt comes with the suspension seat, and a safety interlock system allows for neutral start and operation. Other standard features include glow-plug engine preheat, spark-arrestor muffler, cruise control, brake lights, horn and tilting steering wheel. According to Bobcat, the sleek hood and side panels of these new units are made of tough, durable steel and provide superior visibility to the front. Accessories available include rear working lights, side mirror, sunshade and grill guard.

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**The new Bobcat CT230 compact tractor can handle up to a 68-inch-wide bucket, and the machine measures 56 inches wide (with agricultural tires), 118 inches long, and 96 inches high at the ROPS.**





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# Market Watch Lite

By KATIE WEILER, Managing Editor

Access our online reader response form at [ConstructionEquipment.com/info](http://ConstructionEquipment.com/info). Just key in the issue date and make your selections. Subscribe to our monthly eNewsletter at [ConstructionEquipment.com/subscribe.asp](http://ConstructionEquipment.com/subscribe.asp).

## Wacker

Among new options for Wacker's mobile generator range is an extended-run fuel tank, which is sized at 135 gallons to provide a 72-hour run time under continuous load. In addition, a factory-installed fluid-containment system is available to capture spills and leaks. Other options include a cold-weather package, which includes temperature-activated shutters, block heater, electronic governor, LCD strip heater, lube-level maintainer and more.

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## Jergens

According to Jergens, its line of Kwik-Lok pins are suitable for applications that require frequent connecting and disconnecting, and serve as replacements for fasteners such as detent, clevis, and cotter pins. Kwik-Lok pins are available in five handle styles: T-type, L-type, button, recessed-button and ring. Standard outside diameters range from 3/16 to 1 inch, and length ranges from 1/2 to 6 inches.

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## Stone

The availability of a new 20-inch blade configuration for Stone's Saw Devil CS2 concrete/pavement saw provides contractors the ability to cut depths to more than 7.5 inches without having to invest in a self-propelled saw. Available with a variety of engine options, the walk-behind CS2 still accommodates 12- to 18-inch blades also. The Saw Devil features a 4-inch front wheel guide and rear cutting pointer, depth gauge and positive locking blade control, and a vibration-absorbing steel box frame.

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## Delta

The top three, standard-depth, drawers in Delta's new JOBOX Industrial 2-Door 8-Drawer Cabinet hold up to 75 pounds each, and the bottom five drawers accommodate up to 125 pounds each. Four shelves supported by a reinforced frame inside each door provide additional storage space. The cabinet itself is rolled and formed from one piece of steel to add strength, while heavy-gauge, 7-inch full corner gussets resist warping.

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## Proceq

A concrete test hammer from Proceq is designed to read on any surface from any direction, without the need to refer to conversion curves to compensate for impact direction. That's because the Silver Schmidt measures the true rebound coefficient and converts it to compressive strength. The optically acquired "Q" value is intrinsically angle independent. The unit is controlled via a graphic user-interface featuring a single button and inclination sensing.

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## Nilfisk

Nilfisk-Advance America has two new industrial vacuums, models GWD 120 and GWD 220, designed to collect both wet and dry materials without having to stop and change filters. The GWD 120 uses a single motor, while the GWD 220 has two motors for extra power. Features include an ergonomic "tip-and-pour" tank system, float valve, and adjustable handle.

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# Market Watch Lite



## Topcon

Global Navigation Satellite System (GNSS) receivers that are part of the Topcon GR-3 product family are now available with an internal Code Division Multiple Access (CDMA) cellular modem option. This allows the use of signals from two major cell phone providers — Verizon and Sprint. The new receiver kits are available with both single- and dual-mode UHF receivers. In 2006, Topcon in-

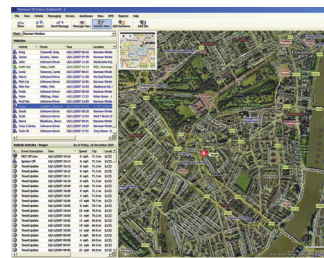
troduced the fully integrated GR-3 system, including receiver, batteries, antenna and communications.

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## Navman Wireless

Online AVL2 vehicle-tracking and logistics software system provides vehicle-position and vehicle-activity information. The system is said to support several hybrid-mapping display options, including views of the vehicle's actual surroundings, by using high-resolution satellite imagery and high aerial photography. It includes two-way messaging with vehicles; integrated navigation functions; real-time and historical vehicle/driver activity reporting; driver ID; speed alerts, idle time, unauthorized movement; and "geo-fencing" capability.

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## Hilti

Hilti's DD 110-D Dry Diamond Coring tool is designed for high performance in hand-held dry coring of various base materials when used with Hilti's HDMU diamond core bits and VCD 50 vacuum. Hilti says the compact, lightweight design and the DD 110-D's new grip help reduce user fatigue. A 1,600-watt motor delivers power through two-speed gearing. Under Hilti Lifetime Service, if repairs are ever needed on the DD 110-D, it will be serviced quickly at no cost for two years.

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## ▶ Wacker

With a 16-inch blade diameter, the BTS 1140L3 is a new offering in Wacker's cutoff-saw product line. Weighing 23.4 pounds, it is powered by a 6.1-horsepower two-cycle engine and offers a cutting depth of 5.7 inches. The saw features Wacker's L3 (Long Life Lubrication) piston, which is furnished with a special graphite surface coating to eliminate piston and cylinder overheating during tough, continuous operations. At the same time, a multi-ribbed belt is designed to provide better power transmission to the cutting blade.

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## ▶ Fibre-Metal

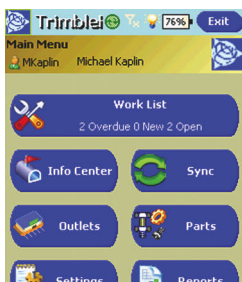
Protection against falling debris is not the only reason for wearing safety headgear on jobsites, according to Fibre-Metal, a brand of North Safety Products. As such, the Supereight E1 Full Brim product is equally adept at protection against rain and the sun's harmful rays. While the smooth crown design of the hardhat deflects falling objects, an eight-point suspension offers a sophisticated head protection system.

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## ▶ Trimble

TrimbleFS software is a Windows Mobile application that extends enterprise information into the field and automates data gathering to improve the efficiency of field technicians who maintain, repair and install equipment. The software wirelessly connects field technicians to job-ticket information. Field technicians can view service history, accept or reject job dispatches, send messages, record work performed, scan barcodes, record equipment or user information, manage spare parts, print invoices and more.

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# Market Watch Lite

## ► Miller

The portable Millermatic Passport Plus all-in-one MIG welder provides sufficient arc on mild and stainless steel. However, the new welder also provides performance on aluminum, from 18-gauge through quarter-inch, in combination with the new direct-connect Spoolmate 100 Series spool gun. A three-position material selection switch sets optimal arc characteristics for steel, stainless steel and aluminum. Passport Plus features Miller's exclusive multi-voltage plug and Auto-Line power management technology, enabling it to connect to either 115- or 230-volt power.

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## ◀ Rojone

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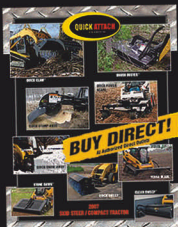
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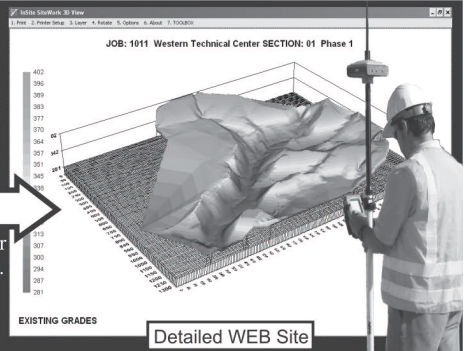
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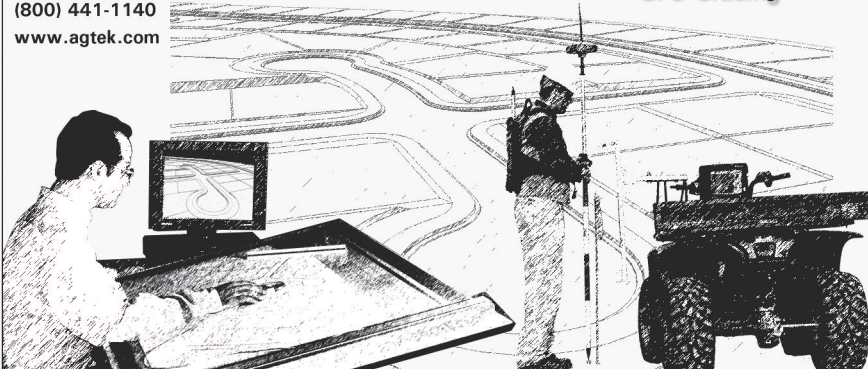
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# Iron Works

By KEITH HADDOCK, Contributing Editor

## M-R-S Scraper

Specialist scraper manufacturer built some of the world's largest pull-type scrapers in the 1960s



M-R-S Manufacturing made a name for itself in designing and building large earth scrapers beginning in 1943. The letters stand for Mississippi Road Services, and the company had its start in Jackson, Miss., moving its headquarters 20 miles north to Flora in 1946. Filling the need for high-speed earthmoving vehicles, M-R-S concentrated from the outset on 4-wheel tractors with matching scrapers and wagons. The company's first efforts produced a 72-horsepower tractor coupled to a bottom dumping wagon holding 8 cubic yards or 13 tons. The outfit was known as the "Mississippi Wagon."

M-R-S believed the 4-wheel tractor concept provided better traction, higher speeds, and lower maintenance costs. The typical M-R-S scraper outfit consisted of a 4-wheel tractor pulling a standard 4-wheel pull-type scraper. This arrangement allowed any brand of scraper to be pulled by an M-R-S tractor as well as its own. Scrapers by LeTourneau or Bucyrus-Erie were often seen behind M-R-S tractors, but most common were scrapers built by Wooldridge Manufacturing of Sunnyvale, Calif. Wooldridge made pull-type scrapers adapted for M-R-S tractors, and were marketed by M-R-S as an integral unit.

A unique feature of the M-R-S design was the hydraulic weight transfer system between the scraper and the tractor. A long hydraulic ram extended from the tractor drawbar to a high point on the scraper gooseneck. Operation of this ram adjusted weight distribution between the scraper front wheels and the tractor rear wheels. More weight could therefore be transferred to the tractor wheels for increased traction in adverse conditions, or for self loading.

Some very large capacity scrapers were developed by M-R-S in the 1950s and 1960s. The 500-horsepower M-R-S

**M-R-S 250 tractor-scraper combination hauls 65-yards in 1961. A hydraulic cylinder between the tractor and scraper transfers weight to driving wheels for added traction.**


250 tractor, when coupled to the 41-yard heaped capacity Wooldridge OS-300B scraper, was billed as the world's largest rubber tired earthmover when launched in 1955. On a good haul road, the outfit could attain 34 mph in top gear. An even larger scraper, the 250-series, with capacities up to 65 cubic yards heaped, was available for the M-R-S 250 tractor in 1961. And some high-volume versions were offered for coal handling, including one of the largest volume single scraper bowls ever made, the model 250T, which could carry a heaped load of 90 cubic yards! This monster incorporated a 430-horsepower engine on the rear, and was drawn by a 430-horsepower M-R-S tractor.

In the 1960s, M-R-S offered elevating scrapers designed by Hancock Manufacturing and continued to offer 4x4 or 4x2 tractor and scraper combinations of both standard and elevating types throughout the 1970s. In 1986, Taylor Machine Works purchased M-R-S, and manufacturing was transferred to the Taylor Works at Louisville, Miss. After a few machines were built at the new location, orders dwindled and the line was discontinued by the end of the 1980s.

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