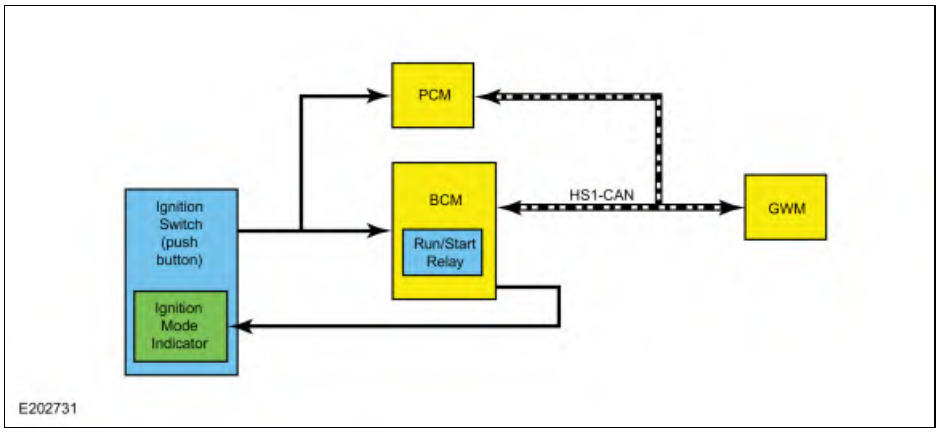


Item	Description
1	HS-CAN1
2	Ignition switch (push button)
3	GWM
4	PCM
5	Ignition mode indicator
6	BCM
7	Run/Start relay

Network Message Chart - Push Button Ignition Switch

GWM Module Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Ignition status	BCM	Informs the GWM of the current ignition status; off, run, start, unknown or invalid.

PCM Module Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Ignition status	BCM	Informs the PCM of the current ignition status; off, run, start, unknown or invalid.

Push Button Ignition Switch

The push button ignition switch controls the ignition mode.

There are 2 circuits the BCM monitors from the push button ignition switch to change the ignition mode. One circuit is monitored for voltage and the other for a ground signal. When the START/STOP button is pressed, one circuit routes battery voltage to the BCM while a voltage signal from the BCM on the second circuit is routed to ground, indicating a request to change the ignition mode. Changing the ignition mode out of OFF works in conjunction with the PATS. The BCM must recognize a valid programmed key before it changes the ignition mode out of OFF.
Refer to: Steering Wheel and Column Electrical Components - System Operation and Component Description (211-05 Steering Wheel and Column Electrical Components, Description and Operation).

Refer to the following table for information about achieving the various ignition modes.

Ignition Entry Condition	Desired Ignition Mode	Action To Take

Ignition Entry Condition	Desired Ignition Mode	Action To Take
Off	ON (engine off)	Press the START/STOP button without applying the brake pedal.
Off or on	START	Apply the brake pedal and then press the START/STOP button.
On (engine off)	OFF	Press the START/STOP button.
On (engine running)	OFF	Press and hold the START/STOP button.

Ignition Mode LED Indicator

The ignition mode LED indicates the ignition mode of the vehicle. The BCM controls the voltage to the ignition mode LED indicator. Refer to the following table.

Ignition Mode	Ignition Mode LED Indicator
Off	Off
On (engine off)	Flashing
On (engine running)	On

OFF

The BCM controls the relays providing voltage to the vehicle electrical systems. When the ignition is in the ON mode, a single press and release of the START/STOP button (without applying the brake pedal) changes the ignition to the OFF mode. No programmed key is required to change the ignition to the OFF mode when the vehicle is running.

If the vehicle is in motion, a momentary press of the START/STOP button does not shut the vehicle off. If the vehicle is moving at a speed greater than 15 km/h (9 mph), the START/STOP button must be pressed and held for longer than one second (or pressed 3 times within 2 seconds) to turn the ignition off.

When the BCM changes the ignition mode to OFF, it communicates the ignition mode to the other modules by sending an ignition status message over the CAN.

ON

When the ignition is in the ON mode, the BCM activates the run/start relay to provide voltage to the vehicle electrical systems and communicates the ignition mode to the other modules by sending an ignition status message over the CAN.

When the vehicle enters ON mode, multiple indicators in the IPC prove out and the IPC displays the gear selection and the vehicle mileage.

START

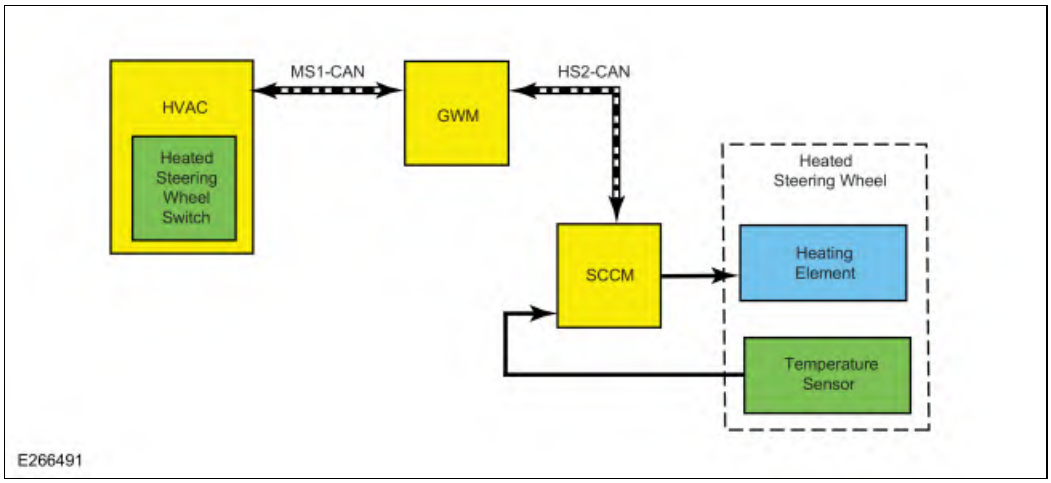
If the brake pedal is applied when the START/STOP button is pressed, and a valid key is detected within the vehicle, the vehicle temporarily goes into the START mode.

In addition to activating the run/start relay, the BCM communicates the ignition mode to the other modules by sending an ignition status message over the CAN.

After the ignition has completed the vehicle start sequence, the ignition mode returns to ON and the ignition mode indicator in the ignition switch illuminates steadily.

The engine can be started from any ignition mode.

System Diagram - Heated Steering Wheel



Item	Description
1	Heated steering wheel
2	SCCM
3	GWM
4	Temperature sensor
5	Heating element
6	HS-CAN2
7	HVAC
8	Heated steering wheel switch
9	MS-CAN

Network Message Chart - Heated Steering Wheel

SCCMNetwork Input Messages

Broadcast Message	Originating Module	Message Purpose
Engine power status	PCM	Indicates to the SCCMwhether the engine is running.
Ignition status	BCM	Indicates which ignition mode is active.
Steering wheel heat request	FCIM	To activate the heated steering wheel function when the touchscreen button is pressed on the FDIM, or when the conditions are met to activate the heated steering wheel (and heated seats) during a remote start.

FCIM Module Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Heated steering wheel command status	APIM	Informs the FCIM that the heated steering wheel touchscreen button was pressed on the FDIM.
Ambient exterior temperature data	IPC	Used by the FCIM when determining if outside conditions are cold enough to request the heated steering wheel be activated during remote start operation.

Heated Steering Wheel

When the engine is running and the SCCM receives a request to heat the steering wheel, the SCCM applies voltage and ground to the steering wheel heating elements (integral to the steering wheel) to heat the steering wheel to a temperature of approximately 82-94Â°F (28-34Â°C). The heated steering wheel temperature is maintained by the SCCM using a temperature sensor in the steering wheel.

The SCCM is designed to remain on, heating the steering wheel and maintaining the temperature until switched off on the FDIM or the ignition is turned off.

The controls and indicators for the heated steering wheel system are located on the FDIM (touchscreen) only. The FDIM does not communicate on any network and is connected directly to the APIM.

Remote Start System

The heated steering wheel system (along with the heated front seats) may be configured using the message center to activate (based on outside temperature) when the remote start feature is used. During remote start, the outside air temperature is continually monitored by the HVAC system. The heated steering wheel system activation changes if the outside air changes from cold to moderate or warm temperatures or back from moderate or warm to cold temperatures.

Component Description

Conventional Ignition Switch

The ignition switch is a multiple position rotary switch that is controlled by a lock cylinder and a key. The ignition switch is monitored by the BCM, which controls the voltage to the various electrical systems depending on input from the ignition switch.

The key removal inhibit solenoid (internal to the ignition switch) is an electronically controlled solenoid that prevents the ignition lock cylinder from being turned to the OFF/LOCK position unless the selector lever is in the PARK position. This also prevents the key from being removed from the ignition lock cylinder.

Push Button Ignition Switch

The push button ignition switch is a momentary dual contact switch that provides direct input to the BCM and PCM. Both sets of contacts are normally open. When the START/STOP button is pressed, one set of contacts provides a ground signal to the BCM and the other set of contacts supplies voltage to the BCM and the PCM.

The ignition mode LED indicator is located near the top of the START/STOP button and is controlled by the BCM.

Steering Column Control Module

The SCCM controls the steering wheel heating elements. The SCCM uses the steering wheel temperature sensor to maintain the steering wheel temperature. The SCCM is designed to remain on, heating the steering wheel and maintaining temperature until switched off using the FDIM or the ignition is turned off.

The SCCM requires PMI when replaced.

Body Control Module

The BCM controls the run/start relays and sets the vehicle ignition mode based on inputs from the ignition switch. It communicates the ignition mode to other modules over the CAN. If a fault is detected with the ignition switch system, Diagnostic Trouble Codes (DTCs) are set in the BCM.

The BCM requires at least 2 keys to be programmed and PMI when replaced. Additionally, the parameter reset procedure must be carried out.

Diagnosis and Testing

Steering Wheel and Column Electrical Components

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	B108A:01	Start Button: General Electrical Failure	GO to Pinpoint Test H
BCM	B108A:24	Start Button: Signal Stuck High	GO to Pinpoint Test H
BCM	B10F1:14	Key In Circuit: Circuit Short To Ground or Open	GO to Pinpoint Test G
BCM	B1142:29	Ignition Status 1: Signal Invalid	GO to Pinpoint Test C
BCM	B1142:29	Ignition Status 1: Signal Invalid	GO to Pinpoint Test H
BCM	B1240:11	Start Button Mode Indicator: Circuit Short to Ground	GO to Pinpoint Test I
BCM	B1240:15	Start Button Mode Indicator: Circuit Short to Battery or Open	GO to Pinpoint Test J
BCM	B1310:12	Run/Start Control: Circuit Short to Battery	GO to Pinpoint Test C
BCM	B1310:12	Run/Start Control: Circuit Short to Battery	GO to Pinpoint Test H
BCM	B1310:14	Run/Start Control: Circuit Short to Ground or Open	GO to Pinpoint Test C
BCM	B1310:14	Run/Start Control: Circuit Short to Ground or Open	GO to Pinpoint Test H
BCM	B1472:12	Ignition Key Removal Inhibit: Circuit Short To Battery	GO to Pinpoint Test F
BCM	B1472:14	Ignition Key Removal Inhibit: Circuit Short To Ground or Open	GO to Pinpoint Test F
BCM	U300A:01	Ignition Switch: General Electrical Failure	GO to Pinpoint Test L
PCM	P2534:00	Ignition Switch Run/Start Position Circuit Low: No Sub Type Information	• For Conventional Ignition Switch: GO to Pinpoint Test D • For Push Button Ignition Switch: GO to Pinpoint Test H
PCM	P2535:00	Ignition Switch Run/Start Position Circuit High: No Sub Type Information	• For Conventional Ignition Switch: GO to Pinpoint Test D • For Push Button Ignition Switch: GO to Pinpoint Test H
SCCM	B112B:04	SCCM: Steering Wheel Module: System Internal Failure	GO to Pinpoint Test Q
SCCM	B112B:44	SCCM: Steering Wheel Module: Data Memory Failure	GO to Pinpoint Test Q
SCCM	B112B:45	SCCM: Steering Wheel Module: Program Memory Failure	GO to Pinpoint Test Q
SCCM	B112B:46	SCCM: Steering Wheel Module: Calibration / Parameter Memory Failure	GO to Pinpoint Test Q
SCCM	B112B:49	SCCM: Steering Wheel Module: Internal Electronic Failure	GO to Pinpoint Test Q
SCCM	B135C:11	Heater Element: Circuit Short To Ground	GO to Pinpoint Test O