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## 2015 FORD Mustang OEM Service and Repair Workshop Manual

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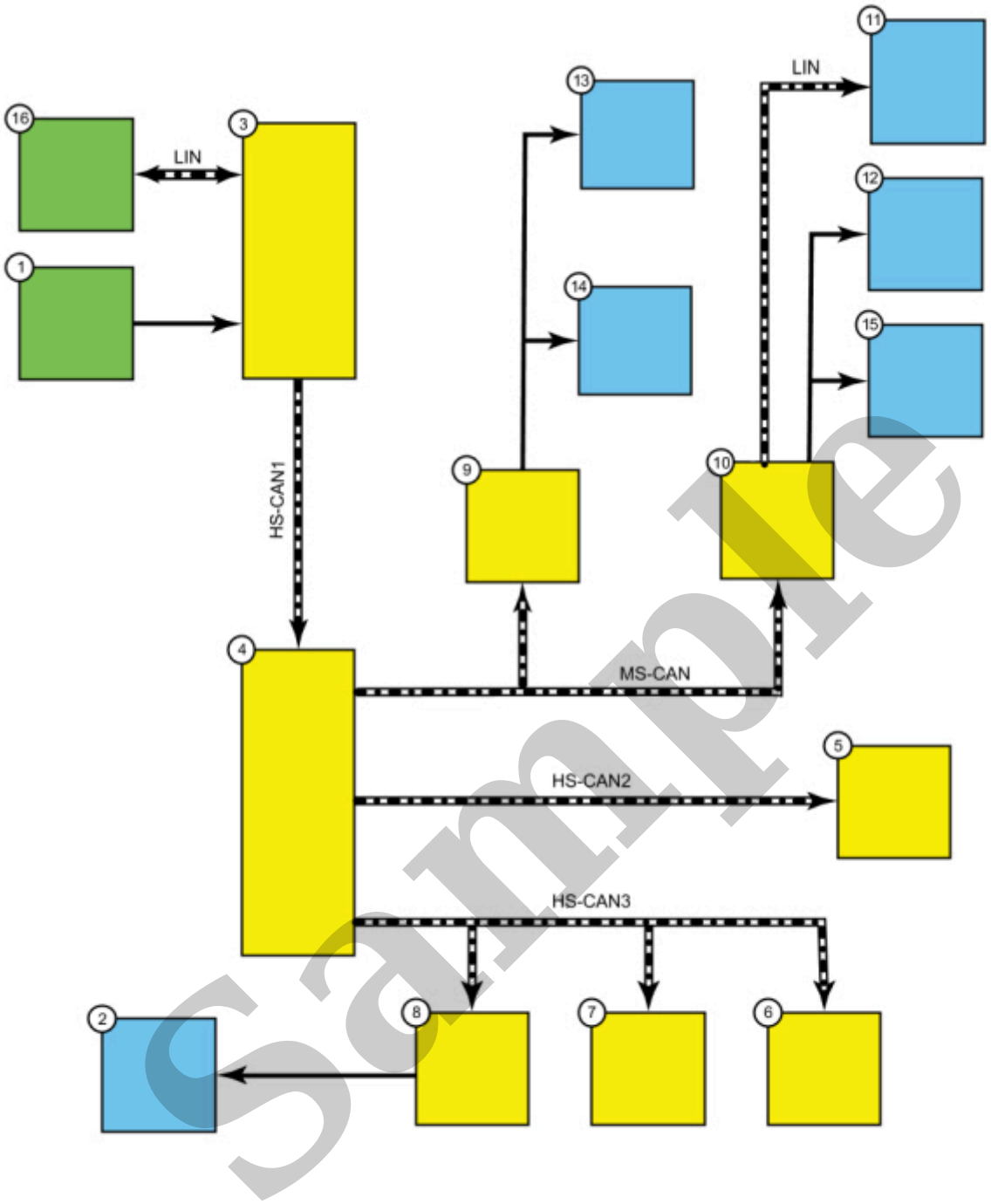



E371201

| Item | Description |
|---|---|
| 1 | Light Sensor |

| | | |
|---|---|---|
| Illumination Dimming Level | BCM (body control module) | Used to command the illumination dimming level for networked modules and outputs hardwired to networked modules. |
| Backlit LED (light emitting diode) Status | BCM (body control module) | Used to provide feedback regarding illumination dimming level for networked modules and outputs hardwired to networked modules. |
| Day/Night Status | BCM (body control module) | Used to command day/night dimming levels to the networked modules and outputs hardwired to networked modules. |

**Networked Illumination Operation**

The networked switches and components, except for front door window switches and front door lock switches, are illuminated when the headlamp switch is in the PARK, ON, or AUTO position. The system-wide illumination dimming level is determined by the BCM (body control module) based on inputs from the ambient light sensor and the dimmer switch (integral to the headlamp switch).

The front door window switches and front door lock switches are non-dimmable and are illuminated whenever the accessory delay relay is energized with the ignition switch ON or OFF.

The BCM (body control module) sends the dimming level message to the GWM (gateway module A) on the HS-CAN1 (high-speed controller area network 1) . The GWM (gateway module A) sends the signals to their intended receiving modules on the MS-CAN (medium speed-controller area network) , HS-CAN2 (high-speed controller area network 2) and the HS-CAN3 (high-speed controller area network 3) as follows:

**MS-CAN (medium speed-controller area network)**

- DDM (driver door module)
- PDM (passenger door module)

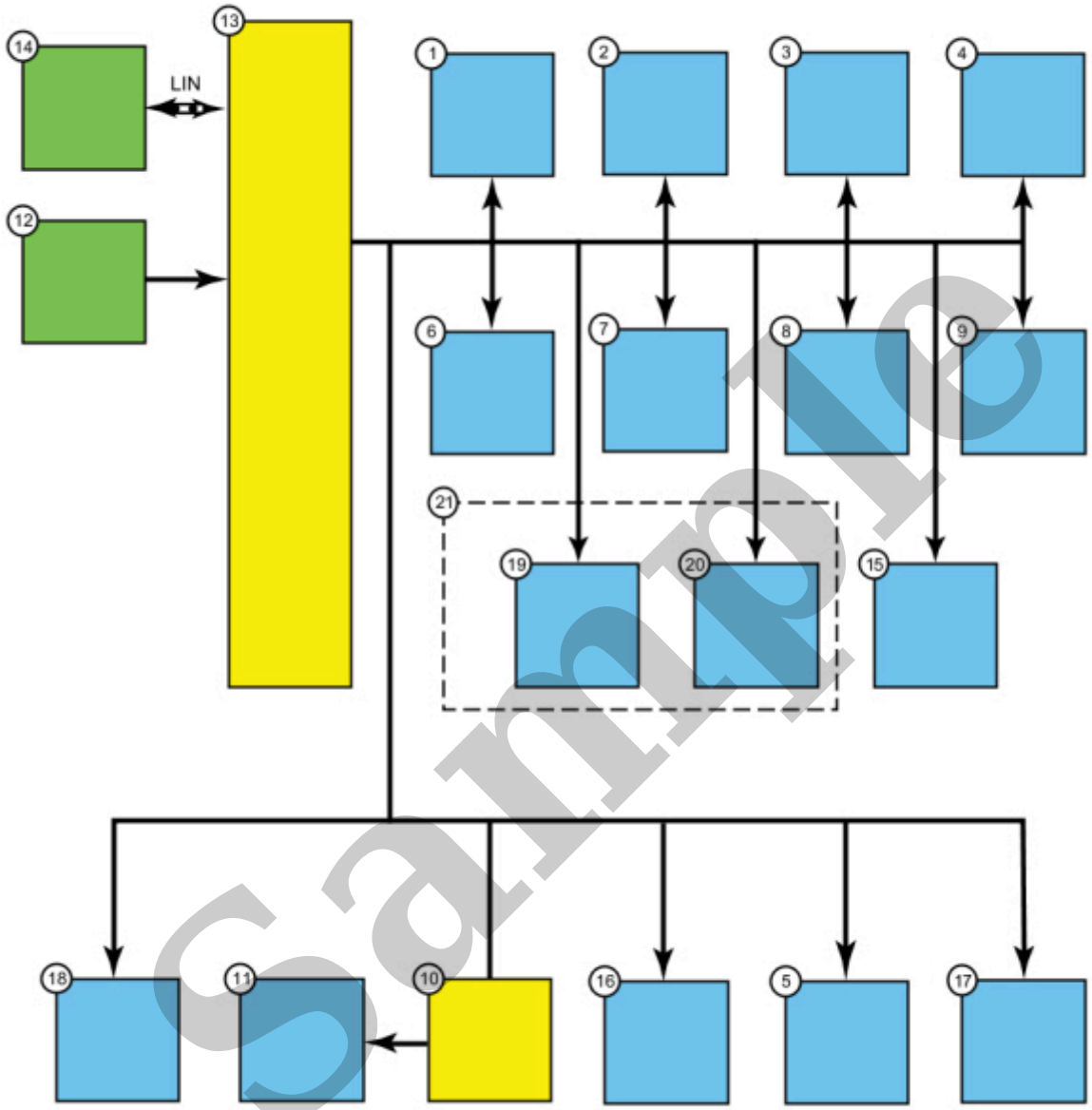
**HS-CAN2 (high-speed controller area network 2)**

- GSM (gear shift module)

**HS-CAN3 (high-speed controller area network 3)**

- IPC (instrument panel cluster)
- ACM (audio front control module)
- APIM (SYNC module)

The receiving modules use the illumination dimming level message to determine the backlighting intensity of networked and non-networked illumination sources. If a module does not receive the illumination dimming




E372297

| Item | Description |
|---|---|
| 1 | Rear Heated Seat Switch |

The BCM (body control module) calculates the correct intensity for the dimmable non-networked illumination sources based on the ambient light intensity input from the light sensor and the requested illumination intensity level input from the dimmer switch (integral to the headlamp switch). The BCM (body control module) provides a PWM (pulse width modulation) voltage to all non-networked illumination sources.

The non-networked, non-dimmable switches are illuminated whenever the ignition switch ON or OFF.

**Field-Effect Transistor (FET) Protection**

Field-Effect Transistors (FETs) are used to protect the BCM (body control module) illumination drivers from damage if the circuit is shorted to ground or experiences excessive current draw. Refer to the System Wiring Diagram to view the different groups of BCM (body control module) non-networked illumination outputs. For a full description of Field-Effect Transistor (FET) protection,

Refer to: Module Controlled Functions - System Operation and Component Description

(419-10 Multifunction Electronic Modules, Description and Operation).

Component Description

**Dimmer Switch**

The illumination dimmer switch is a momentary contact switch that is integral to the headlamp switch. The headlamp switch communicates with the BCM (body control module) over a LIN (local interconnect network) circuit. When the dimmer switch is pressed up or down, the requested illumination level is sent to the BCM (body control module) .

**Global Customer Symptom Code Chart**

| Customer Symptom | Action |
|---|---|
| Comfort & Entertainment > Audio > Display/Multifunction > Inoperative | GO to Pinpoint Test I |
| Comfort & Entertainment > Audio > Display/Multifunction > Inoperative | GO to Pinpoint Test J |
| Comfort & Entertainment > Audio > Steering Wheel Control > Inoperative | GO to Pinpoint Test G |
| Start/Run/Move > Moving > Paddle/SelectShift > Inoperative | GO to Pinpoint Test K |
| Lighting/Glass/Vision > Windows/Glass > Door > Power Function | GO to Pinpoint Test E |
| Lighting/Glass/Vision > Windows/Glass > Door > Power Function | GO to Pinpoint Test F |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test A |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test B |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test C |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test D |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test E |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test F |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test G |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test H |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Inoperative | GO to Pinpoint Test I |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Control | GO to Pinpoint Test A |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Control | GO to Pinpoint Test B |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Control | GO to Pinpoint Test C |
| Lighting/Glass/Vision > Interior Lighting > Instrument Panel > Control | GO to Pinpoint Test G |

| | |
|---|---|
| and down front windows) | |
| The RHF (right-hand front) door lock and/or window control switch illumination is inoperative or always on (with one-touch up and down front windows) | GO to Pinpoint Test F |
| The steering wheel switch(es) illumination is inoperative or always on | GO to Pinpoint Test G |
| The IPC (instrument panel cluster) illumination is inoperative or does not dim | GO to Pinpoint Test H |
| The ACM (audio front control module) illumination is inoperative or does not dim | GO to Pinpoint Test I |
| The information and entertainment display unit illumination is inoperative or does not dim | GO to Pinpoint Test J |
| The GSM (gear shift module) illumination is inoperative or does not dim | GO to Pinpoint Test K |

**Pinpoint Test**

**PINPOINT TEST A : THE ILLUMINATION INTENSITY OF ALL NETWORKED AND NON-NETWORKED BACKLIGHTING CANNOT BE INCREASED OR DECREASED**

Refer to Wiring Diagrams Cell 71for schematic and connector information.

**Normal Operation and Fault Conditions** REFER to: Instrument Panel and Interior Switches Illumination - System Operation and Component Description (413-00 Instrument Panel and Interior Switches Illumination, Description and Operation).

**Possible Sources**

- Wiring, terminals or connectors
- Dimmer switch (integral to the headlamp switch)
- BCM (body control module)

**A1 VERIFY THE OPERATION OF THE HEADLAMPS**

- Ignition ON.
- Place the headlamp switch in the HEADLAMPS ON position.
- Place the headlamp switch in the OFF position.

**Do the headlamps operate correctly?**

| | |
|---|---|
| **Yes** | Install a new headlamp switch.<br>REFER to: Headlamp Switch<br>(417-01 Exterior Lighting, Removal and Installation). |

**Normal Operation and Fault Conditions** REFER to: Instrument Panel and Interior Switches Illumination - System Operation and Component Description
(413-00 Instrument Panel and Interior Switches Illumination, Description and Operation).

**Possible Sources**

- Communication network concern
- Wiring, terminals or connectors
- BCM (body control module)

**B1 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 B2 |

| | |
|---|---|
| **No** | DIAGNOSE a concern with the network.<br>REFER to: Controller Area Network (CAN) Module Communications Network<br>(418-00A Controller Area Network (CAN) Module Communications Network, Diagnosis and Testing). |

**B2 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION**

- Disconnect and inspect all BCM (body control module) 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 (body control module) and related in-line connectors and all previously disconnected illumination system connectors. Make sure all connectors seat and latch correctly.
- Operate the system to determine if the concern is still present.

**Is the concern still present?**

| | |
|---|---|
| **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 BCM (body control module) . |

**Are the parking lamps operating correctly?**

| | |
|---|---|
| **Yes** | If the illumination is inoperative, GO to C3 If the illumination is always on, GO to C2 |

| | |
|---|---|
| **No** | DIAGNOSE a concern with the headlamp switch. REFER to: Headlamps (417-01 Exterior Lighting, Diagnosis and Testing). |

**C2 CHECK THE BCM (BODY CONTROL MODULE) ILLUMINATION OUTPUT CIRCUIT FOR A SHORT TO VOLTAGE**

- Ignition OFF.
- Disconnect BCM (body control module) C2280B .
- Ignition ON.

**Do the non-networked components continue to illuminate?**

| | |
|---|---|
| **Yes** | REPAIR the circuit. |

| | |
|---|---|
| **No** | GO to C5 |

**C3 BYPASS THE BCM (BODY CONTROL MODULE)**

- Ignition OFF.
- Disconnect BCM (body control module) C2280B .
- **NOTE**

  If the jumper wire fuse fails during this step, refer to the Wiring Diagrams manual to identify the possible causes for a short to ground.

  Connect:

| Positive Lead | Measurement / Action | Negative Lead |
|---|---|---|

**Is DTC (diagnostic trouble code) B1315:11 or U1000:00 currently set, or has DTC (diagnostic trouble code) U1000:00 set in the past?**

| | |
|---|---|
| **Yes** | CHECK the circuit for an intermittent short to ground. If DTC U1000:00 is present in the BCM (body control module) , a successful self-test must be completed before the illumination output is enabled. |

| | |
|---|---|
| **No** | GO to C5 |

**C5 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION**

- Ignition OFF.
- Disconnect and inspect all BCM (body control module) 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 (body control module) and related in-line connectors and all previously disconnected illumination system connectors. Make sure all connectors seat and latch correctly.
- Operate the system to determine if the concern is still present.

**Is the concern still present?**

| | |
|---|---|
| **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 BCM (body control module) .<br>REFER to: Body Control Module (BCM)<br>(419-10 Multifunction Electronic Modules, Removal and Installation). |

| | |
|---|---|
| **No** | The system is operating correctly at this time. The concern may have been caused by module connection concerns. ADDRESS the root cause of any connector or pin issues. |

**PINPOINT TEST D : ONE OR MORE NON-NETWORKED ILLUMINATION SOURCE IS INOPERATIVE**