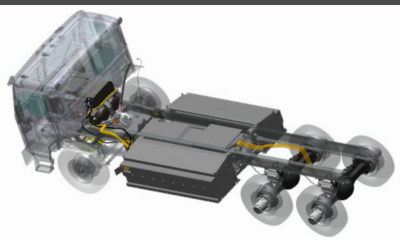
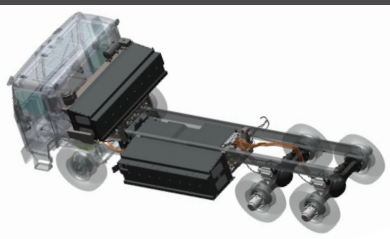
520EV QUICK START GUIDE

Peterbilt's Model 520EV offers a zero emissions, high-performance vehicle for clean, efficient operation. This Quick Start Guide outlines the unique and important guidelines for operating the 520EV.

There are two distinct battery configurations for the 520EV. For rear loader refuse body or roll off refuse body applications, battery packs are mounted on either side of the frame rails and one in between the frame rails. For right hand side loader refuse body applications, the battery pack on the right hand rail moves up behind the cab. This clears up the right hand rail for body equipment mounting. See below for diagrams.

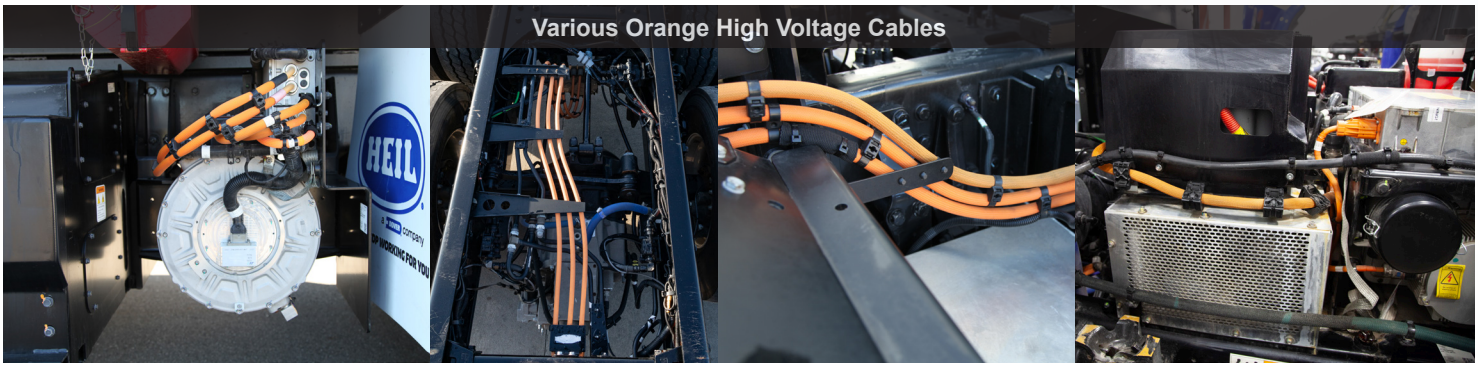
The 520EV can also be ordered with different drive configurations including left hand drive, right hand drive, right hand stand up and dual seated. This quick start guide covers both battery configurations and all drive configurations and will point out differences when necessary.

Rear Loader/Roll Off Configuration	Right Hand Side Loader Configuration
	

1) SAFETY

a. Cables or connectors that are colored in bright orange signify high voltage. Before operating the vehicle, visually check for damaged components or low hanging cables below the truck. If you see anything damaged or in a questionable state, have an authorized Peterbilt technician examine and repair the components without delay. Do not touch, attempt to remove, or service high voltage parts. Ignoring this warning will create risk of injury or death to yourself and bystanders. Your dealer's service center is the best place to have your vehicle repaired. Properly maintained high voltage personal protective equipment is required. If you are not a qualified mechanic for the Peterbilt 520EV, leave all repairs to an authorized service facility. Authorized service facilities are equipped to perform repairs safely and correctly.

Various Orange High Voltage Cables



Rev: 12/2025

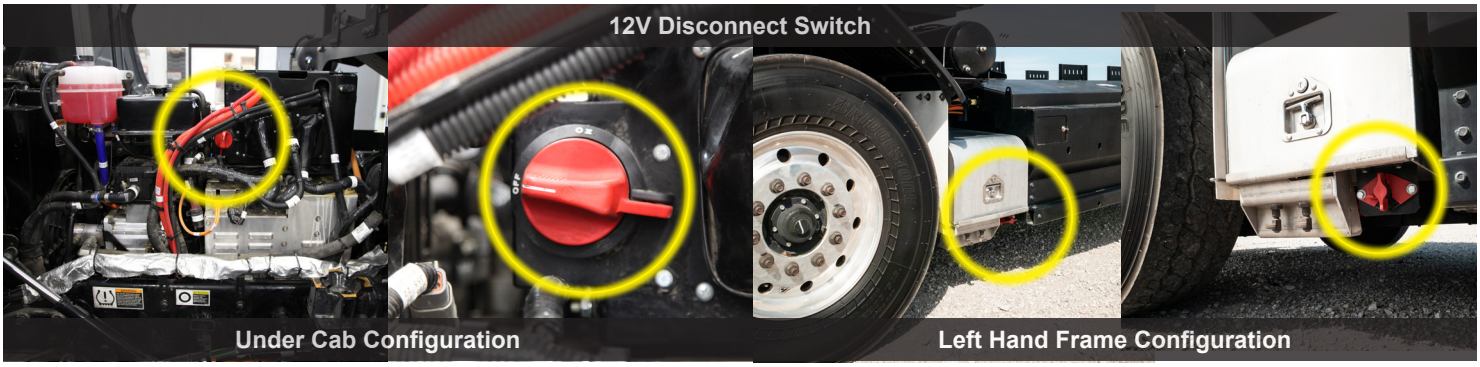
520EV QUICK START GUIDE

b. Electric Vehicles can be very quiet in operation, even when ‘running’. Because of this, the vehicle operator must remain aware of nearby vehicles or pedestrians at all times.

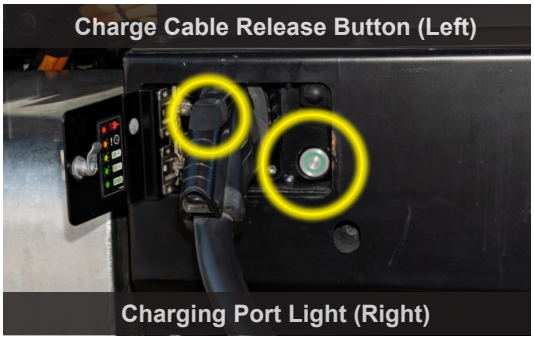
c.‘Truck running’ is indicated by the Power Gauge needle moving to the point on the gauge that lies in between the words ‘CHG’ and ‘ECO’. When the vehicle is ready to drive, the ‘Ready to Move’ tell-tale will illuminate in green.

2) CHARGING / BATTERIES

Before plugging the 520EV to a charger, ensure that the 12V disconnect switch (located under the cab or under the air tank box) is in the ‘on’ position. For best results wait a minimum of two minutes after vehicle shutdown to plug in.



a. After being plugged in, a charge port light will blink green to indicate truck is being charged.
There may be a small delay between when the charger is plugged in to when the truck starts charging.
If Charging does not commence after a small delay, usually less than a minute, restart the sequence by first unplugging the charge cable and then turning off the low voltage disconnect before attempting again. Wait at least one minute before attempting again.

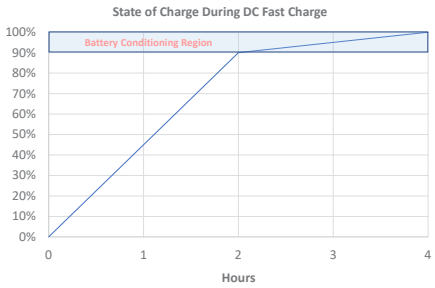


LED Color	Charger Status
	DC Fast Charging
	Charging Complete
	AC Charging (No Errors)
	DC or AC Charge Rate Severely Limited
	Charging Error

Rev: 12/2025

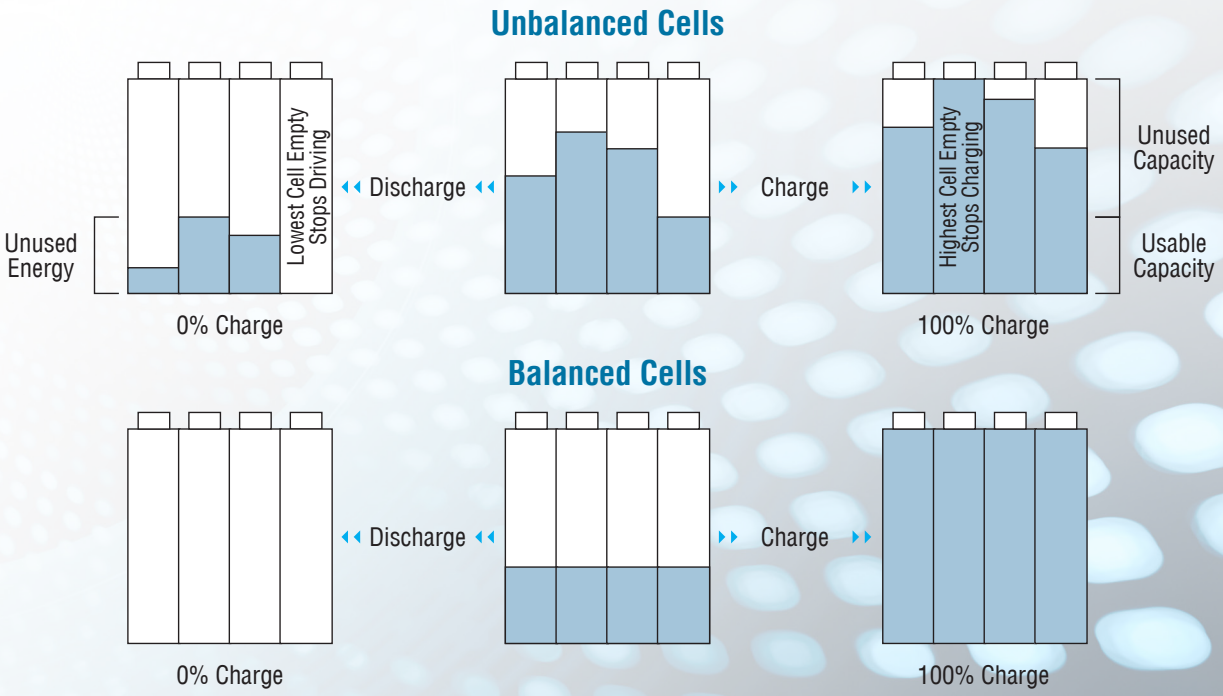
520EV QUICK START GUIDE

b. Max charge speed: Charging will be as fast as possible, per charger type, with the limit speed being the lesser of the vehicle or charger max speed.
   i. Max vehicle charge speed is 150kW.



c. Charge speed will slow down when the battery is nearly full, which is above 90%. Once the truck reaches about 90% state of charge (SOC), it is a good time to stop charging, if opportunity charging. Opportunity charging is when you have a limited time window for charging, such as a lunch break, where you can add critical range without taking all the time needed for a full charge. Utilizing opportunity charges will maximize vehicle productivity.

e. Battery balancing may occur during the last 5% of charging. For the longevity of the battery system, make sure to fully charge the truck at least once a week.
   i. The energy storage system consists of many individual battery cells organized into banks. When driving the vehicle, energy is drawn from the bank, which means energy is drawn from all cells. However, different cells within the bank can have differing energy levels. Once a single cell in the bank is completely empty, the truck considers the bank empty. Alternatively, when charging the truck as quickly as possible, the truck will show to be fully charged when a single cell in the bank is completely full.
   ii. If you charge the truck overnight, the truck's battery monitoring system begins passive balancing and can fill all the cells completely full, minimizing the difference in energy levels.
   iii. Note that if a truck's batteries are very out of balance it may take longer to fully charge from 95%.



520EV QUICK START GUIDE

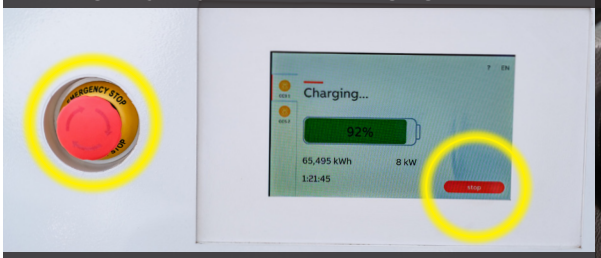
f. To disconnect the charge cable, charging must be stopped.

i. This can be done via the charger's interface or by pressing the button next to the charge port on the truck. Some chargers are equipped with a physical emergency stop button. It is recommended that you do not use this button to stop the charging sequence unless there is an emergency. Doing so may result in faults with the vehicle.

ii. If charging has not been stopped, the release button on the charge cable is interlocked to prevent the charge cable from being released. (See previous picture)

iii. The vehicle also has an interlock which prevents it from being driven while connected to the charge cable. When there is a charger tell-tale illuminated on the instrument cluster the vehicle interlock is engaged.

Emergency Physical Stop Charging Button (Left)



Standard Stop Charging Button (Right)

Charger Tell-Tale

g. Low voltage battery

i. The 520EV is equipped with either a single 12V battery mounted under the cab or a 12V single under cab battery plus three additional 12V batteries mounted in a battery box on the left hand frame rail. These 12V batteries are used to power the cab electronics and enable starting, just like a diesel truck. When the truck is running, the 12V batteries are filled by a high voltage to low voltage inverter which is analogous to an alternator on a diesel truck. Please note that when the 12V batteries are dead the truck will not start. Jump starting is not recommended due to the various low voltage battery installations and electrical options. It is recommended that the dead battery be swapped with a charged battery or trickle charge to full charge in place.

ii. If powering off for an extended period and not plugged into a charger, set the 12V disconnect switch to off. This will preserve charge in the low voltage system. The 520EV has a CCS1 charging port and system voltage of 650V. Compatible DC fast chargers must have a minimum voltage of 700V. For AC charging, a minimum of 11kW is necessary to slow charge.

iii. During charging or when the truck is running, do not turn off the low voltage disconnect. This may cause damage to the vehicle.

iv. The 520EV is equipped with a 12V battery maintenance mode when connected to the Charger.

v. Once the high voltage batteries have been fully charged while the 520EV is still connected to the charger, the truck will enter maintenance mode. Maintenance mode charges the 12V battery from the high voltage batteries once every four hours. Maintenance mode will continue to function until a set amount of energy has been consumed from the high voltage batteries. The maintenance mode energy usage calibration is a dealer configurable setting between 5-20% allowable energy consumption. For example, if a truck is set to 20% maintinance mode, will continue to charge the low voltage batteries every four hours until the truck is at 80% state of charge.

520EV QUICK START GUIDE

3) START UP Pre-Truck Inspection

a. Exterior

i. Check for low hanging cables below the truck, especially, orange high voltage cables. Have an authorized technician examine any questionable components and repair them without delay.

ii. Ensure the wheel cap nuts are in place and torqued properly.

iii. Check the parking spot for evidence of any fluids leaking.

iv. Verify that the truck exterior lights are all functioning.

v. Ensure all windows, mirrors and lights are clean and unobstructed.

b. Power Accessories

i. Verify that the coolant lines, power steering lines, airlines, fittings and other connections are all secure, intact and free of chafing.

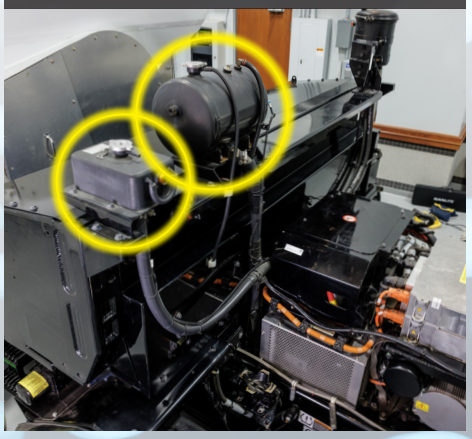
ii. Verify that all coolant reservoirs are in the correct location and adequately filled. There are three coolant reservoirs. The first is the cab heat reservoir. The fluid level in the cab heat reservoir can be checked via the indicator molded into the translucent reservoir under the cab. This reservoir is in the same location for both battery configurations. The battery chiller coolant reservoir is located under the cab on the rear loader configuration. On the right hand side loader configuration, it is located on top of the back of cab battery on the right hand side. The final reservoir is for the power electronics and drive motors. This is located on a bracket behind the right hand side side of the cab for the rear loader configuration. For the right hand side loader configuration, the reservoir is located next to the battery chiller reservoir on the right side of the back of cab battery. The power electronics and battery chiller reservoirs have site glasses for checking coolant level. If fluid can be seen on the site glass then there is adequate fluid.

iii. Ensure the radiator fan is free of debris.

Cab Heat Coolant Reservoir
(Both Battery Configurations)

"Battery Chiller Coolant Reservoir
(Rear Loader/Roll Off Configuration)

Battery Chiller Coolant Reservoir (Left)
& Power Electronics & Drive Motor
Coolant Reservoir (Right)
(Right Hand Side Loader Configuration)



Power Electronics & Drive Motor Coolant
Reservoir (Rear Loader/Roll Off Configuration)

Coolant Reservoir Site Glass

520EV QUICK START GUIDE

3) START UP *continued*

c. Interior

i. Remove the charger plug if necessary.

ii. Switch on the low voltage disconnect switch if necessary. It is recommended to turn the key to the run position for at least one minute. This will allow the truck to fully run through all the starting checks before the ignition sequence.

iii. Turn the ignition key fully clockwise and let it spring back.

iv. Release the park brake.

v. Put the truck in drive.

vi. The truck will be ready to move when the green 'Ready to Move' tell-tale is illuminated.

i. Do not attempt to tow without reading and following directions outlined in the 520EV Operator's Manual. Failure to follow correct towing procedure could result in injury, death or damage to the vehicle.

d. Shutdown

i. Put the truck in N (neutral).

ii. Pull the park brake to ensure that it is applied.

iii. Remove the key from the ignition.

iv. Ensure the 'Ready to Move' tell-tale is extinguished.

4) RANGE/EFFICIENCY *EVs have a limited range, so driver behavior is key to maximizing range!*

a. Highest energy consumption occurs driving at high average speeds/freeway speeds.

i. 65 MPH cruise or slower is recommended.

ii. Routes/applications with more stops/starts will result in the best EV range vs high speed highway driving.

b. Moderate driving behavior.

i. As with any vehicle, moderate acceleration and deceleration will result in the best driving efficiency (25% - 75% of the accelerator pedal).

c. One pedal driving

i. If the vehicle is in motion and the regenerative braking is engaged, the vehicle will be slowed down when the operator's foot eases off the accelerator pedal. This is energy being put back into the batteries.

ii. The regenerative braking system will slow the vehicle to 5mph, then the operator will need to use the service brakes to bring the vehicle to a complete stop. Similar to an engine retarder on an internal combustion engine, regenerative braking is controlled by a multi position button.

iii. There are 4 settings for regenerative braking on the 520EV: Off, 1 – 33% Braking Power, 2 – 66% Braking Power, 3 – 100% Braking Power. Activating the regenerative braking is done via a switch on the center console. A green indicator on the switch will illuminate when regenerative braking is activated. Braking power is set via the 3-way arrow switch found adjacent to the activation switch.

Rev: 12/2025

520EV QUICK START GUIDE

4) RANGE/EFFICIENCY *continued*

iv. Higher regenerative brake settings will result in stronger regenerative braking and more energy being put back into the batteries.

v. Higher utilization of regenerative braking will result in the most efficient driving possible and will extend range.

vi. When the battery is completely full, the vehicle will be unable to use regenerative braking since there is no room in the battery to store the regenerative braking energy. This is normal. When this occurs the regenerative braking tell-tale will light up on the instrument cluster. In the event that the drive motor, drive motor inverter or battery temperature is too high, the regenerative braking tell-tale may also illuminate. This indicates the regenerative braking system has been disabled.

Regenerative Braking Tell-Tale with Full Battery

Regenerative Braking Activation (left) & Braking Power (right) Switches

d. HVAC

i. Energy consumption at idle is relatively low as compared to driving.

ii. Best practice is to eliminate excessive idle time by turning the truck off when leaving the cab. This will reduce energy consumption and improve range.

iii. Utilize the recirculation mode on the HVAC system to minimize heating and cooling energy consumption. Also, do not drive with the windows down and HVAC running.

Recirculation Mode Engaged

520EV QUICK START GUIDE

4) RANGE/EFFICIENCY *continued*

e. Temperature

i. Batteries like to be at moderate (room) temperatures. The truck will automatically adjust the battery temperature by heating them when cold, or cooling them when hot.

1. This means temperature extremes will affect vehicle range. Plan for reduced range in these conditions.

ii. Cab and Powertrain Conditioning

1. Bringing the vehicle, batteries and cabin to operating temperature while connected to the charger, prior to departing, will help to mitigate weather-related range loss. This can be done by starting the vehicle during a charge session.

iii. Park the vehicle with weather-related range loss in mind.

1. For hot climates, park in shade.

Parking in Shade

2. For cold climates, park in an indoor, warmer area if possible.

Parking Inside

Note: This quick start guide is intended as a quick reference. Operators should fully read the 520EV operators manual before operating the 520EV. This quick start guide also does not replace driver training and operators must be properly trained before driving the 520EV.