



2016 +
MODEL X
EMERGENCY RESPONSE
GUIDE

This guide is intended only for use by trained and certified rescuers and first responders. It assumes that readers have a comprehensive understanding of how safety systems work and have completed the appropriate training and certification required to safely handle rescue situations. Therefore, this guide provides only the specific information required to understand and safely handle the fully electric Model X in an emergency situation. It describes how to identify Model X and provides the locations and descriptions of its high voltage components, airbags, inflation cylinders, seat belt pre-tensioners, and the high strength materials used in its body structure. This guide includes the high voltage disabling procedure and any safety considerations specific to Model X. Failure to follow recommended practices or procedures can result in serious injury or death.

The high voltage battery is the main energy source. Model X does not have a traditional gasoline or diesel engine and therefore does not have a fuel tank. Model X comes in various types. The front motor also comes in two types: induction and permanent magnet. The images in this guide might not match the vehicle you are working on.



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IMPORTANT SAFETY INSTRUCTIONS

This document contains important instructions and warnings that must be followed when handling Model X in an emergency situation.

NOTE: Images in this document show a left-hand drive (LHD), North American vehicle. Unless otherwise noted, right-hand drive (RHD) vehicles are mirrored.

NOTE: Model X is equipped with airbags in North America only.

WARNINGS

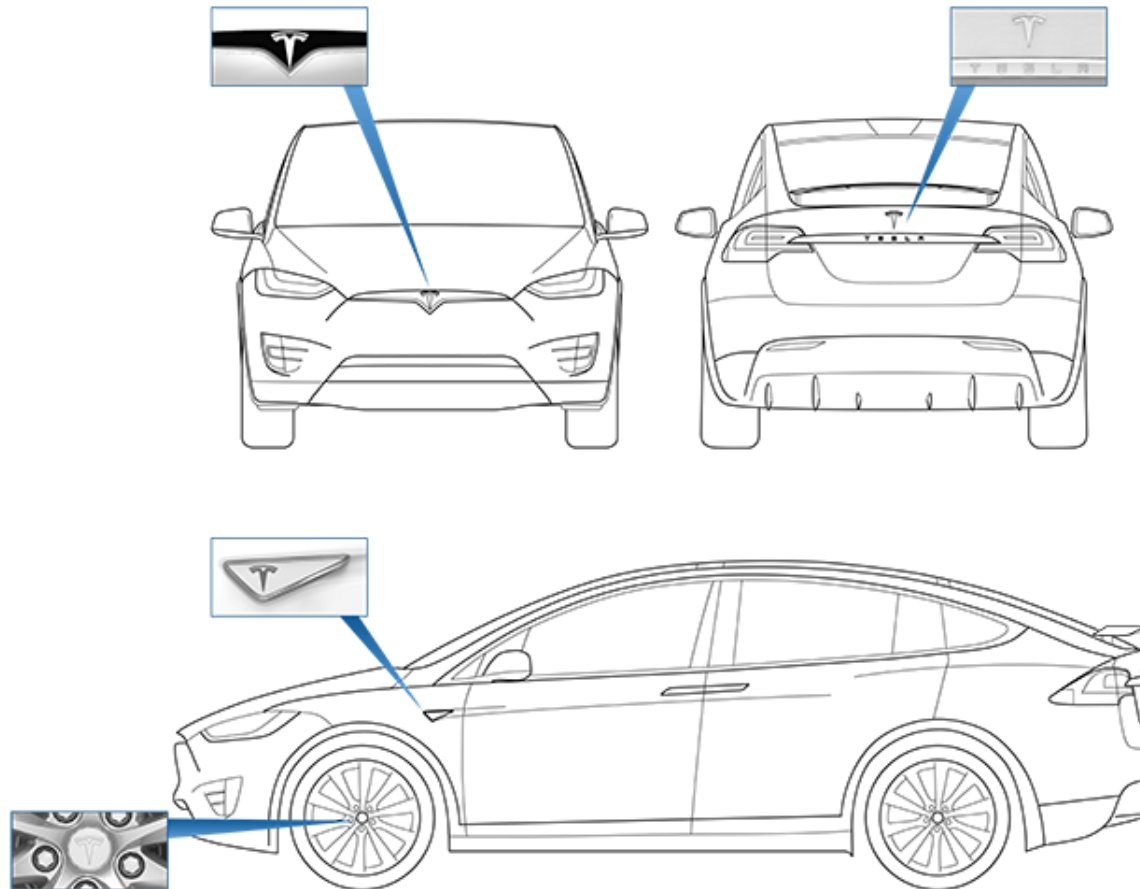
- ⚠ **Warning:** Always use appropriate tools, such as a hydraulic cutter, and always wear appropriate personal protective equipment (PPE) when cutting Model X. Failure to follow these instructions can result in serious injury or death.
- ⚠ **Warning:** Regardless of the disabling procedure you use, ALWAYS ASSUME THAT ALL HIGH VOLTAGE COMPONENTS ARE ENERGIZED! Cutting, crushing, or touching high voltage components can result in serious injury or death.
- ⚠ **Warning:** After deactivation, the high voltage circuit requires 2 minutes to de-energize.
- ⚠ **Warning:** The supplemental restraint system (SRS) control unit has a backup power supply with a discharge time of approximately ten seconds. Do not touch the SRS control unit within 10 seconds of an airbag or pre-tensioner deployment.
- ⚠ **Warning:** Handling a submerged vehicle without appropriate PPE can result in serious injury or death.
- ⚠ **Warning:** When fire is involved, consider the entire vehicle energized. Always wear full PPE, including a self-contained breathing apparatus (SCBA).
- ⚠ **Warning:** When cutting the first responder loop, double cut the loop to remove an entire section. This eliminates the risk of the cut wires accidentally reconnecting.
- ⚠ **Warning:** Never cut the high tension springs attached to the falcon wing doors. These springs might cause portions of the door to rise rapidly if the weight of the doors is reduced through the removal process. Serious injury or death can result from cutting or rapidly releasing the high tension springs.
- ⚠ **Warning:** NEVER TRANSPORT YOUR VEHICLE WITH TIRES IN A POSITION WHERE THEY CAN SPIN. DOING SO CAN LEAD TO SIGNIFICANT DAMAGE AND OVERHEATING. IN RARE CASES EXTREME OVERHEATING MAY CAUSE THE SURROUNDING COMPONENTS TO IGNITE.



BADGING

Model X can be identified by its badges.

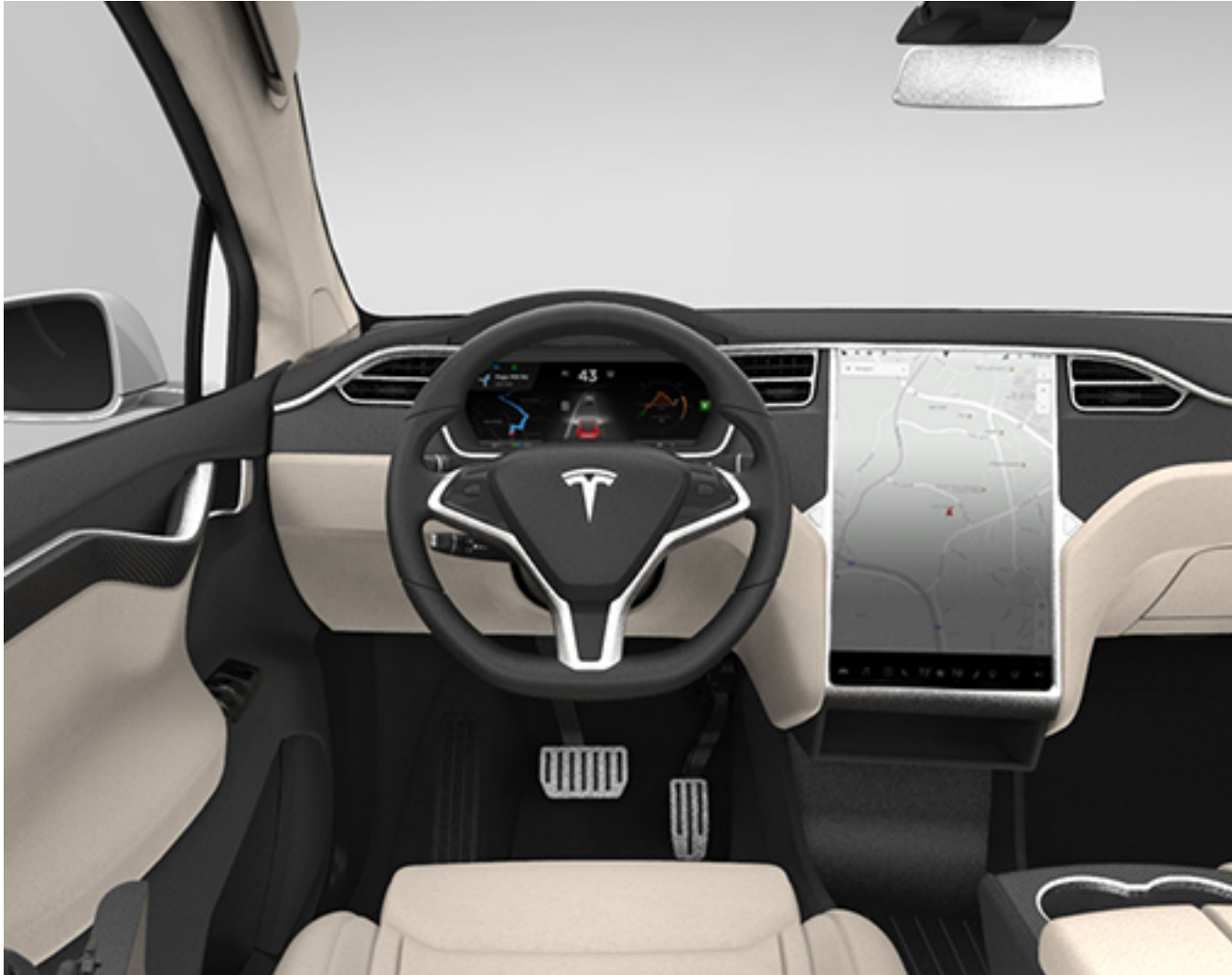
NOTE: The "D" at the end of the battery badge (or "DUAL MOTOR" badge for newer vehicles) on the RH side of the vehicle indicates that the vehicle is a Dual Motor configuration.





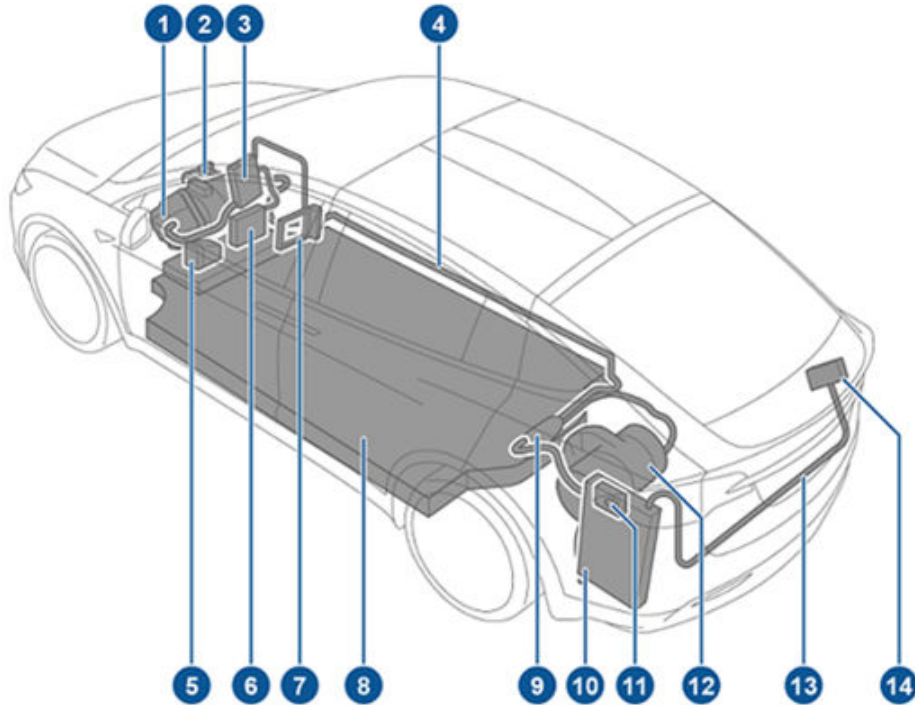
TOUCHSCREEN

Model X can be identified by its 17 in (43 cm) touchscreen.





HIGH VOLTAGE COMPONENTS

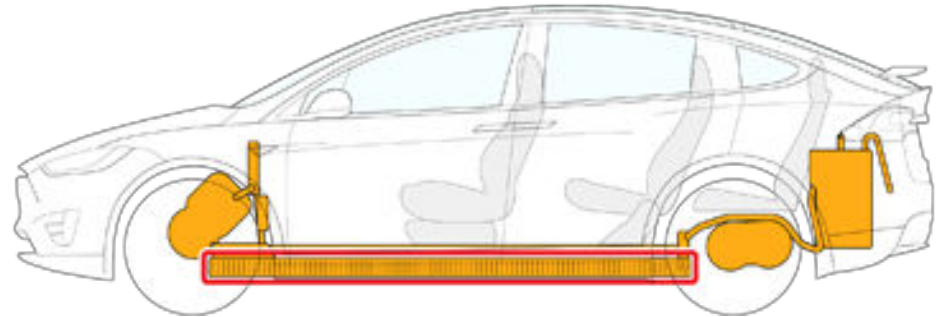
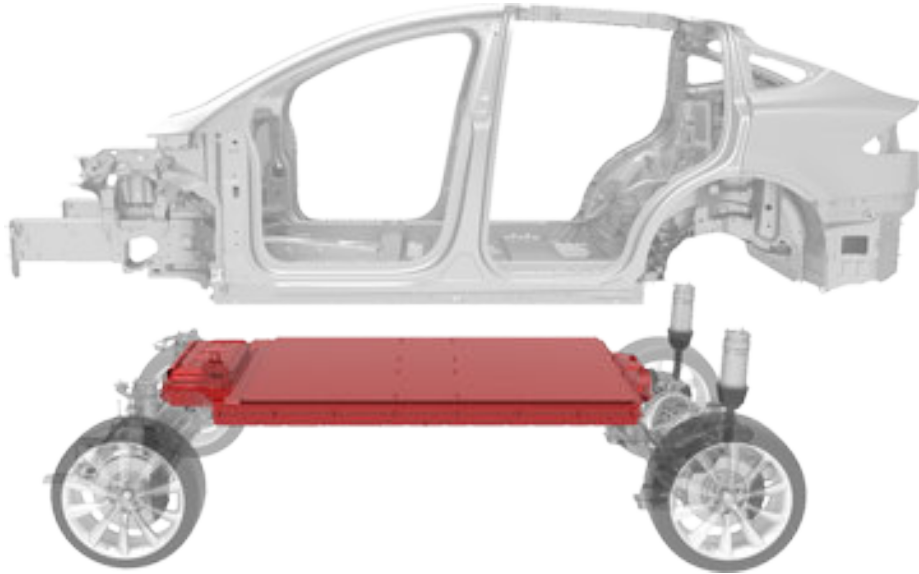


1. Front drive unit
2. A/C compressor
3. Front junction box
4. High voltage cabling
5. Battery coolant heater
6. DC-DC converter
7. Cabin heater
8. High voltage battery
9. Rapid splitter
10. Charger
11. Charge port
12. Rear drive unit
13. High voltage cabling to rear HVAC assembly
14. Rear HVAC assembly



HIGH VOLTAGE BATTERY

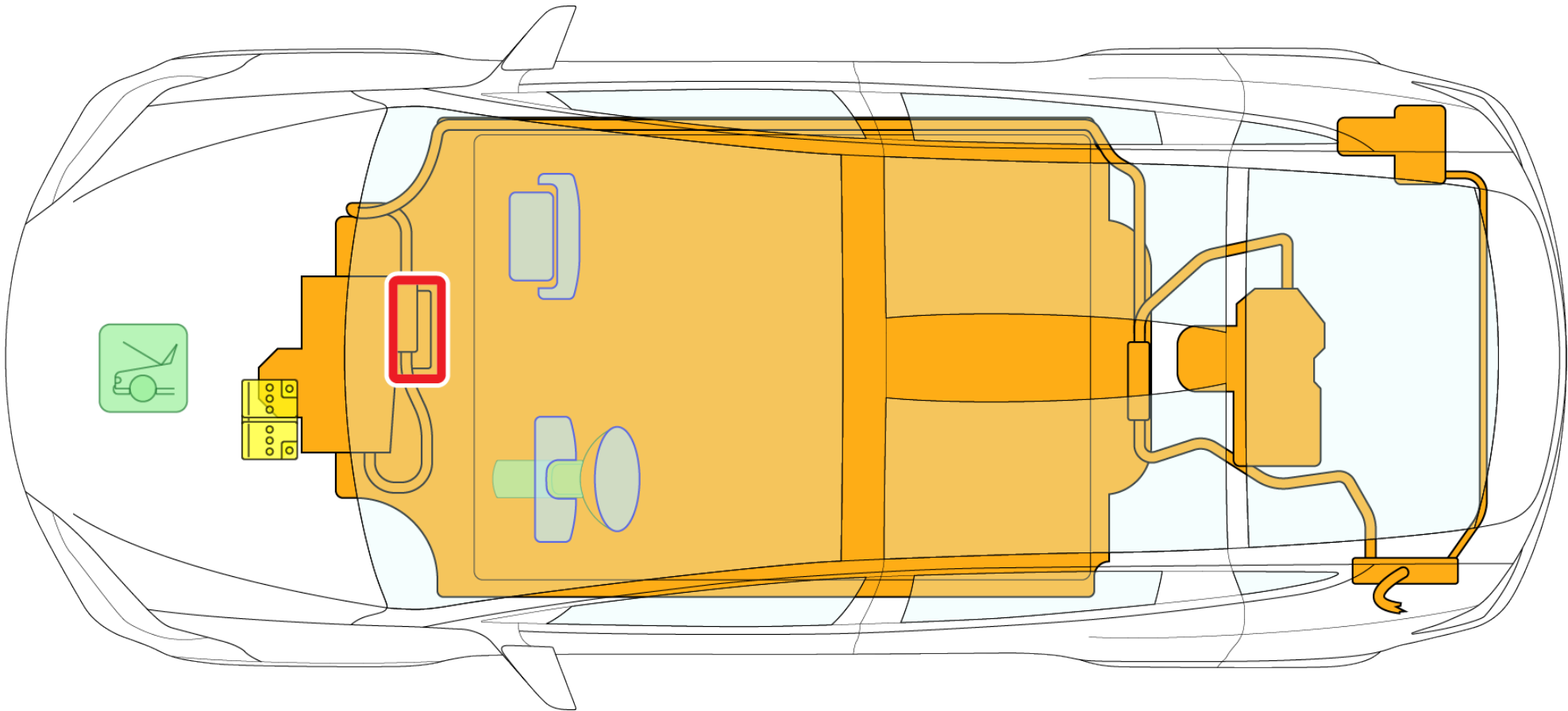
Model X is equipped with a floor-mounted 400 volt lithium-ion high voltage battery. Never breach the high voltage battery when lifting from under the vehicle. When using rescue tools, pay special attention to ensure that you do not breach the floor pan. Refer to [Lifting the Vehicle](#) on page 23 for instructions on how to properly lift the vehicle.





DC-DC CONVERTER AND FRONT JUNCTION BOX

High voltage is present at the DC-DC converter and front junction box, as outlined in red. The DC-DC converter transforms the high voltage current from the high voltage battery to low voltage to charge the Model X 12 volt battery. The front junction box provides high voltage current to various components, such as the battery heater, air conditioning compressor, and cabin heater. Use caution when cutting in this area during a dash lift and dash roll procedure. Use work-around techniques, if necessary.

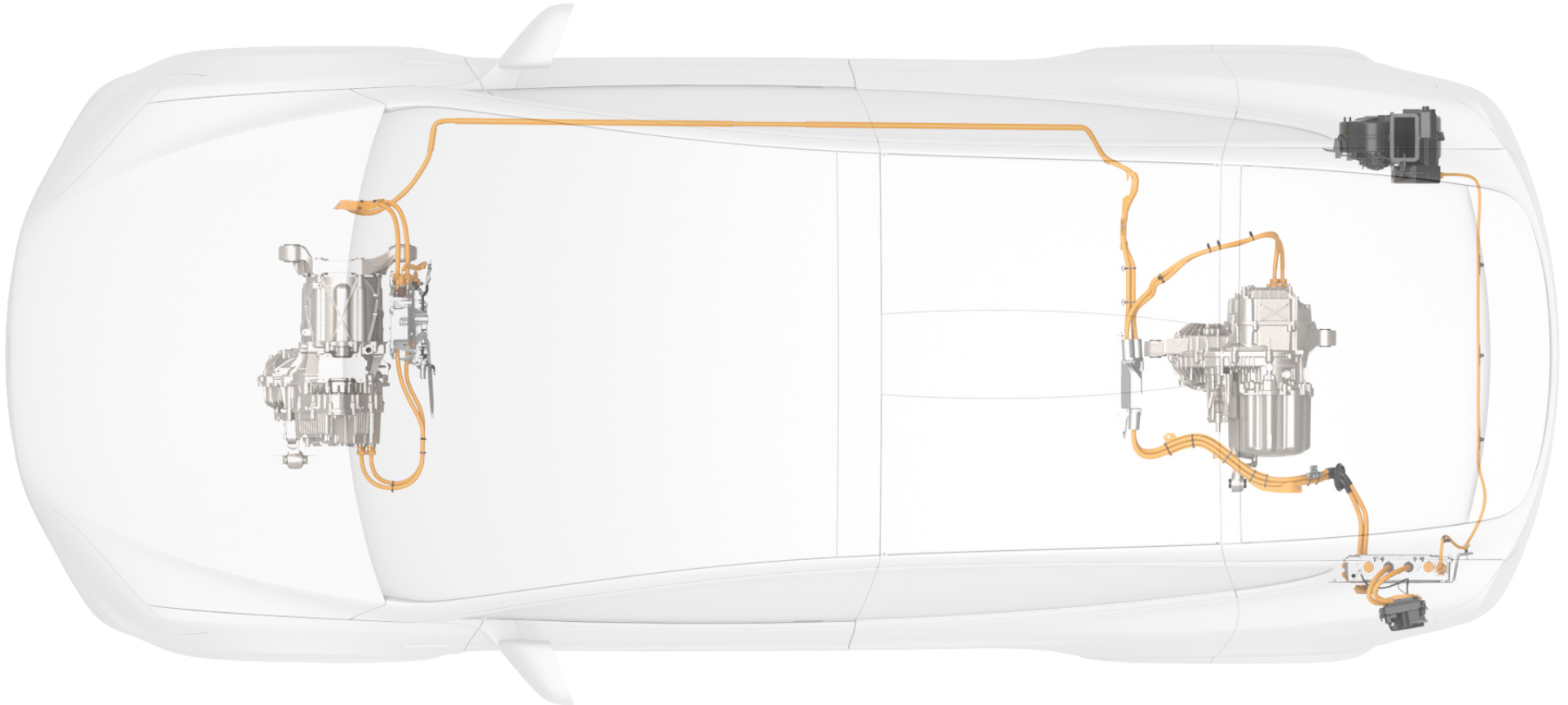




HIGH VOLTAGE CABLES

High voltage cables are shown in orange.

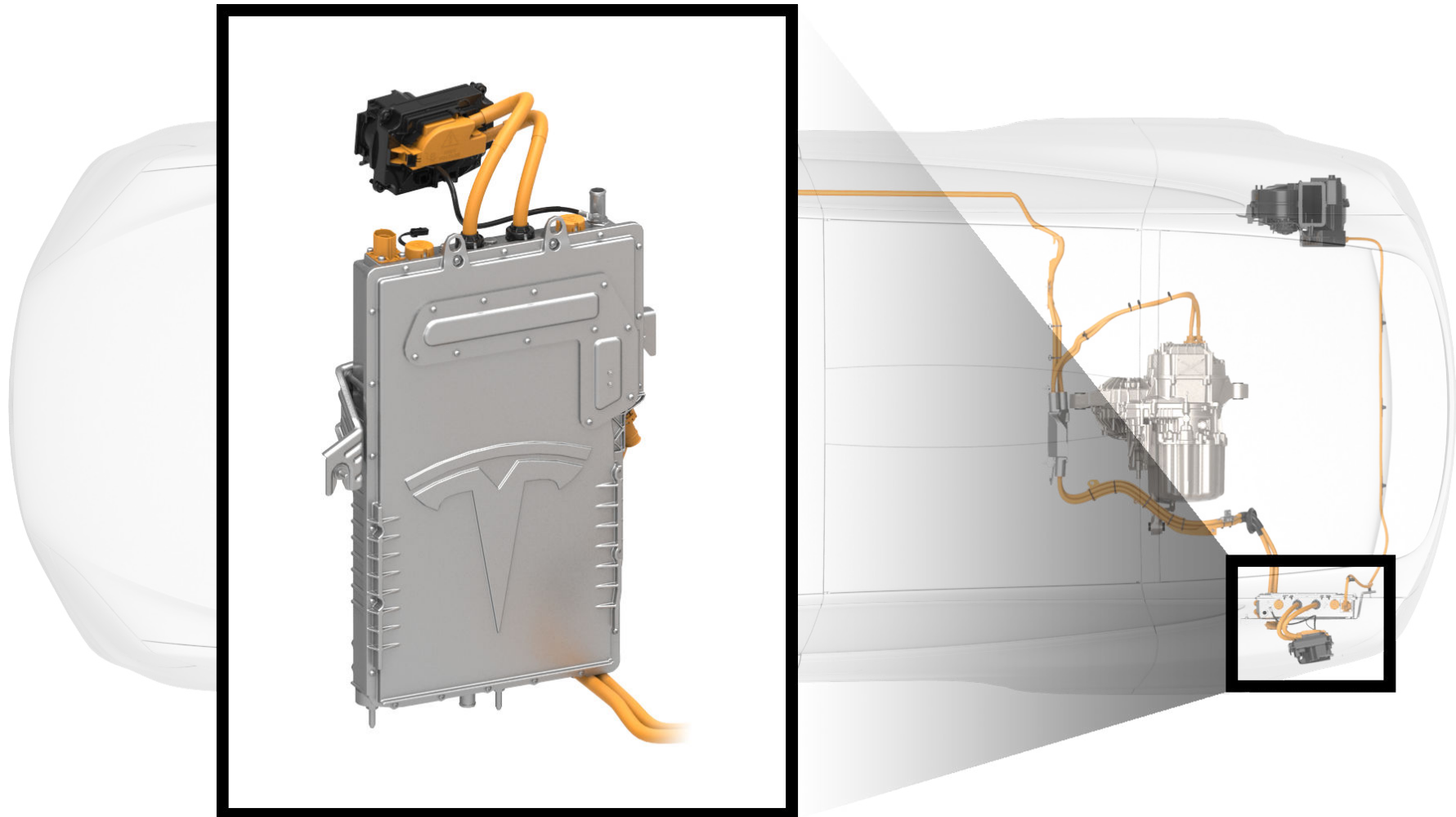
NOTE: The motors depicted in this image may not exactly match the vehicle you are working on.





CHARGER

Model X has one charger located inside the left-hand side quarter panel. This charger converts alternating current (AC) from a charging station to direct current (DC) for charging the high voltage battery. It also routes high voltage to the rear HVAC, if equipped. The high voltage junction box, integrated into the charger, routes any surplus energy from regenerative braking back to the high voltage battery.

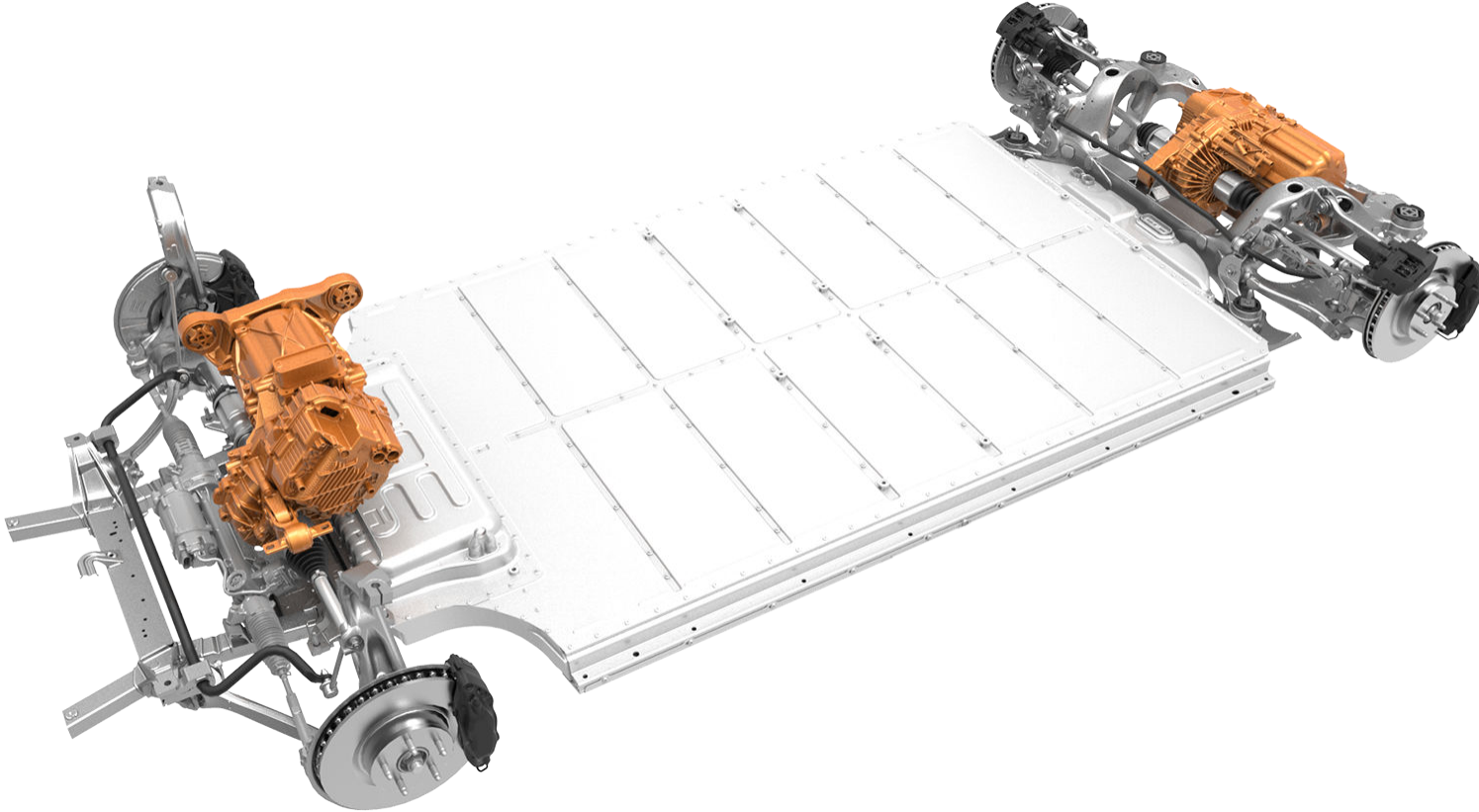




DRIVE UNITS

The rear drive unit is located between the rear wheels, and the front drive unit is located between the front wheels. The drive units convert the direct current (DC) from the high voltage battery into 3-phase alternating current (AC) that the drive units use to power the wheels.

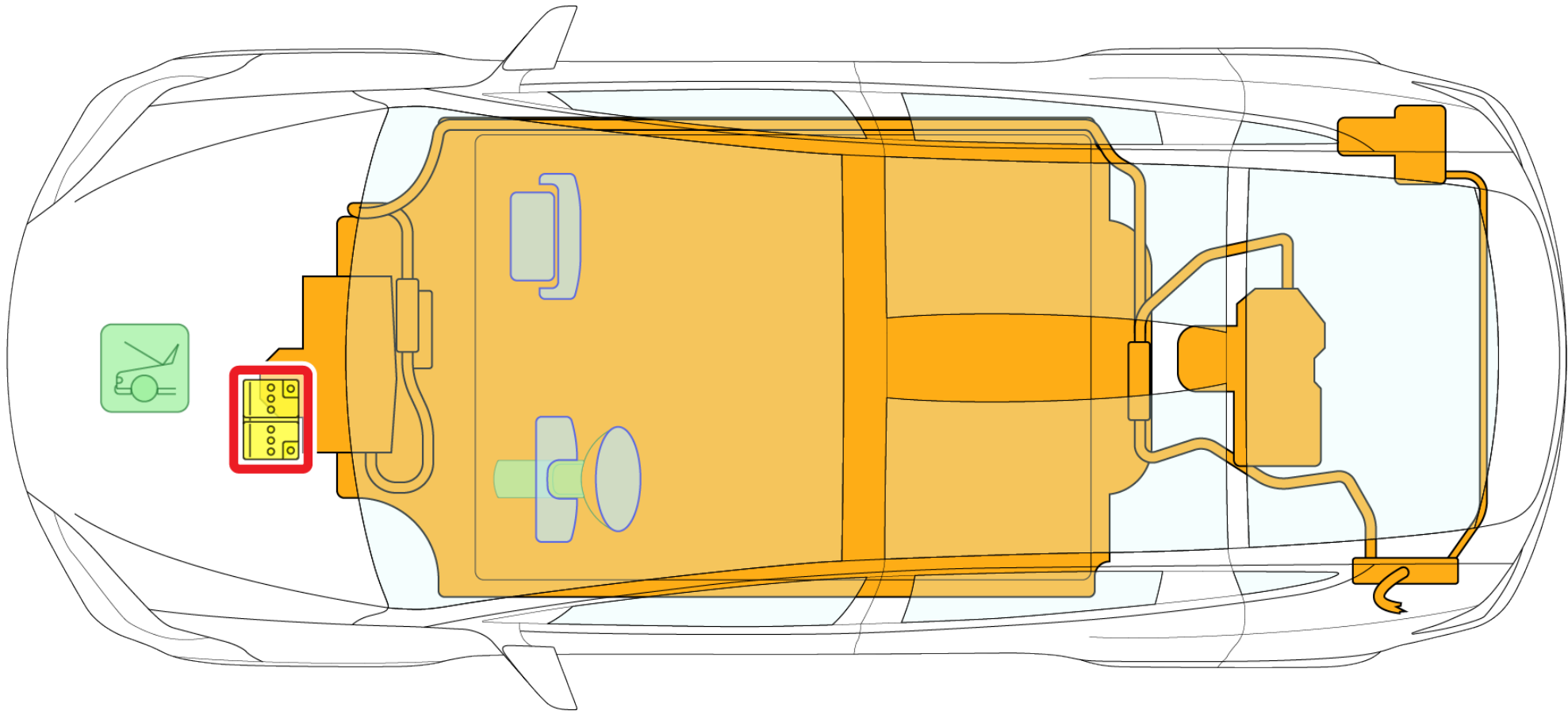
NOTE: The motors depicted in this image may not exactly match the vehicle you are working on.





12 VOLT BATTERY

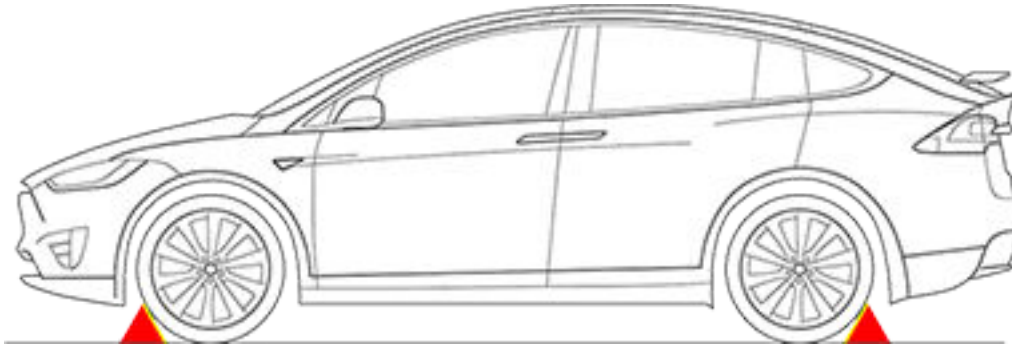
In addition to the high voltage system, Model X has a low voltage electrical system. Its 12 volt battery operates the SRS, airbags, windows, door locks, touchscreen, and interior and exterior lights. The DC-DC converter in the high voltage system charges the 12 volt battery, and the 12 volt battery supplies power to the high voltage contactors, allowing high voltage current to flow into and out of the high voltage battery. The 12 volt battery, outlined in red, is located under the hood and the plastic access panel.





CHOCK ALL FOUR WHEELS

Model X moves silently, so never assume it is powered off. Drivers can choose a setting that determines whether or not Model X will "creep" when a drive gear is selected. If this setting is off, Model X may not move unless the accelerator is pressed, even if shifted into Drive or Reverse. However, never assume that Model X will not move. Always chock the wheels.



SHIFT INTO PARK

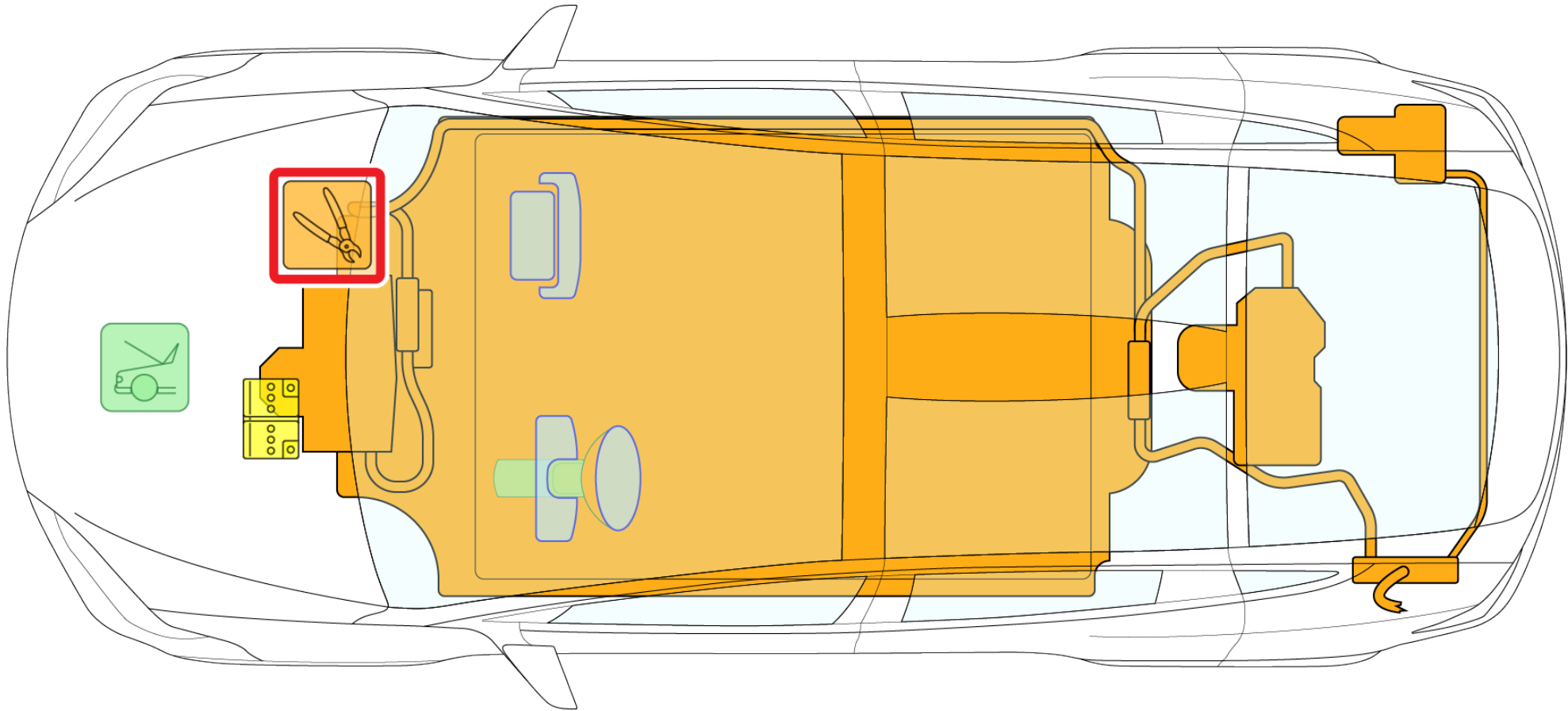
Model X moves silently, so never assume it is powered off. Pressing the accelerator pedal even slightly can cause Model X to accelerate quickly if the active gear is Drive or Reverse. To ensure that the parking brake is engaged, press the button on the end of the gear selector to shift into Park. Whenever Model X is in Park, the parking brake is automatically engaged and the instrument cluster shows the active gear as Park (P).





FRONT TRUNK FIRST RESPONDER CUT LOOP

The first responder loop is a low voltage harness. Cutting the first responder loop shuts down the high voltage system outside of the high voltage battery and disables the SRS and airbag components. Refer to [Cutting the Front Trunk First Responder Loop](#) on page 14 for instructions on how to access and cut the first responder loop.



⚠ Warning: Regardless of the disabling procedure you use, ALWAYS ASSUME THAT ALL HIGH VOLTAGE COMPONENTS ARE ENERGIZED! Cutting, crushing, or touching high voltage components can result in serious injury or death.



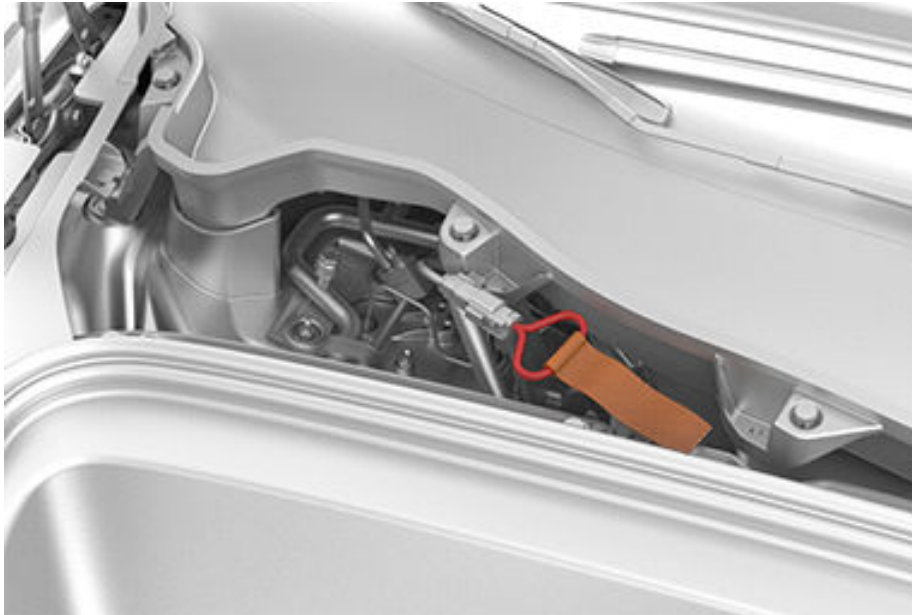
CUTTING THE FRONT TRUNK FIRST RESPONDER LOOP

When cutting the first responder loop, double cut it to remove an entire section. This prevents the wires from accidentally reconnecting.

1. Open the hood. Refer to [Opening the Hood](#) on page 30 for instructions.
2. Remove the access panel by pulling it upwards to release the clips that hold it in place.



3. Double cut the first responder loop.

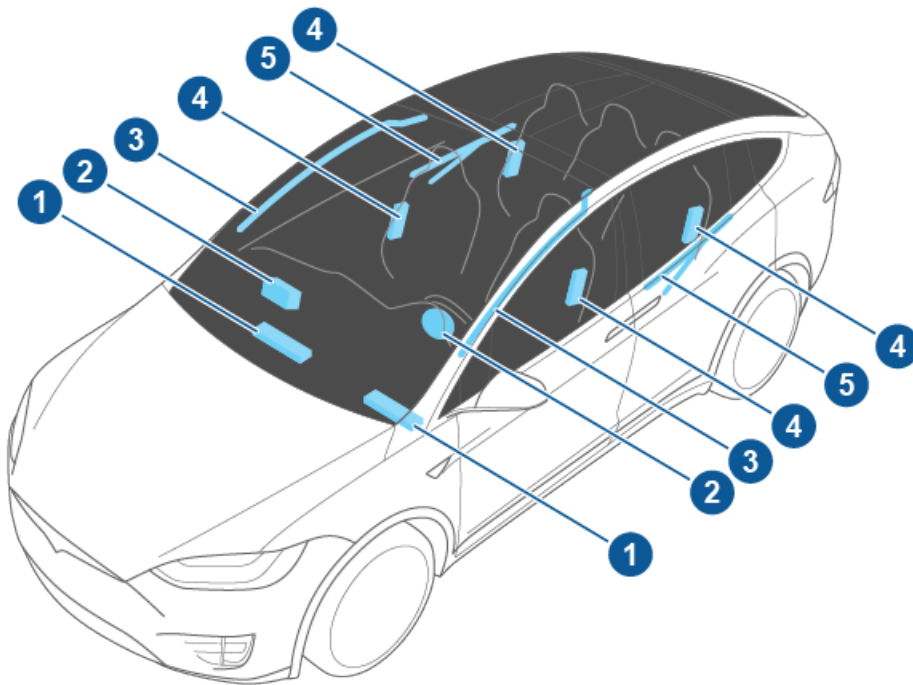


AIRBAGS

Airbags are located in the approximate areas shown. Airbag warning information is printed on the sun visors.

NOTE: Model X is designed to deactivate high voltage in all components and cables outside of the high voltage battery when an airbag is deployed.

NOTE: Left Hand Drive, North American vehicle shown. On Right Hand Drive vehicles, the passenger and driver airbag locations are reversed.



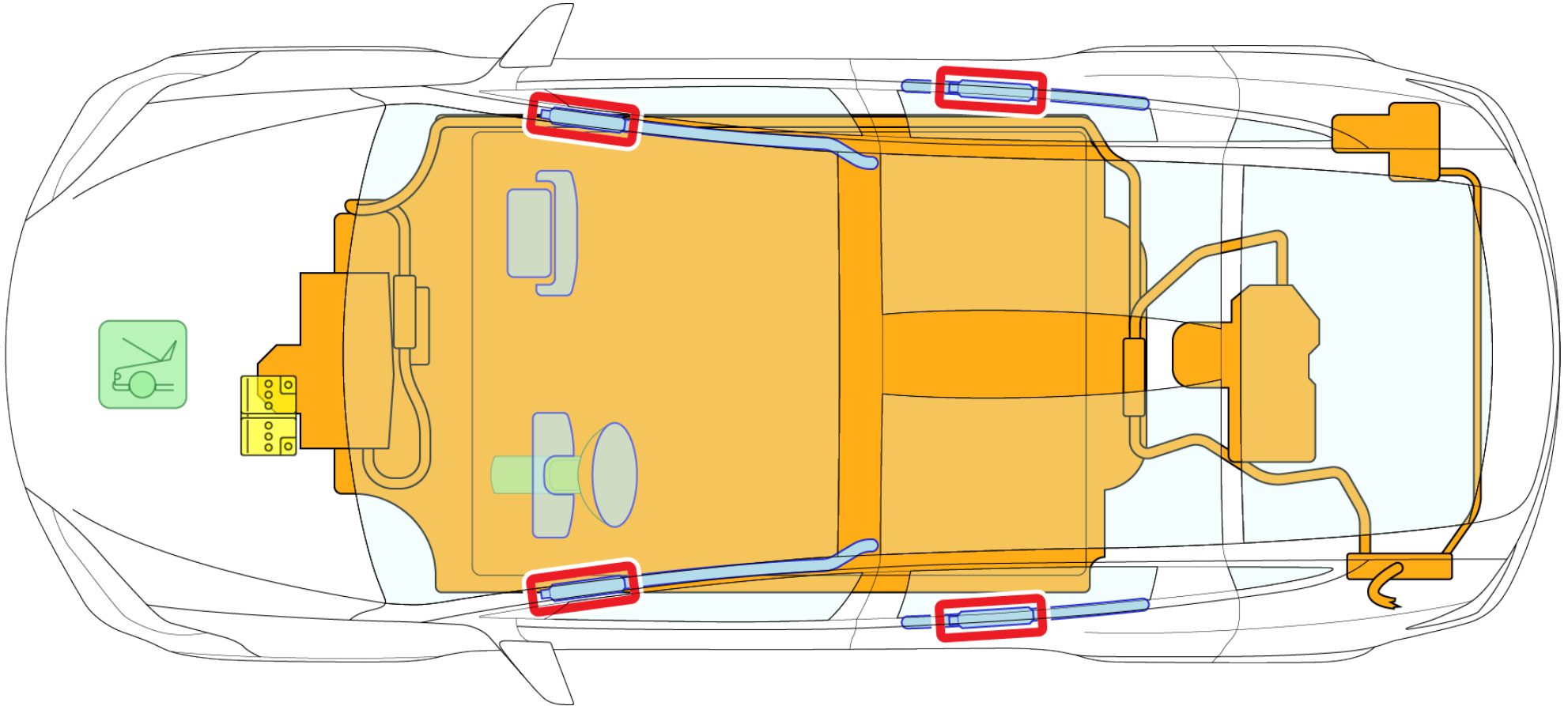
1. Knee airbags
2. Front airbags
3. Curtain airbags
4. Seat-mounted side airbags
5. Door-mounted (curtain) airbags

⚠ Warning: The SRS control unit has a backup power supply with a discharge time of approximately ten seconds. Do not touch the SRS control unit within 10 seconds of an airbag or pre-tensioner deployment.



AIRBAG INFLATION CYLINDERS

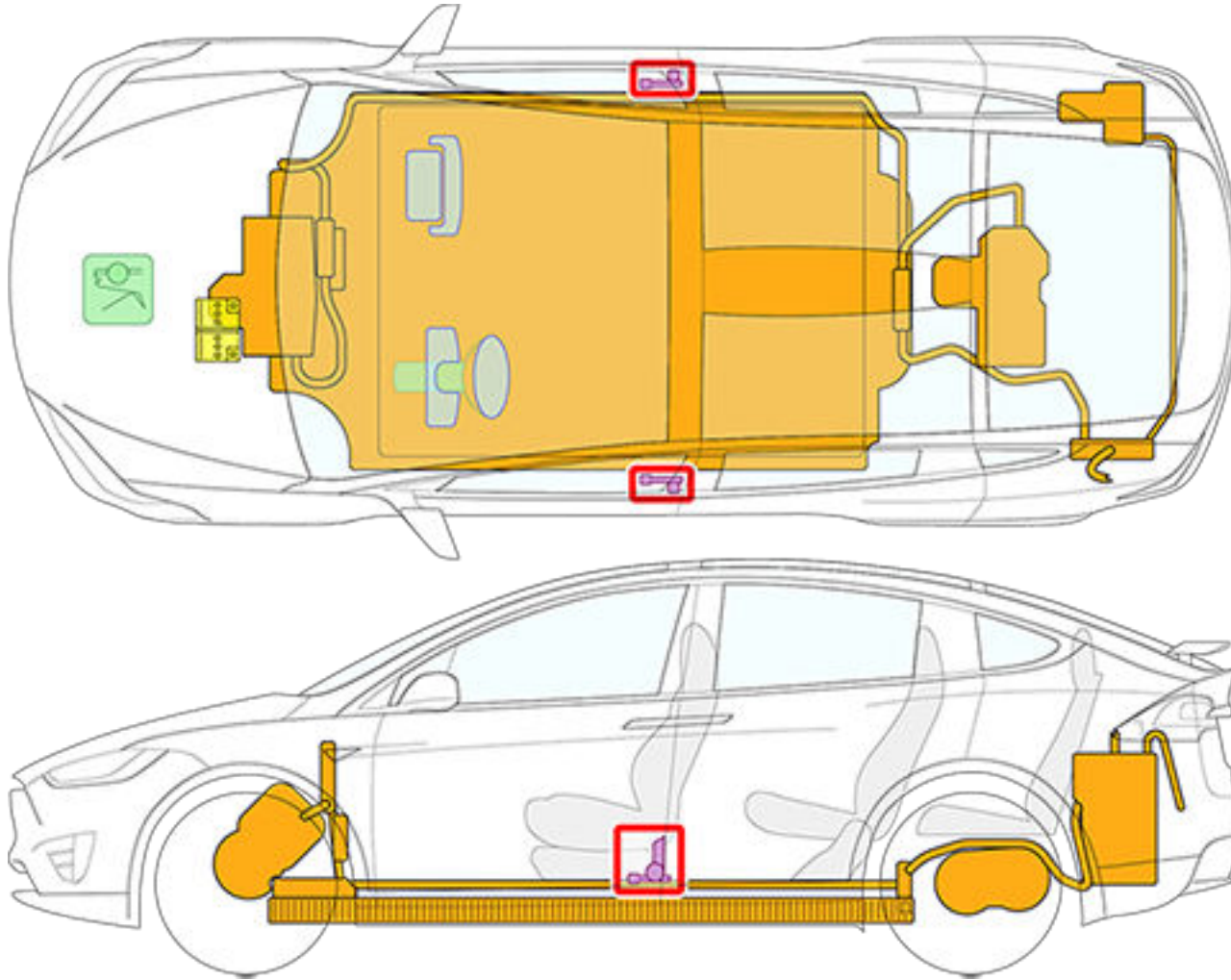
The airbag inflation cylinders, outlined in red, are located in the A-pillars and in the falcon wing doors.



⚠ Warning: The SRS control unit has a backup power supply with a discharge time of approximately ten seconds. Do not touch the SRS control unit within 10 seconds of an airbag or pre-tensioner deployment.

SEAT BELT PRE-TENSIONERS

The seat belt pre-tensioners, outlined in red, are located at the bottom of the B-pillars.

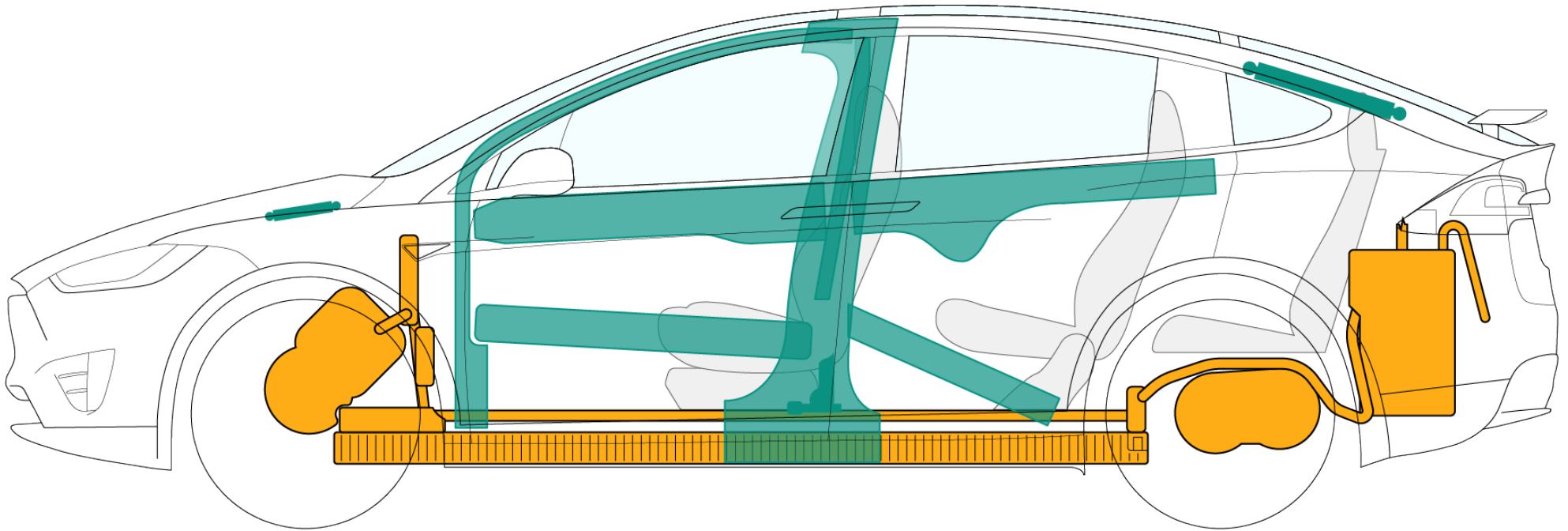


⚠ Warning: The SRS control unit has a backup power supply with a discharge time of approximately ten seconds. Do not touch the SRS control unit within 10 seconds of an airbag or pre-tensioner deployment.



REINFORCEMENTS AND ULTRA HIGH STRENGTH STEEL

Model X is heavily reinforced to protect occupants. The A-pillars and B-pillars are built with boron steel. The B-pillar is additionally reinforced with a dual-phase 980 steel pipe that runs from the roof rail to just below the latch striker. Suitable tools must be used to cut or crush these areas. Reinforcements are shown in teal below.

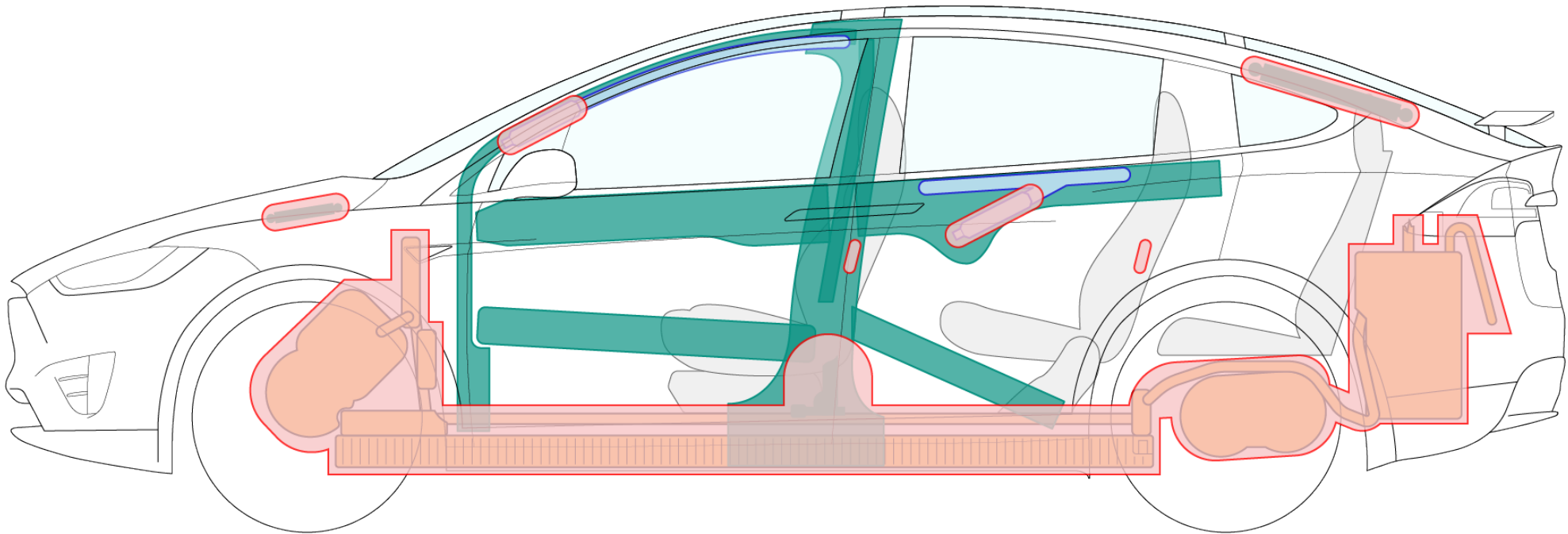


- Warning:** Always use appropriate tools, such as a hydraulic cutter, and always wear appropriate PPE when cutting Model X. Failure to follow these instructions can result in serious injury or death.
- Warning:** Regardless of the disabling procedure you use, ALWAYS ASSUME THAT ALL HIGH VOLTAGE COMPONENTS ARE ENERGIZED! Cutting, crushing, or touching high voltage components can result in serious injury or death.



NO-CUT ZONES

Model X has areas that are defined as "no-cut zones" due to the presence of high voltage, gas struts, SRS components, or other hazards. Never cut or crush in these areas. Doing so could result in serious injury or death. The "no-cut zones" are shown in pink.

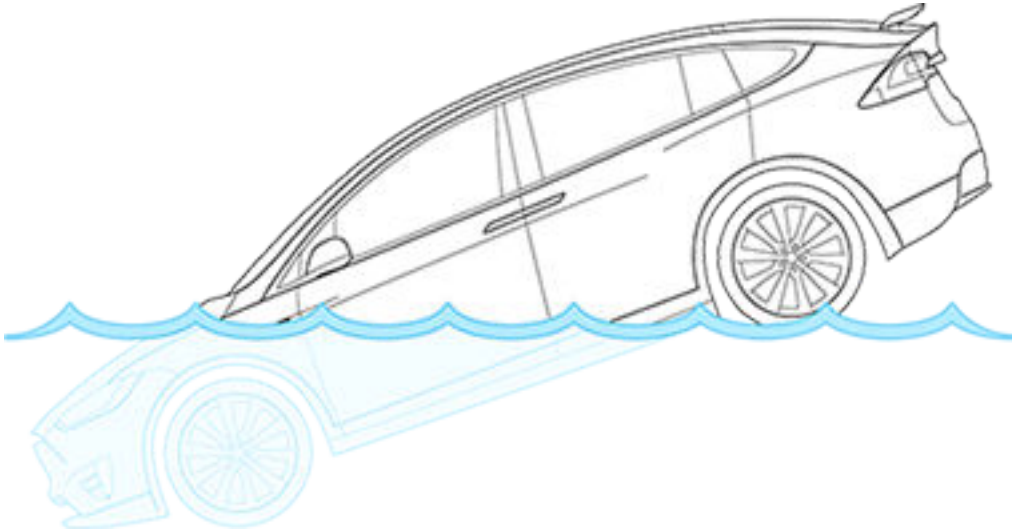


- ▲ **Warning:** Always use appropriate tools, such as a hydraulic cutter, and always wear appropriate PPE when cutting Model X. Failure to follow these instructions can result in serious injury or death.
- ▲ **Warning:** Regardless of the disabling procedure you use, ALWAYS ASSUME THAT ALL HIGH VOLTAGE COMPONENTS ARE ENERGIZED! Cutting, crushing, or touching high voltage components can result in serious injury or death.



FULLY OR PARTIALLY SUBMERGED VEHICLES

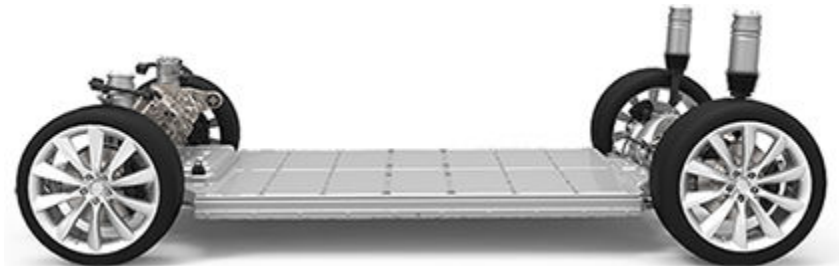
Treat a submerged Model X like any other submerged vehicle. The body of Model X does not present a greater risk of shock because it is in water. However, handle any submerged vehicle while wearing the appropriate PPE. Remove the vehicle from the water and continue with normal high voltage disabling.



⚠ Warning: Handling a submerged vehicle without appropriate PPE can result in serious injury or death.

PUSHING ON THE FLOOR PAN

The high voltage battery is located below the floor pan. Never push on the floor pan inside Model X. Doing so can breach the high voltage battery, which can cause serious injury or death.





FIREFIGHTING

USE WATER TO FIGHT A HIGH VOLTAGE BATTERY FIRE. If the battery catches fire, is exposed to high heat, or is generating heat or gases, use large amounts of water to cool the battery. It can take approximately 3,000 gallons (11,356 liters) of water, applied directly to the battery, to fully extinguish and cool down a battery fire; always establish or request an additional water supply. If water is not immediately available, use dry chemicals, CO2, foam, or another typical fire-extinguishing agent to fight the fire until water is available.

Apply water directly to the battery. If safety permits, lift or tilt the vehicle for more direct access to the battery. Apply water inside the battery ONLY if a natural opening (such as a vent or opening from a collision) already exists. Do not open the battery for the purpose of cooling it.

Extinguish small fires that do not involve the high voltage battery using typical vehicle firefighting procedures.

During overhaul, do not make contact with any high voltage components. Always use insulated tools for overhaul.

Heat and flames can compromise airbag inflators, stored gas inflation cylinders, gas struts, and other components which can result in an unexpected explosion. Perform an adequate knock down before entering a hot zone.

Battery fires can take up to 24 hours to extinguish. Consider allowing the battery to burn while protecting exposures.

After all fire and smoke has visibly subsided, a thermal imaging camera can be used to actively measure the temperature of the high voltage battery and monitor the trend of heating or cooling. There must not be fire, smoke, or heating present in the high voltage battery for at least one hour before the vehicle can be released to second responders (such as law enforcement, vehicle transporters, etc.). The battery must be completely cooled before releasing the vehicle to second responders or otherwise leaving the incident. Always advise second responders that there is a risk of battery re-ignition.

Second responders may choose to drain excess water out of the vehicle by tilting or repositioning it. This operation can assist in mitigating possible re-ignition.

Due to potential re-ignition, a Model X that has been involved in a submersion, fire, or a collision that has compromised the high voltage battery should be stored in an open area at least 50 ft (15 m) from any exposure.

⚠ Warning: When fire is involved, consider the entire vehicle energized. Always wear full PPE, including a SCBA.



HIGH VOLTAGE BATTERY - FIRE DAMAGE

A burning or heated battery releases toxic vapors. These vapors may include volatile organic compounds, hydrogen gas, carbon dioxide, carbon monoxide, soot, particulates containing oxides of nickel, aluminum, lithium, copper, cobalt, and hydrogen fluoride. Responders should always protect themselves with full PPE, including a SCBA, and take appropriate measures to protect civilians downwind from the incident. Use fog streams or positive-pressure ventilation fans (PPV) to direct smoke and vapors.

The high voltage battery consists of lithium-ion cells. These cells are considered dry cells. If damaged, only a small amount of fluid can leak. Lithium-ion battery fluid is clear in color.

The high voltage battery, charge controller(s), DC-DC converter, and drive units are liquid cooled with a typical glycol-based automotive coolant. If damaged, this blue coolant can leak out of the high voltage battery.

A damaged high voltage battery can create rapid heating of the battery cells. If you notice smoke coming from the high voltage battery, assume that it is heating and take appropriate action as described in [Firefighting](#) on page 21.

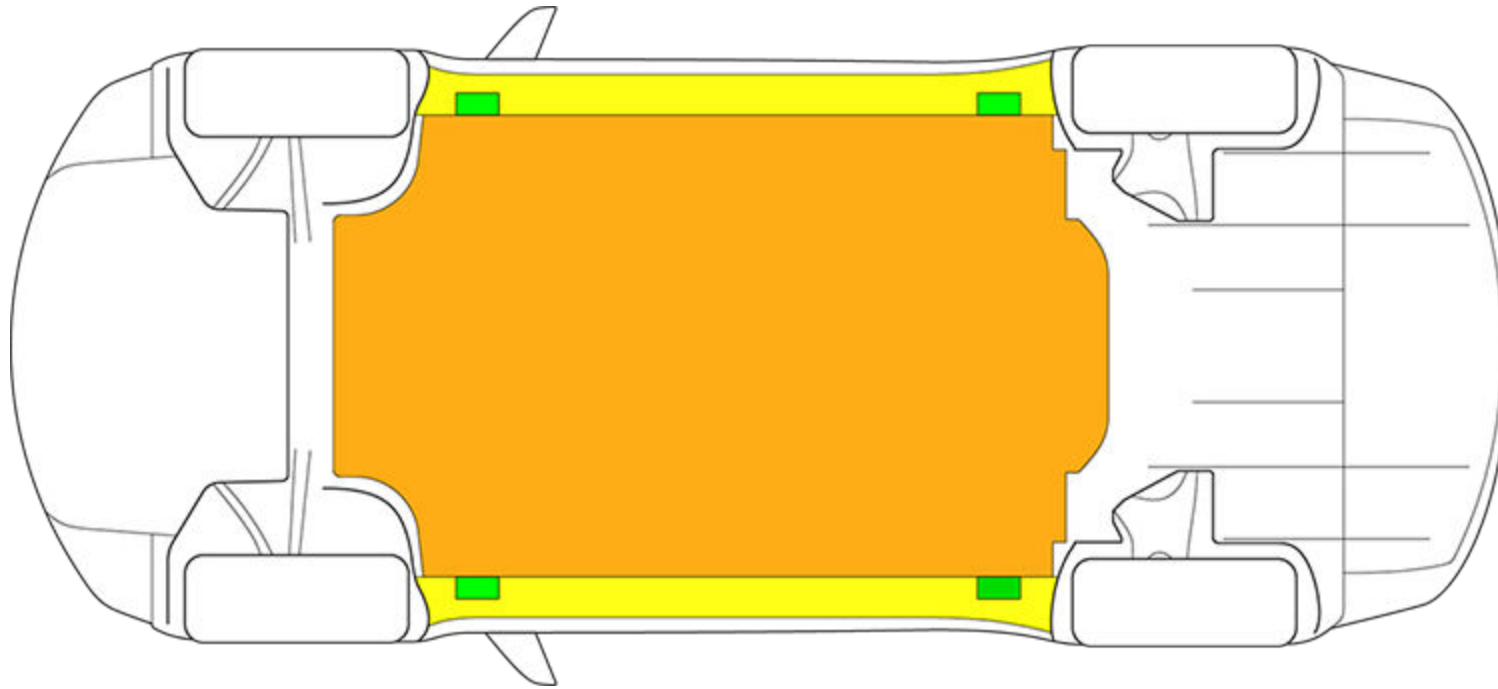





LIFT AREAS

The high voltage battery is located under the floor pan. A large section of the undercarriage houses the high voltage battery. When lifting or stabilizing Model X, only use the designated lift areas, as shown in green.

⚠ **Warning:** The vehicle should be lifted or manipulated only if first responders are trained and equipped at the technician level per NFPA (National Fire Protection Association) and are familiar with the vehicle's lifting points. Use caution to ensure you never come into contact with the high voltage battery or other high voltage components while lifting or manipulating the vehicle.

⚠ **Warning:** DO NOT USE THE HIGH VOLTAGE BATTERY TO LIFT OR STABILIZE MODEL X.

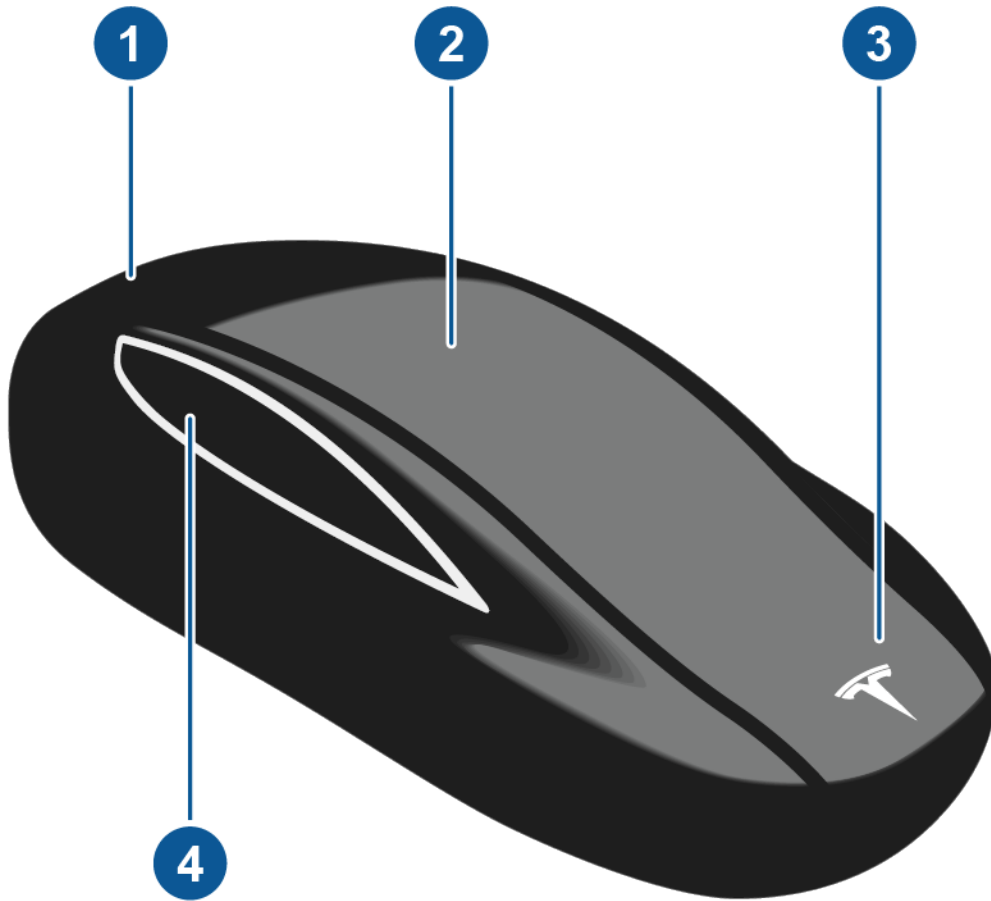


-  Appropriate lift areas
-  Safe stabilization points for a Model X resting on its side
-  High voltage battery



USING THE KEY

Use the key buttons as shown below.

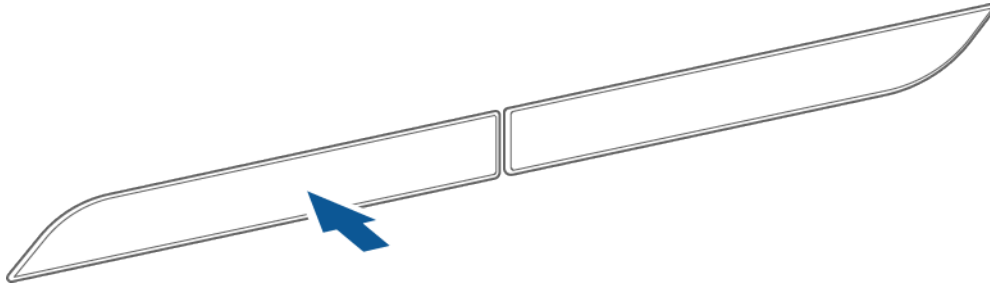


1. Rear trunk. Double-click to open the rear trunk.
2. Unlock all. Double-click to unlock doors and both trunks.
3. Hood/front trunk. Double-click to open the hood to access the front trunk.
4. Falcon wing doors. Double-click to open/close the associated falcon wing door.



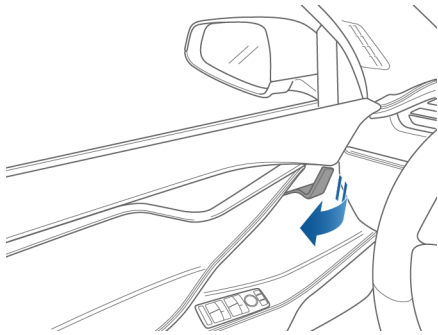
OPENING THE DOORS WITH POWER

To open the Model X doors from the outside with 12 volt power in place, press the exterior handles.



OPENING THE FRONT DOORS WITH OR WITHOUT POWER

To open the front doors from inside Model X, pull the handle towards you.





OPENING THE FALCON WING DOORS WITH POWER

To open a falcon wing door from inside Model X when the 12 volt power is on, use the button located on the inside of the B-pillar.





OPENING THE FALCON WING DOORS WITHOUT POWER

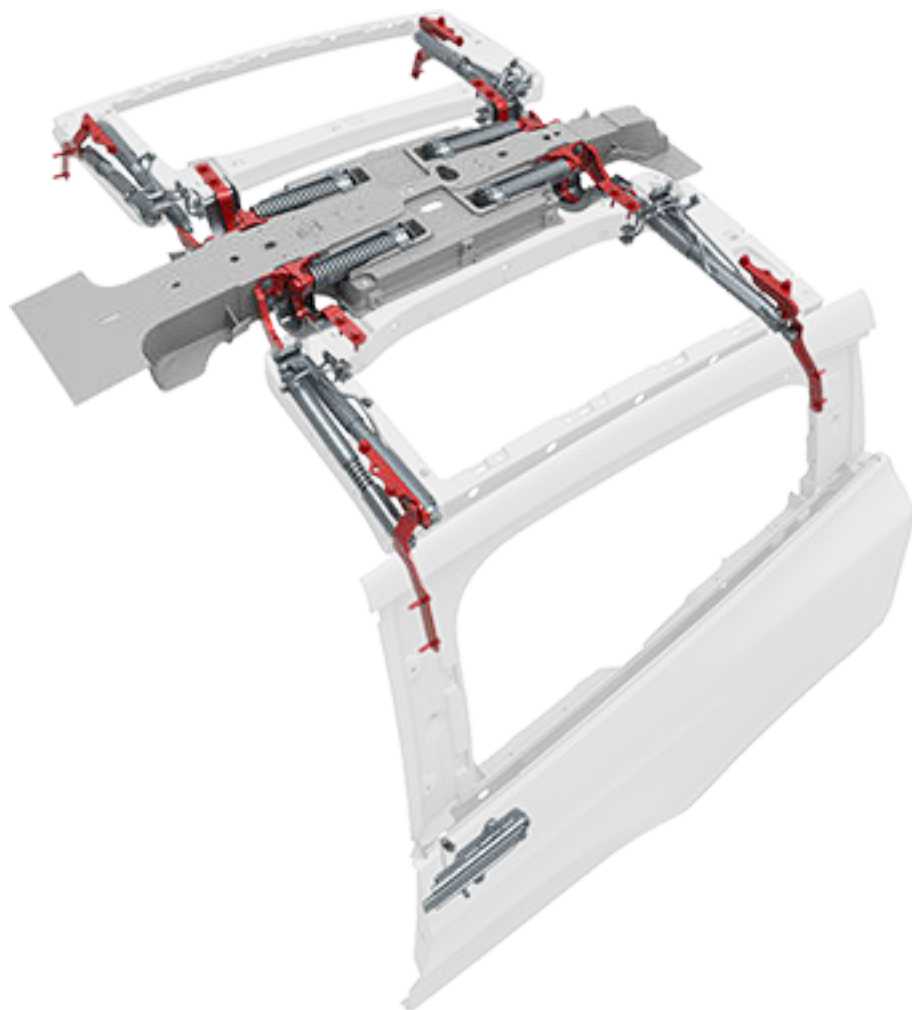
Without 12 volt power, the falcon wing doors can only be opened from the inside of the vehicle. Remove the speaker grill from the door and pull the mechanical release cable down and towards the front seat, as shown below. After the latch has released, manually lift up the doors.





REMOVING THE FALCON WING DOOR

The falcon wing doors open up and over the vehicle. In case of severe damage, you might need to cut or pry the doors from the vehicle. The locations of the hinges and latch are shown in red.





HIGH-TENSION SPRINGS

The falcon wing doors are equipped with high tension springs that assist with normal door opening. These springs might cause portions of the door to rise rapidly if the weight of the doors is reduced through the removal process. Remain clear of the upper roof section of the door while performing door removal on Model X. The locations of the high tension springs are shown in red.

▲ **Warning:** Never cut the high tension springs attached to the falcon wing doors. Serious injury or death can result from cutting or rapidly releasing the high tension springs.



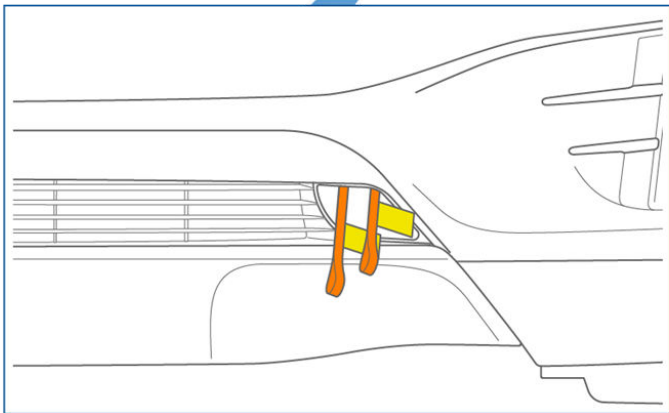
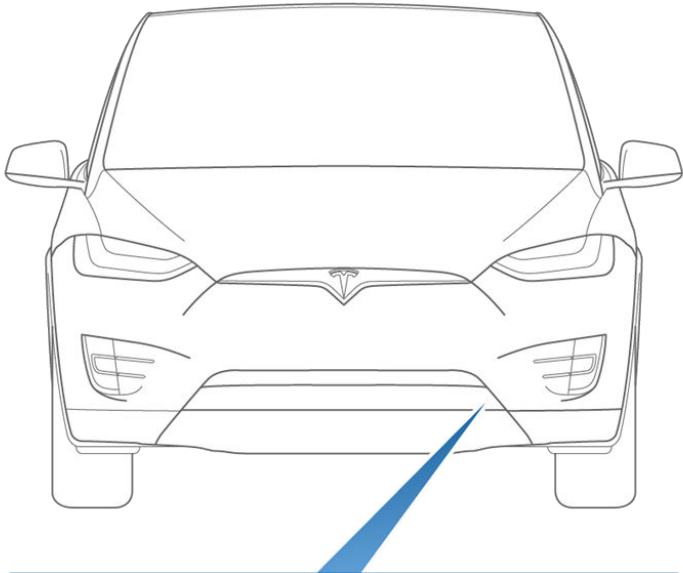


OPENING THE HOOD

Model X does not have a traditional internal combustion engine. Therefore, the area that would normally house the engine is used as additional storage space. Tesla calls this area the “Front Trunk”.

To open the hood, use one of the following methods:

- Touch the associated OPEN button on the touchscreen (Controls > Quick Controls) for the front trunk.
- Double-click the front trunk button on the key.
- Pull the release cables located in the tow attachment on the front bumper. You need to release the tow hook cover first to expose the straps, and then pull the straps, labeled A and B, in alphabetical order to open the primary and secondary latches.





OPENING THE TRUNK

Use one of the following methods to open the trunk:

- Touch the associated OPEN button on the touchscreen (Controls > Quick Controls) for the trunk.
- Double-click the trunk button on the key.
- Press the switch located under the exterior handle on the trunk.





PUSHING THE VEHICLE

- ▲ **Warning:** The following instructions are intended to be used when only moving Model X a very short distance to improve traffic safety. Refer to the Owner's Manual on the touchscreen or the Roadside Assistance Guide in the glovebox for instructions on how to transport Model X. Damage caused by transporting the vehicle is not covered by the warranty.
- ▲ **Warning:** Do not push Model X with its wheels in a position where they can spin, such as in contact with the ground. If this must be done, use a wheel lift and dollies to ensure that all four wheels are off the ground. This may be done for a maximum of 35 miles (55 km), and must not exceed the manufacturer speed rating of the dollies. Tesla recommends the vehicle face forward so the front wheels are lifted and the rear wheels are on dollies. Transporting Model X using any method not specified by Tesla can result in significant damage to the vehicle and can cause serious injury.

In situations where there is minimal risk of fire or high voltage exposure (for example, the vehicle does not accelerate after coming to a stop at an intersection) and 12V power is present, Model X can be quickly pushed in order to clear the roadway. If a driver is present, simply shift Model X into Neutral and then push the vehicle. If a driver is not present, Model X may automatically shift into Park when it detects the driver leaving the vehicle (even if it has previously been shifted into Neutral).

To keep Model X in Neutral (which disengages the parking brake and allows the vehicle to be pushed) without a driver present, use the touchscreen to activate Transport Mode:

1. Ensure Model X is in Park.
2. Press and hold the brake pedal, then on the touchscreen touch Controls > Service > Towing.
3. Hold the Transport Mode button until it turns blue. Model X is now free-rolling and can be slowly rolled (no faster than walking speed) or winched.

NOTE: Model X must detect a key nearby and 12V power is required for Transport Mode to activate.



When Transport Mode is active, Model X displays this indicator light on the instrument panel, along with a message indicating that Model X is free-rolling.

To cancel Transport Mode, shift Model X into Park.

NOTE: If the electrical system is not working, and you therefore cannot use the touchscreen to activate Transport Mode, use self-loading dollies or tire skates. Before doing so, always check the manufacturer's specification and recommended loading capacity. Alternatively, attempt to jump start the 12V battery. For instructions, call Tesla Roadside Assistance

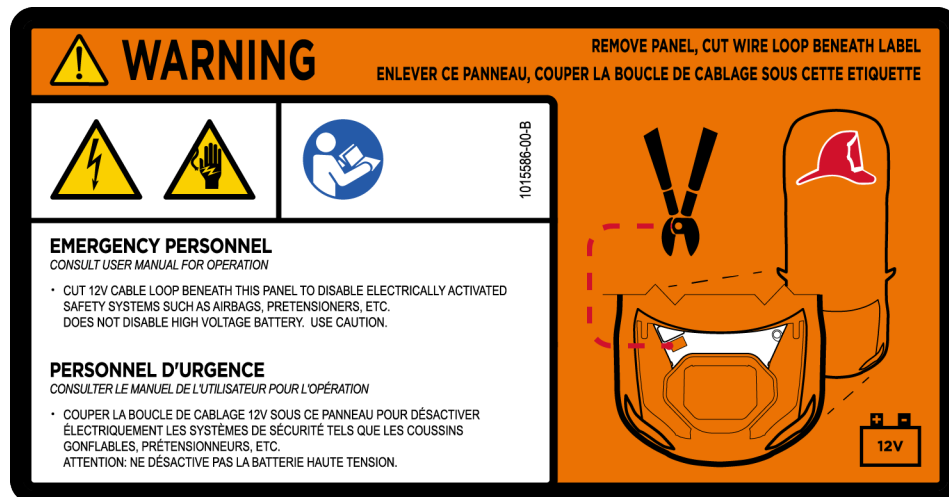


EXAMPLE OF A HIGH VOLTAGE LABEL

An example of a label located on a high voltage component is shown below. Note that, depending on the market region and vehicle build date, labels might change or be translated into other languages.

NOTE: High voltage labels may not be present newer vehicles. Do not rely on the labels to warn you of high voltage components. Always assume all high voltage components are energized.

⚠ Warning: Not every high voltage component is labeled. Always wear appropriate PPE when cutting Model X. Failure to follow these instructions can result in serious injury or death.





CONTACT US

First Responders and Second Responders with emergencies should call Tesla Roadside Assistance. Refer to <https://www.tesla.com/roadside-assistance> for the applicable number.

First Responders and training officers who have questions, please contact firstrespondersafety@tesla.com.



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