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2016 FORD Galaxy OEM Service and Repair Workshop Manual

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No	The system is operating normally at this time. The DTC (diagnostic trouble code) may have been set due to a previous low battery voltage condition.
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BC2 CHECK FOR CHARGING SYSTEM DIAGNOSTIC TROUBLE CODES (DTCS) SET IN OTHER MODULES

- Using a diagnostic scan tool, retrieve the Continuous Memory Diagnostic Trouble Codes (CMDTCs) from all modules.

Is any other battery or charging system related DTC set in other modules?

Yes	<p>DIAGNOSE the charging system concern.</p> <p>REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (BM) (414-00 Charging System - General Information, Diagnosis and Testing).</p> <p>REFER to: Charging System - 3.3L Duratec-V6/5.0L 32V Ti-VCT (414-00 Charging System - General Information, Diagnosis and Testing).</p> <p>REFER to: Charging System (414-00 Charging System - General Information, Diagnosis and Testing).</p>
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No	GO to BC3
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BC3 CHECK THE BATTERY CONDITION AND STATE OF CHARGE

- Ignition OFF.
- 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 BC4
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No	<p>DIAGNOSE the battery.</p> <p>REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).</p>
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BC4 CHECK THE IPMA (IMAGE PROCESSING MODULE A) CIRCUIT FOR A SHORT TO VOLTAGE

BC6 CHECK THE IPMA (IMAGE PROCESSING MODULE A) CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C242A-1	Ω	C242A-13

Are the resistances less than 3 ohms?

Yes	GO to BC7
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No	REPAIR the circuit in question.
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BC7 CHECK FOR IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Disconnect and inspect the IPMA (image processing module A) connector.
- Repair:
 - corrosion (install new connectors or terminals - clean module pins)
 - damaged or bent pins - install new terminals pins
 - pushed-out pins - install new pins as necessary
- Reconnect the IPMA (image processing module A) connectors and make sure it seats and latches correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	<p>Yes CHECK OASIS (Online Automotive Service Information System) for any applicable service articles: TSB (Technical Service Bulletin) , GSB (General Service Bulletin) , SSM (special service message) or FSA (Field Service Action) . 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 IPMA (image processing module A) .</p> <p>REFER to: Image Processing Module A (IPMA) (419-07 Lane Keeping System, Removal and Installation).</p>
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BD2 CHECK THE IPMA (IMAGE PROCESSING MODULE A) CAMERA CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect: IPMA (image processing module A) connector C242F.
- For IPMA (image processing module A) and IPMA (image processing module A) camera measure:

Positive Lead	Measurement / Action	Negative Lead
C242F-3	Ω	Ground

Is the resistance on the suspect circuit greater than 10,000 ohms?

Yes GO to [BD3](#)

No REPAIR the suspect circuit.

BD3 CHECK THE IPMA (IMAGE PROCESSING MODULE A) CAMERA CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: IPMA (image processing module A) connector C242F.

Positive Lead	Measurement / Action	Negative Lead
C242F-3	\bar{V}	Ground

Is the voltage present?

Yes REPAIR the suspect circuit.

No GO to [BD4](#)

- GWM (gateway module A) concern
- TRM (trailer module)
- IPMA (image processing module A)

BE1 VERIFY THE CUSTOMER CONCERN

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

Is an observable symptom present?

Yes	GO to BE2
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No	CLEAR the DTC (diagnostic trouble code) . The system is operating normally at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.
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BE2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, carry out the network test.

Does the TRM (trailer module) pass the network test?

Yes	GO to BE3
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No	REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing). REFER to: Ethernet Module Communications Network (418-00C Ethernet Module Communications Network, Diagnosis and Testing).
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BE3 CARRY OUT THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, carry out the IPMA (image processing module A) self-test.

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

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to DTC (diagnostic trouble code) Chart: IPMA (image processing module A) , in this section.
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Yes	GO to BE7
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No	The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic, or an intermittent fault condition.
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BE7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

NOTE

If new modules were installed prior to the DTC (diagnostic trouble code) being set, the module configuration can be incorrectly set during the PMI (programmable module installation), or the PMI (programmable module installation) may not have been carried out.

- CHECK the vehicle service history for recent service actions related to the TRM (trailer module), GWM (gateway module A) or IPMA (image processing module A). 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
 - if a new replacement module is installed, CARRY OUT PMI (programmable module installation) using as-built data
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to BE8
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No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.
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BE8 CHECK FOR CORRECT TRM (TRAILER MODULE) OPERATION

- CCM (cruise control module)
- IPMA (image processing module A)

BF1 CHECK FOR CCM (CRUISE CONTROL MODULE) SIGNAL

- Ignition ON.
- Using a diagnostic scan tool, clear the Diagnostic Trouble Codes (DTCs) for the module in question.

Is DTC U0405:86 still present?

Yes	<p>RETRIEVE and FOLLOW non-network Diagnostic Trouble Codes (DTCs) from the CCM. REFER to: Cruise Control (419-03A Cruise Control, Diagnosis and Testing).</p> <p>REFER to: Cruise Control (419-03B Cruise Control - Vehicles With: Adaptive Cruise Control, Diagnosis and Testing). REFER to: Collision Warning and Collision Avoidance System (419-03C Collision Warning and Collision Avoidance System, Diagnosis and Testing).</p>
No	DIAGNOSE the observable symptom.

PINPOINT TEST BG : DTC U0422:86

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 (diagnostic trouble code)	Description	Fault Trigger Condition
IPMA (image processing module A) U0422:86	Invalid Data Received From Body Control Module: Signal Invalid	This continuous memory DTC (diagnostic trouble code) sets in the IPMA (image processing module A) when IPMA (image processing module A) receives invalid signal from BCM (body control module) through the GWM (gateway module A) .

Possible Sources

- BCM (body control module)

Is an observable symptom present?

Yes	GO to BH2
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No	CLEAR the DTC (diagnostic trouble code) . The system is operating normally at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.
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BH2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, carry out the network test.

Does the HVAC (heating, ventilation and air conditioning) module pass the network test?

Yes	GO to BH3
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No	REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing). REFER to: Ethernet Module Communications Network (418-00C Ethernet Module Communications Network, Diagnosis and Testing).
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BH3 CARRY OUT THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, carry out the IPMA (image processing module A) self-test.

Are any network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the IPMA (image processing module A) DTC (diagnostic trouble code) Chart in this section.
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No	GO to BH4
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BH4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

Yes	GO to BH7
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No	The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic, or an intermittent fault condition.
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BH7 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERN

- CHECK the vehicle service history for recent service actions related to the HVAC (heating, ventilation and air conditioning) module or IPMA (image processing module A) . 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
 - if a new replacement module is installed, CARRY OUT PMI (programmable module installation) using as-built data
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to BH8
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No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.
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BH8 CHECK FOR CORRECT HVAC (HEATING, VENTILATION AND AIR CONDITIONING) MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the HVAC (heating, ventilation and air conditioning) module connectors.
- Repair:
 - corrosion (install new connector or terminals – clean module pins)
 - damaged or bent pins – install new terminals/pins

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

Is an observable symptom present?

Yes	GO to B12
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No	CLEAR the DTC (diagnostic trouble code) . The system is operating normally at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.
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B12 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, carry out the network test.

Does the APIM (SYNC module) module pass the network test?

Yes	GO to B13
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No	REFER to: Controller Area Network (CAN) Module Communications Network (418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing). REFER to: Ethernet Module Communications Network (418-00C Ethernet Module Communications Network, Diagnosis and Testing).
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B13 CARRY OUT THE IPMA (IMAGE PROCESSING MODULE A) SELF-TEST

- Using a diagnostic scan tool, carry out the IPMA (image processing module A) self-test.

Are any network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network Diagnostic Trouble Codes (DTCs). REFER to the IPMA (image processing module A) DTC (diagnostic trouble code) chart in this section.
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No	GO to B14
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