

U0405:64	Invalid Data Received From Cruise Control Module: Signal Plausibility Failure	This continuous memory DTC can set due to a fault in the CCM or an input to the CCM. RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the CCM. REFER to: Cruise Control (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Diagnosis and Testing). REFER to: Cruise Control (419-03A Cruise Control, Diagnosis and Testing). If no Diagnostic Trouble Codes (DTCs) are present in the CCM, DIAGNOSE the observable symptom.
U0418:86	Invalid Data Received from Brake System Control Module "A": Signal Invalid	This continuous memory DTC can set due to a fault in the ABS or an input to the CCM. RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the ABS. REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing). If no Diagnostic Trouble Codes (DTCs) are present in the ABS, DIAGNOSE the observable symptom.
U0419:86	Invalid Data Received From Steering Effort Control Module: Signal Invalid	This DTC sets when the CCM receives invalid network data from the SCCM with a faulted cruise control switch input. RETRIEVE and REPAIR all non-network Diagnostic Trouble Codes (DTCs) in the other modules on the network.
U0420:86	Invalid Data Received From Power Steering Control Module: Signal Invalid	This continuous memory DTC can set due to a fault in the PSCM or an input to the BCM. RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the PSCM. REFER to: Power Steering (211-02 Power Steering, Diagnosis and Testing). If no Diagnostic Trouble Codes (DTCs) are present in the PSCM, DIAGNOSE the observable symptom.
U0422:82	Invalid Data Received From Body Control Module: Alive / Sequence Counter Incorrect/Not Updated	This continuous memory DTC can set due to a fault in the BCM or an input to the BCM. RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the BCM. REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing). If no Diagnostic Trouble Codes (DTCs) are present in the BCM, DIAGNOSE the observable symptom.
U0423:82	Invalid Data Received from Instrument Panel Cluster Control Module: Alive / Sequence Counter Incorrect/Not Updated	This continuous memory DTC can set due to a fault in the IPC or an input to the IPC. RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the IPC. REFER to: Instrumentation, Message Center and Warning Chimes (413-01 Instrumentation, Message Center and Warning Chimes, Diagnosis and Testing). If no Diagnostic Trouble Codes (DTCs) are present in the IPC, DIAGNOSE the observable symptom.
U0423:86	Invalid Data Received from Instrument Panel Cluster Control Module: Signal Invalid	This continuous memory DTC can set due to a fault in the IPC or an input to the IPC. RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the IPC. REFER to: Instrumentation, Message Center and Warning Chimes (413-01 Instrumentation, Message Center and Warning Chimes, Diagnosis and Testing). If no Diagnostic Trouble Codes (DTCs) are present in the IPC, DIAGNOSE the observable symptom.
U0429:86	Invalid Data Received From Steering Column Control Module: Signal Invalid	This continuous memory DTC can set due to a fault in the SCCM or an input to the SCCM. RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the SCCM. REFER to: Steering Wheel and Column Electrical Components (211-05 Steering Wheel and Column Electrical Components, Diagnosis and Testing). If no Diagnostic Trouble Codes (DTCs) are present in the SCCM, DIAGNOSE the observable symptom.
U0452:86	Invalid Data Received From Restraints Control Module: Signal Invalid	This continuous memory DTC can set due to a fault in the RCM or an input to the RCM. RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the RCM. REFER to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing). If no Diagnostic Trouble Codes (DTCs) are present in the RCM, DIAGNOSE the observable symptom.
U1000:11	Solid State Driver Protection Activated: Circuit Short To Ground	A continuous memory DTC that set in the IPMA when the IPMA has temporarily disabled the camera windshield heater defroster output because an excessive current draw exists (such as a short to ground). The IPMA cannot enable the output driver until the short is corrected. ADDRESS all other IPMA Diagnostic Trouble Codes (DTCs) first. After the cause of the concern is corrected, CLEAR the Diagnostic Trouble Codes (DTCs) and REPEAT the IPMA self-test to enable the output driver.
U2018:51	Control Module Software #3: Not Programmed	CHECK the vehicle service history for recent service actions related to this module. This continuous memory DTC can set due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, INSTALL As-Built data from Professional Technician Society (PTS), following the diagnostic scan tool instructions under Module Programming>As-Built. REFER to: Module Configuration - System Operation and Component Description (418-01 Module Configuration, Description and Operation). If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).

U2100:00	Initial Configuration Not Complete: No Sub Type Information	CHECK the vehicle service history for recent service actions related to this module. This continuous memory DTC can set due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, INSTALL As-Built data from Professional Technician Society (PTS), following the diagnostic scan tool instructions under Module Programming>As-Built. REFER to: Module Configuration - System Operation and Component Description (418-01 Module Configuration, Description and Operation). If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to: Interior Rear View Mirror (501-09 Rear View Mirrors, Removal and Installation).
U2101:64	Control Module Configuration Incompatible: Signal Plausibility Failure	CHECK the vehicle service history for recent service actions related to this module. This continuous memory DTC can set due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, INSTALL As-Built data from Professional Technician Society (PTS), following the diagnostic scan tool instructions under Module Programming>As-Built. REFER to: Module Configuration - System Operation and Component Description (418-01 Module Configuration, Description and Operation). If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
U2300:55	Central Configuration: Not Configured	CHECK the vehicle service history for recent service actions related to this module. This continuous memory DTC can set due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, INSTALL As-Built data from Professional Technician Society (PTS), following the diagnostic scan tool instructions under Module Programming>As-Built. REFER to: Module Configuration - System Operation and Component Description (418-01 Module Configuration, Description and Operation). If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
U2300:64	Central Configuration: Signal Plausibility Failure	CHECK the vehicle service history for recent service actions related to this module. This continuous memory DTC can set due to incomplete or incorrect PMI procedures. If there have been recent service actions with this module, INSTALL As-Built data from Professional Technician Society (PTS), following the diagnostic scan tool instructions under Module Programming>As-Built. REFER to: Module Configuration - System Operation and Component Description (418-01 Module Configuration, Description and Operation). If there have been no recent service actions, INSTALL a new module to correct the failure to retain configuration data. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
U3000:41	Control Module: General Checksum Failure	This DTC sets when the IPMA detects the IPMA is not configured correctly. CARRY OUT the PMI procedure (when the original module is not available) for the module in question as directed by the diagnostic scan tool. REFER to: Module Configuration - System Operation and Component Description (418-01 Module Configuration, Description and Operation).
U3000:42	Control Module: General Memory Failure	• ADDRESS all other IPMA Diagnostic Trouble Codes (DTCs) first. If this continuous memory DTC is still present after all other Diagnostic Trouble Codes (DTCs) have been addressed, ▪ INSTALL a new IPMA. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
U3000:44	Control Module: Data Memory Failure	ADDRESS all other IPMA Diagnostic Trouble Codes (DTCs) first. If this continuous memory DTC is still present after all other Diagnostic Trouble Codes (DTCs) have been addressed, INSTALL a new IPMA. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
U3000:49	Control Module: Internal Electronic Failure	• The IPMA has permanently disabled an output because an excessive current draw has occurred more times than the module can withstand. ADDRESS all other IPMA Diagnostic Trouble Codes (DTCs). If this continuous memory DTC is still present after all other IPMA Diagnostic Trouble Codes (DTCs) have been addressed, ▪ INSTALL a new IPMA. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).

U3000:64	Control Module: Signal Plausibility Failure	This DTC sets when the IPMA detects the IPMA is not configured correctly. CARRY OUT the PMI procedure (when the original module is not available) for the module in question as directed by the diagnostic scan tool. REFER to: Module Configuration - System Operation and Component Description (418-01 Module Configuration, Description and Operation).
U3003:16	Battery Voltage: Circuit Voltage Below Threshold	GO to Pinpoint Test N
U3003:17	Battery Voltage: Circuit Voltage Above Threshold	GO to Pinpoint Test O

Symptom Chart(s)

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).

Condition	Possible Sources	Action <i>New: hover over Pinpoint Test links to show title</i>
A module does not communicate with the diagnostic scan tool	• Fuse • Wiring, terminals or connectors • Module	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
The lane keeping aid or lane keeping alert does not turn on or activate	REFER to the Pinpoint Test	GO to Pinpoint Test A
The lane keeping aid or lane keeping alert does not provide driver feedback once activated	REFER to the Pinpoint Test	GO to Pinpoint Test B
The display lines in the IPC do not turn green after the Lane Keeping System (LKS) is turned on	Road conditions	NOTE: <i>The display lines are gray when the IPMA cannot detect lane marking(s) on the road in front of the vehicle.</i> VERIFY the road conditions described under System Display. REFER to: Lane Keeping System - Component Location (419-07 Lane Keeping System, Description and Operation).
The lane keeping aid or lane keeping alert provides early feedback on one side of the lane and late feedback on the other side of the lane	Dirty or cracked windshield	CLEAN and INSPECT the windshield in front of the camera.
	Loose or incorrectly installed IPMA	INSPECT the IPMA for proper installation. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
	Camera alignment	Using a diagnostic scan tool, PERFORM the front camera alignment.
Degraded performance from the lane keeping aid or lane keeping alert system	Dirty or cracked windshield	CLEAN and INSPECT the windshield in front of the camera.
	Camera alignment	Using a diagnostic scan tool, PERFORM the front camera alignment.
LANE KEEPING SYSTEM MALFUNCTION - SERVICE REQUIRED message in the IPC	PSCM concern	RETRIEVE and REPAIR all PSCM Diagnostic Trouble Codes (DTCs). REFER to: Power Steering (211-02 Power Steering, Diagnosis and Testing).
FRONT CAMERA TEMPORARILY NOT AVAILABLE message in the IPC	Temporary over temperature condition	REMOVE the vehicle from direct sunlight, RECHECK after 10 minutes.

FRONT CAMERA LOW VISIBILITY - CLEAN SCREEN message in the IPC	Dirty or cracked windshield	CLEAN and INSPECT the windshield in front of the camera. REPAIR or REPLACE the windshield as necessary if damage is found.
	Dirt or debris in between the camera and the windshield	CLEAN the area between the front camera and the windshield.
	Camera windshield defrost heater	INSPECT the camera windshield defrost heater for damage and DIAGNOSE any IPMA heater Diagnostic Trouble Codes (DTCs) that are present.
FRONT CAMERA MALFUNCTION - SERVICE REQUIRED message in the IPC	REFER to the Pinpoint Test	GO to Pinpoint Test D
The lane keeping aid and lane keeping alert will not turn off	MyKey® in use	Normal operation.

Pinpoint Tests

The Lane Keeping System Does Not Turn On Or Activate

Refer to Wiring Diagrams Cell [124](#) for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Lane Keeping System - System Operation and Component Description (419-07 Lane Keeping System, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B13A6:09	Lane Departure Warning (LDW) Switch Input: Component Failure	An on-demand and continuous memory DTC that sets in the SCCM if the SCCM detects a fault on the lane departure warning (LDW) switch input.

Possible Causes

- Dirty, scratched or obstructed windshield and/or camera
- IPMA overheating condition
- Communication network concern
- Wiring, terminals or connectors
- Lane keeping system switch
- PSCM concern
- SCCM concern
- BCM concern
- CCM concern
- IPC concern
- RCM concern
- PCM concern
- GWM concern
- IPMA concern

Visual Inspection and Diagnostic Pre-Checks

- Certain Lane Keeping System (LKS) concerns can be caused by the IPMA being too cold or overheating due to heavy sunload. Prior to diagnosing a lane keeping system concern, allow the vehicle to warm up or remove the vehicle from direct sunlight. RECHECK after 10 minutes.
- Inspect the Lane Keeping System (LKS) settings in the IPC message center to be sure the concern is not caused by a system setting.

PINPOINT TEST A : THE LANE KEEPING SYSTEM DOES NOT TURN ON OR ACTIVATE

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

A1 VERIFY THE CONCERN

- Verify the operation of the lane keeping system (lane keeping aid and lane keeping alert).

Does the lane keeping system operate correctly?

Yes	The system is operating correctly at this time. The concern may have been caused by high network traffic or the driver's perception of how the lane keeping system operates. REFER to the Owner's Literature.
No	GO to A2

A2 PERFORM A NETWORK TEST

- Ignition ON.
- Using a diagnostic scan tool, perform a network test.

Do all modules pass the network test?

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

A3 CHECK THE IPMA (IMAGE PROCESSING MODULE A) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the IPMA Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	For DTC B134A:14 GO to A12 For all other Diagnostic Trouble Codes (DTCs), REFER to the IPMA DTC chart in this section.
No	GO to A4

A4 CHECK THE PSCM (POWER STEERING CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the PSCM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Power Steering (211-02 Power Steering, Diagnosis and Testing).
No	GO to A5

A5 CHECK THE SCCM (STEERING COLUMN CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the SCCM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Steering Wheel and Column Electrical Components (211-05 Steering Wheel and Column Electrical Components, Diagnosis and Testing).
No	GO to A6

A6 CHECK THE BCM (BODY CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the BCM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing).
No	GO to A7

A7 CHECK THE CCM (CRUISE CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the CCM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Cruise Control (419-03A Cruise Control, Diagnosis and Testing).
No	GO to A8

A8 CHECK THE IPC (INSTRUMENT PANEL CLUSTER) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the IPC Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Instrumentation, Message Center and Warning Chimes (413-01 Instrumentation, Message Center and Warning Chimes, Diagnosis and Testing).
No	GO to A9

A9 CHECK THE RCM (RESTRAINTS CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the RCM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing).
No	GO to A10

A10 CHECK THE PCM (POWERTRAIN CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the PCM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	Diagnose the PCM Diagnostic Trouble Codes (DTCs). SEE Electronic Engine Control. PCM DTC Chart. REFER to the appropriate section in Group 303 for the procedure.
No	GO to A11

A11 CHECK THE GWM (GATEWAY MODULE A) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the GWM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE the GWM Diagnostic Trouble Codes (DTCs). REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to A12

A12 VERIFY THE IPMA (IMAGE PROCESSING MODULE A) LANE KEEPING SYSTEM SWITCH PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the SCCM lane keeping system switch PID (LANE_ASSISTSW).
- While monitoring the PID, press and release the lane keeping system switch several times.

Does the PID consistently match the switch position?

Yes	GO to A13
No	INSTALL a new LH steering column multifunction switch. REFER to: Steering Column Multifunction Switch LH (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). . If the concern is still present after the repair, GO to GO to A14

A13 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Ignition OFF.
- Disconnect and inspect the IPMA connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect the IPMA connectors and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new IPMA REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

A14 CHECK FOR CORRECT SCCM (STEERING COLUMN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the SCCM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect the SCCM connector. 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 service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new SCCM. REFER to: Steering Column Control Module (SCCM) (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). REFER to: Steering Column Control Module (SCCM) - Vehicles With: Active Steering (211-05 Steering Wheel and Column Electrical Components, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

The Lane Keeping System Does Not Provide Feedback When Activated

Normal Operation and Fault Conditions

The lane keeping system only provides feedback when the vehicle speed is above 64 km/h (40 mph) and lane markings are detected on at least one side of the vehicle by the IPMA.

REFER to: Lane Keeping System - Component Location (419-07 Lane Keeping System, Description and Operation).

Possible Causes

- Communication network concern
- PSCM (integral to the steering gear)
- IPMA

Visual Inspection and Diagnostic Pre-Checks

- Verify the lane keeping system turns on and the display lines in the IPC turn green when the system is active and available. If the lines do NOT turn green, [GO to Pinpoint Test A](#)

PINPOINT TEST B : THE LANE KEEPING SYSTEM DOES NOT PROVIDE FEEDBACK WHEN ACTIVATED

B1 CHECK THE PSCM (POWER STEERING CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Ignition ON.
- Using a diagnostic scan tool, check the PSCM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Power Steering (211-02 Power Steering, Diagnosis and Testing).
No	GO to B2

B2 CHECK THE IPMA (IMAGE PROCESSING MODULE A) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, check the IPMA Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to the IPMA DTC chart in this section.
No	GO to B3

B3 CHECK THE STEERING WHEEL VIBRATION

- Change the intensity setting in the lane keeping system message center menu.

Does the steering wheel perform a test vibration after the intensity setting is changed?

Yes	GO to B4
No	GO to B4

B4 CHECK FOR CORRECT PSCM (POWER STEERING CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the PSCM connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect the PSCM connectors and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, REFER to the EPAS symptom chart. Click here to access Guided Routine (EPAS).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

B5 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Ignition OFF.
- Disconnect and inspect the IPMA connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect the IPMA connector and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new IPMA REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC B120C:11, DTC B120C:13

Refer to Wiring Diagrams Cell [124](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA supplies voltage and ground to the camera windshield defrost heater. The IPMA uses input from the front camera and the ambient air temperature data from the PCM to command the heater on and off. The heater may be commanded on if the ambient temperature is below 5Â°C (41Â°F).

Possible Causes

- Wiring, terminals or connectors
- Camera windshield defrost heater
- IPMA

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B120C:11	Heater for Windshield Mounted Sensor: Circuit Short To Ground	An on-demand and continuous memory DTC that sets in the IPMA if an excessive current draw is detected on the heater output circuit.
B120C:13	Heater for Windshield Mounted Sensor: Circuit Open	An on-demand and continuous memory DTC that sets in the IPMA if a lower than expected current draw is detected on the heater output circuit.

Visual Inspection and Diagnostic Pre-Checks

Inspect the integrity of the wiring, terminals and connectors on the jumper harness between the vehicle harness and the camera windshield defrost heater.

PINPOINT TEST C : DTC (DIAGNOSTIC TROUBLE CODE) B120C:11, DTC (DIAGNOSTIC TROUBLE CODE) B120C:13

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)	
NOTE: Before replacing the camera windshield defrost heater, windshield or IPMA for a camera windshield defrost heater concern, verify the integrity of the wiring, connectors and terminals on the camera windshield defrost heater jumper harness.	
C1 CHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)	
• Ignition ON. • Using a diagnostic scan tool, perform the IPMA self-test.	
Is DTC B120C:11 or DTC B120C:13 present?	
Yes	For DTC B120C:11, GO to C2 For DTC B120C:13, GO to C5
No	The system is operating correctly at this time. INSPECT the connectors, wiring and the camera windshield defrost heater for damage or poor connections.
C2 CHECK FOR SHORT TO GROUND WITH THE IPMA (IMAGE PROCESSING MODULE A) CAMERA HEATED WINDSHIELD ELEMENT DISCONNECTED	

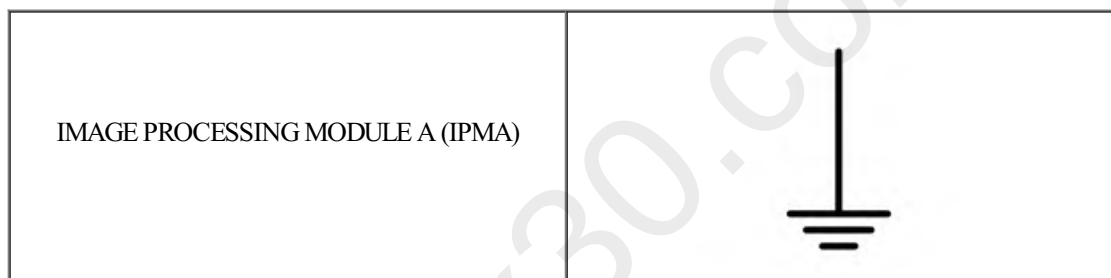
- Ignition OFF.
- Disconnect: Rain Sensor Module [C914A](#).
- Ignition ON.
- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Perform the IPMA self-test.

Is DTC B120C:11 present?

Yes	GO to C3
No	INSTALL a new windshield. REFER to: Fixed Glass (501-11 Glass, Frames and Mechanisms, General Procedures).

C3 CHECK THE IPMA (IMAGE PROCESSING MODULE A) CAMERA HEATED WINDSHIELD ELEMENT OUTPUT CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect: IPMA [C9224](#).
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C9224-8	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to C4
No	REPAIR the circuit. After the repair, CLEAR the DTC, CYCLE the ignition, and RUN the IPMA on-demand self-test to re-enable the circuit.

C4 CHECK IPMA (IMAGE PROCESSING MODULE A) CAMERA HEATED ELEMENT CIRCUITS FOR A SHORT TOGETHER

- Measure:

IMAGE PROCESSING MODULE A (IPMA)

Positive Lead	Measurement / Action	Negative Lead
C9224-8	Ω	C9224-1

Is the resistance greater than 10,000 ohms?

Yes	GO to C5
No	REPAIR the circuits. After the repair, CLEAR the DTC , CYCLE the ignition, and RUN the IPMA on demand self-test to re-enable the circuit.

C5 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) B120C:13 WITH THE IPMA (IMAGE PROCESSING MODULE A) CAMERA HEATED ELEMENT CIRCUITS JUMPERED TOGETHER

- Ignition OFF.
- Disconnect: Rain Sensor Module [C914A](#).
- Connect:

RAIN SENSOR

Lead 1	Measurement / Action	Lead 2
C914A-1		C914A-3

- Ignition ON.
- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Perform the IPMA self-test.

Is DTC B120C:11 present?

Yes	REMOVE the fused jumper wire. INSTALL a new windshield. REFER to: Fixed Glass (501-11 Glass, Frames and Mechanisms, General Procedures).
No	REMOVE the fused jumper wire. GO to C6

C6 CHECK THE IPMA (IMAGE PROCESSING MODULE A) CAMERA HEATED WINDSHIELD ELEMENT CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect: IPMA [C9224](#).
- Measure:

IMAGE PROCESSING MODULE A (IPMA)	RAIN SENSOR
----------------------------------	-------------

Positive Lead	Measurement / Action	Negative Lead
C9224-8	Ω	C914A-3
C9224-1	Ω	C914A-1

Are the resistances less than 3 ohms?

Yes	GO to C7
No	REPAIR the affected circuit.

C7 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Disconnect and inspect all IPMA connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the IPMA connectors and related in-line connectors. Make sure they seat and latch correctly.
- Operate the system to 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 IPMA REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, 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.

Normal Operation and Fault Conditions

In addition to certain fault conditions, the FRONT CAMERA MALFUNCTION SERVICE REQUIRED message is displayed in the message center when the IPMA camera alignment has been initiated, but is incomplete.

Possible Causes

- Communication network concern
- IPMA camera alignment incomplete
- IPMA concern

Visual Inspection and Diagnostic Pre-Checks

Verify the IPMA camera alignment is complete using a diagnostic scan tool.

PINPOINT TEST D : THE MESSAGE CENTER DISPLAYS A 'FRONT CAMERA MALFUNCTION SERVICE REQUIRED' MESSAGE

D1 PERFORM A NETWORK TEST

- Ignition ON.
- Using a diagnostic scan tool, perform a network test.

Does the IPMA pass the network test?

Yes	GO to D2
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

D2 CHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, check the IPMA Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to the IPMA DTC chart in this section.
No	GO to D3

D3 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Ignition OFF.
- Disconnect and inspect the IPMA connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect the IPMA connectors and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new IPMA. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U0100:00, DTC U0100:87

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the PCM through the GWM.

Possible Causes

- Communication network concern
- PCM
- GWM concern
- IPMA concern

DTC	Description	Fault Trigger Conditions
U0100:00	Lost Communication With ECM/PCM "A": No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the PCM over the HS-CAN1 through the GWM are missing for 0.5 second or more.
U0101:00	Lost Communication with TCM: No Sub Type Information	

PINPOINT TEST E : DTC (DIAGNOSTIC TROUBLE CODE) U0100:00, DTC (DIAGNOSTIC TROUBLE CODE) U0100:87

E1 VERIFY THE CUSTOMER'S CONCERN

- Ignition ON.
- Verify if there is an observable symptom present.

Is an observable symptom present?

Yes	GO to E2
No	CLEAR the DTC. The system is operation correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

E2 VERIFY THAT THE DIAGNOSTIC SCAN TOOL COMMUNICATES WITH THE PCM (POWERTRAIN CONTROL MODULE)

- Connect the diagnostic scan tool.
- Check that a vehicle session can be established using the diagnostic scan tool.

Can a vehicle session be established?

Yes	GO to E3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

E3 PERFORM THE IPMA SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Wait 10 seconds.
- Repeat the IPMA self-test.

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the IPMA DTC Chart in this section.
No	GO to E4

E4 PERFORM THE PCM SELF-TEST

- Using a diagnostic scan tool, perform the PCM KOEO.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). SEE Electronic Engine Control, PCM DTC Chart. Refer to the appropriate 303-14 section.
No	GO to E5

E5 PREFORM THE GWM SELF-TEST

- Using a diagnostic scan tool, perform the GWM self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	SEE the GWM DTC Chart. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to E6

E6 RECHECK THE IPMA DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Is DTC U0100:00 or DTC U0100:87 still present?

Yes	GO to E7
No	The system is operating correctly at this time. This DTC may have been set due to high network traffic or an intermittent fault condition.

E7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.

- CHECK the vehicle service history for recent service actions related to the PCM, IPMA or GWM. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to E8
No	The system is operating correctly at this time. The concern may have been caused due to incorrect parts replacement procedures or incorrect module configuration.

E8 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector 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 and related in-line connectors. Make sure they seat and latch correctly.
- Operate the system to 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 a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U0121:00

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the ABS module on the HS-CAN2.

Possible Causes

- Communication network concern
- ABS module
- IPMA concern

DTC	Description	Fault Trigger Conditions
U0121:00	Lost Communication With Anti-Lock Brake System (ABS) Control Module: No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the ABS module over the HS-CAN2 are missing for 10 seconds or more.

PINPOINT TEST F : DTC (DIAGNOSTIC TROUBLE CODE) U0121:00

F1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is there an observable symptom present?

Yes	GO to F2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

F2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Does the ABS module pass the network test?

Yes	GO to F3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

F3 PERFORM THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the IPMA DTC Chart in this section.
No	GO to F4

F4 PERFORM THE ABS (ANTI-LOCK BRAKE SYSTEM) MODULE SELF-TEST

- Using a diagnostic scan tool, perform the ABS module self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing).
No	GO to F5

F5 RECHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using the diagnostic scan tool, perform the continuous memory self-test.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Is DTC U0121:00 still present?

Yes	GO to F6
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

F6 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the ABS module or IPMA. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to F7
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

F7 CHECK FOR CORRECT ABS (ANTI-LOCK BRAKE SYSTEM) MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the ABS module connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect the ABS module connectors and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new ABS module. REFER to: Anti-Lock Brake System (ABS) Module (206-09 Anti-Lock Brake System (ABS) and Stability Control, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U0131:00, DTC U0131:87

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the PSCM through the HS-CAN2.

Possible Causes

- Communication network concern
- PSCM (integral to the steering gear)
- IPMA concern

DTC	Description	Fault Trigger Conditions
U0131:00	Lost Communication With Power Steering Control Module: No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the PSCM over the HS-CAN2 are missing for 0.5 second or more.
U0131:87	Lost Communication With Power Steering Control Module: Missing Message	

PINPOINT TEST G : DTC (DIAGNOSTIC TROUBLE CODE) U0131:00, DTC (DIAGNOSTIC TROUBLE CODE) U0131:87

G1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is there an observable symptom present?

Yes	GO to G2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

G2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Does the PSCM pass the network test?

Yes	GO to G3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

G3 PERFORM THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to IPMA DTC Chart in this section.
No	GO to G4

G4 PERFORM THE PSCM (POWER STEERING CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the PSCM self-test.

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to: Power Steering (211-02 Power Steering, Diagnosis and Testing).
No	GO to G5

G5 RECHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Retrieve the Continuous Memory Diagnostic Trouble Codes (CMDTCs) from all modules.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Is DTC U0131:00 or DTC U0131:87 still present?

Yes	GO to G6
No	The system is operating correctly at this time. The DTC may have set due to high network traffic or an intermittent fault condition.

G6 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the PSCM or IPMA. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to G7
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

G7 CHECK FOR CORRECT PSCM (POWER STEERING CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PSCM connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the PSCM connectors and related in-line connectors. Make sure they seat and latch correctly.
- Operate the system to 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 (EPAS) .
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.

DTC U0140:00, DTC U0140:87

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the BCM on the HS-CAN1 through the GWM.

Possible Causes

- Communication network concern
- GWM concern
- BCM
- IPMA concern

DTC	Description	Fault Trigger Conditions
U0140:00	Lost Communication With Body Control Module: No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the BCM over the HS-CAN1 through the GWM are missing for 10 seconds or more.
U0140:87	Lost Communication With Body Control Module: Missing Message	

PINPOINT TEST H : DTC (DIAGNOSTIC TROUBLE CODE) U0140:00, DTC (DIAGNOSTIC TROUBLE CODE) U0140:87

H1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify that there is an observable symptom present.

Is there an observable symptom present?

Yes	GO to H2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

H2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Do the BCM and the GWM pass the network test?

Yes	GO to H3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

H3 PERFORM THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	DIAGNOSE all non-network Diagnostic Codes (DTCs). REFER to the IPMA DTC Chart in this section.
No	GO to H4

H4 PERFORM THE BCM (BODY CONTROL MODULE) SELF-TEST

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

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing).
No	GO to H5

H5 CHECK THE GWM (GATEWAY MODULE A) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, retrieve the GWM Continuous Memory Diagnostic Trouble Codes (CMDTCS).

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to H6

H6 RECHECK THE IPMA (IMAGE PROCESSING MODULE A) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Wait 10 seconds.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Are DTC U0140:87 or U0140:87 still present?

Yes	GO to H7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

H7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.

- CHECK the vehicle service history for recent service actions related to the BCM, IPMA or GWM. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to H8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

H8 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all BCM connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector 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 and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (BCM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U0151:00, DTC U0151:87

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the RCM on the HS-CAN2.

Possible Causes

- Communication network concern
- RCM
- IPMA concern

DTC	Description	Fault Trigger Conditions
U0151:00	Lost Communication With Restraints Control Module: No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the RCM over the HS-CAN2 are missing for 0.5 second or more.
U0151:87	Lost Communication With Restraints Control Module: Missing Message	

PINPOINT TEST I : DTC (DIAGNOSTIC TROUBLE CODE) U0151:00, DTC (DIAGNOSTIC TROUBLE CODE) U0151:87

I1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify that there is an observable symptom present.

Is there an observable symptom present?

Yes	GO to I2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

I2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Does the RCM pass the network test?

Yes	GO to I3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

I3 PERFORM THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the IPMA DTC chart in this section.
No	GO to I4

I4 PERFORM THE RCM (RESTRAINTS CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the RCM self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing). REFER to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing).
No	GO to I5

I5 RECHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Is DTC U0151:00 or DTC U0151:87 still present?

Yes	GO to 16
No	The system is operation correctly at this time. The DTC may have set due to high network traffic or an intermittent fault condition.

I6 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the RCM or IPMA. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to 17
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

I7 CHECK FOR CORRECT RCM (RESTRAINTS CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all RCM connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the RCM connectors and related in-line connectors. Make sure they seat and latch correctly.
- Operate the system to 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 RCM. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, 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.

DTC U0155:00, DTC U0155:87

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the IPC on the HS-CAN3 through the GWM.

Possible Causes

- Communication network concern
- IPC
- GWM concern
- IPMA concern

DTC	Description	Fault Trigger Conditions
U0155:00	Lost Communication With Instrument Panel Cluster (IPC) Control Module: No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the IPC over the HS-CAN3 through the GWM are missing for 10 seconds or more.
U0155:87	Lost Communication With Instrument Panel Cluster (IPC) Control Module: Missing Message	

PINPOINT TEST J : DTC (DIAGNOSTIC TROUBLE CODE) U0155:00, DTC (DIAGNOSTIC TROUBLE CODE) U0155:87

J1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is there an observable symptom present?

Yes	GO to J2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

J2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Does the IPC pass the network test?

Yes	GO to J3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

J3 PERFORM THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the DTC Chart in this section.
No	GO to J4

J4 PERFORM THE IPC (INSTRUMENT PANEL CLUSTER) SELF-TEST

- Using a diagnostic scan tool, perform the IPC self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to: Instrumentation, Message Center and Warning Chimes (413-01 Instrumentation, Message Center and Warning Chimes, Diagnosis and Testing).
No	GO to J5

J5 PERFORM THE GWM (GATEWAY MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the GWM self-test.

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	SEE the GWM DTC Chart. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to J6

J6 RECHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Is DTC U0155:87 or DTC U0155:87 still present?

Yes	GO to J7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

J7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.

- CHECK the vehicle service history for recent service actions related to the IPC, GWM or IPMA. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to J8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

J8 CHECK FOR CORRECT IPC (INSTRUMENT PANEL CLUSTER) OPERATION

- Ignition OFF.
- Disconnect and inspect the IPC connector and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect the IPC connector and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (IPC) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U0158:00

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the HUD module on the HS-CAN2.

Possible Causes

- Communication network concern
- HUD module
- IPMA concern

DTC	Description	Fault Trigger Conditions
U0158:00	Lost Communication With Head Up Display: No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the HUD module over the HS-CAN2 are missing for 10 seconds or more.

PINPOINT TEST K : DTC (DIAGNOSTIC TROUBLE CODE) U0158:00

K1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is there an observable symptom present?

Yes	GO to K2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

K2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Does the HUD module pass the network test?

Yes	GO to K3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

K3 PERFORM THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the DTC Chart in this section.
No	GO to K4

K4 PERFORM THE HUD (HEAD UP DISPLAY) MODULE SELF-TEST

- Using a diagnostic scan tool, perform the HUD module self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to: Collision Warning and Collision Avoidance System (419-03C Collision Warning and Collision Avoidance System, Diagnosis and Testing).
No	GO to K5

K5 RECHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using the diagnostic scan tool, perform the continuous memory self-test.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Is DTC U0158:00 still present?

Yes	GO to K6
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

K6 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the HUD module or IPMA. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to K7
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

K7 CHECK FOR CORRECT HUD (HEAD UP DISPLAY) MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the HUD module connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect the HUD module connectors and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new HUD module. REFER to: Collision Warning and Collision Avoidance System (419-03C Collision Warning and Collision Avoidance System, Diagnosis and Testing).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U0212:00, DTC U0212:87

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the SCCM on the HS-CAN2.

Possible Causes

- Communication network concern
- SCCM
- IPMA concern

DTC	Description	Fault Trigger Conditions
U0212:00	Lost Communication With Steering Column Control Module: No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the SCCM over the HS-CAN2 are missing for 10 seconds or more.
U0212:87	Lost Communication With Steering Column Control Module: Missing Message	

PINPOINT TEST L : DTC (DIAGNOSTIC TROUBLE CODE) U0212:00, DTC (DIAGNOSTIC TROUBLE CODE) U0212:87

L1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is there an observable symptom present?

Yes	GO to L2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

L2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Does the SCCM pass the network test?

Yes	GO to L3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

L3 PERFORM THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the DTC Chart in this section.
No	GO to L4

L4 PERFORM THE SCCM (STEERING COLUMN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the SCCM self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to: Steering Wheel and Column Electrical Components (211-05 Steering Wheel and Column Electrical Components, Diagnosis and Testing).
No	GO to L5

L5 RECHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using the diagnostic scan tool, perform the continuous memory self-test.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Is DTC U0212:00 or DTC U0212:87 still present?

Yes	GO to L6
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

L6 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the SCCM or IPMA. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to L7
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

L7 CHECK FOR CORRECT SCCM (STEERING COLUMN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the SCCM connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect the SCCM connectors and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new SCCM. REFER to: Steering Column Control Module (SCCM) (211-05 Steering Wheel and Column Electrical Components, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U0253:00

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

The IPMA communicates with the APIM on the HS-CAN1 through the GWM.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U0253:00	Lost Communication With Accessory Protocol Interface Module: No Sub Type Information	A continuous memory DTC that sets in the IPMA if messages received from the APIM over the HS-CAN1 through the GWM are missing for 0.5 seconds or more.

Possible Causes

- Communication network concern
- APIM
- IPMA concern
- GWM concern

PINPOINT TEST M : DTC (DIAGNOSTIC TROUBLE CODE) U0253:00

M1 VERIFY THE CUSTOMER'S CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is an observable symptom present?

Yes	GO to M2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

M2 VERIFY THAT THE DIAGNOSTIC SCAN TOOL COMMUNICATES WITH THE APIM (SYNC MODULE)

- Connect a diagnostic scan tool.
- Check that a vehicle session can be established using the diagnostic scan tool.

Can a vehicle session be established?

Yes	GO to M3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

M3 PERFORM THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the IPMA self-test.
- Clear the Diagnostic Trouble Codes (DTCs).
- Wait 10 seconds.
- Repeat the IPMA self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the IPMA DTC Chart in this section.
No	GO to M4

M4 PERFORM THE APIM (SYNC MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the APIM KOEO self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). SEE the APIM DTC Chart. Refer to the appropriate section in Group 415 for the procedure.
No	GO to M5

M5 PERFORM THE GWM (GATEWAY MODULE A) SELF-TEST

- Using a diagnostic scan tool, perform the GWM self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	SEE the GWM DTC Chart. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to M6

M6 RECHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

- Using a diagnostic scan tool, clear the IPMA Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Check the IPMA Diagnostic Trouble Codes (DTCs).

Is DTC U0253:00 still present?

Yes	GO to M7
No	The system is operating correctly at this time. This DTC may have been set due to high network traffic or an intermittent fault condition.

M7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.

- CHECK the vehicle service history for recent service actions related to the APIM, IPMA or GWM. If recent service history is found:
 - verify correct replacement module was installed
 - HVBOM may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to M8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

M8 CHECK FOR CORRECT APIM (SYNC MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all APIM connectors and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect the ABS module connectors and related in-line 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 TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (APIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U3003:16

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U3003:16	Battery Voltage: Circuit Voltage Below Threshold	Set by the IPMA in continuous memory if the IPMA module detects low battery voltage below 7 volts for more than 500 ms.

Possible Causes

- Wiring, terminals or connectors
- Battery
- Charging system concern
- IPMA concern

PINPOINT TEST N : DTC (DIAGNOSTIC TROUBLE CODE) U3003:16

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

N1 CHECK THE IPMA DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear the Diagnostic Trouble Codes (DTCs). Repeat the IPMA module self-test.

Is DTC U3003:16 still present?

Yes	GO to N2
No	The system is operating correctly at this time. The DTC may have been set due to a previous low battery voltage condition.

N2 CHECK FOR CHARGING SYSTEM DIAGNOSTIC TROUBLE CODES (DTCs) IN THE PCM

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

Are any charging system Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to the appropriate 303-14 section.
No	GO to N3

N3 CHECK THE BATTERY CONDITION AND STATE OF CHARGE

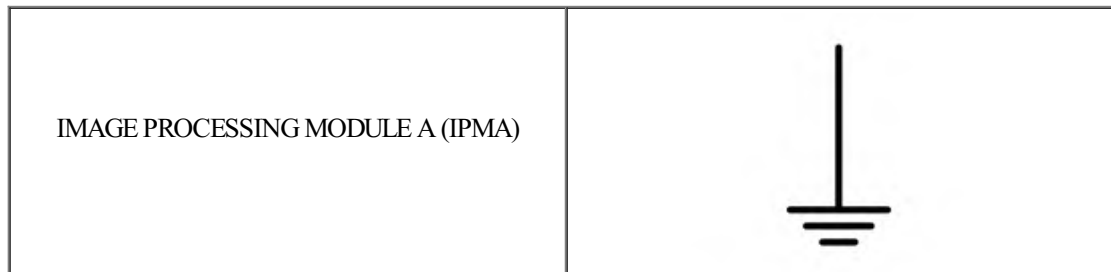
- Check the battery condition and verify the battery is fully charged.
REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

Is the battery OK and fully charged?

Yes	GO to N4
No	REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

N4 CHECK THE IPMA VOLTAGE SUPPLY

- Ignition OFF.
- Disconnect: IPMA module C9224.
- Ignition ON.
- Measure and record the voltage at the battery.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C9224-4		Ground

Is the voltage within 0.2 volt of the recorded battery voltage?

Yes	GO to N5
No	REPAIR the circuit.

N5 CHECK THE IPMA MODULE GROUND CIRCUIT

- Measure:

IMAGE PROCESSING MODULE A (IPMA)

Positive Lead	Measurement / Action	Negative Lead
C9224-4		C9224-5

Is the voltage within 0.2 volts of the recorded battery voltage?

Yes	GO to N6
No	REPAIR the circuit.

N6 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Ignition OFF.
- Disconnect and inspect the IPMA connector and related in-line connectors.
- Repair:
 - corrosion (install new connector or terminals â€ clean module pins)
 - damaged or bent pins â€ install new terminals/pins
 - pushed-out pins â€ install new pins as necessary
- Reconnect the IPMA connectors and related in-line 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW the Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new IPMA. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

DTC U3003:17

Refer to Wiring Diagrams Cell [14](#) for schematic and connector information.

Normal Operation and Fault Conditions

DTC	Description	Fault Trigger Conditions
U3003:17	Battery Voltage: Circuit Voltage Above Threshold	Sets as a continuous memory and on-demand DTC if the IPMA detects high battery voltage above 16.5 volts for 500 ms.

Possible Causes

- Battery
- Charging system concern
- IPMA

PINPOINT TEST O : DTC (DIAGNOSTIC TROUBLE CODE) U3003:17**O1 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U3003:17 SET IN OTHER MODULES**

NOTE: DTC U3003:17 may be stored in the module memory due to past battery charging or vehicle jump starting events.

- Ignition ON.
- Using a diagnostic scan tool, clear the Diagnostic Trouble Codes (DTCs). Repeat the IPMA module self-test.

Is DTC U3003:17 still present?

Yes	REFER to: Charging System - 2.0L EcoBoost (184kW/250PS) â€” MI4 (414-00 Charging System - General Information, Diagnosis and Testing). REFER to: Charging System - 2.0L EcoBoost (184kW/250PS) â€” MI4 (414-00 Charging System - General Information, Diagnosis and Testing).
No	GO to O2

O2 CHECK THE BATTERY VOLTAGE

- Turn off all interior/exterior lights and accessories.
- Start and run the engine at approximately 2,000 rpm for 3 minutes while monitoring the battery voltage.

Does the battery voltage rise to 15.5 volts or higher?

Yes	DIAGNOSE the overcharging condition. REFER to: Charging System - 2.0L EcoBoost (184kW/250PS) â€” MI4 (414-00 Charging System - General Information, Diagnosis and Testing). REFER to: Charging System - 2.0L EcoBoost (184kW/250PS) â€” MI4 (414-00 Charging System - General Information, Diagnosis and Testing).
No	GO to O3

O3 RECHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U3003:17

- Turn the engine off.
- Ignition ON.
- Using a diagnostic scan tool, clear all Continuous Memory Diagnostic Trouble Codes (CMDTCs).
- Using the diagnostic scan tool, perform the IPMA self-test.

Is DTC U3003:17 still present?

Yes	INSTALL a new IPMA. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).
No	The system is operating normally at this time. The DTC may have been set previously during battery charging or while jump starting the vehicle.

Normal Operation and Fault Conditions

REFER to: Communications Network - System Operation and Component Description (418-00 Module Communications Network, Description and Operation).

IPC DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U0130:00	Lost Communication With Steering Effort Control Module: No Sub Type Information	Sets in continuous memory in the IPC if data messages received from the SCCM through the GWM are missing for 5 seconds or longer.

Possible Sources

- Communication concern
- GWM
- SCCM
- IPC

PINPOINT TEST P : U0130:00

P1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is an observable symptom present?

Yes	GO to P2
No	CLEAR the DTC. The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

P2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform the network test.

Does the SCCM pass the network test?

Yes	GO to P3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

P3 PERFORM THE IPC (INSTRUMENT PANEL CLUSTER) SELF-TEST

- Using a diagnostic scan tool, perform the IPC self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to DTC Chart: IPC in this section.
No	GO to P4

P4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, check the GWM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to P5

P5 PERFORM THE SCCM (STEERING COLUMN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the SCCM self-test.

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Steering Wheel and Column Electrical Components (211-05 Steering Wheel and Column Electrical Components, Diagnosis and Testing).
No	GO to P6

P6 RECHECK THE IPC (INSTRUMENT PANEL CLUSTER) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, clear the IPC Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Check the IPC Diagnostic Trouble Codes (DTCs).

Is DTC U0130 still present?

Yes	GO to P7
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

P7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during the PMI, or the PMI may not have been carried out.*

- CHECK the vehicle service history for recent service actions related to the SCCM, GWM or IPC. If recent service history is found:
 - verify correct replacement module was installed
 - vehicle parts build may be used to verify correct part fitment
 - verify the configuration of replacement module was correct
 - re-configure module using as-built data if prior configuration is suspect
 - verify the module was not obtained from a like vehicle and installed into customer vehicle
 - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to P8
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

P8 CHECK FOR CORRECT SCCM (STEERING COLUMN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all SCCM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all the SCCM 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 service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new SCCM. REFER to: Steering Column Control Module (SCCM) (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). REFER to: Steering Column Control Module (SCCM) - Vehicles With: Active Steering (211-05 Steering Wheel and Column Electrical Components, 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 Q : THE PRE-COLLISION ASSIST SYSTEM IS INOPERATIVE

Refer to Wiring Diagrams Cell [146](#) for schematic and connector information.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
CCM C1001:08	Vision System Camera: Bus Signal/Message Failures	This continuous memory and on-demand DTC sets in the CCM when the pre-collision assist forward-looking camera status message from the IPMA are missing.
IPMA C1A67:08	Forward Looking Sensor: Bus Signal/Message Failures	This continuous memory and on-demand DTC sets in the IPMA when the pre-collision assist range status, yaw rate and vehicle velocity messages from the CCM are missing.

Possible Sources

- Wiring, terminals or connectors
- CCM
- IPMA concern
- IPC concern

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Q1 PERFORM THE NETWORK TEST

- Using a diagnostic scan tool, perform the network test.

Do the CCM, and IPMA module pass the network test?

Yes	GO to Q2
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

Q2 CHECK THE IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, perform the IPMA self-test.

Are any IPMA Diagnostic Trouble Codes (DTCs) recorded?

Yes	DIAGNOSE all IPMA Diagnostic Trouble Codes (DTCs). If DTC C1A67:08 is recorded, GO to Q5 For all other IPMA Diagnostic Trouble Codes (DTCs), REFER to: Lane Keeping System (419-07 Lane Keeping System, Diagnosis and Testing).
No	GO to Q3

Q3 CHECK THE CCM (CRUISE CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, perform the CCM self-test.

Are any CCM Diagnostic Trouble Codes (DTCs) recorded?

Yes	If DTC C1001:08 is present, GO to Q5
No	GO to Q4

Q4 CHECK THE MESSAGE CENTER FOR CORRECT OPERATION

- Check the IPC message center for correct operation.

Does the message center operate correctly?

Yes	GO to Q5
No	REFER to: Instrumentation, Message Center and Warning Chimes (413-01 Instrumentation, Message Center and Warning Chimes, Diagnosis and Testing).

Q5 CHECK THE PRIVATE CAN (CONTROLLER AREA NETWORK) CIRCUITS FOR A SHORT TO VOLTAGE

- Disconnect CCM [C1582](#).
- Disconnect IPMA [C9128](#).
- Ignition ON.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1582-2		Ground
C1582-3		Ground

Is any voltage present?

Yes	REPAIR the circuit in question.
No	GO to Q6

Q6 CHECK THE PRIVATE CAN (CONTROLLER AREA NETWORK) CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1582-2	Ω	Ground
C1582-3	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to Q7
No	REPAIR the circuit in question.

Q7 CHECK THE PRIVATE CAN (CONTROLLER AREA NETWORK) CIRCUITS FOR A SHORT TOGETHER

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1582-2	Ω	C1582-3

Is the resistance greater than 10,000 ohms?

Yes	GO to Q8
No	REPAIR the circuits.

Q8 CHECK THE PRIVATE CAN (CONTROLLER AREA NETWORK) CIRCUITS FOR AN OPEN

- Measure:

CRUISE CONTROL MODULE (CCM)	
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Positive Lead	Measurement / Action	Negative Lead
C1582-2	Ω	C9128-11
C1582-3	Ω	C9128-3

Are the resistances less than 3 ohms?

Yes	GO to Q9
No	REPAIR the circuit in question.

Q9 CHECK FOR CORRECT CCM (CRUISE CONTROL MODULE) OPERATION

- Disconnect and inspect CCM connectors.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the CCM 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 service articles TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service article address this concern, INSTALL a new CCM. REFER to: Cruise Control Module (CCM) (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Removal and Installation). If the concern is still present, GO to Q10
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.

Q10 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Disconnect and inspect IPMA connectors.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the IPMA 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 service articles TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service article address this concern, INSTALL a new IPMA. REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, 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.

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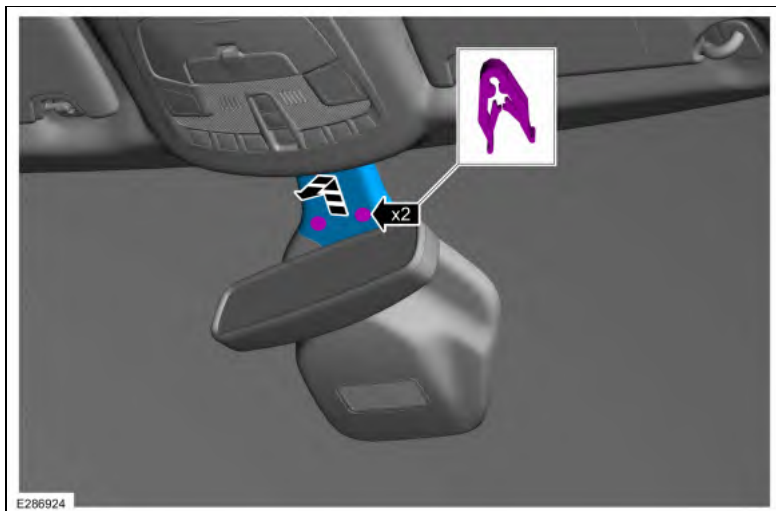
Removal and Installation

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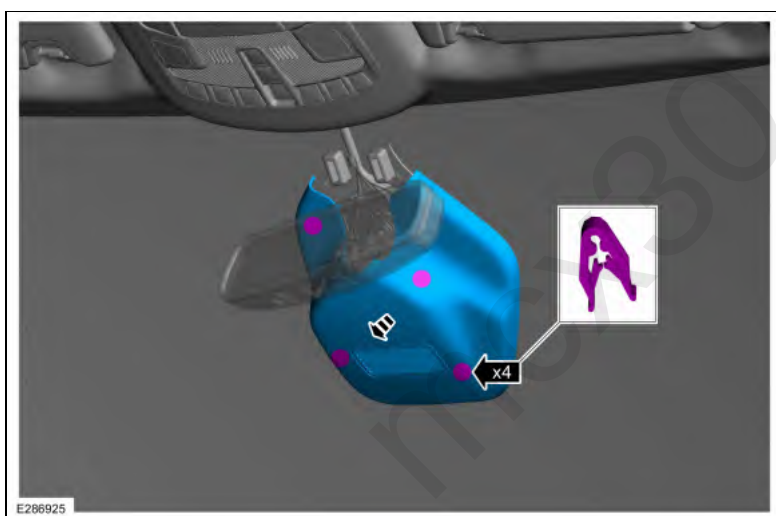
Image Processing Module A (IPMA)

Removal

1. If a new IPMA is being installed, using a diagnostic scan tool, begin the PMI process for the IPMA following the on-screen instructions.
2. Release the clips and remove the upper rain sensor cover.



3. Release the clips and remove the lower rain sensor cover.



4. Disconnect the electrical connector.