FOG LAMPS

417-01 Exterior Lighting
Diagnosis and Testing

2020 Ranger

Fog Lamps

DTC Charts

DTC Chart: BCM

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) .

DTC	Description	Action
B1046:11	Front Fog Lamp Control Switch: Circuit Short To Ground	GO to Pinpoint Test C
B1147:11	Left Front Fog Lamps: Circuit Short To Ground	GO to Pinpoint Test B
B1147:15	Left Front Fog Lamps: Circuit Short To Battery or Open	• If the fog lamp is inoperative, GO to Pinpoint Test B • If the fog lamp is always on, GO to Pinpoint Test C
B1148:11	Right Front Fog Lamps: Circuit Short To Ground	GO to Pinpoint Test B
B1148:15	Right Front Fog Lamps: Circuit Short To Battery or Open	• If the fog lamp is inoperative, GO to Pinpoint Test B • If the fog lamp is always on, GO to Pinpoint Test C
U1000:00	Solid State Driver Protection Active -Driver Disabled: No Sub Type Information	GO to Pinpoint Test B
U3000:49	Control Module: Internal Electronic Failure	GO to Pinpoint Test B

All other BCM Diagnostic Trouble Codes (DTCs)	-	REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing) .

Symptom Chart

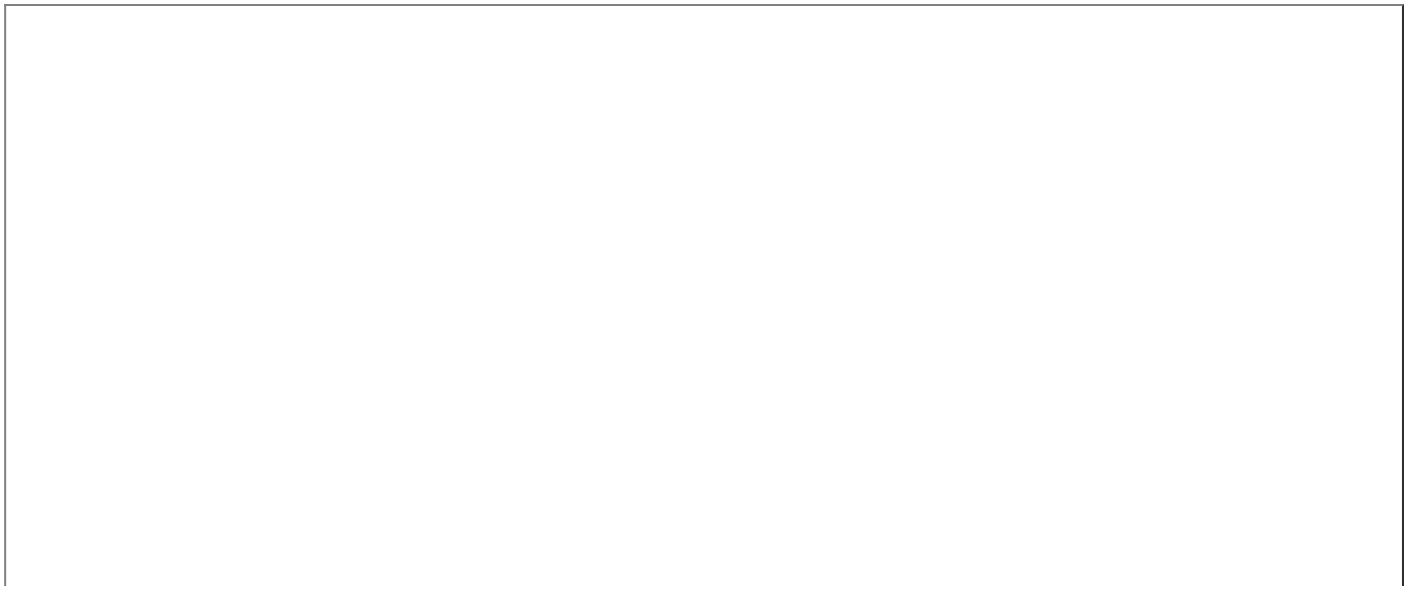
Symptom Chart: Fog Lamps

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	Actions
A module does not respond to the diagnostic scan tool	• Fuse • Wiring, terminals or connectors • Module	REFER to: Communications Network (418-00 Module Communications Network) .
Both front fog lamps are inoperative	Refer to the Pinpoint Test	GO to Pinpoint Test A
An individual front fog lamp is inoperative	Refer to the Pinpoint Test	GO to Pinpoint Test B
The front fog lamps are on continuously	Refer to the Pinpoint Test	GO to Pinpoint Test C

Pinpoint Tests

PINPOINT TEST A : BOTH FRONT FOG LAMPS ARE INOPERATIVE



Refer to Wiring Diagrams Cell 86 for 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) .

Possible Sources

- Wiring, terminals or connectors
- Headlamp switch
- Headlamps concern
- BCM

Visual Inspection and Pre-checks

- Inspect the headlamp switch for damage.

A1 CHECK THE LOW BEAM OPERATION

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

Do the low beams operate correctly?

Yes	GO to A2
No	REFER to: Headlamps (417-01 Exterior Lighting, Diagnosis and Testing) .

A2 CHECK THE HEADLAMP SWITCH

- Ignition OFF.
- Disconnect: Headlamp Switch C205 .
- Carry out the headlamp switch component test.
  Refer to Wiring Diagrams Cell 149 for schematic and connector information.

Does the headlamp switch pass the component test?

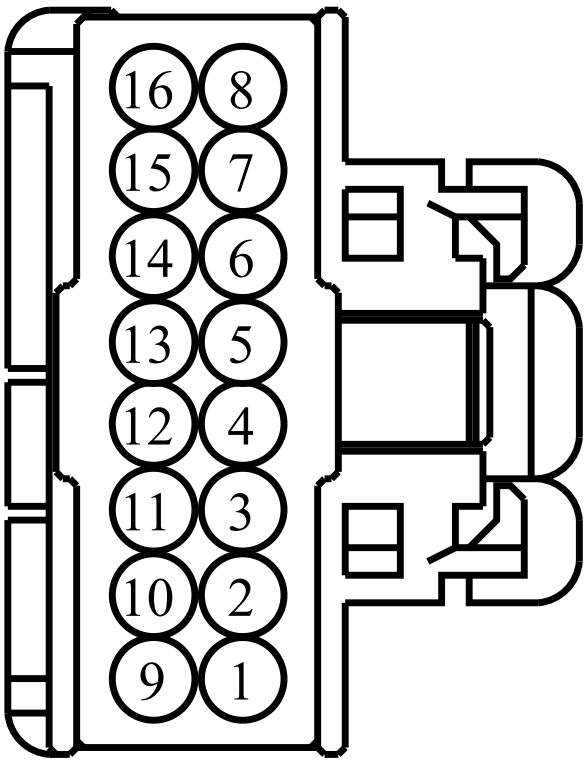
Yes	GO to A3
No	INSTALL a new headlamp switch.

A3 CHECK THE BCM (BODY CONTROL MODULE) FOG LAMP SWITCH INPUT CIRCUIT FOR AN OPEN

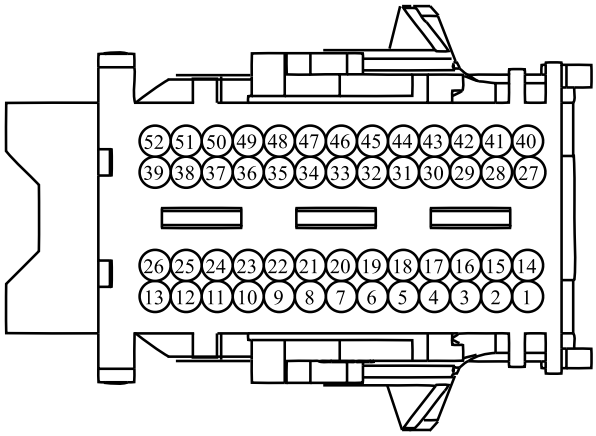
- Ignition OFF.
- Disconnect: BCM C2280G .
- Measure:

Connectors:

HEADLAMP SWITCH



BODY CONTROL MODULE (BCM)



Positive Lead	Measurement / Action	Negative Lead
C205-14	Ω	C2280G-20

Is the resistance less than 3 ohms?

Yes	GO to A4
No	REPAIR the circuit.

A4 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION

- Disconnect and inspect all BCM and all 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 and all 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 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 BCM . REFER to: Body Control Module (BCM) (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 connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST B : AN INDIVIDUAL FRONT FOG LAMP IS INOPERATIVE

Refer to Wiring Diagrams Cell 86 for 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	Description	Fault Trigger Condition
BCM B1147:11	Left Front Fog Lamps: Circuit Short To Ground	A continuous memory and on-demand DTC that sets when the BCM detects a short to ground from the LH fog lamp output circuit.
BCM B1147:15	Left Front Fog Lamps: Circuit Short To Battery Or Open	A continuous memory and on-demand DTC that sets when the BCM detects an open from the LH fog lamp output circuit.

BCM B1148:11	Right Front Fog Lamps: Circuit Short To Ground	A continuous memory and on-demand DTC that sets when the BCM detects a short to ground from the RH fog lamp output circuit.
BCM B1148:15	Right Front Fog Lamps: Circuit Short To Battery Or Open	A continuous memory and on-demand DTC that sets when the BCM detects an open from the RH fog lamp output circuit.
BCM U1000:00	Solid State Driver Protection Active - Driver Disabled: No Sub Type Information	This DTC sets when the BCM has temporarily shut down the output driver. The module has temporarily disabled an output because an excessive current draw exists (such as a short to ground). The BCM cannot enable the output until the cause of the short is corrected, the Diagnostic Trouble Codes (DTCs) have been cleared and a successful self-test is run. For additional information on BCM Field Effect Transistor (FET) protection, REFER to: Module Controlled Functions - System Operation and Component Description (419-10 Multifunction Electronic Modules, Description and Operation) .
BCM U3000:49	Control Module: Internal Electronic Failure	This DTC sets when the BCM has permanently shut down the output driver. The module has permanently disabled an output because an excessive current draw fault (such as a short to ground) has exceeded the limits that the BCM can withstand. CORRECT the cause of the excessive current draw before installing a new BCM . For additional information on BCM Field Effect Transistor (FET) protection, REFER to: Module Controlled Functions - System Operation and Component Description (419-10 Multifunction Electronic Modules, Description and Operation) .

Possible Sources

- Bulb
- Wiring, terminals or connectors
- BCM

Visual Inspection and Pre-checks

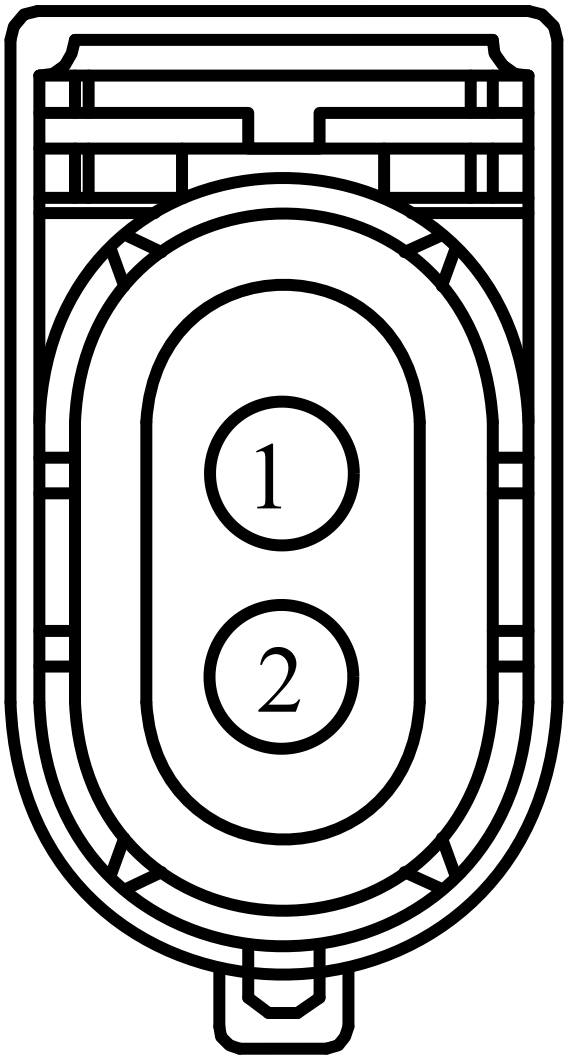
- Inspect the bulbs and make sure they are OK.

B1 CHECK FOR VOLTAGE TO THE INOPERATIVE FOG LAMP

- Ignition OFF.
- Disconnect: Inoperative LH Fog Lamp C152 or RH Fog Lamp C162 .
- Ignition ON.
- Place the headlamp switch in the PARKLAMPS position and engage the fog lamp switch.
- Measure:

  Connectors:

FRONT FOG LAMP LH

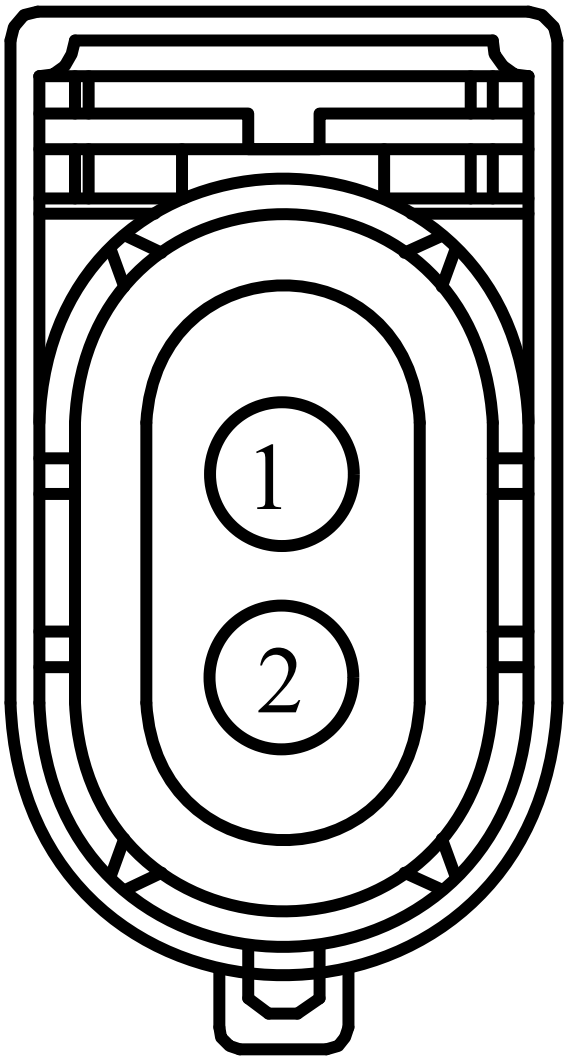


LH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C152-1		Ground

Connectors:

FRONT FOG LAMP RH



RH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C162-1	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to B3

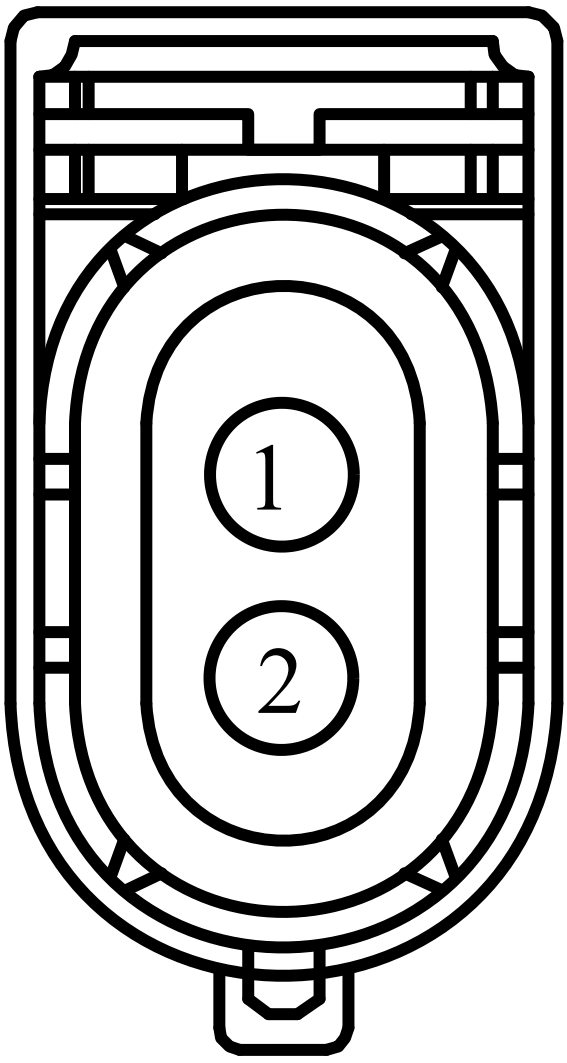
No	GO to B2

B2 REPEAT THE ON-DEMAND SELF-TEST AND CHECK FOR VOLTAGE TO THE FOG LAMP

- Using a diagnostic scan tool, perform the BCM self-test.
- Clear the Diagnostic Trouble Codes (DTCs) and repeat the self-test (required to enable the lamp output driver if DTC U1000:00 is present).
- Measure:

  Connectors:

FRONT FOG LAMP LH

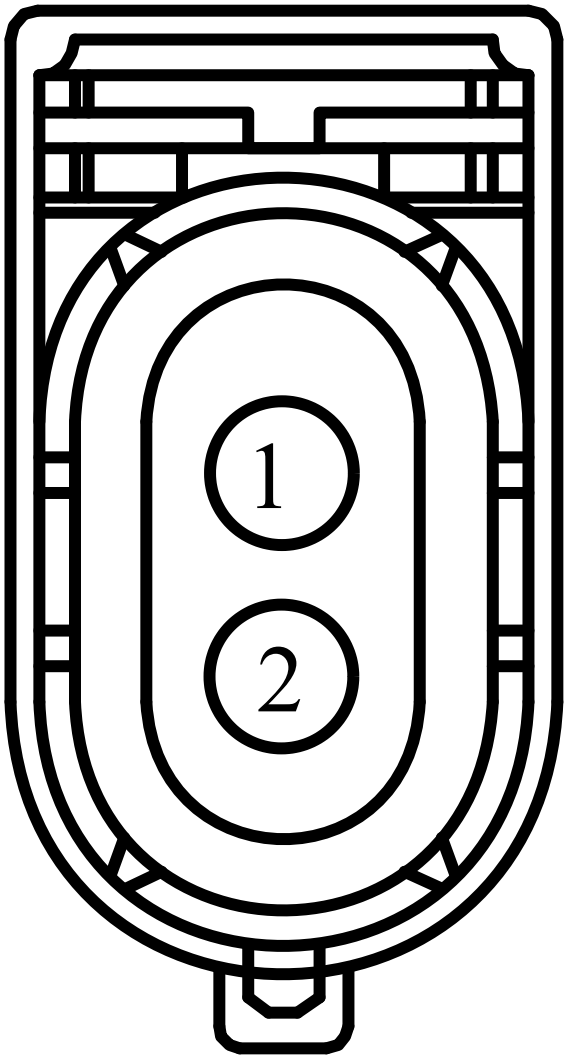


LH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C152-1		Ground

Connectors:

FRONT FOG LAMP RH



RH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C162-1		Ground

Is the voltage greater than 11 volts?

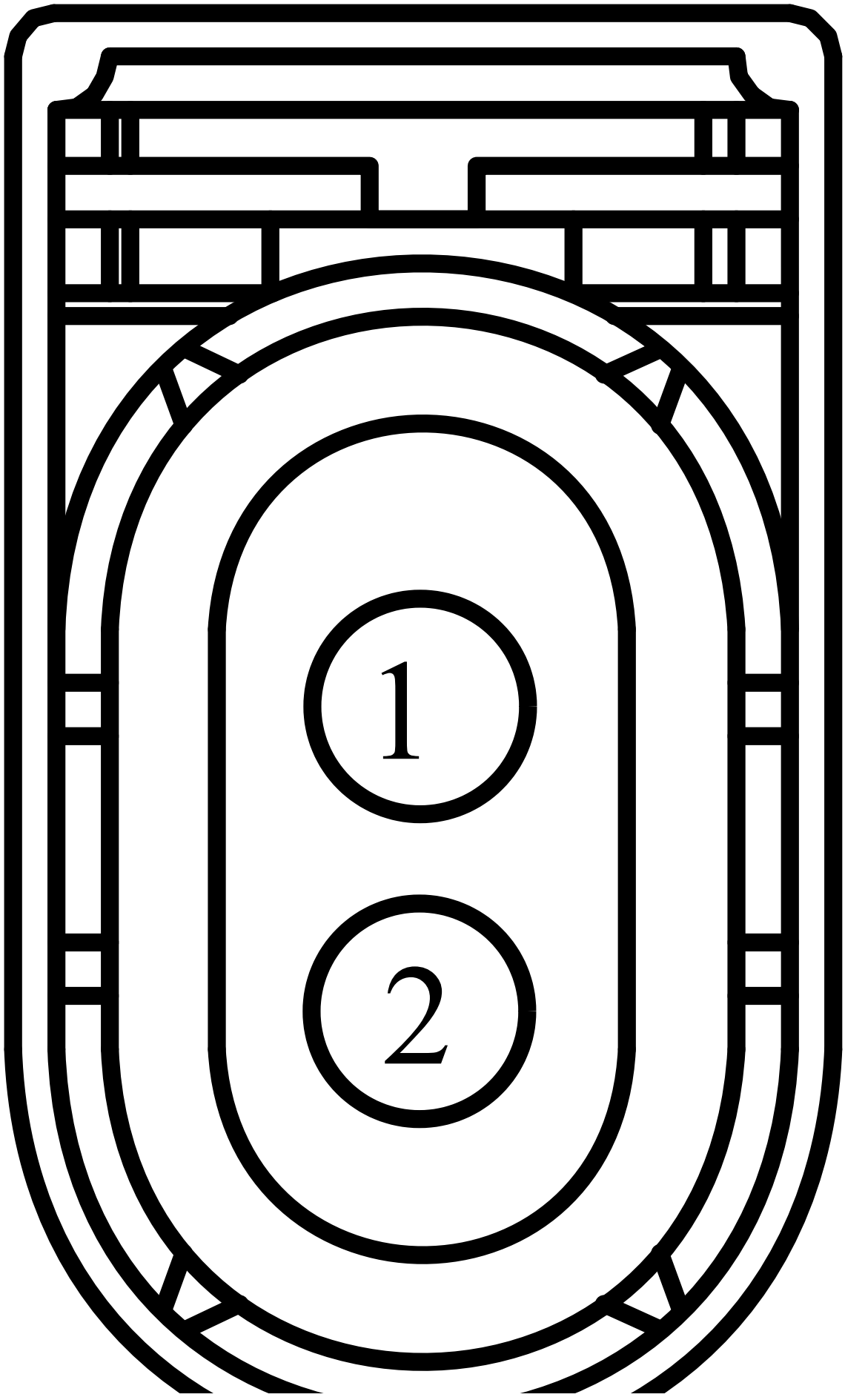
Yes	INSTALL a new front fog lamp. REFER to: Front Fog Lamp (417-01 Exterior Lighting, Removal and Installation) .
No	GO to B4

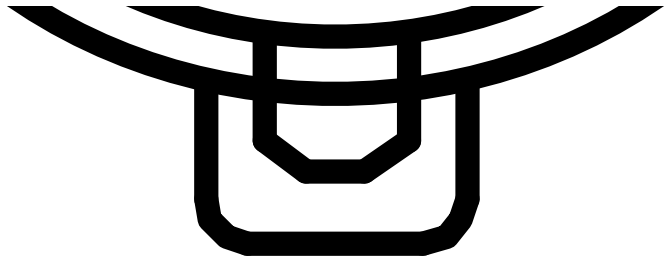
B3 CHECK THE INOPERATIVE FOG LAMP GROUND CIRCUIT FOR AN OPEN

- Measure:

  Connectors:

FRONT FOG LAMP LH


1
2

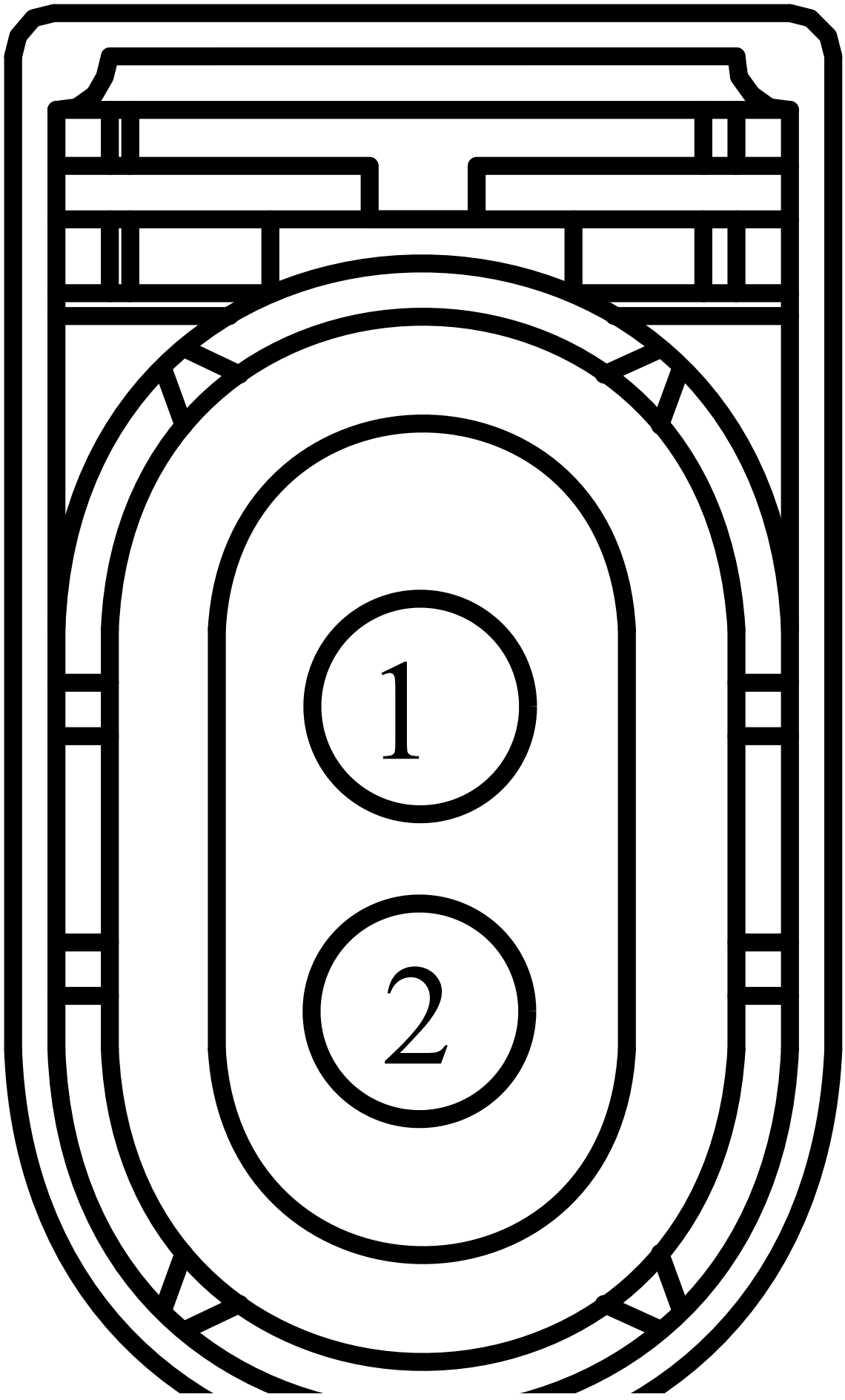


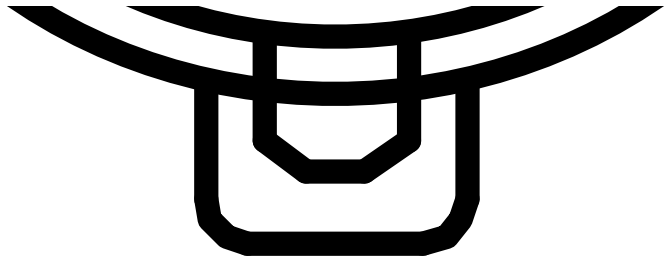
LH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C152-1		C152-2

Connectors:

FRONT FOG LAMP RH


1
2



RH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C162-1	V	C162-2

Is the voltage greater than 11 volts?

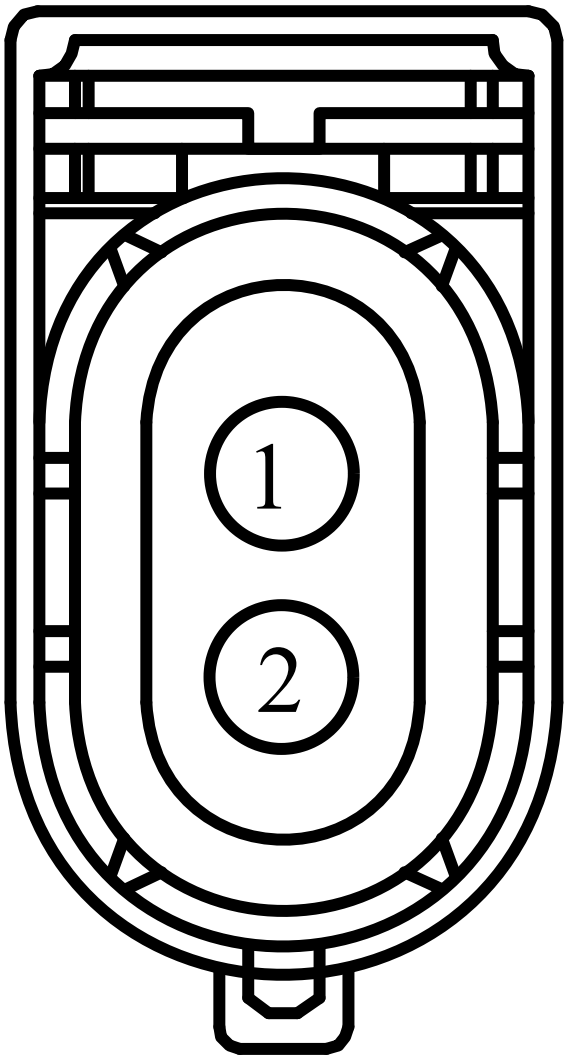
Yes	INSTALL a new front fog lamp. REFER to: Front Fog Lamp (417-01 Exterior Lighting, Removal and Installation) .
No	REPAIR the circuit.

B4 CHECK FOG LAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND

- Place the headlamp switch in the OFF position.
- Ignition OFF.
- Disconnect: BCM C2280B .
- Measure:

Connectors:

FRONT FOG LAMP LH

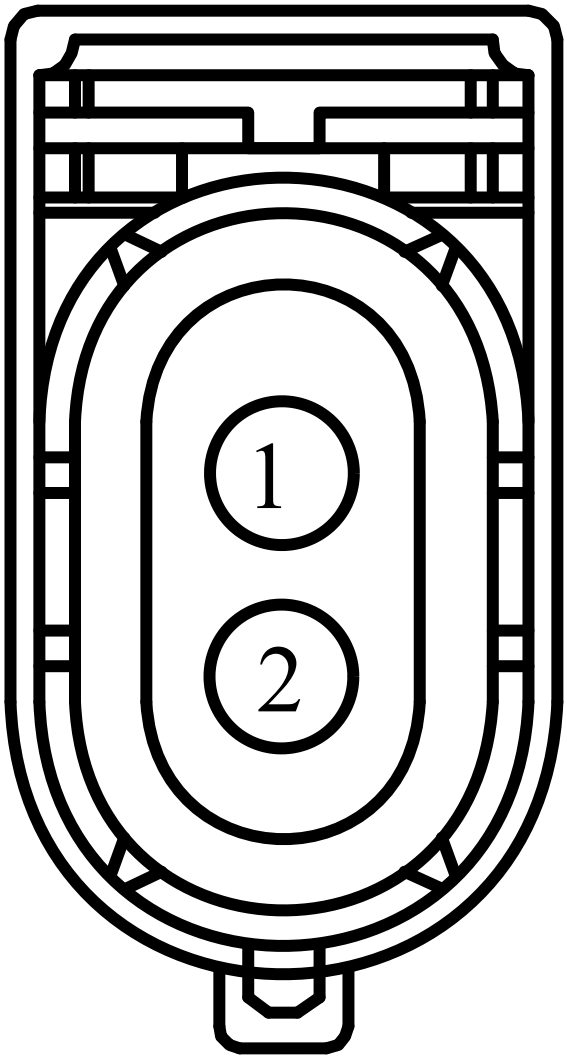


LH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C152-1	Ω	Ground

Connectors:

FRONT FOG LAMP RH



RH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C162-1	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to B5

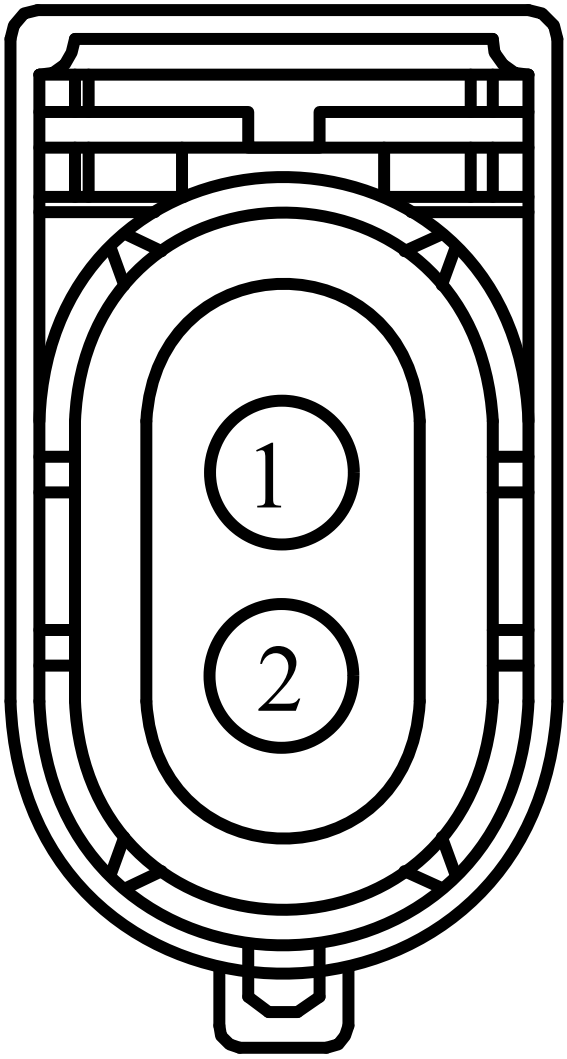
No	REPAIR the circuit. After the repair. If no Diagnostic Trouble Codes (DTCs) are present, TEST the system for normal operation. If DTC U1000:00 is present, CLEAR the Diagnostic Trouble Codes (DTCs) and REPEAT the self-test (required to enable the lamp output driver if DTC U1000:00 is present). If DTC U3000:49 is present, INSTALL a new BCM . REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Removal and Installation) .

B5 CHECK FOG LAMP VOLTAGE SUPPLY CIRCUIT FOR AN OPEN

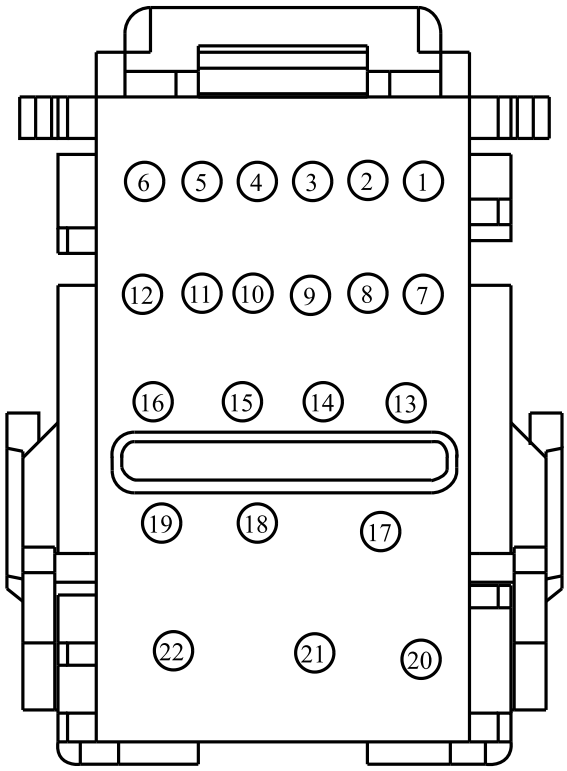
- Measure:

  Connectors:

FRONT FOG LAMP LH



BODY CONTROL MODULE (BCM)



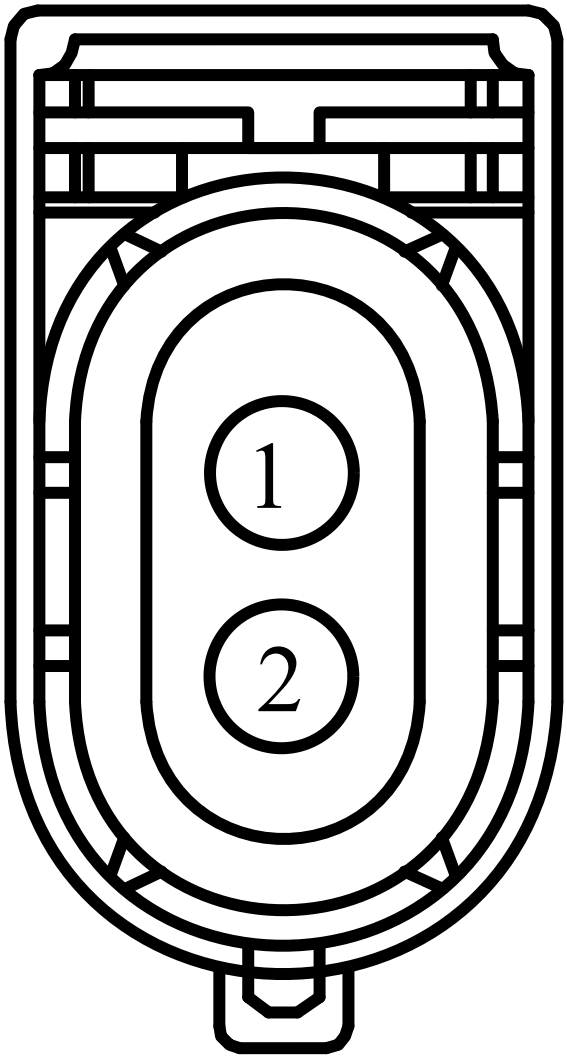
LH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead

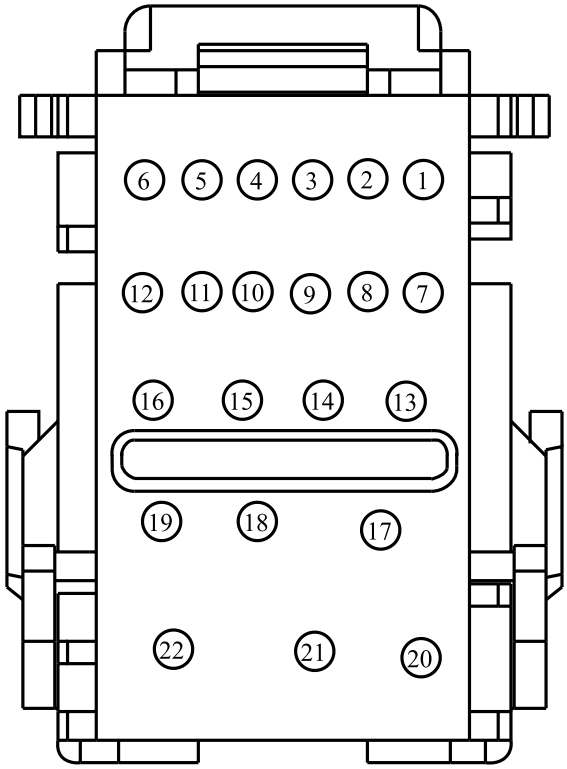
Positive Lead	Measurement / Action	Negative Lead
C152-1	Ω	C2280B-12

Connectors:

FRONT FOG LAMP RH



BODY CONTROL MODULE (BCM)



RH Fog Lamp

Positive Lead	Measurement / Action	Negative Lead
C162-1	Ω	C2280B-5

Is the resistance less than 3 ohms?

Yes	GO to B6
No	REPAIR the circuit.

B6 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION

- Disconnect and inspect all BCM and all 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 and all 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 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 BCM . REFER to: Body Control Module (BCM) (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 connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST C : THE FRONT FOG LAMPS ARE ON CONTINUOUSLY

Refer to Wiring Diagrams Cell 86 for 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	Description	Fault Trigger Condition
BCM B1046:11	Front Fog Lamp Control Switch: Circuit Short To Ground	A continuous and on-demand DTC that sets when the BCM detects a short to ground on the headlamp switch input circuits.
BCM B1147:15	Left Front Fog Lamps: Circuit Short To Battery Or Open	A continuous memory and on-demand DTC that sets when the BCM detects an open from the LH fog lamp output circuit.
BCM B1148:15	Right Front Fog Lamps: Circuit Short To Battery Or Open	A continuous and on-demand DTC that sets when the BCM detects a short to voltage from the RH fog lamp beam output circuit.

Possible Sources

- Wiring, terminals or connectors
- Headlamp switch
- BCM

Visual Inspection and Pre-checks

- Inspect the headlamp switch for damage.

C1 CHECK THE HEADLAMP SWITCH

- Ignition OFF.
- Disconnect: Headlamp Switch C205 .
- Carry out the headlamp switch component test.
  Refer to Wiring Diagrams Cell 149 for schematic and connector information.

Does the headlamp switch pass the component test?

Yes	GO to C2
No	INSTALL a new headlamp switch.

C2 CHECK THE FOG LAMP VOLTAGE SUPPLY CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: BCM C2280B .
- Ignition ON.

Do the fog lamps continue to illuminate?

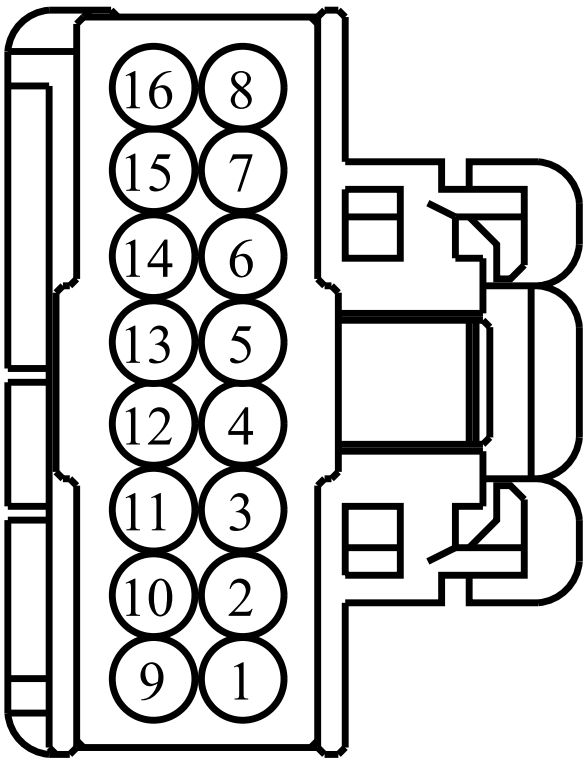
Yes	GO to C3
No	REPAIR the circuits.

C3 CHECK THE BCM (BODY CONTROL MODULE) FOG LAMP SWITCH INPUT CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect: BCM C2280G .
- Measure:

Connectors:

HEADLAMP SWITCH



Positive Lead	Measurement / Action	Negative Lead
C205-14	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to C4
No	REPAIR the circuit.

C4 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION

- Disconnect and inspect all BCM and all 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 and all 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 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 BCM . REFER to: Body Control Module (BCM) (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 connections. ADDRESS the root cause of any connector or pin issues.