Ford Motor Company

ESCAPE HYBRID

EMERGENCY RESPONSE GUIDE

Version 1.0

FOREWORD

Escape Hybrid emergency response procedures are similar to those for a traditional gasoline powered vehicle with the exception of the high voltage electrical system.

The Escape Hybrid vehicle uses a conventional gasoline engine in addition to an electric motor to power the vehicle. The energy used to power the vehicle comes from gasoline - used in the internal combustion engine and electricity used in the electric motor. The energy used to power the vehicle must be stored:

- Gasoline is stored in a traditional fuel tank – like other vehicles.
- Electricity is stored in a high voltage battery pack

The combination of a gasoline engine and electric drive provides for improved performance (V6 performance with a 4 cylinder engine and electric motor), reduced emissions and most importantly – improved fuel economy. The system is self contained (a generator recharges the battery during braking and cruising) so you never have to plug a hybrid in
to recharge the batteries.

The information in this guide will allow you to respond to Escape Hybrid vehicles as safely as you do with conventional vehicles.

The Escape Hybrid has been designed with many features for your protection. These features should help provide you with safe access to the vehicle under various conditions. However whenever you approach a high voltage vehicle in a Fire, Rescue or Recovery situation, you must always follow one cardinal rule.

ALWAYS ASSUME THE VEHICLE IS POWERED UP

ESCAPE HYBRID VEHICLE IDENTIFICATION

- A unique Hybrid label is located on the lift gate, the front driver's door, and the front passenger's door. This can be used to identify a Escape Hybrid vehicle.

- The Escape Hybrid also has a unique left rear quarter glass that contains the high voltage battery air intake.

Note - Hybrid label on front doors

Note - Unique quarter glass with high voltage battery air intake.

Note – Hybrid label on lift gate

- Hybrid vehicles also have unique underhood appearance. The engine cover has a hybrid label for easy identification.

Note the Hybrid label on the engine cover

- The 5th, 6th, and 7th alphanumeric numbers of the vehicle identification number can identify hybrid vehicles. Hybrid Escapes will have a U95 or U96 in the 5th, 6th, and 7th position of the vehicle identification number.

SAMPLE

1 F M Y U 9 5 H 3 5 K A 0 0 1 4 1

The 5th, 6th, and 7th VIN position will be U95 OR U96 on a hybrid vehicle.

DESIGN FEATURES

The following list indicates some of the features that have been designed to disconnect high voltage in the event of an accident.

- Inertia switches are designed to disconnect high voltage and fuel in the event of an accident. There are two inertia switches - both front and rear. If either switch opens, it disconnects the high voltage and electrical circuit to the gasoline fuel pump.

- The high voltage system is disconnected any time the vehicle ignition key is turned to the off position.

- The high voltage system is disconnected any time the High Voltage Service Disconnect Switch is removed (The High Voltage Service Disconnect Switch is located on the top of the High Voltage Battery - see page 8) .

- The high voltage battery contains a fuse that will open in the event of a high current short circuit.

- If the vehicle ignition key is left on, and the high voltage battery temperature exceeds 140 F, thermal sensors will disconnect the high voltage battery. Note - If the key is off, the high voltage is already disconnected.

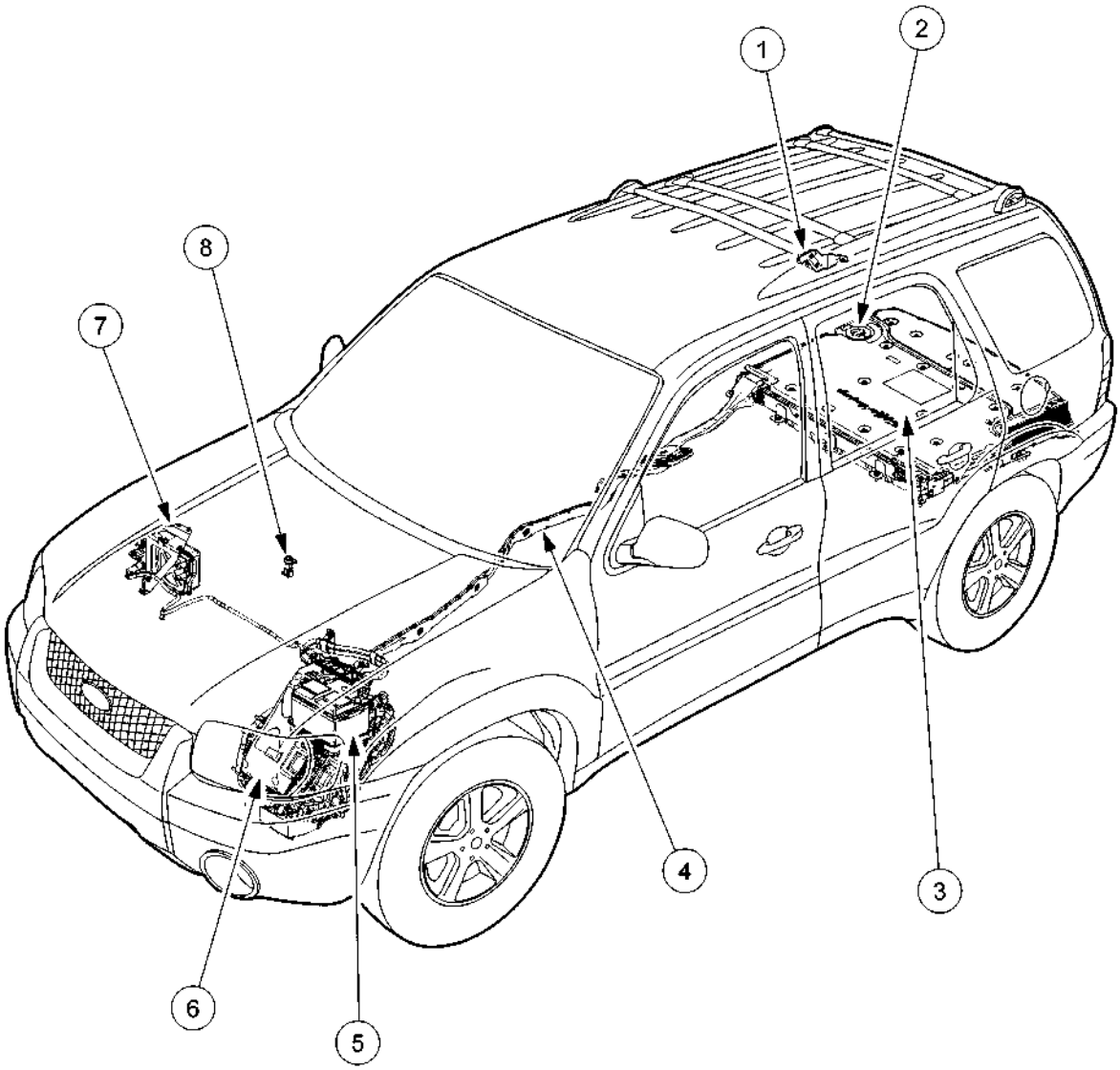
- There is an interlock circuit on all high voltage connectors that disables the high voltage any time a high voltage wiring connector is disconnected.

ESCAPE HYBRID COMPONENTS IDENTIFICATION

Please note the location of the following unique Hybrid components.

	Component	Location	Description
1	Rear Inertia Switch	Passenger side. Behind right rear trim panel	The inertia switch disconnects high voltage and fuel in a collision -see page 8.
2	High Voltage Service Disconnect Switch	The High Voltage Service Disconnect Switch is located on the top, passenger side, of the high voltage battery. It has a molded plastic handle that is safety orange in color for easy identification. The high voltage battery is located below the floor carpet in the rear of the vehicle.	Provides high voltage battery disconnect for service. It has a molded plastic handle that is safety orange in color for easy identification,
3	High Voltage Battery (300+ volts)	Rear of vehicle – below carpet	Sealed Nickel-Metal Hydride – 300 + volts.
4	High Voltage Wiring	Orange wire – Runs along the bottom of the vehicle between the high voltage battery and the ECVT (Electronically Controlled Continuously Variable Transmission). Also connects ECVT to the DC/DC converter	Connects high voltage battery to ECVT Connects ECVT to DC/DC converter. All high voltage wires and connectors will be orange.
5	12 Volt Battery	Driver side of vehicle. Under hood – front	Provides 12 volt power to the vehicle – Traditional lead /acid battery.
6	ECVT (Electronically Controlled Continuously Variable Transmission)	Same position as a traditional transaxle	Contains the traction motor, generator motor and hybrid electronics.
7	DC/DC Converter	Passenger Side . Under hood. Located in front of the shock tower	Provides 12 volt power to charge the battery and run 12V electrical accessories
8	Front Inertia Switch	Passenger compartment, passenger side, front seat, lower kick panel	The inertia switch disconnects the high voltage circuit and the electrical circuit to the gasoline fuel pump in a collision

NOTE: All High Voltage wires and harnesses are wrapped in orange-colored insulation.



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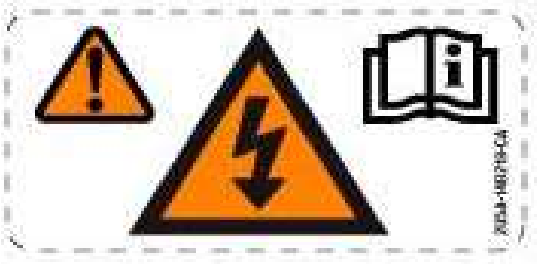
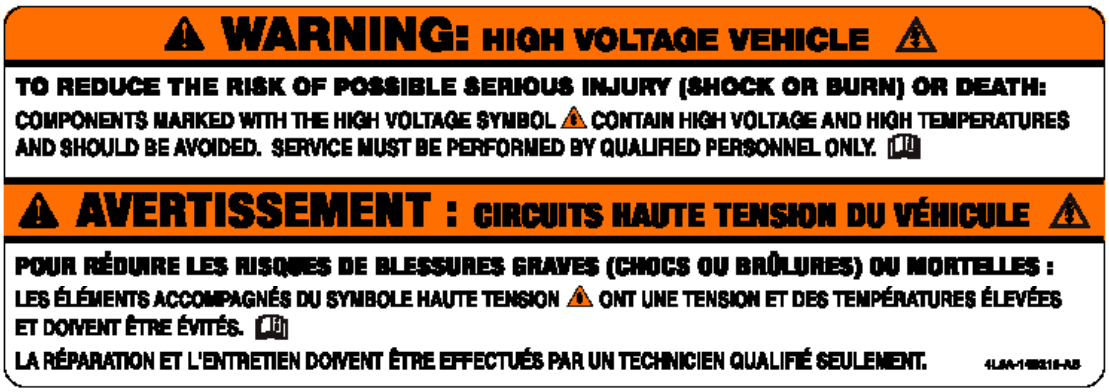
- Warning decals – like the ones shown here - will be located on components included in the high voltage system.





High Voltage Component Warning Decal

HIGH VOLTAGE BATTERIES

- The High Voltage battery is located in the rear of the vehicle – underneath the carpet.

High Voltage Service Disconnect Switch

Inertia switch is located behind this panel

- Batteries consist of 250 individual cells (similar in shape to a size D flashlight battery). Each individual battery cell is contained in a stainless steel case.
- Each individual cell is 1.3 volts. The cells are welded and wrapped together in groups of 5 to form a module. There are 50 modules in the battery pack. The total voltage of the battery pack is 300 volts DC
- The batteries are Ni-MH (Nickel-Metal Hydride). The battery pack contains sealed batteries similar to the batteries used in radio control toys, laptop computers and cell phones.
- The battery case is designed to be water resistant.

The battery cells contain a base electrolyte (consisting of potassium hydroxide as the dominant active ingredient) that is absorbed in a special paper. The electrolyte will not leak from the battery under most conditions; however if the battery is crushed, it is possible for a small amount (drops) of electrolyte to leak. Two cautions should be observed when working with a damaged battery:

Note: The High Voltage Service Disconnect Switch should be moved to the service/shipping position if possible

1. Exposure to electrolyte could cause skin/eye irritation and or burns. If exposed, rinse with large amounts of water – until the soapy feel is gone. Safety items such as face mask, insulated rubber gloves and boots, and a protective raincoat or apron is required when handling a damaged battery

2. If the battery is exposed to intense heat it is possible that hydrogen could be released from the battery. Appropriate cautions should be taken to make sure the area is properly ventilated – such as opening/removing the lift gate or rear glass.

APPROACHING A DAMAGED HIGH VOLTAGE VEHICLE

1. FOLLOW EXISTING TRAINING AND INCIDENT COMMANDER DIRECTION –

This guide only provides supplemental information as it pertains to the Escape Hybrid . The same rules apply when approaching any potential high voltage situation. Always follow your high voltage safety training. Some pre-cautions to take in any high voltage situation include:

- Remove all jewelry, watches, necklaces, earrings, etc. Metal objects are conductors of electricity.
- Wear the necessary protective clothing (high voltage rubber gloves, face shield, insulated boots, protective raincoat or apron)
- Bring the following equipment:
  - Class ABC type fire extinguisher
  - A non-conductive object – about 5 feet long (1.5 meters) – used to safely push someone away from the vehicle if they accidentally become in contact with high voltage.

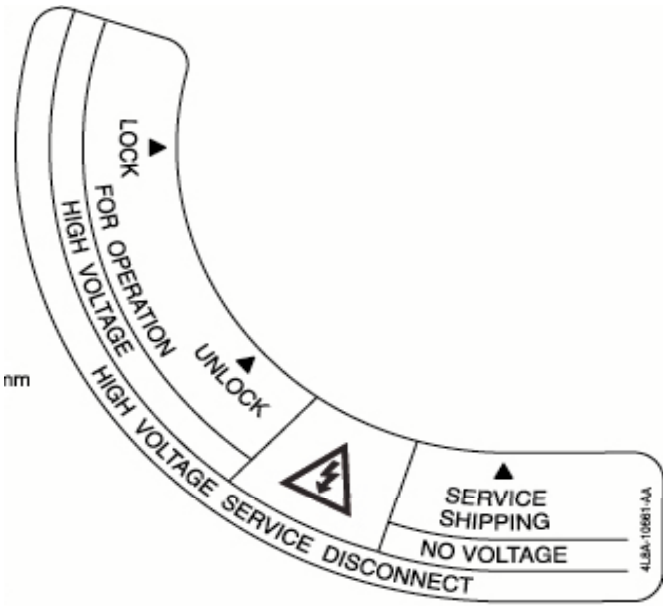
2. APPROACHING A DAMAGED VEHICLE

- Disable the high voltage electrical system using as many of the following steps as possible.

    - Secure the vehicle - Put the shift lever into Park. Remove the ignition key. Block the wheels if necessary. Removing the ignition key or turning it to the off position will disconnect the high voltage system.

    - Disconnect the negative cable from the 12-volt battery – this will also disconnect the high voltage.

    - If possible - remove the High Voltage Service Disconnect Switch by turning it counter clockwise and lifting out. (See section on Hybrid components for location). The High Voltage Service Disconnect Switch should be re-inserted into the service or shipping position



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WARNING – Removing the High Voltage Service Disconnect Switch – disconnects high voltage from the vehicle. The individual cells inside the battery pack will still be charged. Do not cut into the high voltage battery case or penetrate the batteries in any way.

SPECIAL NOTES

If the vehicle is on fire – use Class ABC powder type extinguisher to contain and smother the flames OR if water is to be used - use large amounts (i.e. from a fire hydrant).

If the vehicle has any exposed cables - make sure you are wearing insulated gloves and other protective clothing. Do not touch any broken or damaged orange cables. Treat severed lines as if they contain high voltage.

If the vehicle is submerged in water – do not touch any high voltage components or cables while extricating the occupant. 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. The high voltage battery will be discharged when the fizzing or bubbling has completely stopped.

3. WHAT DO I DO IF THE HIGH VOLTAGE BATTERY CASE HAS BEEN RUPTURED?

- Just like any other battery - hose the area down with large amounts of water.

4. MOVING DAMAGED VEHICLES – WRECKER DRIVERS

- Turn the vehicle ignition key to the accessory position to release the locking steering wheel.
- If possible - remove the High Voltage Service Disconnect Switch by turning it counter clockwise and lifting out. Reinstall in the service/shipping position.
- Follow guidelines in the Wrecker Tow Manual

Front Tow:	Wheel Lift with Dolly for 4WD and no Dolly for FWD
Rear Tow:	Wheel lift with Dolly for all
Flat bed:	Front and Rear

5. SPECIAL NOTE TO SALVAGE YARDS

If this vehicle and high voltage battery are to be scrapped - the high voltage battery must be disposed of properly. Contact Inmeto toll free at 1 –866-220-0595 to schedule battery removal for scrap/ recycling.