



AutoX Driverless Vehicle Test **Law Enforcement Interaction Plan**

To Law Enforcement Officers and Other First Responders:

This document describes the procedures that AutoX designs for law enforcement officers and other first responders, such as firefighters, to safely interact with AutoX driverless test vehicle(s). This guide is intended to be used by trained first responders and assumes a professional-level background in safely responding to emergencies, including those involving damaged vehicles.

This document describes:

- how to access the vehicle;
- how to identify the driving status of the vehicle;
- how to disengage auto-drive mode of the vehicle; and
- how to safely move the vehicle.

AutoX Driverless Vehicle Test

Law Enforcement Interaction Plan

This document describes:

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Speaking with the Remote Operator

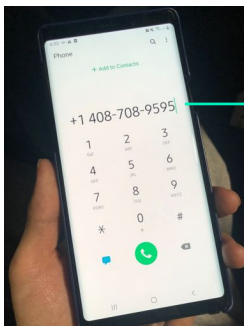
Welcome to AutoX's autonomous vehicle. For more assistance, please call AutoX at: **(408) 708-9595**



This driverless test vehicle is continuously monitored and can be remotely controlled by an AutoX remote operator.

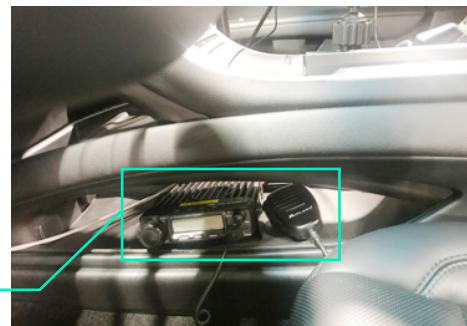
We provide three ways for you to contact our remote operators:

- a. You may directly **call the number (408) 708-9595** using any phone to reach AutoX's fleet management and control center
- b. There is an on-board **two-way radio (walkie-talkie)** located under the middle cup holder between the driver's seat and the front passenger seat.



**a. call the
number (408) 708-9595**

**b. two-way radio
(walkie-talkie)**



c. Two **touch-screen Human-machine Interface (HMI) consoles** are installed on the backs of the driver's seat and of the front passenger seat. These consoles provide the user interface for the passenger(s) sitting at the back of the vehicle with basic information display and passenger support functionalities. Through the console interfaces, a bi-directional audio-visual communication link can be established between the human remote operator and the console user(s).



c. touch-screen Human-machine Interface (HMI) console

2

Gaining Access to the Car

AutoX provides two ways for law enforcement officers and other first responders to gain access to the AutoX driverless test vehicle:

- a.** the vehicle doors always remain unlocked during unmanned tests, so they can be opened by law enforcement or first responders at any time.
- b.** breaking any window will grant access to the interior of the vehicle.



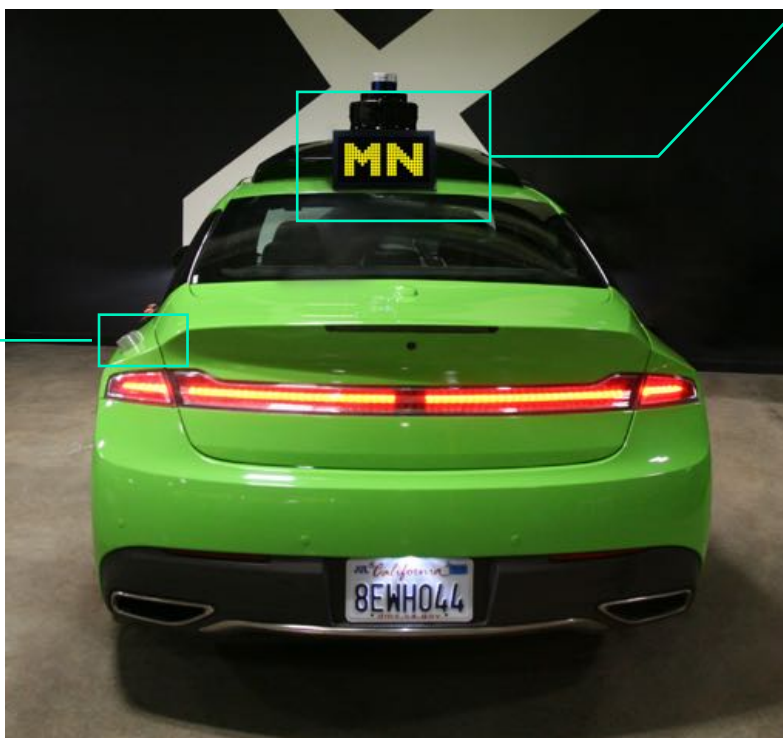
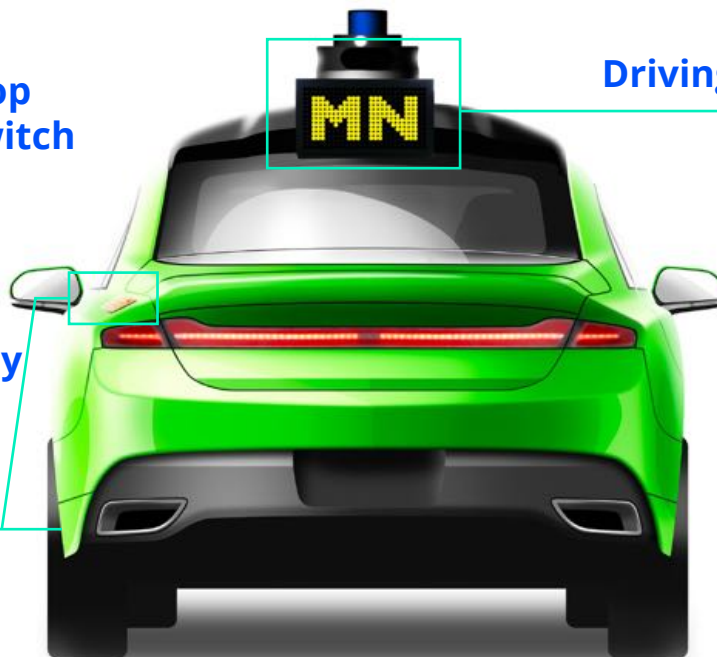
Directly pull the handle to open the door

3

Identifying if the Vehicle is Being Controlled by the Self-driving System or a Remote Control Operator

Emergency stop button and switch to disable Drive-by-Wire, turning the switch to OFF will disable any non-manual control of the vehicle

Driving status display

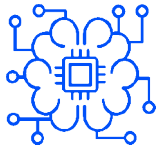


There are three possible drive modes of the AutoX driverless test vehicle:



Manual mode: the vehicle is controlled by a human driver in the vehicle

In this mode, **the vehicle can only be driven by a human physically operating the controls**



Auto-drive: the vehicle is controlled by the self-driving system



Remote control: the vehicle is remotely controlled by human operators

In these modes, the drive-by-wire (DBW) system is active and the vehicle **may move without a driver inside.**

There are two ways to identify the drive mode of the vehicle:

- a. There is a **non-illuminating** display at the top of the rear windshield of the vehicle displaying the drive mode. The non-illuminating display is designed to be visible even under very dim light conditions.
- b. If you contact the AutoX remote operator, the operator is able to tell you the drive mode.

Current drive mode indicated by an alphabetical abbreviation



If the status display shows all black or all yellow, then the display is in a dysfunctional status. Contact AutoX immediately and **DO NOT** stand close to the vehicle until ensuring the vehicle is disengaged from non-manual drive modes (see Section 9 for details).



The display is dysfunctional if the screen shows all black or all yellow.

Drive Mode Indication



Manual: If the drive mode indicator says “**MN**”, it means the vehicle is in the **MANUAL** mode and the DBW (drive-by-wire) system is disengaged. **The vehicle is NOT controlled by the autonomous driving software NOR by a remote operator.**



Auto: If the drive mode indicator says “**AT**”, it means the vehicle is in the **AUTO** mode and is being controlled by the autonomous software installed in the vehicle’s on-board computers. **The vehicle is expected to move without a driver inside.**



Remote: If the “**TO**” indicator is on, it means that **the vehicle is in the TELEOPERATION mode and is being controlled by remote operator(s).**

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Obtaining Owner Information, Vehicle Registration, Proof of Insurance

There are two physical copies of the vehicle owner information, vehicle registration, and proof of insurance. They are:

- a. attached to the **sun visor** in front of the driver seat;
- b. attached to the **sun visor** in front of the front passenger seat.

a. in-vehicle documents attached to the sun visor in front of the driver seat



b. in-vehicle documents attached to the sun visor in front of the front passenger seat



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Pulling Over a Moving Vehicle

The AutoX driverless test vehicle is capable of detecting and recognizing both the visual and audio characteristics of police or emergency vehicles and their siren sounds. The AutoX vehicle is designed to yield as appropriate to the emergency vehicles no matter which direction they are headed. Police officers can pull over a moving AutoX driverless test vehicle as do any other ordinary vehicles regardless of the test vehicle's drive modes. If an AutoX driverless test vehicle detects a police or emergency vehicle is behind it and flashing its lights and/or sounding sirens, the AutoX vehicle is designed to pull over and stop at the next closest parking lot, which is always located within a maximum of 600 feet from any point inside the test ODD (See Section 10).



AutoX driverless test vehicle is capable of detecting police and emergency vehicles and performing an automatic pull over.



The on-board microphone is capable of detecting and recognizing the siren sounds of emergency vehicles.

In addition to autonomous capabilities, AutoX's fleet management and control team is always remotely monitoring any moving driverless test vehicle on the road. The remote monitoring team will act as a backup mechanism to ensure a police pull-over instruction always receives a swift response from the driverless test vehicle.

In the event of a police pull-over, the AutoX on-site support team can reach the scene almost immediately to provide on-scene support, as needed, to law enforcement officers or passengers. The AutoX on-site support team sit on-board a support vehicle that follows the test vehicle continuously during testing (See Section 11).

6

Removing the Vehicle

If you need to remove this vehicle from the scene of an accident, or for any other reason:

This driverless test vehicle is a stock Lincoln MKZ Hybrid with an autonomous driving system installed. You are able to safely move the vehicle through the following methods:

a. If the vehicle is in **Manual mode**, you can drive the vehicle as you would any other. If the vehicle is in **Auto** or **Teleoperation** mode, the vehicle can be manually taken over by

- i.** pressing the brake pedal; or
- ii.** turning the steering wheel for at least one half revolution.

When you conduct a manual takeover, a warning tone will be played saying “manual”;

b. The car can also be moved by using a push bar or by towing it, if necessary.



i. brake takeover: press the brake pedal



ii. steering takeover: turn the steering wheel for at least one half revolution

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Electronic Shift Control, Engine Shut Off, and Opening the Trunk

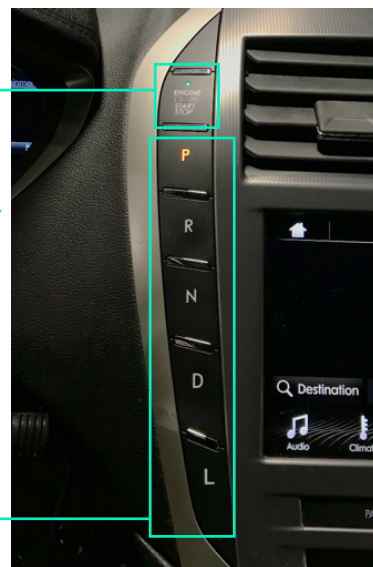
In Manual mode, to shut off the engine, or to shift the car into Park:

Use the electronic shift control panel on the right of the steering wheel to do so. The electronic shift control panel **CANNOT** be manually controlled unless the vehicle is in **Manual mode**. Conduct a manual takeover first (see Section 6).

- a. use the **engine power button** to turn on/off engine;
- b. use the **transmission shift buttons** to shift the transmission into P (Park);

a. engine power button

b. transmission shift buttons with current status indicated with orange LED



To access the rear trunk:

The rear trunk can be accessed in two ways:

- a. pressing the **exterior trunk button**;
- b. pressing the **internal trunk button** to the left of the steering wheel;



a. exterior trunk button



a. internal trunk button

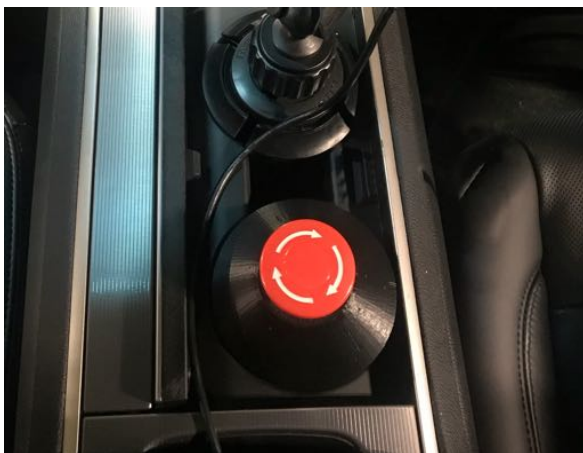
8

Conducting a Forced Drive-by-wire Disengagement

If you are not sure if the vehicle is disengaged from the Auto mode or the Remote control mode, you can conduct a forced drive-by-wire disengagement.

The **drive-by-wire** system is the lowest-level controller used by any computer program, including the self-driving system and the remote control system, to control the vehicle. Conducting a drive-by-wire disengagement will prevent any non-manual control of the vehicle. AutoX provides two ways to do so:

- a. press the emergency disengage button inside the vehicle. This is a **big red button in the cup holder between the driver seat and the front passenger seat**;
- b. press the **red emergency button on the exterior of the vehicle, on the left rear quarter panel**. The vehicle will come to a full stop if it was previously moving, and will set the transmission to park. Then, there is a switch beside the red exterior emergency button, which is the circuit breaker - turning this will cut the power supply to the drive-by-wire system (DBW), and the car will switch into Manual mode. **Please only use the circuit breaker when the vehicle is at a full stop and there is no driver in the vehicle.**



a. emergency button inside the vehicle



b. exterior emergency button and circuit breaker panel

To use the exterior emergency button and the drive-by-wire switch:



Press the red emergency button, and the vehicle will come to a full stop if it was previously moving, and will shift the transmission to park.



To press the button, flip up the plastic cover.



You will see the transmission status panel shows "P", and the status display shows "MN".



Press the button with the other hand.



The switch allows users to cut power to the drive-by-wire system. The switch is currently at "ON" status.



Turn the switch clockwise to "OFF" status.



The switch is now at "OFF" status. The vehicle can NO LONGER move by itself.

Ensuring the Vehicle will not Self Drive



Please note: the vehicle may move under any drive mode or shift status, please use standard precautionary measures such as wheel chocks in addition to exercising the procedures below.

I. Ensure and verify that the vehicle is disengaged from the Autonomous driving mode

The vehicle is disengaged from Autonomous driving mode and will not drive without a human driver physically controlling it in the driver's seat while any of the following are true:

- Any door is open
- Any airbags are deployed
- The Parking Brake is applied

Disengagement from the Autonomous driving mode can be verified by manually pressing the electronic shift control buttons. If the electronic shift control buttons respond to manual inputs, then the vehicle is in Manual mode and will not self drive.



The vehicle will not self drive if the electronic shift control buttons are responding to manual input

II. Ensure and verify that the vehicle's capability to self-drive is removed

The vehicle has lost its ability to be driven by a software system, either autonomously or remotely by a human, if its drive-by-wire system is disconnected. This can be achieved and verified by having the drive-by-wire disengagement switch pointed to the "OFF" position. The switch is located at the rear left side of the vehicle (see Section 8).



The vehicle's drive-by-wire system is disconnected when this switch is at the "OFF" position.

By switching this switch to the "OFF" position, first responders can ensure the vehicle is physically disconnected from any software and hardware systems that can automatically control the vehicle. The vehicle now functions as an ordinary vehicle that can only be driven manually by a human driver sitting in the driver's seat.

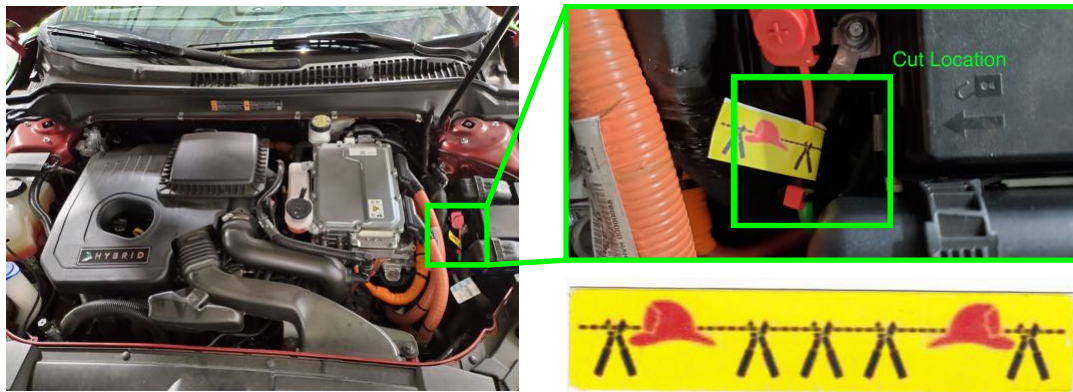
III. Ensure and verify that the base vehicle is disabled

The vehicle contains one 12-volt and one 300-volt high voltage (HV) power source. Disconnecting either or both of the power source will disable the high-voltage power system and the base vehicle.

- Cutting the 12 V Cut Loop

Cutting the 12 V Cut Loop will disable the HV battery and shut down the base vehicle. To achieve this:

1. Open hood. Hood latch release is located to the left of the steering wheel at the base of the lower dash panel.
2. Cut and remove a segment of the 12 V positive power supply cable. This cable is marked with a label designating the cut locations. Make a cut at each side of the cable label and remove the segment.
3. Protect the cut ends from arcing against metal parts.



Cut location of 12 V Cut Loop. Look for the yellow strip that marks the cut location.

If hood access is blocked for any reason:



Alternative cut location to disable the base vehicle when hood access is blocked. Look for the yellow strip that marks the cut location.

- Removing the high voltage Service Disconnect

Removing the high voltage Service Disconnect will disable HV output from the HV battery system. The detailed instructions for removing the Service Disconnect are found on [Page 30](#).

The operational design domain (ODD) is a closed set of conditions under which AutoX driverless vehicle(s)¹ will safely operate. AutoX will not perform any testing tasks with our driverless vehicle(s) if any of the conditions listed below are not fulfilled during tests. AutoX driverless vehicle(s) meet the standards of a Level-4 automated driving system² according to SAE International's definition. The software and hardware systems that the AutoX driverless vehicle(s) carry on board, as well as related systems installed in the AutoX fleet management and control center³ (FMC), are designed to perform non-static driving tasks in the predefined operational design domain.

Non-static driving tasks are those that allow the dynamic assignments and modifications of driving behavior, including but not limited to destination rerouting, dynamic pull over and others. However, any and all driving assignments assigned to AutoX driverless vehicle(s) have to fall within the predefined operational design domain described in this section.

1. Geographic Area

AutoX plans to conduct driverless vehicle tests on a set of pre-selected roads within the city of San Jose, CA. A detailed map and a list of open public roads in the test area will be sent to the local authorities before a driverless vehicle test. **See detailed descriptions of the testing area below.**

2. Road Types

AutoX driverless vehicle(s) will only be tested on certain types of roads, including public roads (as defined on Vehicle Code section 360), streets (as defined in Vehicle Code section 590), and off street public parking facilities (as defined in Vehicle Code section 4000).

¹**AutoX driverless vehicle(s).** The vehicle(s) in the AutoX's driverless test fleet that are listed in the application form.

²**Level 4 automated driving system.** Standard J3016_201806 (https://www.sae.org/standards/content/j3016_201806/)

³**AutoX fleet management and control center.** The vehicle remote operation and monitoring center located in the AutoX headquarters (Address: 441 W Trimble Road, San Jose, CA 95131), which is designed to fulfill the communication link maintaining and the fleet monitoring requirements during the driverless vehicle(s) test.

3. Speed Range

AutoX test vehicles will adhere to posted speed limits and will not exceed 50 mph at any time, whichever is lower.

4. Weather Condition

AutoX will conduct driverless vehicle tests under the mild and clear local weather conditions described below. Weather conditions will be evaluated based on the 7-day forecast by the National Weather Service. If weather conditions change during a test, and no longer adhere to the operational design domain, AutoX will pause or cancel the planned test until the ODD conditions are met. The driverless vehicle will pull over and come to a safe stop, either by its self-driving system or under the control of a remote operator. Specifically, AutoX will only conduct driverless vehicle tests under the following mild and clear local weather conditions:

Visibility: greater than 4.50 miles;

Wind Speed: less than 20 MPH;

Precipitation: less than 1 inch (daily rate of rainfall).

5. Time of the Day

AutoX may conduct driverless vehicle test at any time of a day.

6. Types of Passengers

AutoX will conduct driverless vehicle tests with or without passenger(s) (a passenger is an occupant of a vehicle who has no role in the operation of that vehicle when the autonomous technology is engaged).

7. Other Conditions

The AutoX driverless test vehicle must be within 15 meters of an AutoX test vehicle. The cellular and radio signal coverage in the test area must be sufficiently strong to allow the normal functioning of relevant communication and remote systems.

Where Will the Car Be Seen?

AutoX driverless vehicles will be seen in a clearly defined area in **San Jose, CA**. This area contains some area of **zip code 95131**, and a small part of **zip code 95134**. AutoX

will conduct driverless vehicle tests on a set of selected public roads⁴ and off-street public parking facilities⁵ in the described area.

Road Name	Segment Description
N. 1st St.	Segment between W. Plumeria Dr. and W. Trimble Road
W. Trimble Rd.	Segment between N. 1st St. and Orchard Pkwy.
Orchard Pkwy.	Segment between W. Trimble Rd. and W. Plumeria Dr.
W. Plumeria Dr.	Segment between Orchard Pkwy. and N. 1st St.

⁴**Public road.** Public road is defined in Vehicle Code section 360.

⁵**Off-street public parking facilities.** Off-street public parking facility is defined in Vehicle Code section 4000.



Fig. 1 AutoX driverless vehicle test area (listed public roads are marked in red; unlisted off-street parking facilities are marked in blue)



AutoX support vehicle



AutoX driverless test vehicle

During AutoX driverless vehicle tests, a manually-driven support vehicle will follow the AutoX driverless test vehicle. The support team in the support vehicle will be ready to provide immediate on-site support to law enforcement personnel and other road users when such support is needed.

The AutoX support team on-board the support vehicle consists of **one engineer** and **one safety driver**.

Expected behaviors of the support vehicle

During tests, the support vehicle is expected to closely follow the test vehicle (within 15 meters). The support vehicle will try to keep the test vehicle in sight, while ensuring the safety of other road users and the support vehicle itself. If the tracing vehicle loses sight of the test vehicle (which may be caused by another vehicle or a yellow light at an intersection) for a predefined amount of time, the test vehicle's Minimal Risks Maneuvering (MRM) process will be triggered. The MRM task will re-route the test vehicle to the nearest parking facility (marked in blue on the map in the previous page) if the support vehicle cannot effectively monitor the test vehicle, or assure that the AutoX support team is able to reach the test vehicle within one minute at all times.

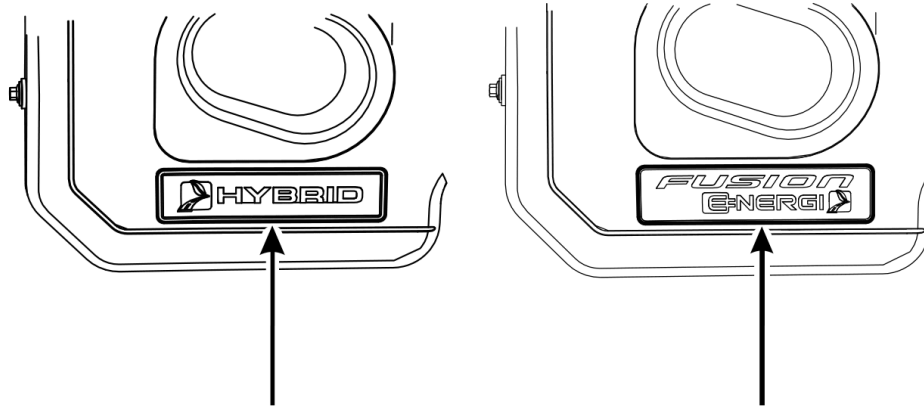
1. The AutoX driverless test vehicle is being monitored by both a support vehicle and the FMC at all times during tests.
2. If a collision occurs or is imminent, the test will terminate immediately and the Minimal Risks Maneuvering (MRM) process will be triggered. Multiple triggering methods are available to initiate the MRM process, including the A.I. system itself, the support vehicle, or the human remote operator. The MRM process will lead the vehicle to a full stop at the next nearest safe parking location. After the vehicle is stopped, a human operator can manually take control of the vehicle.
3. The AutoX support team on-board the support vehicle nearby will make an initial assessment of any out of the ordinary circumstances, and call 911 if there is an accident involving other road users or damage to public properties.
4. The AutoX support team will ensure the vehicle is stopped and disengaged to prevent further accidents, and will check every person involved for injuries and provide assistance if able.
5. The AutoX support team will provide assistance to law enforcement and other relevant road users in operating or interacting with the test vehicle.
6. At the same time, the remote operators will also assess the condition of the test vehicle based on the data sent by the health monitoring module of AutoX autonomous driving software.
7. If it is necessary (e.g. manual take-over is not the preferred option) and feasible (e.g. remote control system still works) to move the vehicle to certain designated locations, the remote operator can also perform the task via remote control.
8. The AutoX fleet management team will arrive at the scene of an incident as quickly as possible to provide any necessary on-site support to law enforcement.



Appendix: 2018 FUSION HYBRID, MKZ HYBRID, FUSION ENERGI - EMERGENCY RESPONSE GUIDE

Hybrid Vehicle Identification

- The Fusion Hybrid and MKZ Hybrid vehicles have a unique engine appearance cover with a raised “HYBRID” (or “HYBRID ENERGI” for Energi vehicles) icon.



Unique Hybrid engine appearance cover
with raised lettering and icon

NOTE: Fusion/MKX Hybrid shown, Fusion Energi similar.

- The 5th, 6th and 7th digits of the Vehicle Identification Number (VIN) identify the Hybrid vehicle line.

VIN POSITIONS 5, 6 and 7	VEHICLE
P0L	Fusion SE Full Hybrid
L2L	MKZ Hybrid Full Hybrid
P0P	Fusion SE Energi Plug-in Hybrid
P0R	Fusion Titanium Full Hybrid
P0S	Fusion Titanium Energi Plug In Hybrid

SAMPLE VIN

3FAD P0L30AR100001



Fusion Hybrid FWD

High-voltage Electrical Disconnect Features

HIGH-VOLTAGE ELECTRICAL DISCONNECT FEATURES



WARNING: ELECTRIC VEHICLES DAMAGED BY A CRASH MAY HAVE COMPROMISED HIGH-VOLTAGE SAFETY SYSTEMS AND PRESENT A POTENTIAL HIGH-VOLTAGE ELECTRICAL SHOCK HAZARD. EXERCISE CAUTION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) SAFETY GEAR, INCLUDING HIGH-VOLTAGE SAFETY GLOVES AND BOOTS. REMOVE ALL METALLIC JEWELRY, INCLUDING WATCHES AND RINGS. ISOLATE THE HV SYSTEM AS DIRECTED BY THE FORD EMERGENCY RESPONSE GUIDE FOR THE VEHICLE. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

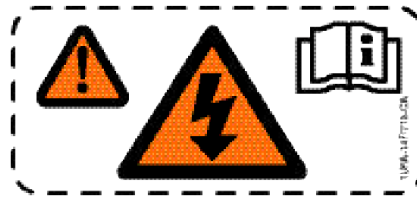
The following list describes certain features that have been incorporated into the Fusion Hybrid, MKZ Hybrid and Fusion Energi vehicles that allow for either simple or automatic shut off of the high-voltage electrical systems.

- High-Voltage Fuse — In the event of a high-voltage short circuit, the high-voltage fuse will open, disabling the high-voltage system.
- High-Voltage Interlock Circuit — Whenever a high-voltage connector is disconnected, the high-voltage interlock circuit opens and disables the high-voltage system.
- Ignition Key in the OFF Position — Any time the 12-volt system is turned off (ignition lock cylinder is in the OFF position), the high-voltage system is disabled.
- High-Voltage Service Disconnect — Whenever the high-voltage service disconnect (located behind the rear seat back) is removed, the high-voltage system is disabled. For additional information, refer to Page 10 in this manual.
- Thermal Sensors — In the event the battery is exposed to extreme hot ambient conditions and/or is being driven extremely aggressively with compromised cooling, power limits will be employed to prevent overheating. However, if the battery is in use and does become too hot, contactors will be opened and the vehicle will shut down. In some instances, if the ignition key is left in the “ON” position, this could cause the high-voltage battery temperature to exceed 60°C (140°F); if this temperature is reached, the thermal sensors located near the high-voltage battery will automatically disable the high-voltage battery.

High-voltage Warning Decals

HIGH-VOLTAGE WARNING DECALS

- On Hybrid and Energi vehicles, WARNING decals are located on components in the high-voltage system throughout the vehicle. Please see example below.



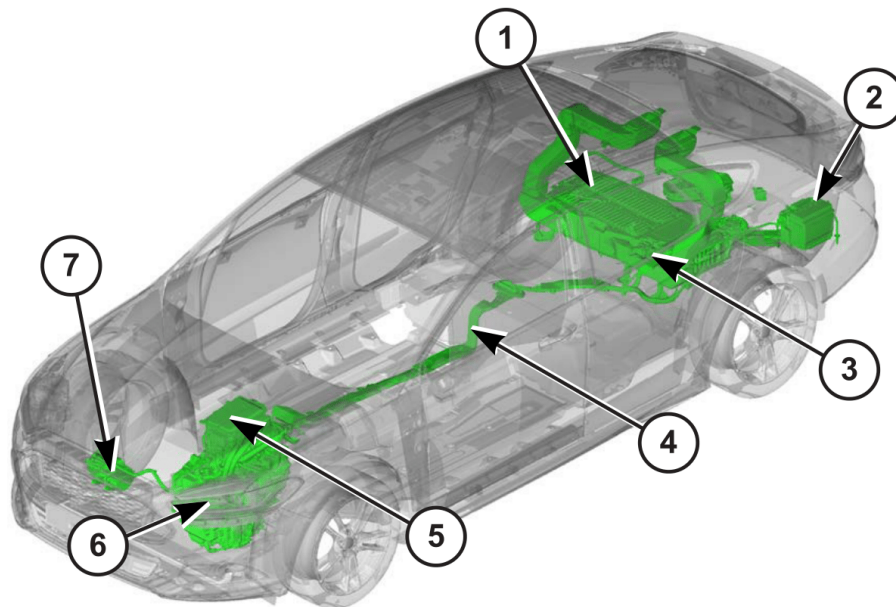
Hybrid Component Location and Identification

HYBRID COMPONENT LOCATION AND IDENTIFICATION

The illustration below and its defining chart on Page 9, provide the location, description and basic function of the Hybrid system components.

NOTE: All high-voltage wires and harnesses are wrapped in orange-colored insulation.

NOTE: Fusion Hybrid shown, MKZ Hybrid similar.



Hybrid Component Location and Identification

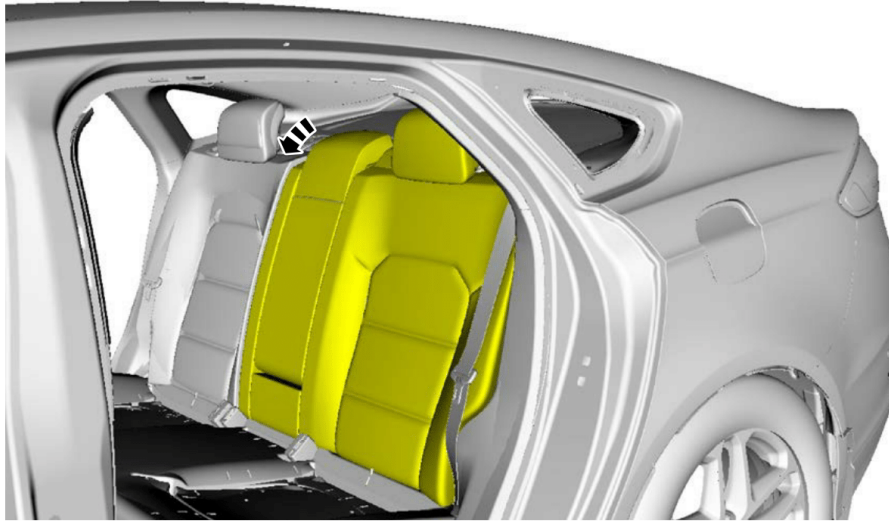
HYBRID COMPONENT LOCATION AND IDENTIFICATION - CONTINUED

	COMPONENT	LOCATION / DESCRIPTION	FUNCTION
1	High-voltage battery approximately 300 Volts DC	Located in the cargo area, behind the rear seat. Sealed lithium battery.	Provides high-voltage storage for the vehicle's electric motor.
2	12-Volt battery	Located in the trunk area. Typical automotive 6-cell lead/acid design.	Provides 12-volts for vehicle accessories.
3	High-voltage service disconnect	Located behind the rear seat backrest. Orange rectangle with a molded plastic handle, about 100 mm (4 in) in length.	Provides means to disconnect the high-voltage battery for safely servicing the vehicle.
4	High-voltage wiring	Runs along the vehicle's floorpan from the high-voltage battery to the Hybrid Powertrain Control Module (HPCM). The electric A/C compressor connects directly to the HPCM. Separate connections from the HPCM are made to the Electronically Controlled Continuously Variable Transaxle (ECVT).	Provides the physical connection between the high-voltage battery and the vehicle's high-voltage equipment.
5	Transmission Control Module	Located above the transmission. Contains controlling electronics for managing propulsion.	Provides rotational force during Electrical Drive Modes. Generates 3-phase AC high-voltage electricity via two cables to and from the traction motor and generator.
6	Electronically Controlled Continuously Variable Transaxle (ECVT)	Transverse-mounted design, similar to the non-Hybrid Fusion MKZ vehicles.	Provides rotational force to the wheels for vehicle propulsion and transmits rotational force to the engine's generator to recharge batteries.
7	Electric A/C Compressor	Located in front of the engine. Has an orange high-voltage wire attached to it using an interlock connector.	Provides electric A/C operation; replaces the belt driven A/C compressor.

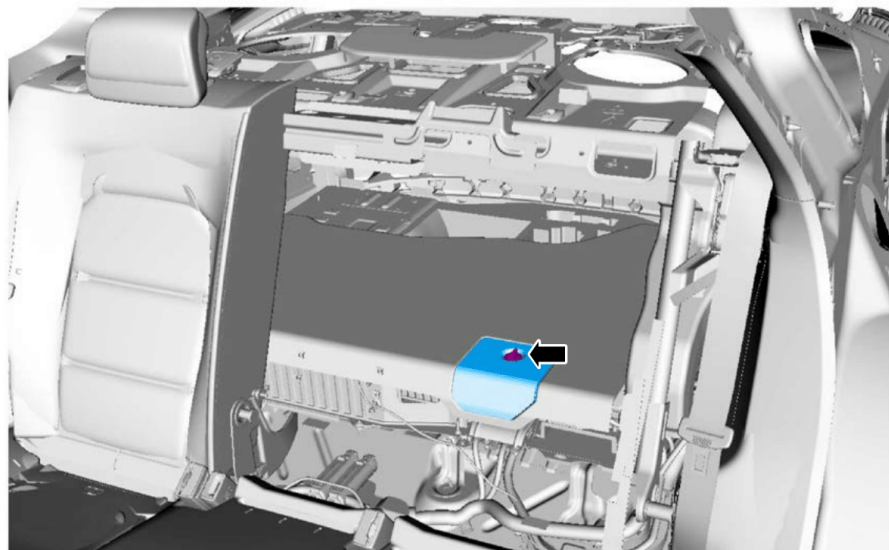
High-voltage Service Disconnect

HIGH-VOLTAGE SERVICE DISCONNECT - FUSION/MKZ HYBRID

1. Position the LH rear seat backrest down.



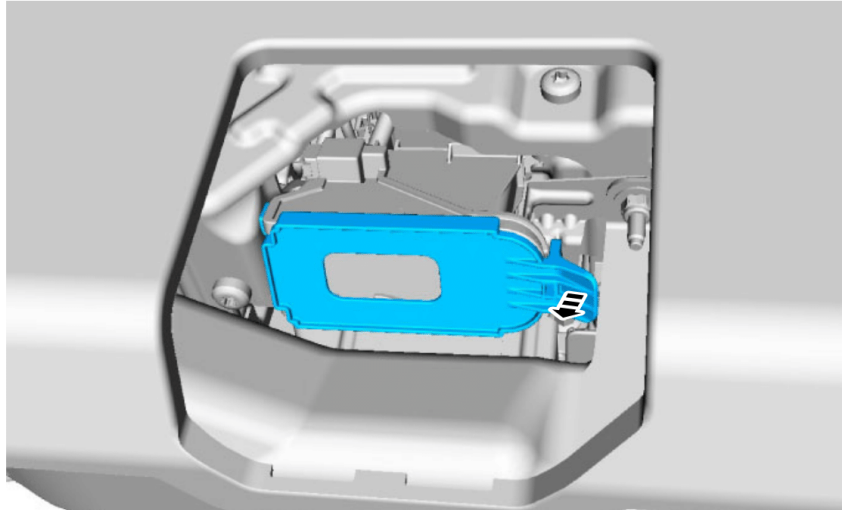
2. Remove the high-voltage battery service disconnect cover.



High-voltage Service Disconnect

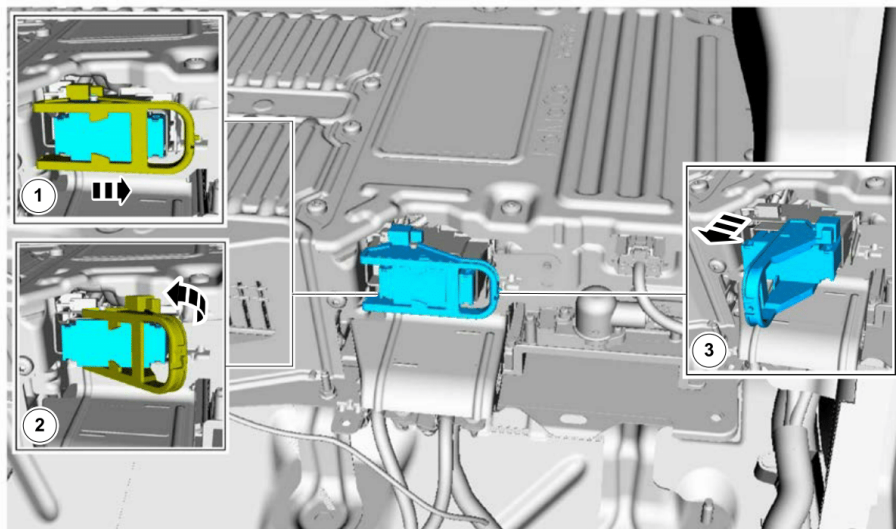
HIGH-VOLTAGE SERVICE DISCONNECT (CONTINUED) - FUSION/MKZ HYBRID

3. Pull to remove the high-voltage battery service disconnect interlock cover.



4. Remove the high-voltage service disconnect:

1. Pull the Lever Position Assurance (LPA) tab toward the front of vehicle to remove.
2. Pull the lever handle outward to disengage the interlock.
3. Rotate the lever to horizontal and remove the battery high-voltage service disconnect.



High-voltage Service Disconnect

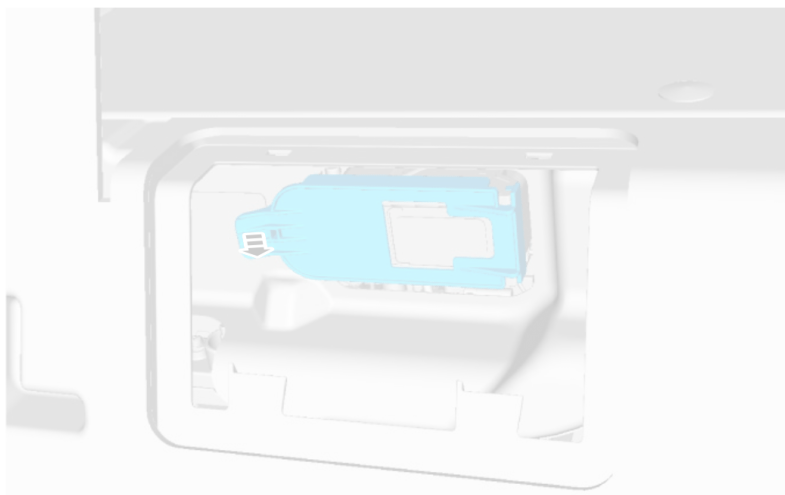
⚠ WARNING: THE HIGH-VOLTAGE SYSTEM MAY RETAIN A DANGEROUS LEVEL OF VOLTAGE FOR A SHORT TIME AFTER THE SERVICE DISCONNECT HAS BEEN REMOVED. WAIT 5 MINUTES FOR THE VOLTAGE TO DISSIPATE BEFORE BEGINNING SERVICE. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

HIGH-VOLTAGE SERVICE DISCONNECT - FUSION ENERGY

1. Position the rear seat backrest down and remove the high-voltage battery service disconnect cover.



2. Pull to remove the high-voltage battery service disconnect interlock cover.



High-voltage Battery Pack

3. Remove the high-voltage service disconnect:

1. Pull the Lever Position Assurance (LPA) tab toward the front of vehicle to remove.
2. Pull the lever handle outward to disengage the interlock.
3. Rotate the lever to horizontal and remove the battery high-voltage service disconnect.



WARNING: THE HIGH-VOLTAGE SYSTEM MAY RETAIN A DANGEROUS LEVEL OF VOLTAGE FOR A SHORT TIME AFTER THE SERVICE DISCONNECT HAS BEEN REMOVED. WAIT 5 MINUTES FOR THE VOLTAGE TO DISSIPATE BEFORE BEGINNING SERVICE. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

HIGH-VOLTAGE BATTERY PACK

WARNING: ELECTRIC VEHICLES DAMAGED BY A CRASH MAY HAVE COMPROMISED HIGH-VOLTAGE SAFETY SYSTEMS AND PRESENT A POTENTIAL HIGH-VOLTAGE ELECTRICAL SHOCK HAZARD. EXERCISE CAUTION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) SAFETY GEAR, INCLUDING HIGH-VOLTAGE SAFETY GLOVES AND BOOTS. REMOVE ALL METALLIC JEWELRY, INCLUDING WATCHES AND RINGS. ISOLATE THE HV SYSTEM AS DIRECTED BY THE FORD EMERGENCY RESPONSE GUIDE FOR THE VEHICLE. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

High-voltage Battery Pack

HIGH-VOLTAGE BATTERY PACK - CONTINUED



WARNING: FIRES IN CRASH-DAMAGED ELECTRIC VEHICLES MAY EMIT TOXIC OR COMBUSTIBLE GASSES. SMALL AMOUNTS OF EYE, SKIN OR LUNG IRRITANTS MAY BE PRESENT. WEAR PERSONAL PROTECTIVE EQUIPMENT (PPE) AND SELF-CONTAINED BREATHING APPARATUS WHEN WORKING IN CLOSE PROXIMITY OR IN A CONFINED AREA, SUCH AS A TUNNEL OR GARAGE. VENTILATE THE VEHICLE INTERIOR BY OPENING VEHICLE WINDOWS OR DOORS. VENTILATE THE WORKING AREA. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.


- Do not cut the high-voltage battery case. Do not penetrate the batteries or case in any way.
- The high-voltage battery is located in the forward portion of the luggage compartment. The high-voltage battery lies flat just behind the rear seat back under the luggage compartment cargo cover.
- Removing the high-voltage service disconnect will disconnect the high-voltage from the vehicle. The battery pack will remain live and dangerous.
- The total voltage of the battery pack is approximately 300-volts DC.
- The battery cells contain a base electrolyte, consisting of lithium hexafluorophosphate and organic solvents as the dominant active ingredient, that is absorbed in special polymeric film. The electrolyte will not leak from the battery under most conditions, however, if the battery is crushed, it is possible for a small amount of electrolyte to leak.


NOTICE: The following must be followed when working with a damaged battery:

- If possible, isolate and avoid contact with high-voltage vehicle components. If contact with the high-voltage system cannot be avoided, Personal Protective Equipment (PPE) such as a splash shield or safety goggles, gloves (latex, rubber or Nitrile), an apron or overcoat and rubber boots are required when handling damaged batteries. Exposure to electrolyte could cause skin and/or eye irritation/burns. If exposed, rinse with large amounts of water for 10-15 minutes.
- If the battery is exposed to intense heat (or other abusive conditions), it is possible that flammable gases and liquid (electrolyte) have been released from the cells. The gases include combustible hydrocarbons such as methane, toxic gases such as carbon monoxide, and very small amounts of eye/skin/lung irritants such as hydrofluoric acid could be released from the battery. Appropriate precautions should be taken to make sure the area is properly ventilated, such as opening the vehicle's windows or doors. First responders should wear Personal Protective Equipment (PPE) and self contained breathing apparatus to safeguard against thermal, electrical, respiratory and skin/eye hazards.

Approaching a Damaged High-voltage Vehicle

APPROACHING A DAMAGED HIGH-VOLTAGE VEHICLE

 **WARNING:** ELECTRIC VEHICLES DAMAGED BY A CRASH MAY HAVE COMPROMISED HIGH-VOLTAGE SAFETY SYSTEMS AND PRESENT A POTENTIAL HIGH-VOLTAGE ELECTRICAL SHOCK HAZARD. EXERCISE CAUTION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) SAFETY GEAR, INCLUDING HIGH-VOLTAGE SAFETY GLOVES AND BOOTS. REMOVE ALL METALLIC JEWELRY, INCLUDING WATCHES AND RINGS. ISOLATE THE HV SYSTEM AS DIRECTED BY THE FORD EMERGENCY RESPONSE GUIDE FOR THE VEHICLE. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

 **WARNING:** DAMAGED ELECTRIC VEHICLES SUBMERGED IN WATER PRESENT A POTENTIAL HIGH-VOLTAGE ELECTRICAL SHOCK HAZARD. EXERCISE CAUTION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) SAFETY GEAR, INCLUDING HIGH-VOLTAGE SAFETY GLOVES AND BOOTS. REMOVE ALL METALLIC JEWELRY, INCLUDING WATCHES AND RINGS. DO NOT ATTEMPT TO EXTRACT THE VEHICLE UNTIL THE HIGH-VOLTAGE BATTERY HAS DISCHARGED INDICATED BY THE ABSENCE OF BUBBLING OR FIZZING. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

1. FOLLOW EXISTING TRAINING AND INCIDENT COMMANDER DIRECTION

- Emergency responders should use **LARGE** amounts of water if fire is present or suspected and, keeping in mind that fire can occur for a considerable period after the crash, should proceed accordingly.
- This guide provides only supplemental information as it pertains to the Fusion Hybrid, MKZ Hybrid and Fusion Energi vehicles. The same rules apply when approaching any potential high-voltage situation. Always follow your high-voltage safety training. Some precautions to take in a high-voltage situation include:
 - Remove all jewelry: Watches, necklaces and earrings. Remove any metal objects that are conductors of electricity.
 - Wear the necessary PPEs: High-voltage rubber gloves, face shield, insulated boots, protective raincoat and apron.
- Bring the following equipment:
 - Class ABC powder-type fire extinguisher.
 - A nonconductive object, about 1.5 m (5 ft) long. This can be used to safely push someone away from the vehicle if they accidentally come in contact with high-voltage.

Approaching a Damaged High-voltage Vehicle

APPROACHING A DAMAGED HIGH-VOLTAGE VEHICLE - CONTINUED

2. APPROACHING A DAMAGED VEHICLE

- Disable the high-voltage electrical system using as many of the following steps as possible:
 - Secure the vehicle: Place the shift lever into the PARK position. Place the ignition in the OFF position. For vehicles equipped with push button start, check that the vehicle ready light is OFF to verify the high-voltage system is disconnected. If the vehicle ready light is ON, press the Start button to turn OFF the ignition. Block the wheels, if necessary.
 - Disconnect the negative cable from the 12-volt battery.
 - If possible, remove the high-voltage service disconnect(s). For additional information, refer to page 12 and 13 in this manual. If the service disconnects cannot be removed, avoid the high-voltage system components, and wear all appropriate PPE as outlined on page 14 of this guide.
- If the vehicle is on fire, use a Class ABC powder-type extinguisher to contain and smother the flames. If water is being used, **LARGE** amounts of water will be required to extinguish the flames. A fire-hydrant or dedicated fire hose can supply the needed amount. Water can cause some degree of arcing/shorting across the cell and/or battery terminals; it can also react with the electrolyte from the cells to generate additional combustible gas and other by-products such as hydrofluoric acid; however, the cooling and smothering effects of flushing the affected article with large amounts of water and/or other fire suppression material is still beneficial for minimizing the severity of the event.
- If the vehicle has any exposed cables, make sure to wear high-voltage rubber gloves and other appropriate PPE. Do not touch any broken or damaged high-voltage orange cables. Treat severed cables as if they contain high-voltage.
- If the vehicle is submerged in water, varying degrees of arcing/shorting within the battery will take place. Do not touch any high-voltage components or orange cables while extricating the occupant(s). Do not remove the vehicle until you are sure the high-voltage battery is completely discharged. A submerged high-voltage battery may produce a fizzing or bubbling reaction to the water. If fizzing or bubbling is observed, the high-voltage battery will be discharged when the fizzing or bubbling has completely stopped, however, still treat it as if it was not discharged.

Approaching a Damaged High-voltage Vehicle

APPROACHING A DAMAGED VEHICLE - CONTINUED

- If the vehicle is on fire, use a Class ABC powder-type extinguisher to contain and smother the flames. If water is being used, **LARGE** amounts of water will be required to extinguish the flames. A fire-hydrant or dedicated fire hose can supply the needed amount.
- If the vehicle has any exposed cables, make sure to wear high-voltage rubber gloves and other protective clothing. Do not touch any broken or damaged high-voltage orange cables. Treat severed cables as if they contain high-voltage.
- If the vehicle is submerged in water, do not touch any high-voltage components or orange cables while extricating the occupant(s). Do not remove the vehicle until you are sure the high-voltage battery is completely discharged. A submerged high-voltage battery may produce a fizzing or bubbling reaction to the water. The high-voltage battery will be discharged when the fizzing or bubbling has completely stopped, however, still treat it as if it was not discharged.

3. IF THE HIGH-VOLTAGE BATTERY CASE HAS BEEN RUPTURED

- Just like any other battery, hose the area down with **LARGE** amounts of water (ie. use a Fire Hose).

4. MOVING DAMAGED VEHICLES — WRECKER DRIVERS

- Rather than attempt to discharge a propulsion battery, an emergency responder, tow truck operator, or storage facility manager should contact experts at the vehicle manufacturer on that subject.
- If possible, remove the high-voltage service disconnect. For additional information, refer to page 12 and 13 in this manual.
- Be alert. There is potential for delayed fire with damaged lithium-ion batteries.
- Call an authorized Ford Dealer or vehicle manufacturer representative, if necessary, to determine additional steps that you should take to safely recover or transport the vehicle.
- Follow the guidelines in the Wrecker Towing Manual.
 - Front Tow: Wheel Lift (FWD)
 - Rear Tow: Wheel Lift with Dolly (FWD)
 - Flatbed: FWD and AWD

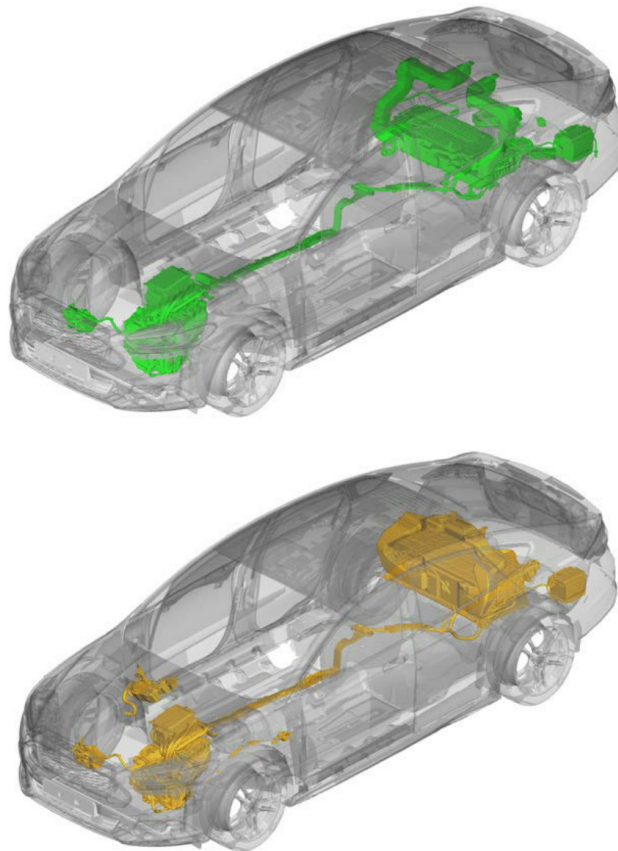
5. SPECIAL NOTE TO SALVAGE YARDS

- If a vehicle with a high-voltage battery is to be scrapped, the high-voltage battery must be disposed of following all local, state/provincial and federal guidelines.
- Operators of tow trucks and vehicle storage facilities should ensure the damaged vehicle is kept in an open area instead of inside a garage or other enclosed building.

Approaching a Damaged High-voltage Vehicle

APPROACHING A DAMAGED HIGH-VOLTAGE VEHICLE - CONTINUED

- If possible, remove the high-voltage battery service disconnect before attempting any extrication procedure. Always assume the high-voltage cabling and components are powered up.
- If occupant extrication is necessary, always use caution when cutting near the vehicle high voltage system components. Do not cut any of the high-voltage under vehicle or under hood cabling (all high-voltage cabling is orange in color). High-voltage cabling runs from the high-voltage batteries under the left hand side of the vehicle to the underhood compartment. Refer to the diagram below for no cut zones.



Towing, Recovery Operations, and Vehicle Storage

DAMAGED VEHICLE GUIDANCE FOR FORD MOTOR COMPANY ELECTRIC AND HYBRID-ELECTRIC VEHICLES EQUIPPED WITH HIGH-VOLTAGE BATTERIES (TOWING, RECOVERY OPERATORS AND VEHICLE STORAGE FACILITIES)

For questions contact Ford USA 1-800-392-3673 / Ford Canada 1-800-565-3673

1. In the event of damage to or fire 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.

2. Vehicle Shutdown and High-Voltage System Disabling

Identify Vehicle

- Determine if the vehicle is an electric or hybrid-electric vehicle, and if it is, advise your dispatch and all other responders that an electric or hybrid-electric vehicle is involved.
- To identify potential symptoms of a damaged high-voltage system, contact an authorized service center or vehicle manufacturer representative. Refer to the Vehicle Owner Manual, Emergency Placard (included in the Vehicle Owner Manual) and/or the Emergency Response Guide for appropriate contact information.
- If you detect leaking fluids, sparks, smoke, flames, increased temperature, gurgling, popping or hissing noises from the HV battery compartment, ventilate the passenger area (i.e., roll down windows or open doors) and call 911.
- Be alert. There is a potential for delayed fire with damaged lithium-ion batteries.

Towing, Recovery Operations, and Vehicle Storage

DAMAGED VEHICLE GUIDANCE FOR FORD MOTOR COMPANY ELECTRIC AND HYBRID-ELECTRIC VEHICLES EQUIPPED WITH HIGH-VOLTAGE BATTERIES (TOWING, RECOVERY OPERATORS AND VEHICLE STORAGE FACILITIES) - CONTINUED

3. Recovering/Transporting Vehicle

- Call an authorized service center or vehicle manufacturer representative, if necessary, to determine additional steps that you should take to safely recover or transport the vehicle.
- Always approach the 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.
- 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.

4. Storing Vehicles

- **For vehicles in the United States, notify Ford Motor Company 1-800-392-3673 (then follow the prompts on the voice response menu) or an authorized Ford Dealer as soon as possible as there may be additional steps necessary to secure, discharge, handle, and/or store the HV battery and vehicle.**
- **For vehicles in Canada, notify Ford Motor Company 1-800-565-3673 (then follow the prompts on the voice response menu), or an authorized Ford dealer as soon as possible. There may be additional steps necessary to secure, discharge, handle and/or store the HV battery and vehicle.**
- Do not store a severely damaged vehicle with a lithium-ion battery inside a structure or within 50 feet of any structure or vehicle.
- 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.

Towing, Recovery Operations, and Vehicle Storage

For specific information and safety preparation regarding the high-voltage system, refer to WWW.MOTORCRAFTSERVICE.COM, select quick guides for the appropriate vehicle emergency response guide.

⚠ WARNING: ELECTRIC VEHICLES DAMAGED BY A CRASH MAY HAVE COMPROMISED HIGH-VOLTAGE SAFETY SYSTEMS AND PRESENT A POTENTIAL HIGH-VOLTAGE ELECTRICAL SHOCK HAZARD. EXERCISE CAUTION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) SAFETY GEAR, INCLUDING HIGH-VOLTAGE SAFETY GLOVES AND BOOTS. REMOVE ALL METALLIC JEWELRY, INCLUDING WATCHES AND RINGS. ISOLATE THE HIGH-VOLTAGE SYSTEM AS DIRECTED BY THE FORD EMERGENCY RESPONSE GUIDE FOR THE VEHICLE. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

⚠ WARNING: DAMAGED ELECTRIC VEHICLES SUBMERGED IN WATER PRESENT A POTENTIAL HIGH VOLTAGE ELECTRICAL SHOCK HAZARD. EXERCISE CAUTION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) SAFETY GEAR, INCLUDING HIGH VOLTAGE SAFETY GLOVES AND BOOTS. REMOVE ALL METALLIC JEWELRY, INCLUDING WATCHES AND RINGS. DO NOT ATTEMPT TO EXTRACT THE VEHICLE UNTIL THE HIGH VOLTAGE BATTERY HAS DISCHARGED INDICATED BY THE ABSENCE OF BUBBLING OR FIZZING. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

⚠ WARNING: FIRES IN CRASH-DAMAGED ELECTRIC VEHICLES MAY EMIT TOXIC OR COMBUSTIBLE GASSES. SMALL AMOUNTS OF EYE, SKIN OR LUNG IRRITANTS MAY BE PRESENT. WEAR PERSONAL PROTECTIVE EQUIPMENT (PPE) AND SELF-CONTAINED BREATHING APPARATUS WHEN WORKING IN CLOSE PROXIMITY OR IN A CONFINED AREA, SUCH AS A TUNNEL OR GARAGE. VENTILATE THE VEHICLE INTERIOR BY OPENING VEHICLE WINDOWS OR DOORS. VENTILATE THE WORKING AREA. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

⚠ WARNING: ELECTRIC VEHICLES WITH DAMAGED HIGH VOLTAGE BATTERIES REQUIRE SPECIAL HANDLING PRECAUTIONS. INSPECT THE VEHICLE CAREFULLY FOR LEAKING BATTERY FLUIDS, SPARKS, FLAMES, AND GURGLING OR BUBBLING SOUNDS. CONTACT EMERGENCY SERVICES IMMEDIATELY IF ANY OF THESE PROBLEMS ARE OBSERVED. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A VEHICLE FIRE AND PERSONAL INJURY OR DEATH.

Towing, Recovery Operations, and Vehicle Storage

DAMAGED BATTERY ELECTRIC VEHICLE STORAGE PLACARD

- If the vehicle and/or battery high voltage system is damaged, place a sign indicating that it is a battery electric vehicle with potentially dangerous high voltage. See example below:

**WARNING:
BATTERY ELECTRIC VEHICLE WITH
POSSIBLE HIGH VOLTAGE SYSTEM
DAMAGE. DO NOT TOUCH!**

**WARNING:
BATTERY ELECTRIC VEHICLE WITH
POSSIBLE HIGH VOLTAGE SYSTEM
DAMAGE. DO NOT TOUCH!**

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