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2009 FORD F-150 Raptor SVT OEM Service and Repair Workshop Manual

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- IPMA (image processing module A)

NOTE

In cold weather conditions (4°C [40°F] or less), the auto high beams are inhibited for 10 minutes to allow the camera windshield defrost heater to clear the windshield in front of the auto high beam camera.

D1 VERIFY THE HIGH BEAM HEADLAMP OPERATION

- Place the headlamp switch in the HEADLAMPS ON position.
- Place the RH (right-hand) steering column multifunction switch in the HIGH BEAM position while observing the headlamps.

Do the high beam headlamps illuminate?

Yes	GO to D2

No	GO to Pinpoint Test B

D2 CHECK FOR IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODE (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, perform the IPMA (image processing module A) self-test.

Are any IPMA (image processing module A) Diagnostic Trouble Code (DTCs) present?

Yes	REFER to: Lane Keeping System(419-07 Lane Keeping System, Diagnosis and Testing).

No	GO to D3

D3 VERIFY THE AUTOMATIC HIGH BEAM SENSOR IS NOT BLOCKED

- Visually verify the automatic high beam sensor is not blocked. Sources of blockage can include:
  - stickers, window decals or tags.
  - non-OEM window tinting.

Was the automatic high beam sensor blocked?

REFER to: Steering Column Multifunction Switch LH(211-05 Steering Wheel and Column Electrical Components, Removal and Installation).

- Ignition ON.
- Using a diagnostic scan tool, perform the SCCM (steering column control module) self-test.
- Clear the Diagnostic Trouble Codes (DTCs) and repeat the self-test.
- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, perform the SCCM (steering column control module) self-test.

Does SCCM (steering column control module) DTC (diagnostic trouble code) B1007:09 or the condition return?

Yes	The system is operating correctly. The concern was caused by the LH (left-hand) steering column multifunction switch.

No	GO to E2

E2 CHECK FOR CORRECT SCCM (STEERING COLUMN CONTROL MODULE) OPERATION

- Disconnect and inspect all SCCM (steering column control module) 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 (steering column control module) 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 (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 SCCM (steering column control module) . Vehicles without adaptive steering, REFER to: Steering Column Control Module (SCCM) (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). Vehicles with adaptive steering, REFER to: Steering Column Control Module (SCCM) - Vehicles With: Adaptive Steering

HCM (headlamp control module) B1D64:01	Left Headlamp Swiveling Motor: General Electrical Failure	A continuous memory and on-demand DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives a message from the LH (left-hand) headlamp LIN (local interconnect network) circuit that there is a failure of the headlamp swiveling motor.
HCM (headlamp control module) B1D64:87	Left Headlamp Swiveling Motor: Missing Message	A continuous memory and on-demand DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) does not receive a headlamp swiveling motor message from the RH (right-hand) headlamp LIN (local interconnect network) circuit.
HCM (headlamp control module) B1D65:01	Right Headlamp Swiveling Motor: General Electrical Failure	A continuous memory and on-demand DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives a message from the RH (right-hand) headlamp LIN (local interconnect network) circuit that there is a failure of the headlamp swiveling motor.
HCM (headlamp control module) B1D65:87	Right Headlamp Swiveling Motor: Missing Message	A continuous memory and on-demand DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) does not receive a headlamp swiveling motor message from the RH (right-hand) headlamp LIN (local interconnect network) circuit.
HCM (headlamp control module) B1D68:64	Left Headlamp Swiveling Feedback Sensor: Signal Plausibility Failure	A continuous memory and on-demand DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives a message from the LH (left-hand) headlamp LIN (local interconnect network) circuit that the headlamp swiveling feedback sensor is outside it's operating range.
HCM (headlamp control module) B1D69:64	Right Headlamp Swiveling Feedback Sensor: Signal Plausibility Failure	A continuous memory and on-demand DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives a message from the RH (right-hand) headlamp LIN (local interconnect network) circuit that the headlamp swiveling feedback sensor is outside it's operating range.

Possible Sources

- Wiring, terminals or connectors
- Headlamp assembly
- HCM (headlamp control module)

C1510-3	V	Ground
C1510-5	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to F3

No	REPAIR the circuit in question.

F3 CHECK THE HEADLAMP GROUND CIRCUITS FOR AN OPEN

- Measure:
  LH (left-hand) Headlamp or DTC (diagnostic trouble code) B1D64:01 or B1D68:64

Positive Lead	Measurement / Action	Negative Lead
C1509-3	V	C1509-2
C1509-3	V	C1509-4

RH (right-hand) Headlamp or DTC (diagnostic trouble code) B1D65:01 or B1D69:64

Positive Lead	Measurement / Action	Negative Lead
C1510-3	V	C1510-2

Yes	REPAIR the circuit.

No	GO to F5

F5 CHECK HCM (HEADLAMP CONTROL MODULE) LIN (LOCAL INTERCONNECT NETWORK) CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:
  LH (left-hand) Headlamp or DTC (diagnostic trouble code) B1087:83, B1087:86, B1D64:01, B1D64:87 or B1D68:64

Positive Lead	Measurement / Action	Negative Lead
C1509-15	Ω	Ground

  RH (right-hand) Headlamp or DTC (diagnostic trouble code) B1088:83, B1088:86, B1D65:01, B1D65:87 or B1D69:64

Positive Lead	Measurement / Action	Negative Lead
C1510-15	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to F6

No	REPAIR the circuit.

- While observing both headlamps, operate the vehicle in a manor to activate the adaptive front lighting. For operating conditions,
  REFER to: Exterior Lighting - Overview(417-01 Exterior Lighting, Description and Operation).
- Using a diagnostic scan tool, perform the HCM (headlamp control module) self-test.

Is the concern still present or does the DTC (diagnostic trouble code) in question return (disregard any other Diagnostic Trouble Codes (DTCs) at this time)?

Yes	GO to F8

No	The system is operating correctly at this time. The concern may was caused by the HCM (headlamp control module) programming.

F8 CHECK FOR CORRECT HCM (HEADLAMP CONTROL MODULE) OPERATION

- Disconnect and inspect the HCM (headlamp 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 HCM (headlamp control module) and related in-line connectors. Make sure it seats and latches correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	If adaptive front lighting is inoperative in both headlamps, 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 HCM (headlamp control module) . REFER to: Headlamp Control Module (HCM) (417-01 Exterior Lighting, Removal and Installation). If adaptive front lighting is inoperative in only one headlamp, 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 HCM (headlamp control module) .

		HCM (headlamp control module) configuration.
HCM (headlamp control module) U2100:00	Initial Configuration Not Complete: No Sub Type Information	A continuous memory DTC (diagnostic trouble code) that sets due to incomplete or incorrect HCM (headlamp control module) configuration.
HCM (headlamp control module) U2101:56	Control Module Configuration Incompatible: Invalid/Incompatible Configuration	A continuous memory DTC (diagnostic trouble code) that sets due to incomplete or incorrect HCM (headlamp control module) configuration.
HCM (headlamp control module) U2200:45	Control Module Configuration Memory Corrupt: Program Memory Failure	A continuous memory DTC (diagnostic trouble code) that sets due to incomplete or incorrect HCM (headlamp control module) configuration.
HCM (headlamp control module) U3000:41	Control Module: General Checksum Failure	A continuous memory DTC (diagnostic trouble code) that sets due to incomplete or incorrect HCM (headlamp control module) configuration.
HCM (headlamp control module) U3000:45	Control Module: Program Memory Failure	A continuous memory DTC (diagnostic trouble code) that sets due to incomplete or incorrect HCM (headlamp control module) configuration.
HCM (headlamp control module) U3000:46	Control Module: Calibration/Parameter Memory Failure	A continuous memory DTC (diagnostic trouble code) that sets due to incomplete or incorrect HCM (headlamp control module) configuration.

Possible Sources

- HCM (headlamp control module)

G1 CHECK THE HCM (HEADLAMP CONTROL MODULE) PROGRAMMING

- Using a diagnostic scan tool, complete the PMI (programmable module installation) process for the HCM (headlamp control module) following the on-screen instructions.
- REPEAT the HCM (headlamp control module) self-test.

REFER to: Exterior Lighting - System Operation and Component Description (417-01 Exterior Lighting, Description and Operation).

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
HCM (headlamp control module) U0401:00	Invalid Data Received from ECM/PCM A: No Sub Type Information	A continuous memory DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives invalid network data from the PCM (powertrain control module) .
HCM (headlamp control module) U0415:00	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module 'A': No Sub Type Information	A continuous memory DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives invalid network data from the ABS (anti-lock brake system) module.
HCM (headlamp control module) U0416:00	Invalid Data Received From Vehicle Dynamics Control Module: No Sub Type Information	A continuous memory DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives invalid network data from the VDM (vehicle dynamics control module) .
HCM (headlamp control module) U0420:00	Invalid Data Received from Power Steering Control Module 'A': No Sub Type Information	A continuous memory DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives invalid network data from the PSCM (power steering control module) .
HCM (headlamp control module) U0422:00	Invalid Data Received From Body Control Module: No Sub Type Information	A continuous memory DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives invalid network data from the BCM (body control module) .
HCM (headlamp control module) U0429:00	Invalid Data Received From Steering Column Control Module: No Sub Type Information	A continuous memory DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives invalid network data from the SCCM (steering column control module) .
HCM (headlamp control module) U0452:00	Invalid Data Received From Restraints Control Module: No Sub Type Information	A continuous memory DTC (diagnostic trouble code) that sets when the HCM (headlamp control module) receives invalid network data from the RCM (restraints control module) .

Refer to Wiring Diagrams Cell 85for schematic and connector information.

Normal Operation and Fault Conditions REFER to: Exterior Lighting - Overview (417-01 Exterior Lighting, Description and Operation).

REFER to: Exterior Lighting - System Operation and Component Description (417-01 Exterior Lighting, Description and Operation).

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
HCM (headlamp control module) U3003:16	Battery Voltage: Circuit Voltage Below Threshold	A continuous memory and on-demand DTC (diagnostic trouble code) that sets in the HCM (headlamp control module) if the HCM (headlamp control module) detects low battery voltage on the voltage supply input.

Possible Sources

- Wiring, terminals or connectors
- Battery concern
- Charging system concern
- HCM (headlamp control module)

I1 CARRY OUT THE HCM (HEADLAMP CONTROL MODULE) SELF-TEST

- Ignition ON.
- Using a diagnostic scan tool, clear the Diagnostic Trouble Codes (DTCs).
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the HCM (headlamp control module) self-test.

Is DTC (diagnostic trouble code) U3003:16 still present?

Yes	GO to I2

No	The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to a previous low battery voltage condition.

I2 CHECK FOR CHARGING SYSTEM DIAGNOSTIC TROUBLE CODES (DTCS)

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