World premiere of the new battery electric Freightliner eCascadia

05 09, 2022

Highlights Overview

The new battery electric Freightliner eCascadia

Portland, OR – May 9, 2022 – Freightliner Trucks, a division of Daimler Truck North America LLC (DTNA), today unveiled the new eCascadia at ACT Expo in Long Beach, CA. Built on the best-selling heavy-duty truck platform in North America, the new battery electric Freightliner eCascadia provides customers with a zero-emission version of the industry-leading Cascadia and debuts its innovative safety and connectivity features.

Extensive development and rigorous testing through several prototypes and customer-tested trucks, resulted in a powerful and efficient battery electric truck with multiple battery and drive axle options, providing a typical range of 230 miles (depending on vehicle configurations)[1]. The eCascadia is ideally suited for short-haul routes that allow for depot-based charging, examples of which include last mile logistics, local and regional distribution, drayage and warehouse to warehouse applications.

- 320-470 hp (Horsepower)
- Typical range of 230 miles (depending on vehicle configurations)[1]
- Multiple battery options and maximum capacity of almost 440 kWh[2]
- Recharge of 80 percent in approximately 90 minutes
- Up to 82,000 lbs max GCW (Gross Combination Weight)
- Available with single or tandem eAxle
- 116” day cab configuration


[2]Two spec'able battery capacities: 438 kWh (for tandem and single-drive) / 291 kWh (only for single-drive)

Powered by in-house developed Detroit ePowertrain

Detroit, the industry-leading manufacturer of state-of-the-art engines, axles and transmissions, is the power behind the eCascadia. The in-house developed Detroit ePowertrain is designed for a full integration with the eCascadia for maximum power, increased driving dynamics, and driver comfort, all with zero emission.

The eAxle is an electric drivetrain component integrated with an electric motor, transmission and specialized electronics within a compact unit. Detroit’s ePowertrain provides two eAxle designs including a dual motor with max torque of 23,000 lb-ft and max power of 395 hp, and a single motor featuring a max torque of 11,500 lb-ft and max power of 195 hp.
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The new electric eCascadia is ideally suited for short-haul routes that require quick turnaround times. Developed and manufactured by DTNA, the eCascadia is designed for fleets looking to transition to electric commercial vehicles. Utilizing specialized manufacturing processes, the eCascadia contains a number of advanced features to ensure it can handle the demands of the industry.

Innovative Detroit Connect eServices for an efficient and productive electric fleet

Connectivity plays a critical role in successful freight operations. Innovative Detroit Connect eServices have been exclusively developed for eCascadia and offer features that allow for maximum uptime, productivity, and profitability.

An in-house developed Charger Management System (CMS) is integrated directly into the Detroit Connect portal. CMS provides reports about depot utilization, data for grant compliance and Low Carbon Fuel Standard credit reporting, and can strategically save fleets money by leveraging demand-response incentives from local utilities. Additionally, CMS allows for staggered charging of multiple vehicles, charging during off-peak-demand hours, and partial charging. CMS is optimized for use with Detroit eFill chargers, and is also compatible with other popular charger models.

The eRange prediction tool automatically and accurately calculates and displays range over the course of a proposed trip. To give the most accurate indication possible, the tool analyzes multiple data inputs including vehicle parameters, load, weather, traffic, and road gradient. eRange Prediction allows for testing of “what-if” scenarios and performs analysis.

Battery health monitoring tracks and gives visibility into the eCascadia battery’s state-of-health percentage, state-of-charge percentage, remaining range miles, and charging status. Post-trip analysis gives actionable information to improve the eCascadia’s performance, utilization, and driver training. Based on actual trip data, users can visualize and quantify operational differences between trips. Outlying data is highlighted so that managers can easily identify exceptional situations.

Initial release of the CMS solution will occur in Q4 of 2022. Additional CMS features will be introduced in 2023.

Detroit Connect’s traditional features are also available on the new eCascadia, including remote updates to reduce the need to stop and physically connect the vehicle to initiate firmware updates. Remote updates allow users to update one or hundreds of trucks from a single location.

Detroit Assurance suite of safety systems for electric trucks

The Freightliner eCascadia comes standard with Detroit Assurance with Active Brake Assist 5 (ABA 5), setting the benchmark for advanced safety for heavy-duty electric commercial vehicles.

The release of the series production eCascadia marks the debut of a new Detroit Assurance safety feature: Active Side Guard Assist (ASGA). This industry-first technology engages at urban speeds (12 mph or less) to mitigate the truck from making a right turn when a moving cyclist or pedestrian is detected on the passenger side of the truck. ASGA applies automatic braking along with visual and auditory warnings, and is ideal for busy urban settings. This first-of-its-kind technology will help to protect pedestrian on the road today.

The eCascadia will also be the first version of the Cascadia to come standard with Active Lane Assist (ALA). As another first-of-its-kind safety feature it combines Level 2 automated driving with a suite of driver comfort features.

Detroit eConsulting and eFill chargers for seamless transition to electric

Detroit eConsulting is a customer-solution with the goal of making electrification for fleets approachable. The team has worked with nearly 40 Freightliner customers in the last several years. Detroit eConsultants are able to connect all of the dots for customers including right-sizing infrastructure, choosing ideal chargers, navigating rebates and incentives, site selection, connectivity insights, photovoltaic and energy storage, driver training, and more.
On May 9, 2022, Daimler Truck North America LLC (DTNA) and its industry-leading brands Freightliner and Detroit are celebrating the world premiere of the new battery electric eCascadia built for heavy-duty distribution haulage. With series production of the eCascadia starting this year, Freightliner enters a new era from testing and validation to real world customer applications and follows a clear path of strong business focus.

The flagship truck, the Freightliner eCascadia, together with the Freightliner eM2, has already covered more than one million miles in testing on public roads while in customer hands. Now, with its world premiere, start of series production and customer deliveries beginning in 2022, the new battery electric eCascadia and its dedicated services, bring DTNA and their customers one step further towards CO2-neutral transportation.

One thing is clear: Daimler Truck is aware of the important role transportation plays in helping to reach necessary emission reduction goals. DTNA has not only developed electric vehicle products, but also made significant investments in infrastructure consulting, charging services and public charging infrastructure to strive for a more sustainable future.

As the leading heavy-duty truck manufacturer, DTNA is fully committed to reducing emissions from its vehicles, and the commercial transportation industry as a whole and has invested heavily in advanced technologies for its internal combustion engines. From 1998 to today, DTNA has reduced NOx [nitrogen oxides = gas/smog] in its heavy-duty diesel engines by 98 percent. From 2007 to present day, DTNA has improved fuel efficiency in the conventional Freightliner Cascadia, the most fuel-efficient heavy-duty truck on the market, by nearly 35 percent.

The new battery electric Freightliner eCascadia in short

Since its debut in 2007, over 800,000 Freightliner Cascadias class 8 trucks have been sold, making them the clear industry leader. Now, the new eCascadia provides Freightliner customers with a zero-emissions version of the industry-leading Cascadia. Built off a legendary and proven product, the eCascadia’s extensive development and rigorous testing through several prototypes and customer test trucks has resulted in a powerful efficient electric truck.

With multiple battery and drive axle options, providing typical ranges of 230 miles\(^1\), the eCascadia is ideally suited for short-haul routes that allow for depot-based charging, examples of which include last mile logistics, local and regional distribution, drayage and warehouse to warehouse applications.

- 320-470 hp (Horsepower)
- Typical range of 230 miles (depending on configurations)\(^1\)
- Multiple battery options and maximum capacity of almost 440 kWh\(^2\)
- Recharge of 80 percent in approximately 90 minutes
- Up to 82,000 lbs max GCW (Gross Combination Weight)
- Available with single or tandem eAxle
- 116” day cab configuration

\(^1\) Tandem-drive: 220 miles / single-drive long-range: 230 miles / single-drive standard range: 155 miles

\(^2\) Two spec’able battery capacities: 438 kWh (for tandem and single-drive) / 291 kWh (only for single-drive)
Fully integrated battery electric Detroit ePowertrain

Detroit, the industry-leading manufacturer of state-of-the-art engines, axles and transmissions, is the power behind the eCascadia. The in-house developed Detroit ePowertrain is designed for a full integration with the eCascadia for maximum power, increased driving dynamics, and driver comfort.

The eAxle is an electric drivetrain component integrated with an electric motor, transmission and specialized electronics within a compact unit. Detroit’s ePowertrain provides two eAxle designs including a dual motor with max torque of 23,000 lb-ft and max power of 395 hp, and a single motor featuring a max torque of 11,500 lb-ft and max power of 195 hp.

The Detroit ePowertrain offers three battery options for a range of sizes and average, zero-to-full charging times starting with 194 kWh (one and a half to three hours), 291 kWh (two to four hours), and 438 kWh (two to six hours). Detroit HV Battery utilized Li-Ion NMC (Nickel Manganese Cobalt) battery chemistry packed inside of CATL (Contemporary Amperex Technology Co. Limited) prismatic cells. Li-Ion batteries enable the eCascadia to meet critical range targets without sacrificing payload. The eCascadia comes equipped with sensors throughout the vehicle to detect a collision and automatically open the electrical circuit for the high voltage system, shutting down the batteries and eAxle to avoid risk of electric shock or thermal event.

New grille design for aerodynamic improvements

Because the Detroit ePowertrain produces less heat than a traditional combustion engine, temperature and packing requirements for cooling are minimized. This allows the eCascadia to come standard with closed hood vents, a new grille, which reduces drag through forcing more air around the vehicle as opposed to pulling it through the radiator. Additional aero improvements are available in the Aero-X package, standard on the 6x4 model, which includes front wheel well closeouts, air skirts under the high voltage battery impact protection panels, quarter fenders with aero spoilers, and drive wheel fairings.

Designed for driver comfort

One of the most consistent pieces of feedback provided by customer drivers piloting pre-series production models is that the eCascadia offers exceptional driver comfort due to the elimination of engine noise and vibration inside the cab, the torque response in the driver seat and instant torque characteristic that allows smoother operation during high traffic conditions.

The eCascadia’s interior includes an ergonomic and modern wraparound dash, featuring a two-screen LCD digital display that provides the driver with customizable access to vehicle status information on the A-panel screen, and an infotainment B-panel screen featuring multimedia connections. Proven features in the Cascadia have been carried over to the electric version, such as the multi-function steering wheel controls that allow the drivers to accept, decline and end phone calls without removing their hands from the steering wheel, change controls of the instrument cluster unit menus, utilize cruise control, and control stereo volume. A quick-release adjustable steering column comes with full range of motion for driver comfort, an integrated windshield wiper control, and a right-hand column mounted stock switch for shifting, as well as adjusting regenerative braking intensity between low, medium, and high settings.

Smart services as a business tool

The Freightliner eCascadia: connected for enhanced productivity

Connectivity plays a critical role in successful freight operations by providing a closer look at potential problems, data insights, and planning. For electric mobility, Detroit Connect services for eCascadia have been exclusively developed and offer features that allow for maximum uptime, productivity, and profitability.

An in-house developed Charger Management System (CMS) is integrated directly into the Detroit Connect portal. CMS provides reports about depot utilization, data needed for grant compliance and Low Carbon Fuel Standard credit reporting, and can strategically save fleets money by leveraging demand-response incentives from local utilities. Additionally, CMS allows for staggered charging of multiple vehicles, charging during off-peak-demand hours, and partial charging. CMS is optimized for use with Detroit eFill chargers, and is also compatible with other networked DC fast charging stations.
The Freighliner eCascadia: connected for enhanced productivity.

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The new battery electric Freightliner eCascadia marks the debut of a new Detroit Assurance safety feature: Active Side Guard Assist (ASGA). This industry-first technology engages at urban speeds (12 mph or less) and while the driver is still in control it mitigates the truck from making a right turn when a moving cyclist or pedestrian is detected on the passenger side of the truck. ASGA applies automatic braking along with visual and auditory warnings, and is ideal for busy urban settings.

The eCascadia will also be the first version of the Cascadia to come standard with Active Lane Assist (ALA). As another first-of-its-kind safety feature it combines Level 2 automated driving with a suite of driver comfort features. Steer Assist comes standard with ALA and consists of features that help drivers with the ease of steering, especially in tight turning and backing situation at slow speeds. At highway speeds, Steer Assist helps drivers with steep crowned roads and cross winds by sensing and holding the steering wheel slightly off center to assist with lane centering. For example, in the event of a steer tire blowout, Steer Assist manages to keep the steering centered while the vehicle is pulled off of the road.

Detroit Assurance also features Active Brake Assist 5 (ABA 5) to mitigate potential collisions by calculating the truck’s speed and distance to other vehicles to determine if a warning or braking action is needed. ABA 5 can identify a person about to walk into the truck’s path, and issues audible and visual warnings with simultaneous partial braking, followed by full braking if the driver fails to react. Full emergency braking on tractor and trailer on moving pedestrians is a another first-of-its-kind technology in the Class 8 industry.

Additional standard features include Brake Hold Mode, Adaptive Cruise Control to 0 MPH, Intelligent High Beams, Automatic Wipers/Headlamps, Tailgate Warning, and Lane Departure Warning. Optional features include Forward-Facing Video Capture, which utilizes...
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The new electric Freightliner eCascadia in short haul, trailer, school use, vehicles and their associated technologies and components under the Freightliner, Western Star, Thomas Built

Read more about Daimler Truck North America:

Robert Reich, executive vice president and chief administrative officer, Schneider:
Andrea Juretzka, senior product development lead, DTNA:

Approachable transition to electric

The Freightliner eCascadia: supported by a holistic ecosystem

Electric trucks are just one part of the overall electric ecosystem. Among other considerations, capable chargers are needed to reliably and efficiently provide power, for fleet operators looking to integrate electric trucks into their operations.

Detroit eConsulting is a customer-focused solution with the goal of making electrification for fleets approachable. Dedicated consulting teams assist with the planning for customers’ needed infrastructure, and offer a comprehensive line of Detroit eFill Chargers for a seamless and efficient charging solution.

Detroit eFill chargers are designed to utilize CCS1 standard, the most common charging standard in North America, which work seamlessly with all electric vehicles. The broad charger portfolio includes options for multiple needs, ranging from 60-240 kW all-in-one charging stations to scalable 360 kW power cabinets that break out to multiple dispensers. The eFill lineup will also soon include smaller, portable charging solutions for shop spaces and large-scale fleet-charging depots that can deliver up to 1.44 MW of charge power. The first Detroit eFill chargers were deployed across California earlier this year by California Truck Centers.

The Detroit eConsulting team has worked with nearly 40 Freightliner customers in the last several years, and is experienced in setting up the electrification transition for commercial trucking fleets. Detroit eConsultants are able to connect all of the dots for customers including right-sizing infrastructure, choosing ideal chargers, navigating rebates and incentives, site selection, connectivity insights, photovoltaic and energy storage options, and more.

Detroit eConsulting offers three packages: Baseline, Powerline, or Megaline. The top-tier Megaline package is recommended for large-scale electric truck deployments. Customers receive assistance with planning for charging infrastructure, solar panel, and stationary energy storage projects. The eConsulting team interfaces with local utilities on the customers’ behalf. Additional services include a comprehensive cost-benefit and route analysis, and assistance with capital and operating expenditure optimization.

Under the Powerline package, customers will find similar benefits to the Megaline package, without the support for distributed energy resources (for example: solar, storage, and others) or the interface to local utilities. The Baseline package is free to all purchasers of Freightliner electric trucks and includes best practices and dealership-level consultation. Services of the Megaline and Powerline packages are not dependent on purchases of a Freightliner truck.

Backed by the largest dealer network in North America

The maintenance aspect is another important consideration when creating an electric ecosystem. Today’s Freightliner customers benefit from a commitment to maximum uptime and a company-wide goal of 24-hour or less turnaround time for vehicle service and repairs.

Freightliner has the largest dealer and service network across North America with almost 500 Freightliner dealership locations housing over 6,400 service bays.

For 80 years, the brand’s focus has been on customer experience. Freightliner continues this legacy with specialized dealer training for EV sales and charging infrastructure.

While electric powertrains require less maintenance overall, there are key needs to be addressed at regular intervals, usually every 12-48 months. These include air compressor, oil and filter changes, low voltage battery checks, high-voltage wiring checks, eAxle or drive motor lubrication, and cooling circuit flushing.
Service centers working on electric vehicles will require one to two high-voltage trained technicians to start, with qualifications to decommission the vehicles and ensure other service center employees can work around high voltage (HV) components without risk of injury. For example, Freightliner service center HV battery specialists are required to complete “HV Level 3” training, a multi-day, in-person training course with hands-on vehicle experiences.

Addressing urgent need for charging infrastructure for commercial vehicles

Lack of a publicly available, nationwide electric charging infrastructure for commercial vehicles, especially those used for long-haul freight operations, remains one of the biggest barriers for widespread deployment of electric trucks.

Therefore, DTNA laid the foundation together with NextEra Energy Resources, LLC and BlackRock Renewable Power (BlackRock) beginning of the year for a future joint venture to design, develop, install and operate a nationwide, high-performance charging network for medium- and heavy-duty battery electric and hydrogen fuel cell vehicles in the U.S. The sites will also be available for light-duty vehicles. With the goal of accelerating the rollout of carbon-neutral freight transportation, start of operations for the future joint venture is planned for mid-2022. Initial funding is expected to be comprised of approximately $650 million divided equally among the three parties.

The parties plan to build a network of charging sites on critical freight routes along the East and West coast and in Texas by 2026, leveraging existing infrastructure and amenities while adding complementary greenfield sites to fulfill anticipated customer demand. First phase is set to begin construction in 2023.

DTNA brings prior charging station construction experience to the table. In addition to depot-based projects, in cooperation with its local utility company, Portland General Electric (PGE), DTNA opened the first-of-its-kind public charging site for commercial vehicles in the U.S.

Customized financing and leasing solutions for electric trucks and chargers

Daimler Truck Financial Services USA LLC plans to support the eCascadia as well as Daimler Truck North America’s range of electric products with financing and leasing solutions that can be customized to meet each individual customer’s needs — including trucks and charging infrastructure. Daimler Truck Financial Services enables our customers to make the switch with tailor-made solutions that encompasses factors such as customer preference on ownership; incentives provided by government agencies; expansion to support infrastructure, and more. Our proven experience in offering customized finance solutions for our customers and dealers underscores our mission to accelerate the growth of sustainable transportation.

Important findings for series production

The Freightliner eCascadia: developed for real-world applications

Since 2018, Freightliner has deployed real trucks with real customers to run real freight in the real world covering a wide breadth of applications including drayage and local delivery, food distribution, and parcel delivery. Freightliner electric trucks have logged well over one million miles in day-to-day operations, pulling real loads and making real deliveries.

Comprised of over 40 battery electric Freightliner eCascadias and eM2s, the Freightliner Electric Innovation and Customer Experience (CX) Fleets have transformed the testing process by putting trucks into the hands of almost 50 customers to accumulate experience while performing in commercial vehicle applications.

The nation’s leading fleets, including Penske Truck Leasing, NFI, Hub Group, Knight-Swift, Schneider, XPO, Ryder, J.B. Hunt, and UPS, along with specialized fleets such as Loblaw Companies Limited, Sysco, Southern California Edison, Fastenal, Temco Logistics, Bison Transport, Core-Mark, Costco Wholesalers, Iron Mountain Inc., KeHe Distributors, Mondelez International Inc., US Foods and Velocity Truck Rental & Leasing, have all contributed to the development of Freightliner’s electric Class 8 and Class 6/7 trucks.

Participation in the Innovation and CX Fleets and being an active part of DTNA’s Electric Vehicle (EV) Council has provided those companies a chance to test integration of battery electric trucks into their own fleets and to share their learnings and experiences openly amongst all customers. Both fleets were supported by the South Coast Air Quality Management District which focuses on improving air quality in the
Driver feedback goes into production

From collecting driver feedback, comparing the relative impact of driver behavior, temperature, weather, and weight between multiple fleets and duty cycle, to assessing wear, testing charging equipment behavior, and readying the service network, DTNA has gained tremendous operational knowledge that was applied to the production version of the new eCascadia.

The rigorous testing has revealed that powertrain and auxiliary components, thermal management and low voltage electrical are performing better than expected. One ePowertrain feature stands out from previous technologies: the importance of regenerative braking to maximize range. Across the pilots, the average recuperation ratio was 20-25 percent, with some drivers achieving even up to 30 percent.

Testing the electric trucks in real conditions with real fleets has validated and reaffirmed many of the expected benefits of electric trucking from reduced driver fatigue to minimal noise and vibration, and influenced the production version of the eCascadia.

Statements

John O’Leary, president and CEO, DTNA: “The introduction of zero-emission trucks and all their needed support systems is truly a game changer. By developing electric vehicles, investing in charging infrastructure, and offering eConsulting services, we are determined to do our part to make commercial transportation emission-free.”

David Carson, senior vice president, sales and marketing, DTNA: “The eCascadia is a tried and true product that puts the customer first. Our full electric portfolio, including Detroit eConsulting and eFill Chargers and electric-specific connectivity services, give our customers options to successfully transition to electric.”

Rakesh Aneja, vice president and chief of eMobility, DTNA: “Our industry is faced with its biggest transformation ever, and we are determined to help our valued customers convert this challenge into an opportunity. The powerful and efficient eCascadia, with its innovative safety and connectivity features, represents a significant milestone in our transformation journey. Rooted in rigorous real-world customer testing and embedded in a holistic ecosystem, the eCascadia will help ease the electric transition for our customers.

Andreas Juretzka, senior product development lead, DTNA: “The safety, reliability and durability of the eCascadia is unmatched in the industry. We collected all the learnings and customer feedback over one million miles since 2018, and have been relentless driven to ensure our customer needs are met before entering series production. This is unmatched in the industry and will define the tipping point of electrification in the heavy-duty truck segment. Once you have experienced a commercial electric truck, you won’t look back.”

Paul Rosa, senior vice president of procurement and fleet planning, Penske Truck Leasing: “We remain committed to being at the forefront of the electric vehicle movement and the eCascadia has been a terrific option for our customers ready to incorporate EVs into their fleets. We look forward to continuing to work with Daimler Truck to help our customers meet their sustainability goals now and in the future.”

Rob Reich, executive vice president and chief administrative officer, Schneider: “All of our drivers who tested the eCascadia thoroughly enjoyed the experience. We see great value in adding electric trucks to our fleet and are excited about taking the next step with DTNA.”

Read more about Daimler Truck North America: newsroom

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Daimler Truck North America LLC, headquartered in Portland, Oregon, is a leading provider of comprehensive products and technologies for the commercial transportation industry. Daimler Truck North America designs, engineers, manufactures and markets medium- and heavy-duty trucks, school buses, vehicle chassis and their associated technologies and components under the Freightliner, Western Star, Thomas Built Buses, Freightliner Custom Chassis Corp and Detroit brands. Daimler Truck North America is a subsidiary of Daimler Truck Holding AG (DTG), one of the world’s leading commercial vehicle manufacturers.