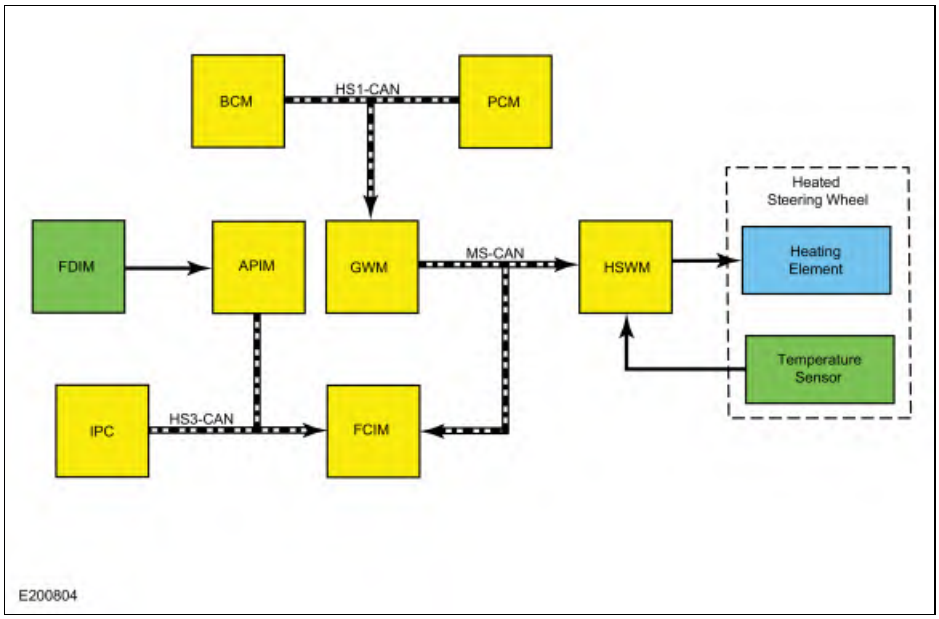
The engine can be started from any ignition mode.

System Diagram - Heated Steering Wheel (vehicles not equipped with adaptive steering)



Item	Description
1	MS-CAN
2	HS3-CAN
3	HS1-CAN
4	FDIM
5	FCIM
6	APIM
7	IPC
8	HSWM
9	GWM
10	BCM
11	PCM
12	Temperature Sensor
13	Heated Steering Wheel
14	Heating Element

Network Message Chart - Heated Steering Wheel

HSWM Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Engine power status	PCM	This message indicates to the HSWM whether the engine is running.
Ignition status	BCM	Indicates which ignition mode is active.
Steering wheel heat request	FCIM	Message is used 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	This message informs the FCIM that the heated steering wheel touchscreen button was pressed on the FDIM.
Ambient exterior temperature data	IPC	This message is 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 HSWM receives a request to heat the steering wheel, the HSWM 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 28-34Â°C (82-94Â°F). The heated steering wheel temperature is maintained by the HSWM using a temperature sensor in the steering wheel.

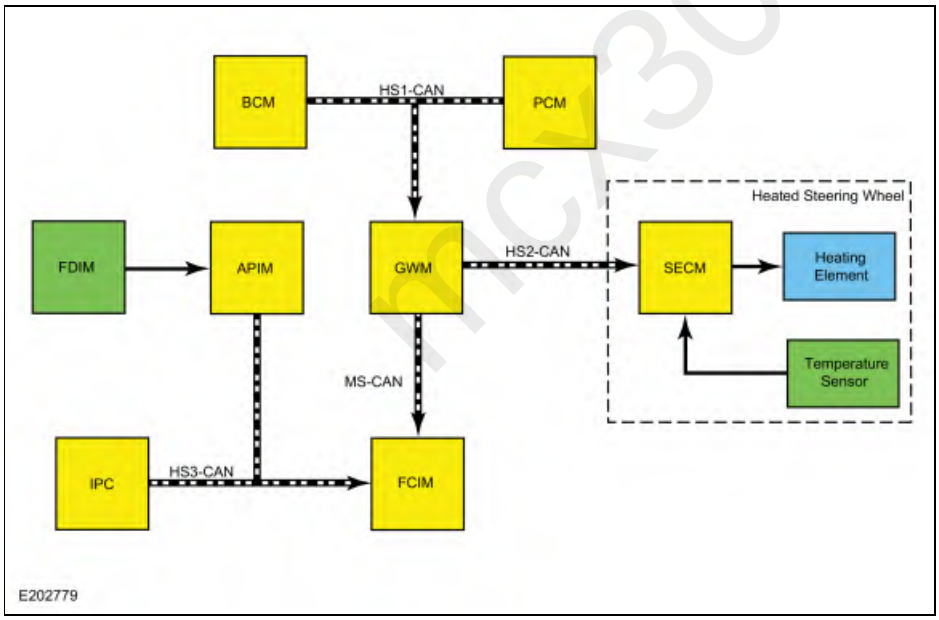
The HSWM is designed to remain on, heating the steering wheel and maintaining the temperature until switched off on the FDIM or the ignition is turned off.

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 when the remote start feature is used, based on outside air temperature. 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.

System Diagram - Heated Steering Wheel (vehicles equipped with active steering)



Item	Description
1	MS-CAN
2	HS3-CAN
3	HS1-CAN
4	HS2-CAN
5	FDIM
6	FCIM
7	APIM
8	IPC

9	SECM
10	Heated Steering Wheel
11	BCM
12	PCM
13	Temperature Sensor
14	Heating Element
15	GWM

Network Message Chart - Heated Steering Wheel

SECM Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Engine power status	PCM	This message indicates to the HSWM whether the engine is running.
Ignition status	BCM	Indicates which ignition mode is active.
Steering wheel heat request	FCIM	Message is used 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	This message informs the FCIM that the heated steering wheel touchscreen button was pressed on the FDIM.
Ambient exterior temperature data	IPC	This message is 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 SECM receives a request to heat the steering wheel and the engine is running, the SECM 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 28-34Â°C (82-94Â°F). The heated steering wheel temperature is maintained by the SECM using a temperature sensor in the steering wheel.

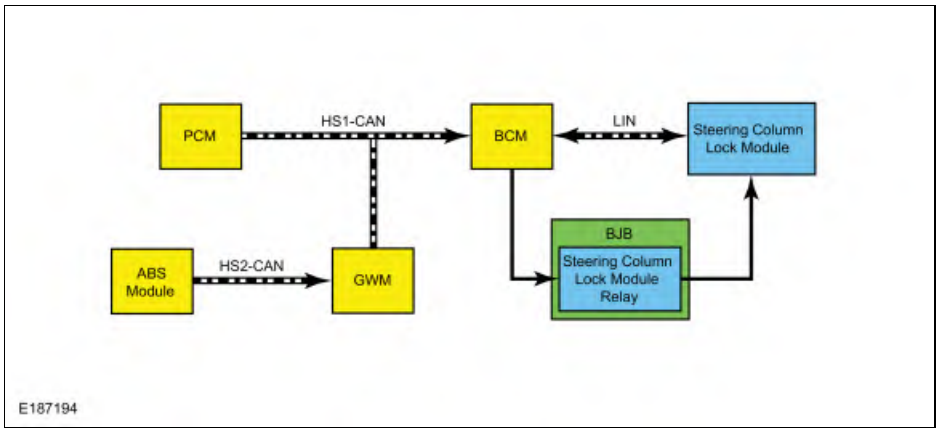
The SECM is designed to remain on, heating the steering wheel and maintaining the temperature until switched off on the FDIM or the ignition is turned off.

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 when the remote start feature is used, based on outside air temperature. 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.

System Diagram - Steering Column Lock (if equipped)



Item	Description
1	HS1-CAN
2	LIN
3	HS2-CAN
4	BCM
5	PCM
6	Steering Column Lock Module
7	BJB
8	Steering Column Lock Module Relay
9	ABS Module
10	GWM

Network Message Chart - Steering Column Lock (if equipped)

BCM Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Engine rpm data	PCM	Provides the BCM with the engine speed to indicate if the engine is running or not.
Wheel rotation count	ABS module	Provides the BCM with the vehicle speed to indicate if the vehicle is moving or stationary.

Steering Column Lock (if equipped)

The steering column lock is used to deter vehicle theft by electronically locking the steering column. This prevents the steering wheel from being rotated to turn the front wheels.

The steering column unlocks when:

- the passive entry feature is used to open the driver door.
- the driver door is opened after unlocking the vehicle with a RKE transmitter.
- the START/STOP button is pressed and a valid programmed passive key is detected.
- the remote start feature is activated.

The steering column locks after:

- the ignition is turned off and 45 seconds have elapsed since the delayed accessory feature has turned off.
- 45 seconds have elapsed since the remote feature turned off the vehicle.

The BCM controls the voltage provided to the steering column lock module using a relay (located in the BJB) and communicates with it over a LIN. The BCM monitors inputs from various systems to determine when to send a command to lock or unlock the steering column. The steering column lock module locks and unlocks the steering column as directed by commands received from the BCM.

If the BCM detects a fault from the steering column lock module or the LIN, the BCM prevents the vehicle from starting.

The BCM does not provide power to the steering column lock module when the vehicle is moving or the engine is running.

Steering Column Lock Messages (if equipped)

The message center displays a message when the BCM detects a fault from the steering column lock module.

The "Steering Malfunction" message displays when a fault with the electronic steering column lock system is present and must be diagnosed.

The "Turn the wheel while starting" message displays when the steering column lock module is unable to unlock the steering column because of a high amount of torque against the lock (such as when the wheels are against a curb when the vehicle is shut off). The torque against the steering column lock must be relieved for the steering column to unlock.

Turn the vehicle off, rotate and hold the steering wheel in one direction while turning the vehicle on. If the message displays again, turn the vehicle off, rotate and hold the steering wheel in the other direction while turning the vehicle on.

Component Description

Left Multifunction Switch

The left multifunction switch is a multiple position switch controlled by a lever. The left multifunction switch is used to control the turn signal, the low/high beam headlamps and the flash-to-pass functions.

Right Multifunction Switch

The right multifunction switch is a multiple position switch controlled by a lever. The right multifunction switch is used to control the front windshield wipers, rear window wiper and window washer functions.

Steering Wheel Switches

The steering wheel switches are comprised of an upper and lower switch cluster mounted on each side of the steering wheel, facing the driver. The switches can be serviced separately from the steering wheel.

The left upper switch cluster controls the message center display.

The left lower switch cluster controls the cruise control system.

The right upper switch cluster controls the audio system.

The right lower switch cluster controls the SYNCÂ® system.

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.

Heated Steering Wheel (vehicles not equipped with adaptive steering)

The steering wheel heater element is part of the steering wheel and cannot be serviced separately. The HSWM uses the steering wheel heater element to heat the steering wheel.

The steering wheel temperature sensor is part of the steering wheel and cannot be serviced separately. The HSWM uses the steering wheel temperature sensor to monitor the steering wheel temperature.

HSWM (vehicles not equipped with active steering)

The HSWM controls the steering wheel heating elements. The HSWM uses the steering wheel temperature sensor to maintain the steering wheel temperature. The HSWM 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 HSWM requires PMI when replaced.

Steering Effort Control Module (SECM) (vehicles equipped with active steering)

The SECM controls the steering wheel heating elements. The SECM uses the steering wheel temperature sensor to maintain the steering wheel temperature. The SECM 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 SECM cannot be serviced independently. It is only replaced as an assembly with the steering wheel.

The SECM requires PMI when replaced.

BCM

The BCM controls the run/start relays and sets the vehicle ignition mode based on inputs from the ignition switch, or push button 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.

Steering Column Lock Module (if equipped)

The steering column lock module locks and unlocks the steering column based on commands received from the BCM. The steering column lock module monitors the position of the steering column lock and, if a fault is detected, reports the failure to the BCM.

When the steering column lock module is replaced, the BCM must configured/trained to the new steering column lock module for the steering column lock module to operate correctly.

The BCM sets a DTC if a fault is detected with the steering column lock module. Additionally, if the BCM is not configured to the steering column lock module, the steering column module keeps the column locked, a programming and/or configuration DTC sets and the vehicle does not start.
To configure the BCM to the steering column lock module,
Refer to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).

Diagnosis and Testing

Steering Wheel and Column Electrical Components

DTC Charts

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).

BCM DTC Chart

DTC	Description	Action
B1026:04	Steering Column Lock: System Internal Failure	DIAGNOSE all other Diagnostic Trouble Codes (DTCs) present. If no other Diagnostic Trouble Codes (DTCs) are present, INSTALL a new steering column lock module. REFER to: Steering Column Lock Module (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). CARRY OUT the BCM to ESCL (Electronic Steering Column Lock Training) procedure. REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).
B1026:05	Steering Column Lock: System Programming Failure	CARRY OUT the BCM to ESCL (Electronic Steering Column Lock Training) procedure. REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).
B1026:09	Steering Column Lock: Component Failure	INSTALL a new steering column lock module. REFER to: Steering Column Lock Module (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). CARRY OUT the BCM to ESCL (Electronic Steering Column Lock Training) procedure. REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).
B1026:49	Steering Column Lock: Internal Electronic Failure	INSTALL a new steering column lock module. REFER to: Steering Column Lock Module (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). CARRY OUT the BCM to ESCL (Electronic Steering Column Lock Training) procedure. REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).
B1026:51	Steering Column Lock: Not Programmed	CARRY OUT the BCM to ESCL (Electronic Steering Column Lock Training) procedure. REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).
B1026:56	Steering Column Lock: Invalid / Incompatible Configuration	CARRY OUT the BCM to ESCL (Electronic Steering Column Lock Training) procedure. REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).
B1026:77	Steering Column Lock: Commanded Position Not Reachable	INSTALL a new steering column lock module. REFER to: Steering Column Lock Module (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). CARRY OUT the BCM to ESCL (Electronic Steering Column Lock Training) procedure. REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).
B1026:87	Steering Column Lock: Missing Message	GO to Pinpoint Test M
B1026:92	Steering Column Lock: Performance or Incorrect Operation	GO to Pinpoint Test M
B1026:93	Steering Column Lock: No Operation	DIAGNOSE all other Diagnostic Trouble Codes (DTCs) present. If no other Diagnostic Trouble Codes (DTCs) are present, INSTALL a new steering column lock module. REFER to: Steering Column Lock Module (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). CARRY OUT the BCM to ESCL (Electronic Steering Column Lock Training) procedure. REFER to: Anti-Theft Key Programming - Scan Tool (419-01B Passive Anti-Theft System (PATS) - Vehicles With: Keyless Vehicle System, General Procedures).