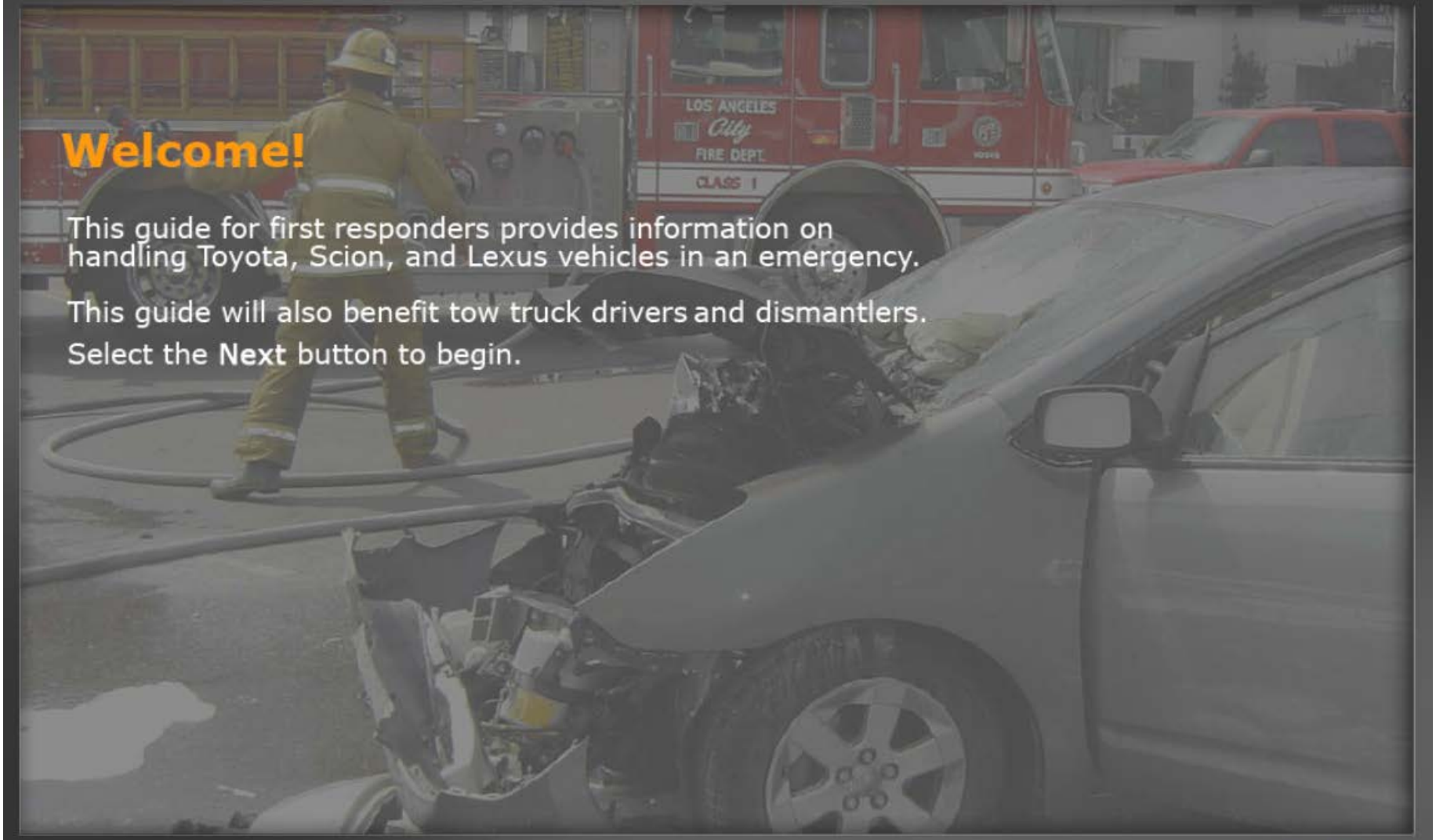
Toyota Emergency Response Guide

TOYOTA



Welcome!

This guide for first responders provides information on handling Toyota, Scion, and Lexus vehicles in an emergency.

This guide will also benefit tow truck drivers and dismantlers.

Select the **Next** button to begin.

Toyota Emergency Response Guide

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Course Sections

Select a section below or use the Next button to view the sections in order

First Responders (law enforcement, firefighters, paramedics)

- Introduction
- First Responder Resources
- SRS Airbags
- Sealtbelt Pretensioners
- Active Headrest System
- Gas-Filled Dampers
- Body
- Body High Voltage System
- Powertrain High Voltage System
- Assess Vehicle
- Immobilze Vehicle
- Disable Vehicle
- Access Patients
- Vehicle Fire
- Vehicle Submersion
- Spills

Second Responders (towing, storage, dismantlers)

- Second Responder Resources
- Towing
- Vehicle Storage

Introduction

This guide supplements other Toyota emergency response resources.

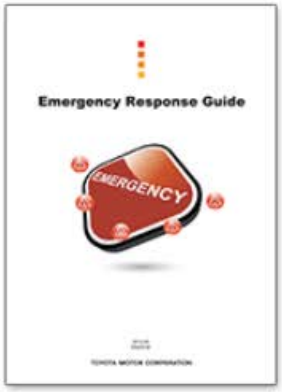
Beginning with the 2014 Toyota Highlander, Toyota will no longer produce Emergency Response Guides (ERGs) for individual models. They will be replaced with:

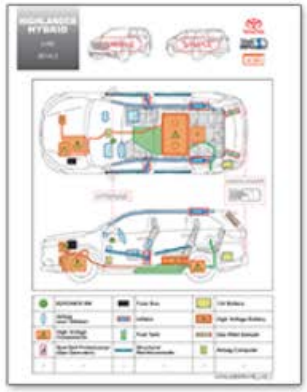
- A single ERG for **all** models
- A 2-page Emergency Response Quick Reference Sheet for each model

The individual ERGs for older models will still be available.

Section 2 shows you how to access these resources using Toyota Techinfo.

ERGs for each model





A Single ERG and Quick Reference Sheets

Toyota Emergency Response Guide

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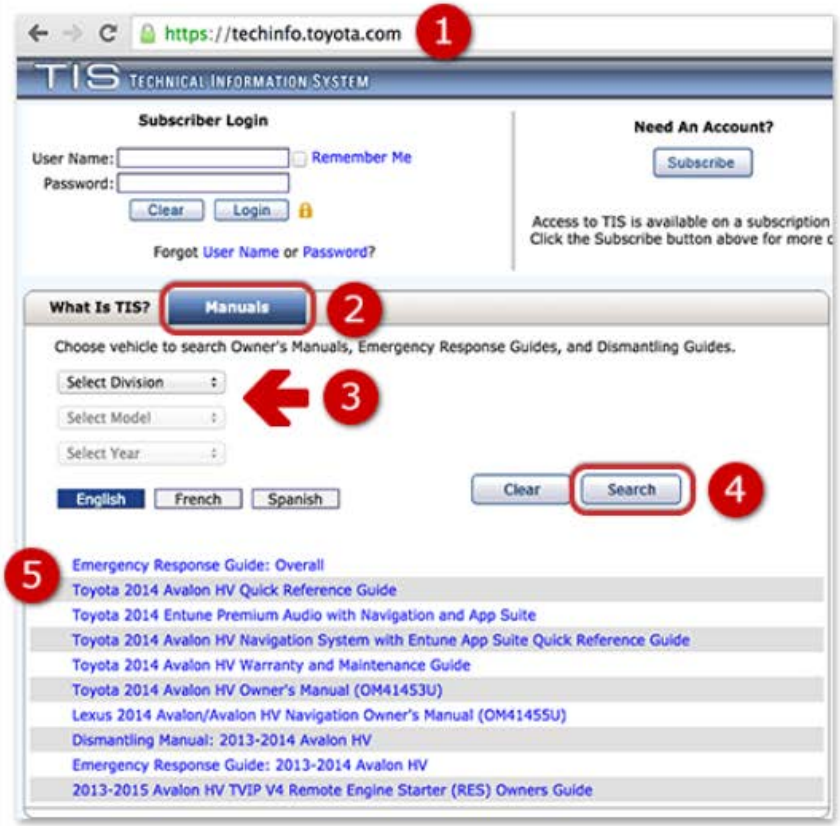
First Responder Resources

Toyota Emergency Response Guide

First Responder Resources

ERG Resources



To access emergency response resources:

1. Type techinfo.toyota.com into your browser.

   This is an open site that does not require subscriber login.

2. Click the Manuals tab.

3. Using the dropdowns, select a Division, Model, and Model Year.

4. Click the Search button.

5. A list of results will be displayed. Click a document to open it in a browser window. Documents include:
   - Emergency Response Guide: Overall
   - Emergency Response Quick Reference
   - Individual ERGs for older models

SAE Standard J2990

Society of Automotive Engineers (SAE) standard J2990, "Hybrid and EV First and Second Responder Recommended Practice," provides first and second responders with the ability to avoid the hazards associated with the high voltage system, communicate hazard identification to other incident responders, and manage the risks in a manner consistent with the best practices utilized by first responders, second responders, vehicle manufacturers, and other responsible organizations.

You may purchase this standard from SAE International by:

- Calling 1-877-606-7323
- Ordering online at http://standards.sae.org/j2990_201211/

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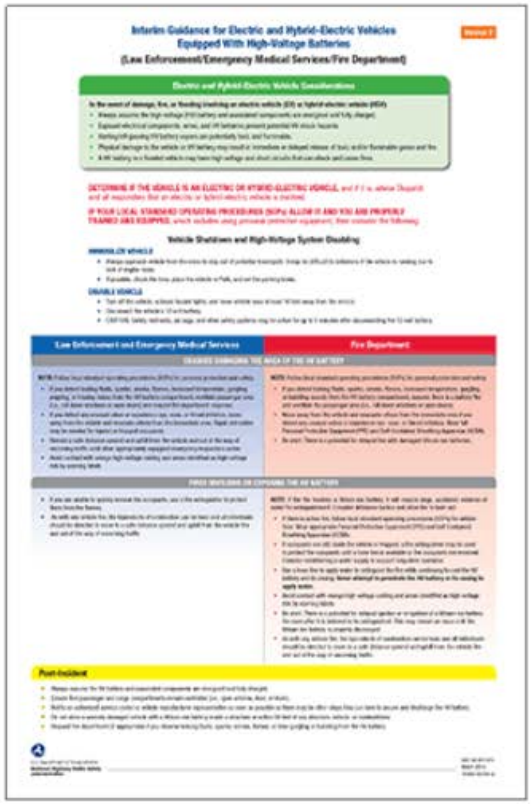
First Responder Resources

NHTSA

The National Highway Traffic Safety Administration (NHTSA) has released three variations of "Interim Guidance for Electric and Hybrid-Electric Vehicles:"

- Emergency Responders
- Tow/Recovery/Storage
- Owners

Select the image to open the version for first responders.



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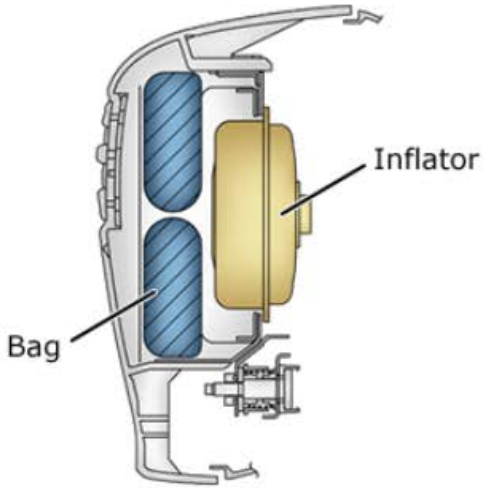
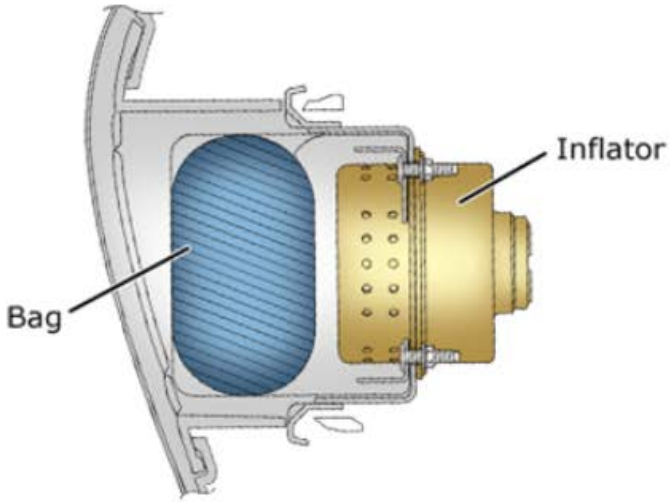
SRS Airbags

Operation

- Supplemental Restraint System (SRS) airbags supplement the seat belts to help reduce impacts to the driver and passengers in a collision
- During a collision, the airbag Electronic Control Unit (ECU) uses information from airbag sensors and sends a deployment signal to the appropriate airbag assembly (or assemblies)
- The deployment signal ignites an inflator, which generates gas to inflate the airbag



SRS Driver Airbag Assembly Cross Section



SRS Front Passenger Airbag Assembly Cross Section

Warnings

- The SRS may remain powered for up to 90 seconds after the vehicle is shut off and disabled
- After shutting off and disabling the vehicle, wait 90 seconds before performing emergency response procedures to avoid unintentional airbag deployment causing serious injury or death
- Cutting an undeployed SRS airbag inflator may cause it to explode
- Immediately after airbag deployment, SRS components are extremely hot and may cause burns if touched
- If an SRS airbag deploys with all doors and windows closed, inflation gas may cause breathing difficulty
- If residue produced during SRS deployment contacts the skin, rinse it off immediately to prevent irritation

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SRS Airbags

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Disable Vehicle

To shut the vehicle off, press the Engine/Power switch once or turn the ignition switch to the Lock (OFF) position.

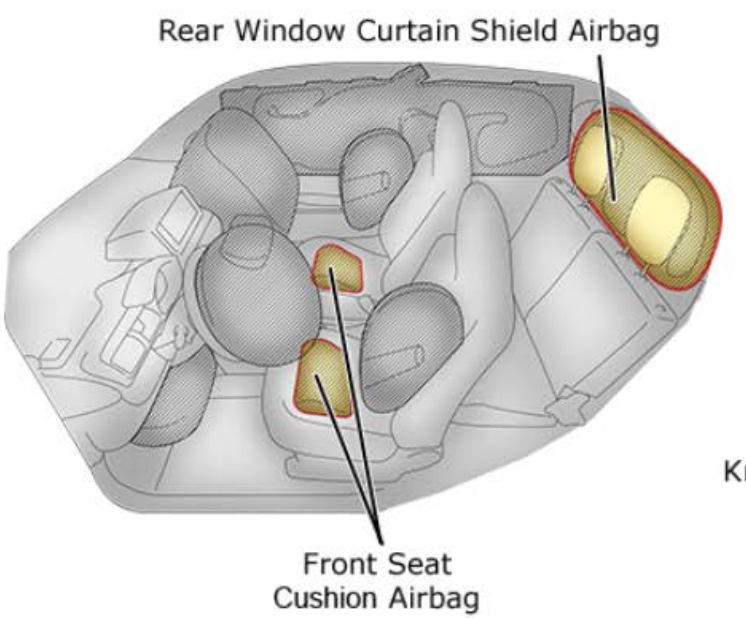
When equipped with an Engine/Power switch, keep the electrical key transmitter outside the detection area (16 ft. or more away from the vehicle).

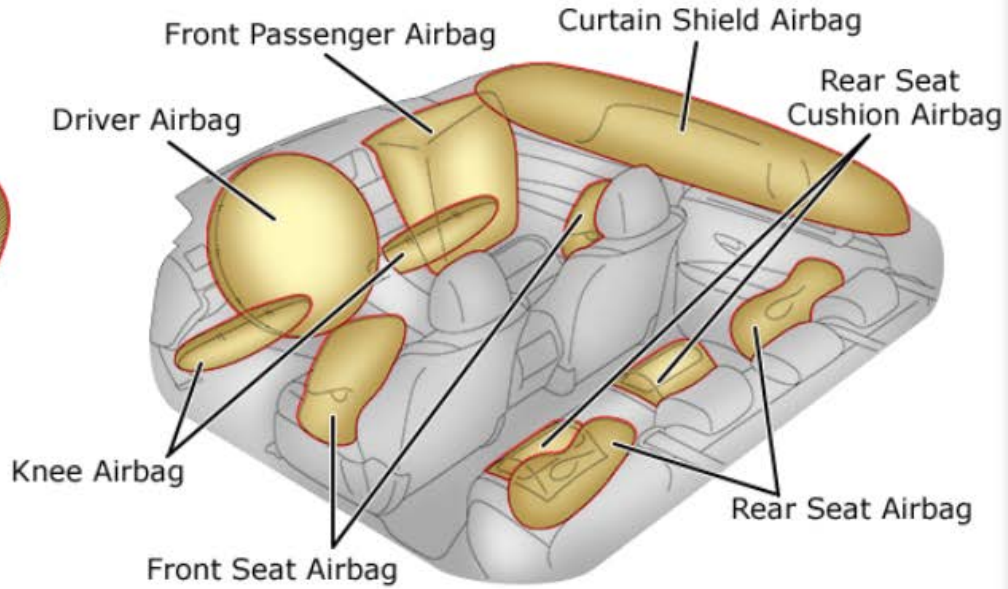
Disconnect the negative terminal of the 12 V battery. Refer to each vehicle's Emergency Response Guide or Emergency Response Quick Reference Sheet for the location of the 12 V battery.

Location

Depending on the model, multiple airbags may be located throughout the cabin. Consult the vehicle's Emergency Response Guide/Quick Reference Sheet for specific airbag and airbag inflator locations.

Select the highlighted airbags to learn more.





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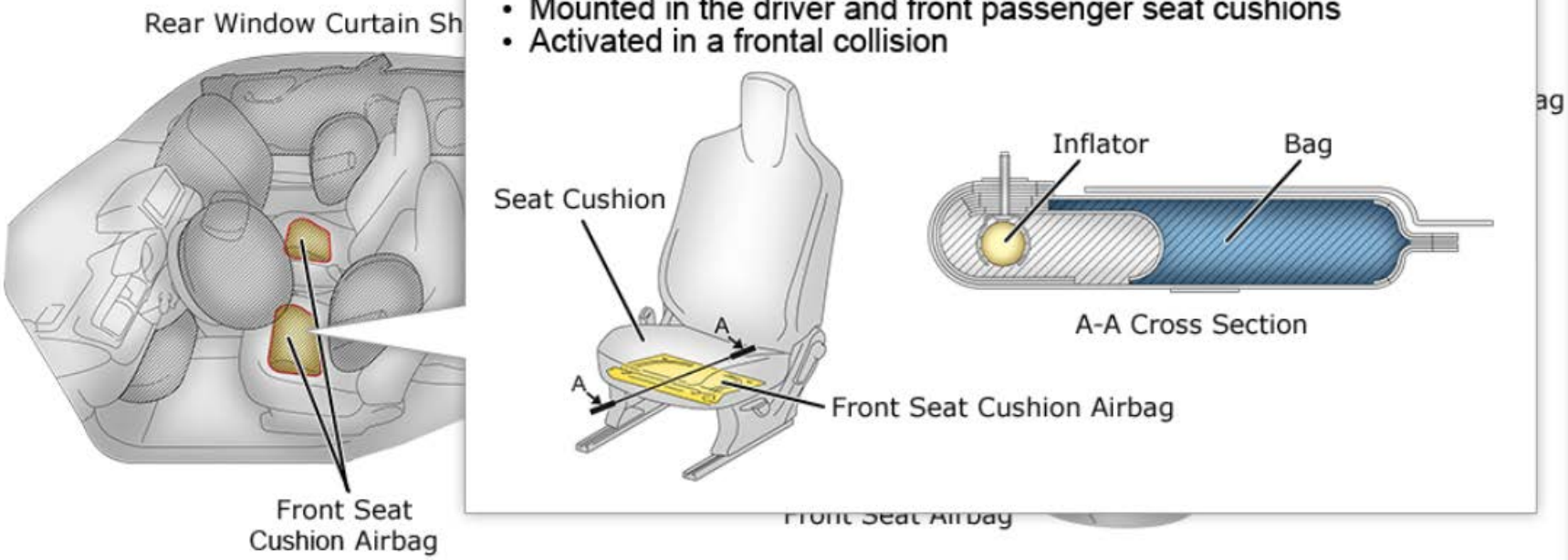

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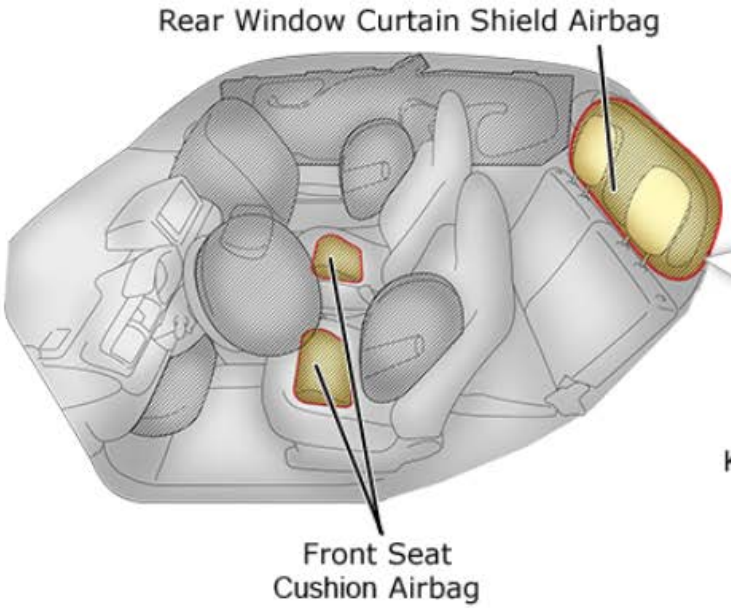
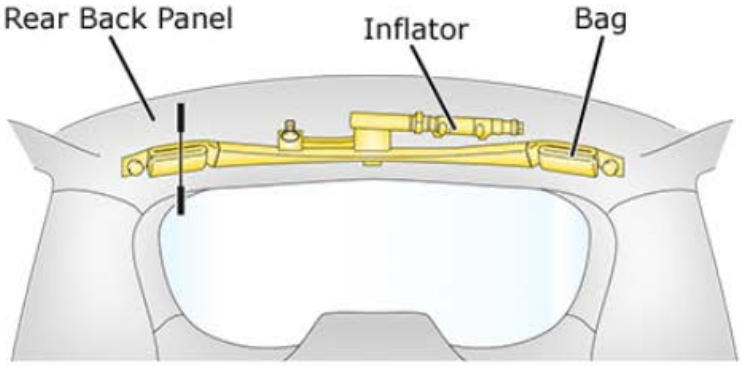


Rear Window Curtain Shield Airbag

- Mounted in the upper rear back panel (back door mounting section)
- Activated in a rear collision

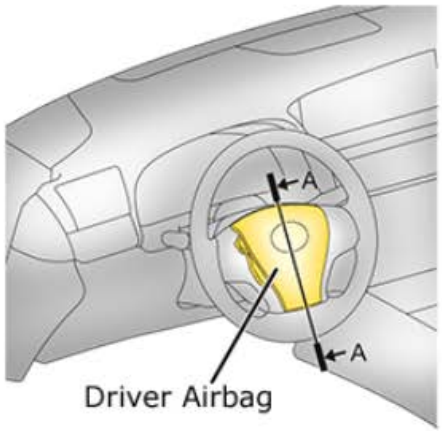


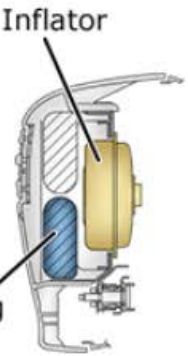
Location

Depending on the model, multiple airbags may be located throughout the cabin. Consult the vehicle's Emergency Response Guide/Quick Reference Sheet for specific airbag and airbag inflator locations.

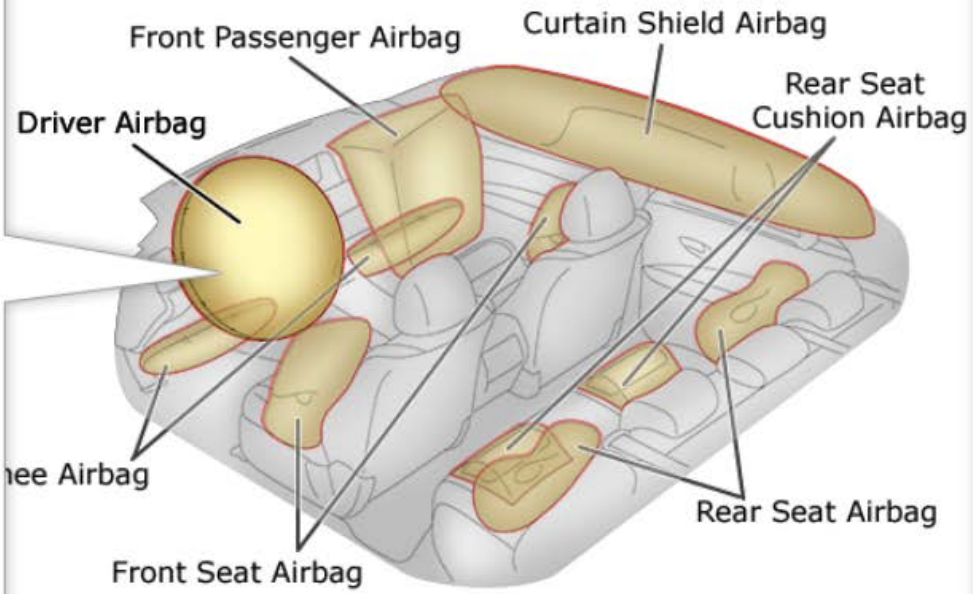
Driver Airbag

- Mounted in the steering wheel pad
- Activated in a frontal collision





A-A Cross Section

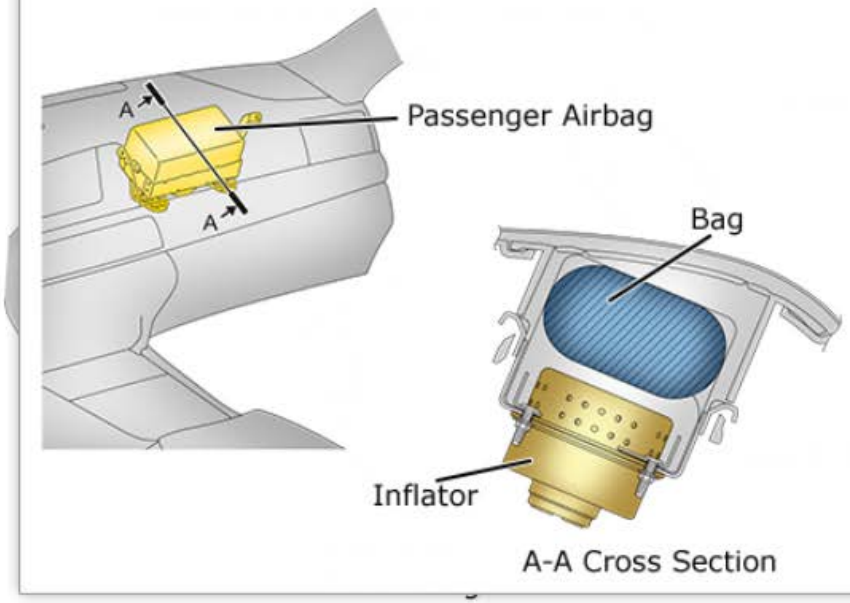


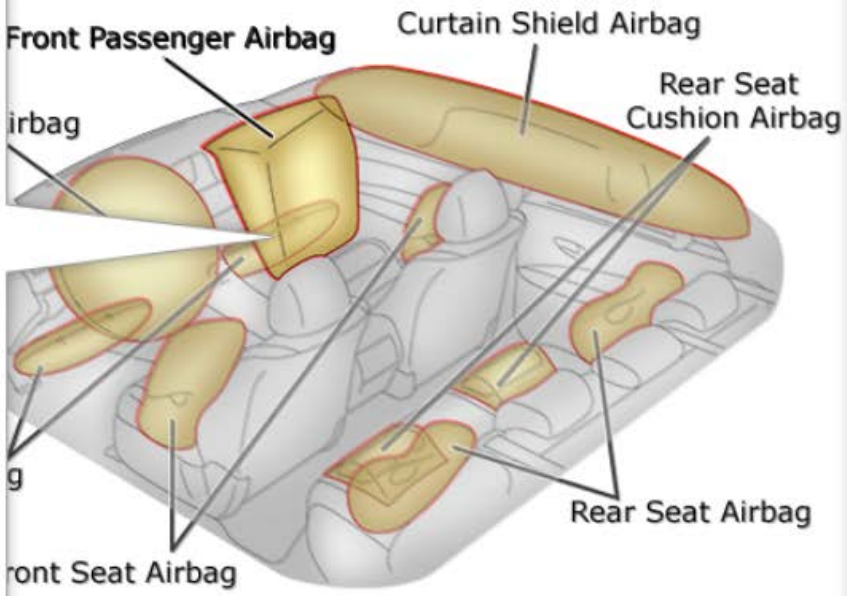
Location

Depending on the model, multiple airbags may be located throughout the cabin. Consult the vehicle's ific airbag and airbag inflator locations.

Front Passenger Airbag

- Mounted in the upper passenger-side instrument panel
- Activated in a frontal collision



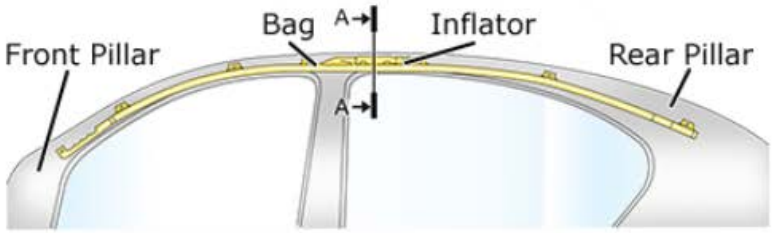


Location

Depending on the model, multiple airbags may be located throughout the cabin. Consult the vehicle's Emergency Response Guide/Quick Reference Sheet for specific airbag and airbag inflator locations.

Curtain Shield Airbag

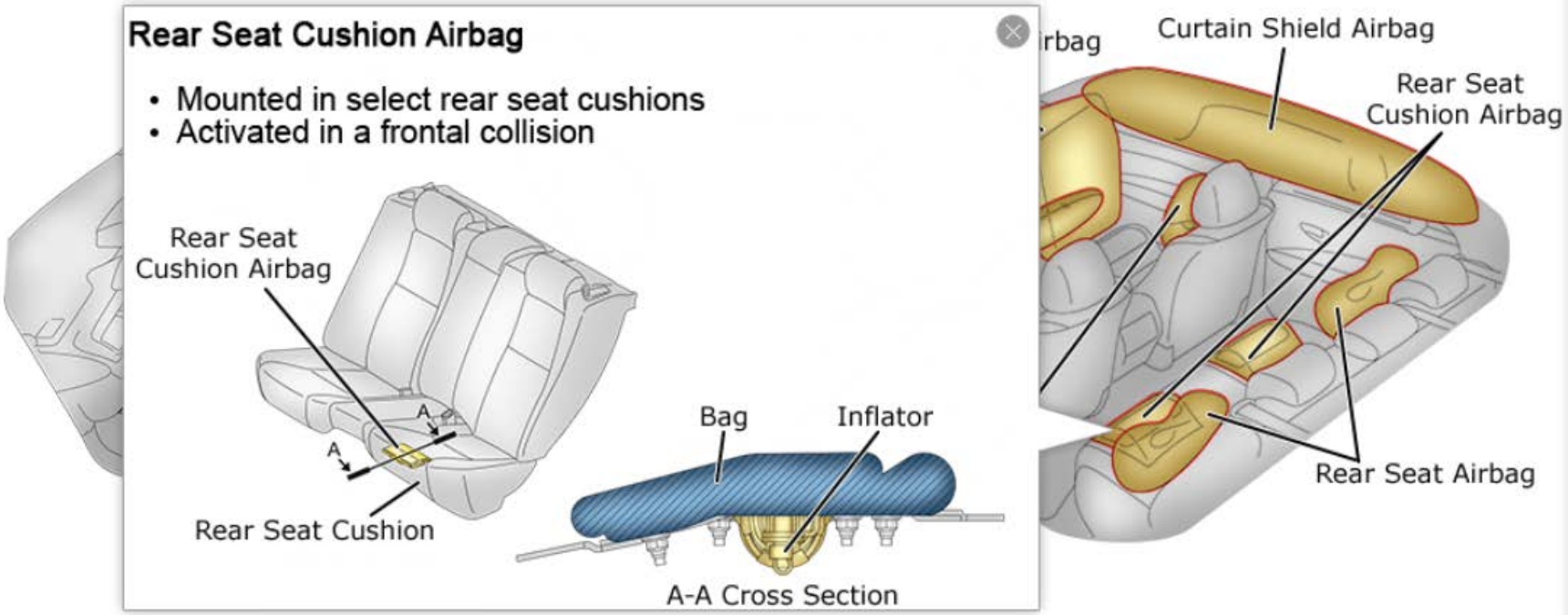
- Mounted between the front and rear pillars on both the driver and passenger side
- Activated in a side collision (and frontal collision on some models)



Location

Depending on the model, multiple airbags may be located throughout the cabin. Consult the vehicle's Emergency Response Guide/Quick Reference Sheet for specific airbag and airbag inflator locations.

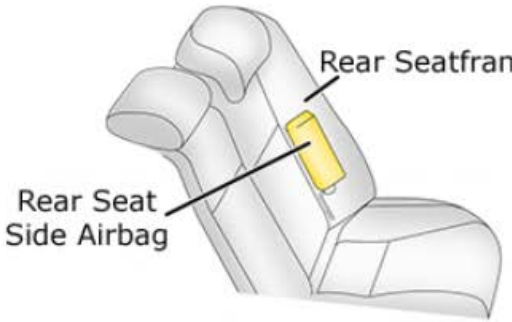
Select the highlighted airbags to learn more.



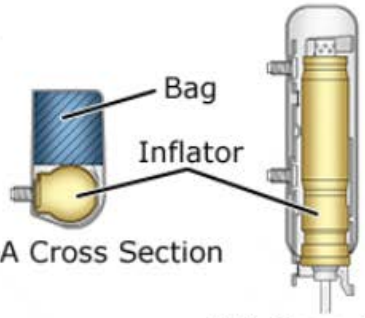
SRS Airbags

Rear Seat Airbag

- Mounted in the side of the rear seat frame or side garnish
- Activated in a side collision (and frontal collision on some vehicles)



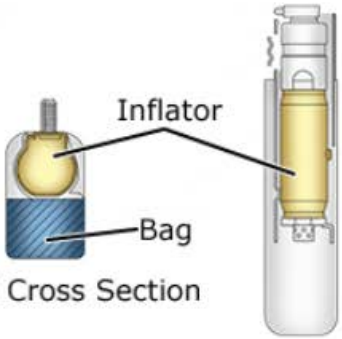
Mounted in the rear seat frame



A-A Cross Section

B-B Cross Section

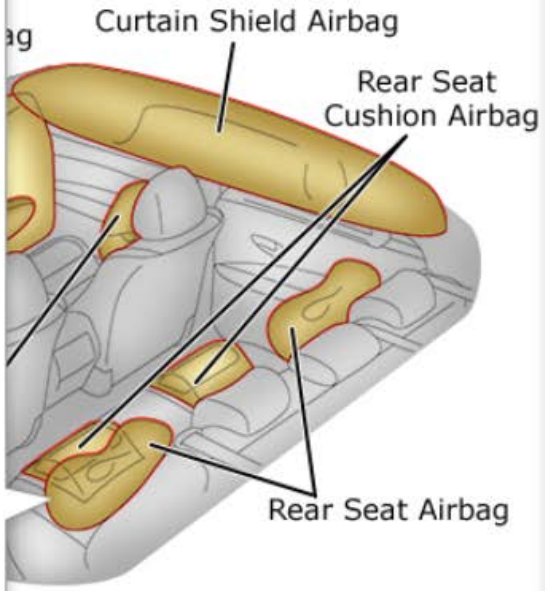
Mounted in the rear seat side garnish



C-C Cross Section

D-D Cross Section

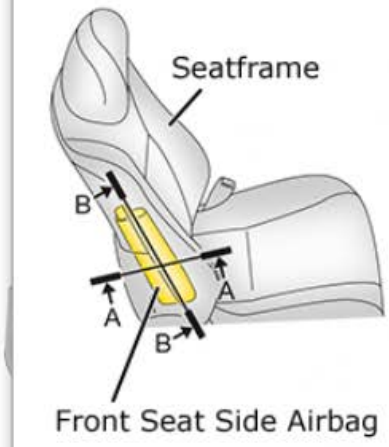
Consult the vehicle's inflator locations.

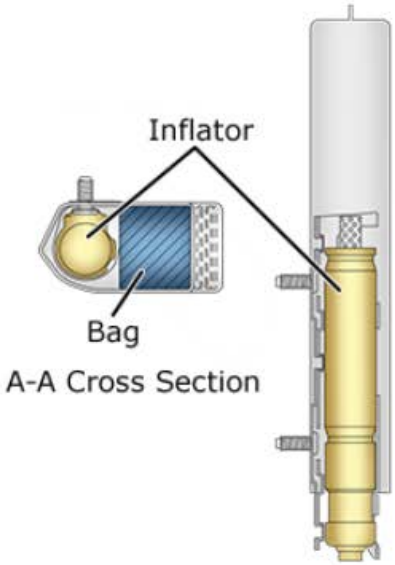


Location

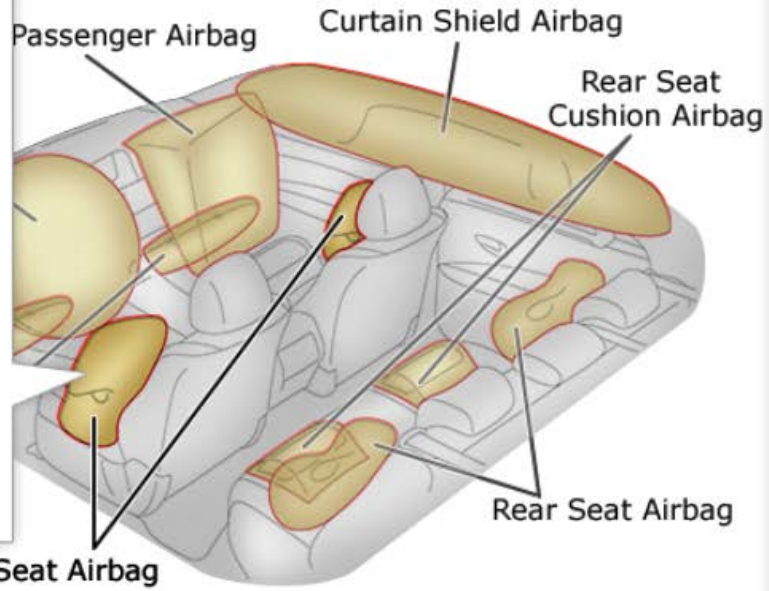
Front Seat Airbag

- Mounted in the driver and front passenger seat frames
- Activated in a side collision (and frontal collision on some models)





hout the cabin. Consult the vehicle's
rbag and airbag inflator locations.



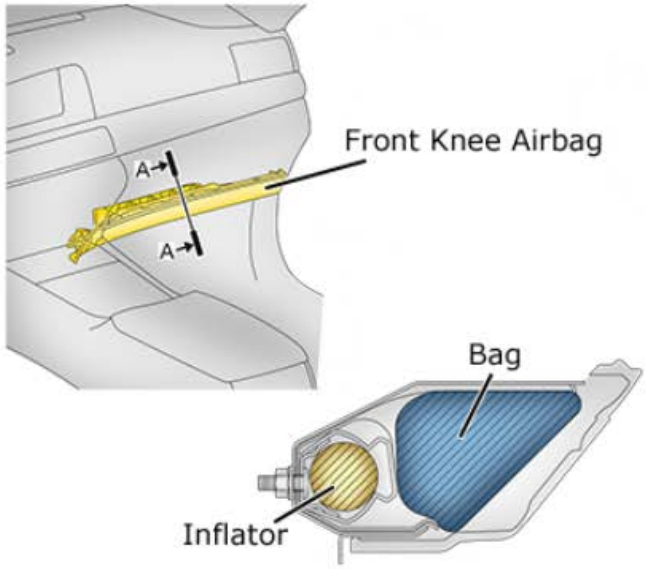
Front Seat
Cushion Airbag

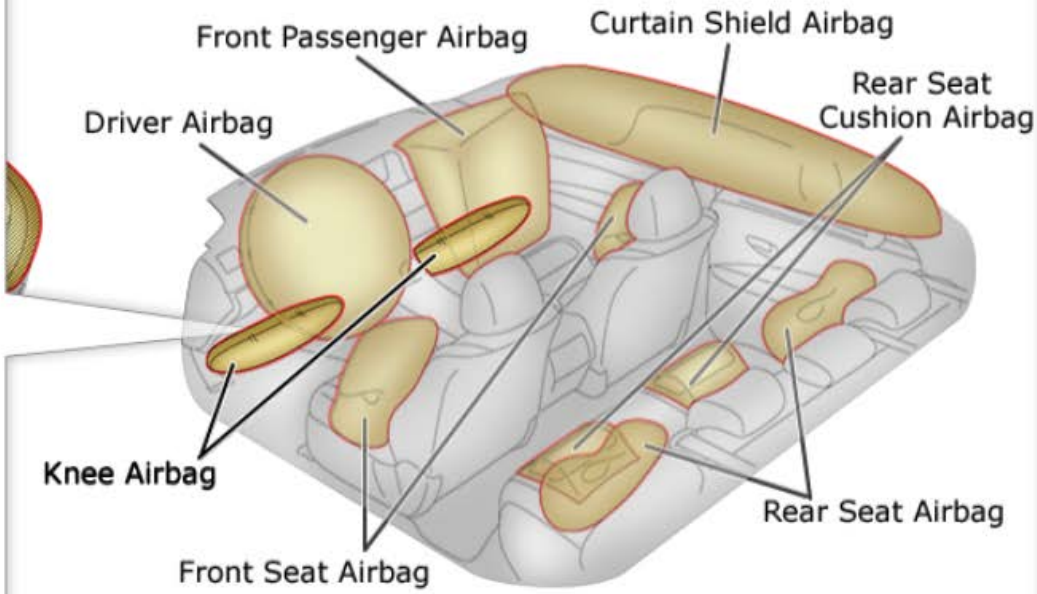
Location

Depending on the model, multiple airbags may be located throughout the cabin. Consult the vehicle's Emergency Response Guide/Quick Reference Sheet for specific airbag and airbag inflator locations.

Knee Airbag

- Mounted in the lower instrument panel on the driver and front passenger sides
- Activated in a frontal collision





SRS Airbags

Identification

Standard SRS identifiers are located near each airbag.

Select to view each image

"SRS" is embossed on the steering wheel, dashboard, and overhead roof rails

Seat airbags are identified by Airbag tags in the seat cover seams

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Seat airbags are identified by Airbag tags in the seat cover seams

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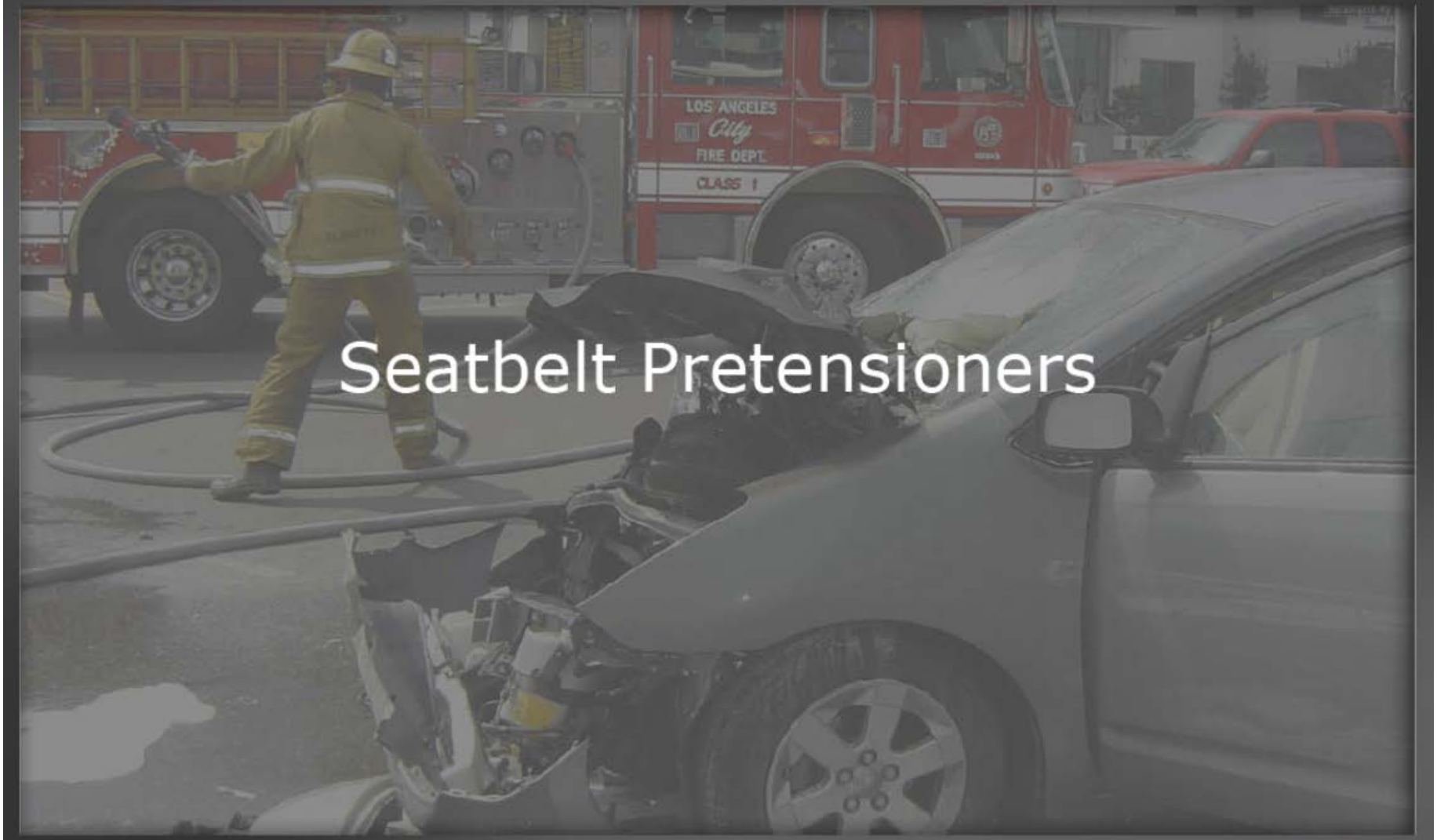
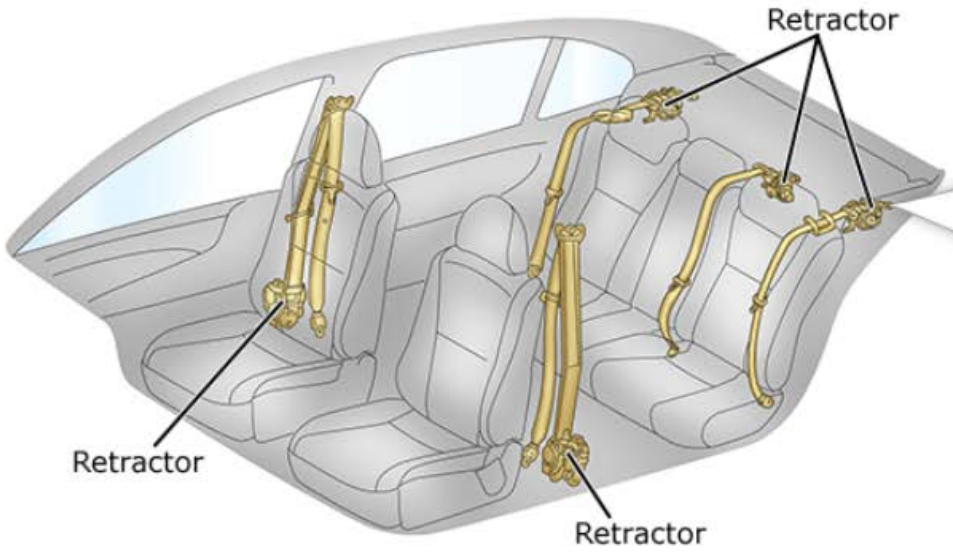


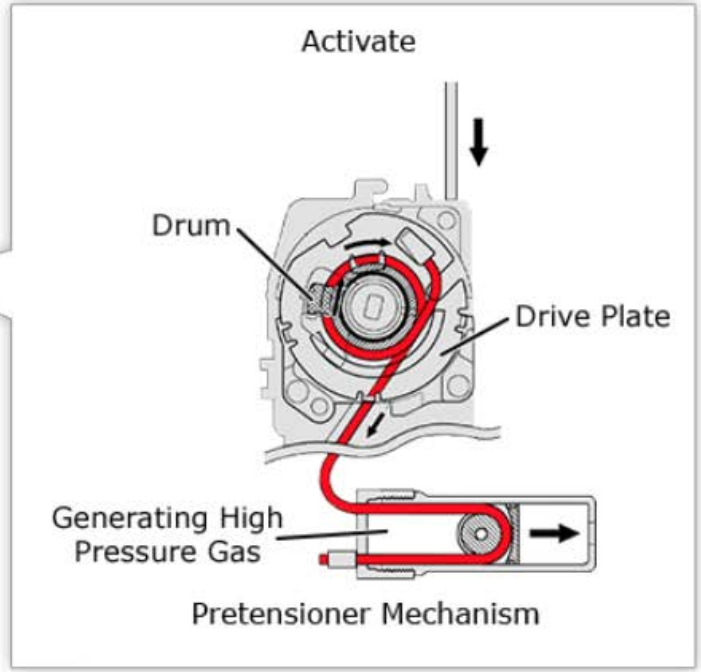
Seatbelt Pretensioners

Seatbelt Pretensioners

Operation

- A pretensioner mechanism is integrated with the seatbelt retractors
- In a strong frontal impact, the seatbelts may retract to restrain the occupants
  - The airbag sensor assembly sends a signal to ignite the gas generator
  - Pressure rotates a gear that retracts the seatbelt
- Some models have rear seatbelt pretensioners





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Seatbelt Pretensioners

Warnings

- Seatbelt pretensioners may remain powered for up to 90 seconds after the vehicle is shut off and disabled
- After shutting off and disabling the vehicle, wait 90 seconds before performing emergency response procedures to avoid unintentional pretensioner actuation causing serious injury or death
- To prevent serious injury or death from unintentional actuation, do not breach the seatbelt pretensioners

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Seatbelt Pretensioners

Warnings

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- After shutting off and disabling the vehicle, wait 90 seconds before performing emergency response procedures to avoid unintentional pretensioner actuation causing serious injury or death
- To prevent serious injury or death from unintentional actuation, do not breach the seatbelt pretensioners

Disable Vehicle

To shut the vehicle off, press the Engine/Power switch once or turn the ignition switch to the Lock (OFF) position.

When equipped with an Engine/Power switch, keep the electrical key transmitter outside the detection area (16 ft. or more away from the vehicle).

Disconnect the negative terminal of the 12 V battery. Refer to each vehicle's Emergency Response Guide or Emergency Response Quick Reference Sheet for the location of the 12 V battery.

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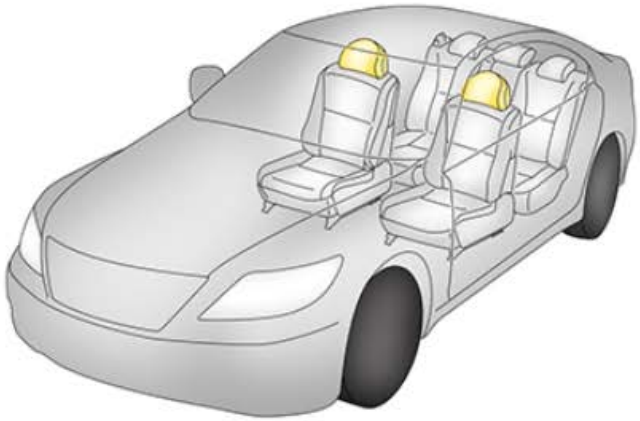
Active Headrest System

Active Headrest System

Operation

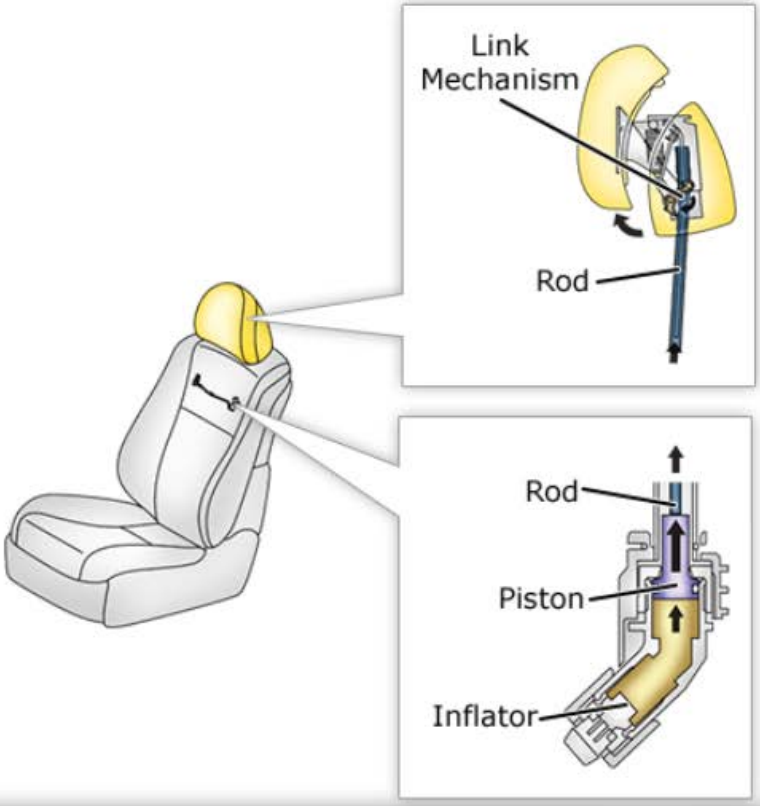
Pushes the headrest forward, helping reduce the possibility of whiplash injuries in a rear impact.

- During a rear impact, the airbag sensor assembly sends an ignition signal to the inflator
- Pressure pushes a rod inside the headrest stay, releasing a lock
- A spring pushes the headrest forward



Location

- Built into the front headrests of some models
- Refer to the individual vehicle Emergency Response Guide/Emergency Response Quick Reference Sheet



Active Headrest System

Warnings

- Active headrests may remain powered for up to 90 seconds after the vehicle is shut off and disabled
- After shutting off and disabling the vehicle, wait 90 seconds before performing emergency response procedures to avoid unintentional active headrest actuation causing serious injury or death
- To prevent serious injury or death from unintentional actuation, do not breach the active headrest inflators

Active Headrest System

Warnings

- Active headrests may remain powered for up to 90 seconds after the vehicle is shut off and disabled
- After shutting off and disabling the vehicle, wait 90 seconds before performing emergency response procedures to avoid unintentional active headrest actuation causing serious injury or death
- To prevent serious injury or death from unintentional actuation, do not breach the active headrest inflators

Disable Vehicle

To shut the vehicle off, press the Engine/Power switch once or turn the ignition switch to the Lock (OFF) position.

When equipped with an Engine/Power switch, keep the electrical key transmitter outside the detection area (16 ft. or more away from the vehicle).

Disconnect the negative terminal of the 12 V battery. Refer to each vehicle's Emergency Response Guide or Emergency Response Quick Reference Sheet for the location of the 12 V battery.

Toyota Emergency Response Guide

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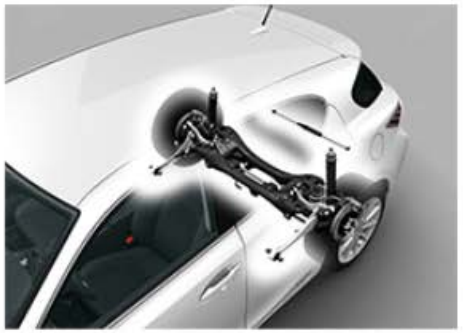
Gas-Filled Dampers

Gas-Filled Dampers

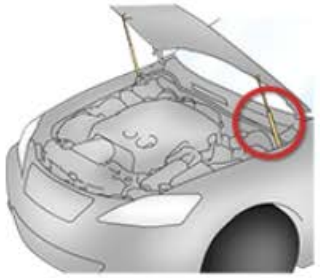
Location

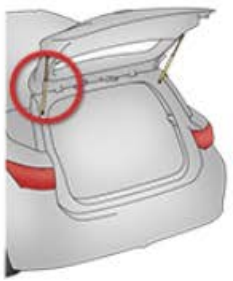
Nitrogen (N2) gas-filled dampers are used in the suspension and to hold body panels open.

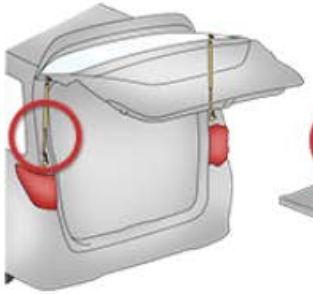
Suspension
- Shocks
- Suspension tower dampers
- Performance dampers

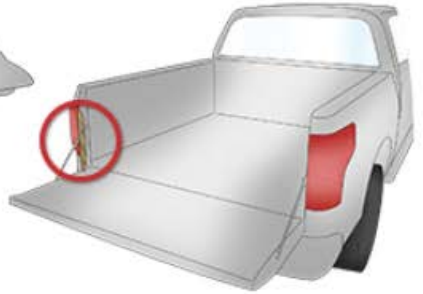


Body Panels









Dampers are installed on both the left and right sides of the body panel.

Vehicles equipped with adjustable height control suspension use compressed air to automatically control vehicle height. The pneumatic cylinders are at a higher pressure than conventional shock absorbers.
Select the link to learn more.

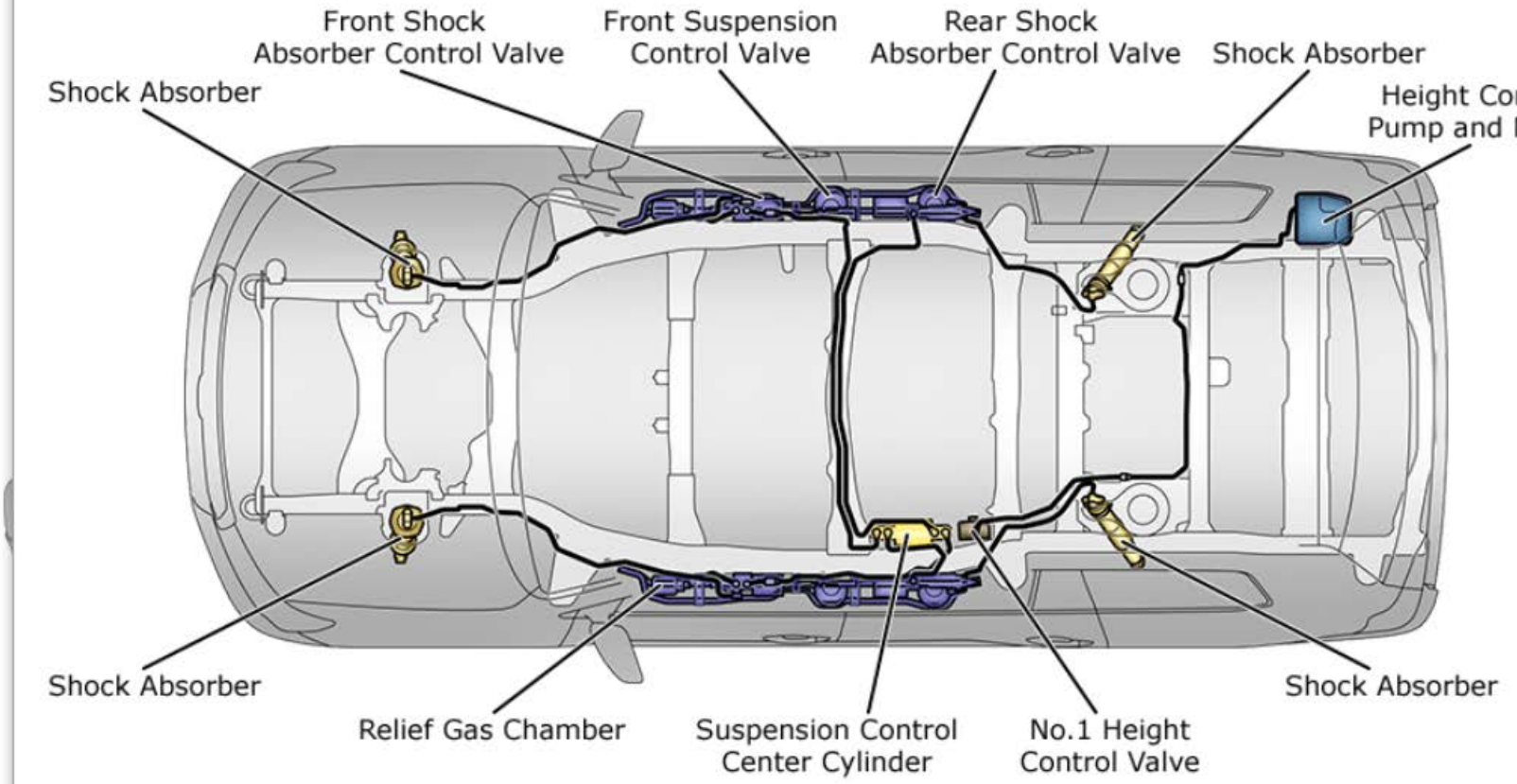
Toyota Emergency Response Guide

TOYOTA

Gas-Filled Dampers

Location

Adjustable Height Control Suspension



Toyota Emergency Response Guide

TOYOTA

Gas-Filled Dampers

Warnings

- Nitrogen expands when heated; in a vehicle fire, dampers may explode, possibly causing an injury
- Wear eye protection when cutting gas-filled dampers

Note: Nitrogen gas is colorless, odorless, and harmless.

Toyota Emergency Response Guide

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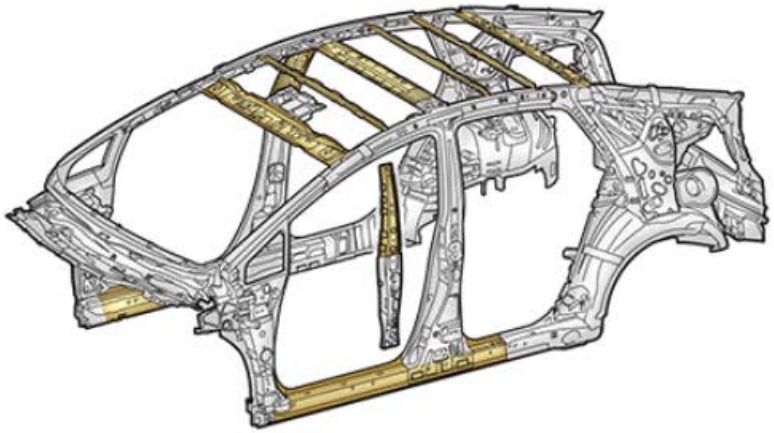
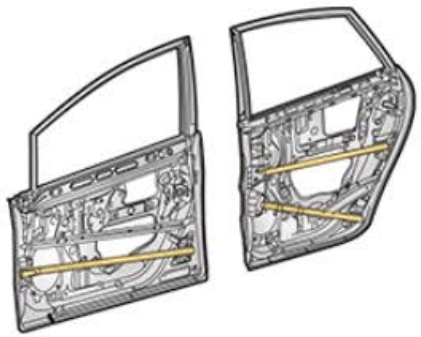
Body

Ultra High Strength Steel

- Approximately 1.3 times higher strength than standard high strength sheet steel
- Used on body structural components on some models
- Refer to the individual vehicle Emergency Response Guide/Emergency Response Quick Reference Sheet for the location of Ultra High Strength Steel



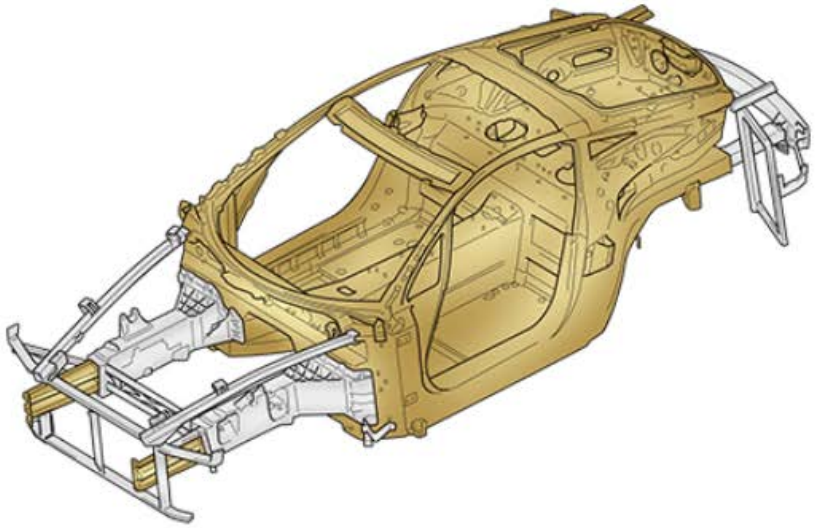
Ultra High Strength Steel



- It is difficult to cut through ultra high strength steel using conventional cutters
- Avoid cutting through structural reinforcements made of ultra high strength steel

Carbon Fiber Reinforced Plastic (CFRP)

- Lightweight and highly rigid
- Used on body structural components on certain models
- Can be cut and deformed using cutters during rescue



Carbon Fiber Reinforced Plastic (CFRP)

- Cutting CFRP creates carbon fiber dust and requires wearing protective equipment such as a dust mask, eye protection, and safety gloves
- CFRP is conductive and may cause a short circuit if carbon fiber dust lands on an electrical circuit
  - Keep electrical circuits free from carbon fiber dust when cutting CFRP

Glass

Laminated Glass

- Windshield (and some front door glass)
- Identified by "LAMISAFE" printed on the glass

- 2 layers of glass bonded with film
- Does not break easily even when struck
- Objects are less likely to penetrate the glass
- Glass shards tend to remain adhered to the film

Tempered Glass

- Door, roof, and back window glass
- Identified by "TEMPERLITE" printed on the glass

- 3 to 5 times stronger than conventional glass
- Breaks into very small pieces when broken

Body High Voltage Components

High Intensity Discharge (HID) Headlights

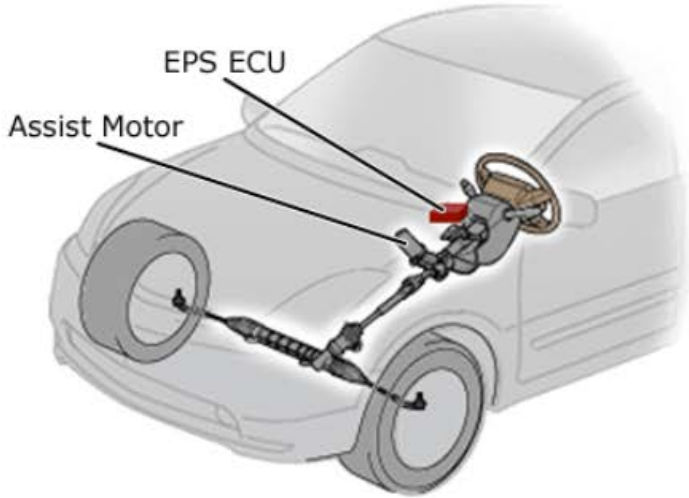
- Some vehicles use High Intensity Discharge (HID) headlights
- Emit light by creating an electric discharge between electrodes inside the bulbs
- When turned on, instantaneously generate 20,000 to 30,000 V
- Refer to the vehicle's Emergency Response Guide/Emergency Response Quick Reference Sheet for the location of high voltage components

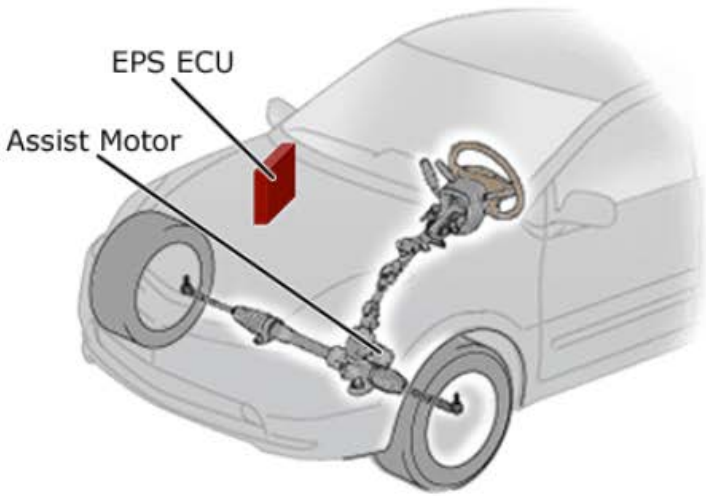
- To prevent serious injury or death from electric shock, avoid touching, cutting, or breaching HID headlight bulbs, sockets, electric circuits, or components
- To prevent burns, avoid touching high voltage sockets or the metal parts on the back of the headlights while they are on and immediately after they are turned off

Electric Power Steering (EPS)

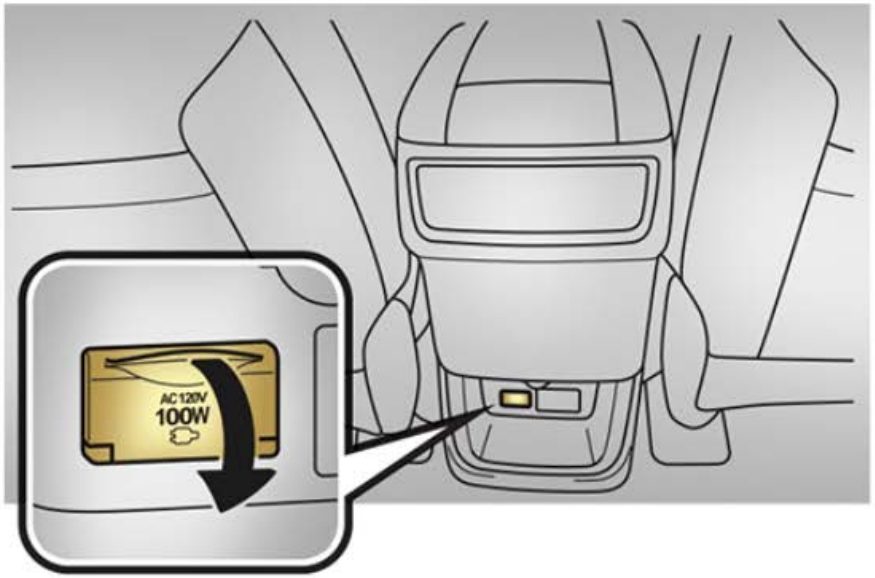
While Electric Power Steering is not considered high voltage, first responders should be aware of its higher arc potential.

- The EPS ECU boosts 12 V up to 46 V to drive an EPS assist motor
  - On some hybrid models, the DC/DC converter lowers voltage (up to 46 V) from the high voltage battery to drive the assist motor
- A wire carrying up to 46 V connects the EPS ECU to the EPS assist motor
- EPS component locations vary by model
  - The EPS assist motor is integrated with the steering gear box or steering column
  - The EPS ECU is located in the engine compartment or instrument panel





Accessory Outlet



Some HVs, EVs, and conventional gasoline engine vehicles may have an accessory outlet that uses its own inverter to convert DC voltage from the high voltage battery to AC voltage that can supply power to electronic devices.

Toyota Emergency Response Guide

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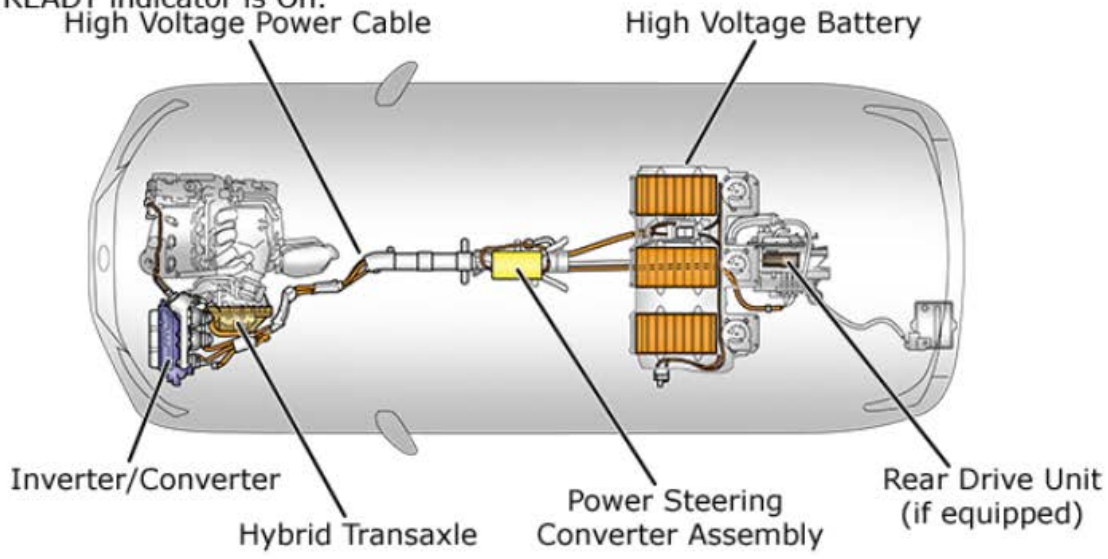
Powertrain High Voltage System

Operation

High voltage electricity drives the electric motor in HVs, PHVs, and EVs. The high voltage system is:

- Deactivated when the ignition switch or Engine/Power switch is turned OFF
- Automatically disabled if SRS airbags deploy or if the hybrid computer detects a decrease in the high voltage system's insulation resistance

The vehicle is shut off only when the READY indicator is Off. When the READY indicator is illuminated, the high voltage system is on. On HVs and PHVs, the gasoline engine may be silent but can start up at any time while the READY indicator is On.



- The vehicle body is insulated from high voltage
- High voltage components have insulated covers

Model-specific diagrams can be found in individual Emergency Response Guides

Toyota Emergency Response Guide

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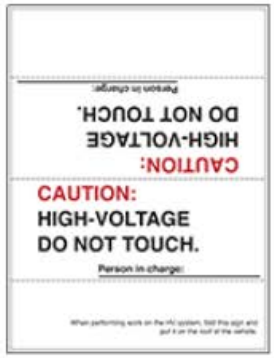
Powertrain High Voltage System

Warnings

- The high voltage system may remain powered for up to 10 minutes after the vehicle is shut off and disabled
  - Failure to shut off and disable the vehicle before performing emergency response procedures may result in serious injury or death from severe burns and electric shock
- To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component
- Wear protective equipment including insulated gloves when there is a risk of touching a high voltage power cable or component
- To avoid electrocution resulting in severe injury or death, display a sign on the roof of the damaged vehicle warning others not to touch the vehicle when the person in charge is away from it



Select the icon to print a warning sign

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Powertrain High Voltage System

Warnings

- The high voltage system may remain powered for up to 10 minutes after the vehicle is shut off and disabled
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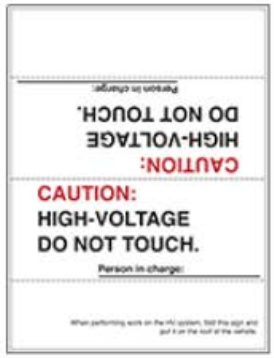
- To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component
- Wear protective equipment including insulated gloves when there is a risk of touching a high voltage power cable or
- To avoid electro the roof of the damaged vehicle warning is away from it



Disable Vehicle

To shut the vehicle off, press the Engine/Power switch once or turn the ignition switch to the Lock (OFF) position.

When equipped with an Engine/Power switch, keep the electrical key transmitter outside the detection area (16 ft. or more away from the vehicle).

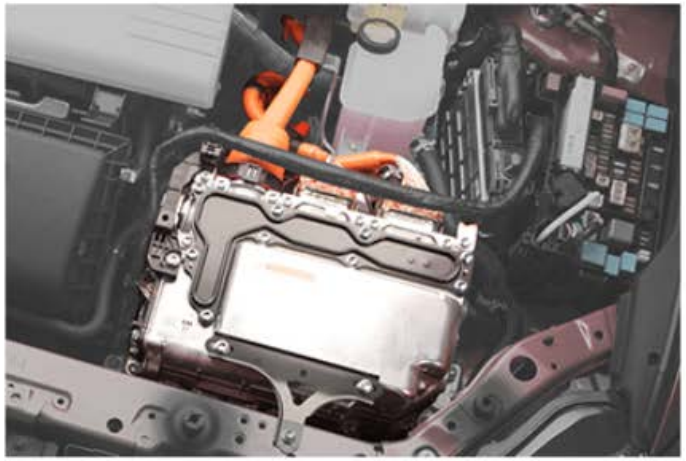
Disconnect the negative terminal of the 12 V battery. Refer to each vehicle's Emergency Response Guide or Emergency Response Quick Reference Sheet for the location of the 12 V battery.

Identification

- High voltage electrical components are contained within insulated metal covers or cases
- High voltage power cables are color-coded orange, indicating high voltage

Consult the vehicle's Emergency Response Guide/Emergency Response Quick Reference Sheet for the location of components in the high voltage system.

Refer to the Assess Vehicle Section to learn how to identify HVs, PHVs, and EVs.



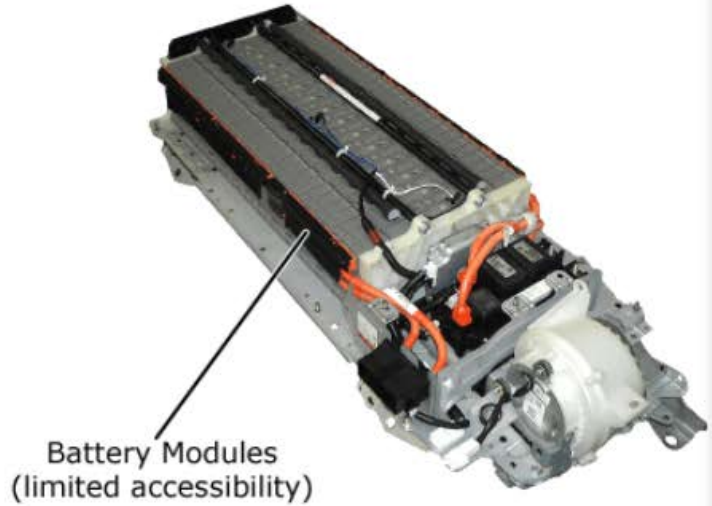
Inverter/Converter

High Voltage Battery

Nickel-Metal Hydride (Ni-MH) Battery

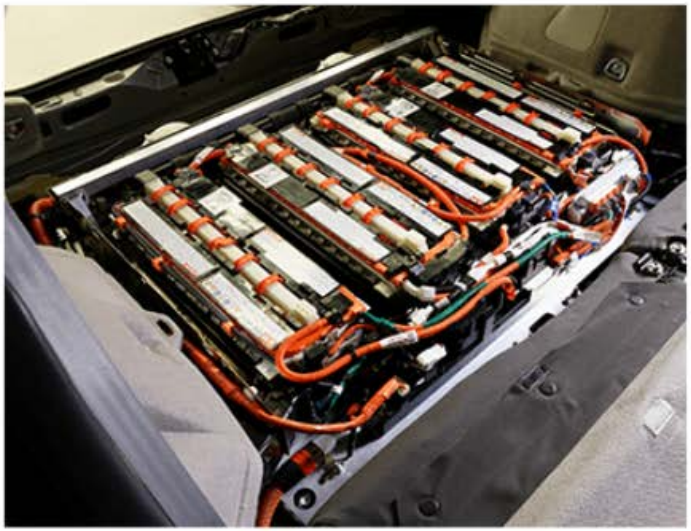
Most models use a nickel-metal hydride (Ni-MH) high voltage battery. Refer to the individual vehicle Emergency Response Guide/Emergency Response Quick Reference Sheet for the specific location.

- 20 or more modules contained in a metal case
- Each module has cells connected in series to obtain high voltage (144 to 288 V)
- A catastrophic crash breaching both the metal case and a metal battery module would be rare
- Even if a module cracks, the cell plates absorb the electrolyte and it will not normally leak
- Electrolyte leakage is unlikely due to the amount of electrolyte contained within the modules
- A Ni-MH electrolyte leak is not a hazardous material incident



- Ni-MH battery electrolyte is a caustic alkaline (pH 13.5) that damages human tissues
- To avoid injury, wear appropriate protective equipment (rubber gloves and eye protection) when there is a risk of touching electrolyte
- All responders in the hot zone should wear the proper Personal Protective Equipment (PPE) for fire fighting including Self Contained Breathing Apparatus (SCBA)

Lithium ion (Li-ion) Battery



To determine the high voltage battery type and location, refer to the individual Emergency Response Guide/Emergency Response Quick Reference Sheet.

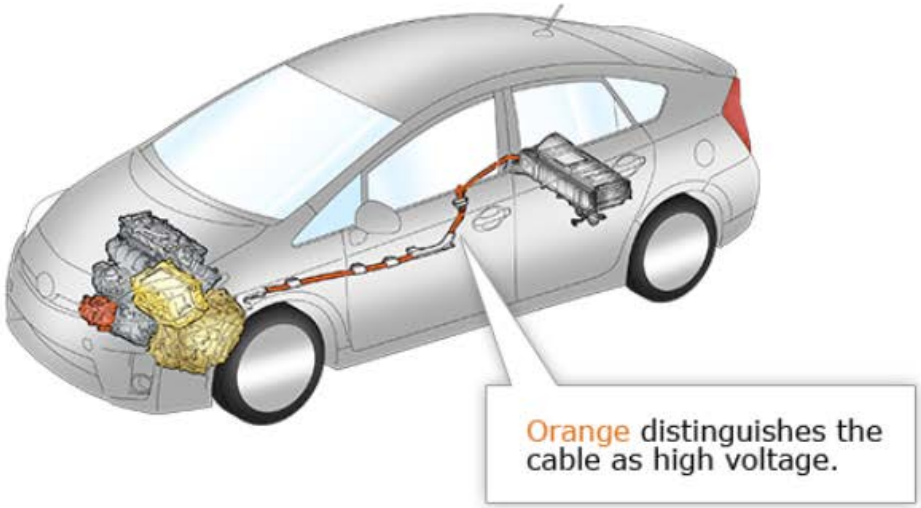
- Li-ion batteries have multiple stacks, each with 14 or more cells contained in a metal case
- Stacks are connected in series to obtain high voltage (207 V)
- A catastrophic crash breaching the metal case, battery frame, and cells would be rare
- Even if a cell is crushed or cracked, the cell separators absorb the electrolyte and leakage is unlikely
- If any electrolyte leaks, it should only be a small amount
  - Electrolyte quickly evaporates
  - A small amount can irritate the eyes, nose, throat, and skin

Warnings

- Li-ion electrolyte is flammable and damages human tissues
- Evaporating electrolyte from a burning Li-ion battery may irritate the eyes, nose, and throat
- To avoid injury from coming into contact with Li-ion electrolyte or vapor, all responders in the hot zone should wear the proper Personal Protective Equipment (PPE) for fire fighting including rubber gloves, eye protection, protective mask, or Self Contained Breathing Apparatus (SCBA)
- Keep spilled Li-ion electrolyte away from fire and ensure the area is well ventilated
- Absorb spilled Li-ion electrolyte and store the absorption material in an airtight container until properly disposed of

High Voltage Power Cable

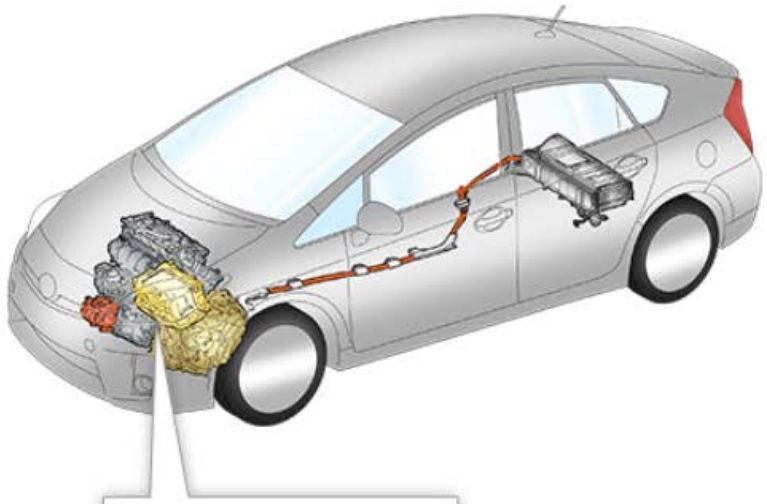
- Connects high voltage electrical components
- Located in the engine/motor compartment and running near the centerline of the vehicle



- High Voltage Battery
- Inverter/Converter
- Hybrid Transaxle
- A/C Compressor

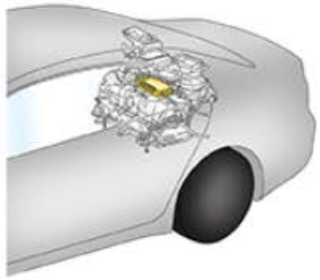
Inverter/Converter

Boosts high voltage from the high voltage battery
Changes DC to 3-phase AC to drive the electric motor



Inverter/Converter:
- Inverter
- Boost Converter
- DC-DC Converter

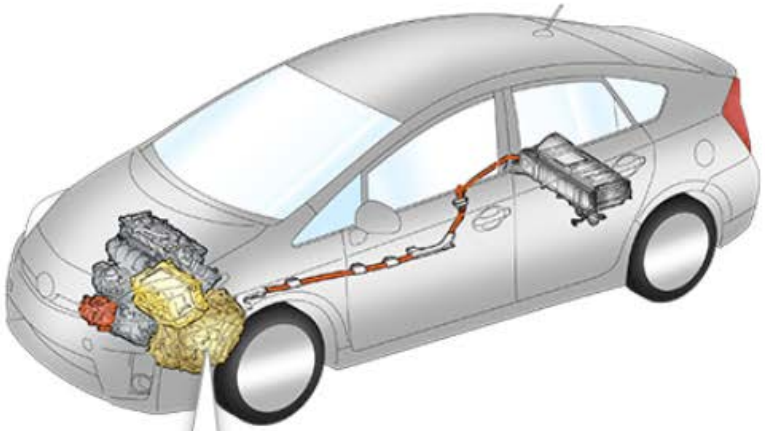
DC-DC Converter
- Steps high voltage down to approximately 14 V DC
- Charges the 12 V battery and powers accessories
- Integrated with the inverter/converter or located near the high voltage battery (depending on model)



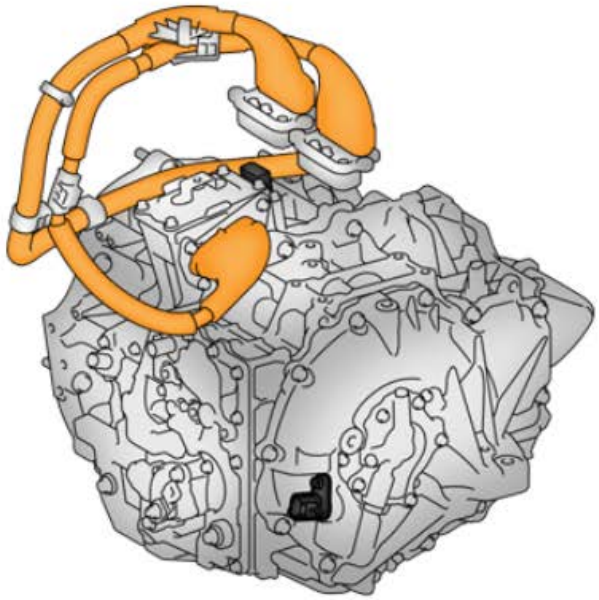
Refer to the individual vehicle Emergency Response Guide/Emergency Response Quick Reference Sheet for the location of high voltage components.

HV/EV Transmission/Transaxle

- Has an electric motor/generator that drives the vehicle's wheels and recharges the high voltage battery
- The inverter/converter powers the motor/generator with up to 650 V AC



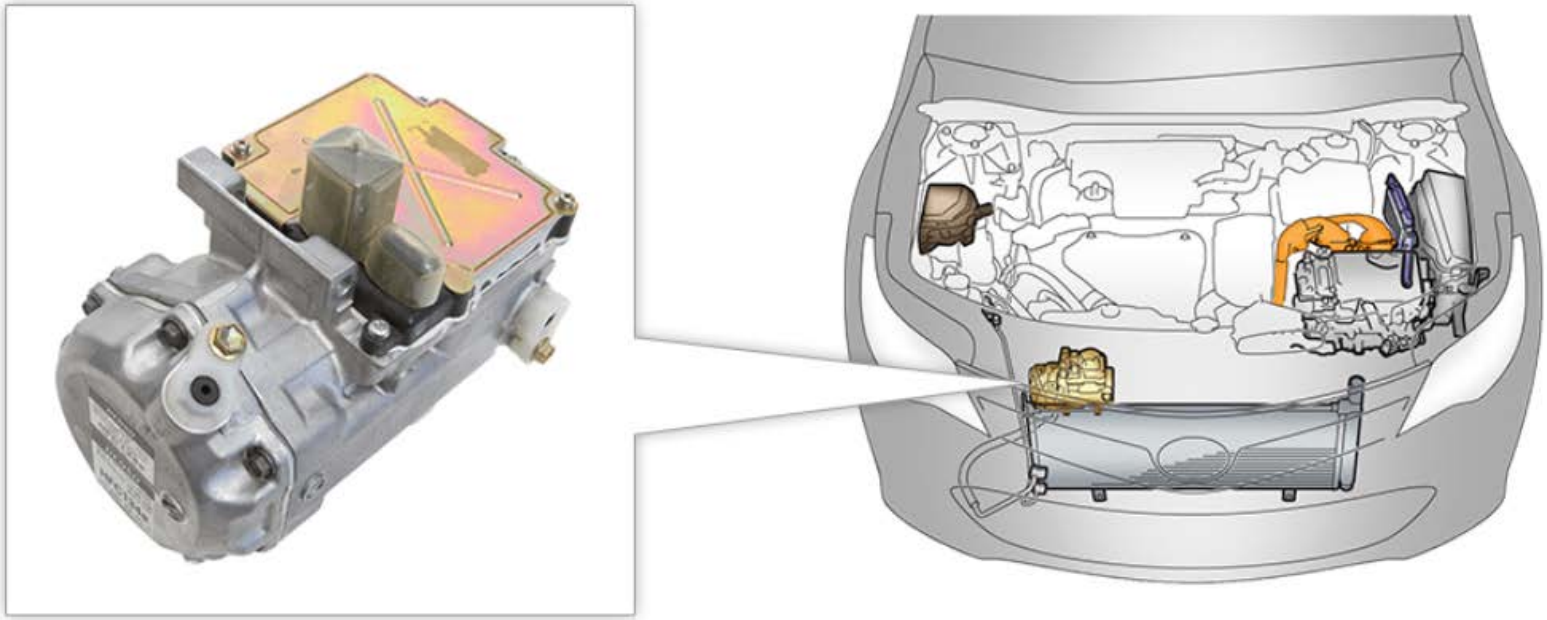
Hybrid Transaxle:
- Located in the engine/motor compartment
- Exact location depends on the vehicle layout



Rear Drive Motor
AWD models also have a rear transaxle with an electric motor that drives the rear wheels. The rear drive motor is located above the rear drive shafts, and it is also powered by the inverter/converter.

A/C Compressor

HVs and EVs use an electric air conditioning compressor that operates on voltages as high as 300 V. A dedicated inverter converts high voltage from the high voltage battery into 3-phase AC.



Toyota Avalon Hybrid shown

Charging Inlet

- PHVs and EVs have a charging inlet to charge the high voltage battery
- Current Toyota PHVs and EVs use SAE J1772 level 1 and level 2 protocol
- External power supply cable will be energized during charging

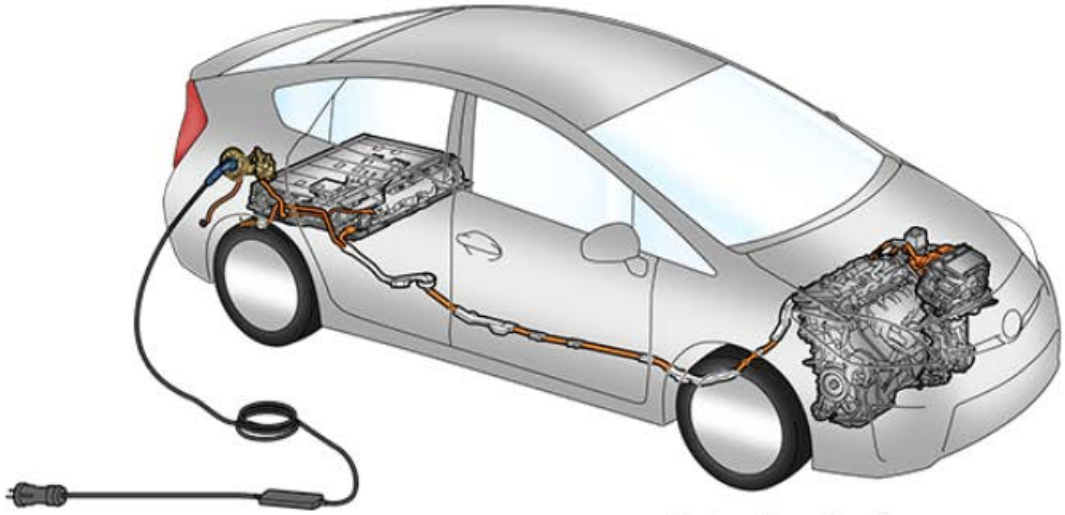
If the vehicle, charge cable, or charger is submerged in water, shut off the utility circuit supplying power to the charge cable before disconnecting it to prevent serious injury or death from severe burns or electric shock.

- If the charge cable assembly connector lock cannot be released, turn the external charger OFF, unplug it, or turn its main breaker OFF
- The charge cable assembly connector lock cannot be released during quick charging
- If charging does not stop even when the charger is turned OFF, turn its main breaker OFF

Onboard Charger

PHVs and EVs have an onboard charger that converts AC power from an external power source to DC, boosts it, and then uses it to charge the high voltage battery. Orange on-board charger cabling is energized during charging.

The onboard charger may be located in the engine/motor compartment or in the HV battery assembly. Refer to the vehicle's Emergency Response Guide/Emergency Response Quick Reference Sheet for the specific location of the onboard charger.



Prius Plug-in shown

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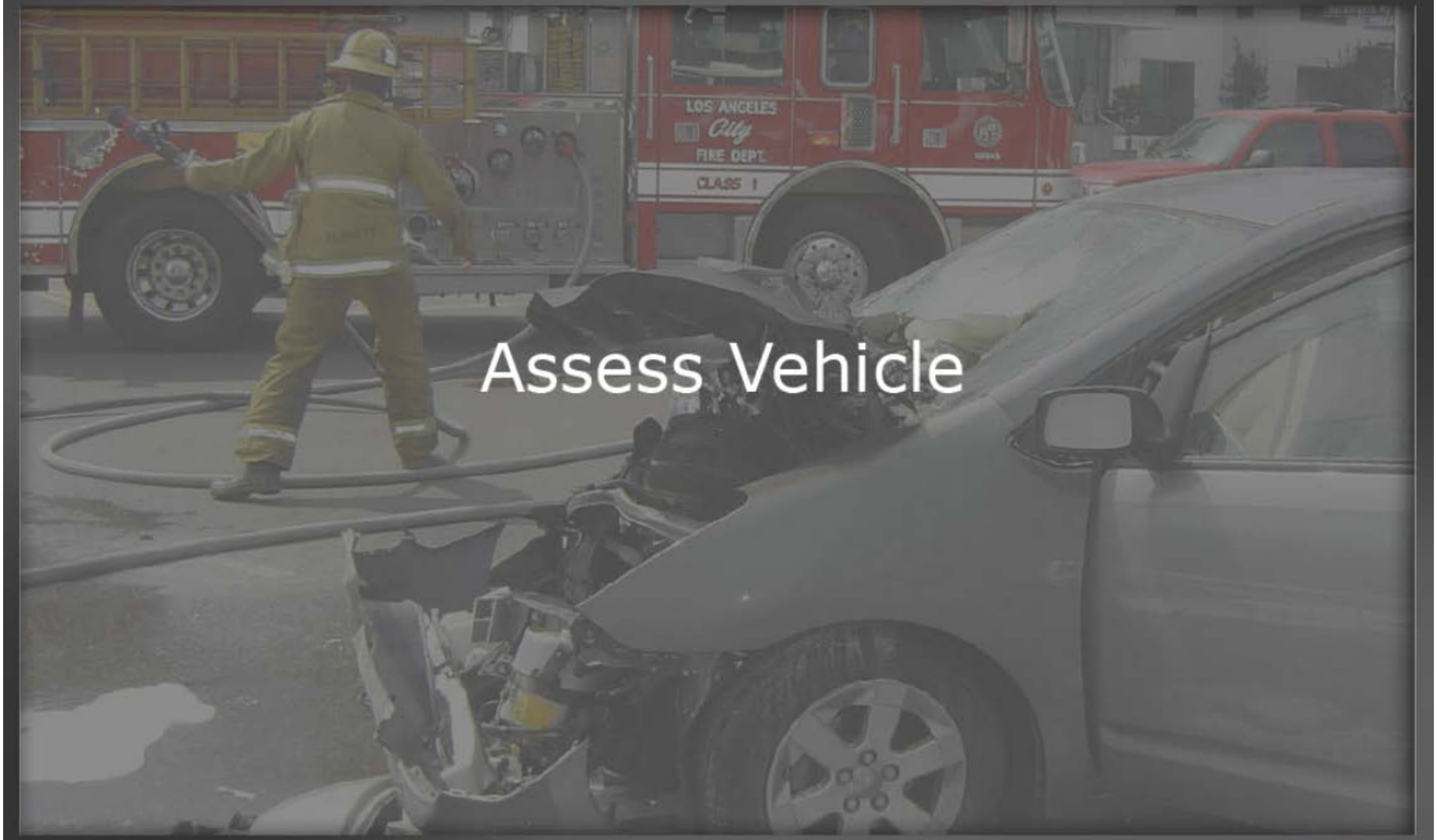


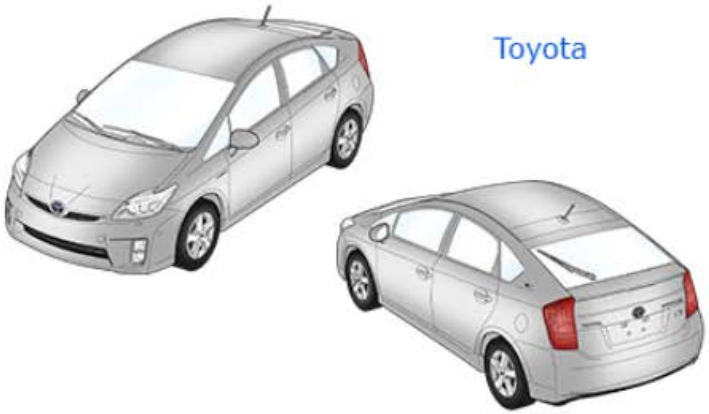
Assess Vehicle

Exterior

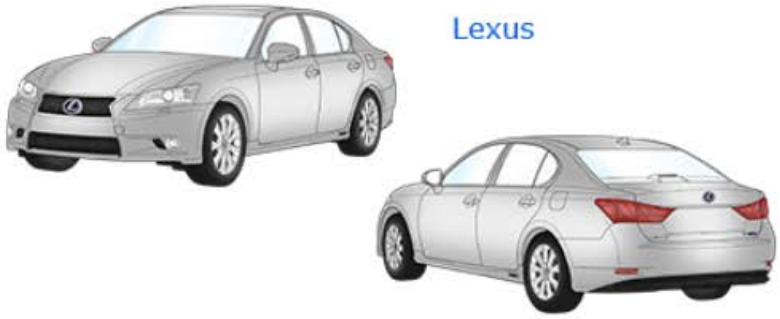
If a vehicle uses a high voltage electrical system, badges and other exterior cues help you identify it as a hybrid or electric vehicle. The individual vehicle Emergency Response Guide/Emergency Response Quick Reference Sheet shows the specific location of badges.

Select the links to see the badges.

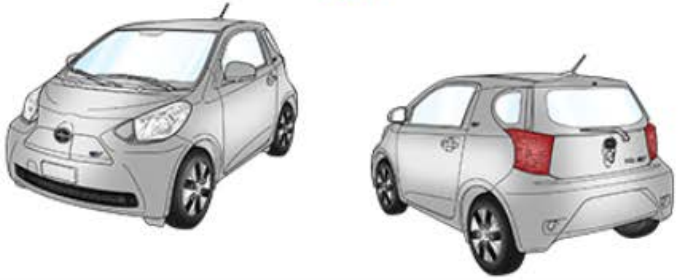
Toyota



Lexus



Scion



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Assess Vehicle

Toyota

- Some models may have blue tinted headlamps
- PHVs and EVs have a charge inlet door (refer to the Powertrain High Voltage System section)

Toyota Emergency Response Guide

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Assess Vehicle

Lexus
- Blue tinted headlamps and taillamps

Blue-trimmed Brand Logo

GS 450h

Model Designation "h"

Blue Hybrid Badging

Toyota Emergency Response Guide

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Assess Vehicle

Scion

Interior

To identify a hybrid or electric vehicle from the interior, look for the following:

- Instrument cluster READY indicator (illuminated when the vehicle is ON and operational)
- Hybrid system indicator in place of a tachometer (may be blacked out if the vehicle is shut off)
- May have a "B" shift lever position

Blue tinted shift selector

Engine/Motor Compartment

You can identify a vehicle as an HV, PHV, or EV from the orange high voltage power cables and the cover in the engine/motor compartment.

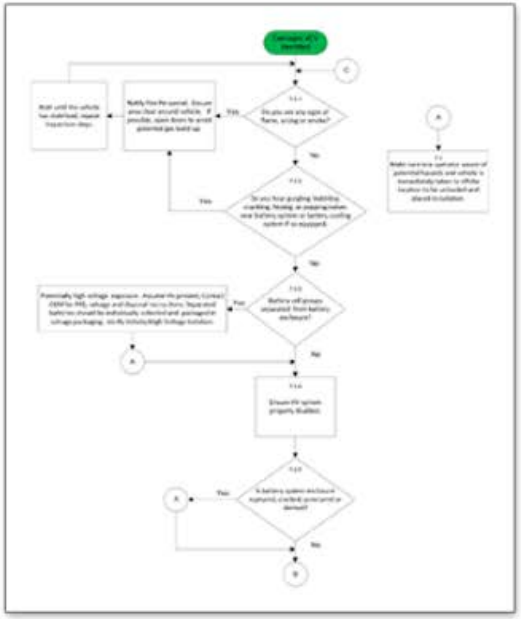
Hybrid models have an under hood label that identifies battery locations and type of high voltage battery

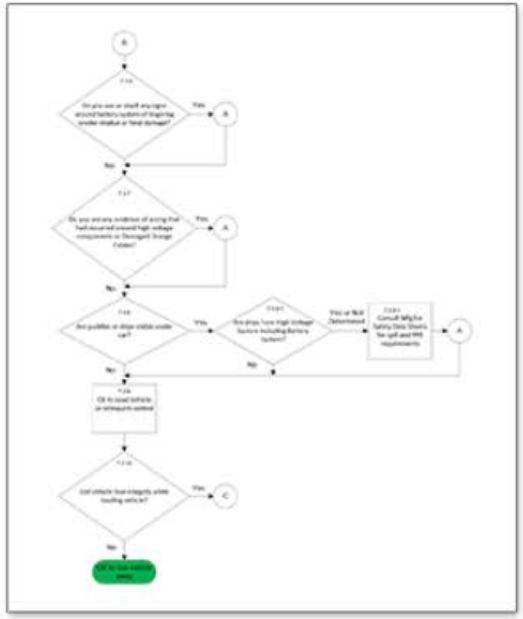
Vehicle Inspection

SAE standard J2990, "Hybrid and EV First and Second Responder Recommended Practice," includes a useful flow chart for on scene inspection of high voltage vehicles.

You may purchase this standard from SAE International by calling 1-877-606-7323 or by ordering online at http://standards.sae.org/j2990_201211/.

On Scene High Voltage Vehicle Inspection Flow Chart





SAE standards help ensure the safety, quality, and effectiveness of products and services across the mobility engineering industry.

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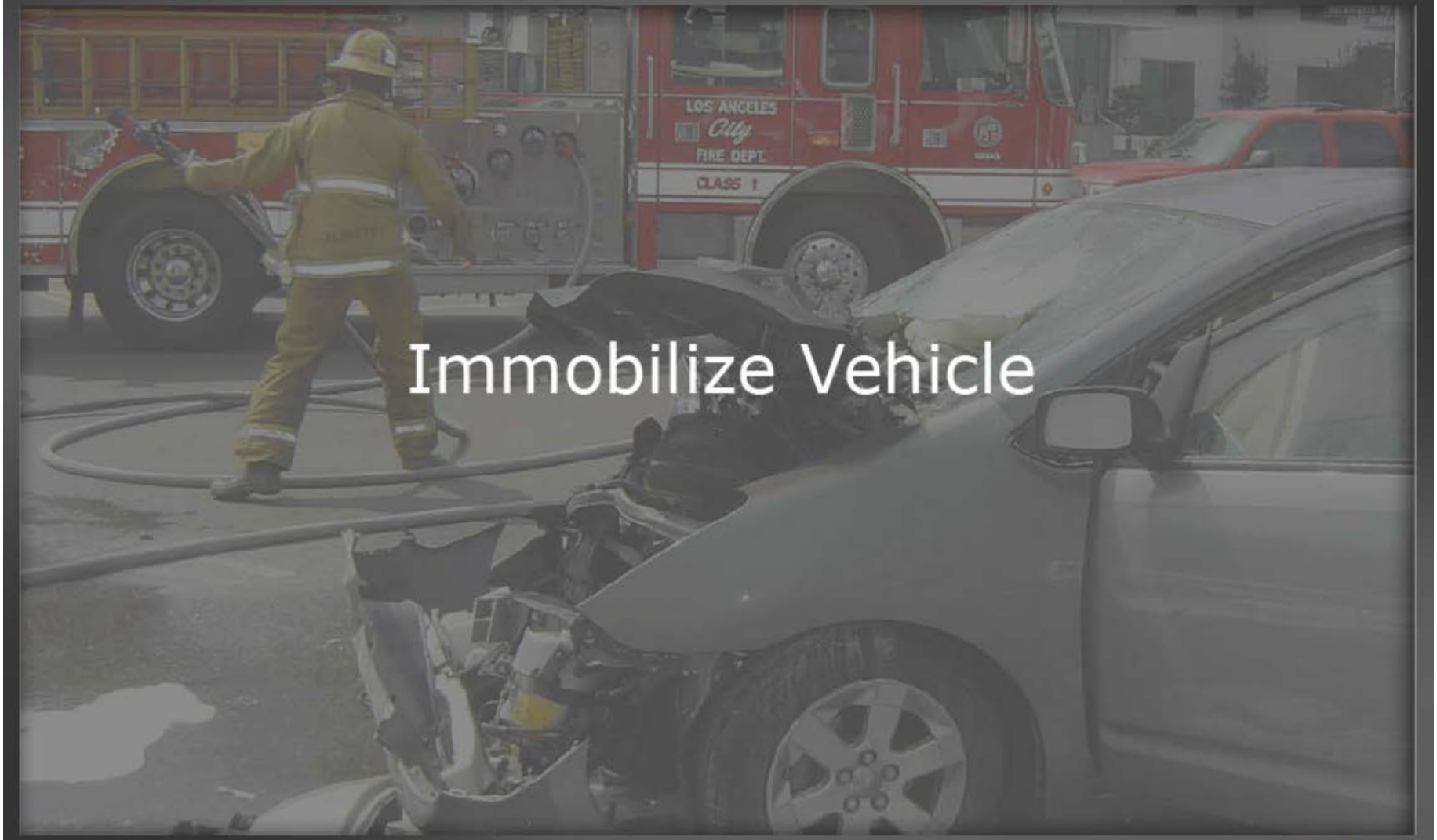

Immobilize Vehicle

Immobilize Vehicle

On arrival, immobilize the vehicle following these steps:

1. Chock the wheels and set the parking brake

The vehicle may have a lever, foot pedal, or switch-type parking brake.



2. Shift the vehicle into Park

Some models use an electronic gearshift selector:

- Press the P position switch near the gearshift selector
- This switch also sets the parking brake on some models

3. Enable Access

Before shutting the vehicle down:

- Lower windows
- Open back door (if equipped)
- Unlock doors
- Move seats and steering wheel

Once the 12 V battery is disconnected, power controls will not operate.

- To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component
- Wear protective equipment including insulated gloves when there is a risk of touching a high voltage power cable or component

Toyota Emergency Response Guide

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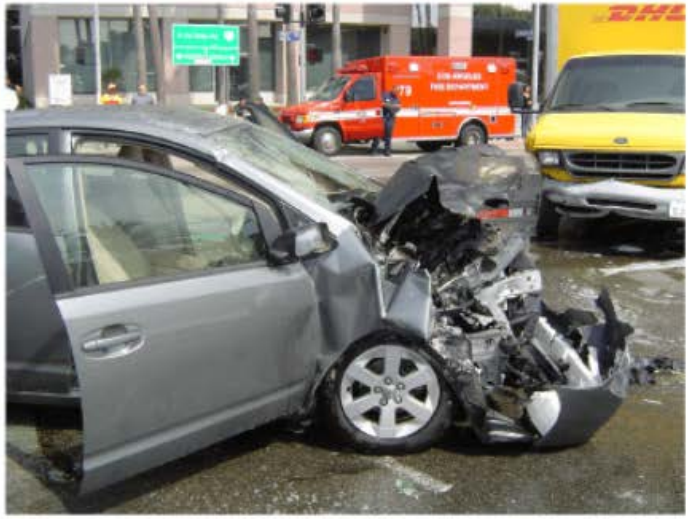
Disable Vehicle

Confirm Vehicle Status



The purpose of disabling the vehicle is to shut off the fuel supply, high voltage supply, and electrical power to the SRS.

The vehicle is on if any of these conditions are met:

- Engine is running
- Ignition switch is in ACC, ON, or START position
- Meters are illuminated
- Air conditioning, audio system, or wipers are operating
- Navigation or other displays are on

Disable Vehicle

Warnings

- Never assume a vehicle is off because it is silent
  - The vehicle may be equipped with an idling stop system
- Always observe the instrument cluster for the READY indicator status to verify whether the high voltage system is on or off
- When the vehicle is equipped with a remote air conditioning system and the meters are illuminated, high voltage may be applied to the air conditioning system even though the READY indicator is off
  - Shut off and disable the vehicle and ensure the meters are off
- Failure to shut off and disable the vehicle before performing emergency response procedures may result in serious injury or death from unintentional deployment of the SRS or unintentional actuation of the seatbelt pretensioners or active headrests
- **Hint:** If the vehicle is shut off, the instrument cluster gauges will be "blacked out" (not illuminated)

Toyota Emergency Response Guide

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Disable Vehicle

Shut Vehicle Off

1. Press the Engine/Power switch once or turn the ignition switch to the LOCK (OFF) position

If equipped with an Engine/Power switch, the vehicle is shut off when all of the following conditions are met:

- Engine is not running
- Meters are not illuminated
- A/C, audio system, or wipers are not operating
- Navigation or other displays are off

Operating the Engine/Power Switch
With the brake pedal depressed, pressing the switch toggles between Stop and Start. If the brake pedal is not depressed, the vehicle will not start.

With the brake pedal released, pressing the switch toggles between Accessory, Ignition-On, and Off.

Click here to see a diagram of the ignition mode sequence.

2. When equipped with an Engine/Power switch, keep the electrical key transmitter outside the detection area (16 ft. or more away from the vehicle).

If the electrical key transmitter is in the cabin or near the vehicle, it could start unexpectedly.

3. Disconnect the 12 V battery's negative terminal.

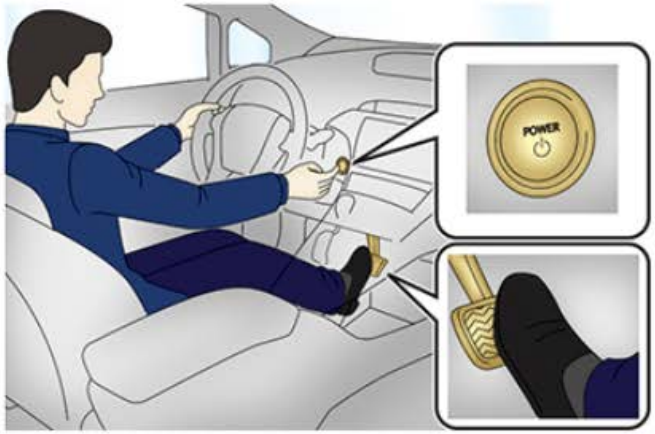
The 12 V battery location varies. Refer to each vehicle's Emergency Response Guide/Emergency Response Quick Reference Sheet for the specific location.

Shutting off the power to the electrical system helps prevent electrical fires and keeps the vehicle from starting.

Click the links to learn more.

Disable Vehicle

Ignition Mode Sequence



Brake pedal depressed:

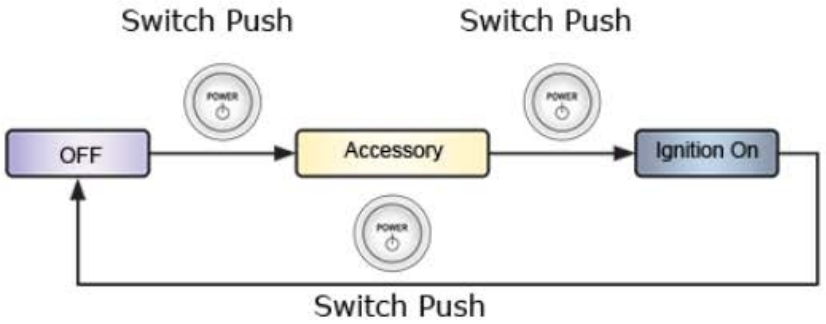
Pressing the Engine/Power switch toggles between Stop and Start.

Brake pedal released:

Pressing the Engine/Power switch toggles between Accessory, Ignition-On, and Off.

In Accessory mode, the radio and other components operate.

In Ignition-On mode, the power windows, wipers, HVAC, and SRS are operational.



Disable Vehicle

12 V Battery Locations

In trunk

Under rear seat

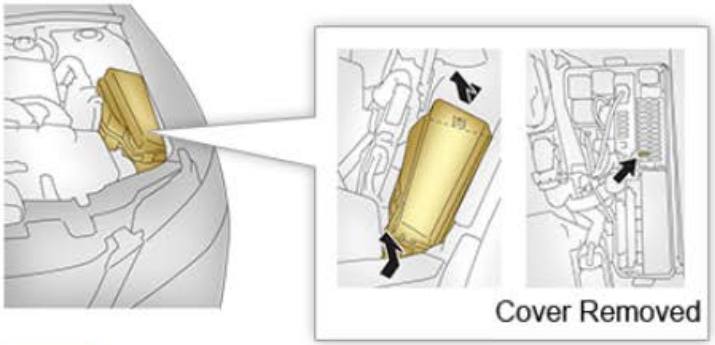
Depending on the model, the 12 V battery is located in the engine compartment, the luggage compartment, or under the rear seat.

Shut Vehicle Off – Alternate Procedure

If the ignition switch or Engine/Power switch is inaccessible or inoperative, follow this alternate procedure to disable the vehicle:

1. Open the engine compartment fuse box cover and remove the appropriate fuse.

   Refer to each vehicle's Emergency Response Guide/Emergency Response Quick Reference Sheet for the location of the fuse box.



2. Disconnect the 12 V battery's negative terminal.
   Depending on the model, the 12 V battery is located in the engine compartment, the luggage compartment, or under the rear seat.

   Refer to each vehicle's Emergency Response Guide/Emergency Response Quick Reference Sheet for the specific location.

⚠ Shutting off the power to the electrical system helps prevent electrical fires and keeps the vehicle from starting.

⚠ If you can't identify the correct fuse, pull **all** the fuses until all of the following conditions are met:

- Engine is **not** running
- Meters are **not** illuminated
- Air conditioning, audio system, or wipers are **not** operating
- Navigation or other displays are **off**

When Charging – Vehicle With Plug-in Charge System

An external power source charges the high voltage battery in PHVs and EVs. If a charge cable is connected to the vehicle's charging inlet, disconnect the cable to stop charging:

Wall-mounted Outlet

1. Push the latch release button on top of the charge cable connector and pull it away from the vehicle's charging inlet.

> ⚠ If you can't release the charge cable assembly connector lock, turn off the external power source. If the lock is still not released:
>
> - Unplug the external charger or turn the main breaker off
> - Disconnect the charge cable assembly from the charge inlet

2. Close the charging inlet cap and charging port lid.

Home Charging Station

3. Turn off the external power source by unplugging it or turning its main circuit breaker off.

> ⚠ If the vehicle, charge cable, or charger is submerged in water, shut off the utility circuit supplying power to the charge cable before disconnecting it to prevent serious injury or death from severe burns or electric shock.

Toyota Emergency Response Guide

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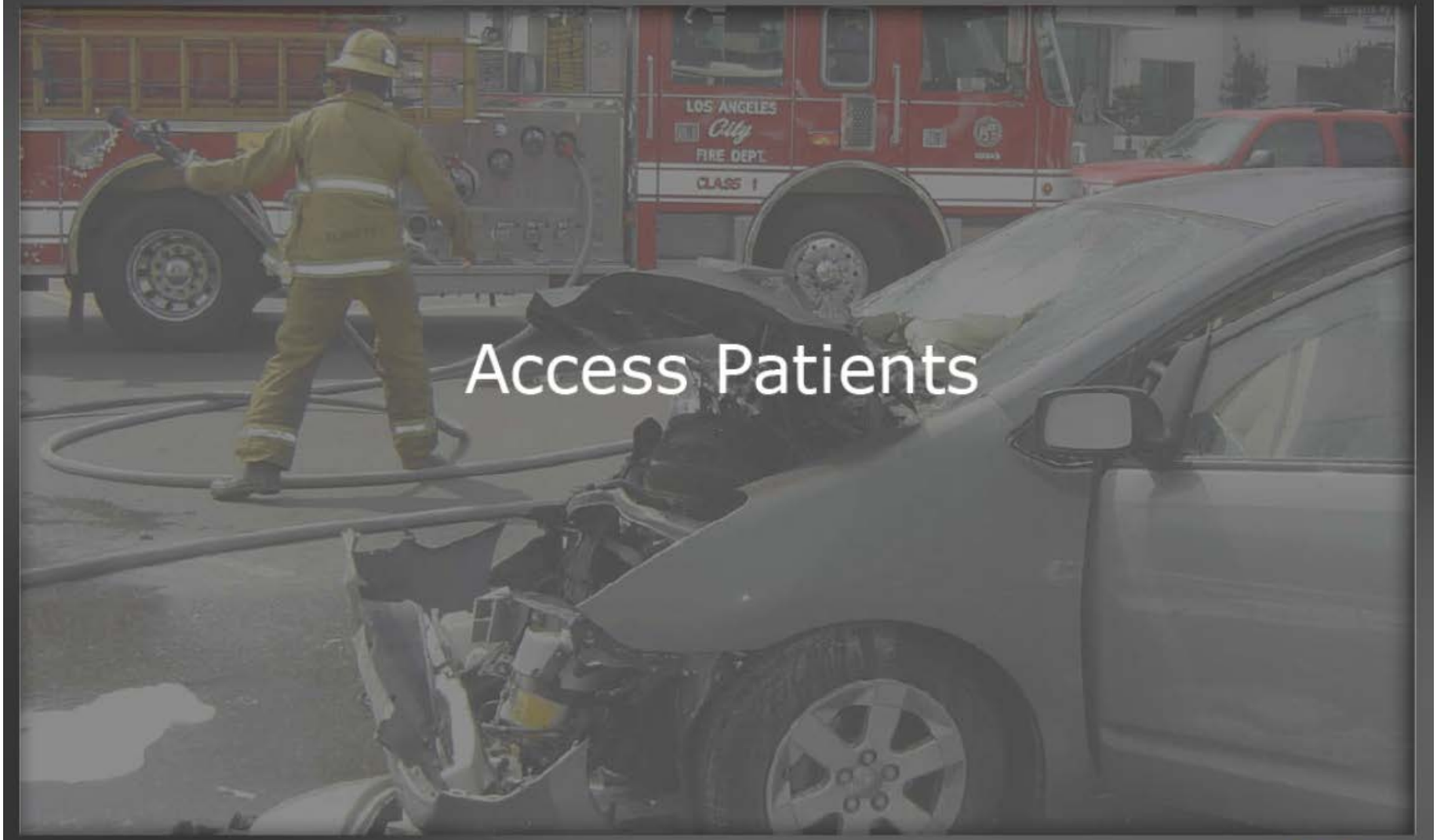

Access Patients

MENU | BACK | PAUSE | PLAY | REPLAY | NEXT

Access Patients

Overview

- Immobilize and disable the vehicle
- Open or remove windows and doors to access patients
- Secure the necessary space by adjusting the position of the steering wheel and seats and removing the head rests
- Crib the vehicle to stabilize it
- Cut the vehicle to gain access to the patient

Access Patients

Overview

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Immobilize Vehicle

On arrival, immobilize the vehicle following these steps:

1. **Chock the wheels and set the parking brake**
2. **Shift the vehicle into Park**
   Some models use an electronic gearshift selector:
   - Press the P position switch near the gearshift selector
   - This switch also sets the parking brake on some models
3. **Enable access**
   Before shutting the vehicle down:
   - Lower windows
   - Open back door (if equipped)
   - Unlock doors
   - Move seats and steering wheel

Once the 12 V battery is disconnected, power controls will not operate.

Access Patients

Overview

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- Open or remove windows and doors to access patie
- Secure the necessary space by adjusting the positi steering wheel and seats and removing the head re
- Crib the vehicle to stabilize it
- Cut the vehicle to gain access to the patient

Disable Vehicle

To shut the vehicle off, press the Engine/Power switch once or turn the ignition switch to the Lock (OFF) position.

When equipped with an Engine/Power switch, keep the electrical key transmitter outside the detection area (16 ft. or more away from the vehicle).

Disconnect the negative terminal of the 12 V battery. Refer to each vehicle's Emergency Response Guide or Emergency Response Quick Reference Sheet for the location of the 12 V battery.

Access Patients

Warnings

- The SRS, seatbelt pretensioners, and active headrests may remain powered for up to 90 seconds after the vehicle is shut off and disabled
  - Wait 90 seconds after shutting off and disabling the vehicle
  - Failure to shut off and disable the vehicle before performing emergency response procedures may result in unintentional airbag deployment or unintentional actuation of seatbelt pretensioners or active headrests, causing serious injury or death
- Cutting an undeployed SRS airbag, seatbelt pretensioner, or active headrest inflator may cause it to explode
- Immediately after SRS airbag deployment, seatbelt pretensioner actuation, or active headrest actuation, the components are extremely hot and may cause burns if touched
- If an SRS airbag deploys with all doors and windows closed, inflation gas may cause breathing difficulty
- If residue produced during SRS deployment, seatbelt pretensioner actuation, or active headrest actuation contacts the skin, rinse it off immediately to prevent irritation
- The high voltage system may remain powered for up to 10 minutes after the vehicle is shut off and disabled
- Failure to shut off and disable the vehicle before performing emergency response procedures may result in serious injury or death from severe burns and electric shock
- To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component

Toyota Emergency Response Guide

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Access Patients

Warnings

- The SRS, seatbelt pretensioners, and active headrests may remain powered for up to 90 seconds after the vehicle is shut off and disabled
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Disable Vehicle

To shut the vehicle off, press the Engine/Power switch once or turn the ignition switch to the Lock (OFF) position.

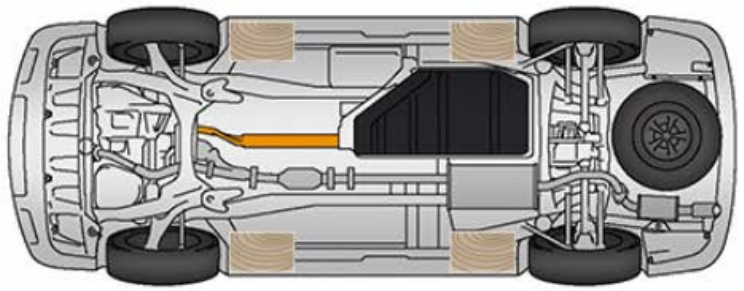
When equipped with an Engine/Power switch, keep the electrical key transmitter outside the detection area (16 ft. or more away from the vehicle).

Disconnect the negative terminal of the 12 V battery. Refer to each vehicle's Emergency Response Guide or Emergency Response Quick Reference Sheet for the location of the 12 V battery.

Stabilize Vehicle

Crib at four points directly under the front and rear pillars.

Optimal cribbing points



Lexus LS400h L shown

- Cribbing under the exhaust system, fuel system, high voltage battery, or high voltage power cables may generate heat, burst air lifting bags, or damage the high voltage power cables
- This may result in a vehicle fire, crushing accident, or electrical shock, possibly leading to serious injury or death

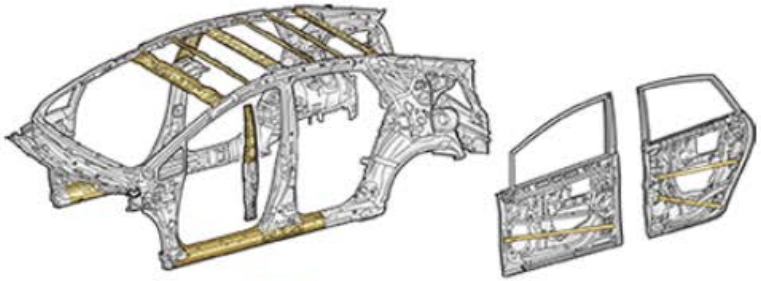
Cut Vehicle

When cutting, pay attention to the location of:

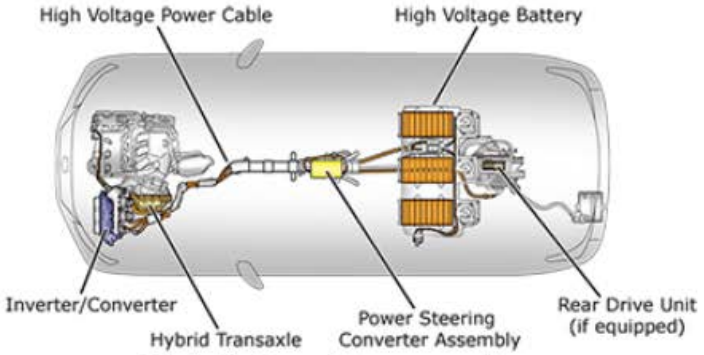
- Ultra high strength steel
- Fuel system
- SRS
- High voltage electrical system components

Note: If the SRS airbag, seatbelt pretensioners, or active headrests have already been activated, the inflator can be cut.

Consult the individual vehicle Emergency Response Guide/Emergency Response Quick Reference Sheet for locations.



Ultra High Strength Steel



High Voltage Components

To prevent serious injury from a fire caused by sparks, use a hydraulic cutter or other tools that do not produce sparks when cutting.

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Vehicle Fire

Toyota Emergency Response Guide

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Vehicle Fire

Introduction

- When attacking an HV, PHV, or EV fire, use copious amounts of water to extinguish the fire and cool the high voltage battery
- The high voltage battery is difficult to access in some vehicles
- If it is difficult to apply copious amounts of water to the high voltage battery, allow the battery to burn itself out
- Refer to the individual vehicle Emergency Response Guide/Emergency Response Quick Reference Sheet for the location of the high voltage battery

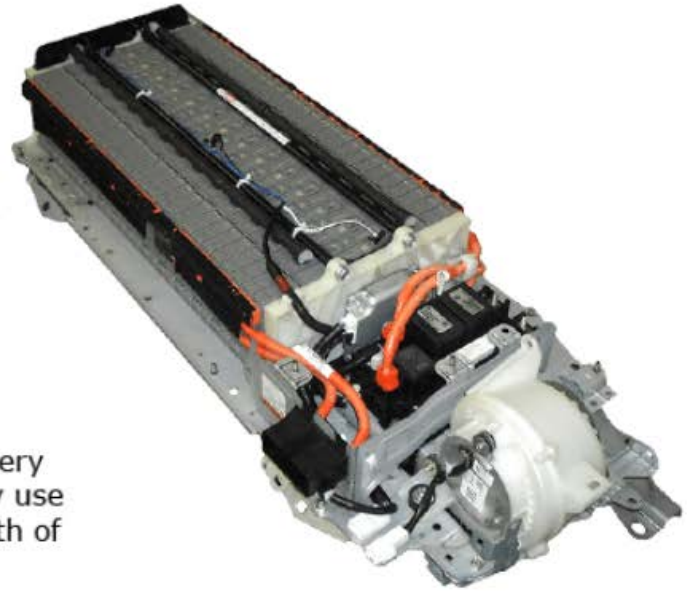
⚠

- To avoid serious injury or death from severe burns or electric shock, never breach or remove the high voltage battery assembly cover under any circumstances, including fire
- If only a small amount of water is used to extinguish a fire, a short circuit may occur in the high voltage battery, causing the fire to reignite
- Because toxic gases are by-products of combustion, all responders in the hot zone should wear the proper Personal Protective Equipment (PPE), including Self Contained Breathing Apparatus (SCBA)

Ni-MH Battery

To attack a Ni-MH battery fire, use copious amounts of water at a safe distance or let the fire burn itself out.

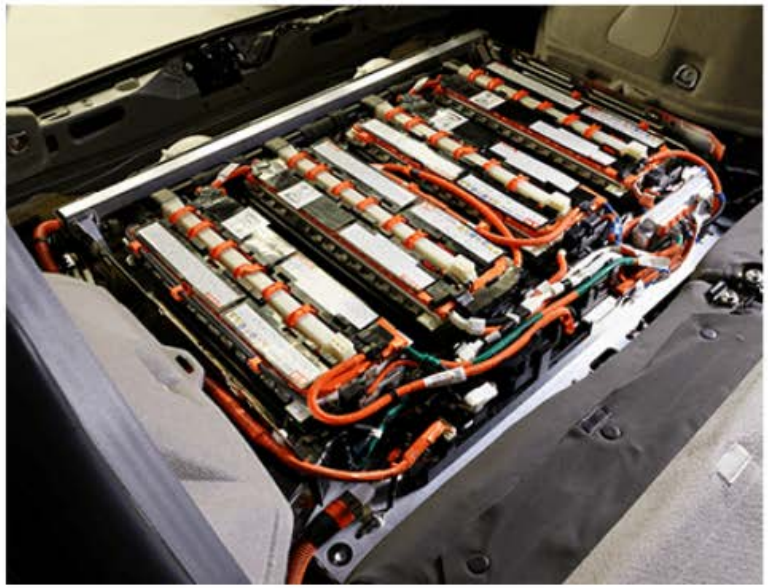
Normally, flooding a Ni-MH high voltage battery with water controls battery fires by cooling adjacent modules below the ignition temperature. Remaining modules not extinguished by water will burn out.



However, flooding the Avalon Hybrid high voltage battery pack is not recommended. The battery case design and location prevent responders from safely applying water through the vent openings. We recommend letting the Avalon Hybrid high voltage battery pack burn itself out.

Defensive Fire Attack
In a defensive attack, pull back a safe distance and allow Ni-MH battery modules to burn out. During this defensive operation, fire crews may use a water stream or fog pattern to protect exposures or control the path of smoke.

Li-ion Battery



To attack a Li-ion battery fire, use copious amounts of water at a safe distance or let the fire burn itself out.

This is particularly true for large format Li-ion batteries like those in the Prius Plug-in Hybrid and second generation RAV4 EV. It is nearly impossible to extinguish burning high voltage batteries in these vehicles.

⚠ There is a potential for delayed ignition or re-ignition of a Li-ion battery fire even after it is believed to be extinguished. This may remain an issue until the Li-ion battery is properly discharged.

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Vehicle Submersion

Toyota Emergency Response Guide

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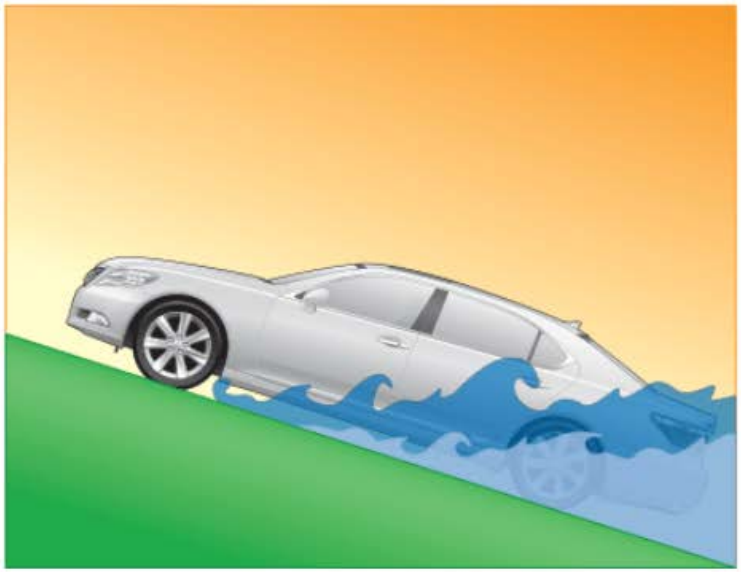
Vehicle Submersion

Introduction

- If an HV, PHV, or EV is fully or partially submerged in water, pull it out as much as possible
- Immobilize and disable the vehicle before performing emergency response procedures
- To prevent a vehicle fire, do not turn a submerged vehicle's ignition switch to ACC or ON or set the Engine/Power switch to Ignition-On
- A submerged HV, PHV, or EV does not have high voltage potential on the vehicle body and is safe to touch
- It is safe to enter the water as the vehicle and water have the same electrical potential
- After some time has passed, electrical corrosion may cause a short circuit leading to a vehicle fire



⚠

- Touching exposed orange high voltage power cables or high voltage components may cause electrical shock due to a change in electrical potential
- To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component
- Wear protective equipment such as **insulated gloves** when there is a risk of touching high voltage power cables or high voltage components

Toyota Emergency Response Guide

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Vehicle Submersion

Introduction

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Immobilize Vehicle

On arrival, immobilize the vehicle following these steps:

1. **Chock the wheels and set the parking brake**
2. **Shift the vehicle into Park**
   Some models use an electronic gearshift selector:
   - Press the P position switch near the gearshift selector
   - This switch also sets the parking brake on some models
3. **Enable access**
   Before shutting the vehicle down:
   - Lower windows
   - Open back door (if equipped)
   - Unlock doors
   - Move seats and steering wheel

Once the 12 V battery is disconnected, power controls will not operate.

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Toyota Emergency Response Guide

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Vehicle Submersion

Introduction

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- After some time has passed, electrical corrosion may c a short circuit leading to a vehicle fire

Disable Vehicle

To shut the vehicle off, press the Engine/Power switch once or turn the ignition switch to the Lock (OFF) position.

When equipped with an Engine/Power switch, keep the electrical key transmitter outside the detection area (16 ft. or more away from the vehicle).

Disconnect the negative terminal of the 12 V battery. Refer to each vehicle's Emergency Response Guide or Emergency Response Quick Reference Sheet for the location of the 12 V battery.

- Touching exposed orange high voltage power cables or high voltage components may cause electrical shock due to a change in electrical potential
- To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component
- Wear protective equipment such as **insulated gloves** when there is a risk of touching high voltage power cables or high voltage components

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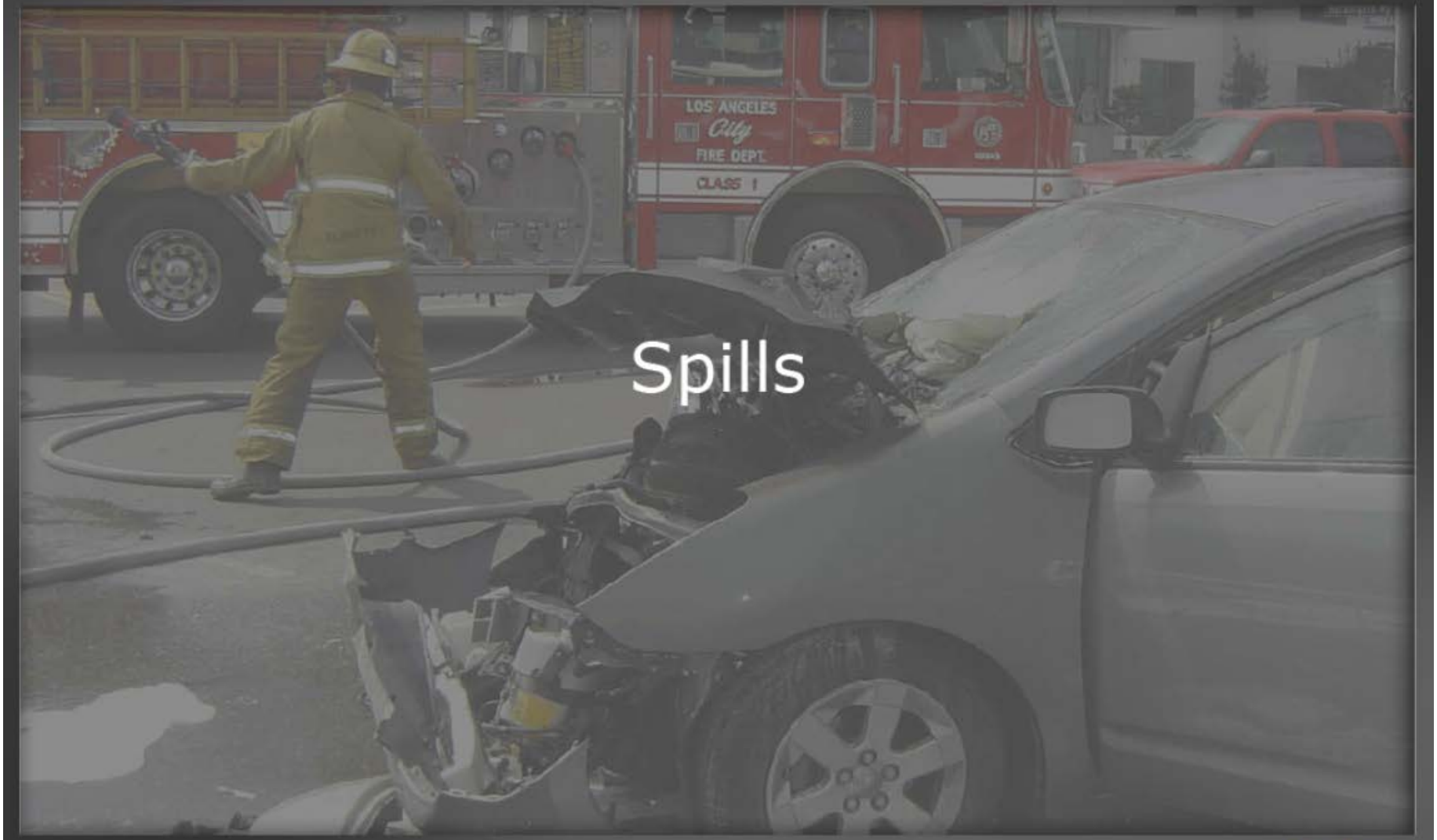

Spills

MENU | BACK | PAUSE | PLAY | REPLAY | NEXT

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Spills

12 V Battery Electrolyte

- Dilute sulfuric acid may irritate the skin if contacted
- Wear appropriate protective equipment such as rubber gloves and eye protection when there is a risk of touching electrolyte
- Contact the OEM for Safety Data Sheets for battery electrolyte in case of spills
- Reference Safety Data Sheets for proper Personal Protection Equipment and disposal instructions

Nickel-Metal Hydride (Ni-MH) Battery

- Even if a module cracks, the cell plates absorb the electrolyte and it will not normally leak
- Electrolyte leakage is unlikely due to the amount of electrolyte contained within the modules
- A Ni-MH electrolyte leak is not a hazardous material incident
- Refer to the Powertrain High Voltage System section for more information about nickel-metal hydride (Ni-MH) high voltage batteries

- Ni-MH battery electrolyte is a caustic alkaline (pH 13.5) that damages human tissues
- To avoid injury, wear appropriate protective equipment (rubber gloves and eye protection) when there is a risk of touching electrolyte

Lithium ion (Li-ion) Battery

- Even if a cell is crushed or cracked, the cell separators absorb the electrolyte and leakage is unlikely
  - If any electrolyte leaks, it should only be a small amount
  - Electrolyte quickly evaporates
- A small amount can irritate the eyes, nose, throat, and skin
- Refer to Powertrain High Voltage System section for more information about Lithium ion (Li-ion) high voltage batteries

⚠

- Li-ion electrolyte is flammable and damages human tissues
- Burning Li-ion batteries may irritate the eyes, nose, and throat
- Li-ion electrolyte vapor may irritate the nose and throat
- To avoid injury by coming into contact with Li-ion electrolyte or vapor, wear appropriate protective equipment (rubber gloves, eye protection, protective mask, or SCBA) when there is a risk of touching electrolyte
- Keep spilled Li-ion electrolyte away from fire and ensure the area is well ventilated
- Absorb spilled Li-ion electrolyte and store the absorption material in an airtight container until disposed of

Second Responder Resources

Toyota Emergency Response Guide

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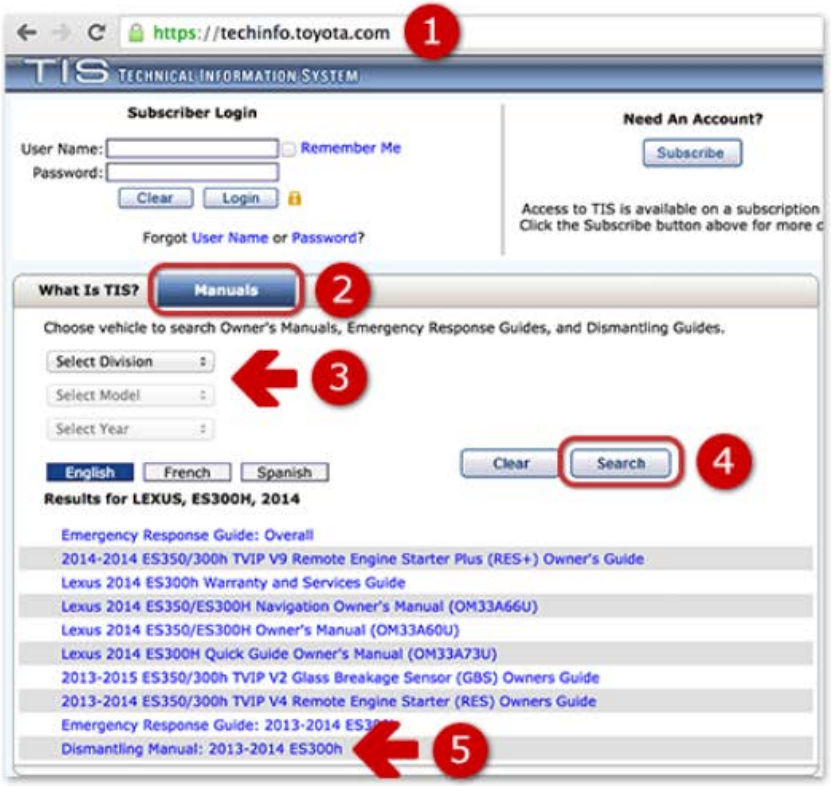
Second Responder Resources

Dismantling Manuals

Dismantling Manuals assist dismantlers in the safe handling of Toyota and Lexus vehicles with high voltage electrical systems.



To access the Dismantling Manuals:

1. Type techinfo.toyota.com into your browser.

   This is an open site that does not require subscriber login.

2. Click the Manuals tab.

3. Using the dropdowns, select a Division, Model, and Model Year.

4. Click the Search button.

5. A list of results will be displayed. Click Dismantling Manual to open the document in a browser window.

SAE Standards

SAE standard J2990, "Hybrid and EV First and Second Responder Recommended Practice"
Provides first and second responders with the ability to avoid hazards associated with the high voltage system, communicate hazards to other responders, and manage risks.

SAE standard J2950, "Recommended Practices for Shipping, Transport, and Handling of Automotive-Type Battery System - Lithium Ion"
Helps you identify, handle, and ship lithium-ion batteries, and provides information about U.S. and International hazardous materials (dangerous goods) transportation regulations.

You may purchase these standards from SAE International by:

- Calling 1-877-606-7323
- Ordering online at http://standards.sae.org/

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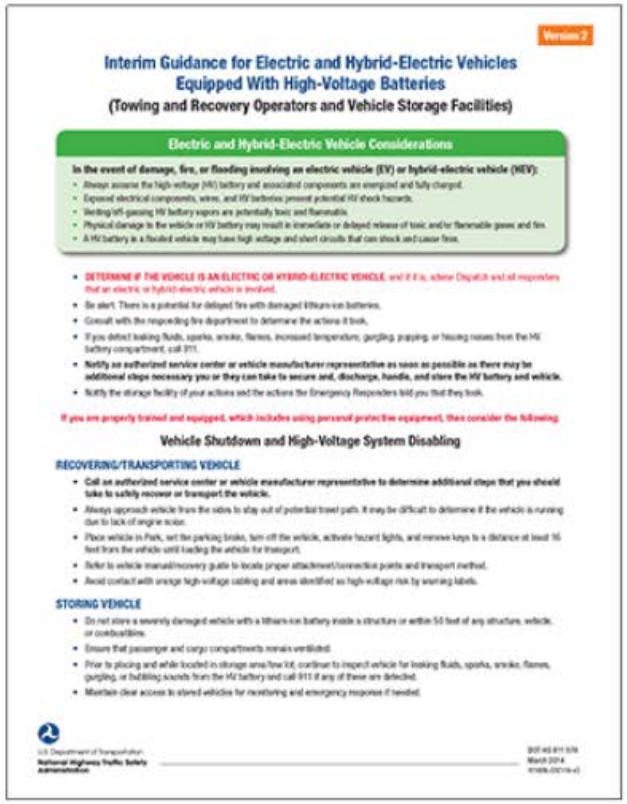
Second Responder Resources

NHTSA

The National Highway Traffic Safety Administration (NHTSA) has released three variations of "Interim Guidance for Electric and Hybrid-Electric Vehicles:"

- Emergency Responders
- Tow/Recovery/Storage
- Owners

Select the image to open the version for Tow/Recovery/Storage.



Version 2

Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High-Voltage Batteries

(Towing and Recovery Operators and Vehicle Storage Facilities)

Electric and Hybrid-Electric Vehicle Considerations

In the event of damage, fire, or flooding involving an electric vehicle (EV) or hybrid-electric vehicle (HEV):

- Always assume the high-voltage (HV) battery and associated components are energized and fully charged.
- Exposed electrical components, wires, and HV batteries present potential HV shock hazards.
- Venting/off-gassing HV battery vapors are potentially toxic and flammable.
- Physical damage to the vehicle or HV battery may result in immediate or delayed release of toxic and/or flammable gases and fire.
- A HV battery in a flooded vehicle may have high voltage and short circuits that can shock and cause fires.

- **DETERMINE IF THE VEHICLE IS AN ELECTRIC OR HYBRID-ELECTRIC VEHICLE**, and if it is, advise Dispatch and all responders that an electric or hybrid-electric vehicle is involved.
- Be alert. There is a potential for delayed fire with damaged lithium-ion batteries.
- Consult with the responding fire department to determine the actions it took.
- If you detect leaking fluids, sparks, smoke, flames, increased temperature, gurgling, popping, or hissing noises from the HV battery compartment, call 911.
- **Notify an authorized service center or vehicle manufacturer representative as soon as possible as there may be additional steps necessary you or they can take to secure and, discharge, handle, and store the HV battery and vehicle.**
- Notify the storage facility of your actions and the actions the Emergency Responders told you that they took.

If you are properly trained and equipped, which includes using personal protective equipment, then consider the following:

Vehicle Shutdown and High-Voltage System Disabling

RECOVERING/TRANSPORTING VEHICLE

- **Call an authorized service center or vehicle manufacturer representative to determine additional steps that you should take to safely recover or transport the vehicle.**
- Always approach vehicle from the sides to stay out of potential travel path. It may be difficult to determine if the vehicle is running due to lack of engine noise.
- Place vehicle in Park, set the parking brake, turn off the vehicle, activate hazard lights, and remove keys to a distance at least 16 feet from the vehicle until loading the vehicle for transport.
- Refer to vehicle manual/recovery guide to locate proper attachment/connection points and transport method.
- Avoid contact with orange high-voltage cabling and areas identified as high-voltage risk by warning labels.

STORING VEHICLE

- Do not store a severely damaged vehicle with a lithium-ion battery inside a structure or within 50 feet of any structure, vehicle, or combustibles.
- Ensure that passenger and cargo compartments remain ventilated.
- Prior to placing and while located in storage area/tow lot, continue to inspect vehicle for leaking fluids, sparks, smoke, flames, gurgling, or bubbling sounds from the HV battery and call 911 if any of these are detected.
- Maintain clear access to stored vehicles for monitoring and emergency response if needed.

U.S. Department of Transportation
National Highway Traffic Safety Administration

DOT HS 811 978
March 2014

Toyota Emergency Response Guide

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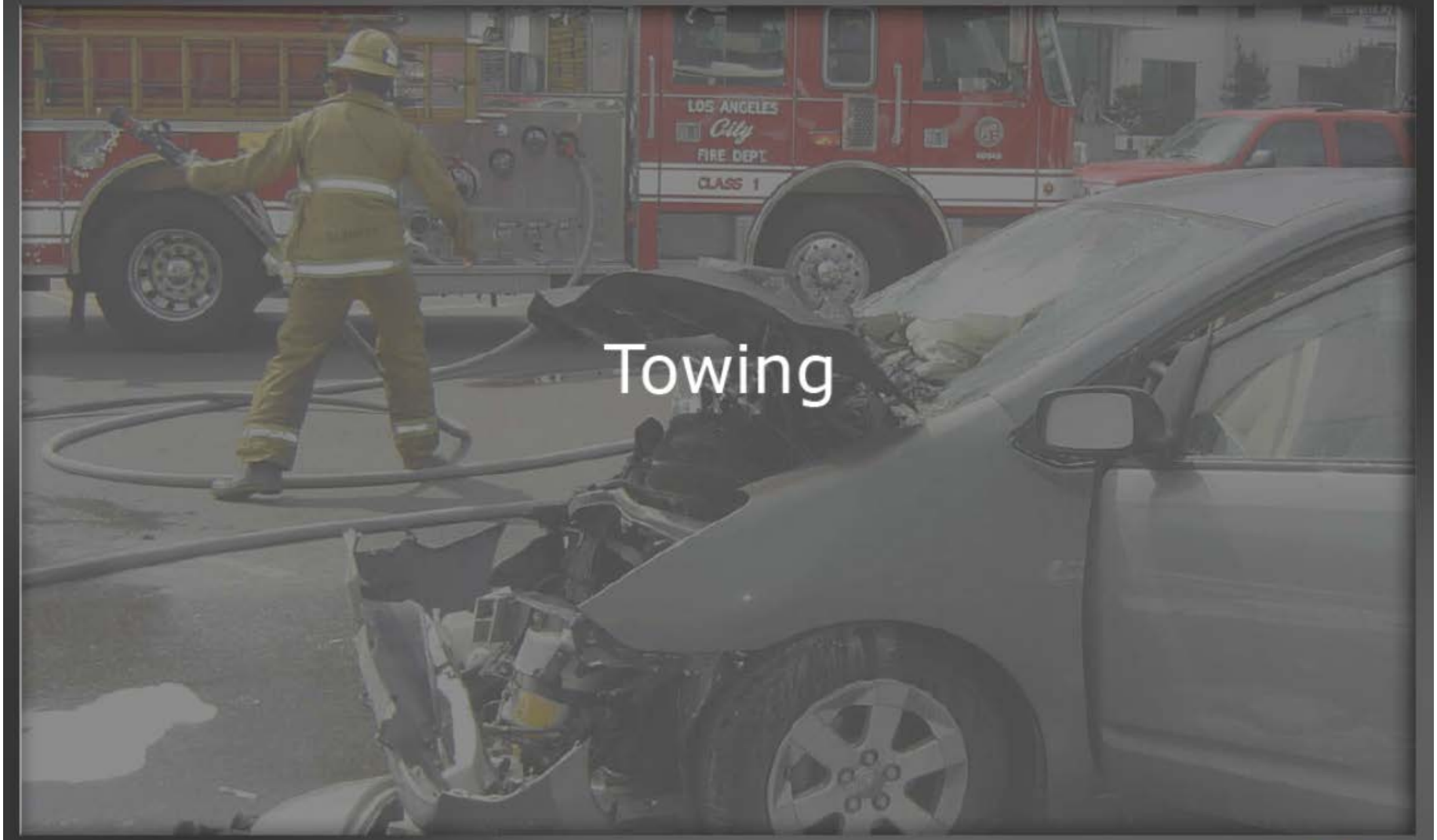

Towing

Preferred Method

Tow all HVs, PHVs and EVs on a flat bed with all four wheels off the ground:

- Before loading the vehicle, disconnect the 12 V battery's negative terminal
- Refer to each vehicle's Emergency Response Guide/Emergency Response Quick Reference Sheet for towing information and the location of the 12 V battery

Only front-wheel drive vehicles may be towed with the rear wheels on the ground.

Consult with the responding fire department on the actions it took.
First responders **must** inform tow operators of HV, PHV, and EV hazards during transit and storage:

- **High voltage**
  - To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component
  - Wear protective equipment such as insulated gloves when there is a risk of touching high voltage power cables or high voltage components
- **Potential for the high voltage battery to re-ignite after a vehicle fire**
- **Leaking high voltage battery electrolyte**
  - Wear appropriate protective equipment
    - Ni-MH battery: rubber gloves and eye protection
    - Li-ion battery: rubber gloves, eye protection, protective mask, or Self Contained Breathing Apparatus (SCBA)

Alternate Method

Use this alternate towing method only when towing with all four wheels on the ground is unavoidable:

1. Release the parking lock

Move the shift lever from P to N while pressing and holding the lock release button.

If equipped with a P position switch, you can't release the parking lock if the 12 V battery is disconnected.

- Use wheel dollies to move the vehicle

2. Unlock the steering wheel
Press the Engine/Power switch until in Ignition-On mode or turn the ignition switch to any position other than LOCK.

If equipped with the electrical key transmitter, the steering wheel can't be unlocked if the 12 V battery is disconnected

- Use wheel dollies to move the vehicle

3. Tow the vehicle in a forward direction at a low speed (under 20 mph) only for a short distance (up to 50 miles)

⚠

Make sure the vehicle is in "Ignition-On" mode.

- If the vehicle is in "Off" mode, the steering wheel may lock, making steering inoperative

Towing with all four wheels on the ground may damage the:

- Transmission when exceeding the speed or distance limit, or when the vehicle being towed is facing backward
- High voltage electrical system
- Idling stop system (if equipped)

Toyota Emergency Response Guide

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Storage

Before Storing

Before storing a wrecked HV, PHV, or EV:

- Disconnect the negative 12 V battery terminal
- Drain fuel and oil
- Remove the service plug

Refer to the vehicle's Dismantling Manual for service plug location and removal steps.

Once you remove the service plug, place it in a secure location.

Only certifed Hybrid Technichians should handle high voltage battery packs.

If a vehicle was submerged

Select the link to learn more

- To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component
- The service plug is a high voltage component
- Wear protective equipment including **insulated gloves** when there is a risk of touching a high voltage power cable or component
- Touching the service plug without appropriate protective equipment may result in serious injury or death from severe burns and electric shock from the high voltage electrical system

Toyota Emergency Response Guide

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Vehicle Storage

Before Storing

Before storing a wrecked HV, PHV, or EV:

- Disconnect the negative 12 V battery term
- Drain fuel and oil
- Remove the service plug

Refer to the vehic
removal steps.

Once you remove

Only certifed Hybr

If a vehicle was su

Select the link to

If a Vehicle was Submerged:

- Drain the water
- Disconnect the 12 V battery and the high voltage battery service plug
- Store in an outdoor location, at least 50 feet away from other vehicles, buildings, and combustibles
  - Electrical corrosion may cause a short circuit leading to a vehicle fire
- Do not turn the ignition switch to ACC or ON or set the Engine/Power switch to Ignition-On

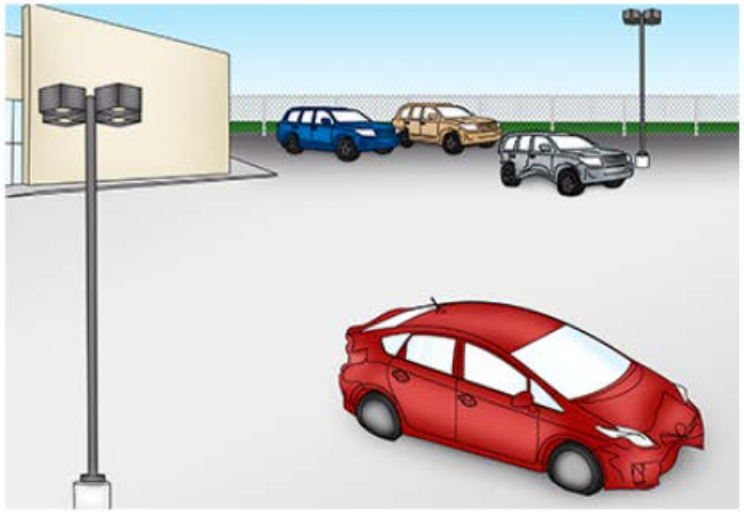
- To prevent serious injury or death from severe burns and electric shock, do not touch, cut, or breach any orange high voltage power cable or high voltage component
- The service plug is a high voltage component
- Wear protective equipment including **insulated gloves** when there is a risk of touching a high voltage power cable or component
- Touching the service plug without appropriate protective equipment may result in serious injury or death from severe burns and electric shock from the high voltage electrical system

Storing

Li-ion Batteries
Vehicles with a Li-ion battery must be stored outdoors, at least 50 feet away from other vehicles, buildings, and combustibles. Always assume the high voltage battery is energized and fully charged.

After some time has passed, a short circuit due to impact or electrical corrosion in the high voltage battery may cause a fire. Call 911 if electrolyte fluid appears to be leaking from the high voltage battery, if you observe sparks, smoke, or flames, or hear gurgling, bubbling, popping, or hissing sounds.

Ni-MH Batteries
Fire will largely consume most Ni-MH batteries. Pay particular attention to the large format Ni-MH battery in the first generation RAV4 EV. If this battery smolders, store it at least 50 feet away from other vehicles, buildings, and combustibles, and monitor it closely.



Select the icons to print each warning sign

Inspecting Lithium ion (Li-ion) Batteries

Li-ion batteries require special handling to help avoid battery re-ignition after a fire has been extinguished on a Plug-in Hybrid Vehicle with a Lithium ion high voltage battery.

- To determine the high voltage battery type and location, refer to the individual Dismantling Manual
- Read the warning label on the high voltage battery cover

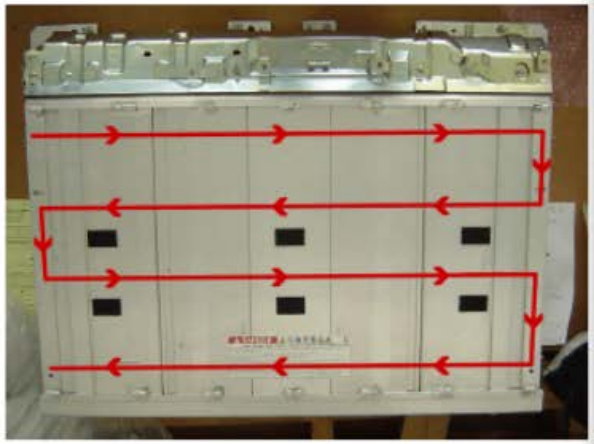
Procedure
If accessible, inspect the Lithium-ion battery for thermal runaway:

- Hold thermometer approximately 12-18 inches above the battery case and scan in the pattern shown
- Scan to the edges of the battery case
- Record the highest temperatures
- Repeat the procedure after approximately 1 hour

Recorded high temperatures should have changed **towards** ambient temperature, or remain **near** ambient.

If temperatures are changing **away** from ambient, move the battery to a safe area, preferably outside. It may have to be completely discharged by authorized recovery personnel using specialized equipment.

This procedure requires you to handle a damaged vehicle. Specialized training, tools, and protective equipment are required to perform these steps. Contact Toyota or authorized service personnel for proper procedures and resources.



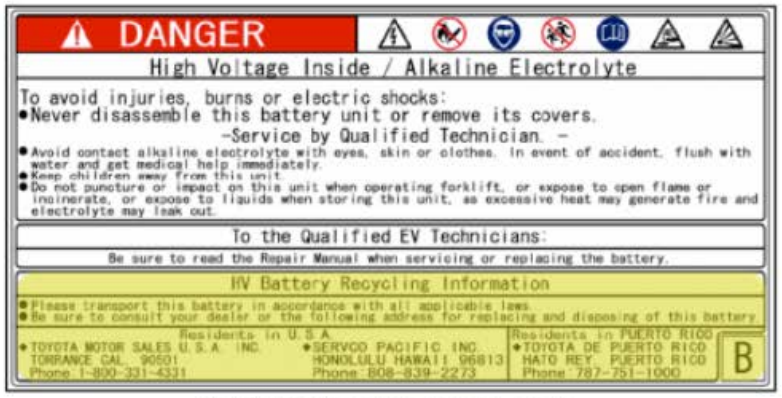
Use an infrared thermometer:

- Capable of accuracy within ± 4°F
- Distance to spot ratio ≥ 10:1
- Capable of temperature readings from -4°F to +212°F

Lithium-ion Battery Warning Label

Recycling High Voltage Batteries

- Follow the warning label on the high voltage battery cover when recycling
- Only certified Hybrid Technicians should handle high voltage battery packs
- For information about recycling, contact:
  - Toyota/Lexus dealer
  - Toyota customer assistance (800) 331-4331
  - Lexus customer assistance (800) 255-3987



Ni-MH Battery Warning Label

Toyota Emergency Response Guide

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Vehicle Storage

Shipping

Li-ion

- A Li-ion high voltage battery that has been removed from the vehicle is a Class 9 hazardous material and must be packed and shipped accordingly

- Transportation regulations for shipping Li-ion batteries is provided in SAE standard J2950, "Recommended Practices for Shipping, Transport, and Handling of Automotive-Type Battery System - Lithium Ion"

- Failure to follow current international, federal, and local hazardous materials transportation regulations may result in fines and/or penalties

Ni-MH

- Ni-MH high voltage batteries are not hazardous materials; shipping them as such is a DOT violation

To identify Li-ion and Ni-MH high voltage batteries, refer to the individual Emergency Response Guide/Emergency Response Quick Reference Sheet and the warning label on the battery cover

Toyota Emergency Response Guide

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Conclusion