

This month's editorial focus is on construction-vehicle technology.

by David Alexander

Wirtgen reclaims the road

The new WR 2500 S road reclaimer and soil stabilizer from **Wirtgen** America, Inc. is a successor to the Model WR 2500. The "S" in the WR 2500 S stands for "Super," because the WR 2500 S is a beefed-up, higher-performance version of the existing WR 2500, according to Wirtgen.

In addition to its performance as a full-depth base recycler of failed road pavements and a soil and base stabilizer, the machine can be adapted for other uses. Like its predecessor, the WR 2500 S can be used to make a foamed asphalt-stabilized base, with significant savings and base performance improvements for the owner and contractor.



The Wirtgen WR 2500 S road reclaimer from Wirtgen America features an upgraded Mercedes V12 diesel engine.



After the engine is mounted on its frame with pumps and radiator fitted, the entire WR 2500 S stabilizer chassis is lowered into place.

One key improvement of the WR 2500 S over the WR 2500, is the upgraded powerplant. A new fuel-injection system in the V12 **Mercedes** OM 44 LA diesel engine boosts engine power from 455 to 500 kW (610 to 670 hp). The fully electronic engine-management system ensures maximum torque stability. The engine now meets **EPA** Tier II and European Level 2 exhaust emission regulations.

Cooling air routing has been reversed, improving cooling performance and operator comfort, as well as lowering ambient particulate levels. The engine is now located in an enclosed compartment, with exhaust emissions redirected toward the rear of the machine and away from groundsmen. A new dual-cyclonic air precleaner should result in an extended service life for the air filtration system.

The operator's compartment has a larger air-conditioning capacity, with increased visibility despite a reduced glass surface area, and now features a second seat. The control panel has been redesigned to include a height-adjustable, multi-function computer graphics display that helps the operator visualize and control functions such as steering, drum door position, and the emulsion injection system. The work lighting has been placed in a bar integrated with the compartment roof for cleaner and safer performance.

The two-frame design allows the WR 2500 S to retain the very important "floating hood" concept, allowing an expanded volume of material to pass freely through the recycling process without creating a friction brake effect on the cutter and cutter drive components. The cutting rotor measures 20 x 96 in (510 x 2440 mm).

Material size is controlled by using hydraulically adjustable, manganese-lined breaker bars that can be remotely adjusted by the machine operator to tighten or close down the area between the rotating cutter and the impact bars, a scheme used for decades by the aggregate crushing industry.

The cutter drum has been redesigned to include bolt-on end rings, which are easier to service. The reinforced cutter drum housing includes multiple wear plate inserts to minimize deterioration. The Type III holder system allows quick and easy replacement of broken or worn-out cutter bit tool holders without the inconvenience and added cost of a cutting torch and welder. Two workers can carry out drum rebuilding in one day without removing the cutter.



Zero house swing excavator from Bobcat

Bobcat Co., a business unit of **Ingersoll-Rand**, has introduced its new ZHS (zero house swing) series compact hydraulic excavators. The Bobcat 430 and 435 models are the first to feature ZHS and the FastTrack drive system, an all-hydrostatic drive system that works like that of a skid-steer loader. Equipped with separate piston pumps and high-torque drive motors to power the left and right tracks, the FastTrack system provides improved torque control for dozing, smoother turns under load, and more gradual turns on surfaces like asphalt and concrete.

To achieve ZHS, Bobcat started with a zero tail swing (ZTS) excavator. On most ZTS compact excavators, the tail of the machine does not extend beyond the width of the undercarriage when slewing the machine, but the right and left front corners often extend beyond the track footprint as the house rotates. The ZHS design eliminates this overhang, allowing the excavator house to remain within the outside edges of the tracks, giving operators 320° of unrestricted motion.

The ZHS design gives contractors a greater range of house rotation when working in tight quarters, but according to Bobcat, even with the cab height of the 430 under 8 ft (2.4 m), the new excavators do not sacrifice cab room. Access to service and maintenance items does not suffer either, and with swing-open tail gates and right-side access doors for hydraulic components, the ZHS machines are as easy to service as Bobcat's conventional excavators.



The Bobcat 430 compact excavator has zero house swing and can travel at up to 5 mph (8 km/h).



A direct-injection, turbocharged Kubota engine delivering 43 hp (32 kW) powers the Bobcat 430 ZHS excavator.

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The Bobcat ZHS series excavators feature improved dual-blade cylinders mounted on each side of the backfill blade, reducing the amount of dirt and debris that can build up on the top of the blade structure. The arm has also been redesigned so that hydraulic hoses are now routed within the structure to improve protection from snagging and other damage.

The Bobcat 430 compact excavator has an operating mass of 8025 lb (3640 kg) with a digging depth of over 10 ft (3 m). Powered by a 43-hp (32-kW) **Kubota** diesel engine, it has a low-range travel speed of 2.6 mph (4.2 km/h), a high-range speed of 5.0 mph (8.0 km/h), and exerts only 4.1 psi (28 kPa) of ground pressure. The 430 has a hydraulic pump capacity of 24 gal/m (91 L/m) with an auxiliary flow of 16.4 gal/m (62 L/m). It will deliver an arm breakout force of 4000 lb (17.8 kN) and a bucket breakout force of 7000 lb (31.1 kN). Operators can equip the 430 with an optional long-arm, giving 11 in

(280 mm) of extra reach, which can save time when loading trucks, cleaning ditches, or doing shallow excavating.

The 435 model is equipped with a 49-hp (36-kW) Kubota turbocharged diesel engine and can travel at 2.8 mph (4.5 km/h) in low range and 5.4 mph (8.7 km/h) in high range. It has an operating mass of 10,555 lb (4790 kg) with a digging depth of 11.2 ft (3.4 m), arm breakout force of 5625 lb (25 kN), and bucket breakout force of 7890 lb (35.1 kN). Auxiliary hydraulic flow is 19.8 gal/m (75 L/m).

Standard features on the ZHS series compact excavators include dozer blade with float feature, four-post TOPS/ROPS (Tip Over Protective Structure/Roll Over Protective Structure) canopy, high-back suspension seat, rubber tracks, and the Bobcat X-Change attachment mounting system. Operators also have the option of adding a cab with heat and air conditioning, keyless start security system, and steel tracks.

Self-loading concrete mixer from AUSA

The 1100 RMX self-loading concrete mixer from AUSA can discharge 1 m³ (1.3 yd³) of freshly mixed concrete in only 15 s.



Spanish company **AUSA** (Automóviles Utilitarios S.A.) claims to be the biggest manufacturer in the world of automatic cement mixers with a capacity of up to 1 m³ (1.3 yd³). Its latest product is the 1100 RMX self-loading concrete mixer that replaces the existing model 1000.

The new mixer is somewhat bigger and has an advanced cabin design to provide a better view of the terrain and the concrete-making process. "All the potential user requirements for this type of equipment have been studied in depth," said Jonathan Fenoy, Project Manager for the 1100 at AUSA.

The production drum has been improved for faster unloading time, which contributes to improved concrete quality. The new machine can discharge 1 m³ (1.3 yd³) in only 15 s.

AUSA has subsidiaries in France, UK, Germany, China, and the U.S.

Vermeer technology goes to waste

Building on nearly a decade of grinder research and development, **Vermeer** Manufacturing Co. has introduced its next generation of organic waste recycling equipment with the HG6000 horizontal grinder. First in a new series of grinders, the HG6000 features solutions for large-scale reduction and recycling of green waste and storm debris.

Two engine options are available on the HG6000. The 525 hp (391 kW) and 630 hp (470 kW) C15/C16 Tier II **Caterpillar**



The Vermeer HG6000 horizontal grinder features a top-loading millbox and a removable anvil design.



Power for the Vermeer HG6000 comes from Caterpillar Tier II C15 (shown) or C16 diesel engines.

units deliver the power and force needed to operate the wide-block hammermill that breaks down organic waste, including hardwood, regrind, and pallets.

High-strength and lightweight aluminum wheels with 385/6SR22.5 radial tires provide on-site mobility and good ground clearance. Available with standard tow hooks, the HG6000



has been equipped to handle an optional fifth-wheel towing configuration so that it can be transported by a variety of towing vehicles.

The HG6000's innovative anvil design allows for convenient removal for maintenance and/or replacement, decreasing service time and making it possible for all anvil work to be performed outside of the machine. For easy maintenance, the entire millbox lid opens from the top of the machine, allowing the operator to remove or change a screen quicker than on side-accessing units.

The grinder removes ground material with the combination of a 4 x 13.3 ft (1.2 x 4.1 m) belly conveyor and a discharge conveyor that is 2.5 x 30.5 ft (0.76 x 9.3 m). At 17 ft (5.2 m) high, the discharge conveyor provides sufficient clearance for loading vehicles.

The horizontal grinder also features the patented Vermeer duplex drum system, which offers optimum cutting performance with reduced maintenance. Hammer wear is reduced due to the protection provided by the drum skin, and both hammers and cutter blocks are reversible, which nearly doubles the life of the hammers.

The HG6000 has been designed with a standard microprocessor-controlled hydraulic PTO from **PT Tech**, which handles transfer of power and torque from the engine to the mill, and maximizes driveline efficiency. The microprocessor-controlled starting sequence permits equipment start up with the push of a button, eliminating the need for an operator to bump the clutch, which reduces clutch failure possibilities on start-up.

The HG6000 also incorporates the patent-pending SmartGrind system. This electronic controller monitors engine speed and material feed rates. The function also stops and reverses material feeding into the hammermill when engine rpms drop below the efficient operating range.

The HG6000 has been equipped with a 36-in (914-mm) diameter hydraulic floating feed roller that can apply constant down pressure on various sized materials. The operator can also reverse the feed roller independent of the feed table to position irregular material as it enters the hammermill.

The high-capacity infeed system features an open-ended chain and slat feed table that allows the grinder to accept longer material, minimizing material preparation time for greater productivity. Equipped with impact-resistant slats, the solid floor design provides continuous support of the infeed chain, extending wear life and

reducing maintenance. The dimensions of the fully supported feed table are 5 x 20 ft (1.5 x 6.1 m).

The HG6000 has been engineered with centrally located controls reducing the amount of time necessary for an operator to become acquainted with machine functions. The standard non-tethered radio remote control allows the operator to run six different machine functions away from the machine or in the material loader.

Like all Vermeer horizontal grinders, the HG6000 features a thrown-object deflector, which reduces the quantity and distance of thrown material, contributing to a safe work environment.

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Volvo's new narrow excavator

Volvo Construction Equipment has launched a new version of its EC210B LC excavator, the EC210B NLC. The excavator has a transport width of just 2.54 m (8.3 ft) and was designed for markets where access to job sites is difficult, such as in mountainous areas.

The superstructure width has been reduced from 2.70 to 2.54 m (8.9 to 8.3 ft) compared to the EC210B LC by reducing the size of the fuel tank, hydraulic oil tank, and the battery compartment, as well as by adding a narrower but heavier counterweight. On the undercarriage the heavy welded X-frame has been made narrower. All the remaining major components such as the

torque, powerful digging forces, and fast digging and slewing speeds. Hydraulic working pressure is 324 bar (1550 psi).

The B-series cab incorporates features that ensure operator comfort and convenience. The seat and joystick control consoles can be adjusted independently to conform to an individual operator's requirements. The cab also has electronic climate control as standard. An expanded window area with a thin crossbar and a large window-wiping area with parallel working wipers contribute to good visibility.

Additional cab features include



The Volvo EC210B NLC excavator has a transport width of 2.54 m (8.3 ft) for easier access to hard-to-reach job sites.

cab, hydraulic pumps, main control valve, coolers, swing motor, track frames, and track motors are unchanged. The 5.7-L six-cylinder Volvo D6D EFE2 low-emissions engine (EU Step 2 and EPA Tier II) produces 107 kW (143 hp) at 1900 rpm.

Thanks to a counterweight that weighs 600 kg (1320 lb) more than that on the standard EC210B machine—as well as one of the longest undercarriages on the market—the new unit is heavier and has a better lifting capacity than any excavator in its class, according to Volvo.

Like other Volvo B-series excavators, the EC210B NLC has a hydraulic system designed to function with precision and minimum of operator effort. To achieve maximum efficiency on a full range of job applications, the system comes with four work modes that respond automatically to the operator's joystick movements.

A boom, arm, and slew priority system, boom flow-regeneration, and two variable-displacement piston pumps deliver the machine's performance and provide high slewing

shock-reducing mounts and sound-absorbing material, an additional rear-view mirror with extended viewing area, and extra storage space behind the seat. The pressurized cab and state-of-the-art ventilation system also provide a comfortable and clean operating environment.

Service Contronic is a portable handheld unit available with the B-Series that minimizes the time spent troubleshooting faults. Operational data is presented in the machine tracking system (MATRIS), which provides details of all fault tracking and information on service requirements. VCADS Pro (Volvo Computer Aided Diagnostic System Professional) allows the machine functions to be tested and changed to specific working conditions.

The B-series also features a new generation of electrical/electronic controls known as Contronics. This system precisely balances available engine power with hydraulic output for maximum performance.

Elkin mixes on the job

Custom-designed **Elkin** mobile concrete mixers transport sand, aggregate, water, and cement out to the jobsite where they are properly batched and mixed at the point of delivery to exact specifications. Elkin's system enables the operator to adjust precise amounts of each ingredient to ensure the specified end result. Raw materials drop through the mixing bowl to the mixing auger, which includes a number of innovative and patented features that result in both increased productivity and a thoroughly blended mix. The auger flighting is notched to permit the backflow that aids the mixing process. These notched flights, combined with the pitch and speed of the hydraulically driven auger, ensure a thoroughly blended mix.

The auger is housed in a trough made of high-strength, two-ply rubber, which conforms to the auger, preventing wear and damage to the system while optimizing productivity. The adjustable auger bearing and trough adjustment rods that provide up and down movement of the auger—and in and out positioning of the trough—are patented.

Elkin mobile mixers are custom designed and sized to fit either existing or new truck chassis as specified by the customer. They are available in a wide range of rear-discharge, front-discharge, and trailer or skid-mounted configurations with capacities from 1 to 10+ yd³ (0.75 to 7.5+ m³) and hourly productivity rates up to 60+ yd³ (46+ m³).



The Elkin mobile concrete mixer carries sand and stone in open bins. Cement is carried in a closed, watertight bin behind the aggregates, and water in a tank at the front.



Elkin mobile mixers are custom designed and sized to fit either existing or new truck chassis and are available in a wide range of rear-discharge, front-discharge, and trailer or skid-mounted configurations.

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Caterpillar makes the grade

Three **Caterpillar** G-Series small track-type tractors—the D3G, D4G, and D5G—are now equipped with **EPA** Tier 2 and CE Stage II emissions-certified Cat 3046 turbocharged diesel engines. With the new engine, the D5G produces 90 hp (67 kW) at the flywheel. The D4G and D3G, previously not available with turbocharged engines, offer net power of 80 hp (60 kW) and 70 hp (52 kW), respectively.

Along with the new turbocharged engine, additional standard equipment on the tractors includes two heavy-duty, 12-V 900 CCA batteries; a turbine-type precleaner; a 110-A alternator for longer life; an air intake heater for easier cold-weather starting; and a comfort-adjustable suspension seat.

The updated G-Series models are available with the Caterpillar AccuGrade laser grade-control system as a factory-installed feature (see “Smooth Operation” on page 25). This earthmoving tool uses laser technology to allow operators to fine grade with increased accuracy without the use of traditional stakes or grade checkers.



The Caterpillar G-Series tractors are designed for construction applications requiring maneuverability and controllability when dozing, grading, cutting ditches, backfilling ditches, spreading fill, and landscaping.

A rotating laser transmitter is mounted on a tripod or trailer high enough for the laser beam to rotate unobstructed above the tractors. Laser receivers mounted on masts attached to the dozer blade detect the laser beam and measure the deviation from finish grade. A dual-receiver system controls both blade lift and tilt. A single receiver system is used to control just blade height.

Electric masts allow the machine operator to adjust the height of the receivers from the driving seat, so the operator can finish building pads of varying elevations without getting off the machine to reset the receivers or laser transmitter. Because the transmitter emits a 360° beam, it creates a grade reference over the entire work area, and multiple machines can use it.

The AccuGrade system is designed for earthmoving applications requiring tight tolerances. It is suitable for fine grading and can provide flat, single, or dual-slope surfaces within 6 mm (0.24 in) of grade. Using an in-cab display, operators can select either automatic or manual operating modes. The display shows the blade's position relative to grade and indicates the need to cut or fill as the tractor moves over the work area.

Also available as a factory option is the Caterpillar Product Link system. Using global positioning satellite technology and the Internet, the system automatically generates machine data and sends it to the owner via the Caterpillar dealer storefront. Product Link provides up-to-date information on such items as machine location, hours, and machine health. It helps owners to achieve lower operating costs through timely service and repairs, and optimize fleet use.

The new models are also available with a factory-installed Machine Security System that inhibits unauthorized machine use by immobilizing vital electrical circuits. Owners can set time parameters for machine use. To operate outside those limits, a special key is needed to start the machine.

Each G-Series tractor incorporates an improved transmission control system for simpler operation and smooth, precise control. A single joystick controls speed, direction, and steering. The joystick has three detented positions for travel: forward, neutral, and reverse. Two joystick-mounted buttons are used to increase or decrease speed. The dual-path, closed-loop hydrostatic drive system provides infinitely variable speed up to 5.6 mph (9.0 km/h) forward and 6.0 mph (9.6 km/h) reverse.



An optional feature on all Caterpillar track-type tractors is the AccuGrade system, which features laser receivers mounted on the blade. An off-board transmitter emits a 360° reference beam, and the receiver can automatically control the machine's hydraulic system to adjust blade lift and tilt as the machine moves over the area.

Moving the joystick left or right turns the tractor. Regardless of ground conditions, steering is consistent and predictable, according to Caterpillar. Moving the joystick all the way to the right or left counter-rotates the tracks for maneuvering in very tight places or for adjusting steering when the blade encounters high side or corner loads. The control system also enables the operator to adjust tractor position easily when working on side slopes.

Longer oil and filter change intervals and easier maintenance result in better machine availability and lower operating costs for the G-Series tractors. Left- and right-side access doors put many maintenance items within easy reach. The radiator and the transmission cooler are now side by side for easier maintenance. All hydraulic pressure taps now are located in one bank. Comprehensive onboard diagnostics speed up troubleshooting.

Two undercarriage configurations are offered—the XL with extended length roller frame, and the LGP (low ground pressure). Each G-Series tractor is equipped with a variable pitch, power angle, and tilt blade for versatility.

The G-Series tractors range in mass from the D3G XL at 16,230 lb (7360 kg) to the D5G LGP at 20,430 lb (9270 kg). Blade capacities range from 1.88 to 3.06 yd³ (1.44 to 2.34 m³).



Advanced line of wideners from Midland

The Millennium line has numerous upgrades and additions to the original range of **Midland** self-propelled wideners and widener attachments. The new line of wideners includes both single- and double-sided, self-propelled road wideners available in 8- and 10-ft (2.4- and 3-m) paving widths. The double-sided discharge models provide productivity and safety for working on divided highways and ramps.

The Millennium product line enhancements for the self-propelled machines include curved spreader blade sections for

changes include additional bracing to handle the more rigorous demands of today's paving operations, and a pre-wired, 50-wire cable harness, ready to accept options such as lights, brooms, beacons, hydraulic push rollers, and washdown equipment.

One final addition to the self-propelled machines is a neutral-start safety switch that disables the starting system when the conveyor belt is engaged, reducing the chance of belt accidents in and around the discharge system.



Midland's Millennium wideners include curved spreader blade sections for added strength and smoother finishes during placement of material.

added strength and smoother finishes during placement of material, a high mast provided for improved stability, and an adjustable outside edger plate that gives better control and stability at the outside edge of the widener while preventing grade irregularities. Midland has also added a new, dual-direction roller chain that enables all machines to change the discharge direction of the material from right to left without the need to reconfigure the conveyor system.

In addition, a new 2-ft (0.6-m) hydraulic cylinder extension combined with a 1-ft (0.3-m) blade extension offers increased versatility and productivity over a wide range of applications. A flexible inside edger plate makes for easier loading and unloading of the machine. Similar upgrades are now included on Midland's line of widener attachments. The attachment line is designed to mount quickly and easily to a wide range of backhoe-loader, grader, and paver brands.

Some additional changes to the self-propelled wideners include a bigger, heavy-duty axle on all 8- and 10-ft (2.4- and 3-m) models. The new axle improves mobility to complement the trend toward larger paving demands. Other

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Komatsu wheels out a new loader

Adding to its line of hydrostatically driven wheel loaders, **Komatsu America Corp.** has introduced the new WA320-5, designed to handle a wide variety of applications in government, utility, construction, sewer, waste, and agricultural markets. According to Komatsu, this machine includes product improvements resulting in increased production, operator comfort, versatility, and reliability.

Powered by a turbo-charged Komatsu SAA6D102E-2-A air-to-air aftercooled engine, the WA320-5 has a net output of 166 hp (124 kW) and fully complies with Tier II regulations.

The WA320-5 incorporates an electronically controlled hydrostatic transmission (HST) with a variable-shift control system. The HST allocates only as much power as is needed for a given application, helping to provide accurate operation. The variable shift control switch lets the operator set a maximum speed anywhere from 0 to 8.1 mph (0 to 13 km/h) for a better match to hydraulic speed in applications such as tight V-cycle truck loading.



The WA320-5 wheel loader from Komatsu has a turbocharged diesel engine that produces 166 hp (124 kW), and features an electronically controlled hydrostatic transmission.

The traction control system is designed to reduce tire slippage in certain applications when the loader is working in sandy or wet conditions. Turning on the traction control switch automatically reduces tractive effort by 50%, thus reducing tire slippage.

The fully hydraulic braking system eliminates problems such as freezing and rusting caused by water condensation encountered in air-operated systems. Daily, time-consuming air tank draining is also eliminated. The wet disc service and parking brakes are fully sealed to lock out contaminants.

The WA320-5's new operator's cab provides a comfortable work environment designed to maintain high operator productivity. The cab is 5% larger than previous models, providing more leg room and storage space. The viscous damping mount system helps to minimize noise, shock, and vibration in rough working conditions. The pressurized cab reduces noise levels to 70 db(A), and keeps dust and other particles from the cab's interior. Additional features include sloped entry steps and improved handrails; new doors and platforms for easy maneuvering in and out of the machine; and a low effort, mono-lever hydraulic system with a forward/neutral/reverse control switch.

Komatsu has designed the WA320-5 to include its Equipment Management Monitoring System (EMMS) that keeps the operator informed of 28 machine functions and helps prevent costly breakdowns and failures before they happen. Located behind the steering wheel in the operator's field of view, EMMS is just one of several new maintenance and service features on the WA320-5 that include full side-opening gull-wing doors for easy engine access, improved drive shaft seals for extended greasing intervals, 500-h oil and filter service intervals, sealed connectors that are resistant to dust and corrosion, and fewer moving parts and service points.


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Circle 238

Sakai gets small for big compaction

Sakai America, Inc. has introduced a small soil compactor with big compactor features. The new roller—the SV201TB—is capable of developing 400 lb/in (70 N/mm) of total applied force over its 54-in (1370-mm) wide padfoot drum. This compaction capability, combined with many other features, enables rapid compaction of cohesive silts and clays on slopes up to 45%, and over any materials compromised by moist conditions.

In addition, the SV201TB is a padfoot compactor that speeds compaction of fine materials while aiding traction over any terrain or material condition. Drive at the drum, as well as at the wheels, adds to its rough terrain and slope capabilities. Center-point articulated steering enables the machine to maneuver up close to foundations, walls, footings, and pipe placements. A strike-off blade provides trench backfilling and rough grading without the need for additional equipment or labor.

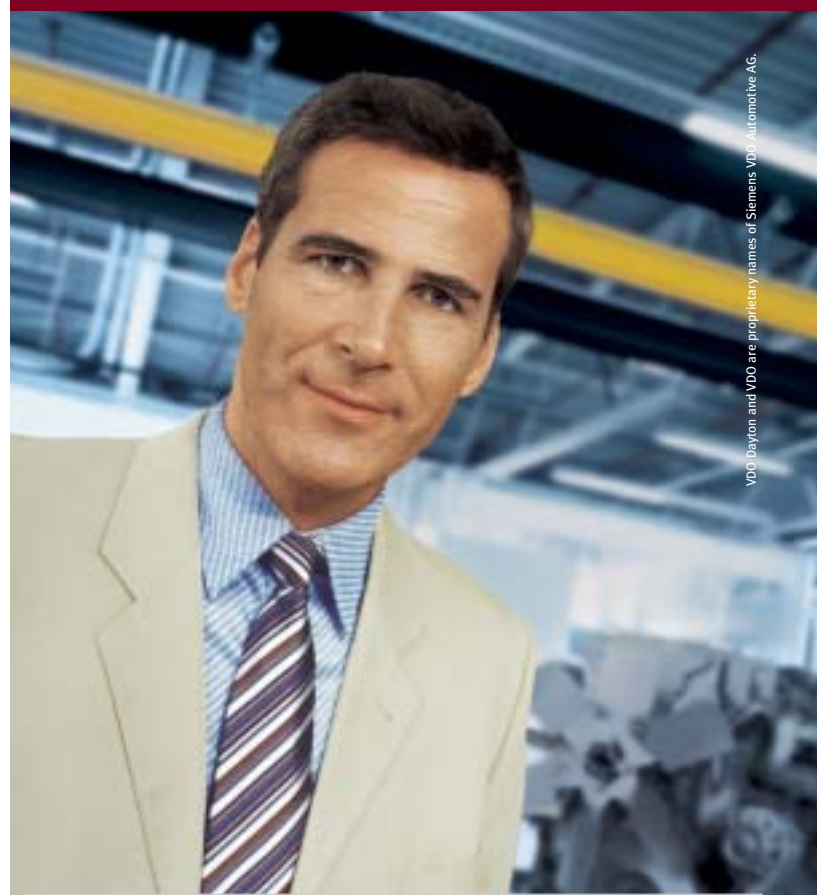


The Sakai SV201TB soil compactor is powered by a Cummins diesel engine that delivers 60 hp (45 kW).

Sakai's custom-designed shock isolation systems reduce the transmission of vibration back to the operator and critical components. A series of custom-designed shock isolators suspend each massive drum assembly within its frame, permitting the drum to vibrate while directing the vibrations down into the material, and at the same time isolating these vibrations from the machine components and the operator.

Powered by a fuel-efficient 60-hp (45-kW) **Cummins** B3.3C liquid-cooled diesel engine that puts out 60 hp (45 kW), the SV201TB is able to achieve compaction quickly and easily on smaller jobs regardless of jobsite terrain or conditions. Other reliability features include the same heavy-duty oscillation/articulation joint design as that of the larger SV400 and SV510 Series, which provides the necessary oscillation to ensure full drum contact with the material even over rough terrain. The SV201 Series is designed for low maintenance at 250-h intervals.

A Roll Over Protection System and seatbelts are included as standard equipment on all rollers marketed in North America.



VDO, Dayton and VDO are proprietary names of Siemens VDO Automotive AG.

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