Starting System

Diagnostic Trouble Code (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).

Diagnostic Trouble Code Chart

Module	DTC	Description	Action New: *hover over Pinpoint Test links to show title*
BCM	C113A:11	Wake-up Signal: Circuit Short to Ground	GO to Pinpoint Test D
BCM	C113A:15	Wake-up Signal: Circuit Short to Battery or Open	GO to Pinpoint Test D
PCM	P06E4:00	Control Module Wake-up Circuit Performance: No Sub Type Information	GO to Pinpoint Test G
PCM	P06E9:00	Engine Starter Performance: No Sub Type Information	GO to Pinpoint Test A
PCM	P06E9:00	Engine Starter Performance: No Sub Type Information	GO to Pinpoint Test B
PCM	P162F:00	Starter Motor Disabled - Engine Crank Time Too Long: No Sub Type Information	GO to Pinpoint Test H
PCM	P2535:00	Ignition Switch On/Start Position Circuit High: No Sub Type Information	GO to Pinpoint Test E
PCM	P2535:00	Ignition Switch On/Start Position Circuit High: No Sub Type Information	GO to Pinpoint Test F

Inspection and Verification

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).

1. Verify the customer concern.
2. Check the battery for loose, damaged or corroded connections.
3. Check the generator for loose, damaged or corroded connections.
4. Check the battery condition and state of charge.
   REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).
5. Remove the accessory drive belt.
   REFER to: Accessory Drive Belt (303-05A Accessory Drive - 6.2L V8, Removal and Installation).
   Verify the crankshaft and each of the components driven by the accessory drive belt rotate and are not seized or damaged.
6. If any aftermarket accessories have been added to the vehicle, make sure they are properly wired.
7. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding.

Symptom Chart(s)

Symptom Chart: Starting System

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).

Symptom Chart

Condition	Possible Sources	Actions
The engine does not crank â€" without Push-button Start	Refer to the Pinpoint Test	GO to Pinpoint Test A

Condition	Possible Sources	Actions
The engine does not crank â€" with Push-button Start	Refer to the Pinpoint Test	GO to Pinpoint Test B
The engine cranks slowly	Refer to the Pinpoint Test	PERFORM the starter system component test. REFER to Starter Motor - Positive Circuit Test in this section.
The engine cranks but will not start	• Fuses • PCM • Fuel pump • Fuel pump relay • Starter • Wiring, terminals or connectors	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. Section 3 Symptom Charts.
Unusual starter noise	Refer to the Pinpoint Test	GO to Pinpoint Test C
The starter spins but the engine does not crank	Starter motor	INSPECT the starter motor mounting and engagement. REPAIR as necessary.
	Damaged flexplate	INSPECT the flexplate for damaged, missing or worn teeth. REPAIR as necessary.
The starter does not disengage from the flexplate	• Starter relay • Wiring, terminals or connectors	REPAIR circuit CDC25 (BN/GN) or CDC54 (WH/GN) for a short to voltage. If necessary, INSTALL a new BJB relay module.
The remote start is inoperative	• Remote start feature not enabled • Passive Key or battery • PCM • Wiring, terminals or connectors	REFER to: Locks, Latches and Entry Systems (501-14 Handles, Locks, Latches and Entry Systems, Diagnosis and Testing).
The remote start has poor range performance	• Passive key or battery • After market systems • High power devices • TV/radio transmission towers	REFER to: Locks, Latches and Entry Systems (501-14 Handles, Locks, Latches and Entry Systems, Diagnosis and Testing).

Pinpoint Test(s)

PINPOINT TEST A : ENGINE DOES NOT CRANK- WITHOUT PUSH-BUTTON START

Refer to Wiring Diagrams Cell 20 for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Starting System - System Operation and Component Description (303-06A Starting System - 6.2L V8, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P06E9:00	Engine Starter Performance: No Sub Type Information	The PCM sets this DTC when no engine rotation is detected during a crank event.

Possible Sources

- Battery
- Battery cables
- IPC
- Starter motor
- BJB starter relay

Visual Inspection and Pre-checks

- Inspect the run/start relay.
- Inspect the high current BJB connections.
- Verify the BJB fuse 36 (30A).
- Inspect the passive key.

A1 PERFORM INSPECTION AND VERIFICATION

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

  NOTE: *If it is necessary to leave the battery charger connected during testing, do not leave it on its highest or boost setting. The highest settings can exceed 16 volts, resulting in false test results and setting of DTCs.*

  Perform Inspection and Verification procedure in this section.

Was an obvious cause for an observed or reported concern found?

Yes	CORRECT the cause as necessary.
No	GO to A2

A2 VERIFY THE BCM (BODY CONTROL MODULE) , IPC (INSTRUMENT PANEL CLUSTER) AND PCM (POWERTRAIN CONTROL MODULE) PASS THE NETWORK TEST

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

Did the BCM, IPC and PCM pass the Network Test?

Yes	GO to A3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

A3 RETRIEVE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, perform PCM self-test.

Are any PCM Diagnostic Trouble Codes (DTCs) other than P06E9 present?

Yes	REFER to the PCM DTC Chart in this section.
No	With automatic transmission, GO to A4

A4 CHECK BCM (BODY CONTROL MODULE) IGN_FINAL PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the BCM Parameter Identifications (PIDs).
- Make sure the transmission is in PARK or NEUTRAL.
- Monitor the BCM PID IGN_FINAL while turning the ignition switch from OFF to START.

Does the PID change from Off to Start when the ignition switch is turned from OFF to START?

Yes	GO to A5
No	DIAGNOSE No power in ON. REFER to: Steering Wheel and Column Electrical Components (211-05 Steering Wheel and Column Electrical Components, Diagnosis and Testing).

A5 CHECK THE PCM (POWERTRAIN CONTROL MODULE) IN GEAR-TRANSMISSION IS APPLYING A LOAD TO ENGINE (IN_GEAR) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the PCM Parameter Identifications (PIDs).
- Monitor the PCM PID IN_GEAR, while placing the gear selector in PARK and then NEUTRAL.

Does the PID read No in both positions?

Yes	GO to A6
No	REFER to: Diagnostic Trouble Code (DTC) Charts and Pinpoint Tests - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (307-01B Automatic Transmission, Transfer Case and Power Transfer Unit - 10-Speed Automatic Transmission â€“ 10R140, Diagnosis and Testing).

A6 CHECK THE PCM (POWERTRAIN CONTROL MODULE) ENGINE CRANKING (ENG_CRANK) PID (PARAMETER IDENTIFICATION)

- Make sure the transmission is in PARK or NEUTRAL.
- Using a diagnostic scan tool, view the PCM Parameter Identifications (PIDs).
- Monitor the PCM PID ENG_CRANK while holding the ignition key in the start position and the brake pedal (with automatic transmission) or fully apply the clutch pedal (with manual transmission).

Does the PID change from Inactive to Active?

Yes	GO to A7
No	GO to A16

A7 CHECK THE BJB (BATTERY JUNCTION BOX) STARTER RELAY FUSE

- Verify the BJB fuse 24 (30A).

Was the fuse OK?

Yes	GO to A8
No	REPAIR the circuit for a short to ground.

A8 CHECK FOR START REQUEST AT THE STARTER

- Disconnect Starter solenoid C197A .
- While holding the key in the START position, measure:

STARTER MOTOR	

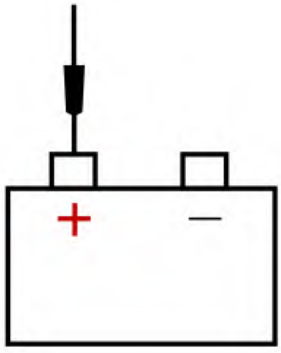
Positive Lead	Measurement / Action	Negative Lead
C197A-1 ("S" terminal)	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to A10
No	Connect Starter solenoid C197A and GO to A9

A9 CHECK THE STARTER MOTOR CONTROL OPERATION

- Disconnect BJB Relay Module C1035C .
- Connect a remote starter switch:

Positive Lead	Measurement / Action	Negative Lead
C1035C-49	Remote Starter Switch	 E148840

- Momentarily engage the remote starter switch.

Does the engine crank?

Yes	GO to A10
No	REPAIR circuit for open.

A10 CHECK THE STARTER MOTOR FOR CORRECT OPERATION

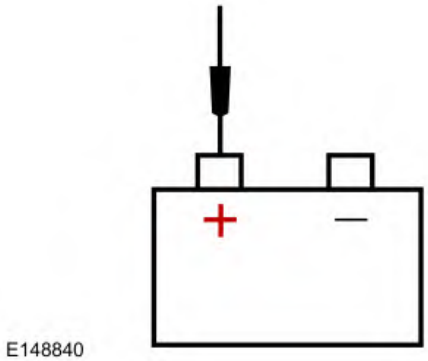
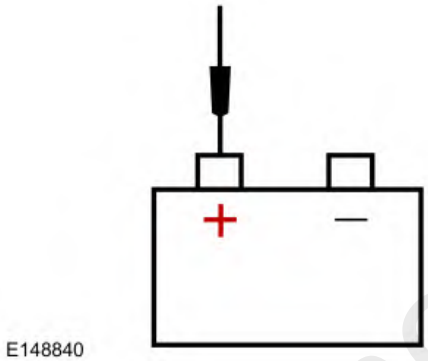
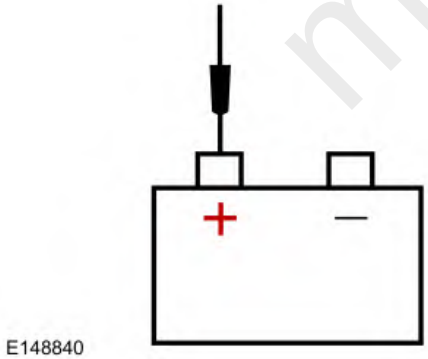
- Perform Starter Motor - Positive Circuit Test in this section.

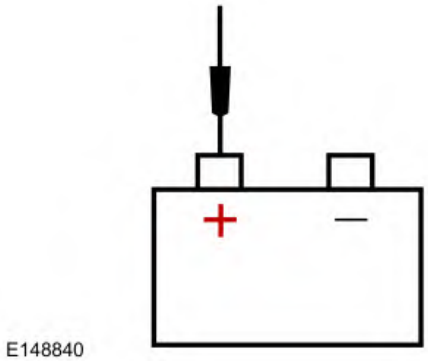
Was an obvious cause found?

Yes	Correct the cause as necessary.
No	GO to A11

A11 CHECK THE BATTERY GROUND CABLES

- Measure:

Positive Lead	Measurement / Action	Negative Lead
 E148840		Ground G100
 E148840		Ground G101
 E148840		Ground G102

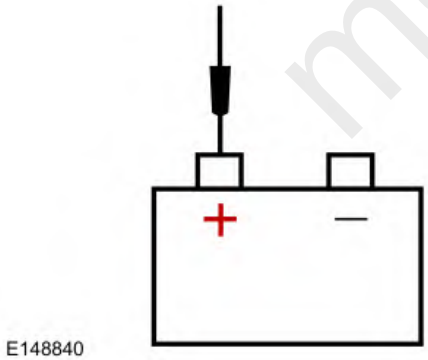
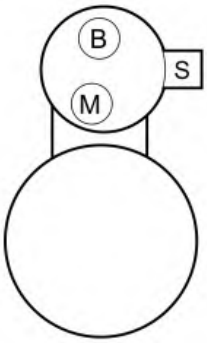
Positive Lead	Measurement / Action	Negative Lead
 E148840		Ground G103 (with dual batteries)

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 - 6.2L V8 (414-01 Battery, Mounting and Cables, Removal and Installation).

A12 CHECK THE STARTER MOTOR GROUND

- Measure:

Positive Lead	Measurement / Action	Negative Lead
 E148840		 E148837 Starter motor case

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 mounted. REFER to: Starter Motor (303-06A Starting System - 6.2L V8, Removal and Installation).

A13 CHECK THE VOLTAGE TO THE STARTER MOTOR

- Measure:

STARTER MOTOR	

Positive Lead	Measurement / Action	Negative Lead
C197B-1 ("B" terminal)		Ground

Is the voltage greater than 11 volts?

Yes	GO to A14
No	INSTALL a new positive battery cable. REFER to: Battery Cables - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (414-01 Battery, Mounting and Cables, Removal and Installation).

A14 CHECK FOR START INPUT AT THE STARTER

- Connect BJB starter relay.
- Disconnect Starter solenoid C197A .
- While holding the key in the START position, measure:

STARTER MOTOR	

Positive Lead	Measurement / Action	Negative Lead
C197A-1 ("S" terminal)		Ground

Is the voltage greater than 11 volts?

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

A15 CHECK THE PCM (POWERTRAIN CONTROL MODULE) STARTER RELAY CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect BJB starter relay.
- Disconnect ACM C240A .
- Disconnect PCM C175B .
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-44	Ω	Ground
C175B-78	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to A16
No	REPAIR the affected circuit.

A16 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 OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (PCM).
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.

A17 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.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new BCM. 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 connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST B : ENGINE DOES NOT CRANK - WITH PUSH-BUTTON START

Refer to Wiring Diagrams Cell 20 for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Starting System - System Operation and Component Description (303-06A Starting System - 6.2L V8, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P06E9:00	Engine Starter Performance: No Sub Type Information	The PCM sets this DTC when no engine rotation is detected during a crank event.

Possible Sources

- Battery
- Battery cables
- IPC
- Starter motor
- BJB starter relay

Visual Inspection and Pre-checks

- Inspect the run/start relay.
- Inspect the high current BJB connections.
- Verify the BJB fuse 36 (30A).
- Inspect the passive key.

B1 PERFORM INSPECTION AND VERIFICATION

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

  NOTE: *If it is necessary to leave the battery charger connected during testing, do not leave it on its highest or boost setting. The highest settings can exceed 16 volts, resulting in false test results and setting of DTCs.*

  Perform Inspection and Verification procedure in this section.

Was an obvious cause for an observed or reported concern found?

Yes	CORRECT the cause as necessary.
No	GO to B2

B2 CHECK FOR NO KEY DETECTED MESSAGE IN THE MESSAGE CENTER

- **NOTE:** *There are certain areas inside the vehicle where the passive key may not be detected and the message center displays NO KEY DETECTED. If the passive key is in the far outside edges of the interior (like in a door map pocket or above a sun visor) it might not be detected. Move the passive key to a different location and try to start the vehicle again.*

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

Is NO KEY DETECTED displayed?

Yes	DIAGNOSE the NO KEY DETECTED concern. REFER to: Passive Anti-Theft System (PATS) (419-01C Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, Diagnosis and Testing).
No	GO to B3

B3 VERIFY THE BCM (BODY CONTROL MODULE) , IPC (INSTRUMENT PANEL CLUSTER) AND PCM (POWERTRAIN CONTROL MODULE) PASS THE NETWORK TEST

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

Did the BCM, IPC and PCM pass the Network Test?

Yes	GO to B4
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

B4 RETRIEVE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, perform PCM self-test.

Are any PCM Diagnostic Trouble Codes (DTCs) other than P06E9 present?

Yes	REFER to the PCM DTC Chart in this section.
No	With automatic transmission, GO to B5

B5 CHECK THE OPERATION OF THE STOPLAMPS

- While observing the stoplamps, apply the brake pedal.

Do the stoplamps illuminate?

Yes	GO to B6
No	DIAGNOSE All the Stoplamps are inoperative. REFER to: Spot Lamps (417-01 Exterior Lighting, Diagnosis and Testing).

B6 CHECK THE BRAKE PEDAL POSITION (BOO1) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).
- Monitor the PCM B001 PID while applying the brake pedal.

Does the PID read On?

Yes	GO to B8
No	GO to B7

B7 CHECK THE BPP (BRAKE PEDAL POSITION) SWITCH CIRCUIT FOR VOLTAGE AT THE PCM (POWERTRAIN CONTROL MODULE)

- Ignition OFF.
- Disconnect PCM C175B .
- While applying the brake pedal, measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-23	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to B22
No	REPAIR the circuit.

B8 CHECK BCM (BODY CONTROL MODULE) IGN_FINAL PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the BCM Parameter Identifications (PIDs).
- Make sure the transmission is in PARK or NEUTRAL.
- Monitor the BCM PID IGN_FINAL while pressing the ignition switch - push button start and the brake pedal.

Does the PID change from Off to Start when the ignition switch - push button start and brake pedal are pressed?

Yes	GO to B9
No	DIAGNOSE No power in ON. REFER to: Steering Wheel and Column Electrical Components (211-05 Steering Wheel and Column Electrical Components, Diagnosis and Testing).

B9 CHECK THE PCM (POWERTRAIN CONTROL MODULE) IN GEAR-TRANSMISSION IS APPLYING A LOAD TO ENGINE (IN_GEAR) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the PCM Parameter Identifications (PIDs).
- Monitor the PCM PID IN_GEAR, while placing the gear selector in PARK and then NEUTRAL.

Does the PID read No in both positions?

Yes	GO to B10
No	REFER to: Diagnostic Trouble Code (DTC) Charts and Pinpoint Tests - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (307-01B Automatic Transmission, Transfer Case and Power Transfer Unit - 10-Speed Automatic Transmission â€“ 10R140, Diagnosis and Testing).

B10 CHECK THE PCM (POWERTRAIN CONTROL MODULE) ENGINE CRANKING (ENG_CRANK) PID (PARAMETER IDENTIFICATION)

- Make sure the transmission is in PARK or NEUTRAL.
- Using a diagnostic scan tool, view the PCM Parameter Identifications (PIDs).
- Monitor the PCM PID ENG_CRANK while pressing the ignition switch - push button start and the brake pedal (with automatic transmission) or fully apply the clutch pedal (with manual transmission).

Does the PID change from Inactive to Active?

Yes	GO to B11
No	GO to B22

B11 CHECK THE BJB (BATTERY JUNCTION BOX) STARTER RELAY FUSE

- Verify the BJB fuse 24 (30A).

Was the fuse OK?

Yes	GO to B12
No	REPAIR the circuit for a short to ground.

B12 CHECK FOR START REQUEST AT THE STARTER

- Disconnect Starter solenoid C197A .
- While holding the key in the START position, measure:

STARTER MOTOR	

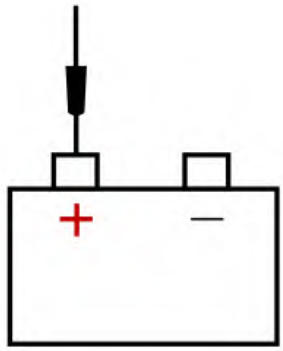
Positive Lead	Measurement / Action	Negative Lead
C197A-1 ("S" terminal)	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to B16
No	Connect Starter solenoid C197A and GO to B13

B13 CHECK THE STARTER MOTOR CONTROL OPERATION

- Disconnect BJB Relay Module C1035B .
- Connect a remote starter switch:

Positive Lead	Measurement / Action	Negative Lead
C1035C-49	Remote Starter Switch	 E148840

- Momentarily engage the remote starter switch.

Does the engine crank?

Yes	GO to B14
No	REPAIR circuit for open.

B14 CHECK THE PCM (POWERTRAIN CONTROL MODULE) STARTER RELAY CONTROL CIRCUITS FOR A SHORT TO VOLTAGE

- Connect BJB Relay Module C1035C .
- Disconnect PCM C175B .
- Ignition ON.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-44	V	Ground
C175B-78	V	Ground

Is any voltage present?

Yes	REPAIR the affected circuit.
No	GO to B15

B15 CHECK THE PCM (POWERTRAIN CONTROL MODULE) STARTER RELAY CONTROL CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect BJB Relay Module C1035B .
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-44	Ω	Ground
C175B-78	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to B16
No	REPAIR the affected circuit.

B16 CHECK THE STARTER MOTOR FOR CORRECT OPERATION

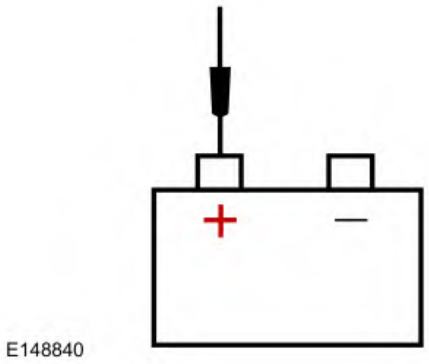
- Perform Starter Motor - Positive Circuit Test in this section.

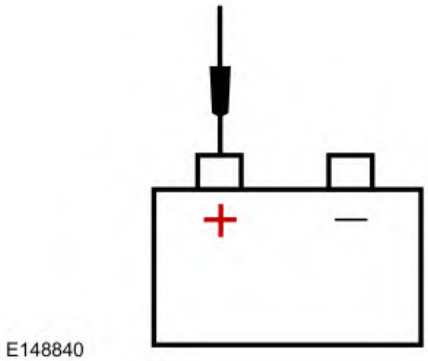
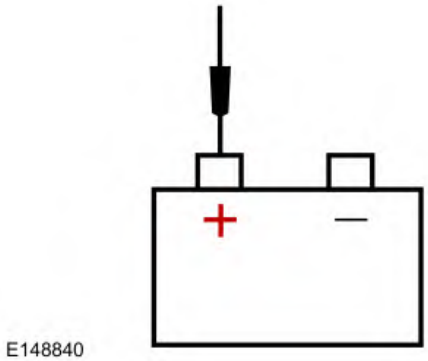
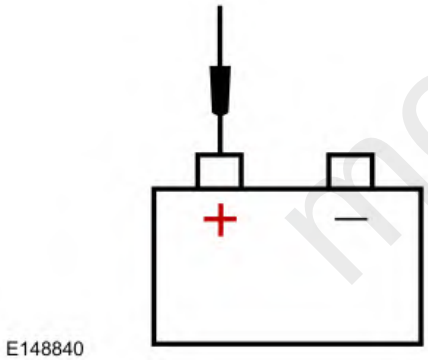
Was an obvious cause found?

Yes	Correct the cause as necessary.
No	GO to B17

B17 CHECK THE BATTERY GROUND CABLES

- Measure:

Positive Lead	Measurement / Action	Negative Lead
		Ground G100

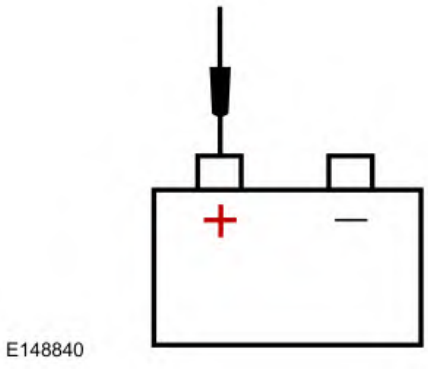
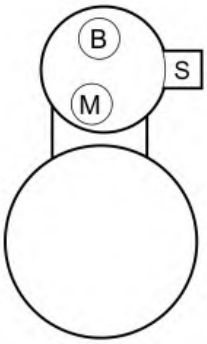
Positive Lead	Measurement / Action	Negative Lead
 E148840		Ground G101
 E148840		Ground G102
 E148840		Ground G103 (with dual batteries)

Are the voltages greater than 11 volts?

Yes	GO to B18
No	CLEAN or INSTALL new negative battery cables as necessary. REFER to: Battery Cables - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (414-01 Battery, Mounting and Cables, Removal and Installation).

B18 CHECK THE STARTER MOTOR GROUND

- Measure:

Positive Lead	Measurement / Action	Negative Lead
		 Starter motor case

Is the voltage greater than 11 volts?

Yes	GO to B19
No	CLEAN the starter motor mounting flange and MAKE SURE the starter motor is correctly mounted. REFER to: Starter Motor (303-06A Starting System - 6.2L V8, Removal and Installation).

B19 CHECK THE VOLTAGE TO THE STARTER MOTOR

- Measure:

STARTER MOTOR	

Positive Lead	Measurement / Action	Negative Lead
C197B-1 ("B" terminal)		Ground

Is the voltage greater than 11 volts?

Yes	GO to B20
No	INSTALL a new positive battery cable. REFER to: Battery Cables - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (414-01 Battery, Mounting and Cables, Removal and Installation).

B20 CHECK FOR START INPUT AT THE STARTER

- Connect BJB starter relay.
- Disconnect Starter solenoid C197A .
- While holding the key in the START position, measure:

STARTER MOTOR	

Positive Lead	Measurement / Action	Negative Lead
C197A-1 ("S" terminal)		Ground

Is the voltage greater than 11 volts?

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

B21 CHECK THE PCM (POWERTRAIN CONTROL MODULE) STARTER RELAY CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect BJB starter relay.
- Disconnect ACM C240A .
- Disconnect PCM C175B .
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-44	Ω	Ground
C175B-78	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to B22
No	REPAIR the affected circuit.

B22 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 OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (PCM).
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.

B23 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.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new BCM. 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 connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST C : UNUSUAL STARTER NOISE

Normal Operation and Fault Conditions

Correct starter operation relies on correct mounting of the starter to the engine, alignment of the starter ring gear to the flexplate and correct functioning of the starter assembly (internal gears, bearings).

Possible Sources

- Engine
- Starter motor
- Starter motor mounting

Visual Inspection and Pre-checks

- Inspect the starter motor.
- Inspect the starter motor mounting.

C1 CHECK THE STARTER MOUNTING

- Inspect the starter mounting bolts for looseness.

Is the starter motor mounted correctly?

Yes	GO to C2
No	INSTALL the starter motor correctly. REFER to: Starter Motor (303-06A Starting System - 6.2L V8, Removal and Installation).

C2 CHECK FOR STARTER NOISE

- Ignition OFF.
- Connect a remote starter switch between the starter solenoid C197B-1 ("B" terminal) and C197A-1 ("S" terminal).
- Engage the starter and verify the noise is due to starter operation.

Is the noise due to the starter engagement?

Yes	REFER to: Starter Motor Drive Gear and Flywheel Ring Gear Inspection (303-06A Starting System - 6.2L V8, General Procedures).
No	REFER to: Engine (303-00 Engine System - General Information, Diagnosis and Testing). to continue diagnosis.

PINPOINT TEST D : C113A:11, C113A:15

Refer to Wiring Diagrams Cell 23 for schematic and connector information.

Normal Operation and Fault Conditions

The wake-up control circuit wakes up the PCM prior to the engine cranking. The PCM needs to wake up prior to a crank request so it has time to go through its initialization. The wake-up control circuit is controlled by the BCM. The BCM activates the wake-up control circuit when the driver door is opened, the BCM detects a passive key, or when the Engine start button is pressed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
BCM C113A:11	Wakeup Control: Circuit Short To Ground	Set by the BCM when a short to ground is detected on the wake-up control circuit.
BCM C113A:15	Wakeup Control: Circuit Short To Battery Or Open	Set by the BCM when a short to voltage or an open is detected on the wake-up control circuit.

Possible Sources

- BCM
- PCM
- Wiring, terminals or connectors

D1 CHECK FOR BCM (BODY CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, perform the BCM self-test.

Is DTC C113A:11 present?

Yes	GO to D2
No	If DTC C113A:15 is present, GO to D4 For all other BCM Diagnostic Trouble Codes (DTCs), REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing).

D2 CHECK THE PCM (POWERTRAIN CONTROL MODULE) FOR A SHORT TO GROUND

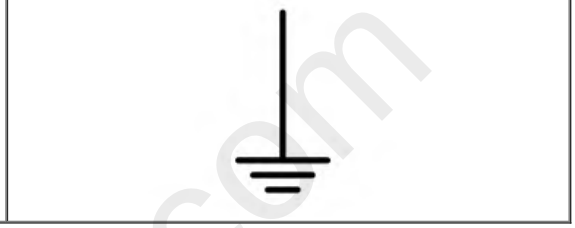
- Ignition OFF.
- Disconnect PCM C175B .
- Ignition ON.
- Using a diagnostic scan tool, clear the BCM Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform the BCM self-test.

Is BCM DTC C113A:11 present?

Yes	GO to D3
No	GO to D7

D3 CHECK THE PCM (POWERTRAIN CONTROL MODULE) WAKE-UP SIGNAL CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-7	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to D6
No	REPAIR the circuit.

D4 CHECK THE PCM (POWERTRAIN CONTROL MODULE) WAKE-UP SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect PCM C175B if necessary.
- Disconnect BCM C2280F .
- Ignition ON.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-7		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to D5

D5 CHECK THE PCM (POWERTRAIN CONTROL MODULE) WAKE-UP SIGNAL CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	BODY CONTROL MODULE (BCM)

Positive Lead	Measurement / Action	Negative Lead
C175B-7	Ω	C2280F-18

Is the resistance less than 3 ohms?

Yes	GO to D6
No	REPAIR the circuit.

D6 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.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new BCM. 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 connections. ADDRESS the root cause of any connector or pin issues.

D7 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 OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (PCM).
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.

PINPOINT TEST E : P2535 (WITHOUT PUSH BUTTON START)

Refer to Wiring Diagrams Cell 20 for schematic and connector information.

Normal Operation and Fault Conditions

When the ignition is turned to the START position the PCM receives a voltage signal on the crank detect circuit. The PCM then supplies voltage and ground to the starter relay coil when the required inputs have been received.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P2535:00	Ignition Switch On/Start Position Circuit High: No Sub Type Information	This DTC sets when the PCM detects voltage on the crank detect circuit while the engine is running.

Possible Sources

- BCM
- Ignition switch
- PCM
- Wiring, terminals or connectors

E1 CHECK THE CRANK DETECT CIRCUIT FOR A SHORT TO VOLTAGE WITH THE PCM (POWERTRAIN CONTROL MODULE) DISCONNECTED

- Ignition OFF.
- Disconnect PCM C175B .
- Ignition ON.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-22		Ground

Is any voltage present?

Yes	GO to E2
No	GO to E3

E2 CHECK THE CRANK DETECT CIRCUIT FOR A SHORT TO VOLTAGE WITH THE BCM (BODY CONTROL MODULE) DISCONNECTED

- Ignition OFF.
- Disconnect BCM C2280B .
- Ignition ON.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-22	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	INSTALL a new BCM. REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Removal and Installation).

E3 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 OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (PCM).
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.

PINPOINT TEST F : P2535 (WITH PUSH BUTTON START)

Refer to Wiring Diagrams Cell 20 for schematic and connector information.

Normal Operation and Fault Conditions

When the engine start/stop switch has been pressed, the PCM receives a voltage signal on the crank detect circuit. The PCM then supplies voltage and ground to the starter relay coil when the required inputs have been received.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P2535:00	Ignition Switch On/Start Position Circuit High: No Sub Type Information	This DTC sets when the PCM detects voltage on the crank detect circuit while the engine is running.

Possible Sources

- BCM
- Ignition switch - Push Button Start
- PCM
- Wiring, terminals or connectors

F1 CHECK THE CRANK DETECT CIRCUIT FOR A SHORT TO VOLTAGE WITH THE PCM (POWERTRAIN CONTROL MODULE) DISCONNECTED

- Ignition OFF.
- Disconnect PCM C175B .
- Ignition ON.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-22		Ground

Is any voltage present?

Yes	GO to F2
No	GO to F3

F2 CHECK THE CRANK DETECT CIRCUIT FOR A SHORT TO VOLTAGE WITH THE BCM (BODY CONTROL MODULE) DISCONNECTED

- Ignition OFF.
- Disconnect BCM C2280B .
- Ignition ON.
- Measure:

POWERTRAIN CONTROL MODULE (PCM)	

Positive Lead	Measurement / Action	Negative Lead
C175B-22		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	INSTALL a new BCM. REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Removal and Installation).

F3 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 OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (PCM).
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.

PINPOINT TEST G : DTC P06E4

Refer to Wiring Diagrams Cell 25 for schematic and connector information.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P06E4:00	Control Module Wake-up Circuit Performance: No Sub Type Information	This DTC sets when the PCM detects control module Wake-up circuit performance.

Possible Sources

- PCM
- Wiring, terminals or connectors

G1 RETRIEVE DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, perform PCM self-tests.

Is DTC P06E4 recorded?

Yes	RETRIEVE and RECORD all CMDTCs. If BCM DTC C113A:11 or C113A:15 is found, GO to Pinpoint Test D. Clear all Diagnostic Trouble Codes (DTCs). RERUN the PCM self-test. If the DTC returns, CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 6.2L V8, Removal and Installation).
No	The repair is completed.

PINPOINT TEST H : DTC P162F

Refer to Wiring Diagrams Cell 25 for schematic and connector information.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P162F:00	Starter Motor Disabled - Engine Crank Time Too Long: No Sub Type Information	This DTC sets when the PCM detects Engine Crank Time Too Long.

Possible Sources

- PCM
- Wiring, terminals or connectors

H1 RETRIEVE DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, perform PCM self-tests.

Is DTC P162F recorded?

Yes	This DTC sets in the PCM when the engine has been cranked for more than a total of 60 seconds without allowing sufficient time for the starter to cool. Diagnose all other DTCs and symptoms. Check the charging system voltage and correct as necessary. Clear the DTC
No	The repair is completed.

Component Test(s)

Starter Motor - Positive Circuit Test

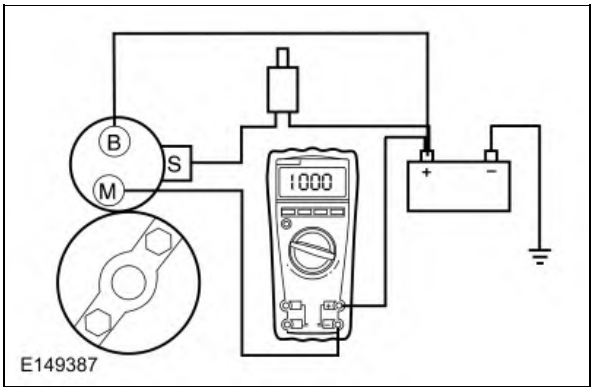
NOTE: *Always make the multimeter connection at the component terminal rather than at the wiring end of the connector. Making a connection at the wiring end of the connector could result in false readings because the meter will not pick up a high resistance between the wiring connector and component.*

1. Make sure the battery is fully charged.
   REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

2. Perform a battery drain test.
   REFER to: Battery Drain Check (414-01 Battery, Mounting and Cables, General Procedures).

3. Connect a remote starter switch between starter solenoid â€œSâ€ terminal and the battery positive terminal.

4. Connect the multimeter positive lead to the battery positive post. Connect the negative lead to the starter solenoid "M" terminal.



5. Place gear selector lever in Park or Neutral.

6. Engage the remote starter switch. Read and record the voltage. The voltage reading should be 0.5 volt or less.

7. If the voltage reading is 0.5 volt or less, perform Starter Motor - Ground Circuit Test in this section.

8. A voltage reading greater than 0.5 volt is an indication of excessive resistance in the connections, the positive battery cable or in the starter solenoid. Remove the cables from the solenoid "B", "S" and "M" terminals. Clean the cables and connections and reinstall the cables to the correct terminals. Repeat Steps 3 through 6.

9. If the voltage reading is still greater than 0.5 volt when checked at the "M" terminal, move the multimeter negative lead to the starter solenoid â€œBâ€ terminal.

10. With the gear selector lever in Park or Neutral, engage the remote starter switch. Read and record the voltage.

11. If the voltage reading at the "B" terminal is lower than 0.5 volt, the concern is in the connections at the starter solenoid or in the solenoid contacts. Install a new starter motor.
    REFER to: Starter Motor (303-06A Starting System - 6.2L V8, Removal and Installation).

12. If the voltage reading taken at the solenoid "B" terminal is greater than 0.5 volt after cleaning the cables and connections at the solenoid, the concern is in the positive battery cable connection or in the positive battery cable itself. Clean the positive battery cable connection. If this does not resolve the concern, install a new positive battery cable.
    REFER to: Battery Cables - 6.2L V8 (414-01 Battery, Mounting and Cables, Removal and Installation).

Starter Motor - Ground Circuit Test

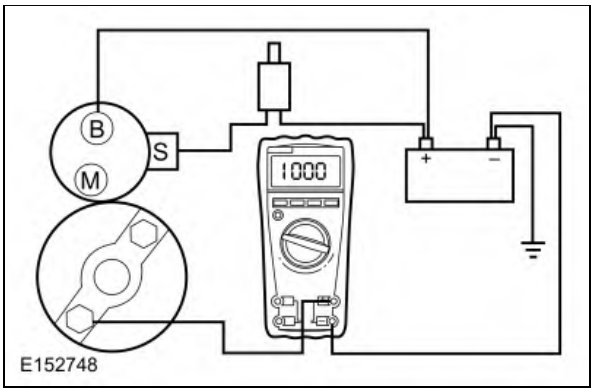
A slow cranking condition can be caused by resistance in the ground or return portion of the cranking circuit. This procedure checks the voltage drop in the ground circuit.

1. Connect a remote starter switch between starter solenoid "S" terminal and the battery positive terminal.

2. Connect the multimeter positive lead to the starter motor housing (the connection must be clean and free of rust or grease). Connect the negative lead to the negative battery terminal.

3. Place gear selector lever in Park or Neutral.

4. Engage the remote starter switch and crank the engine. Read and record the voltage reading. The reading should be 0.5 volt or less.



5. If the voltage reading is greater than 0.5 volt, clean the negative cable connections at the battery, the body ground connections and the starter ground connection. Retest.

6. If the voltage reading is greater than 0.5 volt, install a new negative battery cable.
   REFER to: Battery Cables - 6.2L V8 (414-01 Battery, Mounting and Cables, Removal and Installation).

7. If the voltage reading is less than 0.5 volt and the engine still cranks slowly, install a new starter motor.
   REFER to: Starter Motor (303-06A Starting System - 6.2L V8, Removal and Installation).