

# 345 HORSEPOWER SAYS: WHATEVER IT IS, IT MOVES.



**MEN LOVE POWER. Why?** [ **LONG LIVE THE TRUCK** ] generates a whopping 380 lb.-ft. of torque — that's more than Ever see what happens when something gets in the way of a tornado?

Exactly. That's the thinking behind the Chevy Vortec™ Max powertrain — create a ferocious vortex inside the combustion chamber, along with a high compression ratio, to generate formidable power. And the 345-hp Vortec Max,\* available on 2006 Silverado, is no exception. Designed to be durable and powerful, the Vortec Max uses cast-aluminum cylinder heads with high-flow ports and combustion chambers to help deliver more horsepower than Ford, Toyota, or Nissan half-tons.

In fact, when partnered with the standard Hydra-Matic® four-speed automatic transmission, Silverado's Vortec Max

**VORTEC MAX**

Dodge HEMI. And, with our available Vortec Max Performance Package†, which includes an automatic locking rear differential, a 9.5-inch axle, heavy-duty transmission, and a trailering package for a max trailering weight of 10,000 lbs‡, the Vortec Max offers more towing capacity than Dodge HEMI or any other half-ton pickup.

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**CHEVY**  **SILVERADO**

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\*Available on select uplevel half-ton extended and Crew Cab models. †Maximum trailer weight ratings are calculated assuming a properly equipped base vehicle plus driver. See dealer for details. \*\*Dependability based on longevity: 1981–July 2004 full-line light-duty truck company registrations. Excludes other GM divisions. ©2005 GM Corp. Buckle up, America!

For information circle 55

Reed Business Information.

# CONSTRUCTION EQUIPMENT

December 2005

ConstructionEquipment.com

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# Top 100 Products 2005

PERIODICAL





Top **100**  
Products  
**2005**

The New H-Series



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GPS: 24

GLONASS: 14

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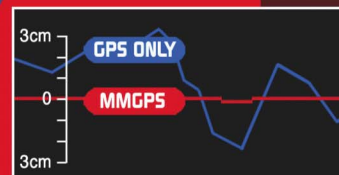
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Cover photo by George Pfoertner®

 Reed Business Information®

## FEATURES

### EXCLUSIVE

#### 24 Top 100 New Products of 2005

*Construction Equipment* editors choose the 100 most significant product introductions of the year. In evaluating these products, we look for advances in technology, new product lines, significant improvements to existing products, or a product that increases competition in its field. To locate specific product categories, see the following page numbers or check the alphabetical index on pages 66-67.

24 Heavy Earthmoving

32 Light Earthmoving

36 Trucking & Hauling

40 Paving/Compaction/Concrete Pumps

42 Light Equipment

49 Drilling & Trenching

51 Lifting & Material Handling

56 Ancillary Products



### PRODUCTION HEROES

#### 68 Wheelbase Is Key to Skid-Steer Productivity

Design elements that make skid-steer loaders indispensable on most jobsites can also present some challenges to productive operation. With hydrostatic drive on a short wheelbase and narrow tread width, the skid-steer is fast and maneuverable. But unpracticed or careless operators will occasionally struggle to keep all four tires on the ground.



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## Editors' Choices

Each fall, as our editorial team reviews the year's collection of new products, we marvel at the number of construction products that promise improvements in productivity and efficiency. We're also intrigued by the new introductions or new lines, and manage always to find a product or two that just surprises us by its design or innovative solution.

This year, a Conexpo/Con-Agg year, provided an even larger field from which to choose the Top 100 new products of 2005. It was a banner year, and our team spent a bit more time that fall day debating the merits of many products on the list. Sometimes it's tempting to just bump it to the Top 105, but we remained true to the spirit of the list.

For the second consecutive year, we also looked at each category of equipment — heavy earthmoving, light earthmoving, trucking & hauling, paving/compaction/concrete pumps, light equipment, drilling & trenching, lifting & material handling, trucks, and ancillary products — and picked one product in each that we thought was worthy of slightly more recognition.

In order to make the Top 100 list, a product has to qualify as a new line or a significant improvement to an existing product, or it has to represent advances in technology, or it has to increase competition in its category. Editor's Choice recognition goes to the one product in each category that best represents those criteria.

*Construction Equipment's* reason for existence is to be *the* equipment journal for companies that use these machines and related products in their projects, from site preparation to road building to school construction to mining — and all those in between. We publish all the new-product news that we have room for, and try to keep our readers up to date. And, thanks to our electronic newsletter, eMarket Watch, we can publish that news even more quickly.

We carry a passion for construction equipment, which makes our annual Top 100 a pleasure to put together. And determining our editors' choices is just a part of the fun.



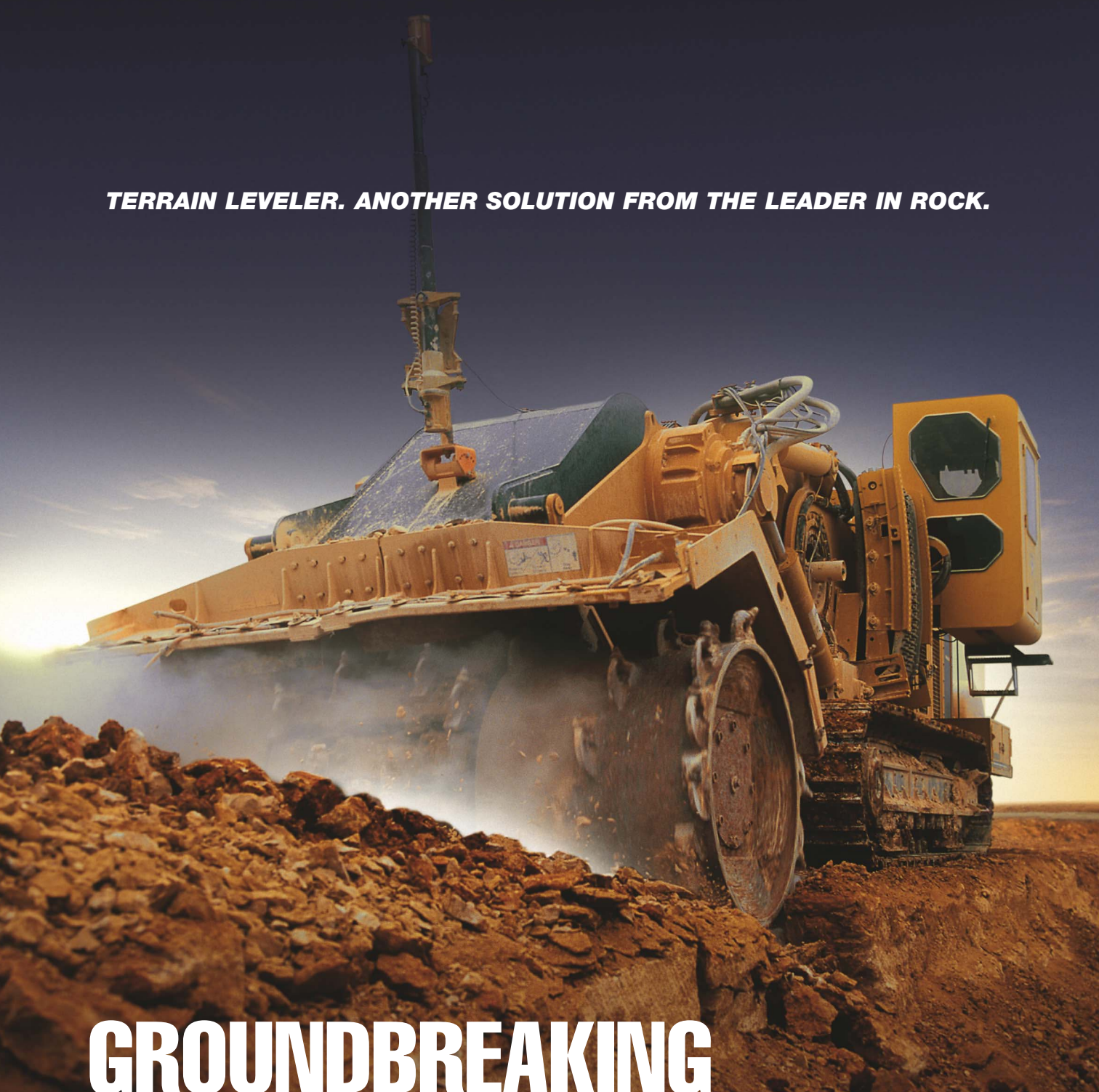
Rod Sutton, Editor in Chief

*Rod*

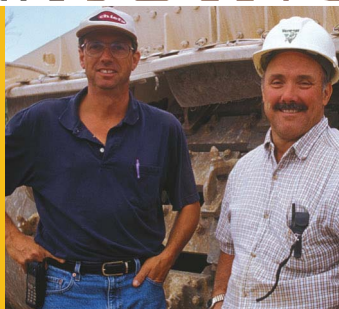
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— Rick Brown, L.B. Enterprises, Belton, MO

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For information circle 5

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# MARKET WATCH

By KATIE WEILER, Managing Editor



p. 14



## ◀ Yanmar

Yanmar enters the backhoe-loader market with its Model CBL40. It is powered by a 3-cylinder Tier II engine that delivers 37.2 horsepower. Backhoe digging depth is 10 feet with reach of 13 feet 2 inches. The machine features a heavy-duty frame and reinforced backhoe boom, arm and loader arm. Backhoe digging force is 5,800 pounds at the bucket and 3,600 pounds at the arm. Loader lift capacity is 2,960 pounds with a breakout force of 4,375 pounds.

For information circle **150**

## ▶ Caterpillar

Replacing the 657E, the 657G open-bowl scraper features Cat's C18 ACERT engine for the tractor and the C15 ACERT engine for the scraper. It has a heaped capacity of 44 cubic yards and a rated load of 104,058 pounds. The radiator has 9 fins per inch (the previous model had 33 fins per inch) to increase space and reduce clogging in severe applications. Cab improvements include a single-lever control for the bowl, apron and ejector.

For information circle **151**



## ▼ International

A new class-6 4x4 truck builds on features and benefits from the company's 4000 series. The 4200 4x4 factory-built vehicle (available in 21,500- and 25,999-pound GVW) extends International's 4x4 offering into a lighter GVW rating. It is said to provide excellent maneuverability and visibility, as well as extended service intervals. The 4200 comes equipped with the Diamond Logic Electric system.

For information circle **152**



## ▼ LBX

Weighing 152,600 pounds, the Link-Belt 700 LX hydraulic excavator fills a gap in the product line.

The 700 LX produces 57,800 pounds of lifting capacity over the end (measured at ground level, at a 20-foot radius). It's the first Tier-3-compliant Link-Belt excavator with a 425-hp Isuzu diesel engine. It is also the first LX machine with a hydraulically driven fan. Link-Belt's Inte-LX computer control system monitors hydraulic output and regulates engine performance.

For information circle **153**





# Market Watch



## Housby

Housby Mixer Systems' GT mixer truck is engineered with a second operator's station in the rear of the truck. The company says the truck also offers complete hydraulic control of the drum and chute system and gives ready-mix producers the ability to provide precise concrete placement. GT is currently engineered to interface with Housby Mixer Systems and a Mack chassis.

For information circle **154**

## Astec

Equipped with a 24-hp gasoline engine, the RT160 trenches up to 2, 3 or 4 feet deep in widths from 4 to 8 inches. It has a hydrostatic ground drive system, and the hydraulic trencher drive system is directly connected to the trencher head shaft. It measures 42 inches high, 74 inches long, and 36 inches wide with standard tires.

For information circle **155**



## Stone

WolfPac 4100 is a 40-inch-wide, double-drum drive, double-drum vibration asphalt roller for use in confined areas. The operator can direct the vibration to both drums, the front, or the rear. An electro-hydraulic circuit combined with a custom-designed manifold allows the operator to activate the vibration where needed. It's powered by a 24.8-hp water-cooled Kubota diesel engine.

For information circle **156**



## Vermeer

Navigator Six Shooter is positioned for curb-to-home applications with "fast drops and quick shots," says the company. Measuring 35.5 inches wide by 115 inches long, it can be maneuvered and transported easily. Powered by a 25-hp Kubota diesel, it has 550 ft.-lbs. of rotary torque and 5,500 pounds of push/pull. Maximum carriage speed is 130 fpm.

For information circle **157**



# The Perfect







### **Vermeer**

The 350-hp T858 Commander is a sliding offset trencher for use in rock. Weighing 92,000 pounds, T858 can shift the trencher 32.5 inches in either direction. Powered by a Cat C9 diesel with 350 horsepower, it has a hydrostatic transmission. An integrated electronic control system monitors engine performance and adjusts ground speed. Auto-tilt track has an oscillating frame that allows individual tracks to follow the ground's contour. For information circle **158**

### **International**

The 4100 Class 5 conventional has gross weight ratings of 17,800 and 19,500 pounds, and is powered by International's VT 365 V-8 diesel with 230 horsepower and 540 lbs.-ft. of torque mated to an Allison 1000 automatic. The truck claims medium-duty features of its 4000 series, including a comfortable steel cab, multiplex wiring and more. For information circle **159**



### **Yanmar**

Universal zero-tail-swing Vi045-5 and Vi055-5 excavators have operating weights of 10,121 and 11,312 pounds, respectively. High-strength boom side plates are 50 percent thicker than previous models, says the company. Larger engine hood covers make maintenance access easier, and hydraulic hoses are recessed and protected by removable covers.



For information circle **160**

### **Service Trucks International**

STI introduces the Eagle Pro II model 2460 service body and 1061 Tiger Crane. The body offers 24-inch-deep, 60-inch-tall cabinets that are mounted low for easy access. The 1061 hydraulic crane features a 62,000-ft.-lb. rating, 21 feet of hydraulic reach, 60 fpm line speed, proportional wireless control, and Auto II Speed load-sensing control on all functions.

For information circle **161**



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# **CATERPILLAR®**

For information circle **6**



# Market Watch

## Stellar

Stellar's X-Tra-Lift Utility Pro loading device is designed for a full-size, dual rear-wheel chassis with a cab-to-axle measurement of 60 inches. The package includes a hydraulic/electric X-Tra-Lift loading system with a 1,300-pound lifting capacity and a 9-foot-long Knapheide Mfg. brand utility body. Several options are available.

For information circle **162**



## Astec

Astec introduced the DD-65 and DD-1215 compact directional drills with 6,000 and 12,000 pounds of push/pull, respectively, and 500 and 1,500 ft.-lbs. of rotary torque. Each has rack-and-pinion carriage drive. The DD-65 is 10 feet by 35.5 inches for maneuvering close to housing for fiber-to-the-home installations. The DD-1215 drills 120 feet per minute.

For information circle **163**

## National Crane

The 13100A boom truck has a maximum capacity of 30 tons at a 5-foot radius. Standard four-section boom measures 100 feet, but when configured with jib and optional 110-foot boom, maximum tip height is 162 feet. Single-line pull is 9,300 pounds. Features include load moment indicator with optional work area definition system and self-lubricating "Easy Glide" wear pads.

For information circle **164**



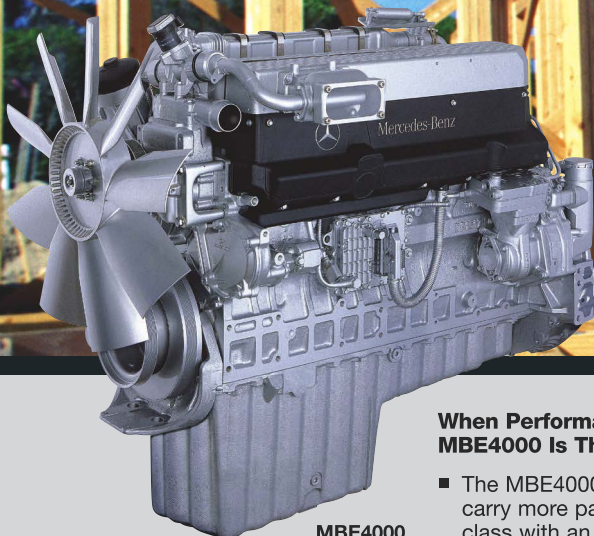
## Vermeer

Model RT350 riding trencher delivers 37 horsepower for use on smaller projects. It digs 48 inches deep with widths from 4 to 12 inches. Powered by a Cummins A1700 engine, it has a disc/caliper park brake and 42-inch wheelbase. Forward/reverse ground-drive foot pedal includes patented creep override that frees operator's hands to control attachments.

For information circle **165**

# MBE4000...Committed To Hauling

200+ more lbs per day = 62,400+ more lbs per year



**MBE4000**

### When Performance And Weight Are Critical, MBE4000 Is The Engine Of Choice.

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- The MBE4000's high torque at low RPM means excellent acceleration and outstanding gradeability with reduced shifting.





## Gehl

Offered as an enhancement to its Personnel Work Platform (PWP) System, the Radio Remote Control System allows operators to raise, lower, extend and retract the telescopic-handler boom with a wireless remote control. It can also be used to start and stop the engine. A proportional trigger control allows operators to control the speed of the boom.

For information circle **166**



## Stellar

The Flex36 Series hooklift has a hook height of 36 inches, and the series' four models re-

place the nine current models. Hooklifts work on cab-to-axle measurements of 60, 84, 108 and 120 inches, and can be pressure-adjusted to accommodate lifting capacities from 9,000 to 16,000 pounds.

For information circle **167**



## American Augers

DD-185 replaces the DD-140B, and provides 185,000 pounds of push/pull with 25,000 ft.-lbs. of rotary torque. Features include rack-and-pinion carriage drive and rear downrigger-style hydraulic thrust stabilizers.

For information circle **168**



## Caterpillar

Both the 301.6C and 301.8C mini-excavators feature 22 percent more bucket digging force and 10 percent more stick digging force than previous models. Engine power increased 4 percent to 18.1 horsepower. A variable-displacement hydraulic pump eliminates stalling. Operating weight is 3,792 pounds with a cab; 3,548 with a canopy.

For information circle **169**

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## or a brand new home



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 Braking HP Is Available For Maximum Safety And Reduced Maintenance Cost

# 1100

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- Stick, TIG and Wire Welding
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- 11,500 Watts peak 3-phase power
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## MANUFACTURER NEWS

### International to Test Hybrid Trucks

In late September, International Truck and Engine announced it was about to begin the nation's largest

medium-truck, diesel-electric hybrid utility field test program in the first quarter of 2006. Preliminary results

of its Class 5 and 6 hybrid vehicles showed impressive numbers, including a decrease in fuel usage from 40 to 60 percent while reducing emissions.

The field-test program, sponsored by WestStart's Hybrid Truck Users Forum (HTUF), will test 24 factory-built utility trucks

**International will field-test 24 utility trucks featuring an integrated hybrid power-train solution.**

equipped with an integrated hybrid power-train solution jointly developed by International and Eaton Corp. The study was designed to anticipate how trucks in the test would be used on a larger scale.

"When you combine the high cost of diesel with potential maintenance savings and tax incentives, the business case for hybrid-electric vehicles becomes more

and more favorable," says Tom Cellitti, vice president/general manager, Medium Vehicle Center, International. "As the production volume of hybrid trucks increases, the price will decrease due to scale, making a commercially viable product more likely in the future."



## SUPPLIER NEWS

### JLG Moves to GM Engines

Beginning next month, JLG will use General Motors engines to replace the discontinued Ford engines it has been using in its combustion-powered boom and scissor lifts.

GM's Vortec 3000 is a 3-liter, four-cylinder gas engine with 82 horsepower at 2,800 rpm. JLG has GM parts inventoried for service, and will continue to support the Ford-powered products. Service training related to the Vortec is underway, and JLG also plans to install GM engines in remanufactured machines.

JLG dealers will handle all General Motors' warranty work.

## MANUFACTURER NEWS

### Cat Taps JLG to Build Telehandlers

Caterpillar formed a global alliance with JLG to develop and produce a full line of Cat-branded telehandlers. The deal is expected to close by the end of the year.

"This alliance leverages our respective strengths, combining Caterpillar's global brand, distribution

expertise and component capabilities with JLG's strong design capabilities in the telehandler and lift industry, to deliver world-class telehandler product to our customers," said Ed Rapp, vice president of Caterpillar's Building Construction Products Division.



## INDUSTRY EVENTS

### World of Concrete Coming in January

On Jan. 17-20, 2006, the World of Concrete will take place at the Las Vegas Convention Center, Las Vegas. Seminars run from Jan. 16-20, 2006.



hanley wood

Last year, more than 73,000 construction professionals from about 110 countries attended the show to see the thousands of new products, ideas and technologies from almost 1,600 exhibitors. For more details, visit the website [www.worldofconcrete.com](http://www.worldofconcrete.com).



## INDUSTRY NEWS

### Graduates Strengthen Industry

Recognizing that the shortage of qualified service technicians is a pressing concern in the construction-equipment industry, Local 150 of the International Union of Operating Engineers established a four-year Apprentice Technician program in

2001. On Oct. 8, 2005, the program's first class graduated, each man having accumulated 864 hours of classroom and lab work, plus 8,000 hours of work as a technician for a contractor or dealer.

According to program coordinator, Jim Yasko, the graduates have completed in-depth courses for maintaining, troubleshooting and repairing diesel en-

gines and drive-train components, as well as hydraulic, electrical and mobile air-conditioning systems.

In addition, graduates are qualified welders, have earned certification as hazardous-material technicians, have completed employer-required OSHA safety training and are certified forklift operators.

Local 150 also has enlarged the scope of



Roger Allen, third from left, Coordinator & Administrator for Local 150's Apprenticeship and Skill Improvement Program, accepts a commemorative plaque from the first Apprentice Technician graduating class, which includes, left to right, Brian Mason, Dan Koch, Mike Brock, Jamie Wallisch, Adam Sweet, Paul Forward, Nathan Allen, Mike Leaver, Ken Dato, Jerald Buerger and Dustin Walzer.

its overall technician-training efforts, says Yasko, by working with high-school juniors and seniors through its School-to-Apprentice-

ship program, and by providing advanced training for member technicians through its Journeyman Upgrade program.

## MARKET REPORT

### Louisiana Contractor's 2006 Outlook

Our 2005-06 Annual Report & Forecast questionnaires hit the field within a couple weeks of Hurricane Katrina's devastation, and shortly after Rita pounded Texas. As expected, Louisiana equipment managers are expecting a busy 2006. Rental dealers/equipment distributors in the Mid-South region (including Texas and Louisiana) are also anticipating busy years in 2006. *Construction Equipment* will publish the complete Annual Report & Forecast next month.

Business expectations **..Excellent**

Expecting volume increases **.....81%**

Expecting fleet expansions **.....57%**

Estimated fleet-replacement rate **..11.2%**

## MAINTENANCE TIPS

### Focus on Casings for Retread Savings

Casings are the core of your tire investment," says Al Cohn, commercial tire technical marketing manager for Goodyear. He recommends these key practices for extracting maximum value from tire casings:

- **Maintain Pressure** — Underinflated tires not only waste fuel but also overheat, which damages the casing. Check air pressures daily with a calibrated gauge. Find your tires' correct tire pressures at [www.goodyear.com/truck/tireinfo/safety.html](http://www.goodyear.com/truck/tireinfo/safety.html).
- **Choose Wisely** — Match tire load rating to the job. For construction duty, choose treads with stone ejectors and tire designs with extra sidewall protection. Avoid designs with a pressure distribution groove.
- **Match Duals** — Both tires in a dual assembly must be properly inflated to share the load. Goodyear recommends no more than 3/4-inch difference in circumference for 8.25R20 tires and a 1 1/2-inch difference for 9.00R20 and larger tires.
- **Change Tires Early** — Running tires to minimum tread depths before pulling them doesn't pay. "You



#### Underinflating Is Overloading

(Load limits at various inflation pressures)

Pressure (psi)	70	75	80	85	90	95	100	105	110	115	120
Load (lbs.) DUAL	4,660	4,870	5,070	5,260	5,510	5,675	5,840	6,005	6,205	6,405	6,610
Load (lbs.) SINGLE	4,820	5,070	5,310	5,550	5,840	6,095	6,350	6,610	6,790	6,970	7,160

Carrying 6,600 pounds on an 11R24.5 tire inflated only to 85 psi is basically the same as overloading that tire by 16 percent. Goodyear's Al Cohn says it will cut tread life by 13 percent. He estimates that underinflating to only 75 psi will drop expected mileage by 30 percent.

want to have around 3/32 of an inch remaining to protect your casing for retreading," says Cohn.

- **Make Quality Repairs** — An unlimited number of nail holes can be repaired, a maximum of two section repairs, up to a 3/8-inch injury in the tread area, and limited sidewall repairs based on stress zone.
- **Inspect Regularly** — Inspections should watch for a checklist of conditions including underinflation, sidewall damage, tread damage, irregular wear, and objects embedded in tires.



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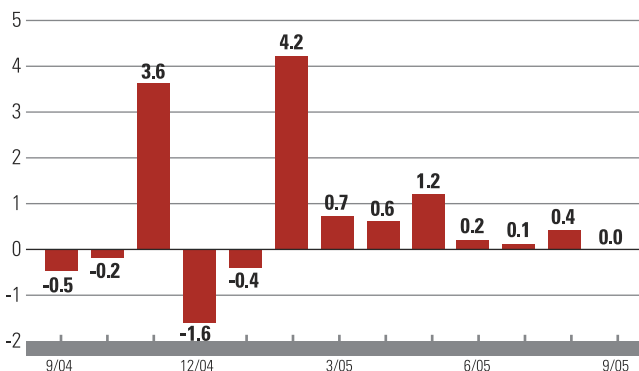
For information circle 9



### ↔ PUBLIC CONSTRUCTION SPENDING

Public construction spending has been stalled at a \$248 billion annual pace for the four months ending in September. A 9-percent rise by the end of 2006 is expected. Key drivers of this improvement will be federal transportation funding, rise in spending to build public buildings, drawing on improved budget balances, and capacity expansion of private infrastructure in the fourth year of economic expansion. Construction activity will grow most for water, sewer, power and transportation facilities.

(% change from previous month)

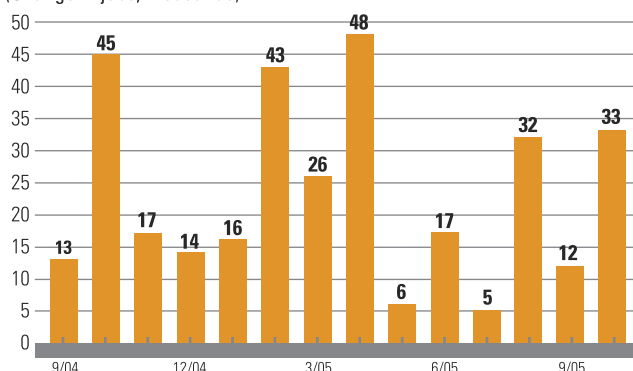


Source: U.S. Department of Commerce

### ↑ CONSTRUCTION EMPLOYMENT

Contractors have added to their crews for 20 consecutive months, a total of 471,000 employees. Nonetheless, the unemployment rate for construction workers is still 5.5%, too high to cause serious labor shortages. Hurricane clean-up work probably accounts for 15,000 to 20,000 of the 45,000 jobs added in September and October. This demand for labor will be ebbing quickly, but it will be offset by a rise in rebuilding hiring. Some 175,000 more constructions jobs are expected in '06.

(Change in jobs, thousands)

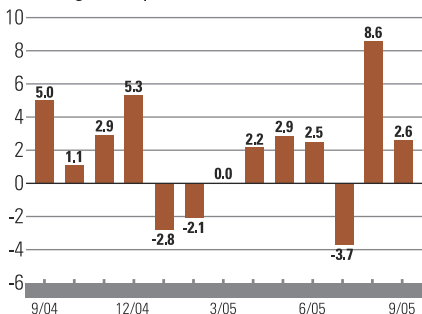


Source: U.S. Department of Labor

### ↑ CONSTRUCTION EQUIPMENT SHIPMENTS

Equipment shipments rose to nearly \$3 billion in September, manufacturers' order backlog remained at 11 weeks, and manufacturers' inventory/sales ratio declined to a record lean 1.38. Monthly shipments are expected to stay near the current level through 2007. Equipment prices have been nearly steady for several months. Ahead, expect stable steel prices and strained manufacturing capacity to drive equipment prices up about 3 percent in 2006.

(% change from previous month)

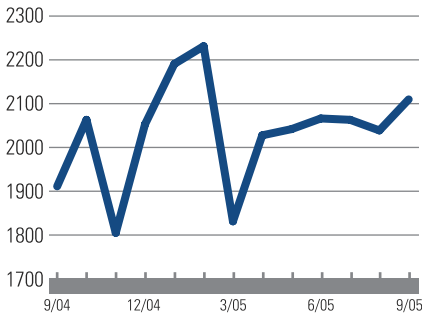


Source: U.S. Department of Commerce

### ↔ HOUSING STARTS

Starts averaged 20.06 million for the six months through September, down only 7 percent from the January/February peak of 2.21 million. A further decline to 1.84 million is expected over the next 18 months. Signs of a weakening market are now pervasive. There have been significant declines in permits, model-home traffic, and home-price appreciation as well as increases in mortgage rates and the inventory of unsold new and existing homes. Mortgage lending standards are also tightening.

(Annual rate, thousands)

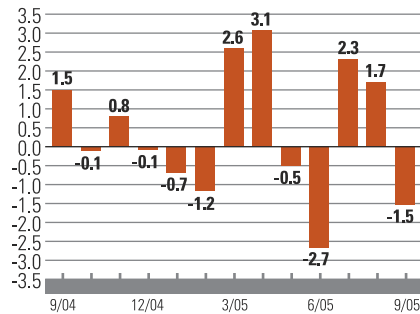


Source: U.S. Department of Commerce

### ↔ COMMERCIAL CONSTRUCTION SPENDING

Commercial construction spending (retail, warehouse and parking) has been steady for six months. The only significant gain has been for smaller shopping centers built to serve new residential neighborhoods. This relatively steady market weakened little in the last recession and then recovered quickly early in the business expansion. No catching up is needed. Market growth through 2007 will be only 3 percent to 4 percent.

(% change from previous month)



Source: U.S. Department of Commerce



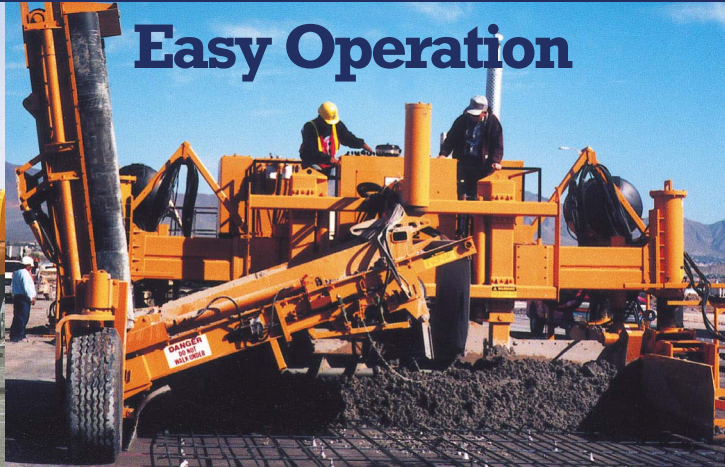
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## Easy Operation



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## Smooth Groove



- TC-2700 Texture/Cure machine
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For information circle 10



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## Heavy Earthmoving

# Top 100 New Products of 2005

The editors of *Construction Equipment* choose the 100 most significant product introductions of the year

Our Top 100 Products Award program was conceived to call special attention to the most significant products introduced each year. We receive more than 1,200 product releases annually and publish nearly 600 of them. We have to choose each month which products have greater interest to the majority of our readers.

In evaluating products for the Top 100 Awards, we look for advances in technology, new product lines, significant improvements to existing products, or a product that increases competition in its field. Also, the highlighted products had to be featured in the magazine between November 2004 and October 2005. Because we narrow down the awards to 100 products, we may not be able to recognize other deserving products in the field.

### Mainframes Give Dozer Line Balance

Six unique mainframes are manufactured to give J-Series crawler dozers perfect balance, regardless of blade or track configuration, says **John Deere**. Completely redesigned, the models have longer track frames and improved balance for better grading. An advanced monitor displays machine operating parameters and acts as

an interface for the operator to change operating characteristics of the machine, read diagnostic codes, and troubleshoot systems from the seat. Model 750J and 850J use PowerTech engines ranging from 145 to 200 horsepower. Estimated list price: \$280,000 to \$350,000.

For information circle **238**







## H Series Improves Medium, Large Loaders

**Caterpillar** upgraded both its medium and large wheel loaders this year. H Series medium loaders have new features, including load-sensing hydraulics with simultaneous lift and tilt capabilities, ACERT engine, and electro-hydraulic controls. H Series offers a 5-percent improvement in fuel efficiency and 20 percent more lift force. H Series medium models include the 950H, 962H, 966H and 972H. Estimated list prices: \$250,000 to \$450,000.

H Series large wheel-loader models are the 980H and 988H. Each has an ACERT Tier III engine; a C15 in the 980H and a C18 in the 988H. Also included on the new series is the company's Impeller Clutch Torque Con-



verter/Rimpull Control System that allows the operator flexibility to modulate rimpull. It also has a throttle lock for faster cycle times and hydraulic efficiency. Estimated list prices: \$650,000 to \$750,000.

For information circle **239**



## Engine Matched To Hydraulic System

**Volvo** has extended its excavator line to include the 70-ton EC700, which uses 80-ton components in its undercarriage. Tandem hydraulic pumps are connected directly to the engine to avoid power losses, the company says. The machine is powered by Volvo's Tier 3 D16E EAE3 that delivers 424 horsepower at 1,800 rpm. Maximum dig reach is 42 feet 4 inches. Estimated list price: \$700,000 (base machine and bucket).

For information circle **240**

## High Static Tipping Load

**Ingersoll-Rand** added compact wheel loaders to its line with the WL-350 and WL-440. Transverse-mounted engine and hydraulic pump at the rear give these loaders a high static tipping load, the company says. Straight tipping load is 11,731 pounds for the WL-350; 14,620 pounds for the WL-440. WL-350's operating weight is 11,240 pounds with a 1.2-cubic-yard bucket and 60-hp engine. The 73-hp WL-440 weighs 12,230 pounds with a bucket of 1.4 cubic yards. Hydrostatic drive, parallel loader linkage, and limited-slip differential are standard features. Estimated list price: \$55,000 to \$75,000.

For information circle **241**







# Heavy Earthmoving



## Center of Gravity Stays Put

Completely redesigned compact loaders from **Mustang** include models ML28, ML48, ML48T and ML68. They use a rigid frame and all-wheel-steering to keep the center of gravity constant, giving the machines the ability to lift the maximum amount of payload at the maximum height while turning. They feature a tight turning radius to maneuver around crowded jobsites. Float position valves provide smooth transport of heavy loads safely and comfortably. With the EcoSpeed option, the machines can travel up to 25 mph. Lift capacity ranges from 6,295 pounds on the ML28 to 9,217 pounds on the 79-hp ML68. Estimated list price: \$43,000 to \$84,000. For information circle **242**

## Loader Cycles Quickly

**John Deere's** 844J is the company's first 7-yard loader and, according to the company, combines engine power, hydraulic performance, and Smart-shift transmission for quick cycle times. Its 12.5-liter PowerTech engine has 380 net horsepower at 1,600 rpm and peak torque of 1,390 foot pounds at 900 rpm. Smart-shift transmission provides smooth gear and directional changes by continuously sensing speeds and loads. Solid-state electrical distribution system has a sealed-switch module for the operator interface designed for long life. Estimated list price: \$460,000 to \$500,000. For information circle **243**



## Crawlers Integrate Electronics

After celebrating the 100th anniversary of its track-type tractors in 2004, **Caterpillar** announced its T-Series track-type tractors. The machines meet Tier III emissions requirements and have full electronics integration. Models D8T, D9T and D10T have plug-and-play capability with future machine automation and efficiency-improving attachments, says the company. ACERT engines are used in the series: 347-hp C15 in the D8T, 464-hp C18 in the D9T, and 646-hp C27 in the D10T. All have electronically controlled, heavy-duty planetary powershift transmissions with large-diameter, high-capacity, oil-cooled clutches. Estimated list price: \$476,650 to \$851,470. For information circle **244**



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For information circle 11

**The Group**





# Heavy Earthmoving



## Larger Cabs Offer More Comfort

**JCB 456 HT and 456 ZX** wheel loaders offer operators in production applications a large cab, with 50 percent more volume than the previous model. The seat, armrest and steering console are adjustable, and the machine can be specified with either a single or multi-lever control on the loader end. The hydrostatic fan has been repositioned to improve airflow through the coolers, which enables better servicing of the radiator core. The machine can be specified with either Z-bar or High Torque parallel-lift loader end. It also features an increased payload of 6 percent. Estimated list price: \$225,000 to \$250,000.

For information circle **245**

## Excavators Have Articulating Boom

Two zero-tail-swing excavators have been added to the **Ingersoll-Rand** lineup: ZX-75 at 7.5 metric tons and ZX-125 at 12.5 metric tons. ZX-75 has an operating weight of 16,538 pounds and is powered by a 72-hp four-cylinder, turbocharged diesel. ZX-125 weighs 27,563 pounds with a 94-hp diesel. Articulated-boom systems allow for work outside and parallel to the tracks. Maximum dig depth is 13 feet 11 inches and 15 feet 4 inches, respectively. Safety features include overload warning when craning and load holding valves. Estimated list price: \$85,000 to \$125,000.

For information circle **246**



**Editor's Choice**

## Change Direction Without Using the Clutch

Redesigned D-Series motor graders from **John Deere** use event-based shifting that allows the operator to make directional changes without using the clutch. It also delivers smooth gear changes, eliminating automatic blade control over-correction problems associated with harsh shifts. Cab changes improve comfort, convenience and visibility and provide 26 percent more space and 40 percent more glass than previous models. Horsepower ranges from 185 to 245 using Deere's PowerTech engines. Low-effort hydraulic controls provide ease of operation for the blade, circle, wheel lean and other hydraulic functions. Estimated list price: \$200,000 to \$350,000.

For information circle **247**





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# Heavy Earthmoving

## 15-tonner Has Independent Boom Swing

**Takeuchi's** 32,000-pound TB1140 excavator has a wide-angle independent boom swing normally seen on mini-excavators. It gives the machine maximum dump height of 20.4 feet, maximum reach of 28 feet 1 inch, and the capability to dig an 8-foot flat-bottom trench at 17 feet 2 inches. It can offset dig 77 degrees left and 52 degrees right. Bucket breakout force is 22,188 pounds. Powerplant is an 83.4-hp Isuzu turbo diesel. Estimated list price: \$130,000.

For information circle **248**



## Scraper Offers Three Loading Options

**E-Ject's** 17 scraper from **E-Ject Systems** can be top loaded, push loaded, or self loaded. The patented scraper's apron opens 63 inches, and the bowl lift design eliminates the need for draft arms and reduces scraper width, weight and complexity. Its capacity is 17 cubic yards, heaped. Estimated list price: \$70,000 to \$90,000.

For information circle **249**



## Excavator-Style Boom for Visibility

**Caterpillar's** 930G wheel loader has the company's VersaLink linkage design for heightened visibility to forks and bucket corners. The excavator-style boom increases durability without increasing loader weight, the company says, combining the speed, strength and durability of Z-bar linkage with the versatility and parallel lift and control of its tool carriers. Dual mode steering allows for traditional steering or the company's QuickSteer for tight, repetitive operations. Proportional-flow auxiliary hydraulics provide infinite adjustment of third-function flow. Estimated list price: \$130,000 to \$160,000.

For information circle **250**



## All-Wheel-Steering Allows Tight Turning Radius

**Gehl's** 80 Series compact wheel loaders have all-wheel-steer, giving them a tight turning radius and allowing the machines to maintain the same tipping capacity whether transporting at full-turn or in a straight line, the company says. Four models have ranges of 7,055- to 12,015-pound operating weights and 38 to 76 horsepower. EcoSpeed transmission has ride control and enables loaders to travel up to 25 mph. The new series was totally redesigned with more modern looks and improved visibility. Estimated list price: \$50,000 to \$81,000.

For information circle **251**





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# Light Earthmoving

## Wider Working Ranges

**Komatsu's** PC18MR-2, PC20MR-2 and PC27MR-2 compact hydraulic excavators have operating weights of 4,090, 5,060, and 6,590 pounds, respectively. They all use Komatsu engines, rated at 15, 20 and 25.5 horsepower. The MR-2 Series was redesigned from the ground up, and it offers increased strength, wider working ranges and higher stability. They feature the company's HydrauMind hydraulic system, which gives the operator precise control at all times. Estimated list price: \$31,150 to \$35,700.

For information circle **189**



## Super Boom Lift Linkage

The LT185.B and LT190.B are **New Holland's** first entries into the fast growing market of compact track loaders. The new models have rated operating capacities of 2,400 and 2,900 pounds, respectively. They feature New Holland's Super Boom vertical-lift linkage, which gives the operator maximum dump reach at maximum lift height. They also are equipped with a two-speed travel system that yields a top speed of 8 mph. Estimated list price: Starting at \$46,500 and \$51,500, respectively.

For information circle **191**

## Proven Undercarriage Technology

A line of compact track loaders combines the technology from **Case's** new 400 Series skid-steer loaders with the company's long experience building undercarriages for crawler dozers and excavators. Rigid — not suspended — rollers/track frame provides the best in support with fewer moving parts, Case says. The vertical-lift 445CT and radial-lift 450CT have net horsepower ratings of 74 and 82, respectively, with lift capacities of 3,500 and 3,857 pounds. Estimated list price: \$33,000 to \$56,000.

For information circle **190**



## New Heavyweight Entry

**Komatsu's** SK1026-5 skid-steer loader, with an operating weight of 8,134 pounds, pushes the company's skid-steer line into heavy-weight territory. The new model has a standard rated operating capacity of 2,650 pounds, which climbs to 2,850 pounds when equipped with an optional counterweight kit. It has a vertical-lift loader design and standard two-speed travel system. Powered by an 84-hp Komatsu diesel engine, it has a 21-gpm auxiliary-hydraulic system running at 3,045 psi.

For information circle **192**



## Narrow Operating Width

The **Bobcat S205** is designed to provide the performance of a mid-sized skid-steer loader in a compact package. It is powered by a turbocharged 61-hp engine and offers 16.3-gpm auxiliary hydraulic flow. The machine has a 2,050-pound rated operating load, yet has an operating width of just 66 inches, which can be trimmed to 60 inches with optional offset rims. The vertical-lift-path S205 has a lift height of 118.2 inches and fills the niche between the company's S185 and S220 models. Estimated list price:

\$27,000 to \$31,000.

For information circle **193**



## Quick-Attach Backhoe

**Kubota's L39** compact backhoe-loader features an integral main frame and is powered by a 37.4-net-hp Kubota diesel engine. When the backhoe is mounted, the machine's Category I, three-point hitch linkage can be stored onboard, and an independent PTO provides 30.5 horsepower. Maximum backhoe digging depth is 121 inches, bucket breakout force is 5,825 pounds, and loader lift height is 114.2 inches. Both the loader bucket and backhoe feature attach/remove systems that require no tools. Estimated list price: \$38,600.

For information circle **194**



## Welded Unitized Chassis

Some differences between **Case's** XT Series and the new 400 Series skid-steers include: new engines, new cooling packages, spring-applied hydraulic release parking brake, and new instrument cluster on "A" pillar. There are five radial- and three vertical-lift models that range from 49 to 82 net horsepower from their Tier 2 engines, with maximum rated operating loads of 1,500 to 3,000 pounds. All machines feature a welded unitized chassis. Estimated list price: \$25,000 to \$46,000.

For information circle **195**



**Editor's Choice**

## Best-in-Class Features

Two models mark **John Deere's** initial entry into the compact track loader market: CT 322 and CT 332, which are powered by 62- and 76-hp Deere engines, respectively. The loaders offer best-in-class breakout force, stability, tractive effort and travel speed, according to the company. Tipping loads for the two are 6,400 and 9,200 pounds, with operating weights of 8,305 and 10,825 pounds. Both have two-speed transmission, hydraulic Quik-Tatch, a self-leveling bucket, and high-flow hydraulics. Estimated list price: \$35,000 to \$55,000.

For information circle **196**





# Light Earthmoving

## Suspended Undercarriage with Suspension

**ASV's** Posi-Track RCV vertical lift machine offers 86 horsepower, high-flow hydraulics, selectable self-leveling, and hydraulic quick-attach. It is said to have the most lift height in its class — 131 inches. The machine runs on a suspended rubber track undercarriage, which uses multiple contact points to distribute tractor weight evenly. Torsion axle suspension of the undercarriage helps maximize contact with the ground. Tracks are directly driven by single-speed drive motors, with travel speeds up to 6 mph. The hydraulic system provides up to 38 gpm to the standard high-flow auxiliary circuit on demand. Estimated list price: \$50,000.

For information circle **197**



## New Power-Train Design

Two new skid-steer loaders from **New Holland**, the LS185.B and LS190.B, have rated operating capacities of 2,500 and 2,800 pounds, respectively. Both models use the company's Super Boom vertical-lift linkage. The LS185.B is an addition to the line, while the LS190.B replaces the LS190 and remains the company's largest skid-steer. Features include Tier II engines with higher horsepower, simplified power train and new cab enclosures. Estimated list price: Starting at \$33,390 (w/bucket).

For information circle **199**



## Low 5.0 psi Ground Pressure

Powered by a 46-hp Kubota engine, the **Bobcat** T140 compact track loader has a 110-inch lift height and a rated operating capacity of 1,400 pounds. The radius-lift-path machine supplies 16.9-gpm of hydraulic flow to power more than 40 attachments. The loader is 56 inches wide, weighs 6,424 pounds, and features a low 5.0 psi of ground pressure. Estimated list price: \$32,000 to \$36,000.

For information circle **198**



## Several Performance Increases

**Case** refined the design of four CX compact-excavator models — the CX27B, CX31B, CX36B and CX50B. The machines are Tier-II-compliant and have an overall increase of 19 percent in horsepower, a 15-percent gain in hydraulic flow, and a 14-percent boost in hydraulic horsepower. The open, three-post ROPS provides a 20-percent larger operator platform and 40 percent wider entry area. Operating weights range from 5,666 to 10,383 pounds, and maximum digging depths are from 9 feet 2 inches to 11 feet 9 inches. Estimated list price: \$38,000 to \$64,000.

For information circle **200**





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# Trucking & Hauling



## Built for Work Tools

The M2 106V extends **Freightliner's** Business Class M2 truck line with a chassis designed for specialized applications that require heavy-duty, front-end stability and power. A front-engine power take-off provision and integral front frame extensions offered in 6-, 12-, and 24-inch increments adapt the truck to power and carry snow plows, refuse packers, cranes, utility equipment, hydraulic pumps, winches and stabilizers. Freightliner says the 55-degree wheel-cut and 2,500-square-inch wind-shield are best-in-industry features.

For information circle **252**

## Biggest AC-Drive Truck

The B Series of **Liebherr's** T282 haul truck jumped 40 tons to a nominal payload rating of 400 tons with the use of the new 56/80R63 tires and the 3,650-hp MTU20V4000 diesel engine (adding nearly 1,000 horsepower). It's the biggest AC diesel electric-drive mining truck — with the largest nominal payload and most horsepower — available today. Top speed remains 40 mph, but the more-powerful engine accelerates the truck faster and maintains greater haul speeds on grades. Estimated list price: \$3.5 million.

For information circle **253**



## Axle-Back Gets Tallest Frame

**Mack** replaced the last of its R-model ancestry with the Granite Axle Back. The front axle is set 50½ inches behind the front bumper — that's 20½ inches further back than the standard Granite and the Granite Bridge Formula. The high-capacity Cornerstone frame, with taller main rails, is standard equipment. Flaring the frame rails up front allowed Mack to increase the radiator size.

For information circle **254**

## Dodge's All-Out Work Truck

**Dodge** reinforced its commitment to its emerging commercial-vehicle program with the 2006 Dodge Ram 3500 Box-Off 4x2 Dually sporting what was best-in-class acceleration, towing capacity and torque.

An 11,500-pound-GVW model with a Cummins turbodiesel delivers 325 horsepower and 610 lbs.-ft. of torque and is rated to tow 15,900 pounds. The truck's standard engine is Dodge's V8 Hemi. Oil-change intervals are double that of competing vehicles. The Ram 3500 rides on 17-inch wheels and features a 35-gallon fuel tank. Estimated list price: Regular cab: \$27,670 to \$31,215; Quad cab: \$31,300 to \$35,050.

For information circle **255**







Editor's Choice

## Case Steps Up to 40 Tons

**Case** added the 35-ton 335 and 40-ton 340 to its articulated-dump-truck lineup. Their unique front driveline routes power directly from a limited-slip differential mounted on the transmission to each front wheel via a pair of transaxles. It eliminates a driveshaft and adds 4 inches of suspension travel. A wider wagon frame carries payload lower, increasing stability. Lift cylinders are protected by their mounting inside the frame. An innovative warm-up circuit option uses the transmission retarder to warm the hydraulic oil at engine idle speed. The engine can be started in warm-up mode by a switch accessible from ground level. Estimated list price: \$490,000 to \$495,000.

For information circle **256**

## Pioneers Work-Truck Multiplexing

**International's** Model 7700 brought multi-varied front leaf suspension and true multiplexed wiring to the vocational truck market. The 7700 targets on/off-highway applications where customers value lightweight components, federal-bridge-formula compliance, and/or other premium features such as 12-inch rails, polished aluminum fuel tanks and battery box, and clean packages to accommodate quad axles. Estimated list price: \$95,000 to \$125,000.

For information circle **257**



## Heavy Hauler Embraces 625 Horsepower

**Peterbilt's** Model 357 heavy hauler is a new configuration of the Model 357 vocational truck and tractor that can accommodate high-power engines up to 625 horsepower, such as Caterpillar's C15. A high-capacity cooling system with 1,440 square inches of radiator core surface keeps the powerplant cool. The truck measures 119 inches from bumper to back of the cab, and has a setback front axle. It features a stationary grille, frame extensions, and optional front-engine power take off for special applications such as logging, oilfield and snowplowing. Estimated list price: \$100,000 to \$125,000.

For information circle **258**

## Floor Design Cut Weight

**IMT** patented the floor structure of its Dominator II service body because the design controls body weight yet maintains structural integrity. It also allowed IMT to increase compartment size and increase the size of the workbench bumper with no increase in overall weight. New sidepack tops reduce the likelihood of rust and integrate rain eaves over compartment doors. There's also a new electrical control panel. Estimated list price: \$12,000 to \$18,000.

For information circle **259**







# Trucking & Hauling

## Four Models Suit Most Jobs

**Maintainer** consolidated its customers' most-requested features into the four models of the Signature Series — three mechanic-style bodies with hexagonal-boom cranes, and a 2-ton lube body. All the trucks have closed-center hydraulic systems and hydraulic air compressors. Cranes are rated 6,350, 10,000, and 12,000 pounds, and the service body carries a 650-gallon diesel-fuel tank, two 120-gallon and two 60-gallon oil tanks, a 60-gallon antifreeze tank, and an air-pump system for 120-pound kegs of grease. Estimated list price: \$45,000 to \$65,000. For information circle **260**



## Light Truck with Heavy Capacity

Unibody construction of **Dodge's** Sprinter van/cab-and-chassis reduces its curb weight for improved cargo capacity. With 16-inch wheels, the cab-and-chassis GVWR jumps to 10,200 pounds. Best-in-class advantages that Dodge claims for the Sprinter include highest fuel economy at 25 mpg, most cargo capacity with 473 cu. ft., greatest payload at 4,824 pounds, lowest side step-in height and lowest load-floor height — both at 17 inches. The Mercedes-Benz I-5 turbodiesel (154 horsepower and 243 lbs.-ft. torque) requires oil changes only every 10,000 miles. It's available in three wheelbase choices up to 158 inches. Estimated list price: \$27,000. For information circle **261**



## Biggest-Payload Dumper

The **Moxy** MT41 carries 2,000 pounds more payload than the MT40B that it replaced, and its rating of 80,012 pounds gives it the greatest capacity among articulated dump trucks (although there are ejector trucks that will carry more). The MT41 represents Moxy's first use of wet disc brakes. Scania's 12-liter DC12 delivers the same horsepower and torque ratings (429 horsepower and 1,367 lbs.-ft.) as its 14-liter DI14 diesel predecessor. Estimated list price: \$459,351. For information circle **262**



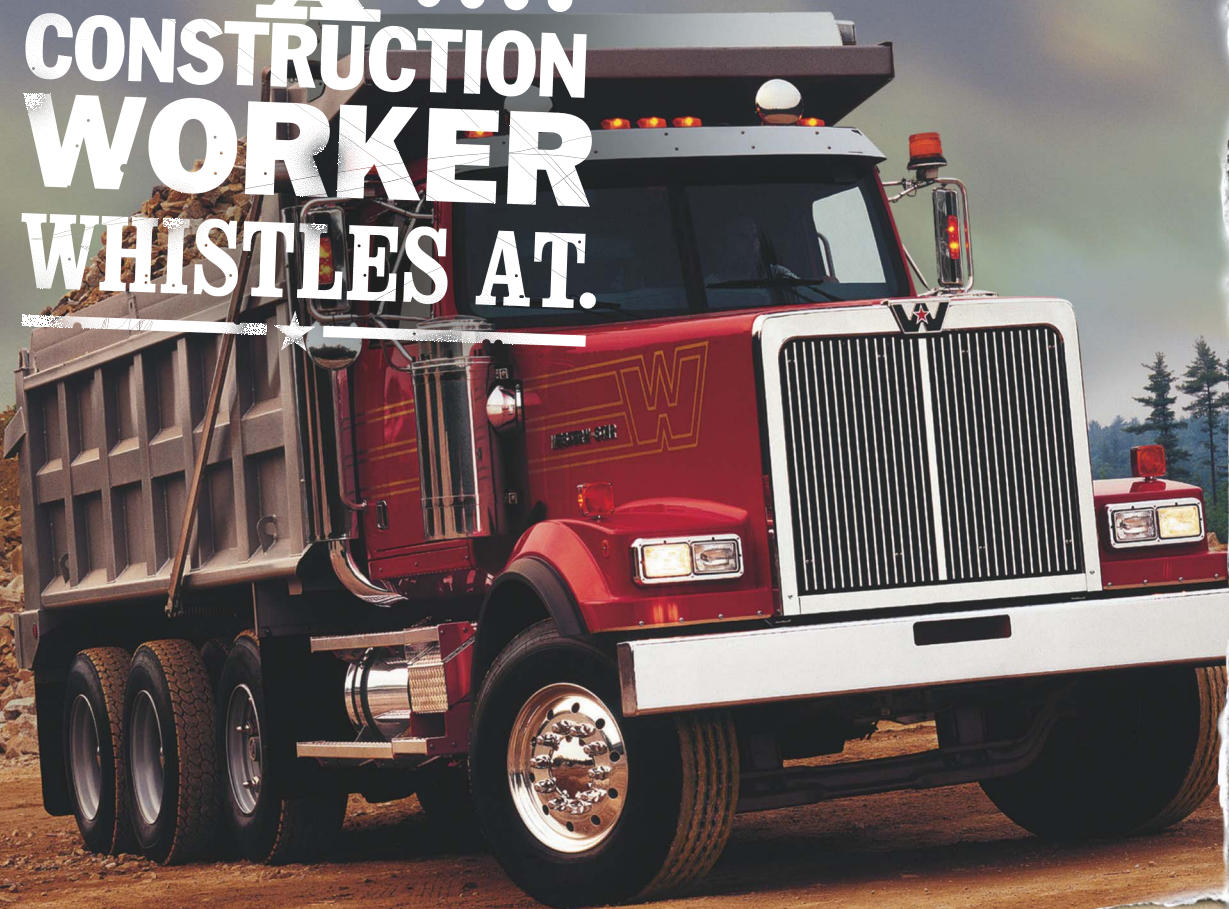
## Pushing the Pickup Envelope

**International's** CXT and RXT create a whole new category of trucks. The RXT is a 5-ton, 22-foot-long commercial pickup built on the International 4000 Series platform, and the CXT is the world's largest pickup truck, built on the 7000 Series platform. Both incorporate heavy-duty truck components and exclusively use International engines. The CXT offers an optional International DT570 engine that delivers 310 horsepower and 950 lbs.-ft. of torque for a towing capacity of up to 20 tons. Estimated list price: CXT: \$115,000 to \$135,000; RXT: Starts at \$70,000. For information circle **263**





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For information circle 15





# Paving/Compaction/Concrete Pumps



## New Design Enhances Visibility

**Bomag's** BW190AD-4 tandem vibratory roller is fitted with 79-inch-wide drums. Slanted drum-support legs and the open design of the front and rear frames enhance visibility to both drums and to sprinkler systems. A 131-hp Deutz water-cooled diesel provides the power to deliver 28,800 pounds of centrifugal force in its low-amplitude/ high-frequency (3,600 vpm) setting, and 40,950 pounds in its high-amplitude/low-frequency (2,880 vpm) setting. Estimated list price: \$156,650 to \$184,100 (with Asphalt Manager system).

For information circle **264**



## Steel Engine-Protection Hoods

The **Bomag** BPR45/55D, BPR55/65D and BPR65/70D reversible-plate compactors feature larger engines, faster working speeds, better gradeability, and greater maximum centrifugal forces than their predecessors. They also have steel engine protection hoods to protect components from damage. The new models have horsepower ratings from 8.8 to 13.1, working speeds from 88.6 to 92 fpm, and maximum centrifugal forces of 10,116 to 15,512 pounds. Estimated list price: \$10,690 to \$19,960.

For information circle **265**



## Choice of Mobil-trac or Steel Track

Model AP-1055D asphalt paver from **Caterpillar** is powered by a Cat C7 engine with ACERT technology that provides 224 horsepower and meets Tier 3 regulations. The paver offers dual operator stations, exclusive Mobil-trac or steel track undercarriage, high-capacity cooling package, and Cat's material-handling system with independent feeder and auger controls. The 10-foot paver is capable of paving widths up to 26 feet. Estimated list price: \$450,000 to \$475,000 (tractor and screed).

For information circle **266**

## Special Five-Section Boom

The 63Z-Meter concrete pump from **Putzmeister** reaches more than 200 feet vertically and 190 feet 7 inches horizontally, which the company says makes it the world's largest truck-mounted concrete boom pump. The five-section boom, designed specifically for North America, is a Z-fold configuration. Using electronic-over-hydraulic systems, Putzmeister's Ergonics monitors performance and allows the operator to set control parameters for the boom, pump and various other functions.

For information circle **267**





## Precise Material Handling System

In the material-handling system of **Ingersoll-Rand's** new highway-class pavers — the track-mounted 5110 and wheel-mounted 5160 and 5170 — the conveyor drives are independent of the auger drives. Each conveyor and auger measures material flow with a sonic sensor and adjusts asphalt flow for precise delivery. Basic screed width is 8 feet, with a maximum paving width of 28 feet. A 185-hp Cummins diesel drives through a hydrostatic transmission. It also features a 30kW tractor-mounted generator. Estimated list price: \$299,000.

For information circle **268**



## Transports at Less Than 75,000 Pounds

**Terex Roadbuilding** aims to develop the PR-950 into the only milling machine over 800 horsepower that transports at less than 75,000 pounds. This prototype met the target weight of 73,000 pounds for the three-track PR-950. The four-track version is expected to

weigh 78,500 pounds. The idea is to be able to load a machine with capability to profile pavements up to 150 inches wide on a lowboy and transport it using standard overweight permits in finicky states.

For information circle **269**



## Environmentally Friendly Electric Screed

**LeeBoy** equipped its Legend Screed System with electric heat and offers the electrically heated version as an option on its commercial-class pavers. The new screed, says LeeBoy, provides all the features as the conventional Legend System. The electric screed comes in an 8- to 15-foot-width version for the 8500 and 8515 paver models, and in an 8- to 15.5-foot version for the 8816. Using an on-board electric generator for its heat source, the screed is said to eliminate fuel, flames and fumes, and provide more consistent heat and reduced maintenance costs.

For information circle **270**



## Rubber Tracks Reduce Ground Pressure

The 50,800-pound CR662RM RoadMix material transfer vehicle (MTV) from **Terex Roadbuilding** features rubber tracks that spread the vehicle load over a broad surface, reducing ground pressure so it can work on base and top courses. Terex says the CR662RM, with augers in the receiving hopper, is the first and only MTV to reblend 100 percent of the asphalt. Terex says it will require four to six hours of work to detach the rear conveyor and replace it with any Terex | Cedarapids screed, allowing the unit to be used as a paver.

For information circle **271**





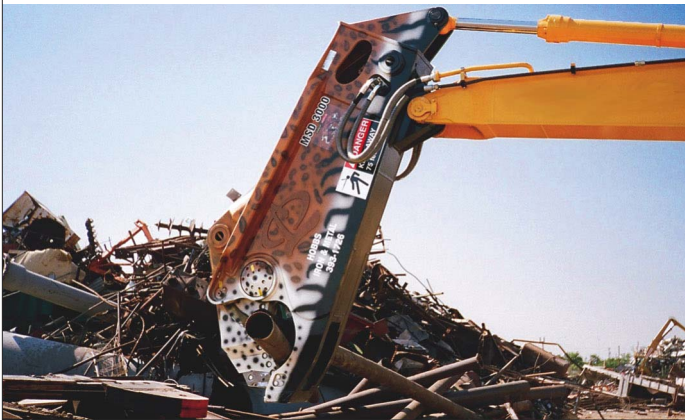


# Light Equipment

## Bolt-on Wear Parts

For 40,000- to 110,000-pound-class excavators, **Stanley LaBounty's** MSD Saber Series shears offer bolt-on replaceable wear parts, including the two-way reversible Saber Tip. Bolt-on parts allow the shear to be maintained quickly. The cylinder features a threaded rod/piston-retention system that eliminates the need for bolts in the cylinder and reduces the risk of hydraulic contamination.

For information circle **272**



## Lessens Air-Quality Concerns

For dust control, the **DustBoss** fan features a high-pressure misting system that creates a dust barrier. The unit increases productivity because the DustBoss frees up the person holding the hose. It has 30 spray nozzles and a 150-psi booster pump. Depending on the model, it covers from 5,500 to 21,000 square feet with up to 100 gpm of dust attracting water particles. Mounted on a 3-wheel carriage, the unit is easy to move around jobsites. Estimated list price: \$15,900 to \$25,900.

For information circle **273**

## Two Generators in One Welder

**Miller Electric's** Trailblazer welding generator contains two separate generators. One provides 100,000 watts of useable peak power — enough to power another welder. The other is a 4-pole, 3-phase generator that creates smooth arc performance. With two generators, two operators can work from the machine without interference from the other. A redesigned airflow system is said to eliminate power drops due to overheating. The welder works more quietly than previous models, says Miller. Fuel-tank capacity is 12 gallons. Estimated list price: \$4,100 to \$4,517.

For information circle **274**



## Versatile Grade Control Systems

The Grade Control Systems family of conventional and 3D grading solutions is flexible enough to accommodate an entire fleet, says **Trimble**. Controller Area Network harnesses allow operators to move sensors from machine to machine. The system's GCS900 3D solution uses design data in the cab of the machine for two-way data transfer in real-time between the machine and office. Users in the office can make design changes and updates and then import them into data-preparation software. 3D data allows the engineer to quality check the design before uploading it to the machine. Once the in-cab computer receives the updated data, the operator selects the new information and the design change is implemented in minutes. Estimated list price: \$10,000 to \$80,000.

For information circle **275**



Editor's Choice

## Hammers Simplify Servicing

**Allied Construction Products** offers two new attachments: inSeries and mSeries hammers. inSeries hammers feature a trapezoidal tool that comes with a lifetime warranty against breakage. Greasing isn't necessary. The hammers do not contain tie-rods, tie-bolts or side-bolts. The mounting bracket combines two brackets into one. Instead of a steel construction, Allied uses a composite, wear-resistant material for the tool bushing. Four models are available, ranging in working weight from 152 to 453 pounds. Blows per minute range from 1,800 to 2,100. Estimated list price: \$5,100 to \$9,225.

Like the inSeries, mSeries hammers do not contain tie-rods or tie-bolts. The RamData Service Indicator system tells the operator when to service the hammer and stores service and working history. A modular design allows each of the three modules to be overhauled separately. Adjustable impact energy matches working conditions, and Ramlube provides continuous greasing to both bushings. Two models are available, with blows per minute from 800 to 1,000. Estimated list price: \$61,000 to \$71,000.

For information circle **276**



## Fewer Set-ups on Jobsite

As an alternative to multi-component base stations, **Topcon's** HiPer XT GPS system combines a 2-watt UHF transmit/receive radio and antenna into a single unit. For optimal signal performance, the transmit/receive antenna is located at the top of the unit. HiPer XT functions as a base or rover, and GPS+ technology uses additional satellites to reduce downtime and improve accuracy. It has a 10-hour run time on one charge of the internal batteries. Bluetooth technology allows cable-free wireless communication with field computers.

For information circle **277**



## GPS and Total Station Combined

**Leica's** SmartStation integrates GPS and total-station functionality into a compact package with common software, database, storage medium and user interface. Operators perform GPS and land-surveying procedures through the total-station keyboard. All data is stored in one database on a CompactFlash card. The integrated package eliminates the need for cables, additional batteries or extra data loggers. Operators may also use GPS and the total station separately.

For information circle **279**



## Easy-to-Access Service Points

No need to remove the canopy to access service points on AirSource compressors from **Ingersoll-Rand**. The corrosion-resistant canopy opens 90 degrees for servicing. At 1,850 pounds, the unit has a low center of gravity, is stable when towed, and allows two-tool use. The remote spin-on separator element eliminates the need to enter the separator tank and prevents spillage during oil changes. By moving the toolbox from the wheel side to the rear, near the canopy opening and service valves, users no longer have to strain to store or remove a tool. Estimated list price: \$15,000 to \$17,000.

For information circle **278**





# Light Equipment

## Automated Light Towers

Available as an option with the company's portable light towers, the LSC-100 Light Sequence Commander from **Allmand** automatically shuts on and off power to light towers — without operator interaction. As natural light decreases, the system's sensor engages the power unit and activates the lights. As light increases, the sensor automatically switches off the light and power unit. To prevent generator and light-circuit damage, the system starts the engine and brings it up to temperature before lights are activated, and then shuts the engine down when lights are deactivated. An eight-event digital timer allows the operator to preset activation and deactivation times. Estimated list price: \$1,000 to \$1,500.

For information circle **280**



## Trowels Provide Safety

A gyroscopic safety sensor on **Wacker's** CT Series walk-behind trowels provides operator protection. After the operator looses hold of the handle, it will begin to spin counterclockwise. The sensor then stops the engine and engages the gearbox brake. Momentum will carry the handle, but it will stop within a 270-degree rotation. To eliminate runaway handle rotation during restarts, the engine rev-limiter senses engine acceleration during starting and will not let the operator start the machine at full throttle. To reduce operator fatigue, Wacker has moved the engine to center the weight of the trowel. Estimated list price: \$2,200 to \$3,000.

For information circle **281**



## Easy Starts and A Smooth Arc

The Vantage 300 welder/generator from **Lincoln Electric** offers 300 amps, 32 volts at 100-percent duty cycle. Chopper Technology provides easy starts, smooth arc, low spatter and optimal bead appearance. Compared to the

previous model, Vantage 300 is 290 pounds lighter at 1,035 pounds and provides 3-phase power and 1-phase AC generator power in

place of 1-phase AC generator power. Service improvements include a sliding and removable door to the engine and a 90-degree tilt-down control panel. Fuel capacity is 15 gallons. The unit is backed by a three-year warranty. (The engine is warranted by the manufacturer.) Estimated list price: \$9,190.

For information circle **282**



## Safe Shop Repairs

Designed to replace sledgehammers and chisels, the **Slide Sledge** Heavy Equipment hammer delivers the impact of a 21-pound sledgehammer. An optional 5-pound handle provides even more power. Using a linear motion, the hammer focuses power for precision impact to push out pins and bucket teeth. This linear motion replaces the swing motion of sledgehammer use and is safer for shop workers, says Slide Sledge. With more than 20 interchangeable tips, it can be used for a variety of applications. Estimated list price: \$299 to \$499 for hammer; \$40 to \$100 for accessory tips.

For information circle **283**



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# Light Equipment

## Green Generators

Thirteen mobile generators from **Ingersoll-Rand** are built with a compact design and environmentally friendly features. Designed to hold at least 110-percent capacity of all fuel, oil and coolant contained within the generator, the units offer minimal water entrainment, single fuel tanks with double-wall protection and minimum 24-hour prime-power run times.



A reduced footprint makes the units easy to maneuver on the jobsite. AREP technology built into the alternators delivers maximum motor-starting capability, says I-R. Estimated list price: \$12,000 to \$141,000.

For information circle **284**

## Jaw Attachment Easy to Transport

For a constant force curve during closing cycles, the CC 3300 jaw attachment from

**Atlas Copco** has two moving jaws with one hydraulic cylinder for each jaw. Unlike the previous model, the CC 3300 features the Coupling and Positioning System (CAPS), which keeps the two jaws connected when removed from the unit and helps operators refit the jaws through a special guide system. CAPS also helps operators transport disassembled jaws and maintain proper alignment. Universal jaws open 40 inches wide and deliver 441 tons of cutting force. Steel-cutting jaws open 17 inches wide and also provide 441 tons of cutting force. Estimated list price: \$100,000 to \$120,000.

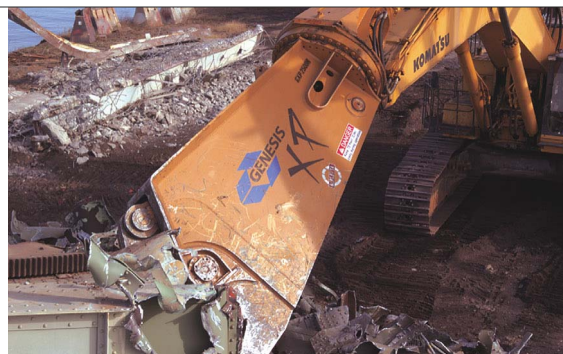
For information circle **285**



## Shear Eliminates Welding Repairs

An addition to **Genesis**' XP Series shears, the GXP 2500 features a patented bolt-on piercing tip to eliminate welding downtime on the jobsite. Replacing the tip takes less than 30 minutes, says Genesis. The shear fits excavators in the 200,000-pound-plus range. The rotating model — GXP 2500R — provides more than 3,000 tons of cutting force at 5,000 psi. It fits excavators at 240,000 pounds plus. At a weight of 53,000 pounds (45,000 pounds for the non-rotating model), the GXP 2500R has a 48-inch jaw depth and jaw opening of 46 inches.

For information circle **286**



## Grader Attachment for Skid-Steers

For skid-steer loaders and other machines with quick-attach capabilities, **Flanegan Western's** FW Grader Attachment features both hydraulic steerable and hydraulic leaning front wheels for stable control in tight areas. Two models are available, both with hydraulic blade tilt, side-shift and rotation. Manual blade positioning is also offered. Estimated list price: \$5,850 to \$7,500.

For information circle **287**

## Breakers Show Intelligence

**Indeco's** HP (High Performance)

Series breakers feature the company's "intelligent" variable-speed-and-power system that is designed to automatically sense the hardness of the material being broken, then to adjust the impact per blow for maximum effectiveness. The 19 new HP Series models have operating weights ranging from 230 to 17,200 pounds, and energy-class ratings from 200 to 16,000. All new models incorporate a slimmer profile, says Indeco, which facilitates maneuvering in restricted spaces and enhances the machine operator's visibility to the work area.

For information circle **288**







## ONE FIELD SERVICE VEHICLE STANDS ALONE.

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For information circle 17



# Meeting Regulations

## Exceeding Expectations



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For information circle 18



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# Drilling & Trenching



## HDD for Tight Spots

**Vermeer's** D7x11 Navigator Series II directional drill is compact for confined areas (measuring 35.5 inches across), and has 1,300 foot-pounds of rotational torque along with 9,000 pounds of pullback force. Featuring a Tier II Kubota engine, the drill has increased horsepower from its predecessor to 47, and rack-and-pinion carriage drive. Dual hydrostatic pumps provide dedicated hydraulics to power specific functions. Carriage speed has been improved to 105 fpm. Vice controls are integrated into the right-side joystick so the controls can be operated without moving the hand. Estimated list price: \$65,000 to \$70,000. For information circle **201**

## Customers Drive Features

**Ditch Witch** says its JT2020 Mach 1 directional drill was designed with extensive customer input. It has rubber tracks, state-of-the-art operator and pipe-loader systems, and the same undercarriage as the JT1720 Mach 1. It provides 20,000 pounds of pullback force and delivers up to 30 gpm of drilling fluid. The pipe-loading system lets the operator select columns from the operator's station, and its two-speed carriage drive enables the operator to quickly connect pipe. It also features a rack-and-pinion thrust drive. Estimated list price: \$150,000. For information circle **202**



## Compact HDD Touts Design

With a curved hood that gives it a sleek look, **Astec's** EarthPro Series DD-3238 directional drill features the same dual rack-and-pinion carriage drive technology as on the company's maxi rig drills. It has 32,000 pounds of pullback force, can produce up to 3,800 foot-pounds of rotary torque, and has a maximum rotary speed of 225 rpm. An ergonomic operator's station includes a microprocessor-controlled electronic readout for all function gauges. It also offers both a drill mode and machine diagnostic screen. Multifunction single joystick controls all drill functions. Powered by a 125-hp John Deere turbocharged diesel, the drill weighs 20,000 pounds and has an onboard mud pump that can deliver up to 47 gpm at up to 1,500 psi. Estimated list price: \$230,000 to \$275,000. For information circle **203**



**Editor's Choice**

## New Tool for Pipe Bursting

HB80 HydroBurst fits between **Hammerhead's** smaller HB5058 and larger HB125. The static pipe-bursting machine can be used on water, sewer and gas lines from 4 to 12 inches. It has 80 tons of pulling force and weighs 3,060 pounds for ease of transport. Rod design allows for a positive grip to the rod and eliminates jaw slippage. A spinner eliminates the need to hand-spin rods, and a set of vices torque the rods together to form a uniform rod string. Estimated list price: \$110,000 to \$145,000. For information circle **204**







## What can you do with the Tow-Pro Series?

The JLG Tow-Pro Series towable boom lift is designed around you and the jobs you need to perform. With an integrated air line, water line, and electric power to the platform, the Tow-Pro Series machines are set up to handle more of the tools and accessories you use every day. In addition, generators, air compressors and pressure washers fit easily on the accessory mounting tray and provide you with the power to handle an amazing variety of jobs. Find out how the Tow-Pro Series can boost your productivity. Visit [www.jlg.com/TowPro10](http://www.jlg.com/TowPro10) or call 877-JLG-LIFT.



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For information circle 19



# Lifting & Material Handling



## Strongest Four-Axle Mobile Crane

The 120-ton LTM 1100-4.1 mobile crane has 48,500 pounds total ballast, and **Liebherr** says it is the strongest four-axle mobile crane on the market. Depending on the job needs, the crane can carry along 2,645 pounds, 14,770 pounds, or 26,450 pounds ballast. With a 171-foot-long, six-section telescopic boom, the 46-foot-long boom extension and 62.5-foot-long double swing-away jib, the crane has a 276-foot height under hook. It is powered by a 460-hp Liebherr six-cylinder engine.

For information circle **205**



## Sets Up in Less Than a Minute

With **JLG's** first towed work platform, the articulating-boom T500J Tow-Pro, operators can simultaneously extend the outriggers and level the platform, making the machine ready for use in less than a minute. An accessory tray mounted at the base of the boom is ready to accommodate a generator, compressor, or power washer and three lines running through the boom (electrical, air, and pressurized-water lines) allow the operator to run this added equipment from the platform. The T500J will lift 500 pounds to its maximum platform height of 50 feet. Estimated list price: \$47,650 (with material-handling hook).

For information circle **207**

## 75-Tonner Reaches 232 Feet

**Grove** takes advantage of the 75-ton RT875E's powerful lift chart and 40 feet of inserts to raise a jib tip to 232 feet — 30 feet higher than the nearest 75-ton rough-terrain crane. The four-section Megaform boom has a tip height of 138 feet; there's an optional 35- to 56-foot jib, and two 20-foot inserts. This final addition to the E Series has a hydraulically tilting cab and it is the smallest Grove with a hydraulic counterweight-removing system.

For information circle **206**







# Lifting & Material Handling

## Auto-Limiter Allows All Outrigger Positions

**Tadano's** TR-600XXL-4 is the only 60-ton rough-terrain crane available with a five-section boom, and its 146-foot boom-tip height is 22 feet taller than any RT up to 80 tons. Operators can extend the four outriggers to four different lengths. Tadano's AML automatically detects individual outrigger position, boom length, boom angle and actual load, then calculates maximum allowable lift over each quadrant of the machine. If the operator picks a load safely and begins to swing or boom out or down toward a position that would exceed the load chart for the machine's current setup, the AML slows the hydraulics and brings the load to a safe stop before the crane becomes unstable. Estimated list price: \$520,000.

For information circle **208**



## Maximum Side Reach

The 3632T telescopic aerial-work platform from **Bil-Jax** offers the most side reach of any trailer-mounted boom in its class as well as continuous 360-degree rotation. Hydraulic outriggers with auto-leveling allow the machine to be set up quickly and easily. A material-lifting option converts the work platform, with 500 pounds of capacity, into a crane. Other options include a drive-and-set option, air line and/or water line to the platform, platform rotation, and DC-electric-motor or gasoline-engine power. Estimated list price: \$30,970 to \$32,470.

For information circle **209**

## Standard Radio Remote

**Stellar's** Model 14528 telescopic service crane brings big-crane features such as hexagonal boom design, hydraulic power to extend both boom segments (to 28 feet of reach), and a planetary winch with line speeds of up to 60 fpm. The crane is controlled by a multifunction, variable-speed radio remote control that is standard equipment. It's rated to 70,000 ft.-lbs. and can lift 14,000 pounds at a 5-foot radius and 2,500 pounds at the full 28 feet of reach. Estimated list price: \$26,000.

For information circle **210**





# The Best-Selling Curb and Gutter Machines in 2005... Again.



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Visit our booth #C5168 at World of Concrete and see why more curb and gutter contractors are choosing the GT-3600 for high production. Everybody is talking about how quick and easy its new Hook-and-Go mold mount system works. The GT-3600 has bigger legs for durability, new G21 controls and we've nearly doubled the travel speed for job-site mobility.

Three Commander IIIs on display:

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... 3-Track curb and gutter, the world's most powerful curb and gutter machine

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Our GT-3200 and Commander II will also be on display.

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# Lifting & Material Handling

## Capacity Reaches 32,000 Pounds

**CareLift** stretched telehandler boundaries by introducing the ZB32032 with a maximum capacity of 32,000 pounds. This addition to the Super HeavyWeight line, with a sideshift/fork positioner carriage, is able to pick and carry 30,000 pounds. The two-section boom's maximum lift height is 32 feet. The ZB32032 is powered by a Cummins BSB5.9 diesel rated at 173 horsepower, through a Dana 32,000 series powershift transmission. Estimated list price: \$339,230.

For information circle **211**



**Editor's Choice**

## 135 Feet of Reach Transports Without Permits

**Genie's** Z-135/70 articulating boom aerial-work platform allows a machine with 135 feet of platform height to be transported on a single drop trailer without permits. The unit weighs 44,900 pounds and has stowed length of 42 feet 5 inches and height of 10 feet 1 inch. Its expanding axle system eliminates telescoping joints and reduces overall width to 8 feet 1 inch. The Z-137/70 offers the largest working envelope among articulating booms, providing 141 feet of maximum height, 69 feet 9 inches of horizontal out-reach, and 75 feet 6 inches of up-and-over clearance. Estimated list price: \$379,000.

For information circle **213**

## Transports with Crawlers on

**Link-Belt's** 218 HYLAB HSL is a 110-ton lattice boom crawler crane that can move in most states without removing the crawlers. As the first crane design from the new Hitachi-Sumitomo-Link-Belt alliance, new features of the 218 HSL include its rated capacity limiter, winch package with wet brake design, seven-piece counterweight design with removal system, a 266-hp Mitsubishi 6D24-TLAZL engine, and third and fourth drum options. Lift capacity has increased, and overall assembly/disassembly are faster using Link-Belt's Quick Draw system.

For information circle **212**



## Lifts Maximum Weight to Maximum Height

All but one of **Gehl's** CT-Series telehandlers can raise its rated capacity up to maximum lift height — the 7,000-pound CT7-23 will take 6,000 pounds to maximum height. With four models rated at 5,000 and 6,000 pounds and two rated at 7,000 pounds, Gehl targeted the light end of the construction/agricultural markets with the CT Series. All machines are designed for loader and material-handler work.

Grapple buckets can be added, as well as universal skid-steer-loader adapters to make quick changes between various work tools. Estimated list price: \$59,000 to \$79,000.

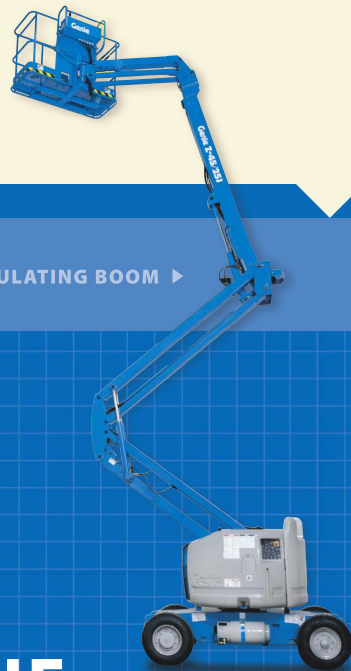
For information circle **214**





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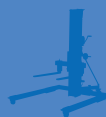
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For information circle 21



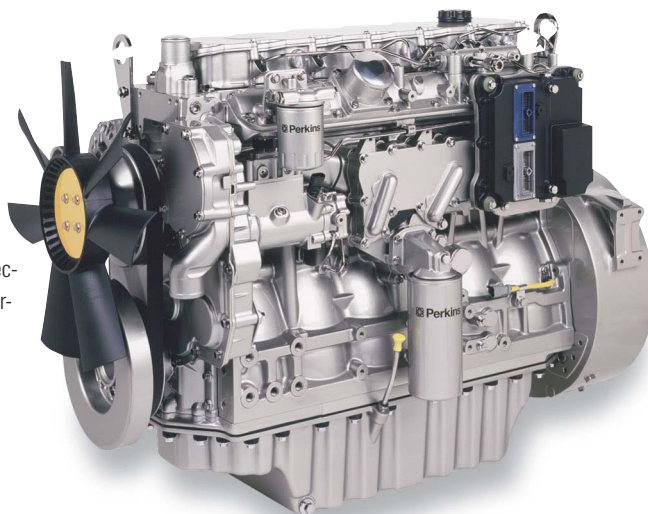


## Ancillary Products

### New Engines Easy on OEMs

The 1100D-Series from **Perkins** is a range of three-, four- and six-cylinder diesel engines, Tier-3/Stage IIIA-compliant, with horsepower ratings from 56 to 275. Available with either advanced mechanical or electronic fuel systems, and with natural, turbocharged or turbocharged/after-cooled aspiration, the D-Series features a common platform of 1.1-liter displacement per cylinder. For the vehicle manufacturer, says Perkins, the D-Series design allows these engines to be easily accommodated in applications formerly using the C-Series, and in addition, provides more build options, power and torque increase and reduced sound. Estimated list prices: \$5,000 to \$13,500.

For information circle **215**



### Hurricane 18 Indulges Operator

The outstanding feature of **Morbark's** new Hurricane 18 chipper, aimed at the requirements of large-scale tree-care specialists and land-clearing contractors, is its optional loader and operator's platform. By equipping the Hurricane 18 with the company's Mor-Lift Model 150 hydraulic knuckle-boom loader (which has a lift capacity of 2,000 pounds at 10 feet) and with an operator's platform complete with joystick controls, the operator is positioned safely above debris and works in a comfortable environment. The Hurricane 18, says Morbark, provides a heavy-duty, loader-fed chipper without the investment required for a conventional whole-tree chipper. Estimated list price: \$90,000 to \$95,000.

For information circle **217**

### Drive System Delivers More Control

The **Vermeer** CC155 Concrete Cutter is designed for cutting streets for utility installation or pothole repair. It uses a hydrostatic ground-drive system that incorporates two hydraulic pumps and four hydraulic wheel motors to create, says Vermeer, "a true all-wheel-drive system." It is designed to provide torque to all four wheels in all speed ranges, which equates to better traction and less tire spinning during cutting — with the net results of more efficient cutting and longer tire life. The CC155 is powered by a 155-hp Cummins diesel engine. Estimated list price: \$225,00 to \$235,000.

For information circle **216**







## RFID Keeps Tabs on Tools

According to **Bosch**, tool-using companies, such as construction firms, typically incur costs of \$.40 per hour per employee to replace misplaced tools. To help reduce these costs, Bosch's Safe & Sound radio frequency identification (RFID) program assists in tracking tools by supplying, writing-to and installing RFID tags into its new power tools. The company also offers to install tags into older Bosch tools (for just the cost of the tag) through its Factory Service Centers, and will supply RFID tags for competitive tools, but suggests authorized dealers install them. When RFID technology is fully developed, says Bosch, a tool could report its purchase date and location, warranty history, recent users and service history. RFID tags typically add 3 to 5 percent to the price of a new tool.

For information circle **218**

## New Grease Tackles Tough Jobs

### ChevronTexaco Global Lubricants

says it reformulated its Chevron Delo Grease EP to improve mechanical stability and water resistance, resulting in longer service life and reduced costs. The new lubricant is extreme-pressure grease available in multiple NLGI grades and, according to the company, "provides exceptional performance in numerous applications, allowing organizations that use it to reduce their inventory by carrying a single grease."

For information circle **219**



## Technology Seals Tire Punctures for Good

**Goodyear's** DuraSeal technology allows tires to be manufactured with a gel-like, solvent-free compound built into the inner liner. The DuraSeal system, says the company, instantly and consistently seals punctures up to 1/4 inch in the tread area, and the self-repair will last until the tire is retreaded. The system is designed to remain effective even after retreading. According to the company, DuraSeal adds about 5 to 7 pounds to the weight of a tire, provides excellent sealing efficiency at temperatures from minus 40F to 100F and does not affect a tire's operating temperature, high-speed performance, durability or rolling resistance. DuraSeal adds an approximate 12 percent price premium to the tire.

For information circle **220**



## Smaller Filter Maintains Efficiency

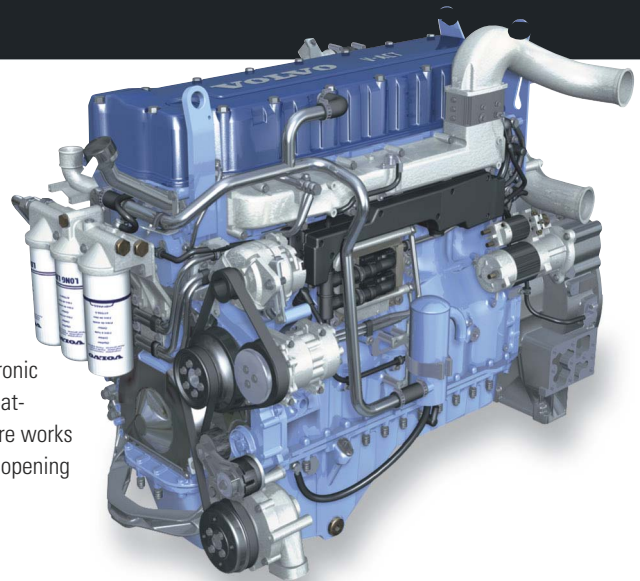
Recognizing that space constraints under the hoods of heavy-duty, diesel-powered vehicles are causing packaging challenges for vehicle manufacturers, **Donaldson** developed its PowerCore filtration technology. The Donaldson two-stage PowerCore air cleaner, for example, packs twice the amount of filter media into the same space as a conventional air cleaner. The air cleaner's element uses media with Ultra-Web nanofiber technology, designed for greater sub-micron capacity and improved overall efficiency. The new air cleaner features a straight-through airflow design and modular construction, allowing it to be installed in multiple configurations to fit the space available. Estimated list price: \$95 to \$350.

For information circle **221**





# Ancillary Products



## Volvo Technology Aims for Simplicity

**Volvo** brought its 9- to 16-liter off-highway diesel engines into Tier 3/Stage IIIA-compliance with its V-ACT system (Volvo Advanced Combustion Technology). It uses a new “flexible” high-pressure fuel-injection system, new fixed-geometry turbochargers with improved airflow characteristics, enhanced electronic control units, new camshafts, new charge-air coolers and radiators — plus a patented, “switchable” internal exhaust gas recirculation system. The latter feature works through a specially designed exhaust-valve rocker arm that activates a second opening of the exhaust valve to allow a controlled amount of exhaust gas back into the cylinder during the inlet stroke to lower peak combustion temperatures.

For information circle **222**



## GM's Pickup Powerplant King

This season's most-powerful light-truck engine is **General Motors'** 2006 Duramax LBZ diesel available in the Chevy Silverado/GMC Sierra 2500 and 3500 Series pickups. The V8 diesel delivers 360 horsepower at 3,200 rpm and 650 lbs.-ft. of torque at 1,600 rpm (the strongest competitors from Ford and Dodge currently are rated at 325 hp/570 lbs.-ft. and 325 hp/610 lbs.-ft., respectively). Duramax's fuel economy improved even as power increased. One transmission choice available on GM trucks with the big diesel is the Allison 1000 6-speed automatic. Estimated list price: (Duramax option) \$5,310.

For information circle **223**

## Rugged Shoulders Resist Damage

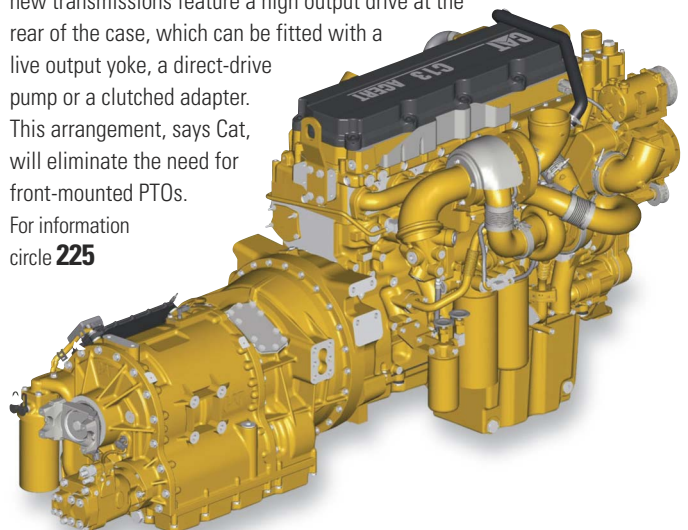
The **Michelin** X-Super Terrain AD, an E4 23.5R25 radial tire for articulated trucks, is designed with a deep tread and new rubber compound to extend service life, and with modified shoulder and sidewall construction aimed at enhancing resistance to damage. The new tread pattern, says Michelin, combines aggressive traction with self-cleaning capability, and the overall design of the new tire results in low rolling resistance and provides a good ride for the operator. Estimated list price: \$3,600. For information circle **224**



## Rear-Drive Auxiliary Saves Space

In a move that surprised many in the industry, **Caterpillar** announced it would build a complete line of fully automatic transmissions, designed to match up with Caterpillar engines used in vocational on-highway trucks. The new on-highway transmissions are based on the design of transmissions used in Caterpillar's articulated trucks, but have been modified, says the company, to ensure acceptance in the on-highway marketplace. The new transmissions feature a high output drive at the rear of the case, which can be fitted with a live output yoke, a direct-drive pump or a clutched adapter. This arrangement, says Cat, will eliminate the need for front-mounted PTOs.

For information circle **225**





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# Ancillary Products

## Tire Design Promotes Optimal Life

Long-lasting, cool-running tires are of the utmost concern for quarry operators who depend on rigid-frame haul trucks to keep up production.

According to **Bridgestone**, its new V-Steel Rock Quarry Premium (VRQP) radial tire meets these stringent requirements. The new tire, says the company, provides a unique combination of extra-deep tread, specially designed tread compounds that provide enhanced wear resistance and cut resistance, along with a tread design that promotes cooler running temperatures. The net result, says Bridgestone, is a long-lasting tire that provides exceptional heat resistance.

For information circle **226**



## SystemOne Aims to Cut Track Costs

At the heart of **Caterpillar's** SystemOne undercarriage, available for certain of its crawler dozers and loaders, is a uniquely designed and manufactured pin-and-bushing cartridge, which is sealed and lubricated for life, eliminates the need for turning pins and bushings, and allows the bushing to turn while under sprocket load. The cartridge, assembled in a clean room, is laser-welded and has lifetime internal seals. Remaining undercarriage components are essentially designed to last as long as the cartridge. The SystemOne undercarriage is estimated to cost 25 to 30 percent more than a conventional system, but projections of extended life range from 50 to 70 percent.

For information circle **227**



## High-Lift Welder Neatly Packaged

**Genie** ArcPro275 is an arc-welding system that places a 275-amp stick/TIG welder (the Lincoln Electric Invertec V275S) conveniently outside the personnel platform of a Genie telescopic-boom aerial work platform and a 12,500-watt hydraulically driven generator at the base of the machine. The system provides both 208V, three-phase power for the welder and 110V, single-phase power for electrical tool use. For intermittent use, the generator is rated at 13,500 watts. The new system also fits Genie articulated-boom models with lift heights of 60 feet or more. Estimated list price: \$11,700.

For information circle **228**

## Varied Tier-3 Technology

At the heart of **Komatsu's** Tier-3 technology for off-highway diesel engines is a patented combustion-chamber design, which works in concert with the company's high-pressure common-rail fuel system and an enhanced electronic control system that provides increased processing speed and increased inputs. Also, for its smaller Tier-3 "ecot3" engines, Komatsu uses improved charge-air coolers and enhanced-performance turbochargers. In addition, Komatsu's larger ecot3 engines employ a cooled exhaust-gas recirculation system (EGR), which is specially designed for the rigors of off-highway application, says the company.

For information circle **229**





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"We've been using our new MSD 3000R Saber Series for tearing down the LTV Steel Mill in Cleveland. I have been around shears a long time. This product is simply a large step above anything I have ever used. Its performance has been phenomenal."

— *Brian Baumann; B & B Wrecking;  
Cleveland, OH*



"We owned an MSD 50 LaBounty that we bought back in '89. Since we bought our new MSD 2500 Saber Series Shear, we have doubled our production and significantly reduced maintenance and downtime. We simply love this shear."

— *Stuart Boylan,  
Branch Manager;  
Pacific Steel & Recycling;  
Gillette, Wyoming*



"For the past several months, we have been using our MSD 3000R Saber at the GM Foundry in Danville, IL along side a competitive shear we are renting. Simply put, the 3000 is running circles around it. It has exceeded all of our expectations in regards to power, speed and overall performance." — *Jim Park, Project Manager; Brayman Construction Corp.; Saxonburg, PA*



"With the significant increase in power, we are now able to take on materials that we would not have dreamed of in the past. The Saber Tip has significantly reduced the amount of time it takes to maintain the product, which leaves it to cutting more iron and making us more productive. Overall, we couldn't be happier." — *Walter Fleischhacker, President; Northeast Metal Processors, Plantersville, MS*



"I have owned and operated LaBounty shears for over 10 years and currently own 7 of them, along with many other LaBounty attachments. When I started using the new MSD Saber Series, I was amazed. It's got unbelievable power, it's fast, the operator has excellent visibility and maintenance has been drastically reduced with the bolt on Saber Tip. LaBounty has done it again. This shear is just awesome." — *Tom Petrizzo, Mill Metals; Jersey City, New Jersey*



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## THE MSD SABER SERIES — ONLY FROM LABOUNTY

For information circle 23





# Ancillary Products

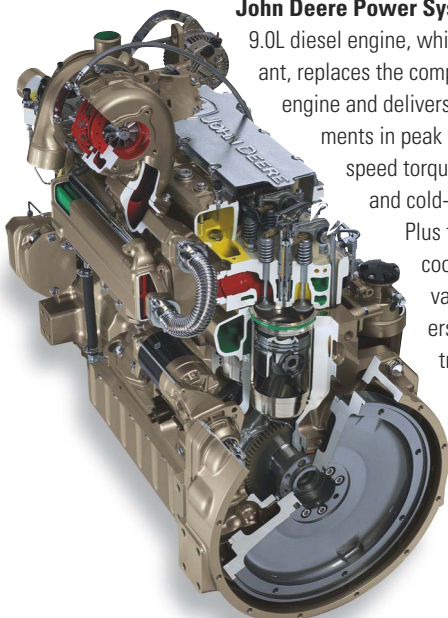


## “Liftable” Cutter Expands Capability

**Jarraf Industries’** low-ground-pressure Geo-Boy Brush Cutter is designed to mow and mulch material in land-clearing and right-of-way-maintenance applications. The Geo-Boy, says the manufacturer, can clear brush and trees up to 12 inches in diameter, and also has the ability to lift and roll its cutter head to heights of 11 feet. Estimated list price: \$280,000 to \$290,000.

For information circle **230**

## New 9.0-Liter Delivers Improved Economy



**John Deere Power Systems’** new PowerTech Plus 9.0L diesel engine, which is Tier 3/Stage IIIA-compliant, replaces the company’s PowerTech 8.1-liter engine and delivers, says the company, improvements in peak power, peak torque, low-speed torque levels, transient response and cold-weather starting. PowerTech Plus technology encompasses cooled exhaust gas recirculation, variable-geometry turbochargers and “state-of-the art” electronic control. The manufacturer claims significant increases in fuel economy for the new 9.0-liter engine, compared to its Tier 2/Stage II-compliant 8.1-liter predecessor.

For information circle **233**

## Processing Head Cuts and Crushes

According to **Construction Technologies**, its IronWolf Crusher, which uses a proprietary cutter/crusher head driven by a huge hydraulic power pack, can be mounted on a variety of host machines. The cutter/crusher head is equipped with a large up-cutting drum that incorporates a tooth pattern designed to trap rock within the confines of four teeth, then to slam the rock into breaker bars mounted in the drum housing. This system, says the manufacturer, allows the IronWolf to effectively cut and crush various types of rock, asphalt pavement and concrete, as long as the material is laminated or already fractured. Estimated list price: \$235,000 to \$450,000.

For information circle **231**



## New System Allows Tires or Tracks

The Versatile Track System (VTS) from **Loefering Manufacturing** is a bolt-on, rubber-tracked undercarriage system designed to be installed on (or removed from) virtually any brand of wheeled skid-steer loader in about an hour. The undercarriage, with 18-inch-wide tracks, bolts directly to the skid-steer’s wheel hubs and features a bi-directional, torsion suspension system. VTS currently is available for skid-steers with wheelbases from 42.5 to 51.5 inches. Estimated list price: \$11,500 to \$15,000.

For information circle **232**





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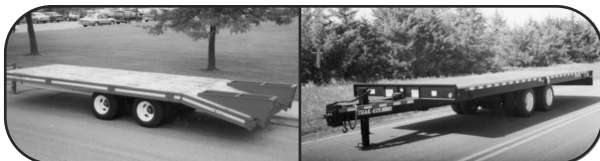
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## Ancillary Products

### "Configurable" Sensors Give More Info

According to **Qualcomm**, its GlobalTRACS 3.0 equipment-management solution, by monitoring up to four configurable sensors, can observe and report on customer-determined thresholds and durations for critical



parameters in construction machine systems. The goal of the new tracking system is to provide "instant critical alerts that can help prevent expensive damage to engines, transmissions and hydraulics." The sensor monitors will also provide non-critical alert observations and

historical data, delivered on predetermined schedules to maintenance personnel, to assist in spotting potential problems.

For information circle **234**



### Self-Propulsion Takes Machine to Material

Towable recycling machines in land-clearing and high-volume recycling applications typically operate from a stationary position, requiring support machines to transport material to the recycler. If the machine is towed to material, rough terrain and soft soils can be hazards. But, says **Bandit**, its new self-propelled 4680 Beast Recycler, equipped with a Caterpillar 325-size track undercarriage, moves easily and efficiently to the material, reducing costs along the way. The 860-hp 4680 is equipped with a 57-inch-diameter mill, designed to process whole trees and stumps and logs up to 40 inches in diameter. Estimated list price: \$535,000 to \$575,000 (depending on power unit and options).

For information circle **236**



## "Keyholing" Conserves Resources

The VT250D Keyholing VaXcavator from **McLaughlin Boring Systems** is a self-contained unit capable of exposing utilities beneath asphalt and concrete surfaces. A core drill, capable of operating up to 25 feet from the rear of the VaXcavator's trailer, first removes a small core of pavement. The system's vacuum excavator then removes soil beneath the displaced core to expose the utility. When closing the keyhole, either the dry excavated material from the hole is replaced, or dry fill from the system's storage tanks is used. The core is cemented back into position. The VT250D, says McLaughlin, requires only two people for its operation, and replaces multiple pieces of specialized equipment. Estimated list price: \$55,000.

For information circle **235**

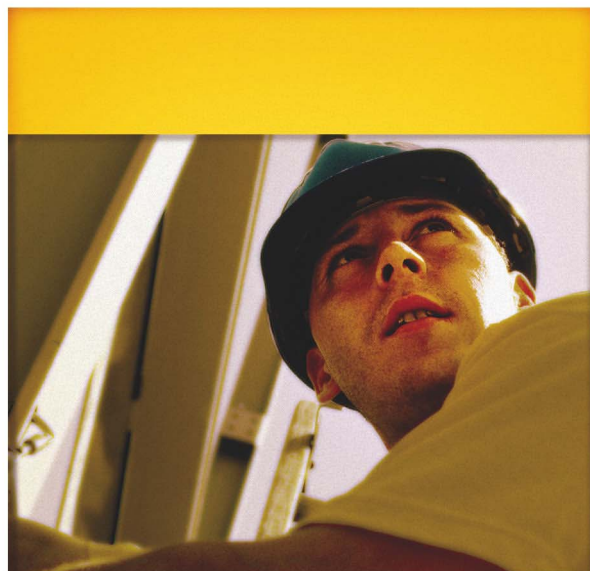
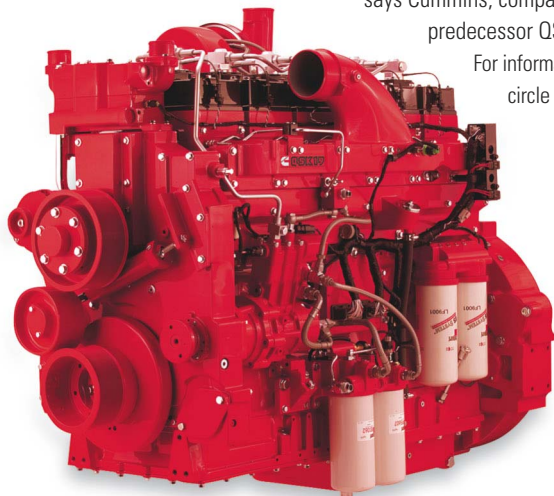


## In-Cylinder Techniques Simplify Design

A modular common-rail fuel system and advanced in-cylinder combustion technology were key elements in bringing the **Cummins 19-liter QSK19** engine into Tier-3 compliance. The new fuel system, working with an upgraded electronic control module, achieves peak injection pressures of up to 23,500 psi and maintains peak pressures independent of engine speed, load factors or fueling capability. In the power cylinder, use of a new single-piece Ferrous Cast Ductile (FCD) iron piston yields a 10 percent increase in durability and reduces oil consumption by 20 percent,

says Cummins, compared to the predecessor QSK19.

For information circle **237**



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For information circle 27



# Production Heroes: Skid-Steer Loaders

By LARRY STEWART, Executive Editor

## Wheelbase Is Key to

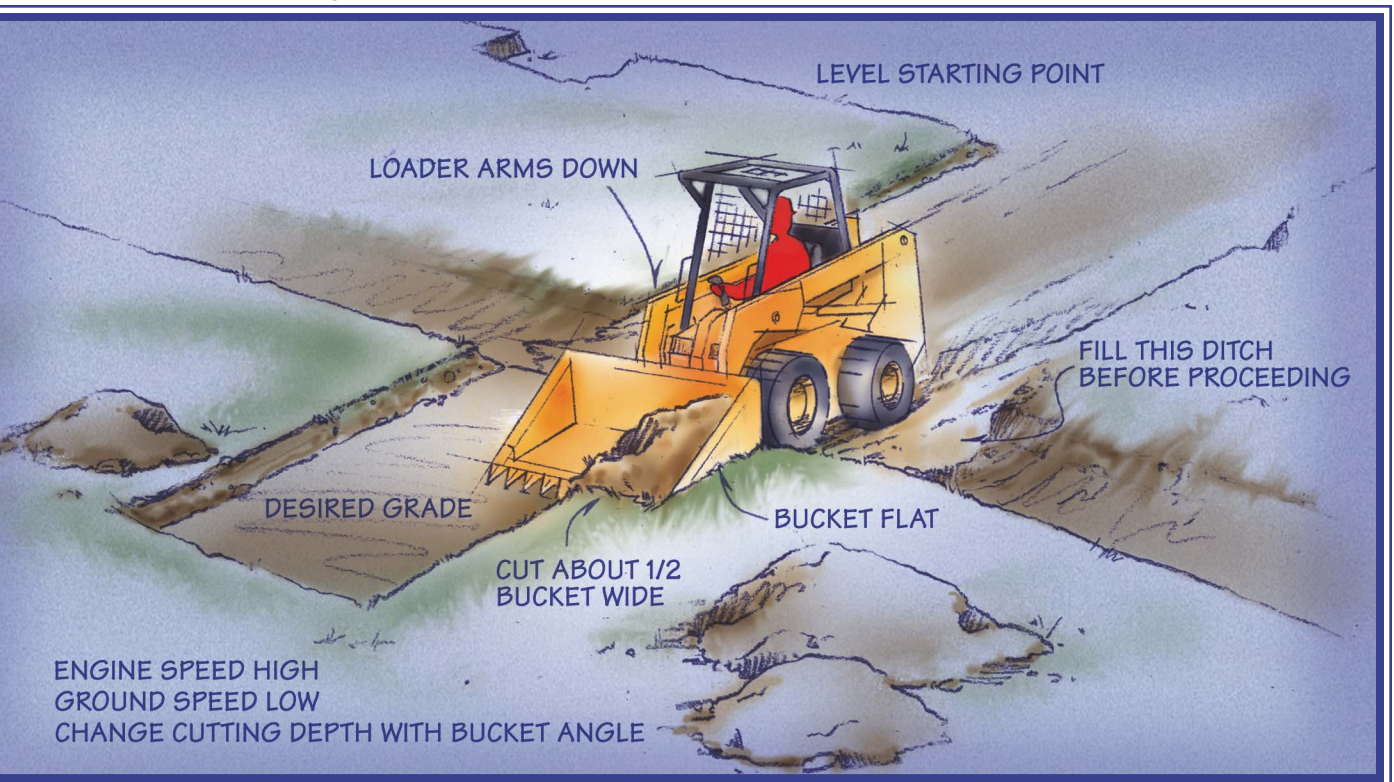
While almost anybody can make skid-steer loaders move fast, they require finesse and a sense of balance to finish jobs smoothly

**D**esign elements that make skid-steer loaders indispensable on most jobsites can also present some challenges to productive operation. With hydrostatic drive on a short wheelbase and narrow tread width, the skid-steer is fast and maneuverable. Unpracticed or careless opera-

tors will occasionally struggle to keep all four tires on the ground.

"The machine is deliberately unbalanced, with 70 percent of its weight over the rear two wheels when unloaded and 70 percent of the gross weight over the front two wheels when loaded," says Glenn Lee, safety and training

### Match Finishing Passes



A skid-steer loader's bucket is only as level as its tires, so finish grading has to start on a flat surface. Iron out a starting point by shaving the high spots and filling the lows in short pushes. Work with the loader arms down and the bucket flat, using minor corrections in bucket angle to vary the depth of cut. Slow ground speeds

and fast engine rpm give the operator time to react and the hydraulic system power to respond. Use a method called "pass matching." Once you've carved a level pass, make cuts half a bucket wide, using the other half of the bucket as a depth gauge following the existing grade.



# Skid-Steer Productivity

manager with Bobcat Enterprises, an equipment dealer in Cincinnati. “It has to be designed that way to turn efficiently.

“Most people don’t realize the degree of the disparity in weight, or how easily the machine can be tipped back,” he adds. “It will do a wheelie if you push sticks forward too quickly, but you don’t want the machine bouncing around the jobsite.”

Lee observes that, because the machine is small, rushed operators sometimes fail to respect the fact that they’re moving as much as 3,000 pounds of material.

“We have to stress that operators move the sticks smoothly and operate the skid-steer controllably,” says Al Weishaar, skid-steer loader product specialist at Caterpillar. “It’s more of a problem with less-experienced operators. Their impression is that if the machine is moving fast, they’re getting production. But that’s not necessarily the case.”

Weishaar strives to refocus attention on handling material one time, or as little as possible, and properly applying the work tool.

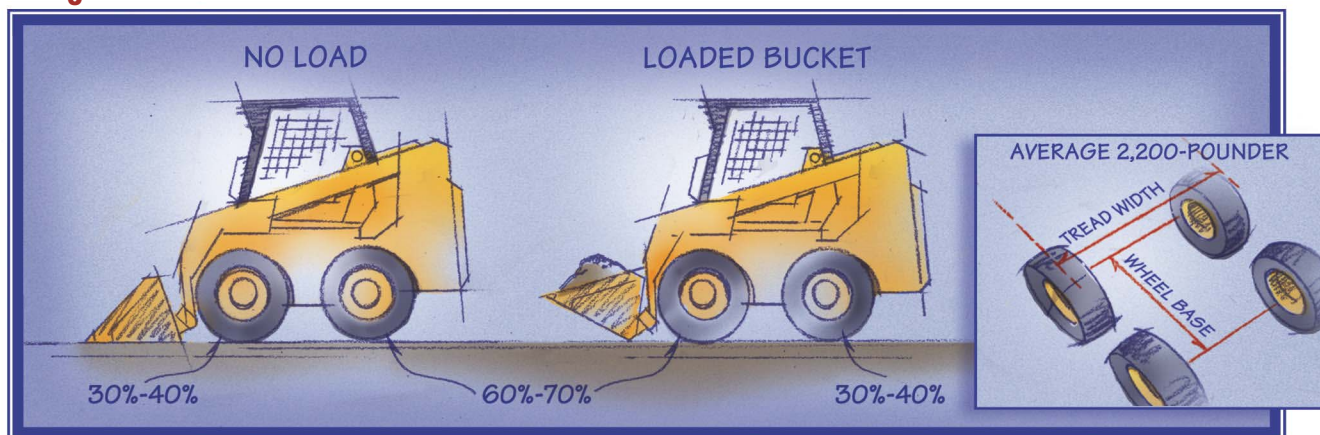
“Try to use the full capacity on every load,” he says. “That’s how real production can overcome the image of speed as production.

“Excessive speed could cause damage to the machine or injury to the operator if they’re working in really rough conditions,” Weishaar adds. “I have seen skid-steer loaders going so fast over rough surfaces that the tires are leaving the ground. The machine and operator will both survive longer if they slow down.”

A skid-steer’s hydrostatic drives react very quickly to movement of the control levers. All trainers advise skid-steer operators to check their path before turning or reversing the machine.

“A skid-steer loader very quickly can change direction in any way — almost instantly,” says Weishaar. “There are a lot of visibility

## Weight Distributed on Short Wheelbase



**Design features that make skid-steers fast and nimble can also present stability issues. In order to steer around one axle, the machines carry 60 to 70 percent of their weight on the rear axle. When loaded, most of the gross weight rides on the front axle. Wheelbase is only 45 inches on the average machine with 2,200**

**pounds of rated operating capacity. Jackrabbit accelerations with no load in the bucket can raise the front wheels off the ground. With a tread width of just 56 inches, these machines can tip to the side if the operator doesn't manage the center of gravity by controlling the speed and load height.**



# Production Heroes: Skid-Steer Loaders

## Wear the Seat Belt

Use the safety bar and wear safety glasses, a hardhat and steel-toed shoes.

Source: AEM



## No Riders

And never move or swing a load over anybody's head.

Source: AEM



## Stay Inside

Never enter or leave the operator's station when the loader arms are raised.

Source: AEM



## Three Points of Contact

When you mount and dismount, keep three points of contact with the machine – both hands and one foot, or one hand and both feet. Source: AEM



issues, especially to the rear and rear sides.

"With your daily inspection, make sure the travel or backup alarm is working," he adds. "We've incorporated rear-view mirrors, which decreases turning around to look behind you, but still doesn't take away all your blind spots."

A training videotape from VISTA called Skid Steer: Safe Operating Techniques suggests, "If anybody walks up to the machine to talk to you, put the loader arms down and turn the machine off. Don't restart until the area is clear."

Filling a skid-steer's bucket is much like getting a full bucket with a wheel loader. Drop the bucket flat on the loading floor and drive into the bank or pile until you lose power or traction.

"Then raise the loader arms slightly to plant all the tires firmly on the ground," says Weishaar. "Curl the bucket back until it's full. You may not get the complete fill factor when digging muddy ground, but rated load is based partly on material density. You can reach the rated operating capacity of the bucket and the machine even if you don't get the bucket completely full."

A skid-steer loader can pick up more than its rated operating load. Skid-steers are rated to work with only 50 percent of their tipping capacity because when they put a load in motion, the dynamic forces on a short wheelbase and narrow tread width can tip the machine.

"Loading from a pile, some persons will gouge into the pile instead of scooping," says Marty Turek, curriculum developer and instructor with the Operating Engineers Local 150 in northern Illinois. "They push in and roll the bucket to get a load in a snap, but stickier materials won't want to come out of the bucket. For the sticky materials, you have to make more of a linear cut — penetrate and then raise the loader arms, making a shallower, longer cut upwards."

Roll the bucket back as it fills to keep the load in the bucket.

"We see these machines building a ramp in front of pile, too," says Turek. "When they come up to the pile they don't have enough





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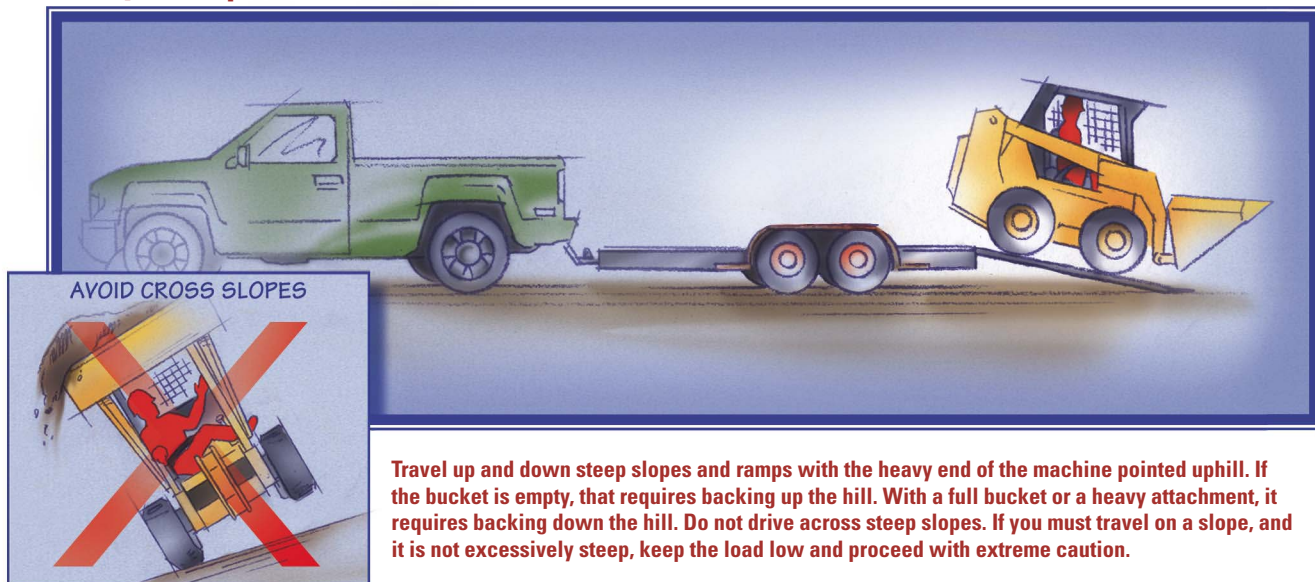
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# Production Heroes: Skid-Steer Loaders

## Heavy End Uphill



**Travel up and down steep slopes and ramps with the heavy end of the machine pointed uphill. If the bucket is empty, that requires backing up the hill. With a full bucket or a heavy attachment, it requires backing down the hill. Do not drive across steep slopes. If you must travel on a slope, and it is not excessively steep, keep the load low and proceed with extreme caution.**

down pressure on the bucket, or the bucket's not flat on the ground. You might even want a slight downward angle to make sure the bucket is cutting when you get to the pile."

The loading floor has a significant impact on the unsprung skid-steer loader's productivity and the operator's endurance. Turek recommends keeping the bucket down on the ground most of the time in a loading area, always working to keep it smooth.

"You'll see cowboys who like to bring the front two wheels up off the ground as they're driving into the pile. They think they're getting more down pressure, but they're actually giving up half the machine's traction and increasing down pressure on the rear tires. Those rear tires dig ruts in the site, which decreases traction on later passes," says Turek. "It doesn't really matter if the tires are up or down. Physics say you only have so much weight on the machine, so you're only going to get so much down pressure. If you want more penetration, just tilt the bucket angle down a little more."

"To achieve breakout force, start with the bucket flat on the ground and raise the lift arms slightly, then use bucket angle to penetrate hard material," says Caterpillar's Weishaar. "Keep all the tires on the ground and planted firmly. Then it's easy to make changes in the penetration force with minor changes in the bucket angle."

"The short wheelbase makes finish grading

more difficult," says Turek. "If you have one tire that's not level with the others, the bucket has to tilt. Since the tires determine the pitch of your bucket, you have to level the area where your tires are sitting.

"Start shaving down the high points," Turek recommends. "If you're not comfortable, take a 1/2 of a tenth at a time. It's hard to do, but if you take a few minutes to set up, it will make the rest of the job a lot easier.

"As soon as the bucket gets out of level, stop and back up. If you keep going, you'll make it worse because the bucket goes up when the front wheels go over a hump and when your rear tires go up the bucket cuts down. It just facilitates cutting a wave pattern into the surface."

Once the starting point is leveled, you can work outward from that point using a method that Weishaar calls "pass matching."

"If you want to maintain an established grade, you start from a level point and make passes half a bucket wide, matching each pass to the existing grade," says Weishaar.

"Work with the bucket flat, the loader arms lowered, and use minor corrections in the bucket angle to vary the depth of cut. A little correction in the bucket angle is easier and faster than correcting using the loader arms.

"The key to finish grading with a skid-steer loader is slow travel speed and high engine rpm," he adds. "At low engine speed, the



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Four models are currently available in the series, two 36-inch and two 48-inch diameter models with the choice of a Honda or WACKER engine.

[www.wackergroup.com](http://www.wackergroup.com)

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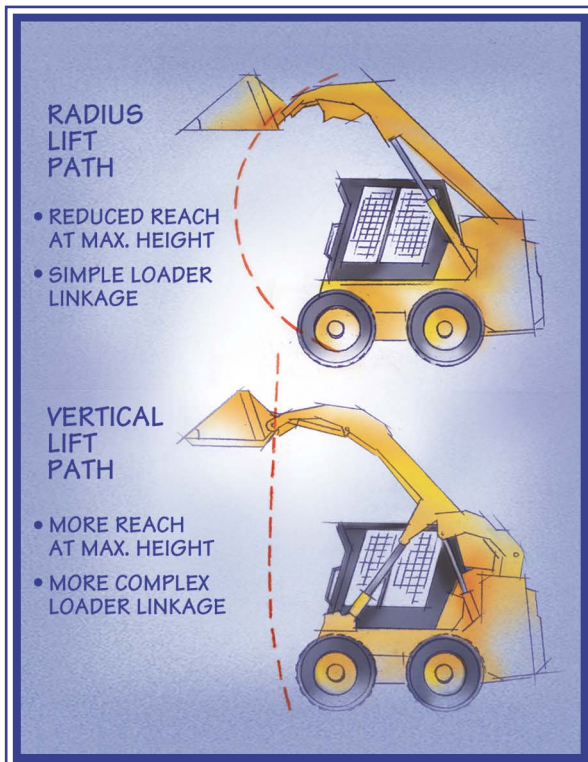




# Production Heroes: Skid-Steer Loaders

## Radius vs. Vertical Lift

Skid-steers with vertical-lift loader mechanisms are best for forklift work, and they can excel at loading trucks because they reach farther than radius-lift machines at the top of the lift range. The linkage also holds the forks or bucket closer to horizontal through the entire lift path. Simple radius-lift machines are typically better for digging and using heavy work tools because a system with fewer moving parts generally withstands stress better with less maintenance.



hydraulics will be too slow to respond. At high travel speed, it's hard for the operator to respond quickly enough. It's another one of those situations where going fast is not always the most productive choice."

Weishaar warns finish graders to limit their bucket loads and avoid wheel slip. Spinning causes unnecessary tire wear and requires grade rework.

"If you're not fine grading but smoothing a work area you can leave some contour there, but you definitely want to be level at the point of high lift or loading into a truck," says Weishaar. "An uneven load in the bucket can really compound a slight side slope and risk tipping the loader. A slope down to the truck can decrease the loader's rated operating capacity dramatically."

Carry loads as low as possible to keep the center of gravity low and to leave an unobstructed view from the operator's seat.

Drive straight up and down slopes. The heavy end of the machine should always be uphill. With most of the machine weight on the rear tires, an unloaded skid-steer should be

backed up slopes. When the loader is carrying its rated capacity it can be driven forward up slopes, but should be backed down.

Slow down when approaching to load a truck or hopper. Drive as close to the dumpsite as possible and raise the bucket slowly.

"Travel as little as possible," says Weishaar. "You could get dynamic tipping caused by hard braking and hoisting at the same time. It compounds the weight transfer forward."

When raising the bucket, be careful to keep it level. A very full load can spill over the back of the bucket, into the operator's compartment, and onto the operator's feet.

Loaders with vertical-lift linkage are designed to hold the bucket or pallet forks more nearly level. And because they do not swing the load upward in an arc as a radius-lift machine does, there's less demand to roll forward with arms in the air to place a load.

VISTA's Safe Operating Techniques video bridges from this point to remind operators to wear proper protective gear. "Wear safety glasses. If a rock tumbles off the back of the bucket and shatters the windshield, you're going to need eye protection." 

## Training Resources

For more information about the range of operator training available from the sources in this story contact:

### Bobcat Co.

(701) 241-8700

[www.bobcat.com/training/index.html](http://www.bobcat.com/training/index.html)

### Bobcat Enterprises

(937) 444-3865

[www.bobcat-ent.com/logic/](http://www.bobcat-ent.com/logic/)

### Caterpillar Equipment Training Solutions

(800) 962-6628

[www.cat.com](http://www.cat.com)

### International Union of Operating Engineers Local 150

(815) 436-4150

[www.asiplocal150.org](http://www.asiplocal150.org)

### VISTA Training

(800) 942-2886

[www.vista-start-smart.com](http://www.vista-start-smart.com)



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For information circle 33



## Startup Quadruples Revenue with GPS Grade Control

With nearly stakeless grading, Russ Chrisman is having trouble keeping work in front of six earthmoving machines

When Russ Chrisman launched his excavating business three years ago, he had a strong hunch that grade-control technology relying on global positioning system (GPS) satellites would become his small company's competitive advantage. Revenues have doubled in each of the last three seasons, and he's pretty certain he was right.

Chrisman began the first year with four primary Caterpillar earthmovers: two dozers — a D6R and a D4 — and two excavators — a 322 and a 325. He hired three operators and the four of them worked that first season the traditional way, with grade stakes and simple laser grade guidance.

"I had a special code on our time cards for tracking the amount of time that each of us spend off the tractors setting grade stakes," Chrisman says. "Three of us had 892 hours out of the machines just doing staking work that first year.

"There was no way we could keep up," he adds. "I was looking at either hiring someone to do the staking [he estimates it would have been a \$70,000- to \$80,000-per-year proposition] or buying the GPS grade control system and eliminating a lot of grade stakes."

Chrisman put together a simple cost justification based on his time study and made the case to his banker. With an initial investment of about \$150,000, he equipped the two dozers with Trimble Auto Sitevision systems, bought two GPS base stations, and set up earthmoving systems capable of automatic grade control.

RC Excavating's investment in staking time dropped to about 100 hours in the second year even as revenue doubled.

"I've never had one of my guys calling in to say he's shut down because he doesn't know what to do next," says Chrisman. "They have the whole job model right there on their screens, so they can go anywhere on the site

### PROFILE



**Russ Chrisman,**  
Owner

### RC Excavating

**Headquarters:**  
Green Bay, Wisconsin

**Specialties:**  
Excavating and site prep for streets, water-retention ponds, residential and commercial development

**Fleet Value:**  
\$1 million

**Fleet Makeup:**  
Four dozers, two excavators, two loaders, two rollers

**Grade Controls:**  
Three dozers equipped with GPS-based, automatic 3D grade controllers

**Employees:**  
13

**Market Range:**  
20-mile radius



Photos: George Pfoertner

**An RC Excavating dozer works a cut between two stands of trees, where satellite signals fade after 10 a.m. Motivated operators recognize falling GPS-location accuracy and move higher on the site where more satellite contact improves grade-control accuracy.**



# Great Managers



**Chrisman checks one of two base stations that his company maintains. The base station is a fixed, known reference point that communicates via radio with the GPS grade-control system to improve the accuracy of blade control.**

and they know what needs to be done.”

Chrisman ascribes much of the success to his employees. In fact, he is an excavator operator, so he scarcely used the grade controllers in the field himself. His operators are construction veterans innovative enough to want experience with the advanced technology. They knew why Chrisman was keeping track of staking time, and that his plan was to go stakeless with GPS controls.

“For GPS grade controls to really work, you’ve got to have operators who are charged up about the technology and take some pride in using it,” says Chrisman. “You can wind up with a real mess on your hands if the accuracies get too far out and the operator thinks, ‘It’s good enough,’ and keeps right on working [the cab display shows when GPS accuracy has degraded because the receiver isn’t getting signals from enough satellites].”

Chrisman still has engineers stake some stations on most jobs so that his operators can double check alignments and grades. RC operators make note of the elevations that inspectors write on manholes and hydrants and other site infrastructure, and they check elevations at all the marked stations.

“We get out and take a few shots with a laser to the hubs at the start of most jobs, too,” says Chrisman. “The contractor is responsible to check the benchmarks. If you don’t, you can set yourself up for problems.”

As an example, he recalls when one local municipality’s engineering department reestablished bench-

marks throughout its jurisdiction. But the numbers on some plans that RC Excavating was to complete hadn’t changed to reflect the altered benchmarks.

“If we had designed our model using the old data, we would have been off by about three inches all over the site,” says Chrisman. “But we got to the bottom of it and were able to correct the whole thing just by adjusting our offsets at the controller in the cab.”

Other challenges were more technical.

“Working with Terramodel to put the project plans into a digital model was the scariest thing about it,” Chrisman says. “The system depends on a lot of information coming in that has to be put into a digital design before the machines can go to work.”

“Before I could pull the trigger on buying the systems, I had to make sure I was able to design a road and load the model on the dozer’s grade control.”

None of the projects RC Excavating has done began with a complete, three-dimensional electronic model that could be plugged in simply to the Trimble computers. Chrisman, who is neither an engineer nor a computer geek, had to learn how to translate two-dimensional plans into the electronic models that automatic grade-control systems follow when they guide the blade.

“Our Trimble rep sent me a 45-day trial version of the Terramodel software and a 52-page PowerPoint that described how to get started,” says Chrisman. He sat down at the computer in the evenings and worked through the PowerPoint slides and Terramodel’s online help. “In a week I was feeling pretty good about the system. In two weeks I was ready to place an order.”

He says for RC Excavating’s site-prep purposes, the task is relatively simple. Project designs supply a series of three-dimensional points — locating them with longitude, latitude, and elevation — that describe the project’s centerline. And the rest of the project is made up of vertical offsets from that centerline. He identifies manholes and other fixtures that could be damaged but leaves out project details that the site-prep contractor will never have to touch. As long as the subgrade is where it needs to be, the dozer operator doesn’t need to see curbs and other infrastructure that will be placed on top after RC Excavating’s work is finished.

“You can build a lot of a design model pretty easily by creating a template and then just copying and pasting it where you need it,” says Chrisman. “It really was easier than I thought it would be.” 





## Introducing the **NEW M850**

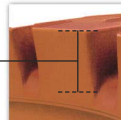
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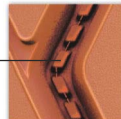
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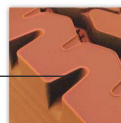
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## Don't Be Seduced by Technology

Without the end in mind, technology will leave you reeling with information overload but no useful applications

We frequently read about autonomous data collection and tracking technologies that have been developed to help us improve efficiency and save costs. We hear success stories and we also know about failures.

There is no doubt that new technologies in equipment tracking, health monitoring, communication, and data processing will enable us to achieve breakthrough improvements in fleet management. The question becomes, "How do we successfully design, develop and implement new fleet-management systems based on the wireless autonomous data collection and asset-tracking technologies now available?"

I believe the answer lies in three areas. First, you must not be seduced by the technology and implement solutions without defining the business process you want to improve and setting clear objectives for success. Second, you must focus on producing actionable information that simplifies and improves decisions. Third, you must define the data last and remember that data collection is not an end in itself. Let's look at each area in turn and use a small example to drive home the points.

### Define the business process

Many companies have put GPS tracking boxes on their equipment so that they can find out where the machines are at a given point in time and record engine hours. They learned a lot about the reliability of the technology and the quality of their suppliers. They had maps or lists showing location and hours worked, and they could access the data when they wanted. They had more data, but nothing changed. The technology had little if any impact on business performance.

Let's now imagine that you run a number of trucks to fuel your fleet in a given area and that you would like to reduce the cost of the

operation. The tracking boxes now have a defined and specific purpose: to provide you with the location of the machines and knowledge of hours worked so that you can plan fuel truck routes and reduce visits to machines that have sufficient fuel for the day ahead. There is a reason to use the technology, an objective for the system, and an opportunity for a return on your investment.

Defining the business process you want to improve makes it possible to establish performance requirements for the system and measure successful implementation. The table on the next page shows the questions that need to be asked and provides answers within the context of the fueling system example.

### Focus on actionable information

Data is not information, and information is unlikely to result in action unless it is presented in a clear, well understood and compelling format. Quantity must not be confused with quality, and decision makers must not be bogged down with metrics and information they do not need. The business process you want to improve and the results you want to achieve make it possible to define the metrics and control limits needed to produce actionable information and ensure that it is used to make decisions on a regular basis.

The table on p. 82 shows that the system will provide the fuel truck operators with tabular reports showing the location and hours of fuel remaining for only those machines that are likely to run out in the next 12 hours. The key metric (hours of fuel remaining) and the control limit (12 hours) can be defined and calculated within the system and used to ensure that the fuel truck drivers will not have to go through long lists or do any calculations



**Mike Vorster**

David H. Burrows Professor of Construction Engineering and Management at Virginia Tech.

Vorster will lead the Construction Equipment Institute Jan. 10-13, 2006, in Austin, Texas. For more information, contact Susan Beck at: [sbeck@reedbusiness.com](mailto:sbeck@reedbusiness.com) or call 630-288-8494.



## Evaluate How Technology Benefits Operations

<b>Objectives</b> <ul style="list-style-type: none"> <li>■ What specific business process will the system address?</li> <li>■ What improvements and savings relative to current practice can be expected from the development and implementation of the system?</li> </ul>	<ul style="list-style-type: none"> <li>■ We would like to reduce the cost and improve the efficiency of fueling equipment in the Eastern Kentucky region.</li> <li>■ We currently run five fuel trucks in the region and believe that this could be reduced to four if routes could be planned and unnecessary stops eliminated.</li> </ul>
<b>Performance Requirements</b> <ul style="list-style-type: none"> <li>■ What information is to be provided by the system if it is to meet the objectives?</li> <li>■ When and where must this information be provided?</li> <li>■ What are the format requirements for the information?</li> </ul>	<ul style="list-style-type: none"> <li>■ The system must deliver the following information for each machine in the region: <ul style="list-style-type: none"> <li>• Machine location</li> <li>• Hours of fuel remaining if less than 12 hours</li> </ul> </li> <li>■ Hours of fuel remaining is calculated as the maximum hours on a tank minus hours worked since last fuel stop.</li> <li>■ The information must be provided in tabular format sorted by machine location and hours of fuel remaining.</li> </ul>
<b>Actionable Information</b> <ul style="list-style-type: none"> <li>■ What information will be produced and steps will be taken to ensure that actionable information, and only actionable information, is provided to system users?</li> </ul>	<ul style="list-style-type: none"> <li>■ Only machines with less than 12 hours of fuel remaining are included in the tabular report</li> <li>■ The information must be provided at the end of each day at all central fuel storage locations.</li> </ul>
<b>Data Required</b> <ul style="list-style-type: none"> <li>■ What data must be collected to provide the required information and how frequently must they be recorded?</li> </ul>	<ul style="list-style-type: none"> <li>■ Location - recorded daily between 4 and 5 p.m.</li> <li>■ Engine hour meter reading recorded daily between 4 - 5 p.m.</li> <li>■ Engine hour meter reading recorded when last fueled.</li> </ul>

**Data collection and tracking technologies can lead to information overload. Avoid this trap by setting clear objectives and then use the information to simplify processes and improve performance.**

to see which machines must be fueled. They know the action they must take: All listed machines must be fueled before the end of the next shift.


Our example system also calls for the information to be provided at a time and location convenient to the user. The drivers will be able to pick up their lists when and where they fill their fuel trucks and plan their routes. It gives them what they need to do their work — no more and no less.

### Defining data last

The table shows that defining data requirements is a top-down process that starts with setting clear objectives and ends with a list of the data needed to calculate the required metrics. The process does not start with thinking about the data that can be collected using the technology and then dreaming up, imagining or creating possible uses.

Our example shows that we need three pieces of data (location and engine hours at the end of the shift

and engine hours when last fueled) to develop a system that will improve the efficiency of our fueling operation. We could easily imagine that the first two elements (location and engine hours at the end of the shift) could be used to improve preventive maintenance scheduling. This application will, however, need to be studied and justified with the same top-down approach and attention to detail used to define the fueling system.

Wireless autonomous data collection and tracking technologies can easily swamp us in data and add to both work load and complexity. Our example showed how this could be avoided by starting with clear objectives and focusing on the use of the information as opposed to the use of the technology. Implementing and using a new technology is not an end in itself. It is a means toward simplifying processes, reducing work load, and improving performance. Working through the questions and the format set out in our table will ensure that you achieve good results. 





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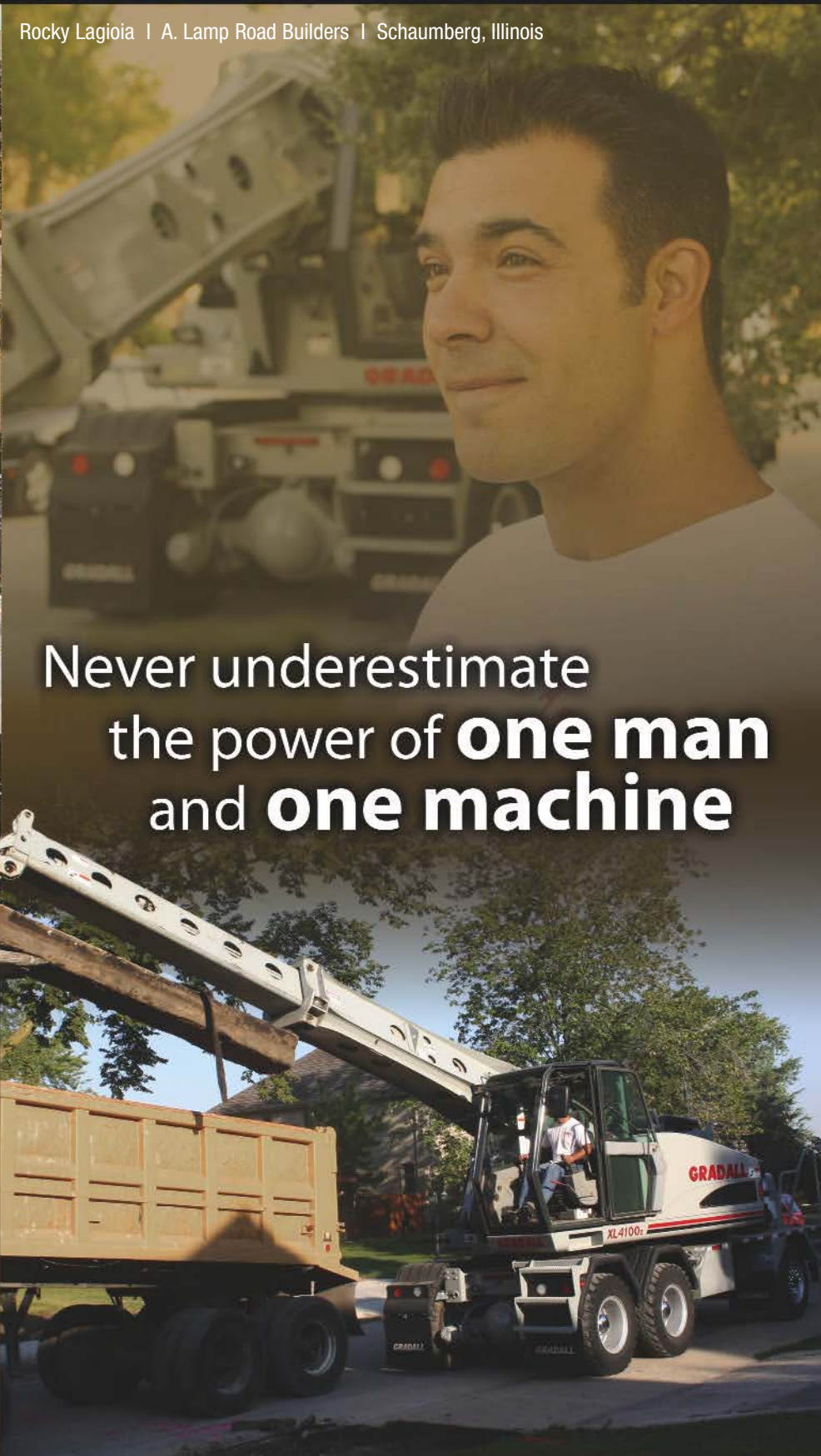
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## Volvo's Bendix EST Keeps the Business Side Up

EST uses existing ABS wheel sensors, and adds sensors at the steering wheel and on the chassis to determine when road speed/directional change are about to cause a rollover

**H**ave you ever seen a big rig rolled over on its side? Ever owned a truck that did roll? It's a mess; it costs a lot of money; and there's a good chance that the driver was badly hurt or killed in the wreck.

Such accidents typically occur on sharply curving freeway off-ramps and during sudden emergency maneuvers. They happen because drivers are going too fast or get trucks into situations that make them unstable. To compensate for such tendencies, most truck builders now offer "stability control." These products use the electronics in now-standard anti-lock braking systems to slow down the vehicle — something drivers might do if they realized trouble's afoot, but don't because the rollover's happening before they realize it.

Makers of stability-enhancement systems like ArvinMeritor, Bendix and Bosch have been showing off their products for several years, but only recently has one of them allowed reporters with CDLs to drive a rig equipped with it. That's Bendix, which supplies a system to Volvo Trucks; together they hosted a demonstration in Dallas during the recent Great American Trucking Show.

Volvo calls its optional Bendix system Electronic Stability Technology, or EST. It uses the existing ABS wheel sensors, and adds sensors at the steering wheel and on the chassis to determine when road speed and a directional change are about to cause a rollover. EST reacts instantly by cutting engine power



**With EST turned off, the trailer begins rolling over in a tight turn, and would, pulling the tractor with it, if an outrigger didn't keep it upright.**

and applying the brakes on the tractor and trailer. It works, at least within limits, to keep drivers out of trouble.

The demo rig was a Volvo VT880 pulling a tank trailer loaded with water to bring gross combination weight to 78,000 pounds, according to Charlie Ross, a Bendix engineer who acted as a driver instructor. He showed me how to go through the course, how a rollover begins without the driver realizing it, and what EST does to compensate.

He turned EST off to show how a rollover starts. You'd think you'd get a seat-of-the-pants warning as the trailer begins to lift its inside wheels in a hard turn, but you don't. It's

past the point of no return before you might even see it in the mirrors, Ross said. These are forceful maneuvers, and as a passenger I had to hang on. Wheeled outriggers on the demo trailer kept it from going on its side, and we could recover to try it again.

Ross did this twice, in a decreasing radius turn, such as in an off-ramp, and in a lane-change maneuver, which you might do to avoid a motorist or pedestrian who's blundered into your way.



**With EST on, engine power is cut and brakes apply automatically, slowing the rig before it can roll over.**



# Truck Report

"The lane change doesn't get you," Ross said, noting that the trailer follows the tractor rather well through the first quick turn, "but the recovery does." When trying to cut back into the origi-

nal lane, the trailer's mass changes direction again, but with greater force, and can start a rollover.

In both situations with EST turned off, the tanker trailer would've rolled

onto its side were it not for the outrigger, whose tire forcefully contacted the asphalt as the rig's regular tires howled. Tires don't last long during such demonstrations, Bendix and Volvo people said.

Then Ross switched on EST and went through the turns again at the same 30- to 40-mph speeds. This time the system sensed what was happening and slowed the vehicle enough to avoid the rollovers. While standing outside during previous runs, I could hear the ABS cycling the brakes and watch the rig slow down, but it was not visually exciting.

Driving it was more impressive. I got us up to the proper speeds and at Ross' direction, kept my foot on the accelerator — something that goes against a driver's instincts in such a situation — as I went into the cone-marked turns. EST realized I was going too fast and cut engine power, then applied the brakes, all in less than a second. By the time I entered the dangerous part of each maneuver, our speed was slow enough for me to complete the turns with no more trouble.

The Bendix system applies each brake individually, based on the situation, he explained. The outside brakes work harder because centrifugal force has put more weight on those wheels and they'd be able to apply more braking power. When the rig began stabilizing, it eased off the brakes and let me reapply power. By then the engine was lugging and I could start thinking about downshifting. It all happened so fast that I couldn't feel exactly what EST was doing, but I knew it had slowed us down and kept the rig's business side up.

"Now, this won't prevent all rollovers," Ross said. "If we were going 50 or 60 mph, we'd probably roll over anyway. But the system does all it can to help the driver."

Volvo says EST is available on trucks as well as tractors. If it prevents one rollover, the savings would pay for ordering it on an entire fleet.

For information circle **188**



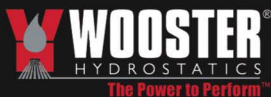
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# Market Watch Lite

By HEATHER BURLINGAME, Senior Production Editor



## ◀ Ditch Witch

Equipped with a 31-hp Kubota turbo diesel engine, Ditch Witch says its SK650 is the only mini skid steer that directs 20 net horsepower to the attachment. Operators do not have to shut down the machine to change attachments — quick-disconnect attachment fittings enable attachments to be changed with the hydraulic system under pressure. The machine also features a foot pedal auxiliary control.

For information circle **170**

## ▶ Miller Electric

The Millermatic Passport is an inverter-based MIG arc welding power source, wire feeder, self-contained shielding gas system and gun all in a single package. It weighs 45 pounds and can weld for 25 minutes with 25 feet of weld on  $\frac{3}{16}$ -inch-thick material with one cylinder of gas. It has current output range of 30 to 180 amps. It can connect to 115- and 230-volt power sources without removing the cover. Price is \$1,724.

For information circle **171**



## ▶ Caterpillar

S365B and S385B Mobile Shears have jaw openings of 33.3 inches and 34.6 inches, respectively. The S365B shear can be boom-mounted on the Cat 330C L excavator (77,400 pounds), and stick mounted on the Cat 365C L excavator (151,900 pounds). The larger S385B shear is ideal for boom mounting on the 345C L excavator (101,900 pounds), and it can be stick mounted on the 385C L excavator. Each has a hardened, welded-on piercing tip on the upper jaw, and bolt-on knife segments run the entire length of the lower jaw. Cat says the straight-line knife position in the lower jaw increases effective shear force, and the rhomboid shape of the knives in the upper jaw boosts wire cutting performance. Jaw cycle times are less than 8 seconds.

For information circle **174**



## ▶ TransTech

The Shoulder Wedge Maker shapes the edge of an HMA mat on shoulderless roads. Mounted on the screed extension face against the edge gate, it develops a 30-degree slope off the edge of the mat. It can be mounted on either side of the paver.

For information circle **172**

## ▶ Leica

Interchangeable between the company's Survey Total Stations and GPS positioning sensors, GradeStar Version 5.0 is Leica's latest generation of machine-control systems for grading and dozing. The GSM5 consolidated sensor module — the central communications point between positioning sensors and the GradeStar interface — can also have an internal GPS for space savings and ease of installation. The component can be easily exchanged between machines. The system features a universal control panel to reduce operator training from machine to machine.

For information circle **173**





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**Lite**



**Eaton**

Designed for on-highway applications with varying terrain and load conditions, the Fuller UltraShift LHP (Linehaul High Performance) transmission provides fully automatic 2-pedal operation. It can handle torque capacities to 1,750 pounds-feet and loads to 110,000 pounds GCW. The LHP features 13 speeds and a selectable low starting gear of 12.2:1. It also features progressive gearing, which provides gathered ratios in the low-end and high-end gears for startability and operating efficiency. Gathered gears let the engine operate within a tighter rpm range.

For information circle 175

**Fecon**

The BH47EXC adds to the line of Bull Hog mulchers. Weighing 2,200 pounds with a flow of 30 to 35 gpm, the attachment is designed for light excavators with a low ground pressure. It features 18 carbide-tipped tools and a maximum cutting width of 32 inches.

For information circle 176

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# Market Watch Lite



## ▲ Kenco

The new barrier lift attachment can be used on any concrete surface including barriers, sound walls, curbing and piling. An automatic actuator allows hands-free movement of the barrier, and elastomer pads aid lifting. Capacities range from 1,500 to 40,000 pounds. Model KL1500 is priced at \$1,950; the KL40000 is \$12,500.

For information circle **177**

## ▲ McGill

The PF175H portable, wide-beam floodlight is UL Listed for wet locations. Other features include a die-cast, heavy-gauge aluminum construction; an impact-resistant lens; and a patented hinge door. The unit is also available with a 150W high-pressure sodium lamp for an energy-efficient alternative.

For information circle **178**



## ▲ Hotsy

The 1200 series of self-contained, gas-powered hot-water pressure washers has an integrated roll cage that secures the heating coil. All eight models use diesel or fuel oil to heat the water, producing 3,000 to 4,000 psi and 4.3 to 5.6 gpm of flow. The belt-drive pump has a seven-year warranty; the Schedule 80 heating coil carries a five-year warranty. Prices range from \$8,000 to \$16,000.

For information circle **179**



## ▲ Multiquip

The QP-4TH 4-inch trash pump is ideal for removing water with high solid content. Debris up to 2 inches in diameter can pass through the pump. Maximum pumping capacity is 555 gpm. Features include an 11-hp engine (gas or diesel), dual discharge ports and removable stainless-steel wear plate in the volute.

For information circle **180**



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## THERE ARE 13 THINGS WRONG WITH THIS PICTURE AND ONE THING THAT'S VERY RIGHT.

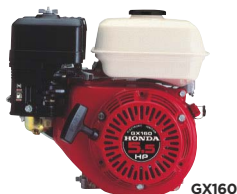
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# Market Watch Lite

## ▶ Ridge Tool

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For information circle **181**



## ▶ Knaack

Weather Guard diamond tread aluminum truck boxes feature an Extreme Protection Lock system for security. The lock retracts when locked to hinder tampering, and an internal torque ring eliminates common keyhole break-ins. The covers open to a full 90-degree angle, and a level holder provides storage for 48-inch levels.

For information circle **182**



## Meteorlogix

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For information circle **183**

## ▼ Trimble

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pressure gauge and reference chart. The tooling design allows quick changeover from one tube size to another. The unit is an upgraded design of the 1015-1 flaring unit, which it replaces.

For information circle **185**

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For information circle **186**

## ▶ ICS

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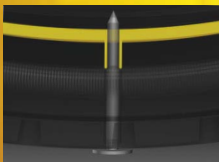
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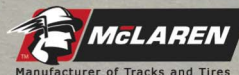
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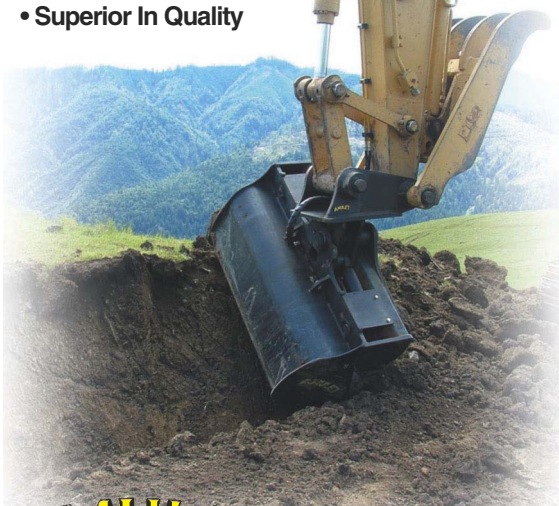


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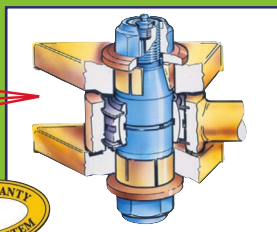
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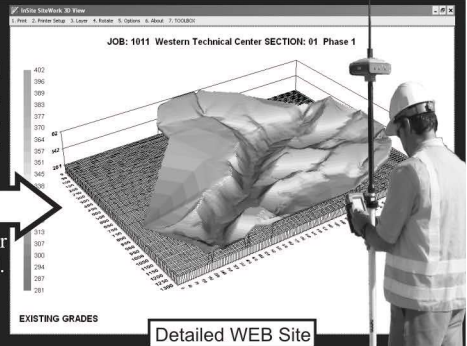
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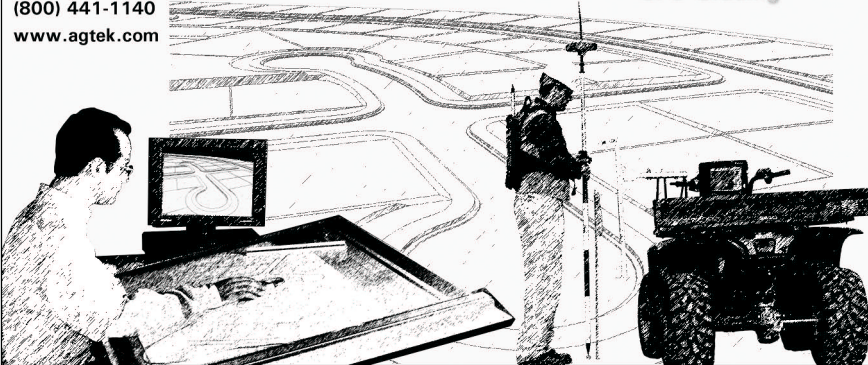
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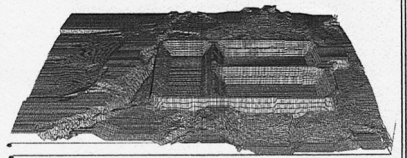
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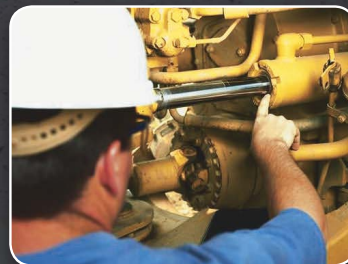
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# Iron Works

By KEITH HADDOCK, Contributing Editor



**Deere's JD570 featured a 12-foot standard blade, an operating weight of 20,278 pounds, and an 83-flywheel-hp John Deere diesel engine.**

That early grader featured a 12-foot standard blade, an operating weight of 20,278 pounds when equipped with cab and scarifier, and an 83-flywheel-hp John Deere diesel engine. Its full power-shift transmission provided eight speeds forward up to 21 mph and four reverse speeds. The machine also featured all-hydraulic blade movements including a horizontal side shift of six feet outside the wheels and blade positioning up to 90 degrees left or right for bank cutting capability. The all-hydraulic controls were also a break-

## Articulated Grader

**John Deere introduced the world to frame articulation on motor graders**

**J**ohn Deere's first motor grader was big news in 1967. The revolutionary JD570 featured not only front-wheel steering, but also frame articulation, which caused a stir in the grader industry. Some questioned the need for two methods of steering. But contractors quickly realized the new machine's many advantages when they found it could work more effectively in confined areas.

The JD570's articulated frame combined with regular steering reduced the turning radius and allowed the operator to "crab steer" the grader into new operating configurations. Articulation allowed him to put the front wheels over a windrow, on a slope, or down in a ditch and still keep the rear drive wheels on solid footing. The articulated-frame concept became the standard of the industry as other manufacturers gradually developed similar designs. Now, with the exception of today's compact utility machine makers, all grader manufacturers offer articulated frame machines in their line.

through since they were arranged to work according to the operator's natural response. For instance, the 360-degree circle rotation was achieved by twisting a T-bar, and blade side shift was achieved by moving this T-bar right or left.

Although not meant to be a big high-production grader, the JD570 boasted all the blade movements of its bigger brothers, making its small size ideally suited to housing developments, industrial construction, and the many finishing jobs often necessary after the big machines moved on. It found a niche market before today's compact graders became available.

Deere added more sophisticated and larger graders to its product line, but the small JD570 was so successful it remained unaltered until 1972, and then only slightly modified to the JD570A. This model, with a bit more power and weight, enjoyed an even longer production run until 1986 when the improved 90-flywheel-hp JD570B grader took over.

---

*You can read more about the evolution of construction equipment in Keith Haddock's illustrated book "The Earthmover Encyclopedia" available in most bookstores. Also, consider a membership in the Historical Construction Equipment Association, [www.hcea.net](http://www.hcea.net). Be sure to visit [ConstructionEquipment.com](http://ConstructionEquipment.com) for past Iron Works features.*



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