

Introducing the new

VOLVO VNL



TOP
TEN
STORIES

A bigger deal

SAVE UP TO 7.5% FUEL

THE GREAT SHIFT

THE WORLD'S
SAFEST VOLVO

TRUCKSPOTTING 24/7

*The best thing that's happened
to sleep since pillows*





The shape of trucks to come

You recognize big change when you see it. The new Volvo VNL looks fast even when it's standing still. On the road, aerodynamics and turbo compounding helps to save up to 7.5% more fuel.

Inside, drivers will notice remarkably better work and living spaces. A new 70-inch sleeper featuring a reclining bunk and telescopic ladder. An innovative, one-of-a-kind steering wheel, a high-end infotainment system and the most ergonomic seats on the road. All combined with improved uptime services and even more safety features to keep drivers on the road.

[Read the Top Ten Stories](#) to find out more details that add up to big change in the shape of trucks to come.

TOP TEN STORIES

— Contents

It just resonates modern and original

Volvo Trucks improved everything from the infotainment system to cup holders to make the new Volvo VNL the easiest

A new 70-inch sleeper and a broader and more peaceful sleeping area—complete with better mattresses, more

A hundred little things—active accident avoidance, more visibility, better seating and steering positions, the

How does any truck find over 7% fuel savings these days? A brand new turbo-compound engine is one

Design

1

How do you make a truck look like it's moving forward even before the driver steps on the pedal? How meticulous design with attention down to the millimeter created the most aerodynamic, efficient Volvo Truck yet. **Page 6**

Sharper, brighter, safer LED lights shine further down the road.



Driving

2

truck on the road to drive. A one-of-a-kind steering wheel, more seat comfort, fingertip controls—just the shortlist of things made better for the long haul. **Page 10**

When drivers sit in the seat, everything they interact with has been improved



Rikard Orell
Design Director

Living

3

intuitive storage and power outlets, and one-touch window shades—means drivers can be better rested on the road. **Page 16**

Safety

4

best headlights available—and a few big ones, like the strongest cab on the road, illustrate why the new Volvo VNL is the safest Volvo ever. **Page 22**

We set the standard for safety, so we can't compromise

Engines

5

way. But the new VNL features engine innovations, torque packages and axle ratio efficiencies to save even more fuel. **Page 26**

More power and more efficiency—Volvo Trucks provide more savings in more applications.



A re-designed living space makes for better rested and more productive drivers—even the passengers will be happier.

It's a truly unique engine

Position Perfect™ steering wheel, better seats, more visibility, controls at your fingertips—driving has never been easier, or safer, than in the new Volvo VNL.



This truck exceeds customers' expectations for fuel efficiency

New predictive cruise control software, faster, tougher components, quicker shifts and remote transmission

Adaptive Gearing. Adaptive Loading. A new Extreme Efficiency package that switches torque curves in

Dealers have made major investments into building up their dealer service network to better serve fleets.

We're the leading uptime solutions provider in North America

Some of the best new features on the new Volvo VNL are actually in the Volvo Uptime Center in



Magnus Gustafson
Vice President
Aftermarket Quality and Operations

A truck isn't worth what you paid for it. It's worth what you get from it. How will the

I-Shift

6

diagnostics—the latter available only on Volvo Trucks—make the transmission that revolutionized trucking even easier to use. Which makes drivers even more productive. **Page 30**

"The I-Shift helps to get more drivers into trucks"

Applications

7

more gears. The new Volvo VNL engines and split torque packages offer more versatility over various applications—which means more savings. **Page 34**

Dealers

8

And they've developed a unique service process that gets trucks rolling again faster. **Page 38**



Matt Davison
Vice President
Network Development

Uptime

9

Greensboro, NC. People and technology come together in unique ways to elevate Volvo's uptime performance and keep trucks on the road. **Page 42**

Cost of Ownership

10

new Volvo VNL give you more? Let us count the ways. **Page 46**



Volvo Trucks Uptime Center knows what's going on with every truck, 24/7.

Information was correct at time of distribution. Vehicles and services may include options.

© 2017 Volvo Truck Group North America, LLC

Printed in USA



“Everything is dynamic, everything is flexible, everything is high-performance”

RIKARD ORELL, DESIGN DIRECTOR



It just resonates modern and original

Walking around a top-secret prototype of the new Volvo VNL in the secure design studio in Greensboro, NC, Rikard Orell points to an angle on the hood.

“In this area things came down to the millimeter. The center-line section of the hood and the exit to the windshield are extremely sensitive to the final shape so the air flows precisely,” Orell says.

Orell and his team formed a task force group to meet every day, asking where else they could find opportunities in the shape itself. They took to hand-sculpting with clay, shaving away slivers. And they thought about lines.

MOVING LINES When you’re bringing the first all-new truck to the product line in years, all the lines on its body have to say something about the truck—and about Volvo Trucks.

Which is why Orell spent a lot of time thinking about high-performance motorsports, aircraft and speedboats.

“The lines on the hood, the roof, the grille—everything is moving through the form. We wanted to make it look fast and dynamic. It’s meant to be premium, to have strength without being heavy. The whole gesture is forward moving.”

DESIGNED ACHIEVEMENTS The new design accomplishes many things. It improves aerodynamics with details like flush window seals. It incorporates new safety elements.

Director of Product Marketing Wade Long, who was one of the original team members on the Volvo VNL project, thinks the design speaks volumes.

“The truck looks like it’s always moving forward,” Long says. “It just resonates modern and new and original.”

NEXT LEVEL DETAILS Even details like automotive paint, something no other manufacturer uses, make the truck look crisp and clean.

Volvo, Long says, was the first manufacturer to bring automotive design features to the trucking industry. “Twenty years later, we’re bringing the next level of automotive features to trucking.”

Orell points to the truck’s headlights. “Perfect example,” he says, calling them “amazing, world class automotive quality headlights. From a safety standpoint they’re better for the driver and everybody on the road.”

But we have integrated the headlights so they would not become their own element. “I was very careful not to put any form or shape that’s static, that makes your eye just go to it. So like the side intakes and the headlights—everything is moving with the gesture of the truck.”

Orell and Long both understood, when those lines were drawn and sculpted and tweaked and finally carved in, that the truck they created would carry Volvo Trucks into the next decade, and leave the rest of the trucking industry racing to try to catch up. ●



Rikard Orell
Design Director



Top left: “The lines on the hood, the roof, the grille—everything is moving through the form.”

Bottom left: The grille has a new design and a new motif.

Top center: Details like flush window seals also improve aerodynamics.

Top right: The new V-shaped LED lights are instantly recognizable.

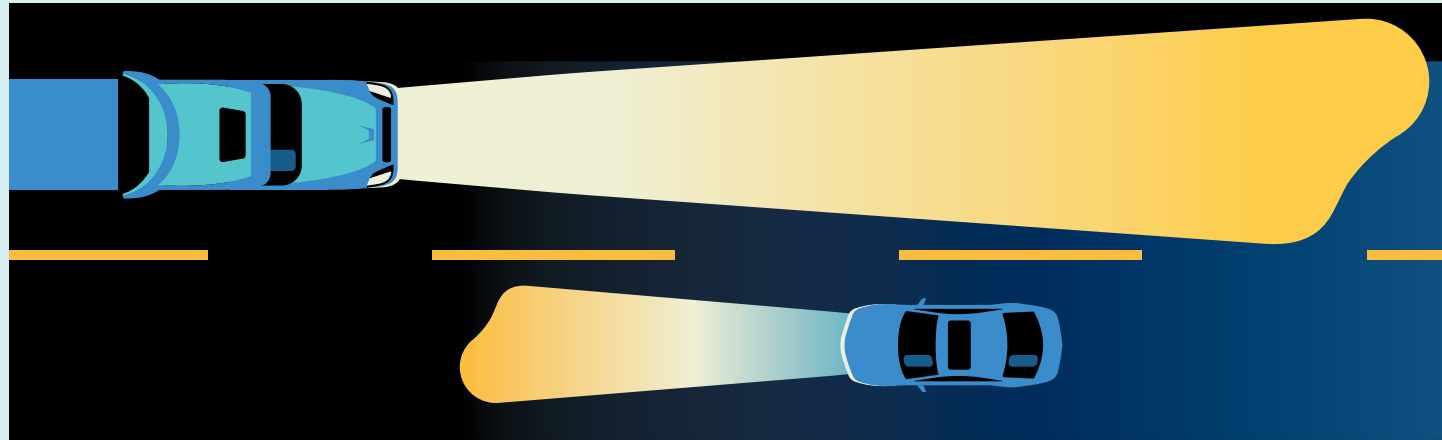
WINDOW SEALS



Sealing out the wind

In aerodynamics, every little detail matters. Even window seals. In the new Volvo VNL, windows are flush with the exterior. Eliminating seals that caused turbulence makes the truck more aerodynamic, and makes one of the quietest cabs on the road even quieter.

HEADLIGHTS



LIGHTING A NEW WAY

New LED headlights illuminate further down the road. They spill less into oncoming traffic. LED light is easier on drivers' eyes. Daytime running lights were designed to emphasize "how amazing these world class automotive-quality headlights are," says Brian Balicki.

VISIBILITY

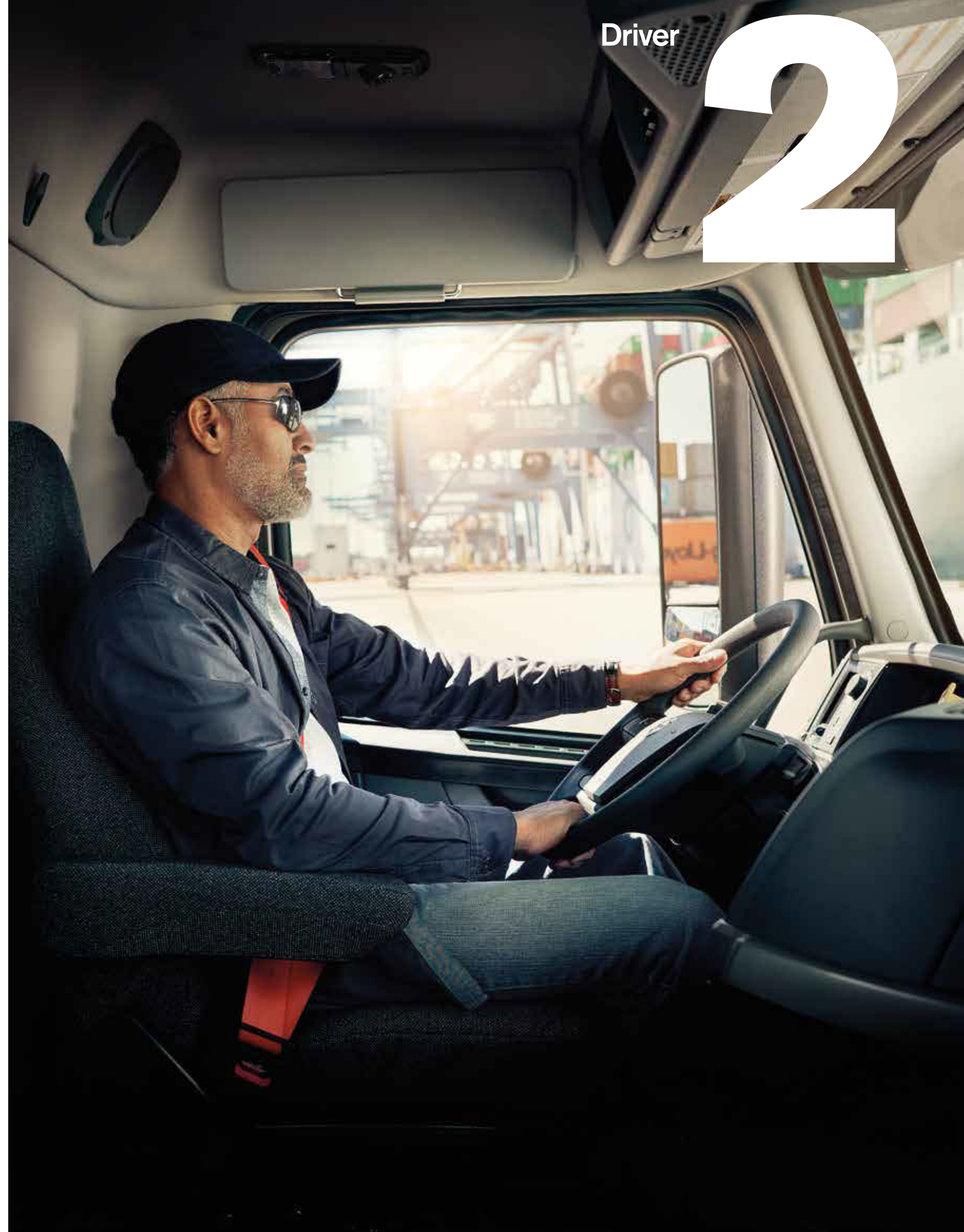
20/20 foresight

Vision is safety. Rob Simpson says designers "shrink-wrapped" the new Volvo VNL engine as small as possible to reduce the volume of the hood and increase drivers' forward visibility. Combined with an uninterrupted windshield and adjusted driver seat position, Volvo VNL visibility is even better than before.



Driver

2





**The world at
your fingertips**

2. Driving

Wouldn't it be great, Volvo Trucks' engineers and designers thought, if drivers would talk about all the ways the new Volvo VNL is better than any other truck on the road?



Wouldn't it be great if drivers talked about how quietly and smoothly Volvo Trucks' new longhaul truck drove? How much easier it was on their arms and shoulders and backs?

If they continually noticed how all the switches and controls are right where they need to be, easy to find and use?

CONTINUALLY IMPRESSIVE "The nicest part of a really good design is when you notice things even after owning it for a year or two," Chief Interior Designer Brian Balicki says—and he's worked hard to make that happen with the new Volvo VNL.

First, to create a sense of a refined, performance-oriented product, Balicki drew from F1 auto racing, where choices blend form and function. "That's the intention behind the raven color for the dash," Balicki explains. "It puts everything in background so you don't focus on the physical form of the instrument panel. Instead you focus on the features and functions baked into instrument panels."

IMPROVING IMPROVEMENTS From there, every time the team improved something, they thought about how to improve it more.

When they upgraded the truck's seat to better fit drivers' hips and to allow more movement, they also redesigned the seat control panel to adjust more easily and quickly. When they added an all-new driver information screen, they tweaked everything surrounding it to provide the clearest line of sight.

NEW AT THE WHEEL The new steering wheel is one example, says Marketing Product Manager Jason Spence. The innovative three-motion Position Perfect™ steering wheel, the only one of its kind in a truck, allows drivers to tilt the wheel on the column, so they can drive more like an automobile. But adding that wasn't enough, Spence said. The team made the

wheel even more functional by moving key control buttons to its face.

"We encourage drivers to always have hands on the wheels, so we put all controls they need running down the road within easy and quick hand reach," says Spence.

That emphasis extends throughout the cab in small, convenient details. One-touch window controls, like those in cars, mean drivers spend less time with their hands off the wheel.

Making work easier for the driver was the intent of every new development in the Volvo VNL.

"Complexity is tremendous in today's trucks, and if we can make that easier to understand that's a great benefit to the driver," Spence says.

NEXT-LEVEL FOCUS Balicki agrees that an extra level of innovation—often coming after drivers spent hours in a test model—defined the design process.

"It helped us drive some of these intuitive features no other original equipment manufacturers are focusing on at this moment," Balicki says. "These are also the kinds of things that are going to make drivers proud to have this truck."

Which is why Balicki knows that, two years from now, a Volvo VNL driver will notice for the first time that the mat in the "birdbath" in-dash storage area can be removed for cleaning. Or that the angled storage space in the center console is the perfect fit for oversized drink bottles. Or how the diffused light-green backlighting in the cab is better at night, less fatiguing to the eye.

"We took it as a challenge to show people how much we're focusing on driver productivity," he says. "As they sit in the seat of this new truck, everything they interact with or can see has been improved. Anything we can do to help them focus on what's outside the vehicle helps them be safer, better drivers." ●



Jason Spence
Product Marketing
Manager

When drivers sit in the seat, everything they interact with has been improved

innovative three-motion Position Perfect™ steering wheel, the only one of its kind in a truck, allows drivers to tilt the wheel on the column, so they can drive more like an automobile. But adding that wasn't enough, Spence said. The team made the



King of cups

"Cup holders are the first thing drivers mention," Fred Whitt says. New cup holders fit into a modular rail system, so drivers can place beverages exactly where they want them. Easily movable with clip-on/off fittings. Fits up to four cup holders. A slanted storage space in the center console holds hard-to-fit larger bottles.

"Cup holders are the first thing drivers mention," Fred Whitt says. New cup holders fit into a modular rail system, so drivers can place beverages exactly where they want them. Easily movable with clip-on/off fittings. Fits up to four cup holders. A slanted storage space in the center console holds hard-to-fit larger bottles.

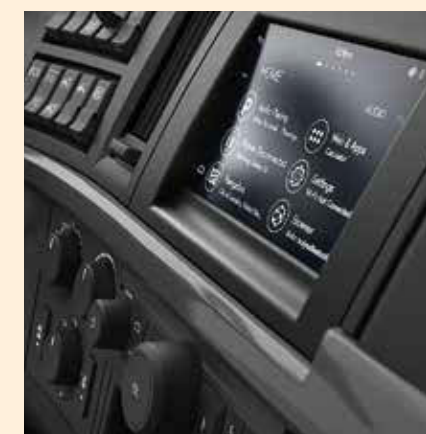
THREE-MOTION STEERING WHEEL



Neck tilt saves your neck

Only Volvo offers the new three-motion adjustable steering wheel—Position Perfect™. Not only can drivers tilt and telescope the steering wheel, they can tilt the wheel relative to the steering column. "When you position the wheel more vertically, like a car's, you reduce fatigue on drivers' arms, neck and shoulders" says Jason Spence.

"No other manufacturer is focusing on these intuitive features"



High-end infotainment

New seven-inch full color infotainment display offers high-end audio with connectivity, Bluetooth, navigation, apps and exterior camera options. The display has both touch-screen and physical controller. And the driver information provides clear icons and easy to understand text. "This system is unique to Volvo. It's a big change for the industry," says Whitt.

SEATS


Better seating arrangement

Drivers have very well defined opinions about comfort for seats," says Jason Spence. The new seat travels farther fore and aft and has a better range of hip points. Consultation with drivers and seat designers produced better ergonomic and orthopedic support. Premium material options add more comfort.



DRIVING HIGHLIGHTS

The best thing that's happened to sleep since pillows

The image shows the interior of a Volvo VNL truck, specifically the sleeping quarters. A French Bulldog is lying on a bed with a white sheet and a plaid blanket. The bed is equipped with several pillows, including a large grey one and a blue and white striped one. In the background, there is a control panel with a digital display showing '03:50' and '47.96'. A framed picture with the text 'HOME SWEET HOME' is mounted on the wall. To the right, there is a wooden table with a glass of water and a small potted plant. The overall atmosphere is cozy and modern.

The new Volvo VNL is a sleek, high-performance vehicle. But inside, it's peaceful, modern, even lush. The broader sleeping area is built to absorb more road vibrations, so both bunks are comfortable even during drive time. An embedded spring mattress surrounded by an extra layer of foam and pillow top cover adds resting comfort. Everything inside the new Volvo VNL helps drivers sleep better, so they can work better.



2. Living

“We’re taking comfort to a completely new level”

Wade Long has been driving the development of a 70-inch sleeper since the company decided to launch a new product line.

“One thing our dealers always ask for is a 70-inch sleeper,” says Long, director of product marketing for Volvo Trucks. “Drivers don’t like to be touching the walls when they’re sleeping.” He pauses before proudly adding, “Well, we’re delivering a 70-inch sleeper.”

Actually, Long and Volvo Trucks are delivering a whole line of sleepers—the new Volvo VNLs. One of them is, indeed, a 70-incher, radically upgrading driver comfort. Nowhere, says Long, is that more obvious than in the completely reimagined living environment.

A LONG LIST OF BETTER IDEAS “Cabinets opening toward the back

to make more space, a reclining bunk for watching TV or reading, a table that allows you to work ergonomically, clear lines of sight to the TV from the upper bunk,” Long says, part of a long list of advancements.

“Volvo was the first company to bring automotive comfort level to the trucking industry. Now we’re taking it to a completely new level. These are the things drivers will be talking about on the radio.”

CALMER AT THE CORE The core idea behind the new Volvo VNL interior was to create an even calmer, more restful space, which means more productivity and safer drivers. First, designers planned a broader, more stable sleeping area. Then they refit the cab to create more—and more intelligent—storage space.

“By creating a resting environment that is less congested,



we’re helping the driver to relax,” Long says, “which is vitally important day after day on the road.”

KEEPING DRIVERS Volvo understands that drivers who are more content with their work space are more likely to stay on the job, too. “Drivers talk,” Long says. “They know when fleets cheapen down the truck. If a fleet promotes they’re buying premium mattress for the drivers, they’ll talk about that. They know which fleets are desirable to drive for.”

“These are innovations you won’t see on any other truck”

Premium mattresses were just one component Brian Balicki’s interior design team considered in an exhaustive search to create more comfort and ease. Balicki, Chief Interior Designer on the project, attended RV and boat shows for inspiration. Then he went on the road, driving trucks, to see what worked and what didn’t in the real world.



Wade Long
Director of Product
Marketing



Better rest makes drivers more alert, safer, and more productive.

“We tried to go through the same steps drivers will so we could catch the little things,” Balicki says. “For instance, instead of making drivers snap shades on every window, we wanted to create a premium experience with integrated shades. Now it takes seconds to close all the shades.”

NEW ANGLE ON COMFORT The new reclining bunk, the only one of its kind, lets drivers transition comfortably between work and rest. Its adjustable positions add an easy-chair feel to the cab, making a more relaxing place to check in with the office, keep up with paperwork, watch a movie or read before easing into sleep.

Throughout the interior, premium craftsmanship and innovative details like softer LED lighting, electrical outlets for the top bunk, easily reachable controls, smart storage arrays, larger refrigerator, removable floor mats—every detail was chosen to create a warm, clean, calming environment.

“We know if drivers don’t have a decent night’s rest, that affects their productivity for the next day or even the entire week,” Balicki says, “so it’s important they have a rejuvenating experience. A driver who is better rested is likely to be more alert, safer, more productive and in a better mood.” ●



Brian Balicki
Chief Interior Designer

LIGHTS AND CURTAINS

LIGHT CONTROL

Airline-style window shades block light with one simple motion. New double-sided 100% blackout curtain slides more easily into place. Softer, more consistent LED lighting keeps power consumption low. Ambient lighting for the footwell allows night movement without an overhead light. “These are innovations you won’t see on any other truck,” says Wade Long.



LIVING HIGHLIGHTS

INTERIOR DETAILS



Easier living

More storage in better places. Cup holders moved closer make it easier to relax with beverages. Better access to USB and 12-volt charging ports for top and bottom bunks. Handy central controls within easy reach of the reclined bunk and living space.

“These are the details drivers will be talking about on the radio.”

GLOBETROTTER PACKAGES

PERISCOPING LADDER

NEXT LEVEL DETAILS

Our highest level premium sleeper designed for maximum relaxation and productivity for one or two people. Extra standing room, carpeted floor inserts, a leather-wrapped, Position Perfect steering wheel and ergonomic, leather-stitched seats. Exterior detailing includes chrome brightwork finishes, stainless trim, Globetrotter decaling and aerodynamic fairings. A truck that signals ownership is a point of pride.



Stepping up bunk access

Improving on innovation, the new telescoping ladder swings into place smoothly on torque hinges with quick-release latches and pins. Molded step pads make step surfaces horizontal. Anodized aluminum finish withstands wear and tear. Three points of contact and ergonomic step positioning allows safe, easy and comfortable upper bunk use.



The world's safest Volvo



4. Safety

Focusing on safety, says Director of Product Management Fred Whitt, has been a part of Volvo Trucks' mindset since the outset. And its effects ripple outward.

"From a humanitarian perspective, it's the right thing to do," Whitt says. "It's not just about protecting the driver, it's about protecting everybody else on the road as well."



In the new Volvo VNL, safety is not a collection of features. It's a design imperative, built from the inside out.

"We set the standard for safety, so we can't compromise. We can't take shortcuts," says Whitt. "We have always held ourselves to a higher standard because it's been part of our makeup from the very beginning."

THE ONE AND ONLY "Volvo is the only..." When you talk about safety with the people at Volvo Trucks' Greensboro, NC, headquarters, you hear a lot of sentences start that way.

The Volvo VNL is the only long-haul truck with a warning that displays on the windshield. Volvo trucks are the only trucks with standard driver-side airbags.

A FORTRESS AT THE CENTER But it starts at the heart of things—the cab. Fortified more than ever before, the

Volvo VNL cab exceeds the new, tougher ECE29 standards.

"Nobody tests their cabs like we do," Whitt says. "Our competitors like to say they 'meet or exceed' crash standards, which means they meet them. We exceed them."

The Volvo VNL is the only longhaul cabs built from high-strength steel. Which is why the Volvo VNL is the only longhaul truck that exceeds both of the globally acknowledged crash safety tests.

SAFELY SEATED When Volvo Trucks put new, more comfortable seats in the Volvo VNL, they offered a rollover bag that was integrated in the driver's seat.

Their advanced seats also allow more relaxed driving and improve visibility over the front of the truck, further decreasing blind spots. And every seat is sled-tested to meet the company's rigid standards.

ACTIVE MEASURES Core strength protects drivers in a crash, but the new VNL has technology to actively avoid accidents.

One option: advanced front-end collision avoidance that senses when a vehicle is rapidly slowing or stopped on the highway and begins actively braking. Another available system senses when the trailer is in danger of rolling or jackknifing and applies brakes to individual wheels to stabilize the truck.

"Not only do these technologies protect drivers, they cut costs," Brand Development Director Rob Simpson says. "Instead of a devastating rollover that causes injury, totals the truck and damages the load, you might end up with minor property damage."

FINDING ANOTHER GEAR Even when you're talking about features that don't seem to be primarily about safety, it finds its way into the conversation. The Volvo VNL is the only longhaul truck with I-Shift... and fleets that switch to I-Shift have reported 22% fewer accidents.

"With I-Shift drivers don't have to worry about catching a gear if they're pulling out of a parking lot on grade," Simpson says. "They can pull in and out of traffic in a safe, controlled way."

Safety is not just part of the Volvo product, Simpson says. "Safety is in the Volvo DNA." ●



Rob Simpson
Brand
Development Director

SAFETY PACKAGES

Make the safest even safer



Safety is not optional, but Volvo Active Driver Assist, electric backup alarm plus a park brake alarm and fire extinguisher comprise the Safety+ package. Add the Volvo Active Driver Assist with Lane Change Support, Lane Departure Warning, a security immobilizer system and a Roll-tek driver seat with air bag and you give your drivers the Safety ++ package—the safest Volvo truck ever built.

QUIET CAB



QUIET AND CLEAR

Engine noise and vibration directly contribute to driver fatigue. "When you're fatigued you tend to make mistakes or not react as fast," Simpson says. A new common rail fuel delivery system, wave fuel injectors and other engine modifications make the Volvo VNL quieter and smoother running. Double seals and exacting specifications on the cab doors shut out even more noise.

SAFETY HIGHLIGHTS

"When drivers sit in the seat, everything they interact with has been improved"

COLLISION AVOIDANCE SYSTEM

Warnings on the glass

New display projects a warning signal onto the windshield, instantly alerting drivers to critical messaging without taking their eyes off the road. Volvo Enhanced Cruise uses a heads-up display to warn if the truck is too close to the vehicle in front of it—and will de-throttle the engine and actively brake to help prevent a collision.



ROLLOVER AIR BAG



A brand new bag

The Volvo VNL adds the option of a rollover airbag for the driver. Built into the seat, this airbag deploys in case of a rollover to prevent contact with the side of the cab. Rollover bag complements the standard steering wheel-mounted drive-side airbag.

**“I couldn’t
believe it was
possible to save
6.5% fuel”**

“Drivers want performance, because more performance is less stress. Managers want fuel efficiency, but they also want happy drivers. You have to find a blend of performance and efficiency. I think that’s what we’ve found in this engine.”



5. Engine

When Volvo Trucks engineers first told John Moore that the new D13 with Turbo Compound engine was going to increase fuel efficiency by 6.5%, he didn't believe it.

"That's a huge number. I said, 'You're going to have to prove that to me,'" Moore says. "Getting 6.5% out of anything today is just phenomenal."

The engineers proved it—in fact, Moore now thinks, 6.5% may be a conservative number.

Furthermore, aerodynamics and other improvements will add another percent, raising total fuel savings to 7.5%.

"The new D13 Turbo Compound is a truly unique engine," Moore says as he walks the floor of the Hagerstown, Md., factory where all Volvo Trucks engines are built. "The D13 with Turbo Compound is the only engine in the industry that uses a waste heat recovery system to save fuel by capturing lost energy."

Typically when a gallon of diesel fuel is burned, half of the BTUs are wasted. The D13 with Turbo Compound funnels waste heat through a turbo compound nozzle and turbine. The turbine connects to a gear that brings power to the flywheel, converting exhaust gas energy into mechanical energy.

The result? Up to 50 extra horsepower.

"The D13 picked up 1850 rating on 450 hp. That extra 100 pound-feet of torque puts us at the top of the class," says Brett Pope, senior product manager.

A split torque package lets the engine run in economy or performance mode. Because it's integrated, the engine responds automatically. "As a driver, you just drive," Pope says. "The engine

responds automatically. And you get fuel economy savings and more power."

LITTLE TWEAKS FOR BIG SAVINGS "We just keep finding more things to perfect to get the load off and decrease friction in the engine," Moore says.

A new wave piston, found only in Volvo engines, burns fuel more efficiently at higher compressions. A new two-speed coolant pump reduces load on the engine as it's moving down the highway.

A unique twist on a common rail fuel injection system also lets the engine run much more quietly and smoothly. "It's amazing," Moore says. "Drivers are going to feel a noticeable difference."



John Morre
Product Marketing

ENGINE - TRANSMISSION TEAMWORK More savings come from unique engine, transmission and axle configurations like the XE package. Reducing engine cruise speed by 100 rpm saves between 1% to 1.5% in fuel efficiency.

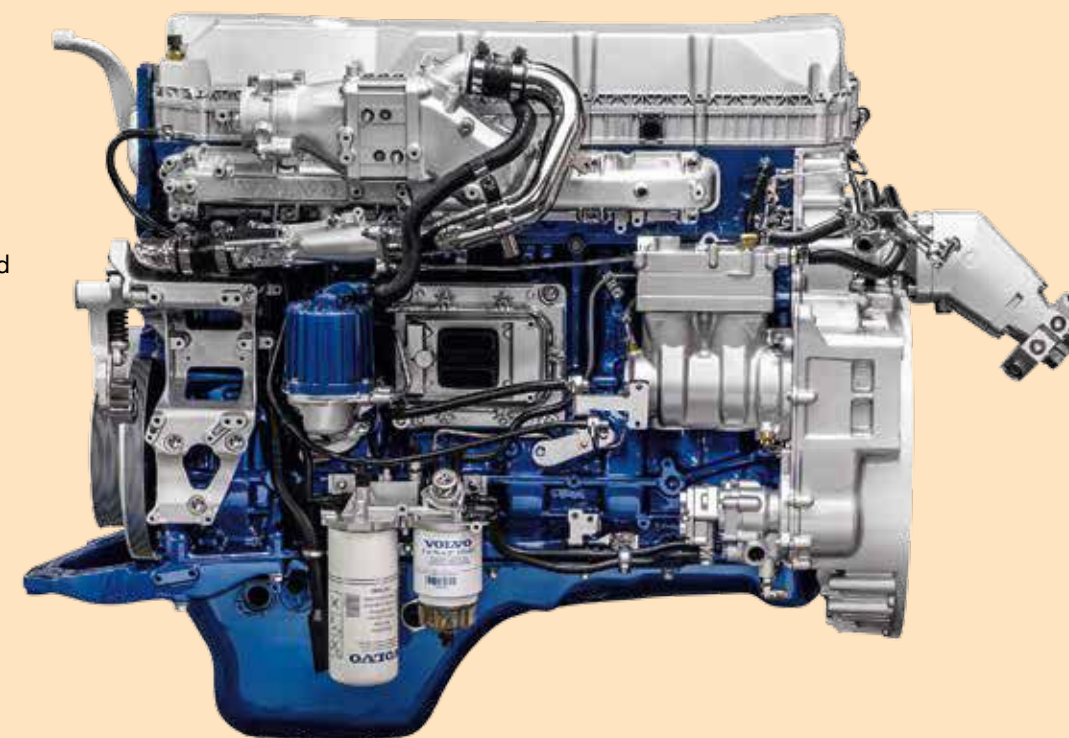
With turbo compounding, drivers will be able to reduce their engine cruise speeds on the highway to 1050 rpm. In states and provinces with 55 mph speed limits, drivers can run at a lower rpm and stay in top gear.

"Also, the turbo compounding engine is more efficient at lower rpms," Moore says. "We have an engine saving fuel and a turbo compound unit maximizing efficiency with peak torque. It's a win-win situation for fuel efficiency and performance." ●

It's a truly unique engine

Just the torque you need

Engine software senses load weight, throttle inputs and roadway and automatically responds for more performance. It drops back into economy mode when less torque is needed. Unlike competitors, Volvo Trucks engines deliver split torque packages in a number of different combinations, with shift points in more gears.

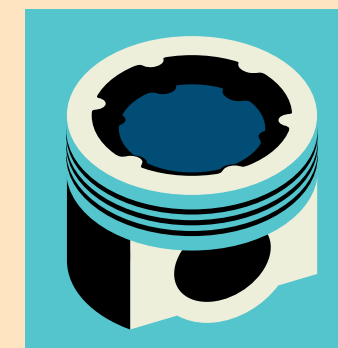


ENGINES HIGHLIGHTS

WAVE PISTON

CATCHING THE WAVE

A new, patented piston design uses a wave-shaped tab inside the piston. The injector sprays fuel directly onto the tab, which deflects the fuel back to the center of the cylinder for a cleaner burn. The wave tab eliminates wet spots on the cylinder walls and reduces soot. "Engineers in Hagerstown found a 90% reduction in soot because of this piston," says Brett Pope.



"Getting 6.5% out of anything today is just phenomenal"

COMMON RAIL FUEL DELIVERY



Special delivery

A common rail fuel delivery system allows for an assembled camshaft, which saves 21 pounds of weight. Common rail also allows the engine to run more smoothly, cutting noise and vibrations to the cab. The results? A noticeably quieter engine, fuel savings, less wear and tear on the camshaft and longer engine life—plus more relaxed drivers.

The great shift

Volvo Trucks Product Marketing Manager Allison Athey drives a truck. "I learned on a manual and it was painful," Athey says. "Every day I'd go home wiped out from shifting all day. Then I went on a trip driving an I-Shift and I was amazed by how much more relaxed I was, how much more I could focus on the road and my trailer safety."



6. I-Shift

The best shifting performance out there made even faster and smoother

Ten years ago, the I-Shift was something entirely new to trucking.

Last year customers wanted I-Shift transmissions in 83% of the Volvo trucks sold. Recently, the 100,000th I-Shift—all of which are manufactured at Volvo Trucks' Hagerstown, Md., facility—was sold to a dealer fleet in Missoula, Montana.

SHIFTING FORWARD And this year, Volvo Trucks is introducing a new version. With it comes a host of improvements meant to make the transmission smoother, more durable and efficient.

Customers who understand the nuts and bolts of trucks will understand that a larger spring pack on the clutch absorbs more vibration, which eases wear and tear all the way down the driveline and reduces noise to the cab. They'll see enhanced countershaft brakes, new engaging sleeves and shift fork configuration all making the I-Shift even smoother and faster under heavier stress and repeated shifting.

But mostly they'll see a great recruiting tool made even more attractive to drivers.

"We have very good shifting performance already, probably the best out here," Athey says, "But we've improved it further. Everybody can be a good driver in a Volvo truck with I-Shift truck. And it makes an excellent driver even better."

EASY ON THE DRIVER The I-Shift literally lifts the burden of shifting

from drivers' shoulders. It's easier on their bodies and less stressful. Because drivers can keep two hands on the wheel, it's also safer.

"The I-Shift helps to get more drivers into trucks," Athey says, "and it extends the careers of veteran drivers."

MORE EFFICIENT MEMORIES Another thing dealers and drivers will like in the new I-Shift is predictive cruise control software called I-See, which takes advantage of the truck's momentum in an intelligent manner to save fuel.

I-See geo-locates and memorizes hills on frequently traveled routes. As the truck approaches a familiar hill, the cruise control software combines load weight with the grade and length of the hill to shift the transmission in the most efficient way possible.

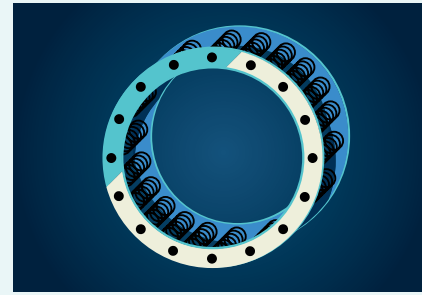
On a recognized downhill, the transmission will disengage the driveline so the truck can coast—or Eco-Roll—to save even more fuel.

CONNECTIONS, CONNECTIONS And the I-Shift is now part of the connected vehicle. It allows Volvo Trucks to be the only manufacturer providing remote diagnostics for the transmission.

"The Volvo engine and Volvo I-Shift are literally tuned and built and tested together and mated and made to work together," Athey says. "Drivers can feel that difference in the truck." ●

SPRING PACK

SHIFT FORKS UPGRADE



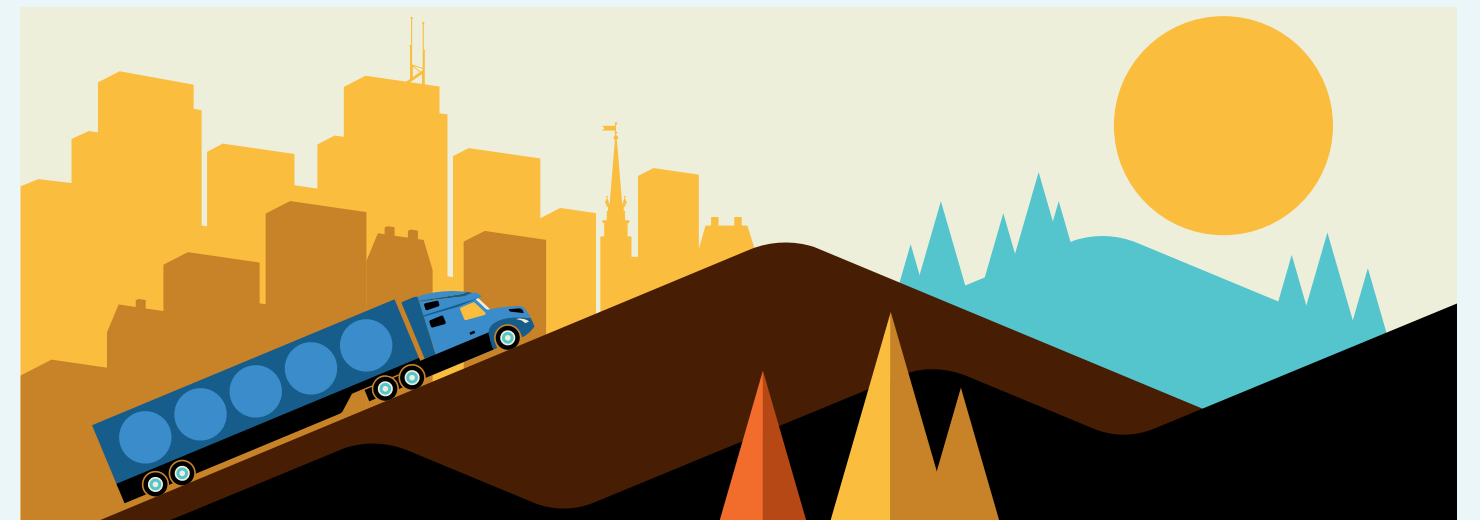
A quieter ride

A larger spring pack on the clutch improves torsional dampening. The bigger spring reduces noise and vibration. Ultimately that means significantly less wear and tear on the clutch and all the way down the driveline and a much quieter ride for the driver.

Longer lives Improved engaging sleeves and a collar around the shift forks to allow quicker shifting without losing momentum. All designed to take heavier stress, shift more smoothly and extend the life of the transmission.



I-SEE



KNOWS THE HILLS AHEAD

Approaching a familiar hill, I-See predictive cruise control software pre-speeds to gain momentum. Because it "knows" where the hill crest is, the load weight and torque requirements, the software holds top gears most efficiently on ascent. Downhill, the driveline disengages to Eco-Roll, saving fuel. The truck can coast until it recognizes the need to accelerate again. "I have talked to customers that already have saved up to 3% fuel thanks to I-See", Athey says.

COUNTERSHAFT BRAKE

"The I-Shift helps to get more drivers into trucks"

Faster shifts

Added pads enhance the countershaft brake, which allows gears to mesh more quickly on every shift. "In a truck hauling 80,000 pounds going up a hill every bit of momentum lost is a big deal," says Allison Athey.



I-SHIFT HIGHLIGHTS

“It’s a win-win for
fuel efficiency and
performance”





7. Applications

The Volvo VNL is one of the most adaptable trucks on the road. "We can spec each truck to address the specific needs of each customer," says Director of Product Marketing Wade Long.

For instance, Volvo Trucks pioneered downspeeding, so it's not surprising they should bring it to the next level with the new Fuel Efficiency packages.

Historically, says Long, "running engine cruise speeds at lower rpms shook the mirrors off the truck." But Volvo Trucks pioneered the downspeeding revolution in 2012, introducing smooth-driving packages that integrated the engine, transmission, software, rear axle ratios and tire sizes.

Now, says Long, with a new generation of engines, I-Shift transmissions, software and trucks, "we can make application-specific solutions with our XE packages that exceed our customers' expectations for fuel efficiency and driver productivity."

TC FOR EXTRA XE Although all Volvo engines can be configured with XE packages, Product Marketing Manager John Moore says the biggest improvement comes when you drop a new D13 Turbo Compound (TC) engine into a new Volvo VNL.

This truck exceeds customers' expectations for fuel efficiency

In the Turbo Compound, heat energy escaping the engine is captured by the turbo flywheel and redirected back into the system. When the engine creates peak torque, it also creates the greatest amount of heat energy.

The D13 TC, combined with the right rear axle ratios, can generate peak torque while cruising as low as 1050 rpm. The engine offers

shift points with full power down to 950 rpm.

"The beauty there is, the engine is saving fuel because it's running at lower rpm, but also driving a turbo unit that's maxi-

mizing efficiency at peak torque," Moore says. "It's a win-win for fuel efficiency and performance, plus there's less wear and tear on the engine because pistons are running less."

A NEW XE Another recent development is the XE-Economy package. XE-Economy switches torque curves in more gears, depending on the engine load. While providing torque on demand—say, when climbing hills—the XE-economy package utilizes I-Shift transmission and rear axle ratios to save fuel when high torque isn't needed.

ADAPTATIONS Other improvements provide more savings.

Adaptive Gearing works with the Volvo I-Shift to lock out the top gear on a fully loaded truck for better performance. When the truck unloads and returns empty, the top gear is available to run more efficiently at lower rpms.

"That lets the driver get home faster and it's more fuel efficient in overdrive," Product Marketing Manager Allison Athey says.

TAKING A LOAD OFF Athey says Adaptive Loading works much the same way. Proprietary software senses load weight and torque requirements. When appropriate, the truck automatically lifts an axle off the road to run more efficiently.

Integration, says Athey, is the key. "We build specific software in the engine that knows when to shift at lower rpms to manage the torque."

"But all our components are fully integrated. They speak the same language. They are literally tuned, built, and made to work together." ●



Allison Athey
Product Marketing Manager

ADAPTIVE GEARING

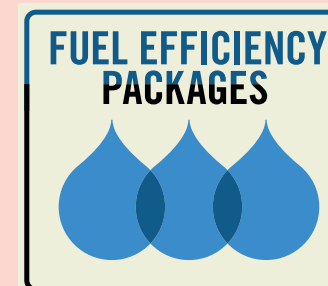
ADAPTIVE LOADING

Wheels up

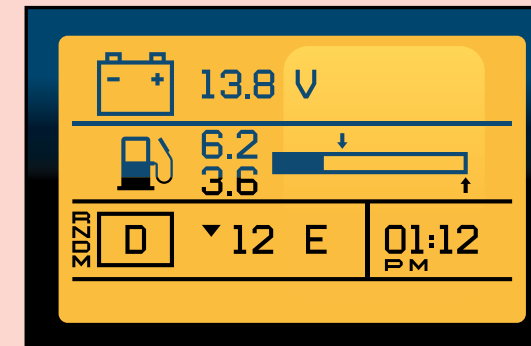
Adaptive loading automatically senses when the truck is empty and lifts an axle off the pavement, reducing friction and saving fuel. "Say you're hauling bulk fuel," Wade Long says. "When you go out loaded, you need all the torque you can get. On the way back empty, the truck can lift an axle and save fuel. It happens automatically, completely independent of the driver."

NEW FUEL EFFICIENCY PACKAGES

SQUEEZING MORE FROM EVERY DROP



The XE engine package creates efficiencies. I-Shift transmission with overdrive and I-See predictive cruise control create savings both in heavy traffic and on the open road. Packages include low rolling resistance tires for even more fuel savings.



LOCKOUT GEAR Adaptive gearing locks out the overdrive (12th) gear on a fully loaded truck, making the transmission a direct drive to increase performance. "Adaptive gearing gives good drivability back to the truck," says Wade Long. "That keeps drivers in Volvo trucks longer." Also, in states and provinces with 55 mph speed limits, the truck can stay in top gear at slower engine speeds, then run at higher speeds in the same gear in other states.

"It's a win-win for fuel efficiency and performance"

D13 TC



Cruising at 1050 rpm

The XE packages and the new D13 TC engine is a perfect match. The turbo unit compresses the heated air to turn a flywheel connected to a gear, which returns an additional 50 hp to the drive train. The D13 TC maintains peak torque while cruising as low as 1050 rpm, saving fuel without sacrificing power.

A bigger deal

Investing heavily in getting your truck back on the road faster than ever before

There are two ways to keep more trucks on the road: create more capacity for repairs and get better at making repairs. Volvo Trucks is doing both in big ways.

■ Last year, Volvo Trucks added 21 new full-service dealerships. Over the next four to five years the company plans to add 80 to 100 new locations.

“We have chosen to significantly increase the pace at which dealers are putting up new facilities,” says Matt Davison, vice president, network development.

The increase in investment has been significant, indeed. Since 2010, The Volvo Trucks dealer network invested more than \$500 million in new or upgraded facilities, increasing technician numbers by 109% and service capacity by 80%. In 2016 alone, \$112 million was invested.

EXPANDING EVERYWHERE New investment is happening across the country, from a six-bay expansion in Oklahoma to a 60-bay dealership in Secaucus, New Jersey, and a new 90-bay facility in Fontana, California.

“What this means for the customer is they’ll have their truck diagnosed, fixed and back on the road faster than ever before,” says Davison.

The expansion is being driven proactively by Volvo Trucks, in response to customer feedback.

“We’ve gone to dealers and said, ‘Look, your average repair time is not acceptable. You’ve got a capacity issue,’” Davison says. “You need to increase your service capacity.”

THE BEST TECHNICIANS The expansion means Volvo Trucks’ dealership network will add between 400 and 450 repair bays per year over the next four to five years. They’re spending money to better train technicians, too.

But it’s not just a case of more is better. More efficient is better, according to Brand Development Director Rob Simpson.



It's night and day how quickly they can turn around those trucks

STREAMLINING REPAIRS To that end, Volvo Trucks is expanding its Certified Uptime Center program—dealerships with dedicated bays assigned to fast-track the intake process and diagnose problems quickly.

As is the case with all Volvo repair shops, when a driver pulls into a Certified Uptime Center, through Remote Diagnostics, personnel from Volvo Action Services have already let technicians know what issues the truck is having before it even pulls onto the lot. Trucks that can be repaired quickly are routed to dedicated, expedited service bays.

"It's night and day in terms of how quickly they can turn around those trucks," Simpson says.

Aided by remote diagnostics, the centers are 71% faster at diagnosing a problem and 24% faster at getting trucks back on the road.

"Certified Uptime Centers are not a marketing gimmick, they're not an advertisement," says Simpson. "It is a very, very robust process. Dealerships have to qualify to get into the program. The competency that exists in these facilities, I feel, is best in class."

BETTER PARTS MAKE BETTER WHOLE Volvo Trucks has also improved its parts distribution so that its parts availability is "world class," according to Simpson.

"We're going to keep working on it, but we're extremely proud of the growth in our dealerships and the investments they're making," Davison says. ●



Matt Davison
Vice President
Network Development



MASTER STATUS

Volvo Trucks has partnered with WyoTech diesel mechanics training program to help reach a longtime goal: 30% of every dealer's technicians earn the status of Master Certified. Right now over 90% of dealers have met or surpassed that metric. Importantly, dealers also have a healthy number of technicians one level below Master Certified, training to reach that status. "We've got a good pipeline of talent for things to come," says Matt Davison.



Innovative processing *Volvo Trucks Certified Uptime Centers fast-track repairs based on extensive standards. Trucks are diagnosed within minutes of arriving and, if the repair will take less than four hours, are routed to dedicated bays where certified master technicians complete repairs.*

"Now customers can have their trucks fixed and back on the road faster than ever"

Greater than the parts

Another Volvo advantage is the commitment to getting the right parts to service facilities to ensure comprehensive ability to keep trucks on the road.



ACCURATE QUOTES

"It used to be that sometimes customers would wind up with a bill that varied from the initial estimate," says Rob Simpson. With the ASIST service management tool, customers receive an accurate estimate prior to repair, and they remain involved in the repair process as it occurs. They know exactly what's being done and what it will cost.

Uptime

9

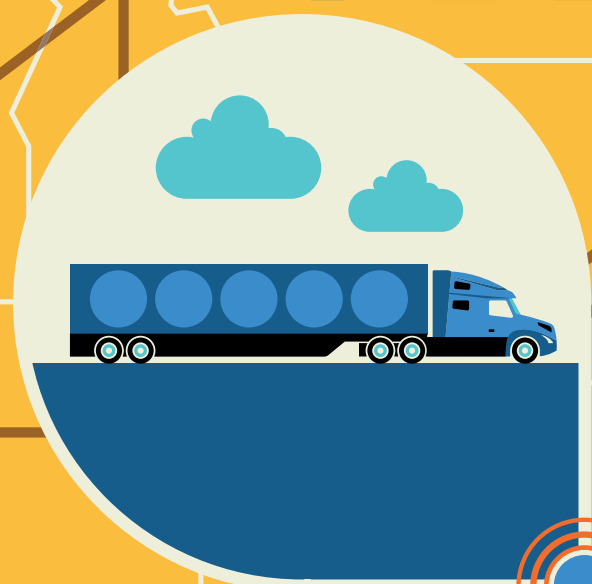
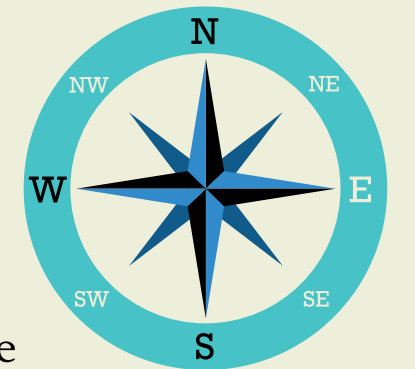
CANADA

USA

MEXICO

Truckspotting 24/7

There's an old saying in trucking—if the wheels aren't turning, you're not earning. Uptime is money. "Over the past 30 years, it's been okay to tell drivers it's going to take four days to fix their truck," says Mark Curri, senior vice president of uptime and customer support. "That's not acceptable anymore."





9. Uptime
“We’re the only ones that guarantee a person on the phone who knows your truck”

For Volvo Trucks improving uptime is about equipping the right people with the best technology. Building an advanced telematics platform into the new Volvo VNL, for instance, allows the team of dedicated professionals at the Volvo Truck Uptime Center in Greensboro, NC, to see what’s going on with every new truck on the road, 24/7.

This allows more seamless interaction between the expert personnel of Volvo Action Services and customer decision-makers and drivers.

Using remote diagnostics, The Volvo Action Services team can intercept issues before they happen, and help customers make the best decisions about what to do next. On the new Volvo VNL, those remote diagnostics will be even more exact thanks to its ability now to capture what is happening in the engine 45 seconds before and 15 seconds after a code is triggered.

“Before we just had a snapshot. Now, we have a movie. We can see what parameters were peaking leading up to the event,” says Mark Curri, senior vice president of

uptime and customer support. “If you’re looking at diagnosing trucks this is the holy grail. It puts us in a much better position to see the broader picture and the context around why a code is triggered.”

MORE PARTS TRACKED

Volvo Trucks monitors each new truck’s Volvo engine, after-treatment and I-Shift transmission. No other manufacturer tracks all of these components.

When diagnostic codes do pop up, Volvo Uptime specialists alert decision-makers to required action. Often they can warn a driver that a part may have issues hours before it does, and guide the driver to assistance.

A VOICE FROM START TO FINISH A major differentiator in the Volvo process is the human touch, says Ash Makki,

product marketing manager. Only Volvo Trucks guarantees a person on the phone through the entire process. Live, Volvo-trained advisors are tracking trucks day and night, nationwide helping customers solve problems.

“These aren’t third-party contractors,” says Makki. “They know your specific truck and your locale and where the best resources are for your issues. The driver is always talking to a truck person. If the operator is not an expert on that topic, they’re sitting among those experts.”

PERFECTING THE PROCESS When a diagnostic code is triggered, the support team goes to work. Advisors will guide the driver to an appropriate service facility. This might involve one of an expanding number of advanced dealer facilities called a Certified Uptime Center. Volvo Trucks is encouraging the development of these advanced facilities nationwide to expedite repairs. When a driver pulls into a Certified Uptime Center, an innovative intake process determines what happens next.

With remotely collected information already in hand, a technician immediately diagnoses the truck, which is then routed to an appropriate service bay. Some bays are dedicated to complex service, others to fast-track repairs with a goal of getting back on the road in hours.

“We’re seeing a substantial reduction in repair time at our certified centers,” says Makki. “Our ability to accurately diagnose the problem has increased dramatically.”

“Volvo is the leading uptime solutions provider in North America. It’s a value we’re bringing to customers by linking them in real time with their vehicles. We don’t tell them they have a problem, we let them know there’s an issue and give them a solution.” ●



Mark Curri
 Senior Vice President of
 Uptime and Customer Support

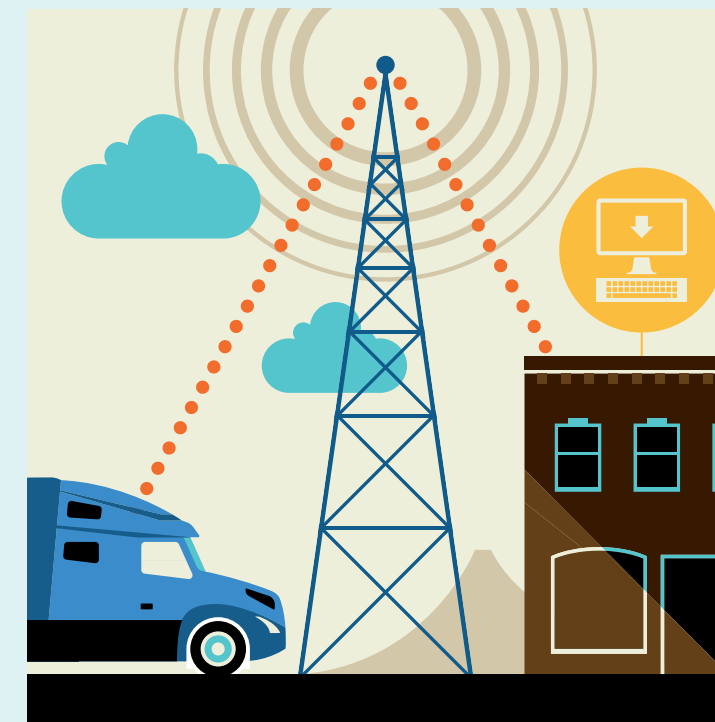
“We’re the leading uptime solutions provider in North America”

Volvo’s voices

The Volvo Uptime Center in Greensboro, NC, features approximately 50 advisors on call at all times. When issues occur, Volvo Trucks guarantees customers speak to a knowledgeable person who can guide them to appropriate repair centers and, when necessary, book hotel rooms, find rental replacements and provide other support services.



“We don’t tell you you have a problem. We give you a solution”



UNMATCHED INTEGRATION

No other manufacturer offers the seamless integration of Volvo Trucks’ ASIST service management tool. It is a platform that links dealers, customers and Volvo support staff through a common interface. Truck and customer info automatically populates forms at repair centers. Decision makers are notified if critical codes pop up. Diagnostic data collected remotely from the vehicle arrives at the repair center before the truck does.

Over-the-air updates

The new Remote Programming allows Volvo customers to perform over-the-air powertrain software and parameter updates. “We’re proud to bring a true over-the-air solution to market,” says Ash Makki. “Now customers can quickly and easily perform updates to help improve the performance and efficiency of their vehicles.”

Cost of Ownership

10



In the end it all
comes down to one thing

The bottom line



10. Cost of Ownership

The true value of the new Volvo VNL becomes clear when you look at all the variables that affect your bottom line. “With a premium product, customers can generate more revenue because they’re running more efficiently,” says Magnus Gustafson, vice president aftermarket quality and operations. “That means they can pay off their debt and build equity faster.”

Since Total Cost of Ownership (TCO) is about numbers, Volvo Trucks ran a pilot program to measure the effects of their Remote Diagnostics service on specific repairs. According to Gustafson, here’s what they found:

- 24% reduced average repair time
- 71% reduced average diagnostic time
- 91% increased ability to “fix it right the first time”

Any one of those numbers is impressive, but combine all of them and the value of this unique offering becomes clear.

THE VALUE OF SPEED Remote Diagnostics not only quickens repairs, in many cases it can anticipate issues before breakdowns occur, saving thousands of dollars. And Volvo Trucks’ Certified Uptime Center process gets trucks back on the road substantially faster.

“Our services impact our customer’s bottom line. The customer sees real value added, not just a gimmick,” says Gustafson.

HAPPY, HEALTHY DRIVERS TCO is complicated, but value is not hard to see in the new Volvo VNL.

Fuel efficiency, for instance. The new Volvo VNL saves up to 7.5% in fuel consumption. Safety matters, too. The new Volvo VNL is optimized to both prevent and mitigate accidents—which impact repair and insurance costs.

The new trucks are designed to keep drivers healthy but also happy, says Wade Long, director of product marketing, which affects driver retention.

“Fleets can spend up to \$15,000 annually recruiting a driver. If fleets have happy drivers, they can save a lot of money in driver replacement,” Long says.

BETTER SECOND LIFE Re-sale has always been a huge Volvo Trucks advantage. On the new trucks, the latest iteration of the I-Shift transmission and cab elements designed with the secondary market in mind will only increase that value.

“The more a truck is worth when you’re getting ready to replace it, the easier it is to pay off a loan or get a better trade-in value,” Long says.

SAVING BY PLANNING Other factors impact TCO. Pre-purchased maintenance and service plans allow customers to lock in at current labor rates, changing a variable cost to fixed cost. Bundling a plan with the truck’s financing can further amortize costs. Other customized design specs can be bundled in a loan, too.

It’s easy to confuse cost with value, that’s not good for business, Long says. “When you buy a premium product, it’s going to pay you back in dividends and savings,” Long says. “It’s going to keep you on the road and save in fuel, maintenance and financing.” ●

“Customers can generate more revenue because they’re running more efficiently”



Wade Long
Director of Product
Marketing

Built for resale

More fuel efficient engines and the improved I-Shift manual automated transmission make trucks more attractive to the secondary market. New comfortable cabs and a greatly improved driving environment add to that too.

“A premium product pays you back”



DURABILITY

REMOTE DIAGNOSTICS

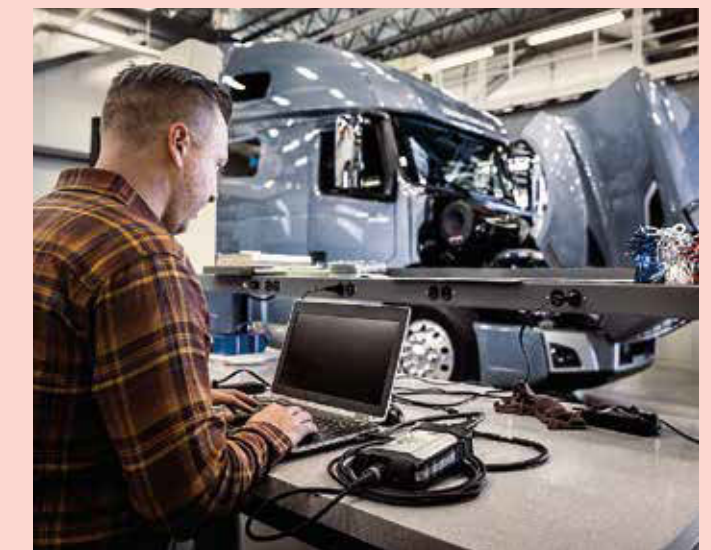


EXTENDING VALUE

“We’re doing a lot of things to give the truck a longer life expectancy and higher residual value,” Wade Long says. “Things like sectioned rubber or carpeted floor mats that are easy to refresh or replace, interior sidewalls for easy cleaning, non-woven material on the kick panel and removable mattress covers.”

Making the best even better

More dealer facilities and more Certified Uptime Centers nationwide mean quicker repair turnarounds. ASIST service management tool allows seamless information integration so fleets can make better decisions more quickly.



A new diagnostic device allows technicians to observe conditions 45 seconds before and 15 seconds after a diagnostic code is generated to understand conditions surrounding the event and generate faster repairs.



GLOBETROTTER

VIRGINIA IS FOR LOVERS

SEA

ACC

SEA

SEA

SEA

SEA

SEA

SEA

SEA



Volvo Trucks. Driving Progress



The new Volvo VNL—Designed, developed and built in the USA

Information was correct at time of distribution. Vehicles and services may include options.

© 2017 Volvo Truck Group North America, LLC

PV835-1035