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2012 FORD Galaxy OEM Service and Repair Workshop Manual

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Module Network Input Messages - PSCM (power steering control module)

Broadcast Message	Originating Module	Message Purpose
Calculated steering angle	IPMA (image processing module A)	Provides a reference steering angle for PSCM (power steering control module) intervention.
Lane keeping alert request	IPMA (image processing module A)	Request to provide haptic feedback (vibration) through the steering wheel to alert the driver of a lane departure.
Lane keeping aid request	IPMA (image processing module A)	Request for steering torque when a lane departure is detected and the lane keeping aid is on.
Lane keeping system status	IPMA (image processing module A)	Used to provide the lane keeping system status (suppressed, available and active states).
Road curvature	IPMA (image processing module A)	Provides road curvature as detected by the camera. Used to calculate required steering torque for lane keeping aid interventions.

Module Network Input Messages - IPC (instrument panel cluster)

Broadcast Message	Originating Module	Message Purpose
Camera status	IPMA (image processing module A)	Used to display camera status messages.
Lane keep assist hands off	IPMA (image processing module A)	Used to display a hands off warning message and sounds a chime through the audio system.
Lane keeping system switch status	IPMA (image processing module A)	Used to display the lane keeping system status (suppressed, available and active states).
Lane keeping system status display	IPMA (image processing module A)	Turns the lane keeping aid system display on and off.

warning consists of a message center warning and an audio chime and is generated after 6 seconds of hands-off driving.

NOTE

Due to certain road conditions and the driver's individual grip/touch on the steering wheel, the system may generate a hands-off warning when hand(s) are still on the steering wheel.

IPMA (image processing module A) Camera Windshield Defrost Heater

The camera windshield defrost heater keeps the windshield in front of the IPMA (image processing module A) clear of frost and ice. The IPMA (image processing module A) uses input from the IPMA (image processing module A) camera and the ambient air temperature to turn the camera windshield defrost heater ON and OFF. Voltage and ground is supplied to the heater by the IPMA (image processing module A). The heater may be commanded on if the ambient temperature is below 5°C (41°F).

The IPMA (image processing module A) camera windshield defrost heating element is integral to the windshield and can not be serviced without replacing the windshield. Before replacing the IPMA (image processing module A) camera heated windshield element or the IPMA (image processing module A) for an IPMA (image processing module A) camera heated windshield element concern, verify the integrity of the wiring, connectors and terminals on the jumper harness.

System Display

When the lane keeping system is turned ON, an overhead graphic of a vehicle and lane markings is displayed in the IPC (instrument panel cluster). If the lane keeping aid mode is selected when the system is ON, arrow markings pointing toward the lane lines may also be displayed. When the system is off, the lane marking graphics are not displayed. Additional graphics appear in the display if the adaptive cruise control is enabled. While the system is ON, the color of the lane markings change to indicate the system status.

Gray: Indicates the system is temporarily unable to provide lane keeping aid or alert activation ON the indicated side(s). This may be caused by:

- The vehicle speed is under the activation limit
- High sunload on the IPMA (image processing module A) camera lens
- Too close to lane markings
- Lane markings are too narrow or wide
- Road has no or poor lane markings in the camera field-of-view
- Following vehicle in front too closely
- IPMA (image processing module A) camera blocked

The steering wheel does not perform a test vibration after the intensity setting is changed through the driver assist menu in the message center.

IPMA (image processing module A) Camera Alignment

IPMA (image processing module A) camera alignment is required for the lane keeping alert and lane keeping aid to function correctly. The procedure is initiated using the diagnostic scan tool and requires about 10 minutes of driving above 64 km/h (40 mph) on a flat, straight road with highly visible lane markings to complete.

NOTE

Avoid lane crossing, excessive steering angle changes or sudden change in vehicle speed during the IPMA (image processing module A) camera alignment process.

NOTE

The alignment completion is indicated on the diagnostic scan tool. If the alignment is unsuccessful, check the IPMA (image processing module A) camera for proper installation.

NOTE

The IPMA (image processing module A) CAMERA MALFUNCTION - SERVICE REQUIRED message in the IPC (instrument panel cluster) disappears when the system is aligned.

The IPMA (image processing module A) camera alignment procedure should be performed when any of the following occur:

- Windshield replacement
- Change in tire size
- Suspension repair or alignment
- Front air bag deployment

Component Description

IPMA (image processing module A) Camera

The lane keeping system contains a IPMA (image processing module A) camera located on windshield (above the interior rear view mirror), that is used to detect the position of the vehicle within the lane. The IPMA (image processing module A) camera requires a camera alignment when removed or replaced.

Lane Keeping System

419-07 Lane Keeping System	2022 F-150
Diagnosis and Testing	Procedure revision date: 10/19/2022

Lane Keeping System

Diagnostic Trouble Code (DTC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#)

(100-00 General Information, Description and Operation).

Diagnostic Trouble Code Chart

Module	DTC (diagnostic trouble code)	Description	Action
IPMA (image processing module A)	B120C:11	Heater for Windshield Mounted Sensor: Circuit Short To Ground	GO to Pinpoint Test C
IPMA (image processing module A)	B120C:13	Heater for Windshield Mounted Sensor: Circuit Open	GO to Pinpoint Test C
IPMA (image processing module A)	B1385:68	Lane Keeping Aid System: Event Information	GO to Pinpoint Test BK

IPMA (image processing module A)	C1001:97	Vision System Camera: Component Or System Operation Obstructed Or Blocked	GO to Pinpoint Test U
IPMA (image processing module A)	C1001:98	Vision System Camera: Component Or System Over Temperature	GO to Pinpoint Test V
IPMA (image processing module A)	U0100:00	Lost Communication With ECM/PCM "A": No Sub Type Information	GO to Pinpoint Test F
IPMA (image processing module A)	U0101:00	Lost Communication with TCM: No Sub Type Information	GO to Pinpoint Test G
IPMA (image processing module A)	U0103:00	Lost Communication With Gear Shift Control Module A: No Sub Type Information	GO to Pinpoint Test H
IPMA (image processing module A)	U0104:00	Lost Communication With Cruise Control Module: No Sub Type Information	GO to Pinpoint Test AN
IPMA (image processing module A)	U0121:00	Lost Communication With Anti-Lock Brake System (ABS) Control Module "A": No Sub Type Information	GO to Pinpoint Test I
IPMA (image processing module A)	U0122:00	Lost Communication With Vehicle Dynamics Control Module: No Sub Type Information	GO to Pinpoint Test Q
IPMA (image processing module A)	U0130:00	Lost Communication With Steering Effort Control Module: No Sub Type Information	GO to Pinpoint Test R
IPMA (image processing module A)	U0131:00	Lost Communication With Power Steering Control Module "A": No Sub Type Information	GO to Pinpoint Test K

IPMA (image processing module A)	U0241:00	Lost Communication With Headlamp Control Module "A": No Sub Type Information	GO to Pinpoint Test AS
IPMA (image processing module A)	U024E:00	Lost Communication With Side Obstacle Detection Control Module "C": No Sub Type Information	GO to Pinpoint Test J
IPMA (image processing module A)	U024F:00	Lost Communication With Side Obstacle Detection Control Module "D": No Sub Type Information	GO to Pinpoint Test J
IPMA (image processing module A)	U0252:00	Lost Communication With Lighting Control Module-Rear "B": No Sub Type Information	GO to Pinpoint Test BE
IPMA (image processing module A)	U0253:00	Lost Communication With Accessory Protocol Interface Module: No Sub Type Information	GO to Pinpoint Test P
IPMA (image processing module A)	U0264:00	Lost Communication With Camera Module- Rear: No Sub Type Information	GO to Pinpoint Test BO
IPMA (image processing module A)	U0293:00	Lost Communication with Hybrid/EV Powertrain Control Module: No Sub Type Information	GO to Pinpoint Test F
IPMA (image processing module A)	U0300:57	Internal Control Module Software Incompatibility: Invalid/Incompatible Software Component	GO to Pinpoint Test AT
IPMA (image processing module A)	U0401:82	Invalid Data Received from ECM/PCM A: Alive/Sequence Counter Incorrect/Not Updated	GO to Pinpoint Test W
IPMA (image processing module A)	U0401:83	Invalid Data Received from ECM/PCM A: Value Of Signal Protection Calculation Incorrect	GO to Pinpoint Test W

IPMA (image processing module A)	U0422:86	Invalid Data Received From Body Control Module: Signal Invalid	GO to Pinpoint Test BG
IPMA (image processing module A)	U0423:86	Invalid Data Received from Instrument Panel Cluster Control Module: Signal Invalid	GO to Pinpoint Test AB
IPMA (image processing module A)	U0424:86	Invalid Data Received From HVAC Control Module: Signal Invalid	GO to Pinpoint Test BH
IPMA (image processing module A)	U0429:86	Invalid Data Received From Steering Column Control Module: Signal Invalid	GO to Pinpoint Test AC
IPMA (image processing module A)	U0452:82	Invalid Data Received From Restraints Control Module: Alive/Sequence Counter Incorrect/Not Updated	GO to Pinpoint Test AV
IPMA (image processing module A)	U0452:83	Invalid Data Received From Restraints Control Module: Value Of Signal Protection Calculation Incorrect	GO to Pinpoint Test AW
IPMA (image processing module A)	U0452:86	Invalid Data Received From Restraints Control Module: Signal Invalid	GO to Pinpoint Test AD
IPMA (image processing module A)	U049A:86	Invalid Data Received From "Door Control Module A": Signal Invalid	GO to Pinpoint Test AX
IPMA (image processing module A)	U0501:86	Invalid Data Received From "Door Control Module B": Signal Invalid	GO to Pinpoint Test AY
IPMA (image processing module A)	U0533:86	Invalid Data Received From Side Obstacle Detection Control Module "A": Signal Invalid	GO to Pinpoint Test J

IPMA (image processing module A)	U2100:00	Initial Configuration Not Complete: No Sub Type Information	GO to Pinpoint Test AF
IPMA (image processing module A)	U2101:00	Control Module Configuration Incompatible: No Sub Type Information	GO to Pinpoint Test BN
IPMA (image processing module A)	U2107:68	Collision Mitigation By Braking: Event Information	GO to Pinpoint Test AG
IPMA (image processing module A)	U2107:82	Collision Mitigation By Braking: Alive/Sequence Counter Incorrect/Not Updated	GO to Pinpoint Test AI
IPMA (image processing module A)	U2108:68	Adaptive Cruise Control: Event Information	GO to Pinpoint Test AH
IPMA (image processing module A)	U2300:55	Central Configuration: Not Configured	GO to Pinpoint Test AJ
IPMA (image processing module A)	U2300:64	Central Configuration: Signal Plausibility Failure	GO to Pinpoint Test AK
IPMA (image processing module A)	U2400:00	Ethernet Failure With Gateway Module A (GWM): No Sub Type Information	GO to Pinpoint Test BZ
IPMA (image processing module A)	U3000:42	Control Module: General Memory Failure	GO to Pinpoint Test AL
IPMA (image processing module A)	U3000:49	Control Module: Internal Electronic Failure	GO to Pinpoint Test AM

Driver Aides & Information > Lane Departure/Keep > Controls > Inoperative	GO to Pinpoint Test BX
Driver Aides & Information > Lane Departure/Keep > Controls > Inoperative	GO to Pinpoint Test BY
Driver Aides & Information > Lane Departure/Keep > Performance > Inaccurate	GO to Pinpoint Test A
Driver Aides & Information > Lane Departure/Keep > Performance > Inaccurate	GO to Pinpoint Test BU
Driver Aides & Information > Lane Departure/Keep > Performance > Inoperative	GO to Pinpoint Test A
Driver Aides & Information > Lane Departure/Keep > Performance > Inoperative	GO to Pinpoint Test B
Driver Aides & Information > Lane Departure/Keep > Performance > Inoperative	GO to Pinpoint Test BS
Driver Aides & Information > Lane Departure/Keep > Performance > Inoperative	GO to Pinpoint Test BT
Driver Aides & Information > Lane Departure/Keep > Performance > Inoperative	GO to Pinpoint Test BW

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	Action
A module does not communicate with the diagnostic scan tool	GO to Pinpoint Test BS
The lane keeping aid or lane keeping alert does not turn on or activate	GO to Pinpoint Test A
The lane keeping aid or lane keeping alert does not provide driver feedback once activated	GO to Pinpoint Test B