

Pinpoint Test(s)**Engine Does Not Crank**

Refer to Wiring Diagrams Cell [20](#) for schematic and connector information.

Refer to Wiring Diagrams Cell [90](#) for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: [Starting System - System Operation and Component Description](#) (303-06B Starting System - 2.0L EcoBoost (184kW/250PS) - MI4, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P06E9	Engine Starter Performance	The <u>PCM</u> sets this <u>DTC</u> when no engine rotation is detected during a crank event.
P0833:23	Clutch Pedal Switch B Circuit: Signal Stuck Low	This <u>DTC</u> sets when the <u>BCM</u> detects a short to ground on the clutch bottom of travel circuit during an on-demand self test.

Possible Sources

- Battery
- Battery cables
- Starter motor
- BJB starter relay
- CPP switch

Visual Inspection and Diagnostic Pre-checks

- Inspect high current BJB connections.
- Inspect BJB fuse 13 (30A).
- Inspect BCM fuse 78 (5A).
- Inspect the Integrated Keyhead Transmitter (IKT).

PINPOINT TEST A : ENGINE DOES NOT CRANK**A1 CHECK THE BATTERY**

- Check the battery condition and state of charge.
REFER to: [Battery](#) (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

Is the battery OK?

Yes	GO to A2
No	CHARGE or INSTALL a new battery as necessary. REFER to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation).

A2 CHECK FOR NO KEY DETECTED MESSAGE IN THE MESSAGE CENTER

- Check the message center while pressing the ignition switch - push button start.

Is No Key Detected displayed?

Yes	Diagnose "No Key Found" Message. REFER to: Passive Anti-Theft System (PATS) (419-01C Passive Anti-Theft System (PATS) - V Button Start, Diagnosis and Testing).
No	GO to A3

A3 CHECK THE IPC (INSTRUMENT PANEL CLUSTER) OPERATION

- Observe the IPC operation while pressing the ignition switch - push button start.

Do some indicators in the IPC illuminate?

Yes	GO to A5
No	GO to A4

A4 CHECK FOR COMMUNICATION WITH THE SCAN TOOL

- Ignition ON.
- Using a diagnostic scan tool, perform the Network Test.

Does the BCM, IPC and RFA module pass the Network Test?

Yes	Diagnose No Power in On. REFER to: Steering Wheel and Column Electrical Components (211-05 Steering Column Switch and Column Electrical Components, Diagnosis and Testing).
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

A5 RETRIEVE DIAGNOSTIC TROUBLE CODES (DTCs)

- Ignition ON.
- Using a diagnostic scan tool, perform self-tests for:
 - RFA
 - BCM
 - PCM

Were Diagnostic Trouble Codes (DTCs) retrieved on-demand during self-test?

Yes	For all <u>RFA</u> module Diagnostic Trouble Codes (DTCs),
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REFER to: [Remote Function Actuator \(RFA\) Module](#) (419-10 Multifunction Electronic Modules,
 For **BCM DTC** P0833:23, GO to [A22](#) For all other **BCM** Diagnostic Trouble Codes (DTCs),
 REFER to: [Body Control Module \(BCM\)](#) (419-10 Multifunction Electronic Modules, Diagnosis at
 For **PCM DTC** P06E9 or P0850 GO to [A6](#) For all **PCM** Diagnostic Trouble Codes (DTCs),
 REFER to: [Electronic Engine Controls](#) (303-14B Electronic Engine Controls - 2.0L EcoBoost (1
 Testing).

No	GO to A6
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A6 CHECK THE PCM (POWERTRAIN CONTROL MODULE) CLUTCH PEDAL AT OR NEAR BOTTOM OF IDENTIFICATION)

- Using a diagnostic scan tool, while viewing the **PCM PID** CPP_BOT, fully apply the clutch pedal and release.

Does the **PID** change from **NO** to **YES** when the clutch pedal is fully applied?

Yes	GO to A7
No	GO to A19

A7 CHECK THE PCM (POWERTRAIN CONTROL MODULE) ENGINE CRANKING (ENG_CRANK) PID (PA

- Make sure the transmission is in NEUTRAL.
- Using a diagnostic scan tool, while viewing the **PCM PID** ENG_CRANK, press the ignition switch - push butt


Does the **PCM PID** ENG_CRANK change from Inactive to Active?

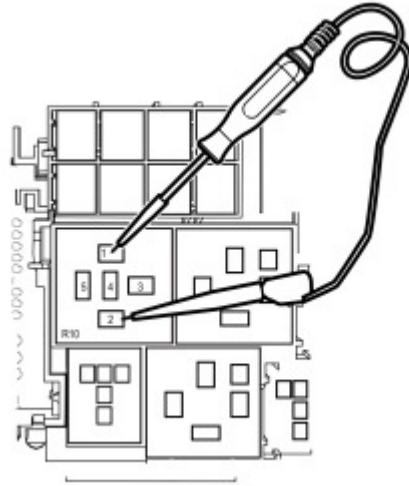
Yes	GO to A8
No	GO to A18

A8 CHECK THE STARTER RELAY CONTROL OPERATION

NOTICE: The following step uses a test light to simulate normal circuit loads. Use only the test light rec beginning of this section. To avoid connector terminal damage, use the Flex Probe Kit for the test light the test light probe directly on any connector.

- Remove the **BJB** starter relay.
- Measure:

Positive Lead	Measurement / Action	
		



E152678

BJB starter relay pin 1



E152678

BJB starter relay


- Make sure the transmission is in NEUTRAL.
- While pressing the ignition switch - push button start and the clutch pedal, observe the test light.

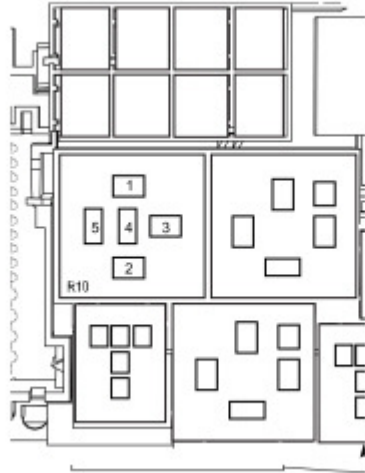
Does the test light illuminate when the ignition switch - push button start and clutch pedal are pressed?

Yes	GO to A9
No	GO to A16

A9 CHECK THE VOLTAGE TO THE STARTER RELAY

- Ignition OFF.
- Disconnect: Starter Relay.
- Measure:

Positive Lead	Me
	



E149481

BJB starter relay pin 3

Is the voltage greater than 11 volts?

Yes	
No	VERIFY <u>BJB</u> fuse 13 (30A) is OK. If OK, REPAIR the circuit for an open. If not OK, REFER to the possible causes of the circuit short.

A10 CHECK THE STARTER MOTOR OPERATION AT THE STARTER RELAY

- Ignition OFF.
- Make sure the transmission is in NEUTRAL.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
<u>BJB</u> starter relay pin 3	

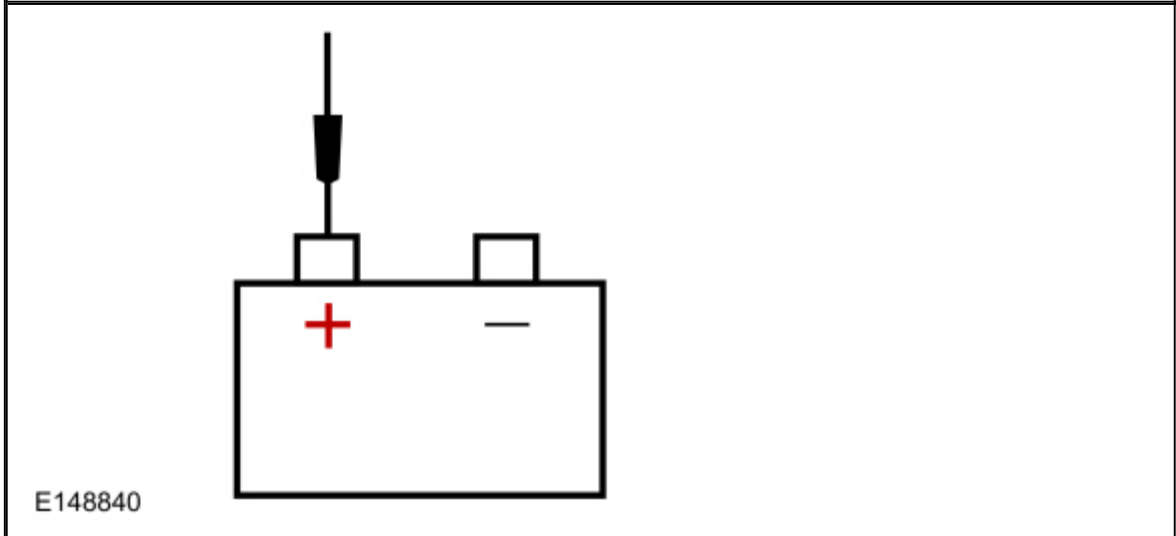
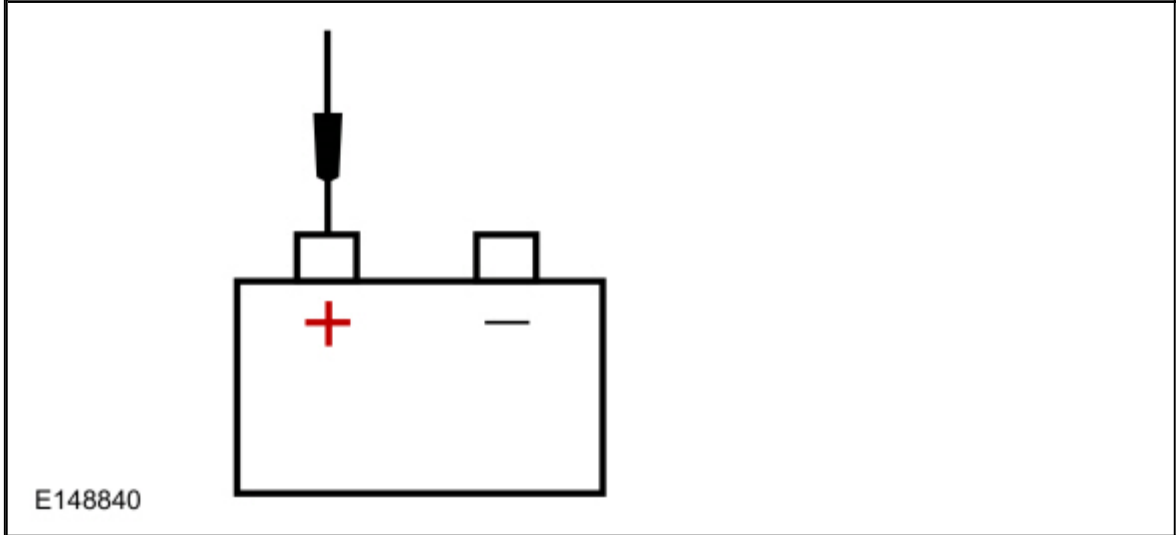
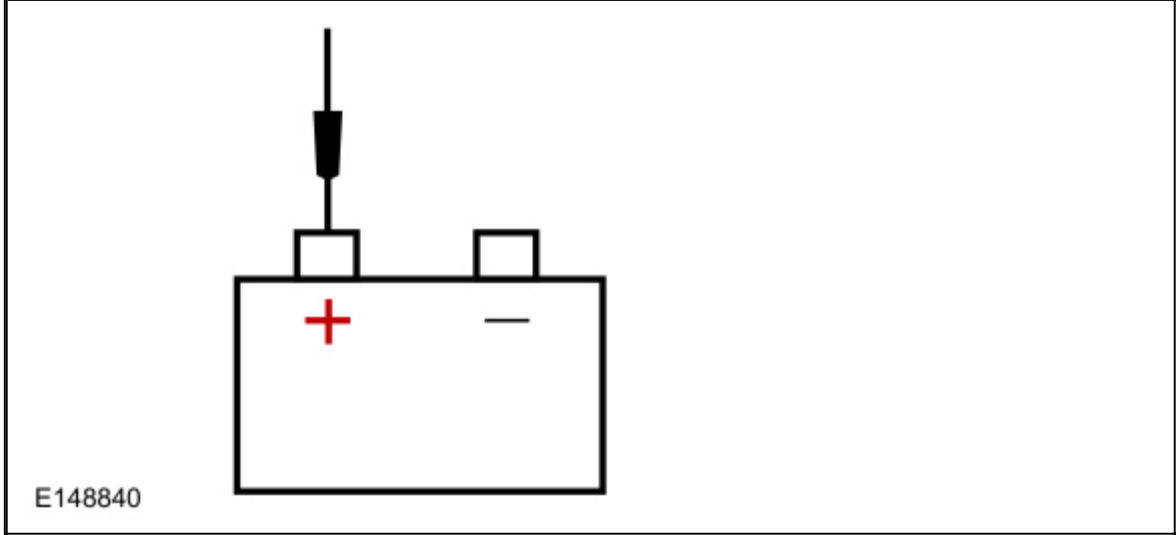
Did the starter engage and the engine crank?

Yes	INSTALL a new starter relay.
No	GO to A11

A11 CHECK THE BATTERY GROUND CABLES

- Measure:

Positive Lead Me

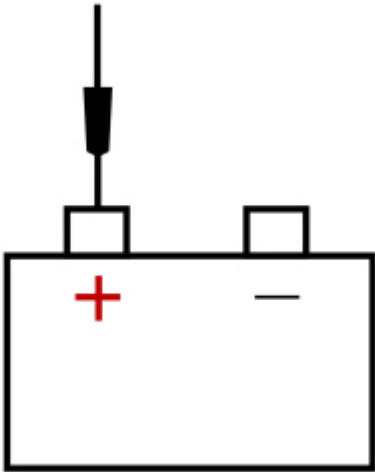



Are the voltages greater than 11 volts?

Yes	GO to A12
No	CLEAN or INSTALL new negative battery cables as necessary. REFER to: Battery Cables - 2.0L EcoBoost (184kW/250PS) - MI4 (414-01 Battery, Mounting ar

A12 CHECK THE STARTER MOTOR GROUND

- Measure:

Positive Lead	Measurement / Action	
 <p>E148840</p>		<p>E148837</p> <p>Starter motor case</p>

Is the voltage greater than 11 volts?

Yes	GO to A13
No	CLEAN the starter motor mounting flange and MAKE SURE the starter motor is correctly moun

A13 CHECK THE VOLTAGE TO THE STARTER MOTOR

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
C197A-1	

Is the voltage greater than 11 volts?

Yes	GO to A14
No	INSTALL a new positive battery cable. REFER to: Battery Cables - 2.0L EcoBoost (184kW/250PS) - MI4 (414-01 Battery, Mounting ar

A14 CHECK THE STARTER MOTOR FOR CORRECT OPERATION

- Ignition OFF.
- Perform Starter Motor - Positive Circuit Test in this section.

Was an obvious cause found?

Yes	Correct the cause as necessary.
No	GO to A15

A15 CHECK FOR START INPUT AT THE STARTER

- Connect: Starter Relay.
- Disconnect Starter [C197B-1](#) ("S"-terminal).
- Press the ignition switch - push button start and the clutch pedal.
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
C197B-1	

Is the voltage greater than 11 volts?

Yes	CLEAN the starter solenoid "S" terminal and starter solenoid connector. CHECK the wiring and intermittent connection.
No	REPAIR the circuit for an open.

A16 CHECK THE PCM (POWERTRAIN CONTROL MODULE) STARTER RELAY CIRCUITS FOR A SHOR

- Ignition OFF.
- Disconnect ACM [C240A](#).
- Disconnect PCM [C1381B](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
C1381B-9	Ω
C1381B-11	Ω

Are the resistances greater than 10,000 ohms?

Yes	GO to A17
No	REPAIR the affected circuit.

A17 CHECK THE PCM (POWERTRAIN CONTROL MODULE) STARTER RELAY CIRCUITS FOR AN OPE

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action	
C1381B-9	Ω	<u>BJE</u>
C1381B-11	Ω	<u>BJE</u>

Are the resistances less than 3 ohms?

Yes	GO to A24
No	REPAIR the affected circuit.

A18 CHECK THE CRANK DETECT CIRCUIT FOR VOLTAGE AT THE PCM (POWERTRAIN CONTROL M

- Ignition OFF.
- Disconnect PCM [C1381B](#).
- While pressing the ignition switch - push button start, measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
C1381B-17	

Is the voltage greater than 11 volts?

Yes	GO to A24
No	REPAIR the circuit.

A19 CHECK THE CPP (CLUTCH PEDAL POSITION) SWITCH

- Ignition OFF.
- Disconnect PCM [C1381B](#).
- While fully applying the clutch pedal, measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
C1381B-13	Ω

Is the resistance less than 3 ohms?

Yes	GO to A24
No	GO to A20

A20 CHECK THE CPP (CLUTCH PEDAL POSITION) GROUND CIRCUIT FOR AN OPEN

- Disconnect CPP switch [C257](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
C257-2	Ω

Is the resistance less than 3 ohms?

Yes	GO to A21
No	REPAIR the circuit.

A21 CHECK THE CPP (CLUTCH PEDAL POSITION) SWITCH CIRCUIT FOR AN OPEN

- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
C1381B-13	Ω

Is the resistance less than 3 ohms?

Yes	INSTALL a new Clutch Pedal Position (CPP) switch. REFER to: Clutch Pedal Position (CPP) Switch (303-14B Electronic Engine Controls - 2.0L Ec and Installation).
No	REPAIR the circuit.

A22 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) WITH CPP (CLUTCH PEDAL POSITION) SWITCH

- Ignition OFF.

- Disconnect CPP switch [C257](#).
- Ignition ON.
- Using a diagnostic scan tool, perform BCM self-test.

Was Diagnostic Trouble Code (DTC) P0833:23 retrieved during on-demand self-test with the Clutch Ped

Yes	GO to A23
No	INSTALL a new Clutch Pedal Position (CPP) switch. REFER to: Clutch Pedal Position (CPP) Switch (303-14B Electronic Engine Controls - 2.0L Eco and Installation).

A23 CHECK THE CLUTCH BOTTOM TRAVEL CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect BCM [C2280A](#).
- Disconnect PCM [C1381B](#).
- Measure:

[Click to display connectors](#)

Positive Lead	Measurement / Action
C1381B-13	Ω

Is the resistance greater than 10,000 ohms?

Yes	GO to A25
No	REPAIR the circuit.

A24 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM connectors.
- Repair:
 - corrosion (install new connectors or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the PCM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK <u>OASIS</u> for any applicable Technical Service Bulletins (TSBs). If a <u>TSB</u> exists for this concern, FOLLOW the <u>TSB</u> instructions. If no Technical Service Bulletins (TSBs) address this concern, REFER to: Powertrain Control Module (PCM) (303-14B Electronic Engine Controls - 2.0L EcoE and Installation).
No	The system is operating correctly at this time. The concern may have been caused by module or of any connector or pin issues.

A25 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all BCM connectors.
- Repair:
 - corrosion (install new connectors or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the BCM connectors. Make sure they seat and latch correctly.
- Connect CPP [C257](#).
- Connect PCM [C1381B](#).
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK <u>OASIS</u> for any applicable Technical Service Bulletins (TSBs). If a <u>TSB</u> exists for this concern, FOLLOW the <u>TSB</u> instructions. If no <u>TSB</u> addresses this concern, INSTALL a new <u>BCM</u> . REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by module or connector or pin issues.
