

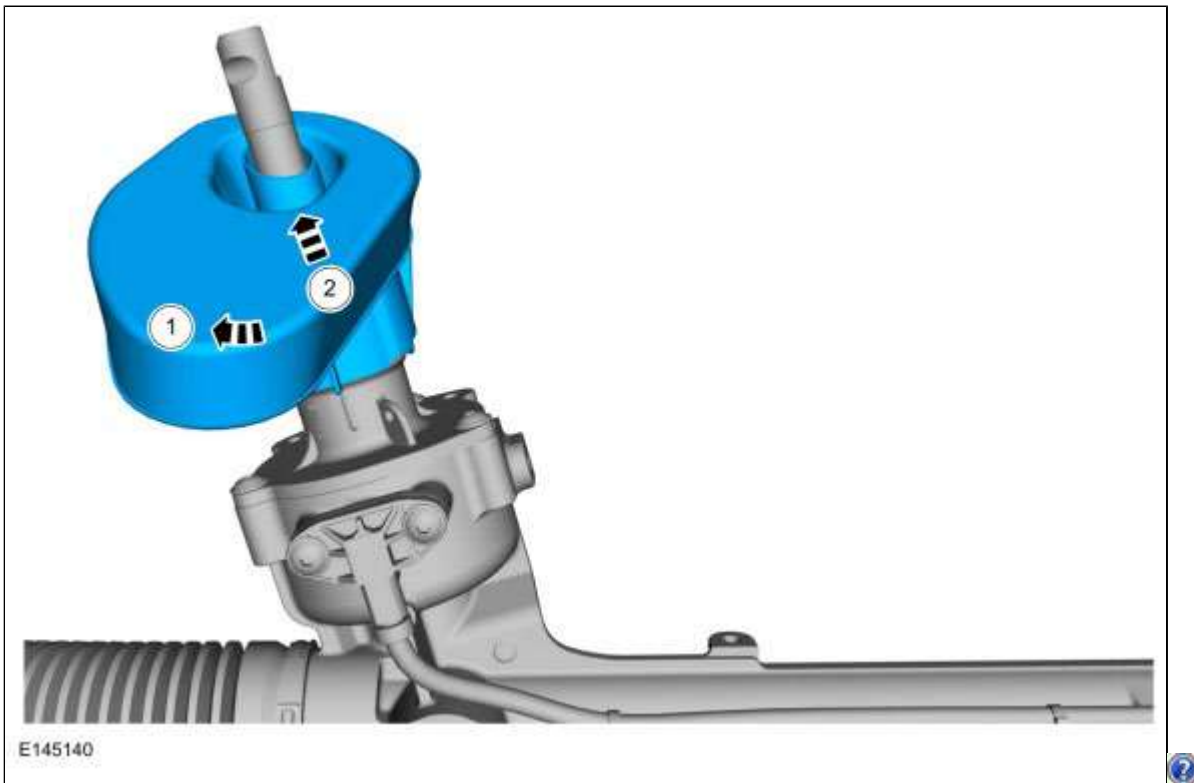
Steering Gear

Removal

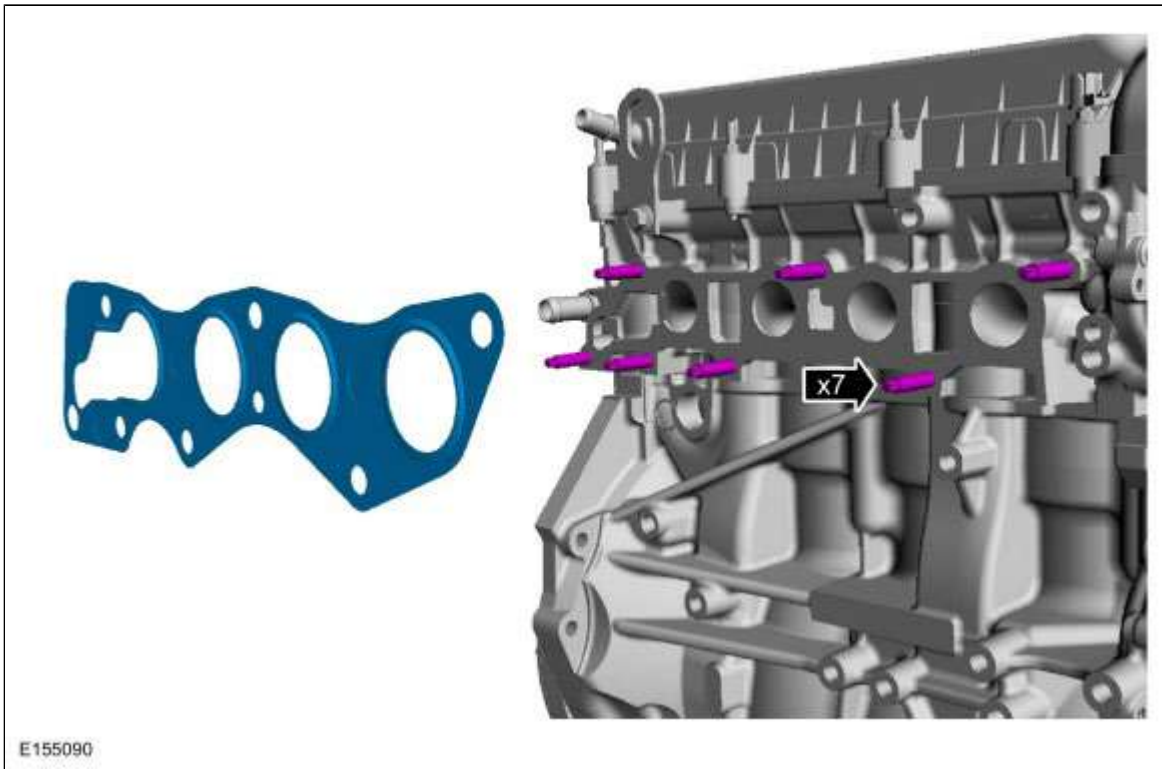
1. **⚠ WARNING:** Before beginning any service procedure in this section, refer to **Safety Warnings** in section **100-00 General Information**. Failure to follow this instruction may result in serious personal injury.

Refer to: [Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

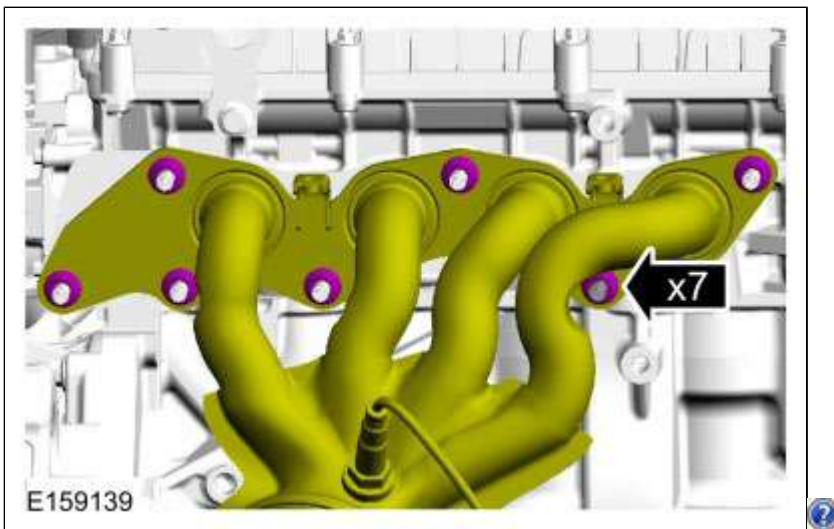
2. Refer to: [Front Subframe](#) (502-00 Uni-Body, Subframe and Mounting System, Removal and Installation).
- 3.



- 4.



11. Torque : 55 Nm



12. Torque : 10 Nm

Automatic Transmission - Hybrid Electric Vehicle (HEV)

DTC Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.
 REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).

DTC Chart

NOTE: Using the diagnostic scan tool, the TR sensor and the IFT sensor Diagnostic Trouble Codes (DTCs) are located within the SOBDMC / TCM.

NOTE: For all other SOBDMC / TCM Diagnostic Trouble Codes (DTCs), Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual.

DTC	Description	Action
P0710:11	Transmission Fluid Temperature Sensor "A"	GO to Pinpoint Test B
P0710:15	Transmission Fluid Temperature Sensor "A"	GO to Pinpoint Test B
P0710:62	Transmission Fluid Temperature Sensor "A"	GO to Pinpoint Test B
P0711	Transmission Fluid Temperature Sensor "A"	GO to Pinpoint Test B
P0712	Transmission Fluid Temperature Sensor "A"	GO to Pinpoint Test B
P0713	Transmission Fluid Temperature Sensor "A"	GO to Pinpoint Test B
P2800:00	Transmission Range Sensor "B" Circuit (PRNDL Input)	GO to Pinpoint Test A
P2801:00	Transmission Range Sensor "B" Circuit Range/Performance	GO to Pinpoint Test A
P2802:00	Transmission Range Sensor "B" Circuit Low	GO to Pinpoint Test A
P2803:00	Transmission Range Sensor "B" Circuit High	GO to Pinpoint Test A
P2806:00	Transmission Range Sensor Alignment	GO to Pinpoint Test A
P2806:79	Transmission Range Sensor Alignment	GO to Pinpoint Test A
P26C3:00	Internal Control Module Transmission Range Sensor Performance	If <u>DTC</u> P26C3:00 is present along with other <u>TR</u> sensor Diagnostic Trouble Codes (DTCs), GO to Pinpoint Test A . If the wrench lamp is illuminated and <u>DTC</u> P26C3:00 is the only code present, CLEAR the <u>DTC</u> and PERFORM the self-test. If the <u>DTC</u> returns, INSTALL a new <u>PCM</u> . REFER to: Powertrain Control Module (PCM) (303-14 Electronic Engine Controls - 2.0L Duratec - Hybrid (96kW/130PS), Removal and Installation).

Pinpoint Tests

Diagnostic Overview

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.
 REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).

Refer to Wiring Diagrams Cell 29 for schematic and connector information.

Transmission Range Sensor

Using the diagnostic scan tool, the TR sensor Diagnostic Trouble Codes (DTCs) are located within the SOBDMC / TCM and the PCM.

Normal Operation and Fault Conditions

The TR sensor monitors the position of the manual control lever shaft. The TR sensor is mounted on the transmission. The TR sensor allows the vehicle to start in park and neutral positions. The TR sensor output signal is linear over the measurement range and the PCM receives this signal verifying the selector lever position.

For vehicles equipped with Sony® sound, the Dual Automatic Temperature Control (DATC) system uses voice commands or the touchscreen to control the system. For vehicles without Sony® sound, the HVAC control module is the only control interface. For details on the HVAC control module communication, refer to Control System Logic in this section.

Blower Motor

The blower motor pulls air from the air inlet and forces it into the heater core and evaporator core housing and the plenum chamber where it is mixed and distributed.

Blower Motor Speed Control

The blower motor speed control uses a PWM signal from the HVAC control module to determine the desired blower speed and varies the ground feed for the blower motor to control the speed.

Evaporator Core

The evaporator core is an aluminum plate/fin type and is located in the heater core and evaporator core housing. A mixture of liquid refrigerant and oil enters the bottom of the evaporator core through the evaporator core inlet tube and continues out of the evaporator core through the evaporator core outlet tube as a vapor. During A/C electric compressor operation, airflow from the blower motor is cooled and dehumidified as it flows through the evaporator core fins.

Heater Core

The heater core consists of fins and tubes arranged to extract heat from the engine coolant and transfer it to air passing through the heater core.

Exhaust Manifold and Catalytic Converter Assembly with Coolant Passages

HEV is equipped with an Exhaust Manifold and Catalytic Converter Assembly with coolant passages to heat engine coolant more rapidly, speeding up passenger compartment heating in cold temperatures. This system includes an ECT sensor 2 on the coolant tube. For engine cooling flow diagrams,

Refer to: [Engine Cooling - Component Location](#) (303-03A Engine Cooling - 2.0L Duratec - Hybrid (96kW/130PS), Description and Operation).

Heater Core and Evaporator Core Housing

The heater core and evaporator core housing directs airflow from the blower motor through the evaporator core and heater core. All airflow from the blower motor passes through the evaporator core. The airflow is then directed through or around the heater core by the temperature door(s). After passing through the heater core, the airflow is distributed to the selected outlet by the airflow mode doors.

Door Actuator - Air Inlet

The air inlet door actuator is a stepper motor style actuator. The HVAC control module monitors the position of the door by counting the motor steps as it rotates. The HVAC control module drives the actuator motor in the direction necessary to move the door to the position set by the recirculation button and the in-vehicle temperature and humidity sensor information.

Temperature Door Actuator - Driver Side

The driver side temperature door actuator is a stepper motor style actuator. The HVAC control module monitors the position of the temperature door by counting the motor steps as it rotates. The HVAC control module drives the temperature door actuator motor in the direction necessary to move the temperature door to the position set by the vehicle occupant.

Temperature Door Actuator - Passenger Side

The passenger side temperature door actuator is a stepper motor style actuator. The HVAC control module monitors the position of the temperature door by counting the motor steps as it rotates. The HVAC control module drives the temperature door actuator motor in the direction necessary to move the temperature door to the position set by the vehicle occupant.

Door Actuator - Footwell Vent

The footwell vent door actuator is a stepper motor style actuator. The HVAC control module monitors the position of the door by counting the motor steps as it rotates. The HVAC control module drives the actuator motor in the direction necessary to move the doors to the position set by the vehicle occupants.

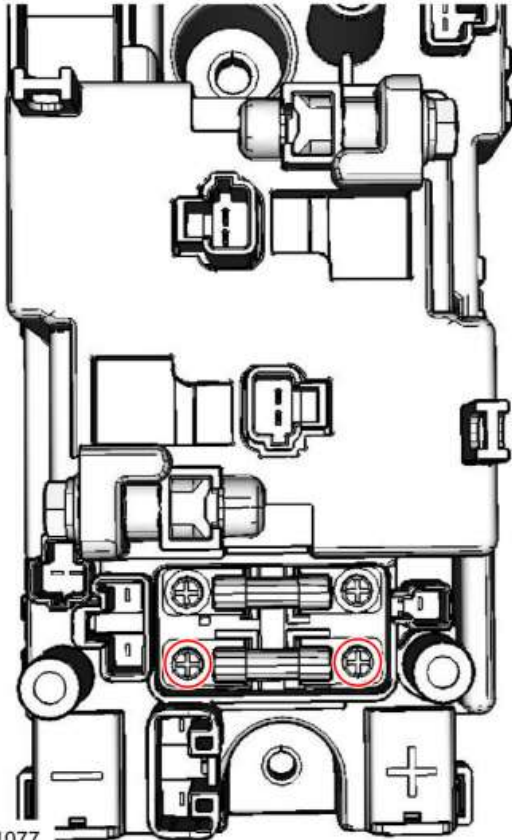
Door Actuator - Defrost/Vent Register

The defrost/vent door actuator is a stepper motor style actuator. The HVAC control module monitors the position of the door by counting the motor steps as it rotates. The HVAC control module drives the actuator motor in the direction necessary to move

E2 CHECK THE CABIN COOLANT HEATER HIGH VOLTAGE LOW CURRENT FUSE

⚠ WARNING: Never install the service disconnect plug when a high-voltage service cover is removed. Always install the cover prior to connecting the service disconnect plug. The cover prevents inadvertent contact with the high voltage which is present at several points under the cover. Failure to follow these instructions may result in serious personal injury or death.

- Ignition OFF.
- Depower the High Voltage Battery system.
REFER to: [High Voltage Battery Disconnect and Connect - Plug-In Hybrid Electric Vehicle \(PHEV\)](#) (414-03A High Voltage Battery, Mounting and Cables, General Procedures).
- Remove the High Voltage Battery electronics cover.
REFER to: [Battery Energy Control Module \(BECM\) - Plug-In Hybrid Electric Vehicle \(PHEV\)](#) (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
- Measure the resistance of the high voltage low current fuse.



E161077

Is the resistance less than 3 ohms?

Yes	GO to E3
No	<p>INSTALL a new (30A) high voltage low current fuse. REFER to: High Voltage Low Current Fuse - Plug-In Hybrid Electric Vehicle (PHEV) (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).</p> <p>INSPECT the high voltage cable between the high voltage battery junction box and cabin coolant heater. INSTALL a new high voltage cable. REFER to: High Voltage Battery Cables - Plug-In Hybrid Electric Vehicle (PHEV) (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).</p>

E3 CHECK THE CABIN COOLANT HEATER HIGH VOLTAGE CABLES FOR AN OPEN

- Disconnect High voltage [BJB_C4815H](#) .
- Disconnect Cabin coolant heater [C1815A](#) .
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4815H-5	Ω	C1815A-A
C4815H-1	Ω	C1815A-B

Possible Sources

- Battery monitoring sensor
- BCM
- Wiring, terminals or connectors

Visual Inspection and Diagnostic Pre-checks

- Verify the fuse link.
- Inspect the battery monitoring sensor.
- Inspect the battery monitoring sensor connector.

PINPOINT TEST A : B11DB:83, B11DB:96, U1007:00

NOTE: Make sure battery voltage is greater than 12.2 volts prior to and during this pinpoint test.

NOTE: Do not have a battery charger attached during vehicle testing.

A1 CHECK ELECTRICAL CONNECTOR CONDITION

- Disconnect Battery Monitoring Sensor C4433 .
- Check the Battery Monitoring Sensor electrical connector for security, damage and corrosion.
- Check the battery cable connections.
- Connect Battery Monitoring Sensor C4433 .

Are all connectors clean and connected properly?

Yes	GO to A2
No	REPAIR any corrosion in the battery cable connections. REPAIR any damaged, bent or pushed-out pins.

A2 RETRIEVE BCM (BODY CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCs)

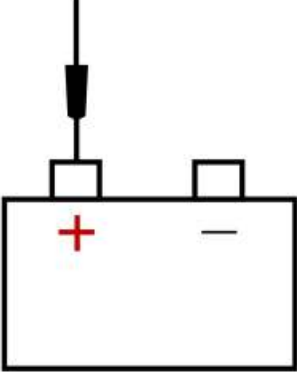

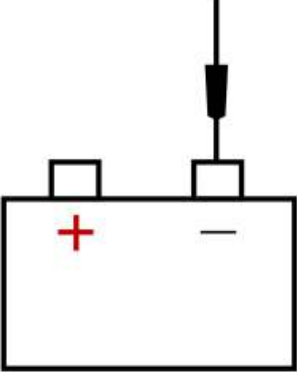
- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs) in all modules.
- Using a diagnostic scan tool, perform the BCM self-test.

Did the DTC return?

Yes	GO to A3
No	The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

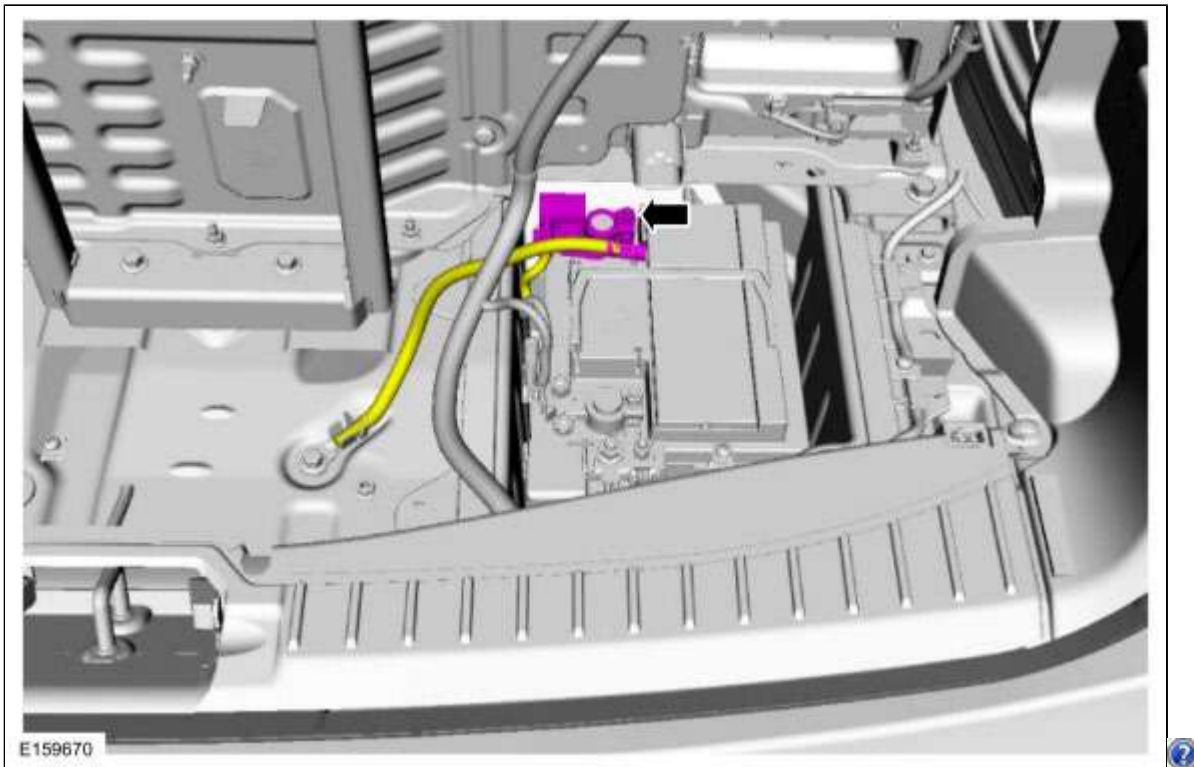
A3 CHECK THE BATTERY MONITORING SENSOR VOLTAGE

- Ignition OFF.
- Disconnect Battery Monitoring Sensor C4433 .
- Measure and record:

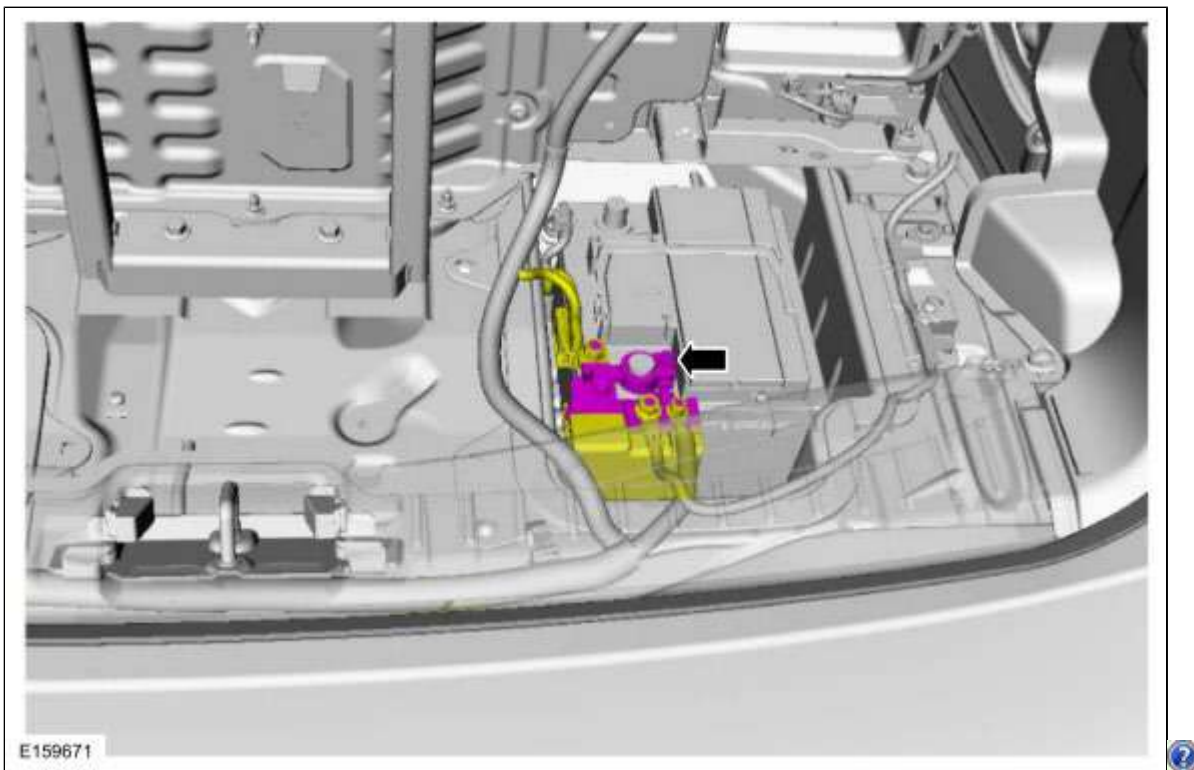
Positive Lead	Measurement / Action	Negative Lead
 <p>E148840</p>		 <p>E148841</p>

- Measure:

Positive Lead	Measurement / Action	Negative Lead



8. Torque : 5 Nm



1. To install, reverse the removal procedure.
2. For vehicles with window one-touch up, perform the window motor initialization.
Refer to: [Power Door Window Initialization](#) (501-11 Glass, Frames and Mechanisms, General Procedures).

(TSBs) address this concern, For diagnosing and testing please refer to the on-line Workshop Manual. If you do not have an on-line subscription, go to www.motorcraftservice.com.

No The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

Navigation Is Inoperative

Normal Operation and Fault Conditions

REFER to: [Information and Entertainment System - System Operation and Component Description](#) (415-00B Information and Entertainment System - General Information - Vehicles With: AM/FM/CD/SYNC/Touchscreen Display, Description and Operation).

See Navigation.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B1215:00	External Memory Card: No Sub Type Information	Set by the <u>APIM</u> when the navigation Secure Digital (SD) card is missing.

Removal of the navigation Secure Digital (SD) card results in loss of navigation while the card is removed. This is normal operation.

Possible Sources

- Navigation map Secure Digital (SD) card not present, not fully seated, or damaged
- Communications network concern
- GPMS

PINPOINT TEST AD : NAVIGATION IS INOPERATIVE

AD1 CHECK THE NAVIGATION SYSTEM OPERATION

- Verify the navigation system operation.

Does the FDIM display "SD CARD FAULT?"

Yes GO to [AD2](#)

No GO to [AD4](#)

AD2 VERIFY THE NAVIGATION MAP SECURE DIGITAL (SD) CARD IS PRESENT

- Check for the presence of a navigation map Secure Digital (SD) card in the media hub Secure Digital (SD) slot.

Is the navigation map Secure Digital (SD) card present and fully seated?


Yes GO to [AD3](#)

No INSTALL the navigation map Secure Digital (SD) card. TEST the system for normal operation.

Rear Turn Signal Lamp Bulb

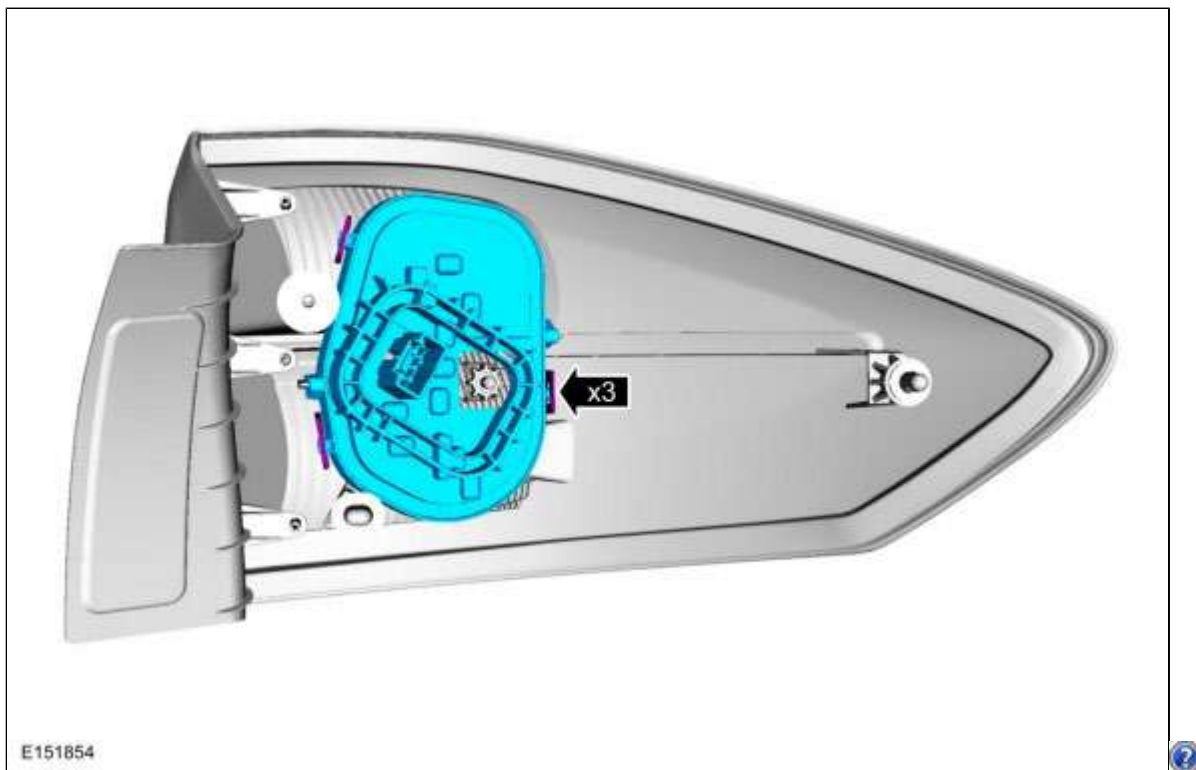
Removal

NOTE: Removal steps in this procedure may contain installation details.

1.  **WARNING:** Before beginning any service procedure in this section, refer to Safety Warnings in section 100-00 General Information. Failure to follow this instruction may result in serious personal injury.

Refer to: [Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

2. Remove the rear lamp assembly.
Refer to: [Rear Lamp Assembly](#) (417-01 Exterior Lighting, Removal and Installation).
- 3.



- 4.

AE9 CHECK THE HEV (HYBRID ELECTRIC VEHICLE) HIGH SPEED CONTROLLER AREA NETWORK (HS-CAN) (+) AND HEV (HYBRID ELECTRIC VEHICLE) HIGH SPEED CONTROLLER AREA NETWORK (HS-CAN) (-) CIRCUITS FOR A SHORT TOGETHER

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C251-6	Ω	C251-14

Is the resistance less than 3 ohms?

Yes	GO to AE11
No	GO to AE10

AE10 CHECK THE HEV (HYBRID ELECTRIC VEHICLE) HIGH SPEED CONTROLLER AREA NETWORK (HS-CAN) (+) AND HEV (HYBRID ELECTRIC VEHICLE) HIGH SPEED CONTROLLER AREA NETWORK (HS-CAN) (-) CIRCUITS FOR AN OPEN

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C251-6	Ω	C251-14

Is the resistance greater than 10,000 ohms?

Yes	REPAIR the <u>DLC</u> or REPAIR the circuit in question.
No	A capacitor internal to a module can still be draining, causing irregular resistance readings. WAIT 5 minutes. REPEAT the pinpoint test.

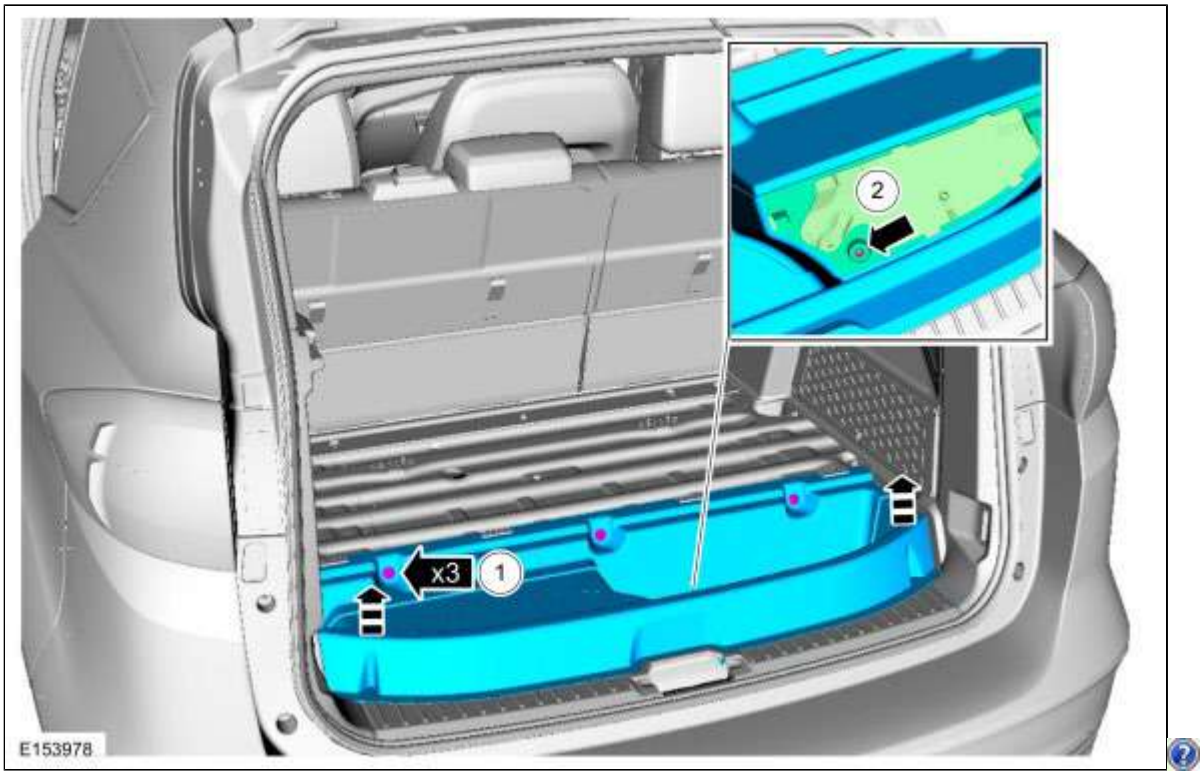
AE11 CHECK THE HEV (HYBRID ELECTRIC VEHICLE) HIGH SPEED CONTROLLER AREA NETWORK (HS-CAN) (+) AND HEV (HYBRID ELECTRIC VEHICLE) HIGH SPEED CONTROLLER AREA NETWORK (HS-CAN) (-) CIRCUITS FOR A SHORT TOGETHER WITH THE MODULES DISCONNECTED

- Measure:

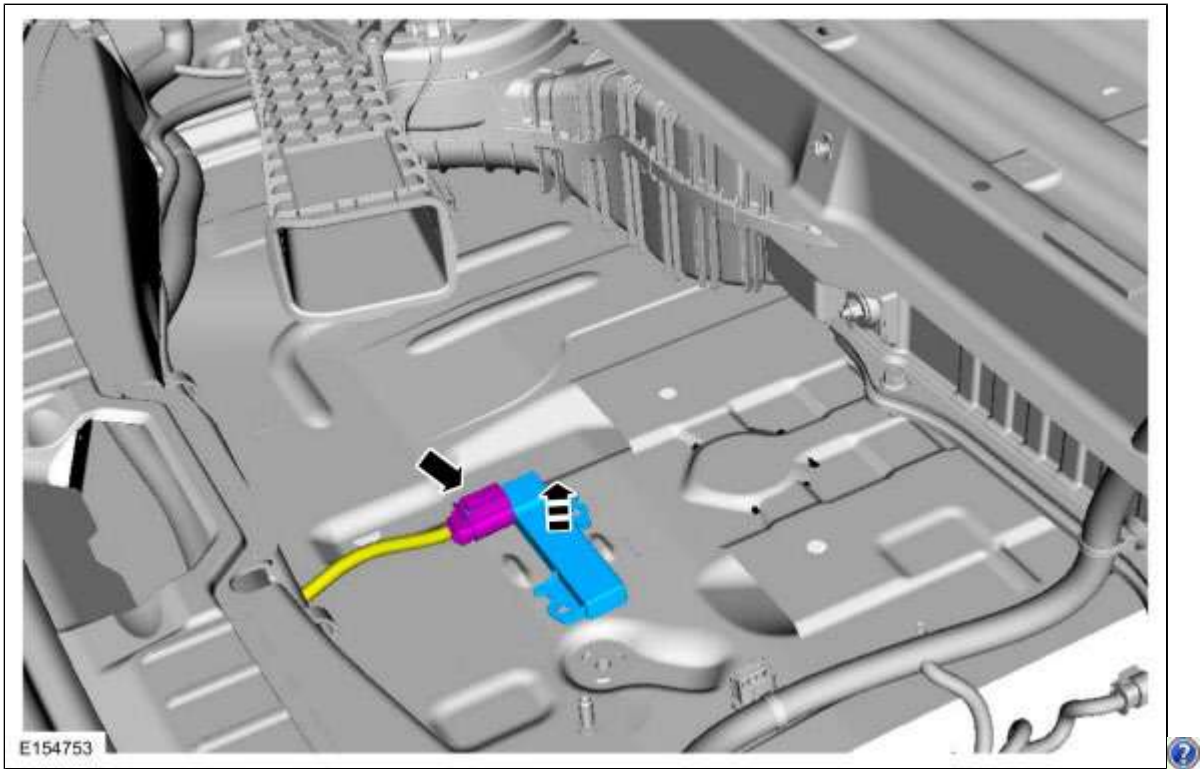
Positive Lead	Measurement / Action	Negative Lead
C251-6	Ω	C251-14

- Disconnect modules one at a time until the resistance is greater than 3 ohms.

- ACCM
- ABS module
- BECDM C4237A
- Direct Current/Direct Current (DC/DC) Converter Control Module
- GWM
- GFM (if equipped)
- PCM C175B
- SOBDM (if equipped)



4.




Installation

1. To install, reverse the removal procedure.

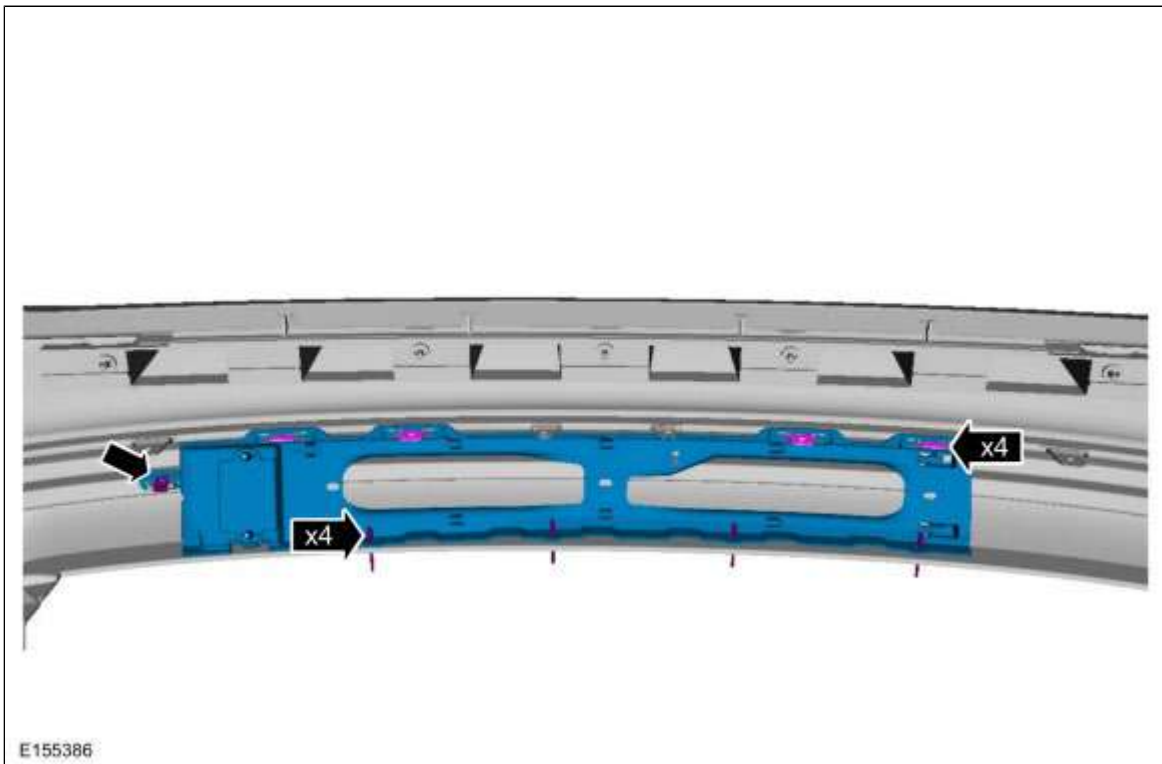
Hands Free Liftgate Actuation Module

Removal

1.  **WARNING:** Before beginning any service procedure in this section, refer to **Safety Warnings** in section **100-00 General Information**. Failure to follow this instruction may result in serious personal injury.

Refer to: [Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

2. Remove the rear bumper cover.
Refer to: [Rear Bumper Cover](#) (501-19 Bumpers, Removal and Installation).
- 3.



- 4.

Yes	GO to S4
No	REFER to: Turn Signal and Hazard Lamps (417-01 Exterior Lighting, Diagnosis and Testing).

S4 VERIFY THE LIFTGATE LATCH RELEASE OPERATION

- Unlock the doors using the door lock control switch.
- Press the liftgate release switch located on the liftgate.

Does the liftgate latch release (or open if equipped with a power liftgate)?

Yes	<p>REPLACE the suspect RKE transmitter.</p> <p>If the suspect RKE transmitter is an Integrated Keyhead Transmitter (IKT), ERASE and PROGRAM the keys. REFER to: Erase All Keys and Key Programming (419-01B Passive Anti-Theft System (PATS), General Procedures).</p> <p>If the suspect RKE transmitter is a passive key, ERASE and PROGRAM the keys. REFER to: Erase All Keys and Key Programming (419-01C Passive Anti-Theft System (PATS) - Vehicles With: Push Button Start, General Procedures).</p> <p>If the suspect RKE transmitter is a key fob, PROGRAM the new key fob. REFER to: Remote Keyless Entry (RKE) Transmitter Programming (501-14 Handles, Locks, Latches and Entry Systems, General Procedures).</p>
No	<p>If equipped with a manual liftgate, GO to Pinpoint Test N.</p> <p>If equipped with a power liftgate, REFER to: Body Closures (501-03 Body Closures, Diagnosis and Testing).</p>

The RKE Transmitter Has Poor Range Performance

Normal Operation and Fault Conditions

REFER to: [Handles, Locks, Latches and Entry Systems - System Operation and Component Description](#) (501-14 Handles, Locks, Latches and Entry Systems, Description and Operation).

Possible Sources

- RKE transmitter
- RKE transmitter battery
- Aftermarket system
- High power devices
- TV/radio transmission towers
- Radio Frequency (RF) receiver
- BCM

Visual Inspection and Diagnostic Pre-checks

- Inspect the RKE transmitter for damage.
- Inspect the RKE transmitter battery.
- Inspect for aftermarket RKE systems

PINPOINT TEST T : THE RKE (REMOTE KEYLESS ENTRY) TRANSMITTER HAS POOR RANGE PERFORMANCE

T1 CHECK FOR THE CORRECT RKE (REMOTE KEYLESS ENTRY) TRANSMITTERS

NOTE: At least 2 programmed keys (Integrated Keyhead Transmitter (IKT) or passive) must be present to begin diagnosis of the RKE system.

- Check that the correct RKE transmitters are used with the vehicle.

Are all the correct RKE transmitters present?

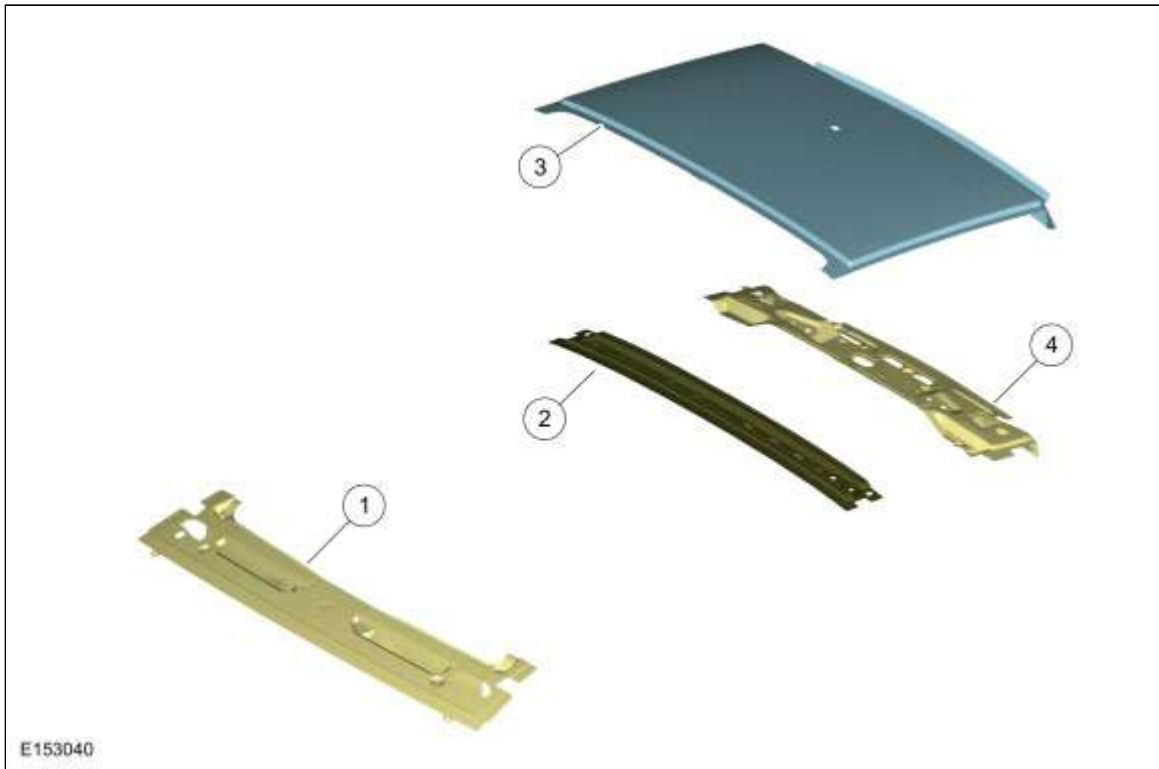
Yes	GO to T2
No	The system cannot be tested without the correct RKE transmitters. INFORM the customer the correct RKE transmitters must be present to proceed with diagnosis of the system.

T2 CHECK ALL THE RKE (REMOTE KEYLESS ENTRY) TRANSMITTERS FOR POOR RANGE PERFORMANCE

NOTE: The 20 m (66 ft) measurement of range is not the standard but is a guideline that clearly indicates a vehicle is experiencing normal range performance.

- Check all the RKE transmitters for poor range performance (less than 20 m [66 ft]).

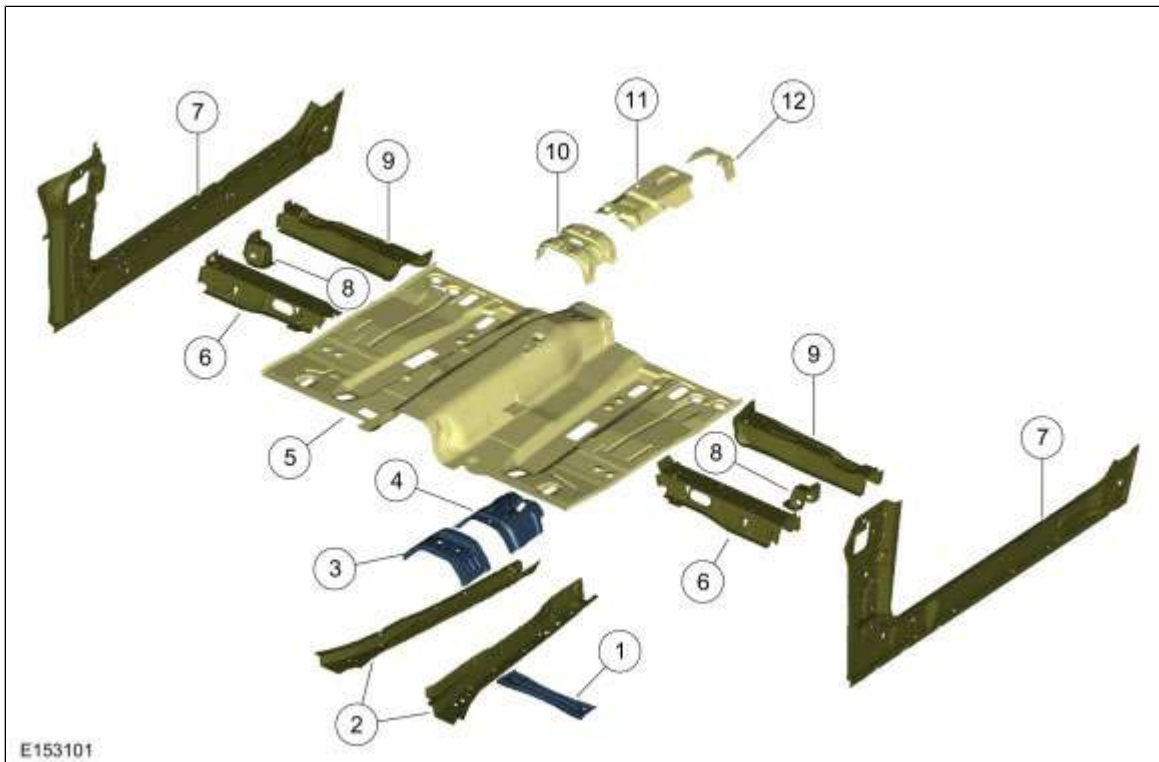
Do all the RKE transmitters experience poor range?



E153040

Item	Description	Steel Type
1	Windshield header panel	Mild steel
2	Roof bow	DP (dual phase) 600 steel
3	Roof panel	BH (bake hardened) 210 steel
4	Rear header panel	Mild steel

Front Floor Assembly



E153101