

30 Giants tell us what
they expect for 2008



38 Can CC
1700 outperform
predecessor?



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Pinnacle gives
a solid ride



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Cover photo: Brandenburg Industrial Service Co.

FEATURES

EXCLUSIVE REPORT: Giants

30 Contractors Shore Up Slipping Confidence

Nonresidential construction continues on a strong pace, which undergirds Giant equipment-fleet owners' generally positive outlook. But significant numbers of Giants firms — materials firms and rental companies, for example — can no longer overlook the weak housing market. They have been expecting the other shoe to drop.



FIELD REPORT



38 New "Combi" Is Faster, Friendlier

Gulf Coast Sand Products in Bacliff, Texas, was being forced to change its method of processing concrete rubble into saleable materials. Crushing seemed to be the answer, but how do you efficiently prepare large volumes of rebar-laced rubble for that process? When *Construction Equipment* visited in Bacliff, the company was experimenting with two Atlas Copco Combi Cutters, which *CE* editors had the chance to evaluate. Senior Editor Walt Moore reveals how the new model performed.



HANDS-ON TRUCKING

48 Axle-Forward Pinnacle's Solid and Satisfying

Can a new name make a big difference? Back in January 2006, Truck Editor Tom Berg reported on a Mack CH Rawhide. He described it as quiet and good riding. A year and a half later, Berg drives the new Pinnacle Axle Forward, which is based on the old CH. There are two Pinnacle models, one with the forward-set axle and another with a setback steer axle. Each has weight-distribution or maneuvering advantages, depending on where and how a truck is to be operated. Berg gives both models a "thumbs up."

MAINTENANCE MANAGEMENT

52 Lube Truck Basics: Buy What You Need

Considering a new lube truck? If so, say the experts, sit down, take a deep breath, and think hard about what capabilities you really need in such a vehicle. In this report, industry experts help you think through the process of sizing and equipping a vehicle that will work efficiently.



BUYING FILE

58 Full-Lane Option Remains Rare Offer

If the milling machine or cold planer is already considered a niche product type, then the full-lane crawler version is the niche of the niche. Of the milling-machine manufacturers surveyed by *Construction Equipment*, only three are offering a full-lane product at this time. And each of those machines represents a full-lane option to the companies' respective largest half-lane milling machines, and not a dedicated full-lane model per se.



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Who Can You Trust?

Those of us with children or grandchildren know how the Internet has changed social interaction, education and even media consumption. How many of us have walked into a room to see a child's face lit up by a computer screen as he or she listens to the latest hit song and carries on four or five "conversations" with friends. And he or she's probably on a website in between instant messages.

A decade ago, one of my kids came home to tell me that her fourth-grade class was learning how to research a paper. The teacher spent substantial time equipping the students for Internet research. Not everything online is true, she said, and you have to determine how reliable a source is. That's called discernment; if your hair's gray, it's wisdom.

As an equipment professional, you've put your trust in *Construction Equipment*. Our own and even third-party readership studies have proven for years that equipment pros read us more consistently than any other national equipment magazine. We don't take that for granted. As we prepare for next year, we know we have to win your trust again.

Our editors have won a major editorial award in each of the past 27 years. This year, we garnered seven awards, including honors for Buying File, Equipment Executive, this column, and a Godfrey Body of Work award given to senior editor Walt Moore by the Construction Writers Association.

Equally important as our print standing, though, is our online standing. As we continue to explore ways *Construction Equipment* can provide important equipment information through electronic media, we have become keenly cognizant of our reputation. We guard our integrity because that is the foundation upon which our reputation rests.

Today, you have a wide array of online sources from which to gather information that helps you do your job. And as that teacher advised her students, discernment has become an important trait for the online equipment pro.

You can continue to depend on *Construction Equipment*, in print or online, to bring you the highest quality, most trustworthy information on equipment and fleet management. And if you have any doubts, you know how to reach us.



Rod Sutton, Editor in Chief

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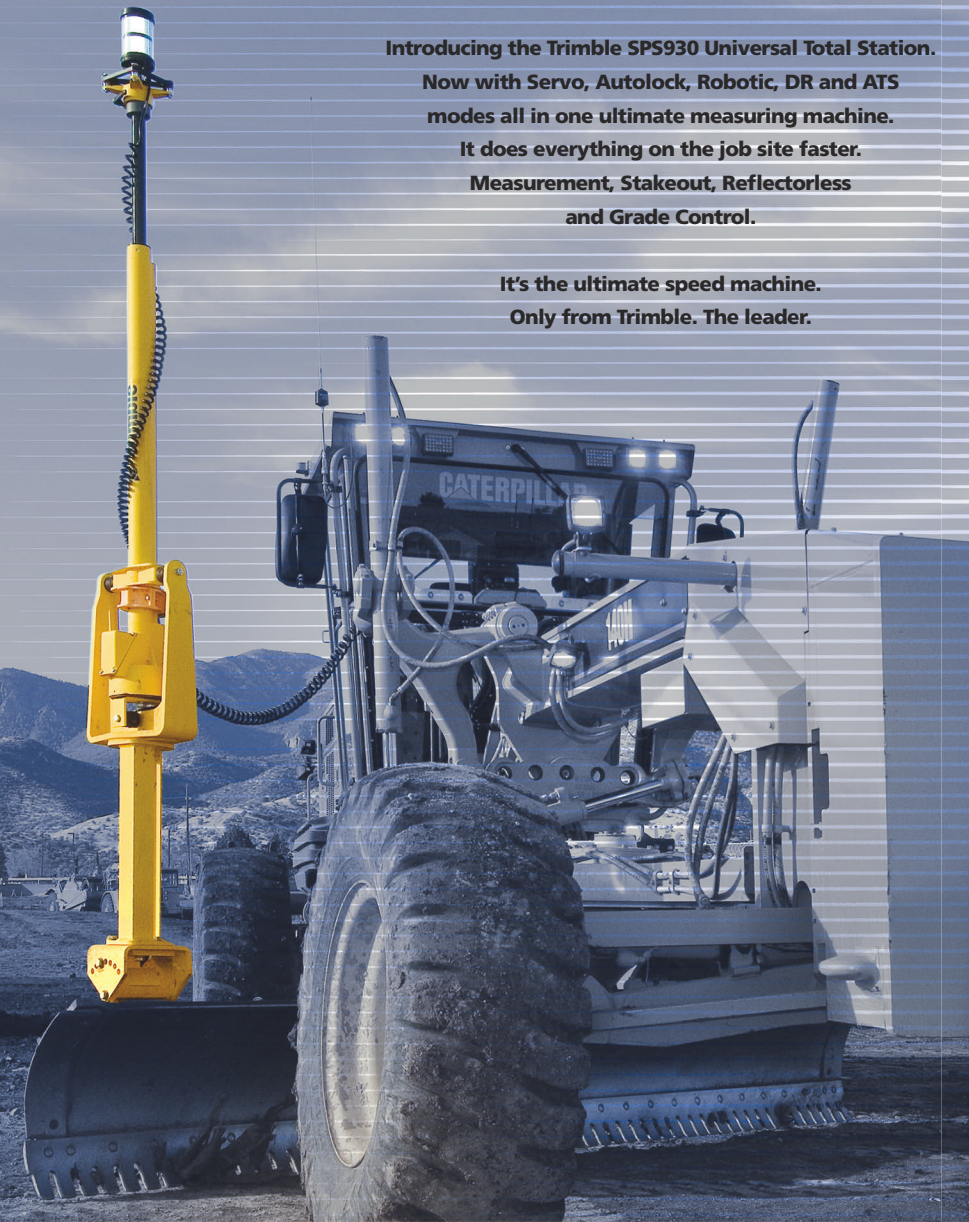
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MARKET WATCH

By KATIE WEILER, Managing Editor



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



◀ Ditch Witch

According to Ditch Witch, the JT3020 horizontal directional drill is an extended-range, self-contained machine providing 30,000 pounds of pullback force and having the capacity to establish pilot bores up to 4.5 inches in diameter and backreamer bores up to 12 inches in diameter. The drill uses a 148-horsepower engine and, says the manufacturer, produces a sound level of only 82 dB(A) at the operator's ear. The JT3020's fluid pump can deliver 42-viscosity drilling fluid at 50 gallons per minute.

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▶ New Holland

Built with a low profile and low-boom design, the M427, M428 and M459 telehandlers provide maximum lift heights of 42, 42, and 45 feet, respectively. Lift capacities range from 3,500 to 5,000 pounds and forward reach from 29 to 31 feet. Turning radius for all three models is 153 inches. The machines reach a top speed of 22 mph.

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▶ Bobcat

With an operating width of only 50 inches, the compact Bobcat S100 skid-steer loader is the replacement for the Bobcat 533, offering a rated operating capacity of 1,000 pounds and a lift height of 8 feet 6 inches. At an operating weight of 4,110 pounds, the S100 is powered by a four-cylinder, 33.5-horsepower diesel engine with a hydraulic pump generating 13.1 gpm. The skid-steer's new domed cab is designed to improve operator visibility, comfort and maneuverability, while accommodating a new instrument panel with additional functions and diagnostic capabilities.

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▶ Caterpillar

The 953D and 963D track loaders feature a new load-sensing, electro-hydraulic implement system. The implement pump provides only the required flow to the work tool and lift arms, allowing more power for the tracks when needed and increasing fuel efficiency. The new electro-hydraulic implement controls provide the operator with responsive, smooth and precise control. A choice of a joystick or two-lever control is available for bucket lift and dump. Powered by the Cat C6.6 ACERT engine, the 953D and 963D track loaders boast net output of 148 and 189 horsepower, respectively.

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✓ Kenworth

Kenworth's Class 6 T270 hybrid is powered by the new Paccar PX-6 engine and features an integral motor/generator and a frame-mounted 340-volt battery pack.



In steady driving conditions above 30 mph, the T270 hybrid operates like a standard diesel vehicle with all power coming from the engine. Below 30 mph, it uses a combination of diesel and electricity. The power-management system automatically switches between the two modes of operation.

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➤ John Deere

Available in widths of 84 and 96 inches, Worksite Pro dozer blades are designed to transform skid-steer and compact track loaders into compact dozers. Measuring 24 inches in height, the blades offer 30-degree hydraulic angle and 10-degree hydraulic tilt for adjustment on the fly. Each is Quik-Tatch mounted and comes standard with a reversible cutting edge and adjustable skid shoes.

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quick attachment of work tools for tasks such as trenching, mowing, tilling, plowing, brush clearing and placing holes with an auger. The hydrostatically driven machine uses a Tier-III-compliant, four-cylinder diesel engine rated at 45 gross horsepower and has a top travel speed of 17.7 mph.

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➤ Stellar

Slider65 sliding-jib-style hooklift has a maximum lifting capacity of 65,000 pounds. The jib allows it to accommodate container bodies in lengths from 16 to 22 feet, while still attaining a maximum dump angle of 49 degrees. Slider65 can also handle flatbeds up to 24 feet in length. It offers an adjustable hook height of either 54 or 61.75 inches. The new hexagonal-shaped jib is said to add strength, reduce flexing, and make it easier to replace wear pads.

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◀ Kioti

The new DK45SE HST is a compact utility tractor having a lifting capacity of 2,493 pounds and equipped with a three-point hitch that allows for

✓ Bomag

Model 4413 self-propelled asphalt paver is powered by a 60-horsepower Cummins A-Series water-cooled diesel that offers 40-percent more output torque than the previous model's engine.



The 4413 includes an exclusive load-sensing hydraulic system that saves on fuel consumption by delivering power only when needed. The machine offers paving widths ranging from 8 to 13 feet. Designed to hold up to 7.5 tons of asphalt, the high-capacity hopper provides long operation intervals with fewer refills.

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Market Watch

▶ John Deere

New adjustable-width tracks and a new backfill blade with foldable end sections allow the 17D compact excavator to work in areas normally restricted to smaller units. When the tracks are retracted and the blades' end sections folded, the machine fits through a 40-inch opening. When fully extended to more than 50 inches, the undercarriage provides stability for excavation and other operations. At an operating weight of 4,364 pounds, the 17D also provides improved performance specs.

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▼ MEC

Models 2591RT, 3391RT and 4191RT have working heights, respectively, of 31, 39 and 47 feet. When the

48-inch roll-out deck is fully extended, the platform measures 180x91 inches. Platform capacities, respectively, are 2,000, 1,500 and 1,000 pounds. According to MEC, the new models incorporate the

Quad-Trax 4WD Power system to allow them to traverse rough terrain to reach the jobsite.

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◀ Hitachi

While offering adjustable-width tracks and a foldable backfill blade to squeeze into tighter spaces, the Zaxis 17U-2 compact excavator offers pro-

ductivity enhancements over the EX17U model it replaces. Net engine output has increased from 12.3 to 14.8 horsepower; operating weight has jumped from 3,814 to 4,173 pounds; and maximum lifting capacity over the front has grown from 864 to 979 pounds. Digging reach remains at 12 feet 10 inches.

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◀ Wirtgen

A milling width of 47.2 inches (1.2 m) suits the W 120 F cold milling machine for the removal of complete asphalt courses to their full depths. The W 120 F has a hydraulically folding supporting wheel, and features front-end loading of reclaimed asphalt pavement via a two-part conveyor system.

The mid-sized milling machine can be equipped with wheels or crawler tracks, and the optional Flexible Cutter System permits the use of different milling drums.

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▶ JCB

The first major redesign to JCB's Robot skid-steers brings cab revisions and power management to reduce stalling. The Series II range includes five wheeled skid-steer loaders with rated capacities from 1,386 to 2,530 pounds — including the Robot 180, JCB's first 1,800-pound-capacity model — and three new compact-tracked-loader variants. New multi-function controls built into the servo control levers allow operators to fine tune auxiliary hydraulics without taking hands off the joysticks. Breakout forces improved across the range up to 20 percent.

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▼ Terex Cedarapids

The CR300L series of asphalt pavers has been updated with a Tier 3, 160-hp diesel that provides 10 percent more torque. The electronic governor is said to hold speed better than the previous mechanical governor. Redesigned hydraulic reservoir has been moved inside the engine basket, reducing the amount of hose required. Series includes the rubber tire CR352L, rubber track CR362L, and steel track CR362LS.

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HEAVY EQUIPMENT FORUMS

What Does It Cost to Move Dirt?

User #1: What is the cheapest price a person could move dirt about 500 to 1,000 feet in an 8-foot cut? It's overburden, so you would dump the dirt back into hole.

User #2: I believe, and it's fairly well documented, that the biggest dozer you can manage will do that relatively short distance in the most economical fashion with the least operators. It does depend on the material and any slope, though.

User #3: How about four 637's tag teaming? I have

never been the number cruncher on a job, but if the conditions are right on a haul that short, we can cycle in five minutes. All four push-pull loading in a train can be loaded and gone in under a minute. It takes some really good operators and a good blade man on the haul roads, though, to keep the production going that good. We were putting out like that in near-perfect conditions.

User #4: Scrapers would be fastest and probably cheapest. Either way you will need

at least one dozer and a blade for haul road and clean up work. 627s would be good as would TS14s. 637 size for small amount of dirt like this is probably overkill, but they would move a lot of muck quickly.

Artics and an excavator are slower, and you still need the blade and dozer. If ground conditions are really sloppy, then these might be better. Artics don't come cheap, nor does a 385.

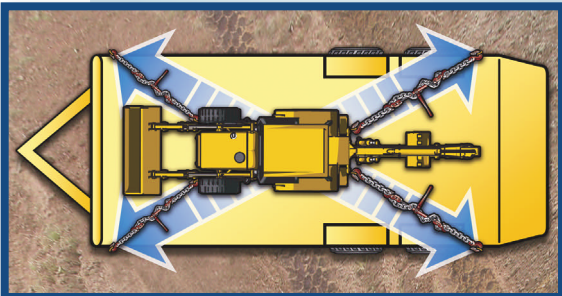
User #2: If you have to haul it and it is loose spoil, use a

loader for ADTs rather than an excavator. This will half your loading time.

HeavyEquipmentForums.com is a user forum where professionals in the heavy-equipment industry can exchange ideas and post questions or comments. Users include owner/operators, operators, company owners, repair technicians, safety officers and others. Posts have been edited for clarity and content.

SAFETY TIPS

"X" Marks the Tie-Down Technique



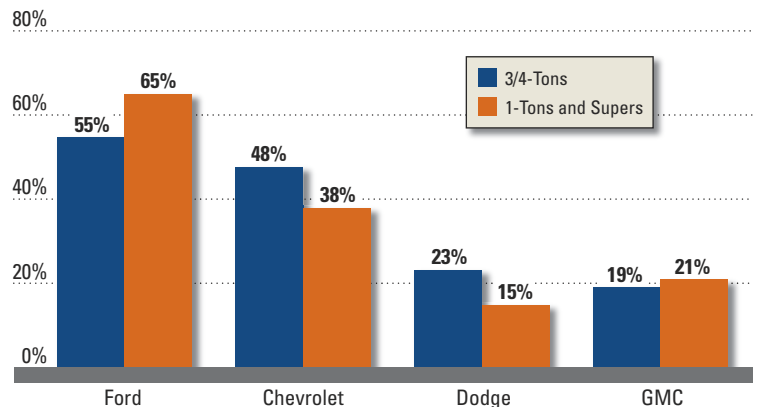
When transporting equipment, VISTA Training suggests visualizing the load restraints as forming a big "X" with load, pulling in opposite directions. They should pull toward the front and the rear of the trailer at the same time as they pull from opposite sides, keeping the machine from moving in any possible direction. Loads secured to the trailer at the sides only can slide forward and backward. If secured at the front and back, it can move side to side.

FLEET MANAGEMENT

Pickup Truck Brand Wars

A *Construction Equipment* survey asked readers to check the brands of ¾-ton and 1-ton/Super Duty pickups they have and/or buy. From about 700 respondents to each question, Ford held an advantage, unless you combine the preferences for General Motors' Chevrolet and GMC divisions. Note: Percentages total more than 100 because survey respondents were allowed to check more than one brand.

(% who have or buy)



Source: Construction Equipment 2007 Pickup Truck Study

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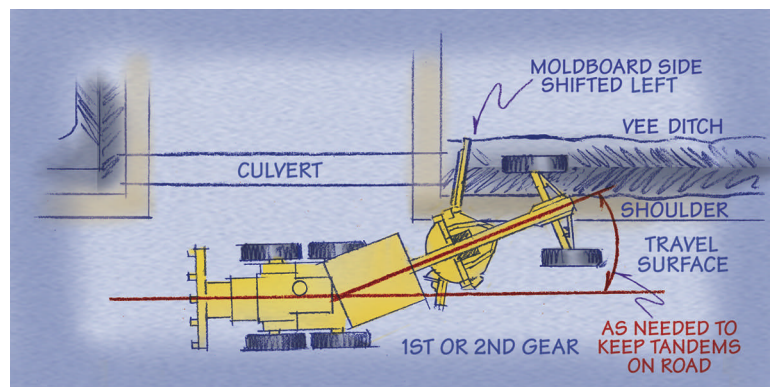
Clear Culverts with a Grader

A motor grader with crab steer can be used to reopen blocked culverts. If the ditch bottom is solid, put the front wheels in the ditch with the rear frame on the road surface. Shift the circle toward the toe of moldboard (the leading edge). Turn the moldboard square to the mainframe and tip it to nearly two-thirds of its maximum forward tip.

Side shift the moldboard, extending the cutting edge into the ditch at the blocked end of the culvert, being careful not to damage the end of culvert. Set the blade angle to match the shoulder slope.

Move slowly forward to remove the blocking material, then rotate the circle to pull the material up onto the road shoulder. Several short passes may be required to reach the bottom of the culvert.

The moldboard may be able to reach the bottom of shallow ditches without articulating the frame.



LETTER TO THE EDITOR

CARB Burdens Small Business

I have just finished reading your article on the 2007 EPA regulations and the proposed California air regulations (Diesel Doldrums, July, p. 13). In all the previous changes made by the EPA, older equipment has been grandfathered in accor-

dance to the applicable regulations of the year made. The retrofitting or elimination of said equipment would be impractical, since it was not imposed on trucks or other equipment in past changes. Further, no data has been obtained on the perfor-

mance of older equipment with ultra-low-sulfur diesel and the amount of emission improvement with this supposed cleaner fuel. It would be great if we could just scrap these machines, but completely absurd, since many small business could not burden the cost.

— Frank C. Musso
Owner, Allied Property Developers

MANUFACTURER NEWS

Volvo Ramps Up to Meet Engine Demand

AB Volvo will invest the equivalent of about \$250 million to meet growing worldwide demand for heavy-duty diesel engines and heavy-duty gearboxes.

Through 2009, the Swedish-based equipment manufacturer is committing more than 1.7 billion SEK in Volvo Powertrain production facilities in order to boost production capacity of the engines and gearboxes by 20 and 50 percent, respectively. Volvo Powertrain is the Volvo Group company responsible for the development of engines, gearboxes and drive shafts, with research design, engineering and production facilities throughout Sweden and in Hagerstown, Md. A large part of the investment, slightly more than 1.1 billion SEK, will go to the company's foundry and production plant in Skovde, Sweden, where production capacity for the engines will be increased by 20 percent. Recently, a \$150-million investment was made in the Hagerstown facility.

Volvo is the world's largest producer of heavy-duty diesel engines in the 9- to 18-liter category.

What does Multiquip know about cutting?

Managers Digest

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MANUFACTURER NEWS

Case Rodeo Series Supports Habitat for Humanity

On a steamy Friday in August, we watched as nearly 50 operator/contestants carefully maneuvered Case backhoe-loaders through a series of three tests of skill that required a steady hand and a good eye. This event was but one stop in the Case Rodeo Series, which, when completed, should involve perhaps 80 such events and 5,000 operators. The event we observed

was held at the Bolingbrook, Ill., location of McCann Industries, a Case dealer with 10 locations in northern Illinois and Indiana. Winner of this event, Brad Pool (holding plaque), an operator for Illiana Remedial Action, an earth-moving/utilities contractor in Hammond, Ind., will go to the Case Rodeo Series North American Championship event in Las Vegas next March to compete for

the grand prize of a Case backhoe-loader valued at nearly \$120,000. And along the way, Case dealers that host a regional Rodeo are supporting and publicizing the work done by Habitat for Humanity. Case and its dealers hope to top \$150,000 for this cause by completion of the Rodeo Series.

—Walt Moore



INDUSTRY NEWS

MRAP Armored Trucks Based on International 7000 Series

A 7000-series vocational chassis with a civilian-style power train is the basis for a new group of specially armored trucks being built by an arm of International Truck and Engine for the U.S. Marine Corps. The heavy 4x4s, which the military calls Mine-Resistant Ambush-Protected, or MRAP, will be used to transport troops in Iraq and Afghanistan and shield them against enemy improvised explosive devices.

International Military and Government LLC says the trucks are among a MaxxPro series it developed for the armed forces. This one has a crew of two and can carry 10 to 12 troops and their equipment. Assembly of 1,971 MRAPs is to be completed by next February under USMC contracts totaling \$1.045 billion.

International's vocational-truck plant in Garland, Texas, builds the chassis and sends them to a military depot at West Point, Miss., where company workers install the armor. A V-shaped hull deflects the force of blasts from buried explosives, while armor along the sides protects against roadside blasts and small arms fire. The armor comes from Plasan Sassa, a specialty manufacturer in Israel, while automotive components are made by

North American suppliers including International's Engine Group.

International is building the MRAPs "as fast as possible," said Archie Massicotte, the military arm's president. "...We offer a number of advantages: we produced over 161,000 commercial vehicles last year, we know how to mass produce quality vehicles, we manufacture our own diesel engines, we've forged strong relationships with a number of key suppliers, and we provide comprehensive global parts and service support for these trucks."

Army and Marine commanders in Iraq began asking for MRAPs several years ago, but Pentagon brass, who thought the war would soon be over, didn't respond until last year, according to news reports. Then they gave priority to MRAP procurement.

The Marines want to keep some MRAP specs confidential, but the gross weight rating is above 31,000 pounds. The

MaxxPro armored trucks have the pre-EPA '07, DT 530 in-line 6-cylinder diesel rated at 300 or 330 horsepower, mated to an Allison 3000 5-speed automatic transmission. Meritor supplies the driving front and rear axles and transfer case. Most components, as well as the basic cab and nose, are taken from International's 7000 series civilian trucks.

"The urgency to rapidly deliver these life-saving armored vehicles to our military forces is clear," says Daniel C. Ustian, chairman, president and chief executive officer of Navistar International.

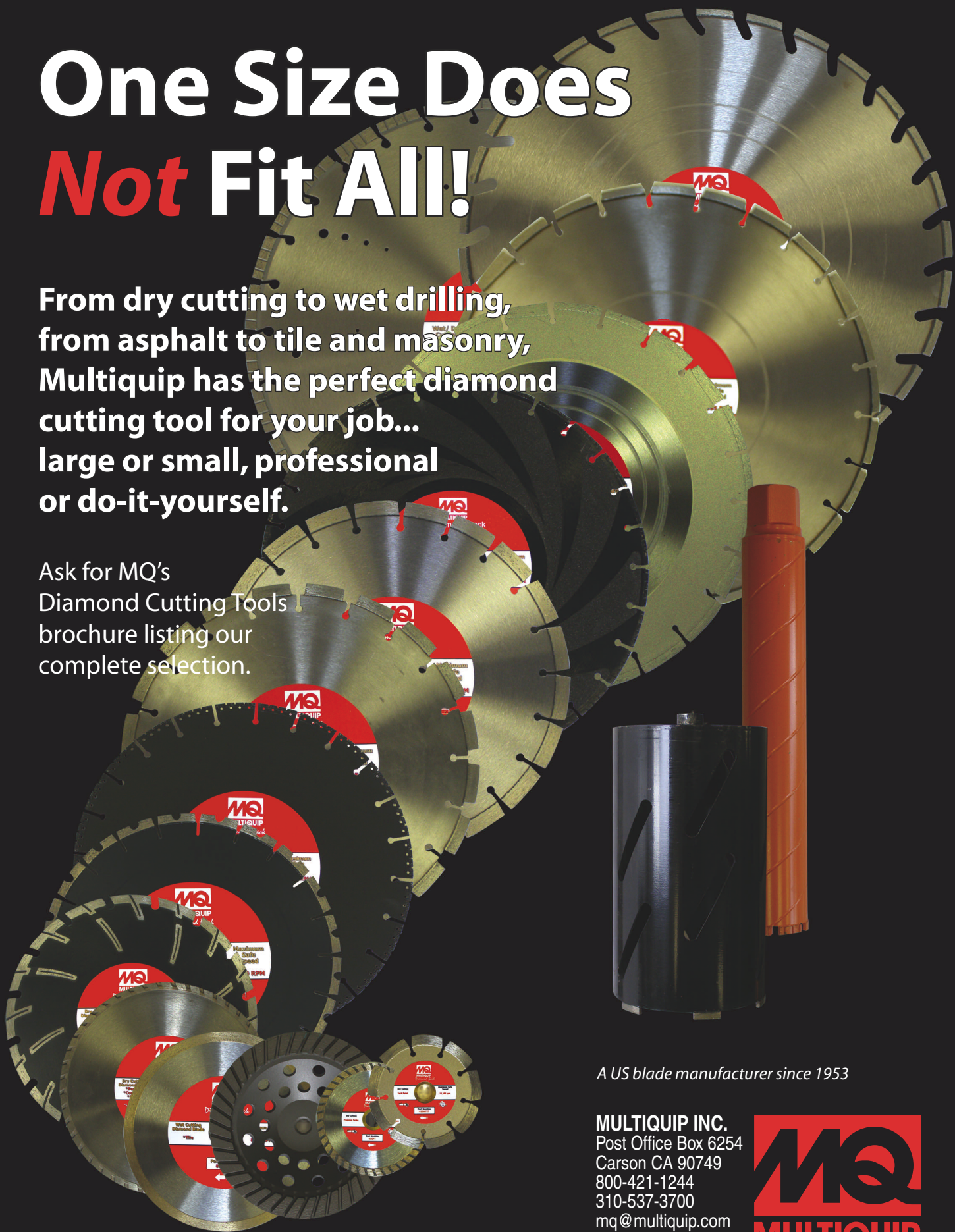
—Tom Berg



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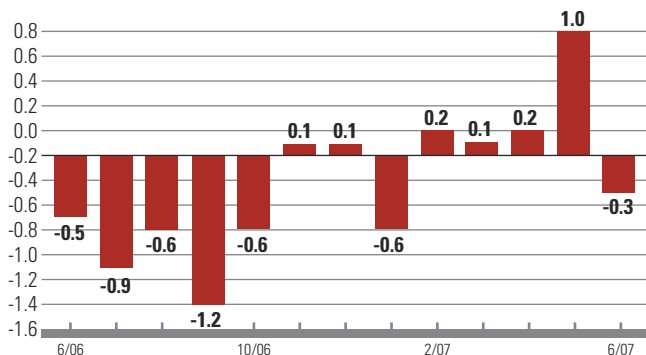
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TOTAL CONSTRUCTION SPENDING

After four consecutive increases, spending fell 0.3 percent in June due to a weak month for the still-booming nonresidential building market and more funding problems for heavy construction. Little change is expected in the next few months. Inflation-adjusted spending is projected to decline further until the end of this year. Total spending will drop 0.6 percent in 2007 and then rise 8.3 percent next year when a recovering housing market offsets slower growth in nonresidential markets.

(% change from previous month)

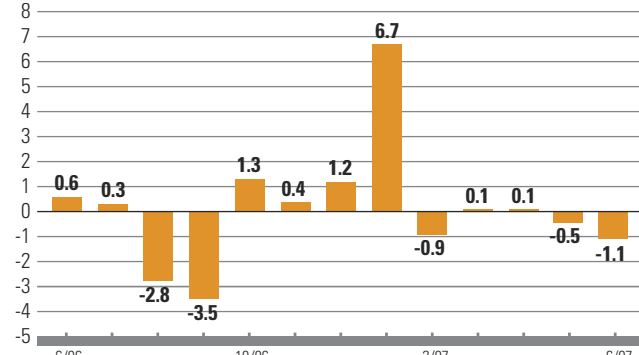


Source: U.S. Department of Commerce

HIGHWAY CONSTRUCTION SPENDING

Spending is down 2.3 percent since a yearend surge, but that's a 5-percent drop when we account for project-cost increases. A growth pace of 10 to 11 percent is still projected through 2008. This will be supported by the 9-percent rise in highway construction starts compared to a year ago, as reported by Reed Construction Data. Bridge work continues to expand faster than pavement, and spending will grow after the bridge failure in Minneapolis last month.

(% change from previous month)

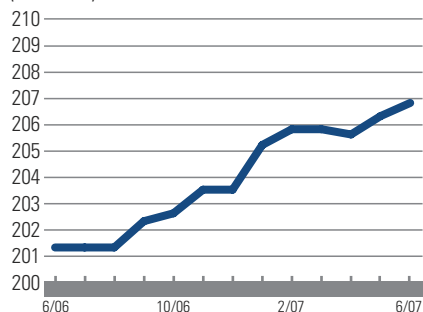


Source: U.S. Department of Commerce

CONSTRUCTION EQUIPMENT PRICE INDEX

The inflation trend for construction equipment was more than halved to less than 3 percent when equipment shipments fell more than 30 percent at the beginning of the year. Although orders and shipments have recovered slightly, it is still a buyers' market except for the largest equipment and for lifting equipment. International factors will keep inflation from dropping much lower. World steel demand remains strong and the U.S. dollar continues to depreciate.

(1980=100)

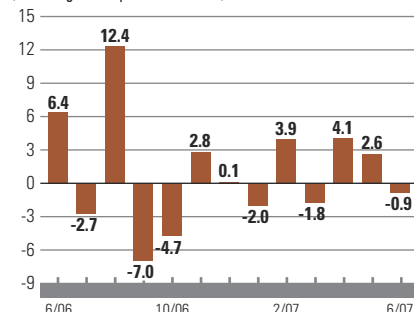


Source: U.S. Department of Labor

MANUFACTURING CONSTRUCTION SPENDING

Spending has been stalled at a high level for the past year after nearly doubling in the previous three years. But a jump in starts earlier this year ensures resumed expansion later this year and in 2008. Chemicals, including petroleum and non-metallic minerals, much of it construction supplies, have been the strong sectors recently. Spending on production facilities for the technology industries has dropped 40 percent in the past year and investment by the motor vehicle industry remains depressed.

(% change from previous month)

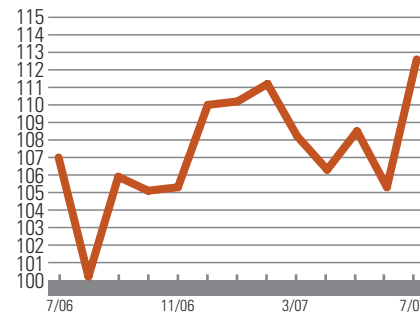


Source: U.S. Department of Commerce

CONSUMER CONFIDENCE INDEX

Confidence was the highest in six years in July in response to lower gasoline prices and a surge in the Dow Jones Industrial index to a record high. Yet the turmoil in financial markets to dump mortgage-related investments and the accompanying 5-percent drop in equities prices has again weakened confidence according to preliminary reports from parallel confidence indexes. The index is expected to stay in the recent range of 115 to 130 for the rest of the year.

(1985=100)



Source: The Conference Board

For the full text of this month's economic analysis, check Economic Outlook at ConstructionEquipment.com

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Exclusive Report: Giants

By LARRY STEWART, Executive Editor

Contractors Shore Up Slipping Confidence

Materials Giants expect lackluster business in 2007,
but mega-mergers reveal long-term confidence

Our industry continues to recover from the recession of 2003, but some Giants — firms that own more than \$25 million worth of equipment — can no longer overlook the weak housing market. Despite the nonresidential construction boom — despite 68 percent of Giants realizing work-volume growth in 2006 (10 percent more than forecast) — Giants' 2007 forecasts in May suggest that the country's largest fleet owners are expecting the other shoe to drop.

Good times continue to roll for businesses in the primary Giant vocation, construction contractors, but they do expect some moderation of what has been a torrid growth rate. *Construction Equipment's* Giants list excludes home

builders, so it is dominated by firms riding the nonresidential construction wave. In 2005, 74 percent of Giant contractors reported increasing work volume. Not expecting a good thing to last, nearly 30 percent of contractor Giants forecast work volume to flatten out in 2006. Twelve percent expected volume to decline. But in this year's survey, a startling 82 percent of contractors reported increased 2006 work volume. Nevertheless, the percentage forecasting work-volume growth for 2007 dropped to 52. Thirty-two percent of Giant contractors expect work volume to level off this year.

Giant contractors have enough work backlogged to sustain their volume far into 2008, or later. Almost half of contractors responding to the Giants survey will rate 2007 as a very good or excellent business year. It's a level of enthusiasm we haven't seen since the late 1990s. As is often the case when firms expect to do good business while volume growth is slowing, there are steep drops in percentages of Giant contractors expecting to increase spending on new equipment and equipment rentals. It should be pointed out, though, that overly ambitious budget watchers expect to reduce these two large line items every year regardless of economic conditions.

The housing slowdown has had a greater impact on Giant materials producers, and they are more stoic about 2007's business prospects.

The percentage of Giant materials firms forecasting increased work volume in 2007 fell by nearly half, compared to the 2006 forecast.

Top 10 Giant Contractors

Company	Fleet-Replacement Value (millions)	Overall Giants Rank
Kiewit	\$2,100	9
Great Lakes Dredge & Dock	\$1,065*	22
Granite Construction	\$875	26
Elmo Greer & Sons	\$475	49
Las Vegas Paving	\$420	59
Weeks Marine	\$400	65
The Walsh Group	\$400	64
Bechtel	\$400	60
Clark Construction Group	\$400	61
T.J. Lambrecht Construction	\$348	69

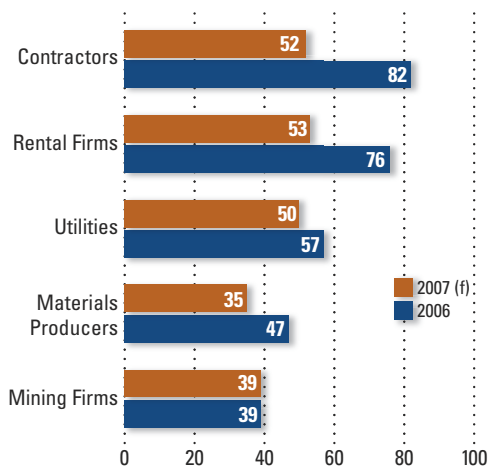
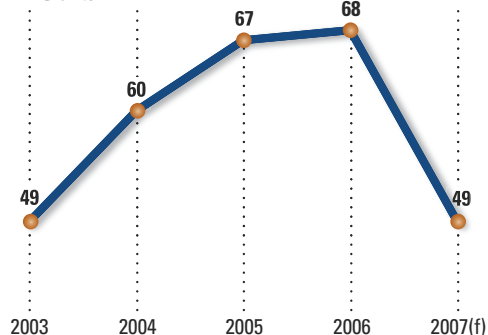
* Construction Equipment estimate

Source: Construction Equipment Giants List, 2007

Contractors Carry Work-Volume Growth

Percent of Giants reporting increased work volume

All Giants



Base: 243

Source: Construction Equipment Giants Studies

The percentage of Giants that worked more in 2006 set a new 10-year high at 68 percent. A startling 82 percent of Giant contractors led with work volume increases, but there were also disappointments as utility companies were the only other Giant vocation that reached or even approached their 2006 work-volume forecasts. Rental Giants' 2007 forecast — 53 percent expecting volume growth — is down nearly 40 points from their 2006 forecast.

The jolt, when 20 percent of materials Giants who were expecting volume increases in 2006 saw work level off instead, is probably responsible for the moderation. Twenty-four percent of materials firms expect 2007 volume to decline.



Work volume and business quality are more closely related for materials Giants than for contractors. Only 24 percent of materials firms forecast a very good or excellent business year — down by more than half from 2006. Percentages expecting to spend more on equipment reflect those declines almost perfectly.

The change in rental Giants' work-volume forecasts closely resembles that of materials firms, but rental companies' volume is coming down from a higher level and their expectations for business quality this year are stronger. Nearly half of all rental Giants anticipate business this year to be very good or excellent.

Rental Giants' exuberance is not surprising, given gradually rising rental rates and equipment users continuing to include rented

A launching truss lifts a 94-foot-long, 70-ton precast-concrete girder into place during Washington Group International's construction of the New River Bridge for light rail in South Florida.

Photo: Washington Group Int'l.

Exclusive Report: Giants



These are just a few of the silos Kiewit Southern located on site to supply paving Atlanta's Hartsfield International Airport runway addition.

Photo: Terex Roadbuilding

equipment in their fleet-management strategies. Giant rental companies enjoy a double portion of the growth of the rental alternative because large national and multi-regional rental firms are uniquely suited to serve Giant contractors. Giant contractors not only have large rental budgets, but they have been applying rental at a greater rate than firms with smaller fleets.

Sales and consolidation of equipment-owning firms — particularly rental and materials Giants — result from the past three years' prosperity. Firms that have been making money are looking for competitive advantages and tax

Top 10 Materials Producers

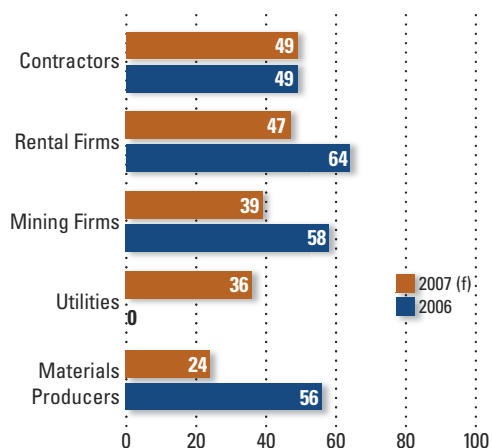
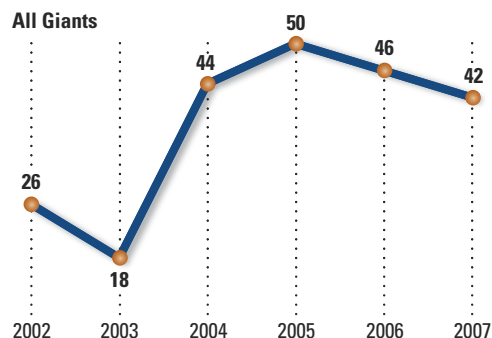
Company	Fleet-Replacement Value (millions)	Overall Giants Rank
Martin Marietta Aggregates	\$2,861	3
Lehigh Heidelberg Cement Group	\$2,850*	4
Lafarge North America	\$2,638*	5
Vulcan Materials	\$2,397*	7
Oldcastle Materials	\$2,005*	12
Cemex North America	\$1,675*	14
MDU Resources	\$1,200	18
Irving Materials (IMI)	\$700	30
Aggregate Industries	\$697*	31
Syar Industries	\$520	38

* Construction Equipment estimate

Source: Construction Equipment Giants List, 2007

Solid Outlook Softening

Percent of Giants forecasting an excellent or very good business year



Base: 243

Source: Construction Equipment Giants Studies

With half of Giant contractors predicting a booming business year, not even dispirited materials Giants could sour what should be a solid year for Giants overall. But the portion of Giant fleet managers expecting a fair or poor business year climbed slightly to 15 percent — a reversal of that ominous measure's four-year slide.

shelters. Equity groups are looking for ways to grow using the produce of their portfolios.

Rental-company sales are the canary in this coal mine, heating up most visibly because of the nature of these unique beasts. A little wobbling of industry confidence has contractors looking for ways to reduce rental expenditures. Rental companies' softening business outlooks may have some owners who survived the early-decade recession thinking about selling out, but they don't outweigh the sustained rental-adoption trend. Certain investors, flush

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Exclusive Report: Giants



Tunnel boring machines open twin 1.7-mile tunnels to extend the Eastside Gold Line Light Rail System in Los Angeles. Joint venture, LRT Constructors, was awarded the contract to design and construct the six-mile extension.

Photo: Washington Group Int'l.

from the general economy's ascendancy, are attracted to the cash-producing power and growth potential of equipment-rental companies.

Cerberus Capital Management's \$6.6-billion acquisition of the titan United Rentals is an example that's hard to overlook of rental's allure for investors. Other private-equity firms' purchases of Hertz, RSC, NES, and Neff declare the investment value of rental fleets. Together with United Rentals, this group includes five of the 10 largest rental companies in the United States.

Top 10 Rental Fleets

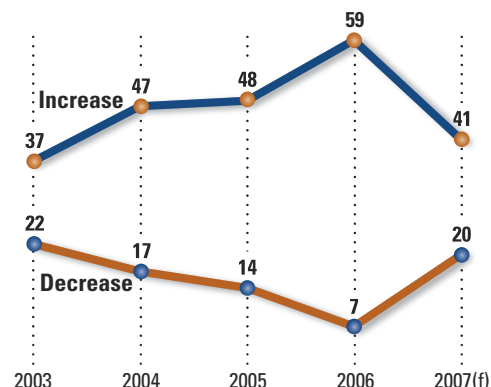
Company	Feet-Replacement Value (millions)	Overall Giants Rank
United Rentals	\$4,000	1
Sunbelt Rentals	\$2,200	8
Hertz Equipment Rental Corp. (HERC)	\$2,075*	11
RSC Equipment Rental	\$1,696*	13
NES Rentals	\$1,000	23
Maxim Crane Works	\$770	27
All Erection & Crane Rental	\$596*	33
Sunstate Equipment	\$550	35
Neff Rental	\$530	36
Finning International	\$522*	37

* Construction Equipment estimate

Source: Construction Equipment Giants list, 2007

Equipment Spending

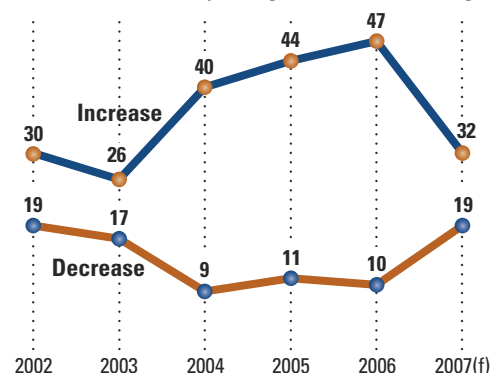
Percent of Giants expecting the indicated change



Base: 241

Rental Use

Percent of Giants expecting the indicated change



Base: 240

Source: Construction Equipment Giants Studies

The portion of Giants increasing fleet spending in 2006 continued to grow, led by contractor Giants and upholding a trend that began in 2002. The 47 percent of Giants who increased use of rental in 2006 set a record for this metric since *Construction Equipment* started measuring it in 1993. Without an unlikely residential-building recovery to boost materials and rental Giants' volumes, fleet-spending and rental use will likely moderate this year.

Materials-producer consolidation continues apace, fueled by the rising value of Giant firms' aggregate reserves and market access. In the past 18 months, four Giants at the top of the materials-producer list have made strategic purchases, often involving other leading companies.

Vulcan Materials bought Florida Rock Industries for \$4.6 billion, and the combined com-



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Exclusive Report: Giants



Lane Construction mills concrete lanes at night in reconstructing I40.
Photo: Wirtgen

pany will increase Vulcan's aggregate reserves more than 20 percent to about 13.9 billion tons.

CRH, the Irish parent company of Old-Castle US, bought APAC in August of 2006 for \$1.3 billion and disposed of contracting and asphalt production in Georgia, North and South Carolina, Texas and Virginia in six separate transactions that raised \$215 million.

HeidelbergCement AG, German parent to LeHigh Cement, bought Hanson to add its rich aggregate reserves and precasting volume to LeHigh's cement-producing capacity.

LaFarge North America's acquisitions of three Chicago-area quarry operations raise its aggregate sales in Chicagoland to 11 million tons.

These companies bet billions of dollars on the long-term value of aggregate reserves even though the new housing market's slide is affecting their income directly and challenging the overall economy enough to reduce the Fed's GDP-growth predictions for 2007 by a quarter point. Federal Reserve Board Chairman Ben Bernanke predicts the materials firms won't have long to wait, though, before home building stops restricting their revenue growth.

"Overall, the U.S. economy appears likely to expand at a moderate pace over the second half of 2007, with growth then strengthening a bit in 2008 to a rate close to the economy's underlying trend," Bernanke told Congress in mid-July.


Bernanke predicted the pace of home sales would remain sluggish for a while, due largely to tightened lending standards and the late-June mortgage-rate increase. But he emphasized that home sales would ultimately rebound on the strength of income growth and still-attractive mortgage rates. Within a month, the Fed had cut its discount rate to banks to encourage the continued flow of smart loans.

"The pace of home sales seems likely to remain sluggish for a time, partly as a result of some tightening in lending standards and the recent increase in mortgage interest rates," he said. "Sales should ultimately be supported by growth in income and employment as well as by mortgage rates that — despite the recent increase — remain fairly low relative to historical norms."

See the List!

Our list of Giants with fleet-replacement values of \$100 million or more can be found at www.constructionequipment.com/community/862/Giants/23402.html.

About CE Giants

The *Construction Equipment* Giants list represents as closely as possible all firms that own fleets with replacement values of \$25 million or more. Equipment-replacement values are compiled by *Construction Equipment* magazine using information provided by the individual companies. When figures are not provided (identified with an asterisk), *Construction Equipment* estimated fleet value. If you feel your firm qualifies as a Giant, please write to Larry Stewart, *Construction Equipment*, at lstewart@reedbusiness.com or phone 314-962-0639. 

Top 10 Mining Fleets

Company	Fleet-Replacement Value (millions)	Overall Giants Rank
Rio Tinto America	\$2,467*	6
CVRD Inco	\$2,093*	10
FCX	\$1,430*	15
Arch Coal	\$1,300	16
Drummond	\$1,100	19
BHP Billiton	\$1,085*	21
North American Coal	\$980*	24
Newmont Mining	\$900*	25
Peabody Energy	\$737*	28
Cleveland-Cliffs	\$561*	34

*Construction Equipment estimate
Source: Construction Equipment Giants list, 2007

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CC 1700 COMBI CUTTER

Cover Story

FIELD REPORT FIELD REPORT FIELD

New “Combi” Is Faster, Friendlier

Atlas Copco's new CC 1700 combination cutter, replacing the CC 1501, utilizes more hydraulic power and has a friendlier design that greatly simplifies jaw changes

By WALT MOORE,
Senior Editor

By his own admission, Junior Green typically has little time or tolerance for salespeople who arrive without appointment at Gulf Coast Sand Products, a concrete recycling company that he and business partner, Todd Ramsey, operate in Bacliff (near Houston), Texas. So, when Tom Ling, regional sales manager for Atlas Copco Construction Tools, made a late-Friday-afternoon cold call on the company, he was fortunate, indeed, to be allowed the time for explaining how his company's products might benefit Gulf Coast Sand Products. As it turned out, the three struck a deal that might be of great value to both parties. Allow us to explain.

Gulf Coast Sand Products has had a long, profitable existence selling recycled concrete, which originates from such sources as road-rehabilitation, sidewalk and patio replacement, and leftover ready-mix. The company separates this material by screening — first with a “bull screen” that passes all but the largest material, then with a powered screening plant that separates the remainder into four basic products — ranging from fines to 12-inch-plus material. The company not only finds ready markets for these sized materials, but also uses them in its related business of installing riprap barriers along Houston's continually eroding shoreline.

But the composition of the company's incoming materials has been changing in the past couple of years. For example, excess ready-mix, left in the truck at the end of the delivery or at the end of the day, has always been somewhat of a staple raw material. The supply of this material has been dwindling, however, as more ready-mix producers recycle the still-fluid concrete into their production operation. At the same time, an increasing volume of concrete rubble from Houston's construction community (much of it containing reinforcing steel) has been piling up in the company's 35-acre processing yard. All of this was forcing Green and Ramsey to find an alternate method for sizing material that more and more did not lend itself to separation by screening.

A crushing plant seemed to be the best solution. But that decided, the consideration remained about how best to accomplish primary reduction of rubble too large to pass the crusher's grizzly. And the rebar complicated the situation.

Just about this time, Ling, whose job includes promoting the market for Atlas Copco's silent demolition tools, called on Green and Ramsey. The three agreed that if Gulf Coast Sand Products would install the “wet kit” (hydraulic plumbing) required for its Hyundai R210LC-7 hydraulic excavator to use an appropriately sized Atlas Copco combination cut-

CC 1700 QUICK SPECS

	Universal	Steel
■ Weight (lb.)	3,704	3,351
■ Max. Cutting Force (lb.)	441,000	441,000
■ Oil-flow Rate (gpm)	40-66	40-66
■ Operating Pressure (psi)	5,076	5,076
■ Carrier Weight Class (lb.)	33,100 - 55,000	33,100 - 55,000

REPORT FIELD R... FIELD REPORT FIELD REPORT

The CC 1700's universal jaw set is designed primarily for crushing concrete and slicing through reinforcing steel, but it can also work at reducing larger pieces of steel debris.



The new CC 1700 Combi Cutter features Atlas Copco's coupling-and-positioning system (CAPS), which uses single-pin mounting for the jaw set. The design of the new tool, compared with that of its predecessor, the CC 1501, reduces operating weight by nearly 400 pounds. The CC 1700, says Atlas Copco, is suitable for use on hydraulic excavators with operating weights from 15 to 25 metric tons.

Photos: George Pfoertner®



The heavy-duty rotation system of the CC 1700 is similar to that of a hydraulic excavator's swing system. Power for the rotation circuit was tapped from the Hyundai's boom circuit. Internal valves in the Combi Cutter limit hydraulic pressure and flow in the rotation circuit to safeguard both the tool and the carrier when rotating in situations that result in undue side-loading stress.

ter, then the company could use the tool for 60 days in order to evaluate it as a possible solution for its primary-reduction needs. In return, Ling could bring in other prospects to see the tool in action.

Construction Equipment's involvement in this arrangement resulted from Atlas Copco's suggestion that Gulf Coast Sand Products actually use two combination cutters — the model CC ("Combi Cutter") 1501, and also the model CC 1700, which recently replaced the CC 1501. This arrangement would allow us to conduct a hands-on comparison of design features between the new and displaced tools, as well as to compare their relative production potential. The idea seemed to us a good



Operator Rodney Ramsey uses the CC 1501 Combi Cutter to experiment with reducing large chunks of concrete rubble in the processing yard at Gulf Coast Sand Products.



For work requiring consistent reduction of heavy-duty steel, the CC 1700's steel-cutting jaws are probably a better choice than the universal jaws.

way to learn more about silent-demolition tools and to observe how design refinement might be making these tools more effective and easier to use.

So on a hot, humid day in mid-June, the *Construction Equipment* crew met up with representatives from Atlas Copco and Gulf Coast Sand Products at the latter's processing yard in Bacliff. From Atlas Copco were Ling; Keith Becker, national service manager; and Charlie O'Dell, service technician based

at Atlas Copco's service center in Round Rock (near Austin), Texas. From Gulf Coast Sand Products were Junior Green, Todd Ramsey, and his brother Rodney Ramsey.

Combination-cutter basics

Silent demolition tools, as the name implies, don't make much noise, that is, compared with hydraulic breakers. These tools (actually attachments for hydraulic excavators) are designed primarily to process masonry and steel debris, whether by using them to completely or selectively demolish structures, or to subsequently reduce the resulting debris.

The tools typically work by crushing or cutting material between two moving jaws, or between a single moving jaw and a stationary jaw. A wide range of these devices is available — identified variously as combination cutters, universal cutters, pulverizers, crackers, shears and grapples — and sold under such brand names as Allied-Gator, Atlas Copco, BTI, Genesis,

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Above: With the cylinder pins removed, the CC 1700 is placed on its side, thus allowing Atlas Copco's Charlie O'Dell, left, and Keith Becker to remove the single mounting pin that attaches the universal jaw set to the housing. **Center:** Thanks to Atlas Copco's coupling-and-positioning system, the two individual jaws of CC 1700's steel-cutting jaw set remain connected to facilitate installation, and bars inserted through lugs on the housing keep the cylinders at the proper installation angle. **Bottom, right:** The steel-cutting jaw set is ready to work, and the universal jaw sits ready for reinstallation, with its jaws still connected and perfectly aligned at the center-pin bore.



LaBounty and Tramac.

As already noted, Ling initially suggested an Atlas Copco combination cutter to process the growing piles of roadway and bridge concrete at Gulf Coast Sand Products, most of it containing rebar. The Atlas Copco combination cutter has two moving jaws — one with a single blade, the other with a double blade — each powered by a stubby, large-diameter hydraulic cylinder that generates tremendous force that is multiplied through the levering action of the jaws. The CC 1700, for example, produces 441,000 pounds of maximum cutting force.

The term "combination" derives from the tool's capability to process both concrete and steel. Atlas Copco combination cutters can be used with a

"universal" jaw set or with a "steel-cutting" jaw set. The former can process both concrete and steel, while the latter is designed for day-in, day-out processing of heavy steel components.

From what we observed at Gulf Coast Sand Products, the universal jaws had abso-

CC 1501 to process two piles of material — the first consisted of leftover ready mix, and the other consisted of large chunks of roadway and bridge concrete with rebar. We timed him as he reduced these materials to piles of rock, most with a top size of about 6 inches, which allowed the rebar to fall free from the material in the second pile.

After Becker and O'Dell switched the CC 1501 for the CC 1700 on the Hyundai, Ramsey repeated the process on similar piles of material. We again timed the process, and then compared the number with that of the CC 1501. We realize, of course, that this is far from a closely controlled production study, but we generally concluded that the CC 1700 was around 25 percent faster.

This squares with a quick experiment we did with Becker in timing the functions of each tool — rotate right, rotate left, jaw open, jaw close and a complete jaw open/close cycle. When

comparing times for the open/close cycles, we noted an approximate 30 percent speed advantage for the CC 1700.

The CC 1700 has a flow rating of 40 to 66 gpm for its jaw operation, so it could use all of the Hyundai's rated 58-gpm hydraulic flow. (Actually, an on-site check indicated that the Hyundai was producing a maximum flow of slightly more than 60 gpm.) The CC 1501, however, has a flow rating of 26 to 40 gpm, and the machine's flow had to be restricted by means of a pressure-reducing valve installed between the pilot system and the auxiliary section of the main valve.

The CC 1501 has a maximum operating pressure of 4,660 psi, pretty much a match for the Hyundai's 4,690-psi implement circuit. The CC 1700, however, has a maximum operating

lutely no problem getting through concrete containing rebar and, after watching Green take on a large, 12-inch-deep, 5-inch-wide, 3/8-inch-thick I-beam with these jaws, we were impressed, too, by how well they worked in this tough application. But after Becker and O'Dell switched from universal to steel-cutting jaws on the CC 1700, we also noted how much faster and more efficiently the latter sliced through the big beam.

Checking speed and specs

To demonstrate the relative production capacities of the CC 1501 and CC 1700, Rodney Ramsey first used the

POWER PLAYER

// This was my first visit to CONEXPO-CON/AGG and I was truly amazed at how so many manufacturers could come together for one show. When I attended I was in the market for a rubber track loader, and I was able to see all of the makes and models in one location. We couldn't miss the next show because machines are becoming so much more productive and versatile. When thinking of buying the next machine, it's easier to see them all in one location. If you're in the construction industry, this is one show you wouldn't want to miss. **//**

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pressure of 5,150 psi, so it was, in effect, running at a slight disadvantage with the Hyundai's 4,690-psi pressure. Although the Hyundai does have a power-boost system, which temporarily raises main pressure to 5,120 psi at the touch of a button in the left joystick, Ramsey did not employ the system when closing the jaws of the CC 1700.

But that said, our perception was that the CC 1700 shattered material with more force than did the CC 1501. This perception might have resulted from the new tool's increased speed, coupled with changes in the geometry of the jaws and their mounting position, which give slightly more maximum cutting force to the new tool.

We also measured the basic dimensions of the universal jaw set for both tools and found that while the CC 1700 has a slightly smaller tip-to-tip opening (29-1/2 versus 31-3/8 inches), the new tool's jaw depth (the vertical distance from a line struck across the jaw tips to the tool's housing) was 45 percent greater, 28-1/2 versus 19-1/2 inches. The increased jaw depth allows the new tool to more easily accommodate large pieces of debris.

But the real difference between the jaw sets of the two tools is the manner in which they are mounted in their respective housings.

Refined Combi design

Each jaw in the set for the CC 1501 is mounted to the housing with its own 4-inch-diameter pin. If the user wants to switch jaw sets, say from the universal to the steel-cutting type, each of the mounting pins must be removed, and when the pins are pulled, each jaw



The CC 1501 uses two mounting pins to secure its jaw set to the housing (left). When the threaded pin-retainer rings are removed and the pins pulled, each of the CC 1501's jaws are freed independently and must be supported (above).

is freed individually and must be supported. Although Becker and O'Dell didn't change jaw sets on the CC 1501, they told us that experts at the Atlas Copco factory in Germany estimate that a jaw-set change on the CC 1501 could require up to eight hours.

By contrast, the jaw sets for the CC 1700 are designed with Atlas Copco's new (and patented) coupling-and-positioning system (CAPS). The two distinctive design elements of this system are that both jaws are mounted in the housing with a single pin, and that the jaws remain connected as a set — even when the pin is removed. These features vastly simplify the process of switching between jaw sets.


Becker and O'Dell switched between the CC 1700's universal jaw set and its steel-cutting jaw set, and then

back again. The first switch (and also the first time the two had performed this task) required 33 minutes. On the second switch, with Ramsey in the cab of the excavator nudging components into alignment, Becker and O'Dell accomplished the job in just slightly more than 15 minutes.

Also simplifying the jaw-set switch on the CC 1700 is the provision Atlas Copco has made for securing the cylinders in their relative mounting positions when disconnected from the jaws. With the CC 1501, the disconnected cylinders swing down against the tool's housing, requiring a lot of muscle (even a small service crane) to get them back into the proper attitude for mounting.

Once the jaws are installed on the CC 1501, adjusting the blade-to-blade clearance between the two jaws (the blades are bolted into the jaws) is a painstaking process that involves using the threaded mounting-pin caps to push the jaws horizontally until the proper dimension is attained. The CC 1700 simply uses shims under the blades to adjust this dimension (and to compensate for wear).

Summing up

As we expected, we learned much about silent demolition tools (combination cutters in particular) during our visit to Gulf Coast Sand Products. We were impressed with the tremendous power these tools generate, both when crushing concrete and when slicing through massive steel structures. From what we observed, the combination cutters seemed to be accomplishing what Gulf Coast Sand Products had hoped — quick reduction of material in a fashion that allows most of the rebar to fall free. The company's probable next step is deciding on a crusher. It's always good to see a small company with the foresight and flexibility to adapt when it sees the basics of its business changing. 

Getting Comparative Specs is as easy as...

1

2

3

Specification (Unit of Measure: English)	Allmand Brothers TLB 535 ESL	Bobcat B100 B	Case 580M Series 2	Caterpillar 430E
ENGINE	Isuzu	Kubota	Case	Cat
Engine make	3LD1	D1105-T	445/M2	3054C DIT
Engine model	0.0	31.5	75.0	97.0
Net engine power - hp				
DRIVE	Hydrostatic	Hydrostatic	Synchromesh/Pwr Shift	Synchromesh/Pwr Shift
Transmission type	1 / 1	1 / 1	4 / 4	4 / 4
No. of speeds (fwd/rev)	5.5	4.7	24.5	26.8
Max. travel speed - mph	2WD	2WD	2WD/4WD	2WD/4WD
No. of drive wheels	2WS	2WS	2WS	2WS
STEERING CONFIGURATION				
Hydraulic pump flow - gpm	8	11.7	28.5	43
Relief valve pressure - psi	2400	--	3050	3611
BACKHOE				
Backhoe bucket width range - in	12" - 36"	--	12" - 36"	12" - 36"
Max. dig depth, optional extended stick - ft/in	--	--	18' 3"	19' 6"
Loading height, standard stick - ft/in	7' 8"	--	11' 2"	13'

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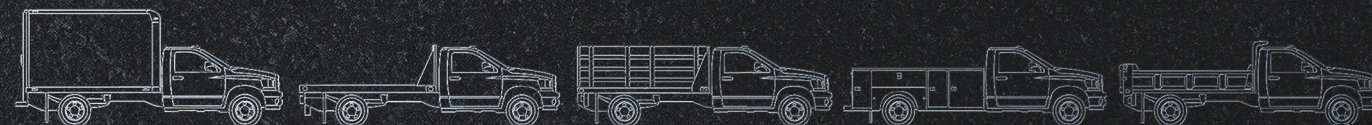
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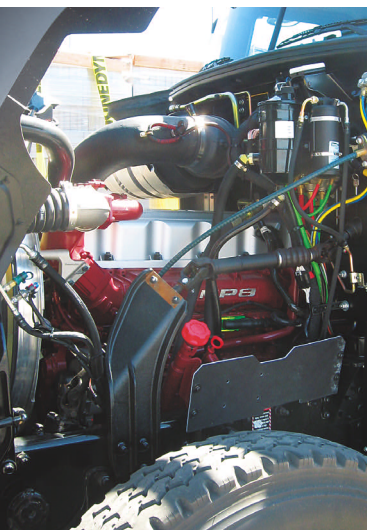


Chrysler Financial



Axle-Forward Pinnacle's **Solid and Satisfying**

This new model has much more than a new name —
a bigger, stronger engine, for instance



New 12.8-liter MP8 diesel in highway type MaxiCruise tuning makes up to 485 horsepower. It's strong and clean-burning. Maxidyne and Econodyne versions have somewhat different operating characteristics.

Can a new name make a big difference? Back in January 2006 we reported on a CH Rawhide, a fancied up version of a tough and reliable tractor Mack's been making for years. I scanned that article and was reminded that I liked the Rawhide's copious chrome trim and described it as quiet and good riding, while also noting that I had some trouble shifting its Mack 18-speed transmission in low range. I can now confess that I had a lot of trouble shifting it; it was nearly new, and like some Mack gearboxes, it needed to be broken in.

A year and a half later, I found myself in another daycab tractor, the Pinnacle shown here, and found I could go through the gears easily, and even float shift without the clutch much of the time. That to me made the Pinnacle Axle Forward, which is based on the old CH, an altogether different machine, even though the credit goes mainly to the Eaton Fuller 13-speed at the other end of the lever. Fullers are usually easy to shift right off the bat, if the truck builder's linkage allows it, and this one did.

But wait. There was another black Mack Pinnacle at this company-sponsored demonstration at the Las Vegas Speedway in Nevada, and its MaxiTorque 13-speed shifted easily, too. It's the same series as that 18-speed in the CH,

so it appears Mack has made some changes for the better. In fact, executives said, the Pinnacle is indeed a changed truck, with more sound-deadening insulation, redesigned controls and instruments, and a stronger and longer cab.

Actually, there are two Pinnacle models, one with the forward-set axle as this pair had, and another with a setback steer axle. Each has weight-distribution or maneuvering advantages, depending on where and how a truck is to be operated. The axle-back version has smoother nose styling and a V at the top of its grill that used to mean Vision, on which it's based.

Changing the chrome V to a P would be difficult, so I'd have eliminated the V and made the grill look like that on the axle-forward model, which has a no-nonsense, straight-across upper bezel. But they didn't ask me.

They did ask me how the trucks drove, and I gave them a thumbs-up. The Pinnacles were such nice performers that I spent an hour more than authorized on the designated loop outside the speedway's grounds. This involved stretches of Interstate 15 and State Route 604, which border the grounds to the north and south. Our hosts instructed us to run clockwise, but I reversed it because northbound 604 has a stiff uphill stretch from just past the speedway to within a mile of the I-15 interchange. This provided a nice workout for an-



The black Pinnacle Axle Forward retains the squarish nose and no-nonsense look of the CH on which it's based. This one has heavy specs including a 14,600-pound-capacity steer axle.

other of the Pinnacle's new features, the 12.8-liter MP8 diesel.

The "8" joined the previously available 10.8-liter MP7 in January. Both, of course, are equipped to meet the government's new exhaust emissions limits, and both are smokeless and odorless. They exhale through oxidation catalysts and particulate filters, and you'd think those things would choke performance but they don't. The engines — Mack's and everyone else's — are gutsy and responsive, and drivers will like them when they begin appearing, even if the big Pre-Buy of '06-powered trucks has choked off sales for the time being.

MP means Mack Power, and the "8" has more of it — up to 485 horsepower and 1,660 pounds-feet of torque in MaxiCruise tune, versus 395/1,560 tops with the "7." The 7 is adequate, but the 8 is more satisfying to drive. Of course, higher horsepower in any engine series makes a big difference in acceleration and hill climbing. The MP8-485 handled the 6-percent grade on SR604 in 7th-direct (10th of 13 ratios), while the MP8-445 in the other Pinnacle Axle Forward required going to 6th-direct or

overdrive (8th and 9th ratios) and topped the hill about 5 mph slower.

Those comparisons are fair, as I pulled the same flatbed trailer with both tractors. The trailer, with its spread tandem, was loaded with palletized concrete blocks, and I guessed the combination weight to be about 78,000 pounds. The tractor I'm focusing on in this article (numbered 5 for the demo) weighed a little more, as it had heavy specs, including a 14,600-pound steer axle, making it suitable to pull lowboys, equipment trailers, and other construction-oriented jobs. The other Pinnacle (number 3) had a 12,000-pound steer axle.

Quietness is a principal improvement in

TEST SET

Truck: Mack Pinnacle Axle Forward (CHU613) conventional daycab 6x4 tractor, BBC 116 inches

Engine: Mack MP8C (MaxiCruise), 485 hp @ 1,600 rpm (465 @ 1,800 rpm) and 1,660 lbs.-ft. @ 1,500 rpm (1,600 @ 1,100 rpm), w/back-of-cab diesel particulate filter

Clutch: Eaton Solo 15.5-in. 2-plate ceramic, 9-spring

Transmission: Eaton Fuller RTLO-16913A, 13-speed overdrive

Front axle: 14,600-lb. Mack (by Meritor) FXL, on taperleafs

Rear axles: 44,000-lb. Mack (by Meritor) S440, on Mack (by Hendrickson) AL461 air-ride

Wheelbase: 196 inches

Brakes: Meritor Q+ S-cam drum w/Bendix ABS and Roll Stability control
Tires & wheels: Bridgestone 11R24.5, M843 front, M711 rear, on Alcoa Dura-Bright polished aluminum discs

Fuel tanks: Twin 93-gal. polished aluminum

Trailer: 48-foot aluminum-steel flatbed

Hands-On Trucking



Burlwood-trimmed dash has big gauges and easy-to-use rotary HVAC controls.

the new Pinnacles, and this was apparent as soon as I had either rig up to highway speeds. There was little wind or road noise — the same thing I said about the CH Rawhide in that previous article — but it seems even more true of the Pinnacles. Mack engineers spent a lot of time fitting new noise-deadening insulation to the new trucks, and they probably knocked off several decibels. Most folks who drive Macks for a living will probably notice this on the new models.

Also nicer are the instruments — big white-on-black gauges with snappy bright-metal bezels and easy to use rocker switches. The rotary knobs for heating and air conditioning are simpler and easier to understand. To turn on the A/C, you push a reasonably sized button marked with a snowflake instead of hitting the tiny Max A/C button as on the old CH.



Above: Yellow Pinnacle Axle Back's nose has smoother styling and a chrome V that used to denote Vision, the model from which it was derived.




Accelerator and brake pedals are the same height from the floor, allowing easy and safe operation.

The accelerator and brake pedals are the same height off the floor, making them easy and safe to operate.

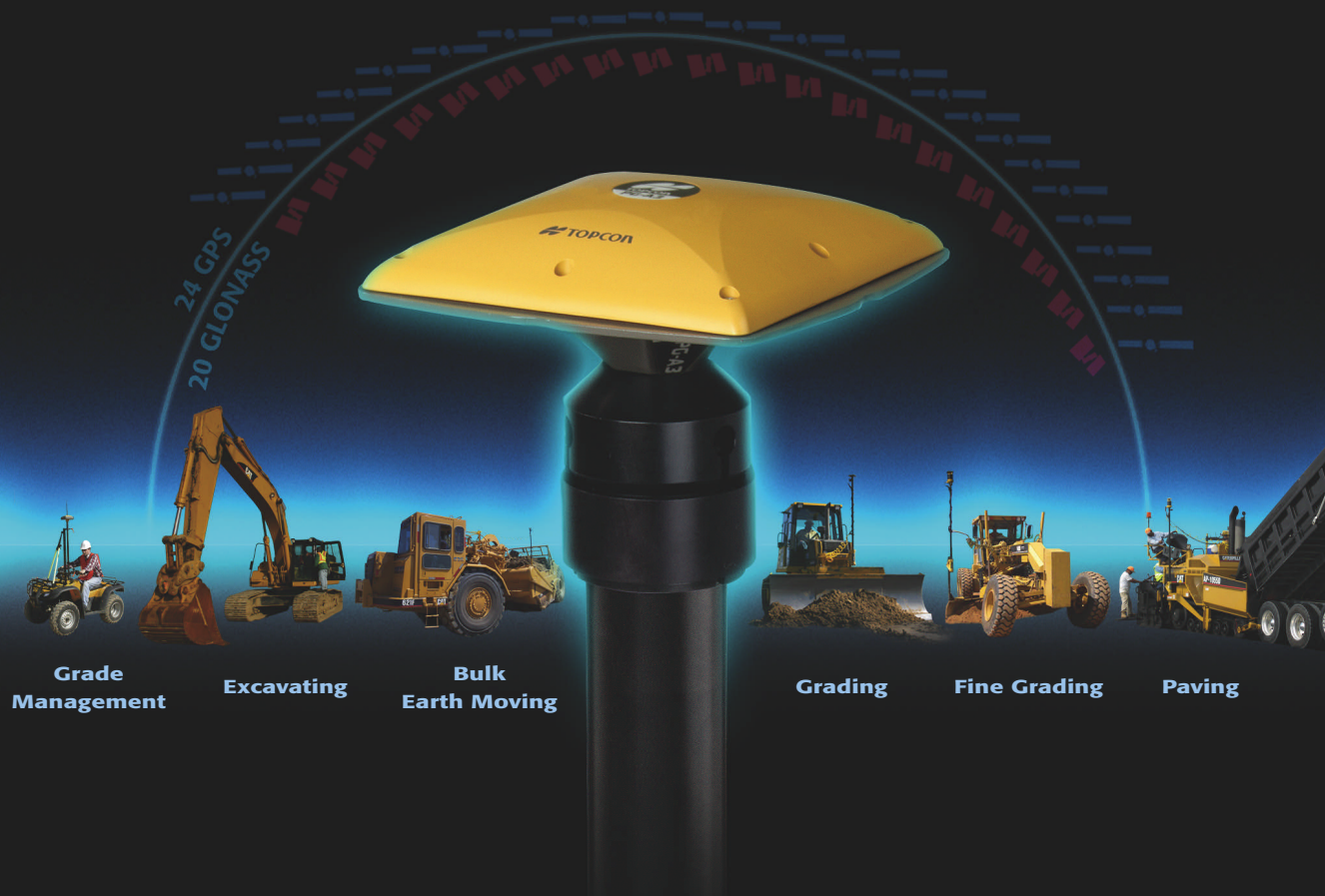
The steel cab is about 4 inches longer than the

CH cab, providing more leg and belly room for big guys and gals, and providing room behind the seats to stow stuff. This was an option last year, but now it's standard on both Pinnacles and the vocationally oriented Granites. Also, the reinforced Granite cab — claimed to be the strongest cab Mack has ever built — is now used on the Pinnacle.

All in all, the new Pinnacle, particularly this Axle Forward model with its MP8 diesel, has a strong, solid feel that made it more than worthy to be included in the demonstration. The demo was the first in a series that comprises the Mack Performance Tour, and customers (actual and hoped-for) are being invited to participate at venues across the country. Attend if you get an invite (or ask your local Mack dealer for one), because you'll be impressed. 

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Lube Truck Basics: Buy What You Need

Think analytically about the type and size of lube truck you need, and you might find it doesn't need to be three blocks long with 900 horsepower

If you're in the market for a lube truck, perhaps we should pass along the advice that was at the top of the list for every lube-truck manufacturer *Construction Equipment* contacted: Size the vehicle to your operation. Sounds elementary, but apparently this basic principle is violated more often than you'd think among lube-truck buyers.

"I've seen it happen," says Tim Worman, product manager, commercial vehicles, for Iowa Mold Tooling (IMT). "A contractor notices a new \$200,000 lube truck that's just been delivered to his competitor, and not to be outdone, immediately orders one exactly like it — only to have it sit idle much of the time. Having a truck that's too large is a detriment, because utilization costs shoot up. But just as detrimental is a truck that's too small, because you won't be able to adequately service the fleet. You have to strike an intelligent balance."

Striking that balance, says Worman and others in the lube-truck business, begins with a "needs analysis" — that careful first step of asking basic questions:

What type of equipment will be serviced? How many units will be serviced? What types of services will be performed? How many of these services will be performed in a typical day? How long will the truck be out before refilling its tanks? In what type of terrain will the truck operate? In what type of climate? Will the truck carry fuel? Is a grease system required? Are used-fluid tanks needed? What are your state's policies on hauling salvage oil?

"Buyers sometimes have preconceived ideas about what they need in a lube truck,"

says Worman. "Some initially insist that they need, say, a 24-foot-long truck with 2,000 gallons of product. But as we work through their actual requirements, we might find that the truck can be half that size — at half the cost — if it simply returns to the shop once during the week to top off its tanks."

Unless you're an experienced lube-truck buyer, you're probably best advised to seek the assistance of reputable manufacturers and dealers when thinking through the needs of your operation. These people have the experience to help you develop a lube-truck that fits your business, and some employ proprietary software to assist in the process.

But, that said, having a fundamental knowledge of lube-truck design — and being aware of choices you might have when buying such a vehicle — might serve you well in the buying process.

Keep in mind, too, that lube-truck manufacturers might approach the design of their products in different ways. For some, every vehicle is basically a "one off," a completely custom truck. Others take the approach that a degree of standardization reduces manufacturing costs, and to that end, they might limit choices, but still allow some latitude in customizing the vehicle to a particular operation.

Body type? Fuel?

Among the most basic considerations when thinking about a lube truck is how much of the vehicle is to be enclosed by protective structures. Typically, you have three choices: completely open; completely enclosed; or open with an enclosed hose-reel compartment. The



This 8x8 Oshkosh lube truck, built by Australia-based Maintcorp, carries nearly 2,700 gallons of fuel and five grades of oil that total nearly 700 gallons. The used-oil tank holds 525 gallons, and the truck also carries 135 gallons each of antifreeze and wash water. The diesel-powered compressor produces an airflow of 125 cubic feet per minute.



Side storage compartments give this new Iowa Mold Tooling (IMA) SiteStar an enclosed look, but the interior of the body is open. For delivering oil-based products, the SiteStar uses hydraulic-motor-and-pump combinations mounted on a central manifold in the enclosed reel compartment. The SiteStar can accommodate either rectangular or oval fuel tanks.



This Eagle Pro Lube model built by Service Trucks International (STI) features an enclosed design with curb-side entry into the interior, side-mounted storage compartments, and a large roll-up door at the reel compartment.



This tandem-axle model built by Maintainer reflects what might be the most widely specified type of lube truck — an open design with an enclosed reel compartment. The unit features a large, oval fuel tank (Maintainer offers fuel tanks from 500 to 5,000 gallons), under-deck storage cabinets, and a choice of an aluminum roll-up door or steel swing-out doors for the reel compartment.

Maintenance Management



Among the patent-pending features of IMT's SiteStar is the use of polyethylene tanks for petroleum-based fluids, antifreeze, water and salvage. According to IMT, the "poly" tanks weigh about 80 percent less than comparably sized steel tanks, remain cleaner than steel tanks, and are less susceptible to collecting condensation. The poly tanks are available in five capacities, ranging from 75 to 350 gallons.

choice of body style, says Walt Van Laren, sales manager for Service Trucks International (STI), usually is dictated by environment, that is, climate and jobsite conditions.

"Buyers in colder climates may favor an enclosed unit," says Van Laren, "as might those who plan to use the vehicle in extremely dusty conditions."

The enclosed lube truck has the appearance of a cargo van, and some of these units can be quite large. The enclosed design not only keeps the product tanks (except fuel) and all other components completely out of the weather and dust, but also provides the technician a relatively clean, dry, protected and sometimes heated area in which to work. Typically, the enclosed design uses a roll-up door at the rear for access to the reel compartment and a side door (or a door within the reel compartment) to give access to the interior.

But variations on this basic theme are certainly possible. For example, Machinery Lubrication magazine recently published an article about an enclosed lube truck designed by employees at Rio Tinto Energy America's Antelope Mine in Wyoming. Among the vehicle's innovations is a reel compartment placed on the left side (just forward of the tandem axle) to avoid the dust that boils up at the rear. The reel compartment also is pressurized to further discourage dust intrusion.

At the other extreme of the design spectrum is the completely open lube truck, which, basically, has all of its various components bolted to a flatbed. This design, while saving on the vehicle's initial cost, is not widely used, primarily because the reels and dispensing nozzles are continually exposed to all manner of contamination.

Most popular of lube-truck designs, perhaps, is the open truck with an enclosed reel compartment at the rear. Some of these vehicles, in fact, might appear at first glance to be enclosed units, especially if side storage compartments extend forward from the reel compartment. Access to the interior of the lube body typically is from a set of steps built into the right side of the body just forward of the reel compartment.

Another fundamental consideration when thinking about a lube truck is whether the vehicle needs to carry fuel. This decision, say the experts, must again be based on the specifics of your operation. All three basic body types can accommodate a fuel tank, but according to Jeff Taylor, Jr. of Taylor Pump & Lift, a custom-lube-truck manufacturer, enclosed bodies are the least likely to be so fitted. The tank simply takes up considerable room, he says, and can reduce the amount of space and capacity to accommodate other products.

But even vehicles with non-enclosed body styles, says STI's Van Laren, seldom are equipped with a fuel tank in excess of 2,500 gallons — and most are more in the range of 1,000 to 1,500 gallons. But, says IMT's Worman, these 1,000- to 1,500-gallon tanks seem to be gaining popularity, based on the number of buyers who specify them on new vehicles.

Products? Chassis?

At the heart of designing a lube truck, of course, is deciding what type of products it will carry (other than possibly fuel) and in what quantities. The products the vehicle carries, of course, will be dictated by the types of services it will be performing, but a "full-service" unit might have on board engine oil (perhaps in more than one grade), hydraulic fluid, final-drive oil, gear lubricant, grease, antifreeze and water (for pressure washing).

The specific petroleum-based products carried, of course, probably will reflect recommendations from the various equipment manufacturers. The same is true for diesel-compatible antifreeze — whether fully formulated conventional or an organic-acid type — or both. And if you plan to premix antifreeze with distilled or deionized water, then larger tanks might be required.

In addition, appropriately sized salvage tanks for both used oil and used coolant might be needed. Remember, however, that regulations in some states may classify salvage oil and coolant as hazardous materials and may limit the amount that can be transported or may require a special license to do so.

The specific volume of each product that the lube truck carries is, again, part and parcel of the needs analysis. But on the practical side, Worman suggests that the analysis should consider the implications of catastrophic failure in a machine system.

“Plan for the worst case,” he says. “If there’s a major problem, you want enough product to handle the situation.”

Once the quantity of required products has been determined and the resulting weight calculated, only then can the lube truck’s chassis be considered. In some instances, such as in mines, the lube truck might never be used on-highway, and if so, the legalities of weight distribution might be avoided — even though the principles of good design should still be observed. In most lube-truck designs, however, keeping the truck within legal weight limits is paramount. Having a truck that needs a permit to move is adding a cost burden that no one wants to pay.

For an on-road lube truck, then, the aggregate weight of the products carried — and perhaps the size and weight of individual tanks — will influence the wheelbase and the size (and number) of axles used for the chassis. At this point, some buyers might legitimately review and perhaps modify their perceived needs to avoid using a tandem-axle chassis, which may be subject to federal excise tax and which may require operators with a commercial driver’s license.

Specifying the chassis, however, also in-

volves other considerations.

“Some lube-truck users may plan to park the vehicle on a flat, accessible spot at the jobsite, then bring the machines to it,” says Van Laren. “But the point of a lube truck is to gain the capacity to take the service to the machine. So, depending on the terrain at jobsites typically encountered, the buyer may want to consider such items as heavier suspension and larger tires.”

Pumps, heaters & accessories

The lube truck uses pumps to move products from the tanks to the hose reels, and these pumps can be powered either hydraulically or pneumatically. Pneumatically powered pumps, says Van Laren, generally can move fluids at the rate of up to five or six gallons per minute, while hydraulic pumps can deliver up to 10 gallons or more per minute.

Although generalizing can be risky, it’s probably safe to say that fuel on a lube truck is almost always moved with a hydraulically powered pump, because it can deliver large volumes rapidly. Probably safe to say, also, is that air-diaphragm pumps normally are used to move antifreeze, water, used coolant and used oil. Grease typically is moved with an air-piston pump.

For moving petroleum-based fluids, either type of pump can be used, and in some instances, you may have a choice. If so, says Van Laren, considerations should include rate of delivery, temperatures at which the pumps will work (moisture in cold weather could affect air-pump performance) and duty-cycle (how often will the pump be used).

Some manufacturers make the case that using air-powered pumps in the petroleum-product circuits reduces cost, because these systems are simpler than hydraulic-drive systems. Those who favor hydraulically powered pumps, however, make the point that hydrau-



The interior of the STI Eagle Pro Lube enclosed model is bright and well lit, has tanks and sub-frame that are mounted via a spring-loaded system to resist twisting and offers a choice of air or hydraulic power for the product pumps.

Maintenance Management

lic pumps not only are faster and quieter, but also are more robust in construction and better suited to continuous operation. Plus, they say, an air compressor large enough to power all of a lube truck's pumps will be expensive, and the perceived savings of an all-pneumatic system may not always materialize. But, again, both types of pumps are competent, and the selection of one type or the other should be guided by those basic considerations suggested by Van Laren.

To make pumping petroleum products easier in cold weather, enclosed lube trucks are sometimes heated to keep the tanks warm. But, exposed product tanks on non-enclosed vehicles also can be heated. Heating methods include circulating engine coolant around the tanks and using 110-volt immersion heaters

powered via a truck-mounted generator, an inverter or an external-current source.

"Tank heaters are always popular in the snow belt," says Worman, "but users in warmer climates also are showing interest. Heating the oil lowers the viscosity enough to allow faster pumping, and you can gain considerable time on each service."


You also may have a choice of filling methods for petroleum-product tanks. Top-fill ports are usually standard, but a bottom-fill system might be available. The latter system uses quick-couplers in the hose reel compartment to fill tanks from the bottom. Since each product's coupler is of a specific size, the risk of cross contaminating products is reduced (compared to top filling), and the risk of dirt entering the system also is reduced.

Another consideration when designing the lube truck is the size of product-delivery hoses, both length and diameter. Hoses 50 feet long are usually standard, but your situation may require them to be longer. And, since hose length and diameter affect flow rates, says Van Laren, some applications may require upgrading from standard-diameter hoses to those with larger diameters. He reminds users, too, that

required flow rates in some situations might preclude the use of an air-powered pump.

A couple of final considerations are those of metering and filtration. If it's important that you record the quantities of products dispensed into particular machines, ask the dealer or manufacturer about metering systems that might have integral software to assist with this record keeping. Regarding filtration, the placement of high-efficiency filters

between petroleum-product tanks and hose reels can assist in assuring that clean oil is delivered to machines. But, says Worman, these filters aren't going to make up for dirty oil loaded into the tanks.

So, maybe before you take delivery of your new lube truck, you should investigate the cleanliness of your bulk-oil supplies. 

Lube-Truck Alternatives

For some equipment-using operations, the use of a lube skid in the back of a service truck (or pickup) may be a more practical approach to field service than a lube truck. Likewise, a lube trailer might be a more effective way to service a small fleet than the conventional lube truck, allowing field service without impinging on the truck's cargo-carrying capacity.

According to Tom Baldacci of W.W. Engineering, a company (based in Chicago, Ill.) that specializes in building custom lube skids, these mobile-service units can be designed and built to mirror a conventional lube truck's capabilities, but on a smaller scale.



Feterl's Model 456 lube trailer carries three 65-gallon product tanks and a 65-gallon used-oil tank powered with air pumps. The heavy-duty, 7x15-foot trailer features a partially enclosed reel compartment and a gasoline-powered air compressor with electric start. An optional 120-pound grease system is available.



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Albian Sands Energy, Inc.*



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Full-Lane Option Remains Rare Offer

Full-lane milling capability covered by only three manufacturers

If the milling machine or cold planer is already considered a niche product type, then the full-lane crawler version is the niche of the niche.

Of the milling-machine manufacturers surveyed by *Construction Equipment*, only three are offering a full-lane product at this time. And each of those machines represents a full-lane option to the companies' respective largest half-lane milling machines, and not a dedicated full-lane model per se.

Each with 150-inch drum options, the established Wirtgen W 2200 and Roadtec RX-900 products have been joined in the full-lane game by the Terex CMI PR950, for which production begins this year.

As a market, sales of 25 to 30 would be considered a good year, notes Jeff Wiley, Wirtgen America's vice president of sales and marketing. As of the mid-point, 2007 was on target to approach that total.

While the ability of contractors to transport these machines can be limited depending on the jurisdiction, another factor of the limited market is the productivity of the machines themselves, he notes.

"They're capable of basically working you right out of work," says Wiley. "If you're on a mill-and-fill and you've got one machine that's 12 feet wide, you can get a lot of area covered in one night. So, a contractor doesn't necessarily need three or four or five of these machines in his fleet. One or two of them pretty much takes care of most all of his mill-and-fill needs."

But, says Wiley, these machines will become increasingly popular, because they offer full-lane milling width while retaining enough horsepower for mill-and-fill applications.

"Our intentions in 2005 have finally come to fruition here in 2007," says Larry Jack, Terex Roadbuilding's director of marketing. He is referring back to a *Construction Equipment* article on half-lane machines in early 2005, in which he outlined the company's objective to develop a high-horsepower milling machine that, at the standard configuration of three tracks and an 86-inch cutting width, would weigh in the vicinity of 75,000 pounds.

As part of a "renewed offensive on the cold-planer market," that machine, the PR950, is also available in a four-track configuration and with the full-lane cutting width of 150 inches.

Full-Lane Crawler Milling Machine Specs

Model	Gross Output (hp)	Std. Cut Width (in.)	Max. Cut Width (in.)	Max. Cut Depth (in.)	Operating Weight (lb.)
Terex CMI PR950 4 Track	950	86	150	15	93,000
Roadtec RX-900 4 Track	950	86	150	14	95,800
Wirtgen W 2200	900	87	150	13.7	96,342

Source: Spec-Check.com Xpanded Specs (Information verified as of July/07)



The Terex CMI PR950 is powered by a 950-horsepower Cummins diesel engine. Comparatively, the Caterpillar powerplant utilized by Astec's Roadtec brand has increased from 860 to 950 horsepower on the four-track version of the RX-900, while the Wirtgen W 2200 also utilizes the Caterpillar 3412E diesel, generating 900 horsepower. According to Wirtgen America, the 12-cylinder Caterpillar engine is "overspecified" for the W 2200's maximum cutting depth of 13.7 inches and, with the resulting immense feed rate, combines with the front-loading conveyor system for a theoretical production capacity of 1,100 tons per hour.

First introduced by Germany-based Wirtgen in 2000, the W 2200 today offers a choice of three cutter spacing configurations on the full-lane drum. Along with the standard 5/8 of an inch spacing, available is a fine 5/16 option and a new, wider Eco-Drum. At spacing of an inch-and-a-quarter, the Eco-Drum is suited for deeper, aggressive excavation.

"What that gives you is greater breakout force," says Wiley. "You're going to have more horsepower per tooth, and it's going to allow you to be a little more productive. When you're doing full-depth excavation, or you're cutting deep concrete, you're not as concerned about a tight, finely spaced pattern, because you're going to overlay it back with four, five or six inches of asphalt anyway."

Versatility is the crux of the half- and full-lane optional machine, says Wiley. Being able to switch back to a 7-foot drum and take on city-street projects when full-lane work is not

available is the "multi-purpose" flexibility the market looks for today.

With Roadtec, "we have seen an increase in popularity of segmented drums," reports the Astec Industries company. "These allow the contractor to change, say, from 12 feet 6 inches to 12 feet by taking off the outside foot-and-a-half and replacing it with a foot-long section. The rest of the housing stays in place, and that means much shorter change times."

With CMI and its current owner Terex for 30 years, Jack notes just how much has changed about the large milling-machine market.

"There was a time you had half-lane machines and you had full-lane machines," he recalls, "and neither one of them crossed that line." Half-lane machines went up to 8.5 feet in width for some special applications, but most were 7 feet in width to process 12- and 14-foot lanes in two passes. "And that's all these half-lane machines did," he says. "Initially, none of them had bolt-on cutters; they were built into the machines."

A change occurred in 1999.

"The then-CMI Corp. introduced the first multi-use machine," says Jack. "It was a tractor that would accommodate either a 7-foot or typically a 12-and-a-half-foot — that's the standard — cutter head."

"In typical milling, I don't know of any manufacturer today that builds a dedicated



Jeff Wiley, vice president of sales and marketing with Wirtgen America, believes milling machines with a full-lane option will grow in popularity because they offer application flexibility by retaining enough horsepower for mill-and-fill applications.

Buying File: Milling Machines



As one of three half-lane milling machine manufacturers offering a full-lane option, Astec-owned Roadtec has noted an increase in the use of segmented drums, which allow users to adjust the milling width without having to

Crawler Pavement Millers

Size	List Price	Hourly Rate
72 to 87.9 in.	\$577,610	\$445
88 in. & over	\$760,200	\$610

Unit Prices... Diesel: \$2.83 Mechanic's Wage: \$43.07 Cost of Money: 5.75%
Hourly Rate = Monthly Rate/176 = Operating Cost

*Hourly rate is the monthly ownership costs divided by 176, plus operating cost. Unit rates used are diesel at \$2.83 per gallon, mechanic's wage at \$43.07 per hour, and money costs at 5.75 percent.

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

full-width-lane machine. Everybody has a tractor that will accommodate both of them.”

Today, the Terex CMI PR950 offers a cut depth of 15 inches, allowing contractors to excavate the entire roadway, right down to the base material.

“We’ve learned over our years of experience here that the shape of the cutter housing does a lot as far as how you purge the material from the cutter housing,” says Jack. “The term that’s used in the industry is the head of material that you carry. The more head of material, or more bulk or mass of material that you have inside the housing, the more material that your cutter bits are running through and, of course, that creates more wear on all the

components, whether it’s the drum, the sliding, the holders and the teeth themselves.”

To combat that, Terex CMI has carried over and enhanced from earlier machines a trapezoid-type-shaped cutter housing that reduces the amount of head.

“The shape of the cutter housing, in conjunction with the helical patterns on the drum, allows us to discharge the material faster,” says Jim Holland, Jr., product manager with Terex CMI.

As a test, the company ran a 600-horsepower machine with the tapered housing against an 800-horsepower machine without the tapered housing. The smaller machine was able to keep pace in a 4-inch cut.

Quick-change tooth holder systems are the trend today.

“It costs you a lot less to own a welded-

type cutter, and it can cost you a lot less to maintain it,” says Terex CMI’s Jack, “but if you’re in New York City and it seems that every block you go into, you’re going to knock one of these things off, what you’re losing there is up-time and production, and that will very quickly outweigh. You can get your payback with these quick-change cutters by getting the machine back on the job quickly.”

Wirtgen offers the HT11 quick-change toolholder system for large-volume milling machines as standard. With this new system, the retaining bolt is significantly larger than the one used in the former HT3 system. Enlarging the contact surface of the upper part to completely cover that of the bottom ensures an even and tight fit between the two. As a result, when the upper part needs to be quickly replaced on a jobsite, the bottom part requires only minimal cleaning, which allows for quicker and easier part changes. Additionally, the bore in the bottom part is protected against milling debris contamination by a seal.

As a product type, the cold planer or milling machine evolved back in 1976, when CMI incorporated conical-bit technology into a rear-discharge fine grader as a road surface reclaiming alternative to simply crunching up the asphalt and hauling it off with a front-end loader.

Today, with Terex CMI catching up to Roadtec and Wirtgen with the full-lane milling option to the half-lane product line, the next player in this game may well be Volvo, having recently acquired the Ingersoll Rand Road Development line.

Just prior to the sale, Ingersoll Rand had begun the completion of an all-encompassing road construction and rehabilitation product offering with the rolling out of two milling machines, including the MT-2000. A four-track, front-load machine capable of running drums up to 86 inches in width, the new Volvo MT-2000 offers four steering modes, three distinct drum cutting speeds, and active anti-spin control.

At the company’s product launch late in 2006, Ingersoll Rand announced plans to expand that product offering to a total of six models. Volvo representatives have since indicated product-line expansion will include larger-width options. 

Web Resources

Find full-lane milling machine manufacturers’ websites in the online version of this story at ConstructionEquipment.com. Just click on Archives, Buying File, and you’ll find a link to this story.

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Gallery of Full-Lane Milling Machines

TEREX ROADBUILDING

Full-Lane-Capable Model Hits Pavement

After extensive field evaluations, Terex begins production this year of the Terex CMI PR950 cold planer, a standard 86-inch milling machine which offers a 150-inch full-lane option. With a class-leading cutting depth of 15 inches, the PR950 combines all-track drive for traction with all-track steering for on-site maneuverability. With a machine turning radius of 8 feet, easy maneuvering around obstructions is further enhanced with the forward-facing positioning of the operator in front of the cutter.

Number of models: 1

New model: PR950

Product-line features: The largest and first of five new milling machines being introduced by Terex in 2007, the PR950 features an exclusive tapered cutting housing design that carries substantially less material and, thus, reduces cleanup. The quick-mount cutting housing design allows for fast removal for maintenance and simpler cutter changing.

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ROADTEC

Large Planer Gains Horsepower Boost

Available with three- or four-track assemblies, the Roadtec RX-900 cold planer offers four cutting-width options ranging from 86 inches up to the full-lane 150 inches. The machine's horsepower has been increased from 860 to 950, and bolt-on track pads are now standard. Micromilling and profiling drums are available. All mills from Roadtec are bi-directional so that the contractor can down-cut easily and rear-load for cold-in-place recycling.

Number of models: 1

Product-line features: Including the smallest RX-400 model just rolled out earlier this year, the entire four-model cold planer product line by Roadtec, an Astec Industries company, now offers optional folding conveyors for easier transport on standard trailers. Various cab options are available, including a new canopy for the full-lane-capable RX-900.

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WIRTGEN AMERICA

Options Galore on Milling Machine

When equipped with the 3.8-meter — or 150-inch — drum attachment, the four-track Wirtgen W 2200 cold milling machine extends its big-project capabilities to full-lane applications. The full-lane drum is available with standard cutter spacing of 5/8 of an inch, as well as both fine (5/16 of an inch) and wider Eco-Drum (1-1/4 inch) spacing options. The new HT11 quick-change toolholder system is standard on large-volume milling machines available from Wirtgen, including the 900-horsepower W 2200 first introduced in 2000.

Number of models: 1

Product-line features: Wirtgen's new optional belt scale for large milling machines provides continuous weight measurement of loaded material. The control system takes the continually measured speed of the belt into account, as well as the inclination angle of the belt scales and roadway. A printout from the provided printer provides date, time and tonnage.

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Know Component Lifecycles for Better Budgets

Derive accurate hourly costs with a clear understanding of how long major machine components last

If we see a machine as a collection of components bolted to a frame, then the frame itself is critical in the selection decision. Engines, transmissions, hydraulic pumps and their related systems will be repaired, rebuilt and replaced; but the frame — the core of the asset — could conceivably last forever. This approach allows one to rethink equipment selection and lifecycle costing.

When we buy a new machine, we buy the frame together with a set of zero-hour components. Operating cost starts off low as the machine “lives off” the original set of components, but it grows over time to reach a relatively level value based on a steady state of ongoing component replacement. This can, theoretically, go on for a long time. But at some stage, replacement becomes necessary as structural failure in the frame, deteriora-

tion in the support systems, and obsolescence take their toll.

A focus on components makes it possible to estimate costs and set budgets based on a knowledge of the cost and life of the major components. In June 2006, we introduced the accompanying table as a simple way to do the calculations and determine the hourly cost of major component replacement.

Columns B through H give the estimated cost and life for the seven major components that comprise the machine. Column I provides for the cost of other repair actions, column J totals the expected cost for each period, column K is a running cumulative total, and column L is the cumulative cost per cumulative hour. The time at



Mike Vorster

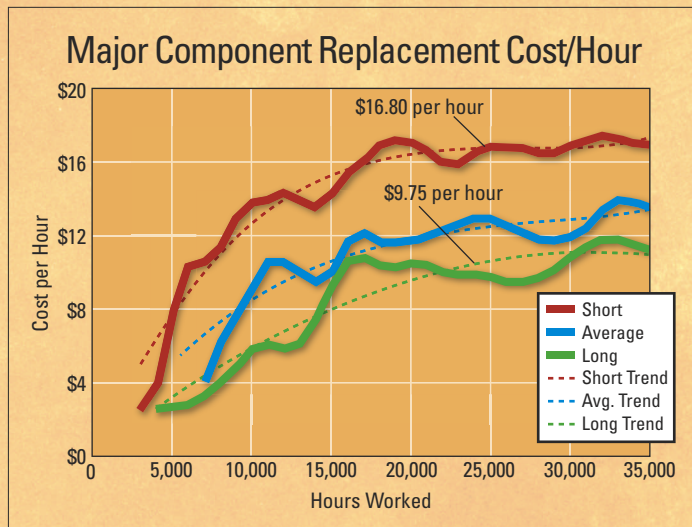
David H. Burrows Professor of Construction Engineering and Management at Virginia Tech. See Construction Equipment.com for full archives of “Equipment Executive.”

Component Costs

	A	B	C	D	E	F	G	H	I	J	K	L
	Major Components									Total	Cumulative Total	Cumulative \$ per Cumulative Hour
	Engine	Turbo	Transmission & center pin	Hydraulic pump & motor	Axles, diff & brakes	Bucket	Cylinders	Misc.				
Cost	\$28,600	\$2,000	\$27,800	\$15,600	\$30,000	\$13,200	\$8,000	\$2,500				
Life	11,000	6,000	10,000	8,000	16,000	8,000	8,000	1,000				
1,000		\$0	\$0	\$0	\$0	\$0	\$0	\$0	x	\$2,500	\$2,500	\$2.50
2,000		\$0	\$0	\$0	\$0	\$0	\$0	\$0	x	\$2,500	\$5,000	\$2.50
3,000		\$0	\$0	\$0	\$0	\$0	\$0	\$0	x	\$2,500	\$7,500	\$2.50
4,000		\$0	\$0	\$0	\$0	\$0	\$0	\$0	x	\$2,500	\$10,000	\$2.50
5,000		\$0	\$500	\$0	\$0	\$0	\$0	\$0	x	\$2,500	\$13,000	\$2.60
6,000		\$0	x \$1,000	\$0	\$0	\$0	\$0	\$0	x	\$2,500	\$16,500	\$2.75
7,000		\$0	\$500	\$0	\$3,900	\$0	\$3,300	\$2,000	x	\$2,500	\$28,700	\$4.10
8,000		\$0	\$0	\$0	x \$7,800	\$0	x \$6,600	x \$4,000	x	\$2,500	\$49,600	\$6.20
9,000		\$0	\$0	\$6,950	\$3,900	\$0	\$3,300	\$2,000	x	\$2,500	\$68,250	\$7.58
10,000		\$7,150	\$0	x \$13,900	\$0	\$0	\$0	\$0	x	\$2,500	\$91,800	\$9.18
11,000	x	\$14,300	\$500	\$6,950	\$0	\$0	\$0	\$0	x	\$2,500	\$116,050	\$10.55
12,000		\$7,150	x \$1,000	\$0	\$0	\$0	\$0	\$0	x	\$2,500	\$126,700	\$10.56

This data represents component costs for a sample mid-sized wheel loader. Although only the first 12,000 hours are shown in the example, data for the entire life of the machine must be tracked.

Equipment Executive



Managers who can coax maximum life out of major components are best able to operate within an efficient budget.

which the costs are incurred is fixed by placing an X in the appropriate column at the appropriate time (at 11,000 hours for the expected 11,000 engine life). Uncertainty over the timing of the event is expressed by spreading 25 percent of the cost to the period just ahead of the nominated period, 50 percent to the nominated period itself, and 25 percent to the period just after. Only the first 12,000 hours of the analysis are shown, but clearly, the table continues up to and beyond the expected life of the machine.

The maximum steady-state hourly cost of major component replacement for the machine can be calculated by dividing the cost of replacing each component by its expected life to determine an hourly cost for the component ($\$28,600 \div 11,000 = \2.60 per hour for the engine), and then aggregating all the hourly costs for all the components. This comes to \$14.70 per hour for the data given. We see that our average cost for the first 9,000 hours is \$7.58, or about half of the maximum steady-state value. This is due to the fact that we are living off or using up the zero-hour components "purchased" at the time we bought the machine.

The data in the table illustrate the lives and costs that can be expected for a mid-size wheel loader. *Construction Equipment* conducts component lifecycle research with contractors and material producers


to determine when most users expect to replace major components, and data for wheel loaders were published in July 2004. The values for the life of engine, transmission and hydraulic systems in the table are equal to the average of the values provided by respondents to the 2004 survey.

Survey data were also analyzed to provide the range in expected component lives cited by the central 75 percent of respondents. The graph below plots column L of the table with the component lives for the engine, transmission and hydraulic systems set at the short, average and long values given by respondents to the survey. Other component lives, and particularly the axles and brakes, remain the same in all cases.

The graph shows clearly how the hourly cost of major component replacement builds up from the low early values to numbers that approach the steady-state condition. It also, and more importantly, shows that companies that achieve the long end of the range reported by *Construction Equipment* can expect to spend \$9.75 per hour, or about \$243,000, on major-component replacement for the first 25,000 hours of the example wheel loader's life. Companies that work at the short end of the range can expect to spend \$16.80 per hour, or about \$420,000, for the same period on the same machine. The difference is significant and will, or probably has, put these companies out of business.

The difference is so big because an inability to achieve average or better component lives consumes the set of zero-hour components just as quickly as it consumes subsequent replacement components. The red line not only rises to a higher level, but it also rises more quickly. Companies that are at the short end of the reported component life range break a \$12 per hour budget within 8,000 hours; those that achieve average values get there after 17,000 hours; and the companies that achieve the long end of the reported range are able to live comfortably within a \$12 budget for in excess of 35,000 hours.

There are myriad things that can and should be done to extend component life and ensure that your fleet well exceeds the short end of the range reported by *Construction Equipment*. Operator training, skill and discipline among mechanics; preventive maintenance; lubrication; coolant selection; oil sampling; and above all, cleanliness, come readily to mind.

The payoff is clear. Your competition is doing it. Do you lead, do you follow, or do you make room for someone else? 

Join Mike for a special webcast on component lifecycle management Oct. 3. See Construction Equipment.com for more details.



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RANCO

New Komatsu Combines Technical Refinement with Nimble Dimensions

Short-tail-swing excavator is designed for compact spaces and high-tech performance

Komatsu's PC138USLC-8 hydraulic excavator has an operating-weight range from 31,107 to 32,568 pounds and uses a 92-horsepower (net) Komatsu diesel engine that is Tier-3-compliant and employs a common-rail, multi-stage-injection fuel system. The new excavator also uses a variable-capacity, piston-type hydraulic pump, which produces a flow of 64 gpm at a main-relief pressure of 5,050 psi in the implement circuit.

This power is packaged quite compactly, however, because the PC138USLC-8 has an upper-structure protrusion (over its 24-inch track shoes) at the rear of only 9.80 inches, according to Komatsu. In addition, the

Basic Specifications

Engine make/model	Komatsu/SAA4D95LE-5
Displacement (liters)	3.26
Horsepower (net)	92 @ 2,000 rpm
Hydraulic Flow (gpm)	64
Main Pressure (psi)	5,050
Operating Weight (lb.)	31,504*

* with 24-inch shoes

company has rounded the front corners of the new model's upper structure, a design element that reduces upper-structure protrusion at the left front corner to less than 12 inches, and protrusion at the right front corner to less than 4 inches. Overall width of the machine is 8.5 feet, and height to the top of the cab is 9.25 inches. Length of track-on-ground is 10.3 feet.

Complementing the unit's 15.1-foot boom are two available digging arms, a standard 8.17-foot version, and a long-reach 10.83-foot version. Maxi-

mum digging depths are 18.0 and 19.3 feet, respectively, or you can leave an 8-foot stretch of level trench at depths of 17.25 and 18.75 feet, respectively. A large selection of buckets is available, as well, ranging from 0.34 to 1.00 cubic yard. Maximum dumping heights for the two arms are 22.4 and 24.1 feet, respectively.

In the new cab, says Komatsu, the operator will be exposed to a low level of sound, about the "level of noise similar to that of a modern automobile." The quiet cab results from reducing noise at its source, coupled with such features as viscous cab mounting, sound-attenuating material around the main control valve, and a sound-attenuating partition between the cab and engine compartment. The air-conditioned cab (automatic controls allow precise regulation of temperature) is pressurized to resist dust intrusion, and a sliding convex door eases access.

A new 7-inch, thin-film-transistor, liquid-crystal-display monitor in the cab allows the operator to choose from five working modes: power, economy, lifting, breaker and attachment. Each mode is designed, says Komatsu, to match engine speed and pump speed with the application. At the right of the monitor is the "Eco-gauge," which is a vertical-bar indicator of how the operation of the machine is affecting fuel consumption. The monitor also serves as a full-color screen for images picked up by the standard rear-view camera.

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The Komatsu PC138USLC-8 can be fitted with an optional 8.5-foot blade to handle routine material-handling chores.

Truck Report

By TOM BERG, Truck Editor

Dodge's Diesel Pickups Meet 2010 Limits

The future is both under the hood and hanging on the frame

Buyers of the latest Dodge 3/4- and 1-ton pickups with the Cummins Turbo Diesel option might want to order them in shades of green, because their engines are emissions-legal not just for 2007, but for 2010 and beyond, according to Cummins. This makes the popular engine the first to meet the federal Environmental Protection Agency's upcoming limits for nitrogen oxides and particulates that will be a challenge for most other diesels in January of 2010.

The future is both under the hood, in the advanced combustion system of the 6.7-liter inline Six (otherwise known as the ISB), and hanging on the frame, in the exhaust system. There, as part of the aftertreatment system, is an "NOx adsorber catalyst," which scrubs nitrogen oxides from the exhaust and changes them to other, less objectional chemicals, including water vapor. Bill Stahl, Cummins' director of OEM service, described the system at an industry maintenance meeting earlier this year.

The NOx adsorber (that's adsorber with a 'd,' because the device accumulates the target substance on its internal surfaces rather than soaking it up, which is what happens during absorption, with a 'b') is the second of three aftertreatment devices. It's mounted between a diesel oxidation catalyst (which has been used on many exhaust systems since '02 and earlier) and a diesel particulate filter (which is new to '07-legal engines, and whose function we've described often in previous articles).

Stahl explained that exhaust gas moves from the engine and turbocharger and enters the three aftertreatment

devices in this order:

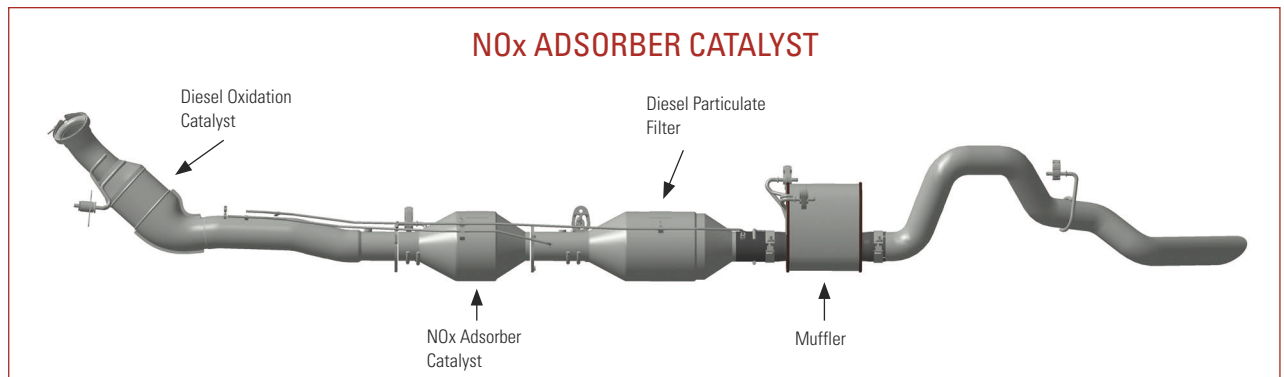
1. Oxidation catalyst, where NOx is converted to nitrogen dioxide (NO₂) and heat is generated.

2. NOx adsorber catalyst, which briefly stores the NO₂ as it's changed into carbon dioxide (a greenhouse gas, but not yet limited by EPA rules), nitrogen (the common, mostly inert gas that makes up 78% of air) and water vapor. It also generates heat needed by the...

3. Diesel particulate filter, which grabs soot that has passed through the other two devices and holds it until it's burned off. Although the particulate filter acts as a muffler, on the Dodge the cleansed exhaust also passes through a resonator, which is a small muffler that further cuts noise. The cleansed gas then leaves the tailpipe.

Regenerations occur automatically in all three aftertreatment devices, and the driver is not aware of the activity. Regens happen often, only minutes apart, separately in each device, and under different temperatures. The adsorber catalyst runs relatively cool, and in fact too much heat can damage it; this is why the NOx adsorber concept works in light-duty trucks but not in medium- or heavy-duty trucks, whose engines usually work harder and run hotter.

Regenerations are prompted by a little bit extra diesel fuel injected into the cylinders late in the combustion cycle. These "unburned hydrocarbons," as Cummins engineers call the extra fuel, react with the precious metals in the devices to generate heat and cause the chemical breakdown of pollutants. The Turbo Diesel's electronic controls manage the regen-



The exhaust system in a light-duty Dodge-Cummins Turbo Diesel has three main components versus two in other '07-legal systems. The NOx adsorber catalyst helps make the engine legal now and in 2010 and beyond.

erations, along with fuel injection, cooled exhaust-gas recirculation, turbocharger operation, and other aspects of advanced combustion, Stahl said.

Vital to the concept is use of ultra-low-sulfur diesel fuel and CJ-4 low-ash motor oil. Stahl emphasized that higher-sulfur fuel and CI-4 or earlier motor oil will subvert the work of the aftertreatment devices, and will damage and eventually ruin them. With the proper fuel and oil, the adsorber is guaranteed durable to 120,000 miles, but should go much longer, he said. The adsorber and the particulate filter should last 240,000 miles with no maintenance.

An '07-legal version of the engine, without the adsorber and with slightly less power and torque, goes in the medium-duty 3500, 4500 and 5500 Chassis Cab models (as well as the Sterling Bullet 4500 and 5500). Cummins' six-cylinder ISB, on which both Dodge diesels are based, is likewise installed in various midrange trucks without the adsorber, and



It's painted red, but is still "green": Diesels in Dodge Ram 2500 (shown) and 3500 HD pickups face comparatively light duty cycles, which allow their NOx adsorbers to function. Heavier, harder-working trucks with the Cummins ISB-based engines can't use the adsorber and will need further aftertreatment come 2010.

with more conservative power and torque ratings.

Using a cleaner-than-required diesel three years early adds virtually nothing to the light-duty Turbo Diesel's cost, at least as seen by the buyer, because the diesel option on Dodge's Ram pickups is priced at \$5,605, similar to those from competitors. Meanwhile, aside from its famous pulling ability, the Turbo Diesel gives the Dodge owner "green" bragging rights, if he wants them. And not so incidentally, Cummins earns EPA credits that can be applied to other engines and allows them to be legal with emissions slightly higher than current limits. But that's another story.

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Crawler Loader D-elivers Smoothness

Largest model in John Deere family undergoes 'modernization'

Faced with taking its largest crawler loader to Tier 3 emissions compliance, John Deere decided to take a good look at the 755C Series II model in totality.

The result is the first Deere D-Series crawler loader, incorporating an updated operator's station, new computerized functions, and a new power train driven by the charge-air-cooled, six-cylinder John Deere 6068H turbo diesel generating 181 net horsepower and meeting Tier 3 certification.

"That's emissions-related, however, it gave us an opportunity to make the kind of changes that enhance performance at the same time," says Dan Drescher, product marketing manager with John Deere Construction & Forestry. "The C-II was a good tractor, but it needed to get modernized."

The crawler loader is a machine type not exactly renowned for smoothness, but the new 755D responds with a computerized proportional power boost that makes turns "smoother than any mechanical system ever could," says Drescher.

Moving through muddy conditions, with the standard 3.14-cubic-yard bucket fully loaded, would not be an unusual scenario for this machine. "Without the power boost, it's going to lug down and turn slower and not be very responsive," says Drescher. "With the power boost, it doesn't do that anymore."

Enhancing the output of a crawler loader is not simply a matter of increasing horsepower, he says.

"One function can't overpower the other; they need to be timed. Your ground speed should match what your boom raise and lower is, for the right conditions, so the hydraulics need to match up with transmission. It looks like it's a pretty basic machine, but there are a lot of challenges there to make it perform properly," says Drescher.

"It is a balancing act. A good example is, 'How long do your tracks need to be?' We actually shortened them up a bit on this one so that you have excellent balance," he says, "but it's easier to turn, so you are a little more maneuverable."

With 101 inches of track now on the ground, the 755's center of gravity was redefined on the D-Series model, resulting in a more balanced machine when fully loaded, says Drescher. A standard 2,090-pound counterweight helps boost the 21-metric-ton 755D's tipping load to 31,597 pounds. Breakout force of 36,869 pounds represents an increase of 18 percent over the previous model.

Up top, the addition of four inches to the door width makes for easier cab entry and exit for the operator. Once inside, visibility to the bucket is clearer, and the redesigned front-mounted monitor features illuminated gauges, a high-visibility screen, and audible/visual warning lights.

It is expected that D-Series upgrades will follow for the other members of the John Deere crawler-loader family — the 130-horsepower 655C Series II and 99-horsepower 605 C models.

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Key Specs: 755D Crawler Loader

755D	
Engine	John Deere 6068H
Net Output	181 hp
Operating Weight	46,255 lb.
Breakout Force	36,869 lb.
Tipping Load	31,597 lb.
Hinge Pin Height	13'4"
Track On Ground	101"
Standard Bucket	3.14 cu. yd.
Optional Bucket	2.62 cu. yd.

Load-sensing hydraulics maximize the productivity of the new John Deere 755D crawler loader, which is operated by a single hydraulic pilot control lever.

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Market Watch Lite

By KATIE WEILER, Managing Editor

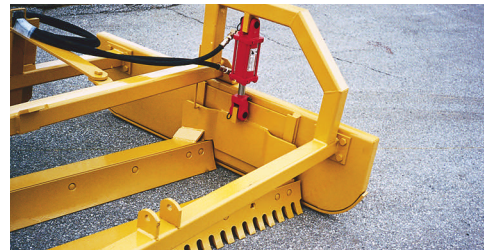
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◀ Nilfisk-Advance America

Helping maintain a dust-free environment for workers and job quality alike, the polypropylene CFM 125 industrial vacuum is particularly suited for use by concrete constructors. Large fixed rear wheels and locking swivel casters provide added maneuverability for the lightweight vacuum, which is powered by two 800-watt motors. With an oversized main filter for minimal maintenance, the CFM 125 features an external filter shaker that maintains the vacuum's suction power and filtration performance.

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▶ RoadRunner

The RoadRunner grading blade uses a serrated cutting edge that is designed to penetrate and crumble hard-packed materials. The rear blade is similar to that of a motor grader's moldboard. The RoadRunner's leveling characteristics result from its 5.5- or 6-foot skid bars, which have heat-treated wear strips. According to the manufacturer, the side panels eliminate windrows and the twin blades, operating on a slight angle, eliminate washboarding.

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▶ Ridgid

Ridge Tool has introduced its ST-33Q super-induction transmitter, which is designed to be used with Ridgid locators to trace underground pipe, cable and other metallic lines. When used in the induction mode, says the company, the ST-33Q induces at 8 kHz and 33kHz...and can provide more than eight times the current on the target utility, compared to 5- and 10-watt transmitters. The ST-33Q has six preset frequencies that can be used directly when connected to the target; end-users can also set their own frequency.

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▶ OEM Data Delivery

A new wireless "electronic diary" captures detailed information on equipment service and repair activities, be they in a shop or field environment.

The OEM DD system gathers information on the location, equipment being maintained, date and time, type of work, and the specific task or reason for the service. It also tracks the disposition, from staging, through work-in-process, to completion. The system provides equipment managers with the intelligence and analytics for understanding what tasks take the most time, and what equipment breaks down most often.

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▶ DeWalt

The new range of DeWalt generators — models DG3000, DG4400B, DG6300B and DG7000B — have maximum AC outputs (in watts) that match their model designations, and rated outputs, respectively, of 2920, 4180, 5950 and 6550 watts. Each uses the new DeWalt commercial-grade engine, which features electronic ignition and low-oil shutdown. The brushless alternator is designed to deliver 25 percent more surge watts, allowing the starting of high-current tools. An optional, 18-volt cordless starting system is available.

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Keytroller

The Start-Smart keyless ignition system replaces the ignition key with a "virtually indestructible" metal piezo (pressure-sensitive) keypad. To start the vehicle, enter the proper code, and if the panel flashes green, indicating the code is accepted, push the start button. Press the stop button to shut down the engine. The system is available also in an anti-theft version.

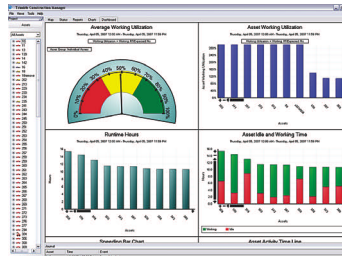
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Market Watch Lite

Protecta

Using lighter-weight hardware and built-in padding for a lighter and more comfortable wear, Protecta has redesigned the Pro harness product line. Protecta, a Capital Safety company, includes impact indicators as standard, informing the worker if the harness has arrested a fall. Label covers completely encase the harness labels and increase the life of the product. Protecta Pro harnesses meet various global standards, including ANSI and OSHA for the United States, CSA for Canada, and CE for Europe.

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Trimble

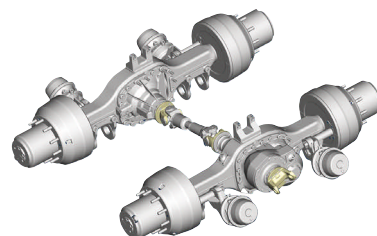
Construction Manager version 1.9 features charts and a dashboard view. New features enable users to identify underutilized equipment with bar charts displaying such data as actual hours worked compared to expected hours and work time compared to idle time. Also included in the new version is a detailed utilization report and maintenance alerts. Software package addresses management areas such as utilization, safety, theft recovery and overall equipment operations.

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ArvinMeritor

Light weight, high ground clearance, and proven design are claimed for a "global" family of high-capacity hub-reduction axles being brought to North America early this summer. The axles offer a wide ratio range as well as a host of suspension adaptations and brake offerings. They feature fabricated housings, which help save up to 600 pounds, depending on model; streamlined carriers for increased ground clearance; and four-planet, hub-reduction gear design used in European applications, with ratios of 3.61 to 7.2. Single axles are rated at 26,000 to 35,000 pounds GVW, and tandems are rated at 52,000 to 70,000 pounds.

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Lincoln Electric

The X-Tractor 1GC is a portable, high-vacuum, welding-fume-extraction system that is designed to reduce welding dust, smoke and fumes in the work environment. The X-Tractor, designed to filter contaminated air and return it to the work area, weighs just 37 pounds. The new system adapts to various welding applications, says the company, including stick, TIG, MIG and flux-cored.

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Topcon

Topcon has added two systems to its 2D excavating control solutions: 2DXi and 2DXe. 2DXi for excavators includes GX-60 touch screen graphical display and four 360-degree tilt sensor all connected via a CANBus configuration. 2DXe system is for excavators and backhoes for use in applications where basic indicate control is all that is needed. The system has four tilt sensors and GX-40 graphical display.

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Bridgestone Firestone

With two new sizes of DuraForce tires specifically for the front axles of backhoe-loaders, more equipment owners can make the switch from bias to radial tires. The new radial tires increase forward and reverse traction by up to 18 percent, says the company. Other benefits include increased tire life of up to 33 percent and a noise-treated tread design that reduces cab noise and road vibration.

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ConocoPhillips

Kendall GT-1 and 76 Super synthetic blend diesel engine oils have been upgraded to API CJ-4 quality. Lubricants are for use in diesels of light trucks. API CJ-4 standard meets lubrication requirements of engines compliant with EPA 2007 emissions standards. The lube is formulated to protect against engine wear, disperse soot, and maintain viscosity control of soot-laden oil, the company says.

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Triton

Offering quiet operation to 62 db, Triton Power's H-Series generator sets range from 20 to 565 kilowatts in output, powered by Perkins diesel engines. Available in both open configurations and in sound-attenuated enclosures with industrial-grade powder-coated paint, the H-Series generator sets feature aluminum hardware to withstand heavy-duty use and extreme weather, and rounded corners for a sleek look and safety.

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Daniel Manufacturing

Designed for compact excavators and backhoe-loaders, the Exca-Beak grapple system is ideal for demolition, hardscaping, feeding chippers, concrete tear-out and more. According to the company, the Exca-Beak al-

lows full operating range of the bucket without the limitations of a thumb. It is available in popular quick-tatch styles and in pin-on configuration.

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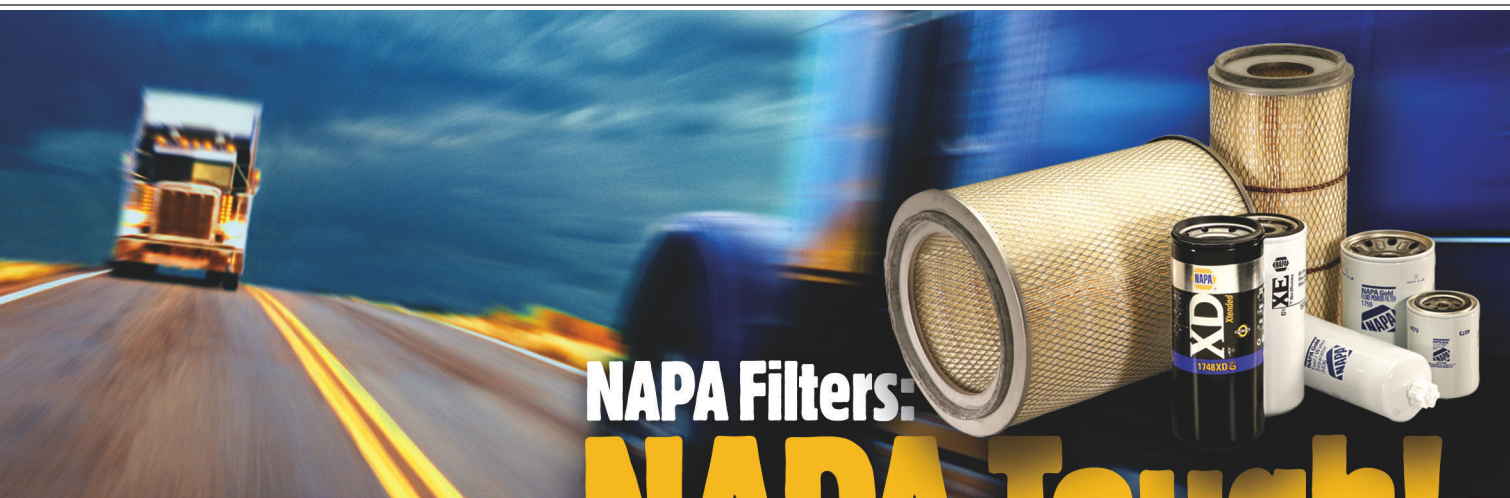


Kold-Ban International

A portable, self-powered fluid injection system by KBI, the NVT Porta Pack can start diesel engines ranging in displacement from 20 to 200 liters.

Starting fluid is injected into the engine's air-intake system with a 36-inch stainless-steel injection probe, secured to the equipment by magnetic stanchions. The injection probe is connected to KBI's Dieselmatic NVT starting fluid system via 60 inches of flexible stainless-steel braided tubing.

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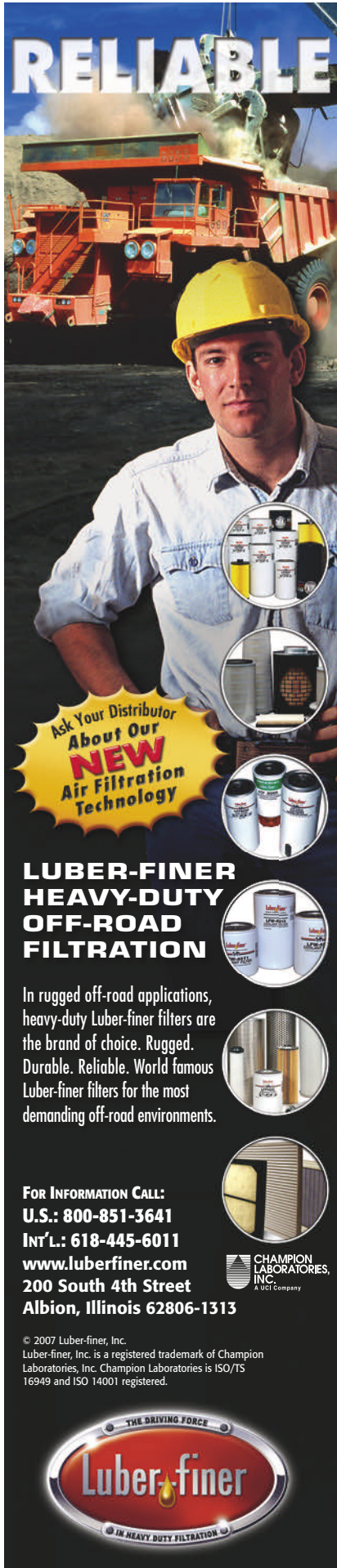
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Market Watch Lite

Caterpillar

The AS2302 Vers-A-Mat screed is a hydraulically extendible model that provides paving widths from 10 to 18 feet. With optional bolt-on extensions, paving width can be extended to 22 feet, or with optional cut-off shoes, paving width can be reduced to 8 feet. According to Cat, the new screed features narrow front-mounted extenders, electrically heated screed plates, and new end gates. Optional equipment includes a "power berm" that creates a curb 12 or 18 inches wide with heights that vary to 6 inches.

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Kaeser Compressors

The M270 portable compressor uses a Mercedes Benz engine and produces 950 cfm at 100 psig, and can produce optional pressures to 200 psig. A galvanized-steel enclosure is designed to protect components and to reduce sound levels, and large foldout doors provide easy



access to routine service points. Optional after-cooler/filter packages are aimed at increasing compressed-air quality.

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Knaack

Jobmaster Model 100 rolling cabinet has seven 6-inch swivel casters and one 6-inch rigid caster to allow one person to maneuver it. Each front caster wheel has a brake for securing the cabinet when open. Shelves are 14 inches deep and are welded in place. Made of 16-gauge steel, the cabinet has a load capacity of 1,200 pounds.

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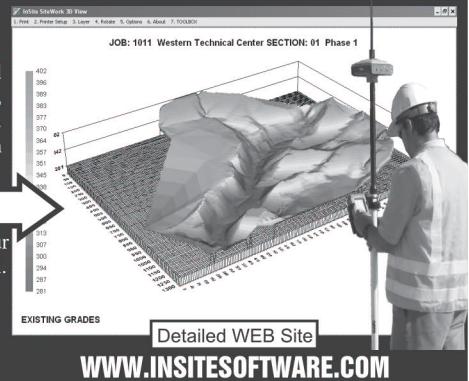
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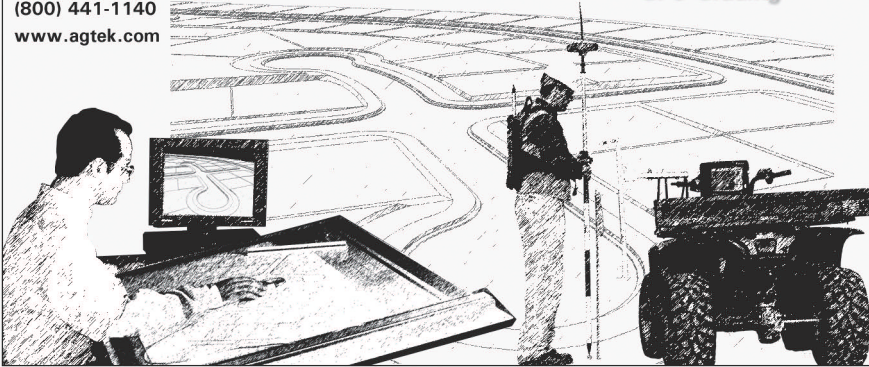
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Michigan Elevating Scraper

Clark Equipment Co. pioneered a line of motor scrapers, including elevating types, to complement its well-known line of wheel loaders



Michigan scrapers were initially sold in three basic sizes: models 110, 210 and 310 with 10-, 18- and 27-cubic-yard heaped capacities.

cock Manufacturing, a pioneer of this type of machine. The following year, Clark purchased Hancock and subsequently developed elevating versions for its entire Michigan scraper line.

The Michigan 110-15 was a 15-yard-capacity elevating scraper based on the 110 tractor furnished with a 225-flywheel-horsepower GM 6V-71T engine. The Michigan drive train included a single-stage torque converter with lockup and power-shift transmission giving nine forward and two reverse speeds. A top speed of 32 mph was quoted. The tractor unit featured the Michigan "Hydra-ride" suspension system installed between the drive axle and the tractor frame to isolate the driver from rough ground conditions. It consisted of a hydraulic cylinder mounted above each front wheel assembly with controlled pressure to absorb shocks. With a full rated load of 36,000 pounds, the tractor-scraper unit tipped the scales at 82,360 pounds.

The 110-15 elevator was driven by a hydrostatic motor positioned at the lower end of the elevator just above the cutting edge. It drove both sides of the elevator chains through a planetary axle, and allowed the operator to select the most appropriate speed to suit the material being excavated. Positioning the elevator drive closest to the ground where digging resistance is greatest helped to prolong the life of the drive chains and sprockets.

In 1981, Clark-Michigan discontinued its scraper production because of dwindling sales and concentrated on its line of wheel loaders. Then in 1985, Clark-Michigan became part of the Swedish-led VME (Volvo Michigan Euclid) Group N.V. Gradually, the Michigan loader models were phased out or merged into Volvo's Swedish-designed L-series loader line. Finally the Michigan name disappeared after a reign of more than three decades.

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In the mid-1950s, before the advent of articulated dump trucks and before hydraulic excavators reached maturity, scrapers were one of the most popular ways to move earth over mid-range distances. Clark Equipment Co., with its famous Michigan-brand wheel loaders established since 1954, launched its first motor scrapers in 1957.

The Michigan scrapers competed for a share of the rapidly expanding scraper market dominated by the likes of Caterpillar, Euclid and Wabco, who themselves had only seriously been in the motor-scraper market for less than a decade. Designed in-house, the scrapers were initially sold in three basic sizes: models 110, 210 and 310 with 10-, 18- and 27-cubic-yard heaped capacities. Except for an unsuccessful larger 410 model (heaped capacity of 44 cubic yards) sold between 1964 and 1970, Clark-Michigan's subsequent upgraded models and new introductions through the 1960s and 1970s were derivatives or variations from these three basic models.

In the 1960s, elevating scrapers became popular, although they had been around since the mid-1950s. Clark-Michigan introduced its first elevating scraper in 1965 by attaching one of its prime movers to a scraper designed and built by Han-

1

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October 3, 2007 1:00 pm CST

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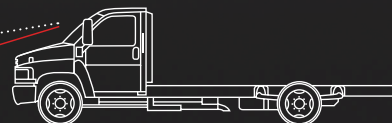


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