

Service Manual: REAR VIEW MIRRORS**DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - OVERVIEW > OVERVIEW****Exterior, Manual**

This vehicle may be equipped with LH and RH manual mirrors. The manual mirror system allows the exterior mirrors and exterior mirror glass to be positioned manually.

Exterior, Power

This vehicle may be equipped with LH and RH power mirrors. The power mirror system allows the exterior mirror glass to be positioned electronically.

Exterior, Heated

This vehicle may be equipped with LH and RH heated mirror glass and with a LH and RH heated spotter glass. The heated mirror glass feature heats the mirror glass to remove frost, snow, ice and condensation.

Exterior, Memory

This vehicle may be equipped with memory mirrors. The memory mirror feature allows the driver to recall or save the preferred positioning of the LH and RH mirror glass.

Exterior, Power Folding

This vehicle may be equipped with LH and RH power folding mirrors. The power folding mirror feature allows the exterior mirrors to be electronically folded and unfolded.

Exterior, Power Telescoping

This vehicle may be equipped with LH and RH power telescoping mirrors. The power telescoping mirror feature allows the exterior mirrors to be electronically extended or retracted.

Exterior, Auto-Dimming

The LH exterior mirror may be equipped with an auto-dimming mirror glass. The LH exterior auto-dimming mirror function is controlled by the interior auto-dimming rear view mirror. The exterior mirror glass only darkens when the interior auto-dimming mirror detects bright light from behind the vehicle during nighttime conditions.

Exterior, Turn Signals

The LH and RH exterior mirrors may be equipped with a mirror-mounted turn signal assembly. For repair procedures and information on the mirror-mounted turn signals, Refer to: Turn Signal and Hazard Lamps .

Exterior, Parking Lamps

The LH and RH exterior mirrors may be equipped with a parking lamp. For repair procedures and information on the mirror-mounted parking lamps, Refer to: Parking, Rear and License Plate Lamps .

Exterior, Spot Lamps

The LH and RH exterior mirrors may be equipped with a mirror-mounted spot lamp assembly. For repair procedures and information on the mirror-mounted spot lamps, Refer to: Spot Lamps .

Exterior, Puddle Lamps

The LH and RH exterior mirrors may be equipped with a puddle lamp. For repair procedures and information on the mirror-mounted puddle lamps, Refer to: Interior Lighting .

Exterior, BLIS ®/ CTA Light Emitting Diodes (LEDs)

The LH and RH exterior mirrors may be equipped with a BLIS ®/ CTA LED. For repair procedures and information on the mirror-mounted BLIS ®/ CTA Light Emitting Diodes (LEDs), Refer to: Blind Spot Information System .

Exterior, Side Cameras

The LH and RH exterior mirrors may be equipped with a side camera. For repair procedures and information on the mirror-mounted side camera, Refer to: Parking Aid .

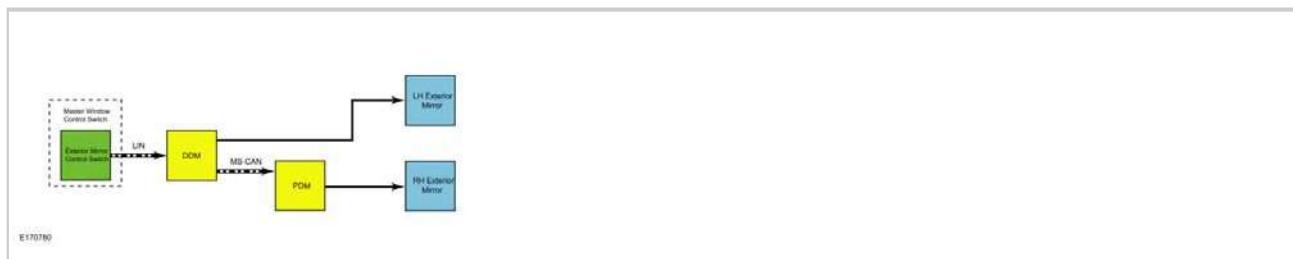
Interior

This vehicle may be equipped with a manual or auto-dimming interior rear view mirror. The manual dimming interior mirror has a lever at the bottom of the mirror assembly that must be pushed forward or pulled rearward to change the reflectance of the interior mirror glass. During nighttime conditions, the auto-dimming interior mirror automatically darkens the mirror glass when headlamps are detected from behind the vehicle to reduce unwanted glare.

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION

System Operation

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > SYSTEM DIAGRAM - EXTERIOR, POWER, WITHOUT MEMORY



Network Message Chart

Module Network Input Messages - PDM

Broadcast Message	Originating Module	Message Purpose
Passenger mirror command	DDM	Contains the movement requests for the RH exterior mirror glass generated by the exterior mirror control switch.

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Module Network Input Messages - PDM

Broadcast Message	Originating Module	Message Purpose
Passenger mirror command	DDM	Contains the movement requests for the RH exterior mirror glass generated by the exterior mirror control switch.

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All functions of the power mirror feature are integrated into one switch module (integral to the LH front door window control switch). The left and right side selection buttons have an LED to indicate which side is active and a directional pad is used for directional control. Neutral is achieved by pressing the lit button to deactivate the left or right exterior mirror, or by allowing the system to time out and reset to neutral.

When the exterior mirror directional pad switch is pressed left, right, up or down with the LH or RH exterior mirror selected, the movement request is sent to the DDM through a LIN circuit. If the LH mirror is selected, the DDM supplies voltage and ground to the appropriate LH exterior mirror motor. If the RH mirror is selected, the DDM sends the passenger mirror command message with the input from the exterior mirror control switch to the PDM. The PDM then supplies voltage and ground to the appropriate RH exterior mirror motor. The DDM and PDM controls the glass movements by reversing polarity of the voltage and ground circuits being supplied to each motor.

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > NETWORK MESSAGE CHART

Network Message Chart

Module Network Input Messages - PDM

Broadcast Message	Originating Module	Message Purpose
Passenger mirror command	DDM	Contains the movement requests for the RH exterior mirror glass generated by the exterior mirror control switch.

Module Network Input Messages - DDM and PDM

Broadcast Message	Originating Module	Message Purpose
Memory command	DSM	Commands the door modules to

initiate a memory save or recall and is used to abort a memory recall that is in progress.

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NOTE: If the DDM or PDM detects a mirror motor feedback circuit fault, a timeout strategy disables the memory operations for 30 seconds to prevent system damage. After the 30 second timeout, normal operation resumes.

All functions of the power mirror feature are integrated into one switch module (integral to the LH front door window control switch). The left and right side selection buttons have an LED to indicate which one is active and a directional pad is used for directional control. Neutral is achieved by pressing the lit button to deactivate the left or right exterior mirror, or by allowing the system to time out and reset to neutral.

When the exterior mirror directional pad switch is pressed left, right, up or down with the LH or RH exterior mirror selected, the movement request is sent to the DDM through a LIN circuit. If the LH mirror is selected, the DDM supplies voltage and ground to the appropriate LH exterior mirror motor. If the RH mirror is selected, the DDM sends the passenger mirror command message with the input from the exterior mirror control switch to the PDM. The PDM then supplies voltage and ground to the appropriate RH exterior mirror motor. The DDM and PDM controls the glass movements by reversing polarity of the voltage and ground circuits being supplied to each motor.

When a memory recall or save is initiated, the DSM sends the memory command message to the DDM and PDM through the MS-CAN. Based on this message, the DDM and PDM recall the requested memory preset mirror position from internal memory or save the current mirror position to correspond with the requested preset. During a memory recall, the DDM and PDM supply voltage and ground to the appropriate exterior mirror motors to achieve the desired memory positions that are stored in memory based on feedback from the mirror motor potentiometers. To support the memory function, the DDM supplies a 5 volt reference and ground to the LH mirror motor potentiometers and the PDM supplies a 5 volt reference and ground to the RH mirror motor potentiometers. The DDM monitors the feedback voltage from the horizontal and vertical potentiometers to determine the position of the LH mirror glass and the PDM monitors the feedback voltage from the horizontal and vertical potentiometers to determine the position of the RH mirror glass. If the exterior mirror control switch is activated in any direction during a memory recall, the DDM sends the manual mirror override message to the DSM. After this message is received, the DSM sends the memory command message to abort the memory recall. After the recall is aborted, the DDM or PDM respond to the exterior mirror control switch inputs. A memory recall is also aborted if the driver seat control switch is activated in any direction during a memory recall.

The LH exterior mirror glass position presets are stored in the DDM and the RH exterior mirror glass position presets are stored in the PDM.

A memory recall or memory save can be initiated by the memory set switch, a RKE transmitter or the keyless entry keypad. For additional information on memory recall or memory save, refer to the Owner's Literature.

For additional information on the memory feature function, Refer to: Front Seats - System Operation and Component Description .

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > SYSTEM OPERATION - EXTERIOR, HEATED

On vehicles equipped with rear window defrost, the heated exterior mirror glass and if equipped, the heated trailer tow spotter mirror glass operates when the rear defrost system is activated.

On vehicles equipped with heated mirrors only, the heated exterior mirror glass and if equipped, the heated trailer tow spotter mirror glass operates when the heated mirror button is pressed on the FCIM.

The heated mirrors are heated for a period of 10 minutes when the engine is running and the defrost system is activated.

The LH and RH heated exterior mirror glass voltage is supplied by the rear window defrost relay through BJB fuse 63 (15A).

On vehicles equipped with a LH exterior auto-dimming mirror, the LH exterior mirror glass takes longer to defrost than the RH exterior mirror glass due to differences in the mirror glass thickness.

If equipped, the rear window defrost can also be commanded on and off using voice commands or by touching the rear window defrost button located on the touchscreen interface (FDIM). For additional information on voice or touchscreen commanded features, refer to the Owner's Literature.

For additional information on the rear window defrost system, Refer to: Glass, Frames and Mechanisms - System Operation and Component Description .

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > NETWORK MESSAGE CHART

Network Message Chart

Module Network Input Messages - DDM

Broadcast Message	Originating Module	Message Purpose
Ignition status	BCM	Used to determine if the ignition switch conditions have been met to fold or unfold the exterior mirrors

Module Network Input Messages - PDM

Broadcast Message	Originating Module	Message Purpose
Passenger mirror command	DDM	Used by the PDM to control operation of the RH power folding exterior mirror.

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND

COMPONENT DESCRIPTION > SYSTEM OPERATION - EXTERIOR, POWER FOLD

 **NOTE:** If the exterior mirrors are folded and unfolded several times consecutively, the power lockout feature disables the system for approximately 3-10 minutes to prevent damage to the power fold motors. After 3-10 minutes have elapsed, normal operation resumes.

 **NOTE:** The power folding mirrors must be synchronized anytime the LH, RH or both power folding mirrors are folded or unfolded without using the power folding mirror control switch, or if a new power folding mirror has been installed. Refer to Power Folding Mirrors Synchronization .

The power folding exterior mirror feature allows both power exterior rear view mirrors to be folded or unfolded using the exterior mirror fold switch (integral to the LH front door window control switch). The LH and RH power folding mirrors fold or unfold at the same time and cannot be controlled independently.

On vehicles equipped with aero mirrors, pushing the power fold button (there is no indicator light) activates the fold function with no additional action required. The power folding mirror mode must be deactivated before going to the LH or RH exterior mirror glass adjust mode. When a left or right mirror adjust mode is active, pressing the folding mirror switch overrides the mirror adjust mode and goes directly to folding mode.

On vehicles equipped with trailer tow mirrors, pushing the power fold mirror button while an LED is lit on the left or right side selection button changes from glass adjustment mode to fold mode. Pushing the left or right side selection button while the power fold button is lit (active) does not change the system to glass adjustment mode. The fold switch must be returned to neutral by pushing the power fold button to deactivate the folding mode or allowing it to time out. Pushing the fold button activates the LED indicator and the function. Pushing the directional control pad up or down initiates the fold function, which folds the mirrors from the deployed or stowed position to the opposite position. The direction (up or down) initiates the fold, but does not control the direction of the fold. The fold mode remains active until the fold button is pushed again to deactivate it or the system times out and returns to neutral.

The DDM monitors the ignition status messages from the BCM, with the GWM acting as a gateway, and when the ignition is on and a mirror fold is initiated, the DDM supplies voltage and ground to the LH exterior mirror folding motor(s) and sends the passenger mirror command message to the PDM. The PDM uses this message to supply voltage and ground to the RH exterior mirror folding motor(s). When the exterior mirror fold switch is utilized again, the DDM reverses the polarity of the voltage supplied to the LH exterior mirror folding motor(s) and sends the passenger mirror command message to the PDM, which reverses the polarity of the voltage supplied to the RH exterior mirror folding motor(s).

The aero power folding mirrors contain one power fold motor in the pivot. The trailer tow power folding mirrors contain two folding motors, one in each arm. The power folding mirror motors are not replaceable. If a power folding mirror motor is found to be inoperative, a new power folding exterior rear view mirror assembly must be installed.

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > SYSTEM OPERATION - EXTERIOR, POWER TELESCOPING

 **NOTE:** If the exterior mirrors are extended and retracted several times consecutively, the

power lockout feature disables the system for approximately 3-10 minutes to prevent damage to the power telescoping motors. After 3-10 minutes have elapsed, normal operation resumes.



NOTE: The power telescoping mirrors must be synchronized anytime the LH, RH or both power telescoping mirrors are extended or retracted without using the power telescoping mirror control switch, or if a new power telescoping mirror has been installed. Refer to Power Folding Mirrors Synchronization .

The power telescoping mirror feature allows the LH and RH power exterior mirrors to be electronically extended or retracted using the telescoping mirror control switch (integral to the LH front door window control switch). The LH and RH power telescoping mirrors extend and retract simultaneously and cannot be controlled independently.

Pushing the power telescoping mirror button while an LED is lit on the left or right side selection button overrides the mirror adjust mode and goes directly to telescoping mode. Pushing the left or right side selection button while the power telescoping button is lit (active) does not change the system to glass adjustment mode, the telescoping switch must be returned to neutral by pushing the telescoping button to deactivate the telescoping mode or allowing it to time out. Pushing the telescoping button activates the LED indicator and the function. Pushing the directional control pad left telescopes the mirrors out, pushing right telescopes in. The telescoping mode remains active until the telescoping button is pushed again to deactivate it or the systems times out and returns to neutral.

When the ignition is on or the accessory delay feature is active and the power telescoping mirror system is initiated by pressing the telescoping mirror control switch, the LH front door window control switch supplies voltage to the BJB retract or extend relay. The activated relay then provides voltage to the LH and RH exterior telescoping mirror motors.

The power telescoping mirrors contains two telescoping mirror motors which are not replaceable. If a power telescoping mirror motor is found to be inoperative, a new power telescoping rear view mirror assembly needs to be installed.

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > SYSTEM OPERATION - EXTERIOR AUTO-DIMMING

The LH exterior mirror is equipped with an auto-dimming feature. This feature automatically reduces the glare caused by bright light behind the vehicle during nighttime conditions. The interior auto-dimming mirror supplies voltage and ground to electronically darken the LH exterior mirror glass based on ambient lighting conditions. The reflectance level of the mirror glass is variable and depends on the amount of rear glare in relation to ambient light conditions in front of the interior mirror.

To provide increased visibility when backing up, the interior auto-dimming mirror glass and LH exterior mirror glass automatically returns to a high reflectance mode whenever the vehicle in REVERSE, regardless of exterior lighting conditions.

An interior auto-dimming mirror concern can affect the operation of the LH exterior mirror auto-dimming mirror.

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > SYSTEM OPERATION- INTERIOR MANUAL-DIMMING

The manual interior rear view mirror can be adjusted from a day position to a night position to reduce unwanted glare caused by headlamps from behind the vehicle. Adjusting the interior mirror is accomplished by using the day/night tab, located on the bottom of the interior mirror. Pulling the tab rearward, towards the driver, adjusts the mirror to the night position. Pushing the tab forward, away from the driver, adjusts the mirror to the day position.

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > SYSTEM OPERATION- INTERIOR AUTO-DIMMING

The auto-dimming feature is active any time the ignition is ON. The interior auto-dimming mirror uses 2 integral photoelectric sensors to detect exterior lighting conditions. When the forward facing sensor detects daytime conditions, the rearward facing sensor is inactive and the mirror glass stays in a high reflectance mode. When the forward facing sensor detects nighttime conditions, the rearward facing sensor is active. When bright lights (glare) are detected by the rearward facing sensor, the mirror glass is electronically darkened. To provide increased visibility when backing up, the interior rear view mirror automatically returns to a high reflectance mode any time reverse gear is selected, regardless of exterior lighting conditions.



NOTE: Blockage of either sensor causes false readings.

DESCRIPTION AND OPERATION > REAR VIEW MIRRORS - SYSTEM OPERATION AND COMPONENT DESCRIPTION > COMPONENT DESCRIPTION

Exterior Mirror Control Switch

The exterior mirror control switch is a momentary contact switch that is integral to the LH front door window control switch, which is connected to the DDM through a LIN circuit. The LED on each exterior mirror selection button illuminates to indicate which exterior mirror is selected for adjustment.

Exterior Mirror Fold Switch

The exterior power folding mirror control switch is integral to the LH front window control switch, which is connected to the DDM through a LIN circuit.

Exterior Mirror Telescoping Switch

The exterior power telescoping mirror control switch is integral to the LH front window control switch, which is connected to the DDM through a LIN circuit.

Exterior Mirror

Each exterior mirror has 2 bi-directional motors that are used to control the position of the exterior mirror glass. Adjusting the exterior mirror control switch to the LH or RH position determines which exterior mirror motor to control.

If equipped with heated exterior mirrors, heated exterior mirrors use heating elements that are integral to the exterior mirror glass.

If equipped with the LH exterior auto-dimming mirror, the LH exterior auto-dimming mirror glass electronically darkens when bright light is detected by the interior auto-dimming mirror from behind the vehicle during nighttime conditions.

If equipped with memory mirrors, each exterior mirror motor is equipped with an integral potentiometer that is monitored by the DDM (LH mirror) or PDM (RH mirror) to determine the position of the exterior mirror glass. Vehicles equipped with memory exterior mirrors are capable of setting Diagnostic Trouble Codes (DTCs) for the mirror circuits.

If equipped with power folding mirrors, the folding mirror control switch, integral to the LH front door window control switch, allows the power folding mirrors to be folded or unfolded.

If equipped with power telescoping mirrors, the telescoping mirror control switch, integral to the LH front door window control switch, allows the power telescoping mirrors to be extended or retracted.

The exterior mirrors may include turn signal indicators and spot lamps. For additional information on the mirror-mounted turn signal indicators or spot lamps, Refer to: Exterior Lighting - System Operation and Component Description .

The exterior mirrors may include puddle lamps. For additional information on the mirror-mounted puddle lamps, Refer to: Interior Lighting - System Operation and Component Description .

The exterior mirrors may include parking lamps. For additional information on the mirror-mounted parking lamps, Refer to: Exterior Lighting - System Operation and Component Description .

The exterior mirrors may include BLIS ® Light Emitting Diodes (LEDs). For additional information on the mirror-mounted BLIS ®, Refer to: Blind Spot Information System - System Operation and Component Description .

The exterior mirrors may include side cameras. For additional information on the mirror-mounted side cameras, Refer to: Parking Aid - System Operation and Component Description .

The exterior mirrors use a jumper harness between the vehicle wiring harness and the exterior mirror motors and the heated mirror glass. The exterior mirror jumper harness is integral to the exterior mirror. Before replacing an exterior mirror or motor, inspect the jumper harness for opens, shorted circuits or damaged and pushed-out pins. If a concern with the exterior mirror jumper harness exists, attempt to repair the jumper harness.

DDM

For the exterior power functions, the DDM receives mirror movement requests through the LIN circuit from the LH front door window control switch. When the LH exterior mirror is selected, the DDM provides voltage and ground to the appropriate LH exterior mirror motor to drive the mirror glass in the desired direction. The DDM sends RH exterior mirror movement requests to the PDM through the MS-CAN.

If the vehicle is equipped with exterior power folding mirrors, the DDM receives mirror movement requests through the LIN circuit from the LH front door window control switch. When a mirror fold is initiated, the DDM supplies voltage and ground to the LH exterior mirror folding motor. When the exterior mirror fold switch is utilized again, the DDM reverses the polarity of the voltage supplied to the LH exterior mirror folding motor. The DDM sends RH exterior mirror fold requests to the PDM through the MS-CAN.

If the vehicle is equipped with memory mirrors, the DDM monitors the potentiometers in the LH exterior mirror to determine the position of the exterior mirror glass. Preset memory positions for the LH exterior mirror glass are stored in the DDM.

When a concern exists, the DDM is capable of setting and storing Diagnostic Trouble Codes (DTCs) for the LH exterior mirror motor drive circuits, position sensor circuits (if equipped) and folding mirror motor circuits (if equipped).

PDM

For the exterior power functions, when the RH exterior mirror is selected, the PDM supplies voltage and

ground to the appropriate RH exterior mirror motor to drive the mirror glass in the desired direction based on messages received from the DDM through the MS-CAN.

If the vehicle is equipped with exterior power folding mirrors, when the PDM receives the RH exterior mirror movement requests from DDM over the MS-CAN, it provides voltage and ground to the RH exterior mirror folding motor.

If the vehicle is equipped with memory mirrors the PDM monitors the potentiometers in the RH exterior mirror to determine the position of the exterior mirror glass. Preset memory positions for the RH exterior mirror glass are stored in the PDM.

When a concern exists, the PDM is capable of setting and storing Diagnostic Trouble Codes (DTCs) for the RH exterior mirror motor drive circuits, position sensor circuits (if equipped) and folding mirror motor circuits (if equipped).

Interior Rear View Mirror - Manual-Dimming

The manual dimming interior rear view mirror has a lever at the back of the mirror that must be pulled forward or pushed rearward by the driver to activate the manual dimming function. Manual dimming is completely controlled by the driver.

Interior Rear View Mirror - Auto-Dimming

The auto-dimming rear view mirror has 2 photoelectric sensors, one on the front of the mirror (facing the windshield) and one on the rear of the mirror (at the top of the mirror glass). Based on inputs from these sensors, the automatic dimming feature adjusts the reflectance level of the interior rear view mirror glass to eliminate unwanted glare. The reflectance level of the mirror glass is variable and depends on the amount of rear glare in relation to ambient light conditions in front of the interior mirror.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > DTC CHART: DDM

Diagnostics in this article assume a certain skill level and knowledge of Ford-specific diagnostic practices. REFER to: Diagnostic Methods .

DTC	Description	Action
B11F6:11	Driver Folding Mirror Motor: Circuit Short To Ground	GO to Pinpoint Test E
B11F6:15	Driver Folding Mirror Motor: Circuit Short To Battery or Open	GO to Pinpoint Test E
B1C09:11	Driver Left/Right Mirror Motor: Circuit Short To Ground	GO to Pinpoint Test B
B1C09:15	Driver Left/Right Mirror Motor: Circuit Short To Battery Or Open	GO to Pinpoint Test B
B1C10:11	Driver Up/Down Mirror Motor: Circuit Short To Ground	GO to Pinpoint Test B
B1C10:15	Driver Up/Down Mirror Motor: Circuit Short To Battery Or Open	GO to Pinpoint Test B
B1C13:11	Driver Up/Down Mirror Motor Feedback: Circuit Short To Ground	GO to Pinpoint Test C

B1C13:15	Driver Up/Down Mirror Motor Feedback: Circuit Short To Battery Or Open	GO to Pinpoint Test C
B1C14:11	Driver Left/Right Mirror Motor Feedback: Circuit Short To Ground	GO to Pinpoint Test C
B1C14:15	Driver Left/Right Mirror Motor Feedback: Circuit Short To Battery Or Open	GO to Pinpoint Test C
C1B15:11	Sensor Supply Voltage B: Circuit Short To Ground	GO to Pinpoint Test C
C1B15:15	Sensor Supply Voltage B: Circuit Short To Battery or Open	GO to Pinpoint Test C
All other DDM Diagnostic Trouble Codes (DTCs)	-	REFER to: Locks, Latches and Entry Systems .

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > DTC CHART: PDM

Diagnostics in this article assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods .

DTC	Description	Action
B11F7:11	Passenger Folding Mirror Motor: Circuit Short To Ground	GO to Pinpoint Test E
B11F7:15	Passenger Folding Mirror Motor: Circuit Short To Battery or Open	GO to Pinpoint Test E
B1C11:11	Passenger Left/Right Mirror Motor: Circuit Short To Ground	GO to Pinpoint Test B
B1C11:15	Passenger Left/Right Mirror Motor: Circuit Short To Battery Or Open	GO to Pinpoint Test B
B1C12:11	Passenger Up/Down Mirror Motor: Circuit Short To Ground	GO to Pinpoint Test B
B1C12:15	Passenger Up/Down Mirror Motor: Circuit Short To Battery Or Open	GO to Pinpoint Test B
B1C15:11	Passenger Up/Down Mirror Motor Feedback: Circuit Short To Ground	GO to Pinpoint Test C
B1C15:15	Passenger Up/Down Mirror Motor Feedback: Circuit Short To Battery Or Open	GO to Pinpoint Test C
B1C16:11	Passenger Left/Right Mirror Motor Feedback: Circuit Short To Ground	GO to Pinpoint Test C
B1C16:15	Passenger Left/Right Mirror Motor Feedback: Circuit Short To Battery	GO to Pinpoint Test C

	Or Open	
C1B15:11	Sensor Supply Voltage B: Circuit Short To Ground	GO to Pinpoint Test C
C1B15:15	Sensor Supply Voltage B: Circuit Short To Battery or Open	GO to Pinpoint Test C
All other PDM Diagnostic Trouble Codes (DTCs)	-	REFER to: Locks, Latches and Entry Systems .

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > DTC CHART: IPMA

Diagnostics in this article assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods .

DTC	Description	Action
B1286:14	Interior Mirror: Circuit Short To Ground or Open	GO to Pinpoint Test G
All other IPMA Diagnostic Trouble Codes (DTCs)	-	REFER to: Lane Keeping System .

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > DTC CHART: FCIM

Diagnostics in this article assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods .

DTC	Description	Action
B1C83:12	Rear Defog Relay: Circuit Short to Battery	GO to Pinpoint Test D
B1C83:14	Rear Defog Relay: Circuit Short To Ground or Open	GO to Pinpoint Test D
All other FCIM Diagnostic Trouble Codes (DTCs)	-	Refer to the appropriate article for the procedure.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > SYMPTOM CHART(S) > SYMPTOM CHART: REAR VIEW MIRRORS - EXTERIOR

Diagnostics in this article assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods .



NOTE: Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper,

razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.

Condition	Possible Sources	Action
One or both exterior mirrors fold inward due to wind pressure	Power folding mirrors are not synchronized (vehicles equipped with folding mirrors only) Mirror structural bracket is damaged	For vehicles equipped with power folding mirror, SYNCHRONIZE the power folding mirrors. REFER to: Power Mirrors Synchronization . If the concern is still present after the power folding mirrors synchronization procedure was performed, INSPECT the mirror for structural damage. If necessary, INSTALL a new mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors . For vehicles not equipped with power folding mirror, INSPECT the mirror for structural damage. If necessary, INSTALL a new mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
Both exterior mirrors are inoperative (with or without memory mirrors)	Wiring, terminals or connectors Power window concern Exterior mirror control switch (integral to the LH front door window control switch) DDM	VERIFY that all power windows can be operated normally from the LH front door window control switch. If all power windows operate normally from the LH front door window control switch, INSTALL a new LH front door window control switch. REFER to: Front Door Window Control Switch - Vehicles With: Front Power Windows . If all power window do not operate normally from the LH front door window control switch, DIAGNOSE the power windows before continuing diagnostics of the exterior mirrors. REFER to: Glass, Frames and Mechanisms .
A single mirror is inoperative/does not operate correctly	Refer to the Pinpoint Test	GO to Pinpoint Test A
A single mirror horizontal or vertical operation does not function correctly	Refer to the Pinpoint Test	GO to Pinpoint Test B

The exterior mirror memory recall feature is inoperative/does not operate correctly	Refer to the Pinpoint Test	GO to Pinpoint Test C
One or both heated exterior mirrors are inoperative	Refer to the Pinpoint Test	GO to Pinpoint Test D
The heated exterior mirrors do not operate from the voice command	Defrost system concern Voice recognition system concern	VERIFY the heated exterior mirrors operation using the FCIM defrost button (if equipped) or heated exterior mirror button (if equipped). If the heated exterior mirrors are still inoperative, GO to Pinpoint Test D If the heated exterior mirrors operate, Vehicles With: Touchscreen Display REFER to: Information and Entertainment System . Vehicles With: Sony Audio System, REFER to: Information and Entertainment System .
The heated exterior mirrors do not operate from the touchscreen command	Defrost system concern APIM FDIM	VERIFY the heated exterior mirrors operation using the FCIM defrost button (if equipped) or heated exterior mirror button (if equipped). If the heated exterior mirrors are still inoperative, GO to Pinpoint Test D If the heated exterior mirrors operate, Vehicles With: Touchscreen Display, REFER to: Information and Entertainment System . Vehicles With: Sony Audio System, REFER to: Information and Entertainment System .
The RH and LH heated exterior mirrors do not defrost at the same rate	Normal operation of the heated exterior mirror	No action required, the system is operating correctly at this time.
The RH and/or LH power folding mirror is inoperative/does not operate correctly	Refer to the Pinpoint Test	GO to Pinpoint Test E
The RH and LH power folding mirror do not fold and/or unfold at the same rate of speed	Normal operation of the power folding mirror	No action required, the system is operating correctly at this time.
The RH and/or LH power telescoping mirror is inoperative/does not operate correctly	Refer to the Pinpoint Test	GO to Pinpoint Test F
The LH auto-dimming exterior mirror is inoperative or always in a darkened state	Refer to the Pinpoint Test	GO to Pinpoint Test G

An exterior mirror selection switch LED is inoperative (exterior mirror selection switch functions normally)	Exterior mirror selection switch	INSTALL a new left front door window control switch. REFER to: Front Door Window Control Switch - Vehicles With: Front Power Windows .
The exterior mirror puddle lamp is inoperative or always on	Refer to the Pinpoint Test	REFER to: Interior Lighting .
The exterior mirror turn signal is inoperative or always on	Refer to the Pinpoint Test	REFER to: Turn Signal and Hazard Lamps .
The exterior mirror parking lamp is inoperative or always on	Refer to the Pinpoint Test	REFER to: Parking, Rear and License Plate Lamps .
The exterior mirror spot lamp is inoperative or always on	Refer to the Pinpoint Test	REFER to: Spot Lamps .
The BLIS ® indicator is inoperative or always on	Refer to the Pinpoint Test	REFER to: Blind Spot Information System .

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > SYMPTOM CHART(S) > SYMPTOM CHART: REAR VIEW MIRRORS - INTERIOR

Diagnostics in this article assume a certain skill level and knowledge of Ford-specific diagnostic practices. REFER to: Diagnostic Methods .



NOTE: Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper, razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.

Condition	Possible Sources	Action
The interior mirror is blemished	Interior mirror glass/housing is dirty	CLEAN the affected interior mirror surface
The interior mirror vibrates or is loose	Interior mirror mounting loose	If the mirror is still on the windshield, do not remove . ATTEMPT to fully seat the mirror first. If the mirror is still loose or vibrates, REMOVE and REINSTALL the mirror. If the condition still exists, INSTALL a new interior mirror. REFER to: Interior Rear View Mirror .
The interior auto-dimming mirror does not operate correctly	Refer to the Pinpoint Test	GO to Pinpoint Test H

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > SYMPTOM CHART(S) > SYMPTOM CHART: REAR VIEW MIRRORS - EXTERIOR NOISE, VIBRATION AND HARSHNESS (NVH)

Diagnostics in this article assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods .



NOTE: Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper, razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.

Condition	Possible Sources	Action
Exterior mirror housing vibrates or is loose	Power folding mirrors are not synchronized (if equipped)	SYNCHRONIZE the power folding mirrors. REFER to: Power Mirrors Synchronization .
	Exterior mirror mounting nuts loose	TIGHTEN the exterior mirror mounting nuts. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
	Aftermarket air deflector/stone shields	If possible, REMOVE the aftermarket parts and ROAD TEST the vehicle. If the concern is no longer present, ADVISE the customer that the aftermarket components were causing the undesired vibration.
Exterior mirror glass vibrates or is loose	Exterior mirror motor mounting screws loose Exterior mirror glass loose	PRESS the center of the exterior mirror glass up, down, left and right to make sure the exterior mirror glass is seated correctly. If the exterior mirror glass is still loose, REMOVE the exterior mirror glass. INSPECT the exterior mirror backing plate for damage. INSPECT the exterior mirror motor mounting screws and TIGHTEN if necessary. If the exterior mirror backing plate is damaged, INSTALL a new exterior mirror glass. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
Wind noise	Foam gasket between exterior mirror housing and door is misaligned or damaged	VERIFY the gasket is in good condition. If necessary, REPOSITION the gasket between the exterior mirror housing and the door. The foam gasket is not

		serviceable and if it cannot be repaired, INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
	Exterior mirror is not correctly fitted to the door	VERIFY there are no gaps between the exterior mirror and the door. If necessary, LOOSEN the exterior mirror nuts and REPOSITION the exterior mirror as necessary. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
	Exterior mirror impact damage	INSPECT the exterior mirror to ensure that there is no damage to the housing or glass.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST A : A SINGLE MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY

Refer to Power Mirrors for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Rear View Mirrors - System Operation and Component Description .

Possible Causes

- Wiring, terminals or connectors
- Power window concern
- Exterior mirror control switch (integral to the LH front window control switch)
- Exterior mirror motor
- Exterior mirror

Visual Inspection and Diagnostic Pre-Checks

- Inspect the suspect exterior mirror for damage or obstructions.



NOTE: Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper, razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST A : A SINGLE MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY > PINPOINT TEST A : A SINGLE MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY



NOTE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

A1 CHECK THE EXTERIOR MIRROR CONTROL SWITCH PARAMETER IDENTIFICATIONS (PIDS)

Using a diagnostic scan tool, view the DDM Parameter Identifications (PIDs).

Using a diagnostic scan tool, view the following DDM mirror control switch Parameter Identifications (PIDs):

L_MIR_SEL

R_MIR_SEL

MIR_SW_DOWN

MIR_SW_UP

MIR_SW_L

MIR_SW_R

While monitoring the Parameter Identifications (PIDs), switch the mirror control switch to the left mirror and press each directional control switch.

While monitoring the Parameter Identifications (PIDs), switch the mirror control switch to the right mirror and press each directional control switch.

Do the Parameter Identifications (PIDs) agree with the mirror control switch presses?

Yes	GO to A2
No	INSTALL a new LH front door window control switch. REFER to: Front Door Window Control Switch - Vehicles With: Front Power Windows .

A2 CHECK THE SUSPECT EXTERIOR MIRROR MOTOR COMMON CIRCUIT FOR AN OPEN

Ignition OFF.

Disconnect: LH Suspect Exterior Mirror: C521 (with memory) or C516 (without memory).

Disconnect: RH Suspect Exterior Mirror: C622 (with memory) or C601 (without memory).

Disconnect: DDM C501B (left mirror).

Disconnect: PDM C652B (right mirror).

Measure:

Left mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C501B-17	Ω	C521-4

Left mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C501B-17	Ω	C516-4

Right mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C652B-17	Ω	C622-4

Right mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C652B-17	Ω	C601-4

Is the resistance less than 3 ohms?

Yes	GO to A3
No	REPAIR the circuit.

A3 CHECK THE EXTERIOR MIRROR JUMPER HARNESS

Inspect the exterior mirror jumper harness between the vehicle harness and the mirror motors for:

Open or short circuits

Damaged or pushed out pins

Corrosion

Is the harness OK?

Yes	INSTALL a new exterior mirror motor in question. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
No	REPAIR the harness as necessary. If the harness cannot be repaired, INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST B : A SINGLE MIRROR HORIZONTAL OR VERTICAL OPERATION DOES NOT FUNCTION CORRECTLY

Refer to Power Mirrors for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Rear View Mirrors - System Operation and Component Description .

DDM DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B1C09:11	Driver Left/Right Mirror Motor: Circuit Short To Ground	A continuous and on-demand DTC that sets in the DDM if the DDM detects a higher than expected current draw when voltage is applied to the horizontal mirror motor circuit.
B1C09:15	Driver Left/Right Mirror Motor: Circuit Short To Battery Or Open	A continuous and on-demand DTC that sets in the DDM if the DDM detects a lower than expected current draw when voltage is applied to the horizontal mirror motor circuit.
B1C10:11	Driver Up/Down Mirror Motor: Circuit Short To Ground	A continuous and on-demand DTC that sets in the DDM if the DDM detects a higher than expected current draw when voltage is applied to the vertical mirror motor circuit.
B1C10:15	Driver Up/Down Mirror Motor: Circuit Short To Battery Or Open	A continuous and on-demand DTC that sets in the DDM if the DDM detects a lower than expected current draw when voltage is applied to the vertical mirror motor circuit.

PDM DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B1C11:11	Passenger Left/Right Mirror Motor: Circuit Short To Ground	A continuous and on-demand DTC that sets in the PDM if the PDM detects a higher than expected current draw when voltage is applied to the horizontal mirror motor circuit.

B1C11:15	Passenger Left/Right Mirror Motor: Circuit Short To Battery Or Open	A continuous memory DTC that sets in the PDM if the PDM detects a lower than expected current draw when voltage is applied to the horizontal mirror motor circuit.
B1C12:11	Passenger Up/Down Mirror Motor: Circuit Short To Ground	A continuous memory DTC that sets in the PDM if the PDM detects a higher than expected current draw when voltage is applied to the vertical mirror motor circuit.
B1C12:15	Passenger Up/Down Mirror Motor: Circuit Short To Battery Or Open	A continuous and on-demand DTC that sets in the PDM if the PDM detects a lower than expected current draw when voltage is applied to the vertical mirror motor circuit.

Possible Causes

- Wiring, terminals or connectors
- Exterior mirror control switch (integral to the LH front window control switch)
- Power mirror system concern
- Exterior mirror motor
- Exterior mirror
- DDM
- PDM

Visual Inspection and Diagnostic Pre-Checks

- Inspect the suspect exterior mirror for damage or obstructions.



NOTE: Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper, razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST B : A SINGLE MIRROR HORIZONTAL OR VERTICAL OPERATION DOES NOT FUNCTION CORRECTLY > PINPOINT TEST B : A SINGLE MIRROR HORIZONTAL OR VERTICAL OPERATION DOES NOT FUNCTION CORRECTLY

 **NOTE:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

B1 CHECK THE MIRROR MOVEMENT

Ignition ON.

Operate the suspect exterior mirror in the up, down, left and right directions.

Does the suspect exterior mirror operate in any direction?

Yes	GO to B2
No	GO to Pinpoint Test A

B2 CHECK THE EXTERIOR MIRROR CONTROL SWITCH PARAMETER IDENTIFICATIONS (PIDS)

Using a diagnostic scan tool, view the DDM Parameter Identifications (PIDs).

Using a diagnostic scan tool, view the following DDM mirror control switch Parameter Identifications (PIDs):

L_MIR_SEL

R_MIR_SEL

MIR_SW_DOWN

MIR_SW_UP

MIR_SW_L

MIR_SW_R

While monitoring the Parameter Identifications (PIDs), press the left mirror selection switch and press each directional control switch.

While monitoring the Parameter Identifications (PIDs), press the right mirror selection switch and press each directional control switch.

Do the Parameter Identifications (PIDs) agree with the mirror control switch presses?

Yes	GO to B3
No	INSTALL a new LH front door window control switch. REFER to: Front Door Window Control Switch - Vehicles With: Front Power Windows .

B3 CHECK THE OUTPUT TO THE SUSPECT EXTERIOR MIRROR

 **NOTE:** The following step uses a test lamp to simulate normal circuit loads. Use only a Rotunda Test Lamp (SGT27000) or 250-300mA incandescent bulb test lamp. To avoid connector terminal damage, use the Rotunda Flex Probe kit for the test lamp probe connection to the vehicle. Do not use the test lamp probe directly on any connector.

Ignition OFF.

Disconnect: Suspect Exterior Mirror: C521 (LH exterior mirror with memory), C622 (RH exterior mirror with memory, C516 (LH exterior mirror without memory) or C601 (RH exterior mirror without memory)).

Ignition ON.

Select the suspect exterior mirror by pressing the appropriate exterior mirror selection switch.

Connect:

Left mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C521-5		Ground
C521-4		Ground

Left mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C516-5		Ground
C516-4		Ground

Right mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C622-5		Ground
C622-4		Ground

Right mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C601-5		Ground
C601-4		Ground

Operate the mirror in left/right directions.

Connect:

Left mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C521-3		Ground
C521-4		Ground

Left mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C516-3		Ground
C516-4		Ground

Right mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C622-3		Ground
C622-4		Ground

Right mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C601-3		Ground
C601-4		Ground

Operate the mirror in up/down directions.

Does the test lamp illuminate only when the direction button is pressed each directions?

Yes	GO to B4
No	GO to B5

B4 CHECK THE EXTERIOR MIRROR JUMPER HARNESS

Inspect the exterior mirror jumper harness between the vehicle harness and the mirror motors for:

Open or short circuits

Damaged or pushed out pins

Corrosion

Is the harness OK?

Yes	INSTALL a new exterior mirror motor in question. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
No	REPAIR the harness as necessary. If the harness cannot be repaired, INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .

B5 CHECK THE SUSPECT EXTERIOR MIRROR CIRCUITS FOR A SHORT TO VOLTAGE

Ignition OFF.

Disconnect: DDM C501B (left mirror).

Disconnect: PDM C652B (right mirror).

Ignition ON.

Measure:

Left mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C521-3		Ground
C521-4		Ground
C521-5		Ground

Left mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C516-3		Ground
C516-4		Ground
C516-5		Ground

Right mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C622-3		Ground
C622-4		Ground
C622-5		Ground

Right mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C601-3		Ground
C601-4		Ground
C601-5		Ground

Is any voltage present?

Yes	REPAIR the circuit in question.
No	GO to B6

B6 CHECK THE SUSPECT EXTERIOR MIRROR CIRCUITS FOR A SHORT TO GROUND

Ignition OFF.

Measure:

Left mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C521-3	Ω	Ground
C521-4	Ω	Ground
C521-5	Ω	Ground

Left mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C516-3	Ω	Ground
C516-4	Ω	Ground
C516-5	Ω	Ground

Right mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C622-3	Ω	Ground
C622-4	Ω	Ground
C622-5	Ω	Ground

Right mirror without memory

Positive Lead	Measurement / Action	Negative Lead

C601-3	Ω	Ground
C601-4	Ω	Ground
C601-5	Ω	Ground

Are the resistances greater than 10, 000 ohms?

Yes	GO to B7
No	REPAIR the circuit in question.

B7 CHECK THE SUSPECT EXTERIOR MIRROR CIRCUITS FOR AN OPEN

Measure:

Left mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C521-3	Ω	C501B-7
C521-4	Ω	C501B-17
C521-5	Ω	C501B-8

Left mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C516-3	Ω	C501B-7
C516-4	Ω	C501B-17
C516-5	Ω	C501B-8

Right mirror with memory

Positive Lead	Measurement / Action	Negative Lead
C622-3	Ω	C652B-7
C622-4	Ω	C652B-17
C622-5	Ω	C652B-8

Right mirror without memory

Positive Lead	Measurement / Action	Negative Lead
C601-3	Ω	C652B-7
C601-4	Ω	C652B-17

Are the resistances less than 3 ohms?

Yes	GO to B8
No	REPAIR the circuit in question.

B8 CHECK FOR CORRECT DDM (DRIVER DOOR MODULE) / PDM (PASSENGER DOOR MODULE) OPERATION

Disconnect and inspect all DDM/ PDM connectors 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 DDM/ PDM connectors and related in-line connectors. Make sure they seat and latch correctly.

Operate the system to determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new DDM/ PDM. REFER to: Driver Door Module (DDM) . REFER to: Passenger Door Module (PDM) .
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.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST C : THE EXTERIOR MIRROR MEMORY RECALL FEATURE IS INOPERATIVE/DOES NOT OPERATE CORRECTLY

Refer to Power Mirrors for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Rear View Mirrors - System Operation and Component Description .

DDM DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions

B1C13:11	Driver Up/Down Mirror Motor Feedback: Circuit Short To Ground	A continuous and on-demand DTC that sets in the DDM if the DDM detects a short to ground from the vertical position feedback circuit.
B1C13:15	Driver Up/Down Mirror Motor Feedback: Circuit Short To Battery Or Open	A continuous and on-demand DTC that sets in the DDM if the DDM detects a short to voltage or open from the vertical position feedback circuit.
B1C14:11	Driver Left/Right Mirror Motor Feedback: Circuit Short To Ground	A continuous and on-demand DTC that sets in the DDM if the DDM detects a short to ground from the horizontal position feedback circuit.
B1C14:15	Driver Left/Right Mirror Motor Feedback: Circuit Short To Battery Or Open	A continuous and on-demand DTC that sets in the DDM if the DDM detects a short to voltage or open from the horizontal position feedback circuit.
C1B15:11	Sensor Supply Voltage B: Circuit Short To Ground	A continuous and on-demand DTC that sets in the DDM/ PDM if the DDM/ PDM detects a short to ground from the exterior mirror position sensor voltage supply circuit.
C1B15:15	Sensor Supply Voltage B: Circuit Short To Battery or Open	A continuous and on-demand DTC that sets in the DDM/ PDM if the DDM/ PDM detects a short to voltage or open from the exterior mirror position sensor voltage supply circuit.

PDM DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B1C15:11	Passenger Up/Down Mirror Motor Feedback: Circuit Short To Ground	A continuous and on-demand DTC that sets in the PDM if the PDM detects a short to ground from the vertical position feedback circuit.
B1C15:15	Passenger Up/Down Mirror Motor Feedback: Circuit Short To Battery Or Open	A continuous and on-demand DTC that sets in the PDM if the PDM detects a short to voltage or open from the vertical position feedback circuit.
B1C16:11	Passenger Left/Right Mirror Motor Feedback: Circuit Short To Ground	A continuous and on-demand DTC that sets in the PDM if the PDM detects a short to ground from the horizontal position feedback circuit.

B1C16:15	Passenger Left/Right Mirror Motor Feedback: Circuit Short To Battery Or Open	A continuous and on-demand DTC that sets in the PDM if the PDM detects a short to voltage or open from the horizontal position feedback circuit.
C1B15:11	Sensor Supply Voltage B: Circuit Short To Ground	A continuous and on-demand DTC that sets in the DDM/ PDM if the DDM/ PDM detects a short to ground from the exterior mirror position sensor voltage supply circuit.
C1B15:15	Sensor Supply Voltage B: Circuit Short To Battery or Open	A continuous and on-demand DTC that sets in the DDM/ PDM if the DDM/ PDM detects a short to voltage or open from the exterior mirror position sensor voltage supply circuit.

Possible Causes

- Wiring, terminals or connectors
- Memory seat system concern
- Power mirror system concern
- Exterior mirror motor
- Exterior mirror
- DDM
- PDM



NOTE: Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper, razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.



NOTE: If the DDM or PDM detects a mirror motor feedback circuit fault, a timeout strategy disable the memory operations for 30 seconds to prevent system damage. After the 30 seconds timeout, normal operation resumes.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST C : THE EXTERIOR MIRROR MEMORY RECALL FEATURE IS INOPERATIVE/DOES NOT OPERATE CORRECTLY > PINPOINT TEST C : THE EXTERIOR MIRROR MEMORY RECALL FEATURE IS INOPERATIVE/DOES NOT OPERATE CORRECTLY

 **NOTE:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

C1 CHECK THE MEMORY SEAT OPERATION

Ignition ON.

Check the operation of the memory seat recall function.

Does the memory seat recall function operate?

Yes	GO to C2
No	DIAGNOSE the memory seat system prior to continuing diagnostics for the exterior mirror memory recall feature. REFER to: Front Seats .

C2 CHECK THE POWER MIRRORS OPERATION

Check the operation of the up/down and left/right function of the suspect power mirrors.

Does the suspect mirror operate in all directions?

Yes	GO to C3
No	GO to Pinpoint Test A

C3 CHECK THE SUSPECT EXTERIOR MIRROR POSITION SENSOR CIRCUITS FOR A SHORT TO VOLTAGE

Ignition OFF.

Disconnect: Suspect Exterior Mirror C521 (left mirror) or C622 (right mirror).

Disconnect: DDM C501B (left mirror).

Disconnect: PDM C652B (right mirror).

Ignition ON.

Measure:

Left Mirror

Positive Lead	Measurement / Action	Negative Lead
C521-20		Ground
C521-10		Ground

C521-11		Ground
C521-9		Ground

Right Mirror

Positive Lead	Measurement / Action	Negative Lead
C622-20		Ground
C622-10		Ground
C622-11		Ground
C622-9		Ground

Is any voltage present?

Yes	GO to C4
No	REPAIR the circuit in question.

C4 CHECK THE SUSPECT EXTERIOR MIRROR POSITION SENSOR CIRCUITS FOR A SHORT TO GROUND

Ignition OFF.

Measure:

Left Mirror

Positive Lead	Measurement / Action	Negative Lead
C521-20	Ω	Ground
C521-10	Ω	Ground
C521-11	Ω	Ground
C521-9	Ω	Ground

Right Mirror

Positive Lead	Measurement / Action	Negative Lead
C622-20	Ω	Ground
C622-10	Ω	Ground
C622-11	Ω	Ground
C622-9	Ω	Ground

Are the resistances greater than 10, 000 ohms?

Yes	GO to C5
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No	REPAIR the circuit in question.
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C5 CHECK THE SUSPECT EXTERIOR MIRROR POSITION SENSOR CIRCUITS FOR AN OPEN

Measure:

Left Mirror

Positive Lead	Measurement / Action	Negative Lead
C521-20	Ω	C501B-15
C521-10	Ω	C501B-6
C521-11	Ω	C501B-5
C521-9	Ω	C501B-16

Right Mirror

Positive Lead	Measurement / Action	Negative Lead
C622-20	Ω	C652B-15
C622-10	Ω	C652B-6
C622-11	Ω	C652B-5
C622-9	Ω	C652B-16

Are the resistances less than 3 ohms?

Yes	GO to C6
------------	----------

No	REPAIR the circuit in question.
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C6 CHECK THE EXTERIOR MIRROR JUMPER HARNESS

Inspect the exterior mirror jumper harness between the vehicle harness and the mirror motors for:

Open or short circuits

Damaged or pushed out pins

Corrosion

Is the harness OK?

Yes	INSTALL a new exterior mirror motor. REFER to: Exterior Mirror - Vehicles With: Long Arm
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Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors . TEST the system for normal operation. If the concern is still present, GO to C7

No REPAIR the harness as necessary. If the harness cannot be repaired, INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .

C7 CHECK FOR CORRECT DDM (DRIVER DOOR MODULE) / PDM (PASSENGER DOOR MODULE) OPERATION

Disconnect and inspect all DDM/ PDM connectors 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 DDM/ PDM connectors and related in-line connectors. Make sure they seat and latch correctly.

Operate the system to determine if the concern is still present.

Is the concern still present?

Yes CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new DDM/ PDM. REFER to: Driver Door Module (DDM) . REFER to: Passenger Door Module (PDM) .

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.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST D : ONE OR BOTH HEATED EXTERIOR MIRRORS ARE INOPERATIVE

Refer to Heated Window for schematic and connector information.

Refer to Power Mirrors for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Glass, Frames and Mechanisms - System Operation and Component Description .

FCIM DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B1C83:12	Rear Defog Relay: Circuit Short to	A continuous and on-demand DTC

	Battery	that sets in the FCIM if the FCIM detects a short to voltage on the heated mirror/rear window defrost relay control circuit.
B1C83:14	Rear Defog Relay: Circuit Short To Ground or Open	A continuous and on-demand DTC that sets in the FCIM if the FCIM detects an open or short to ground on the heated mirror/rear window defrost relay control circuit.

Possible Causes

- Fuse
- Wiring, terminals or connectors
- Rear window defrost relay
- Exterior mirror glass
- Exterior spotter mirror glass
- Exterior mirror
- FCIM
- BJB

Visual Inspection and Diagnostic Pre-Checks

- Inspect the suspect exterior mirror housing and glass for damage.
- Inspect BJB fuse 63 (15A) and BCM fuse 37 (15A).



NOTE: Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper, razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST D : ONE OR BOTH HEATED EXTERIOR MIRRORS ARE INOPERATIVE > PINPOINT TEST D : ONE OR BOTH HEATED EXTERIOR MIRRORS ARE INOPERATIVE



NOTE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

D1 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

Ignition ON.

Using a diagnostic scan tool, perform the FCIM self-test.

Is Diagnostic Trouble Codes (DTCs) B1C83:14 retrieved?

Yes	GO to D2
No	GO to D5

D2 PERFORM THE FCIM (FRONT CONTROLS INTERFACE MODULE) SELF TEST WITH A KNOWN GOOD RELAY INSTALLED

Ignition OFF.

Replace the rear window defrost relay with a known good relay.

Ignition ON.

Using a diagnostic scan tool, clear the FCIM Diagnostic Trouble Codes (DTCs).

Using a diagnostic scan tool, perform the FCIM self-test.

Is Diagnostic Trouble Codes (DTCs) B1C83:14 present?

Yes	GO to D3
No	INSTALL a new rear window defrost relay.

D3 CHECK THE REAR WINDOW DEFROST RELAY CONTROL CIRCUIT FOR A SHORT TO GROUND

Ignition OFF.

Disconnect: Rear Window Defrost Relay.

Disconnect: FCIM C2402A .

Measure:

Positive Lead	Measurement / Action	Negative Lead
C2402A-7	Ω	Ground

Is the resistance greater than 10, 000 ohms?

Yes	GO to D4
No	REPAIR the circuit.

D4 CHECK THE REAR WINDOW DEFROST RELAY CONTROL CIRCUIT FOR AN OPEN

Measure:

Positive Lead	Measurement / Action	Negative Lead
C2402A-7	Ω	Rear Window Defrost Relay, cavity 2

Is the resistance less than 3 ohms?

Yes	GO to D13
No	REPAIR the circuit.

D5 CHECK THE OPERATION OF THE HEATED EXTERIOR MIRRORS GLASS



NOTE: The defrost system activates for 10 minutes

Start the engine.

Activate the heated mirror/rear window defrost system.

With the rear window defrost ON, using an infrared temperature gun or equivalent, measure the temperature of the LH and RH exterior mirrors glass for approximately 30 seconds, noting changes in temperature.

Does the temperature of at least one exterior mirror glass rise?

Yes	GO to D6
No	GO to D8

D6 CHECK THE VOLTAGE TO THE INOPERATIVE HEATED EXTERIOR REAR VIEW MIRROR GLASS

Ignition OFF.

Disconnect: Inoperative Heated Exterior Rear View Mirror, C521 (LH exterior mirror) or C622 (RH exterior mirror).

Start the engine.



NOTE: The defrost system activates for 10 minutes

With the engine running, activate the heated mirror/rear window defrost system.

Measure:

LH mirror

Positive Lead	Measurement / Action	Negative Lead
C521-1		Ground

RH mirror

Positive Lead	Measurement / Action	Negative Lead
C622-1		Ground

Is the voltage greater than 11 volts?

Yes	GO to D7
No	REPAIR the circuit.

D7 CHECK THE INOPERATIVE EXTERIOR REAR VIEW MIRROR GROUND CIRCUIT FOR AN OPEN

Ignition OFF.

Measure:

LH mirror)

Positive Lead	Measurement / Action	Negative Lead
C521-8	Ω	Ground

RH mirror

Positive Lead	Measurement / Action	Negative Lead
C622-8	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to D14
No	REPAIR the circuit

D8 CHECK THE REAR WINDOW DEFROST RELAY

Ignition OFF.

Replace the rear window defrost relay with a known good relay.

Start the engine.



NOTE: The defrost system activates for 10 minutes.

Activate the heated mirror/rear window defrost switch to the ON position.

With the rear window defrost ON, using an infrared temperature gun or equivalent, measure the temperature of the LH and RH exterior mirrors glass for approximately 30 seconds, noting changes in temperature.

Does the temp of the exterior mirrors glass rise?

Yes	INSTALL a new rear window defrost relay.
------------	--

No	GO to D9
-----------	----------

D9 CHECK THE REAR WINDOW DEFROST RELAY CONTROL CIRCUIT FOR SUPPLY VOLTAGE

Ignition OFF.

Disconnect: Rear Window Defrost Relay.

Measure:

Positive Lead	Measurement / Action	Negative Lead
Rear Window Defrost Relay, cavity 3		Ground

Is the voltage greater than 11 volts?

Yes	GO to D10
------------	-----------

No	REPAIR or INSTALL a new BJB.
-----------	------------------------------

D10 CHECK THE REAR WINDOW DEFROST RELAY CONTROL VOLTAGE SUPPLY

Ignition ON.

Measure:

Positive Lead	Measurement / Action	Negative Lead
Rear Window Defrost Relay, cavity 1		Ground

Is the voltage greater than 11 volts?

Yes	GO to D11
------------	-----------

No	VERIFY that BCM fuse 37 (15A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the
-----------	---

	OEM WIRING DIAGRAMS to identify the possible causes of the circuit short.
--	---

D11 CHECK THE HEATED EXTERIOR MIRROR SUPPLY CIRCUIT FOR AN OPEN

Ignition OFF.

Disconnect: Rear Window Defrost Relay.

Disconnect: LH Exterior Mirror C521 .

Measure:

Positive Lead	Measurement / Action	Negative Lead
Rear Window Defrost Relay, cavity 5	Ω	C521-1

Is the resistance less than 3 ohms?

Yes	GO to D12
No	VERIFY that BJB fuse 63 (15A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the OEM WIRING DIAGRAMS to identify the possible causes of the circuit short.

D12 CHECK THE REAR WINDOW DEFROST RELAY CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

Ignition OFF.

Disconnect: FCIM C2402A .

Ignition ON.

Measure:

Positive Lead	Measurement / Action	Negative Lead
Rear Window Defrost Relay, cavity 2		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to D13

D13 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

Disconnect and inspect all FCIM connectors 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 FCIM connectors and related in-line connectors. Make sure they seat and latch correctly.

Operate the system to determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new FCIM. Refer to the appropriate article for the procedure.
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.

D14 CHECK THE EXTERIOR MIRROR JUMPER HARNESS

Inspect the exterior mirror jumper harness between the vehicle harness and the mirror motors for:

Open or short circuits

Damaged or pushed out pins

Corrosion

Is the harness OK?

Yes	INSTALL a new exterior mirror glass. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
No	REPAIR the harness as necessary. If the harness cannot be repaired, INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST E : THE RH (RIGHT-HAND) AND/OR LH (LEFT-HAND) POWER FOLDING MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY

Refer to Power Mirrors for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Rear View Mirrors - System Operation and Component Description .

DTC	Description	Fault Trigger Conditions
B11F6:11	Driver Folding Mirror Motor: Circuit Short To Ground	A continuous memory and on-demand DTC that sets in the DDM if the DDM detects a greater than expected current draw when voltage is applied to the LH exterior mirror fold in circuit.
B11F6:15	Driver Folding Mirror Motor: Circuit Short To Battery or Open	A continuous memory and on-demand DTC that sets in the DDM if the DDM detects a lower than expected current draw when voltage is applied to the LH exterior mirror fold in circuit.
B11F7:11	Passenger Folding Mirror Motor: Circuit Short To Ground	A continuous memory and on-demand DTC that sets in the PDM if the PDM detects a greater than expected current draw when voltage is applied to the RH exterior mirror fold in circuit.
B11F7:15	Passenger Folding Mirror Motor: Circuit Short To Battery or Open	A continuous memory and on-demand DTC that sets in the PDM if the PDM detects a lower than expected current draw when voltage is applied to the RH exterior mirror fold in circuit.

Possible Causes

- The power fold mirror motor lockout feature is active
- Binding or obstructed power fold mirror
- Power fold mirrors not synchronized
- Communication network concern
- Power window concern
- Wiring, terminals or connectors
- Exterior mirror fold switch (integral to the LH front door window control switch)
- Exterior mirror
- Door module

Visual Inspection and Diagnostic Pre-Checks

- Verify all of the power windows can be opened and closed normally using the LH front door window control switch.
- Verify that the power folding mirrors are not binding or obstructed.
- Verify the lockout feature is disabled.

 **NOTE:** Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper, razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST E : THE RH (RIGHT-HAND) AND/OR LH (LEFT-HAND) POWER FOLDING MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY > PINPOINT TEST E : THE RH (RIGHT-HAND) AND/OR LH (LEFT-HAND) POWER FOLDING MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY

 **NOTE:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

 **NOTE:** The power folding mirrors must be synchronized anytime the RH, LH or both power folding mirrors are folded or unfolded without using the power folding mirror control switch, or if a new power folding mirror has been installed. Refer to Power Folding Mirrors Synchronization .

 **NOTE:** If the exterior mirrors are folded and unfolded several times consecutively, the power lockout feature will disable the system for approximately 3-10 minutes to prevent damage to the power fold motors. After 3-10 minutes have elapsed, normal operation resumes.

E1 PERFORM A NETWORK TEST

Ignition ON.

Using a diagnostic scan tool, perform a network test.

Do the DDM and PDM pass the network test?

Yes	GO to E2
No	REFER to: Communications Network .

E2 CHECK THE DOOR MODULE DIAGNOSTIC TROUBLE CODES (DTCS)

Using a diagnostic scan tool, perform the DDM and PDM self-test.

Are any DDM DTC Diagnostic Trouble Codes (DTCs) or PDM Diagnostic Trouble Codes (DTCs) present?

Yes	For DDM DTC B11F6:15 or PDM DTC B11F7:15, GO to E7 For DDM DTC B11F6:11 or PDM DTC B11F7:11, GO to E5 For all other DDM or PDM Diagnostic Trouble Codes (DTCs), REFER to: Locks, Latches and Entry Systems .
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No	If both power folding mirrors are inoperative, GO to E3 If only one power folding mirror is inoperative, GO to E4
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E3 CHECK THE LH (LEFT-HAND) FRONT DOOR WINDOW CONTROL SWITCH

Operate all windows using the LH front door window control switch.

Do all the power windows operate correctly?

Yes	INSTALL a new LH front door window control switch. REFER to: Front Door Window Control Switch - Vehicles With: Front Power Windows . If the concern is still present after switch replacement, GO to E11
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No	DIAGNOSE the power windows before continuing diagnostics of the power folding mirrors. REFER to: Glass, Frames and Mechanisms .
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E4 CHECK THE FOLD CIRCUIT FOR VOLTAGE AT THE SUSPECT EXTERIOR MIRROR

 **NOTE:** The following step uses a test lamp to simulate normal circuit loads. Use only a Rotunda Test Lamp (SGT27000) or 250-300mA incandescent bulb test lamp. To avoid connector terminal damage, use the Rotunda Flex Probe kit for the test lamp probe connection to the vehicle. Do not use the test lamp probe directly on any connector.

Ignition OFF.

Disconnect: Suspect Exterior Mirror C521 or C622 .

Connect:

LH power folding mirror concern

Lead 1	Measurement / Action	Lead 2
C521-19		C516-18

RH power folding mirror concern

Lead 1	Measurement / Action	Lead 2
C622-19		C601-18

Ignition ON.

Press the exterior mirror fold switch.

Does the test light illuminate when the exterior mirror fold switch is pressed?

Yes	GO to E12
No	For a RH power folding mirror concern, GO to E10 For a LH power folding mirror concern, GO to E11

E5 CHECK THE DOOR MODULE DIAGNOSTIC TROUBLE CODES (DTCS) WITH THE SUSPECT EXTERIOR MIRROR DISCONNECTED

Ignition OFF.

Disconnect: Suspect Exterior Mirror C521 or C622 .

Ignition ON.

Using a diagnostic scan tool, clear the DDM (LH power folding mirror concern) or PDM (RH power folding mirror concern) Diagnostic Trouble Codes (DTCs) and repeat the self-test.

Is DDM DTC B11F6:15 or PDM DTC B11F7:15 present?

Yes	GO to E12
No	GO to E6

E6 CHECK THE EXTERIOR MIRROR FOLD IN CIRCUIT FOR A SHORT TO GROUND

Ignition OFF.

Disconnect: DDM C501B (LH power folding mirror concern) or PDM C652B (RH power folding mirror concern).

Measure:

LH power folding mirror concern

Positive Lead	Measurement / Action	Negative Lead
C501B-18	Ω	Ground

RH power folding mirror concern

Positive Lead	Measurement / Action	Negative Lead
C652B-18	Ω	Ground

Is the resistance greater than 10, 000 ohms?

Yes	For a LH concern, GO to E11 For a RH concern, GO to E10
No	REPAIR the circuit.

E7 CHECK THE DOOR MODULE DIAGNOSTIC TROUBLE CODES (DTCS) WITH THE FOLD CIRCUITS JUMPERED TOGETHER

Ignition OFF.

Disconnect: Suspect Exterior Mirror C521 or C622 .

Connect:

LH power folding mirror concern

Positive Lead	Measurement / Action	Negative Lead
C521-19		C521-18

RH power folding mirror concern

Positive Lead	Measurement / Action	Negative Lead
C622-19		C622-18

Ignition ON.

Using a diagnostic scan tool, clear the DDM (LH concern) or PDM (RH concern) Diagnostic Trouble Codes (DTCs) and repeat the self-test.

Is DDM DTC B11F6:11 or PDM DTC B11F7:11 present?

Yes	REMOVE the fused jumper wire. GO to E12
No	REMOVE the fused jumper wire. GO to E8

E8 CHECK THE FOLD CIRCUITS FOR A SHORT TO VOLTAGE

Ignition OFF.

Disconnect: DDM C501B (LH power folding mirror concern) or PDM C652B (RH power folding mirror concern).

Ignition ON.

Measure:

LH power folding mirror concern

Positive Lead	Measurement / Action	Negative Lead
C521-19		Ground
C521-18		Ground

RH power folding mirror concern

Positive Lead	Measurement / Action	Negative Lead
C622-19		Ground
C622-18		Ground

Is any voltage present?

Yes	REPAIR the affected circuit.
No	GO to E9

E9 CHECK THE FOLD CIRCUITS FOR AN OPEN

Ignition OFF.

Measure:

LH power folding mirror concern

Positive Lead	Measurement / Action	Negative Lead
C521-19	Ω	C501B-9
C521-18	Ω	C501B-18

RH power folding mirror concern

Positive Lead	Measurement / Action	Negative Lead
C622-19	Ω	C652B-9
C622-18	Ω	C652B-18

Are the resistances less than 3 ohms?

Yes	For a LH power folding mirror concern, GO to E11 For a RH power folding mirror concern, GO to E10
No	REPAIR the affected circuit.

E10 CHECK FOR CORRECT PDM (PASSENGER DOOR MODULE) OPERATION

Disconnect and inspect all PDM connectors 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 PDM connectors and related in-line connectors. Make sure they seat and latch correctly.

Operate the system to determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new PDM. REFER to: Passenger Door Module (PDM) .
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.

E11 CHECK FOR CORRECT DDM (DRIVER DOOR MODULE) OPERATION

Disconnect and inspect all DDM connectors 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 DDM connectors and related in-line connectors. Make sure they seat and latch correctly.

Operate the system to determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new DDM. REFER to: Driver Door Module (DDM) .
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.

E12 CHECK THE EXTERIOR MIRROR JUMPER HARNESS

Inspect the exterior mirror jumper harness between the vehicle harness and the mirror motors for:

Open or short circuits

Damaged or pushed out pins

Corrosion

Is the harness OK?

Yes	INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
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No	REPAIR the harness as necessary. If the harness cannot be repaired, INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
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DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST F : THE RH (RIGHT-HAND) AND/OR LH (LEFT-HAND) POWER TELESCOPING MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY

Refer to Power Mirrors for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Rear View Mirrors - System Operation and Component Description .

Possible Causes

- The power telescoping mirror motor lockout feature is active
- Binding or obstructed power telescoping mirror
- Power telescoping mirrors not synchronized
- Fuse
- Wiring, terminals or connectors
- Power telescoping mirror relay
- Power telescoping mirror control switch (integral to the LH front door window control switch)
- Power telescoping mirror

Visual Inspection and Diagnostic Pre-Checks

- Verify that the power telescoping mirrors are not binding or obstructed.
- Verify all of the power windows can be opened and closed normally using the LH front door window control switch.
- Inspect BJB fuse 41 (10A).
- Verify the lockout feature is disabled.



NOTE: Clean the entire mirror assembly and glass to assist in verification of the customer concern and/or impact damage. Do not clean any mirror glass or housing with an ice scraper, razor blade, abrasive pad, harsh chemicals or petroleum based cleaning products, as these may damage the mirror glass and/or housing.

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST F : THE RH (RIGHT-HAND) AND/OR LH (LEFT-HAND) POWER TELESCOPING MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY > PINPOINT TEST F : THE RH (RIGHT-HAND) AND/OR LH (LEFT-HAND) POWER TELESCOPING MIRROR IS INOPERATIVE/DOES NOT OPERATE CORRECTLY



NOTE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)



NOTE: If the exterior mirrors are extended and retracted several times consecutively, the power lockout feature will disable the system for approximately 3-10 minutes to prevent damage to the power telescoping mirror motors. After 3-10 minutes have elapsed, normal operation resumes.



NOTE: The trailer tow power telescoping mirrors must be synchronized anytime the RH, LH or both power telescoping mirrors are folded or unfolded without using the power telescoping mirror control switch, or if a new power telescoping mirror has been installed. Refer to Power Folding Mirrors Synchronization .

F1 VERIFY THE OPERATION OF THE POWER TELESCOPING MIRRORS

Ignition ON.

Activate the power telescoping mirrors inward and outward.

Are both power telescoping mirrors inoperative?

	VERIFY the BJB fuse 41 (10A) is OK. If OK, GO to F2
Yes	If not OK, REFER to the OEM WIRING DIAGRAMS to identify the possible causes of the circuit short.
No	For the LH power telescoping mirror inoperative, GO to F10 For the RH power telescoping mirror inoperative, GO to F11

F2 CHECK THE EXTERIOR MIRROR EXTEND RELAY

Ignition OFF.

Disconnect: Exterior Mirror Extend Relay.

Install a known good relay.

Ignition ON.

Check the operation of the telescoping mirrors.

Is the concern is still present?

Yes	REMOVE the known good relay. GO to F3
No	REMOVE the known good relay. INSTALL a new exterior mirror extend relay.

F3 CHECK THE EXTERIOR MIRROR RETRACT RELAY

Ignition OFF.

Connect: Exterior Mirror Extend Relay.

Disconnect: Exterior Mirror Retract Relay.

Install a known good relay.

Ignition ON.

Check the operation of the telescoping mirrors.

Is the concern is still present?

Yes	REMOVE the known good relay. GO to F4
No	REMOVE the known good relay. INSTALL a new exterior mirror extend relay.

F4 CHECK THE POWER TELESCOPING MIRROR RELAYS VOLAGE SUPPLY CIRCUITS FOR AN OPEN

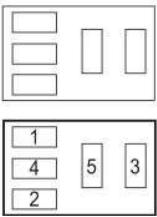
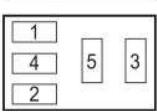
Ignition OFF.

Disconnect: Exterior Mirror Extend Relay.

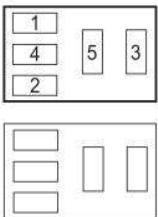
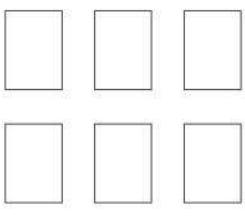
Ignition ON.

Measure:

Extend relay

Positive Lead	Measurement / Action	Negative Lead
  E194557 BJB extend relay, cavity 5		Ground

Retract relay

Positive Lead	Measurement / Action	Negative Lead
  E194558		Ground

BJB retract relay, cavity 5

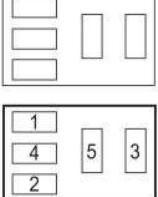
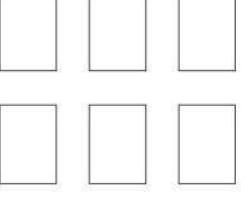
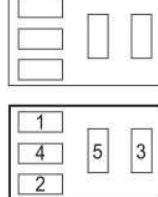
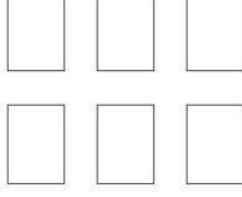
Are the voltages are greater than 11 volts?

Yes	GO to F5
No	REPAIR the circuit in question.

F5 CHECK THE POWER TELESCOPING MIRROR RELAYS COIL GROUND CIRCUITS FOR AN OPEN

Measure:

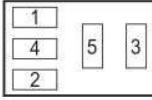
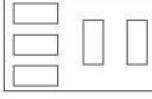
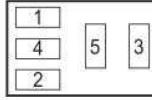
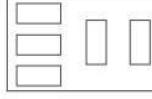
Extend relay

Positive Lead	Measurement / Action	Negative Lead
  E194557		  E194557

BJB extend relay, cavity 5 BJB extend relay, cavity 1

Retract relay

Positive Lead	Measurement / Action	Negative Lead

  <p>E194558</p> <p>BJB retract relay, cavity 5</p>		  <p>E194558</p> <p>BJB retract relay, cavity 1</p>
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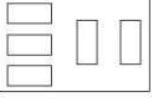
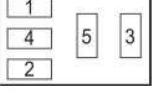
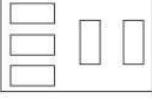
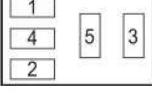
Are the voltages are greater than 11 volts?

Yes	GO to F6
No	REPAIR the circuit in question.

F6 CHECK THE POWER TELESCOPING MIRROR RELAYS SWITCH GROUND CIRCUITS FOR AN OPEN

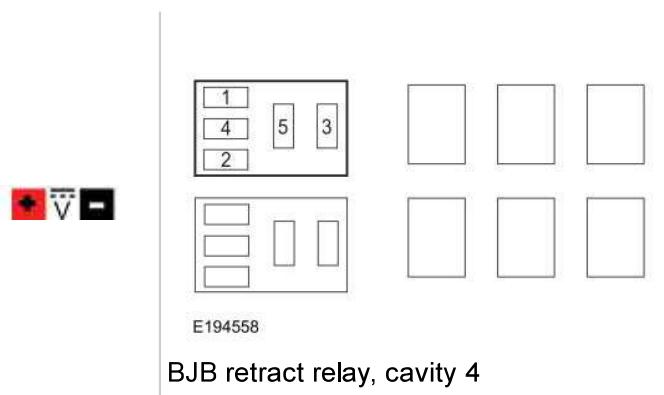
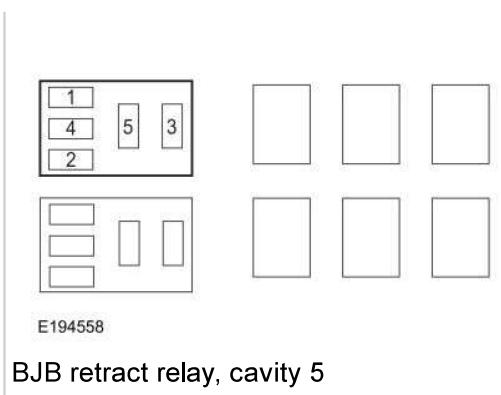
Measure:

Extend relay

Positive Lead	Measurement / Action	Negative Lead
  <p>E194557</p> <p>BJB extend relay, cavity 5</p>		  <p>E19457</p> <p>BJB extend relay, cavity 4</p>

Retract relay

Positive Lead	Measurement / Action	Negative Lead



Is the voltage greater than 11 volts?

Yes	GO to F7
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No	REPAIR the circuit in question.
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F7 CHECK THE SUSPECT RELAY CONTROL CIRCUITS FOR A SHORT TO VOLTAGE

Ignition OFF.

Disconnect: LH Front Door Window Control Switch C535 .

Ignition ON.

Measure:

Extend relay

Positive Lead	Measurement / Action	Negative Lead
BJB extend relay, cavity 2		Ground

Retract relay

Positive Lead	Measurement / Action	Negative Lead
BJB retract relay, cavity 2		Ground

Is any voltage present?

Yes	REPAIR the circuit in question.
-----	---------------------------------

No	GO to F8
----	----------

F8 CHECK THE SUSPECT RELAY CONTROL CIRCUITS FOR AN OPEN

Ignition OFF.

Measure:

Extend relay

Positive Lead	Measurement / Action	Negative Lead
BJB extend relay, cavity 2	Ω	C535-4

Retract relay

Positive Lead	Measurement / Action	Negative Lead
BJB retract relay, cavity 2	Ω	C535-3

Are the resistances less than 3 ohms?

Yes	GO to F9
No	REPAIR the circuit in question.

F9 CHECK THE SUSPECT RELAY CONTROL CIRCUIT FOR A SHORT TO GROUND

Measure:

Extend relay

Positive Lead	Measurement / Action	Negative Lead
BJB extend relay, cavity 2	Ω	Ground

Retract relay

Positive Lead	Measurement / Action	Negative Lead
BJB retract relay, cavity 2	Ω	Ground

Are the resistances greater than 10, 000 ohms?

Yes	INSTALL a new LH front door window control switch. REFER to: Front Door Window Control Switch - Vehicles With: Front Power Windows .
No	REPAIR the circuit in question.

F10 CHECK THE SUSPECT RELAY OUTPUT CIRCUIT FOR AN OPEN

Ignition OFF.

Remove the telescoping mirrors extend **and** retract relays.

Disconnect: LH Exterior Mirror C521 .

Measure:

Positive Lead	Measurement / Action	Negative Lead
BJB extend relay, cavity 3	Ω	C521-16
BJB retract relay, cavity 3	Ω	C521-17

Is the resistances less than 3 ohms?

Yes	GO to F12
No	REPAIR the affected circuit.

F11 CHECK THE SUSPECT RELAY OUTPUT CIRCUIT FOR AN OPEN

Ignition OFF.

Remove the telescoping mirrors extend **and** retract relays.

Disconnect: RH Exterior Mirror C622 .

Measure:

Positive Lead	Measurement / Action	Negative Lead
BJB extend relay, cavity 3	Ω	C622-16
BJB retract relay, cavity 3	Ω	C622-17

Is the resistances less than 3 ohms?

Yes	GO to F12
No	REPAIR the affected circuit.

F12 CHECK THE EXTERIOR MIRROR JUMPER HARNESS

Inspect the exterior mirror jumper harness between the vehicle harness and the mirror motors for:

Open or short circuits

Damaged or pushed out pins

Corrosion

Is the harness OK?

Yes	INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
No	REPAIR the harness as necessary. If the harness cannot be repaired, INSTALL a new

	exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
--	---

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST G : THE LH (LEFT-HAND) EXTERIOR AUTO-DIMMING MIRROR IS INOPERATIVE OR ALWAYS IN A DARKENED STATE

Refer to Power Mirrors for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Rear View Mirrors - System Operation and Component Description .

DTC	Description	Fault Trigger Conditions
B1286:14	Interior Mirror: Circuit Short To Ground or Open	A continuous memory DTC that sets in the IPMA when the IPMA detects a short to ground on the LH exterior auto-dimming mirror output circuit.

Possible Causes

- Wiring, terminals or connectors
- LH exterior mirror glass
- LH exterior mirror
- Interior auto-dimming mirror concern
- IPMA (integral to the interior auto-dimming mirror)

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST G : THE LH (LEFT-HAND) EXTERIOR AUTO-DIMMING MIRROR IS INOPERATIVE OR ALWAYS IN A DARKENED STATE > PINPOINT TEST G : THE LH (LEFT-HAND) EXTERIOR AUTO-DIMMING MIRROR IS INOPERATIVE OR ALWAYS IN A DARKENED STATE



NOTE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

G1 VERIFY THE INTERIOR AUTO-DIMMING MIRROR FORWARD AND REARWARD FACING SENSORS ARE NOT BLOCKED

Visually verify the forward and rearward facing sensors are not blocked or obstructed. Sources

of obstruction can include:

- Stickers, window decals or tags.
- Tool road or parking passes.
- Fold-down screens for TVs or DVD players.
- Non-OEM window tinting.
- Dirt and debris.
- Camper shells.
- Decorative objects hung from mirror.

Are either of the sensors blocked?

Yes	If possible, REMOVE the obstruction. If it is not possible to remove the obstruction, ADVISE the customer the blockage will affect the operation of the interior and LH exterior auto-dimming mirrors.
------------	--

No	GO to G2
-----------	----------

G2 VERIFY THE OPERATION OF THE INTERIOR AUTO-DIMMING MIRROR - DAYLIGHT CONDITIONS

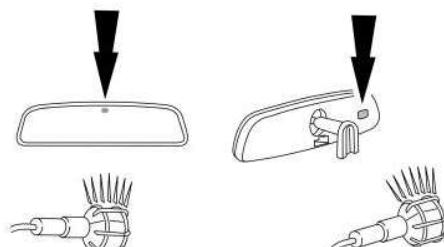
Ignition ON.

Select PARK.



NOTE: Base electrochromatic mirror shown. IPMA mirror is similar.

Use a bright lamp to illuminate the forward facing sensor and the rearward facing sensor. The mirror should adjust to a high reflectance state (mirror will be clear).



E149159

Did the interior auto-dimming mirror adjust to a high reflectance (clear) state?

Yes	GO to G3
------------	----------

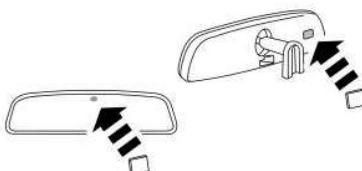
No	GO to Pinpoint Test H
-----------	-----------------------

G3 VERIFY THE OPERATION OF THE INTERIOR AUTO-DIMMING MIRROR - NIGHTTIME CONDITIONS



NOTE: Covering the sensor(s) with a finger or hand is not adequate for this step.

Cover the forward and rearward facing sensors with black electrical tape or other dark material. The mirror should adjust to a high reflectance state (mirror will be clear).



E149155

Did the interior auto-dimming mirror adjust to a high reflectance (clear) state?

Yes	GO to G4
-----	----------

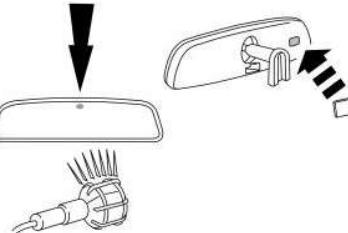
No	GO to Pinpoint Test H
----	-----------------------

G4 VERIFY THE OPERATION OF THE INTERIOR AUTO-DIMMING MIRROR - NIGHTTIME CONDITIONS WITH GLARE



NOTE: Covering the sensor(s) with a finger or hand is not adequate for this step.

Remove the black electrical tape or other dark material from the rearward facing sensor.



E149156

Use a bright light to illuminate the rearward facing sensor. The mirror should adjust to a lower reflectance state (mirror will be dark).

Did the interior auto-dimming mirror adjust to a low reflectance (dark) state?

Yes	GO to G5
-----	----------

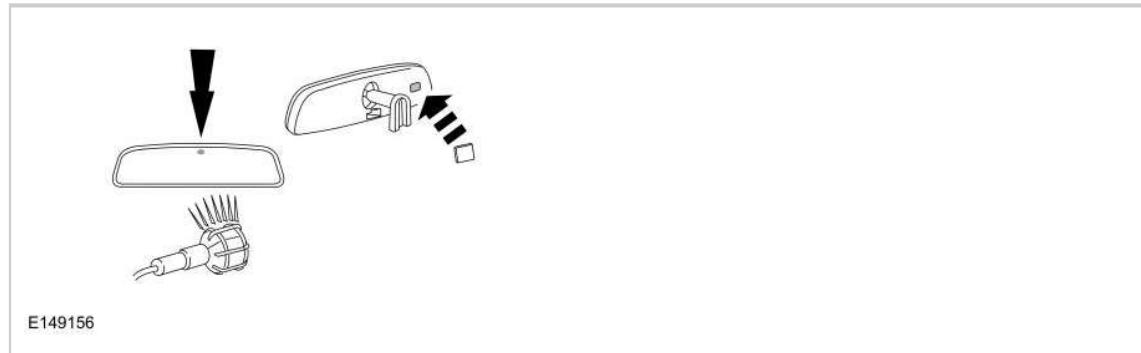
No	GO to Pinpoint Test H
----	-----------------------

G5 VERIFY THE OPERATION OF THE INTERIOR AUTO-DIMMING MIRROR - VEHICLE IN REVERSE AND NIGHTTIME CONDITIONS WITH GLARE



NOTE: Covering the sensor(s) with a finger or hand is not adequate for this step.

Continue to illuminate the rearward facing sensor with the forward facing sensor covered.



E149156

Select REVERSE.

Did the interior auto-dimming mirror adjust to a high reflectance (clear) state after reverse was selected?

Yes	If the LH exterior auto-dimming mirror is inoperative, GO to G6 If the LH exterior auto-dimming mirror is always in a low reflectance (dark) state, GO to G9
-----	--

If the LH exterior auto-dimming mirror is inoperative, GO to G6 If the LH exterior auto-dimming mirror is always in a low reflectance (dark) state, GO to G9

No	GO to Pinpoint Test H
----	-----------------------

G6 CHECK FOR VOLTAGE AT THE LH (LEFT-HAND) EXTERIOR AUTO-DIMMING MIRROR WHILE SIMULATING NIGHTTIME CONDITIONS WITH GLARE

Select PARK.

Ignition OFF.

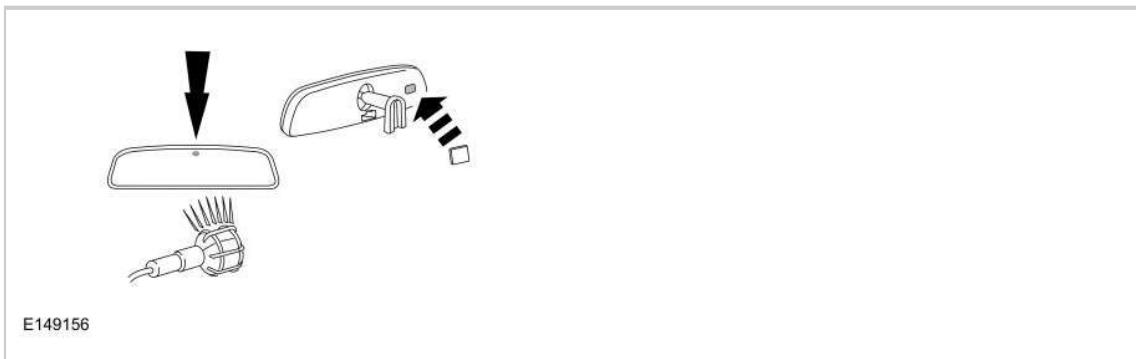
Disconnect: LH Exterior Mirror C516 (without memory mirrors) or LH Exterior Mirror C521 (with memory mirrors).

Ignition ON.



NOTE: Covering the sensor(s) with a finger or hand is not adequate for this step.

Illuminate the rearward facing sensor with the forward facing sensor covered.



Measure:

Without memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C516-2		C516-6

With memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C521-2		C521-6

Is any voltage present?

Yes	GO to G12
No	GO to G7

G7 CHECK FOR AN OPEN BETWEEN THE LH (LEFT-HAND) EXTERIOR MIRROR AND THE INTERIOR AUTO-DIMMING MIRROR

Ignition OFF.

Disconnect: Interior Auto-Dimming Mirror C9039 (without IPMA) or Interior Auto-Dimming Mirror C9012 (with IPMA).

Measure:

Without IPMA, without memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C516-2	Ω	C9039-11
C516-6	Ω	C9039-15

Without IPMA, with memory mirrors

Positive Lead	Measurement / Action	Negative Lead

C521-2	Ω	C9039-11
C521-6	Ω	C9039-15

With IPMA, without memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C516-2	Ω	C9012-5
C516-6	Ω	C9012-6

With IPMA, with memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C521-2	Ω	C9012-5
C521-6	Ω	C9012-6

Are the resistances less than 3 ohms?

Yes	GO to G8
No	REPAIR the affected circuit.

G8 CHECK THE LH (LEFT-HAND) EXTERIOR AUTO-DIMMING MIRROR CIRCUITS FOR A SHORT TOGETHER

Measure:

Without memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C516-2	Ω	C516-6

With memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C521-2	Ω	C521-6

Is the resistance greater than 10, 000 ohms?

Yes	GO to G9
No	REPAIR the affected circuits.

G9 CHECK THE LH (LEFT-HAND) EXTERIOR AUTO-DIMMING MIRROR CIRCUITS FOR VOLTAGE WHILE SIMULATING NIGHTTIME CONDITIONS

Select PARK.

Ignition OFF.

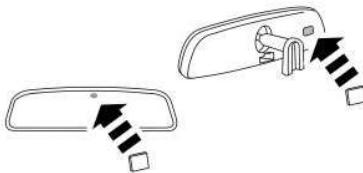
Disconnect: LH Exterior Mirror C516 (without memory mirrors) or LH Exterior Mirror C521 (with memory mirrors).

Ignition ON.



NOTE: Covering the sensor(s) with a finger or hand is not adequate for this step.

Cover the forward and rearward facing sensors with black electrical tape or other dark material. The mirror should adjust to a high reflectance state (mirror will be clear).



E149155

Measure:

Without memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C516-2		C516-6

With memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C521-2		C521-6

Is any voltage present?

Yes	GO to G10
No	GO to G12

G10 CHECK THE LH (LEFT-HAND) EXTERIOR AUTO-DIMMING MIRROR CIRCUITS FOR A SHORT TO VOLTAGE WITH THE INTERIOR AUTO DIMMING MIRROR DISCONNECTED

Ignition OFF.

Disconnect: Interior Auto-Dimming Mirror C9039 (without IPMA) or Interior Auto-Dimming Mirror C9012 (with IPMA).

Ignition ON.

Measure:

Without memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C516-2		Ground
C516-6		Ground

With memory mirrors

Positive Lead	Measurement / Action	Negative Lead
C521-2		Ground
C521-6		Ground

Is any voltage present?

Yes	REPAIR the affected circuit.
No	If the vehicle is equipped with an IPMA, GO to G11 If the vehicle is not equipped with an IPMA, INSTALL a new interior auto-dimming mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .

G11 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

Disconnect and inspect all IPMA connectors 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 IPMA connectors and related in-line connectors. Make sure they seat and latch correctly.

Operate the system to determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new IPMA (integral to the interior auto-dimming mirror). REFER to: Interior Rear View Mirror .
-----	---

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.
-----------	--

G12 CHECK THE EXTERIOR MIRROR JUMPER HARNESS

Inspect the exterior mirror jumper harness between the vehicle harness and the mirror glass for:

- Open or short circuits
- Damaged or pushed out pins
- Corrosion

Is the harness OK?

Yes	INSTALL a new LH exterior mirror glass. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .
No	REPAIR the harness as necessary. If the harness cannot be repaired, INSTALL a new exterior mirror. REFER to: Exterior Mirror - Vehicles With: Long Arm Mirrors . REFER to: Exterior Mirror - Vehicles With: Short Arm Mirrors .

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT TEST H : THE INTERIOR AUTO-DIMMING MIRROR DOES NOT OPERATE CORRECTLY

Refer to Power Mirrors for schematic and connector information.

Normal Operation and Fault Conditions

REFER to: Rear View Mirrors - System Operation and Component Description .

Possible Causes

- Fuse
- Wiring, terminals or connectors
- TR data concern
- Reverse lamp concern
- Interior auto-dimming mirror
- IPMA (integral to the interior auto-dimming mirror) if equipped

Visual Inspection and Diagnostic Pre-Checks

- Inspect BCM fuse 36 (15A).

DIAGNOSIS AND TESTING > REAR VIEW MIRRORS > PINPOINT TESTS > PINPOINT

TEST H : THE INTERIOR AUTO-DIMMING MIRROR DOES NOT OPERATE CORRECTLY > PINPOINT TEST H : THE INTERIOR AUTO-DIMMING MIRROR DOES NOT OPERATE CORRECTLY



NOTE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector. Use only Rotunda Flex Probes (NUD105-R025D)

H1 VERIFY THE OPERATION OF THE REVERSE LAMPS

Ignition ON.



NOTE: If the TR sensor is malfunctioning and the reverse lamps are inoperative or always on, the interior auto-dimming mirror will not function properly.

Move the selector lever through the entire range while monitoring the reverse lamps.

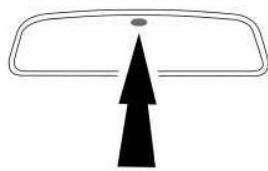
Select PARK.

Do the reverse lamps illuminate ONLY in REVERSE?

Yes	GO to H2
No	DIAGNOSE the reversing lamps. REFER to: Reversing Lamps .

H2 INSPECT THE MIRROR FOR PROPER INSTALLATION

Inspect the interior auto-dimming mirror to make sure the rearward facing sensor is at the top of the mirror glass.



E149165

Is the rearward facing sensor at the top of the interior auto-dimming mirror glass?

Yes	GO to H3
No	INSTALL the interior auto-dimming mirror with the rearward facing sensor at the top of the mirror glass. REFER to: Interior Rear View Mirror .

H3 VERIFY THE FORWARD AND REARWARD FACING SENSORS ARE NOT BLOCKED

Visually verify the forward and rearward facing sensors are not blocked or obstructed. Sources of obstruction can include:

- Stickers, window decals or tags.
- Tool road or parking passes.
- Fold-down screens for TVs or DVD players.
- Non-OEM window tinting.
- Dirt and debris.
- Camper shells.
- Decorative objects hung from mirror.

Are either of the sensors blocked?

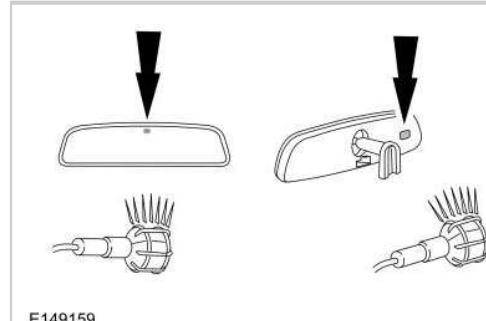
Yes	If possible, REMOVE the obstruction. If it is not possible to remove the obstruction, ADVISE the customer the blockage will affect the operation of the auto-dimming mirror.
No	GO to H4

H4 VERIFY THE OPERATION OF THE INTERIOR AUTO-DIMMING MIRROR - DAYLIGHT CONDITIONS



NOTE: Base electrochromatic mirror shown. IPMA mirror is similar.

Use a bright lamp to illuminate the forward facing sensor and the rearward facing sensor. The mirror should adjust to a high reflectance state (mirror will be clear).



Did the mirror adjust to a high reflectance (clear) state?

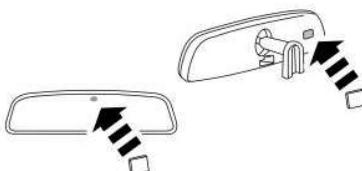
Yes	GO to H5
No	INSTALL a new interior auto-dimming mirror. REFER to: Interior Rear View Mirror .

H5 VERIFY THE OPERATION OF THE INTERIOR AUTO-DIMMING MIRROR - NIGHTTIME CONDITIONS



NOTE: Covering the sensor(s) with a finger or hand is not adequate for this step.

Cover the forward and rearward facing sensors with black electrical tape or other dark material. The mirror should adjust to a high reflectance state (mirror will be clear).



E149155

Did the mirror adjust to a high reflectance (clear) state?

Yes

GO to H6

No

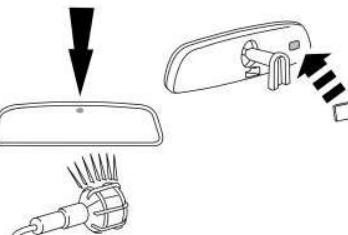
INSTALL a new interior auto-dimming mirror. REFER to: Interior Rear View Mirror .

H6 VERIFY THE OPERATION OF THE INTERIOR AUTO-DIMMING MIRROR - NIGHTTIME CONDITIONS WITH GLARE



NOTE: Covering the sensor(s) with a finger or hand is not adequate for this step.

Remove the black electrical tape or other dark material from the rearward facing sensor.



E149156

Use a bright light to illuminate the rearward facing sensor. The mirror should adjust to a lower reflectance state (mirror will be dark).

Did the mirror adjust to a low reflectance (dark) state?

Yes

GO to H7

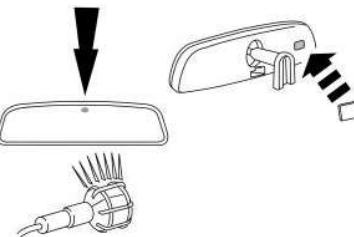
No	GO to H8
----	----------

H7 VERIFY THE OPERATION OF THE INTERIOR AUTO-DIMMING MIRROR - VEHICLE IN REVERSE AND NIGHTTIME CONDITIONS WITH GLARE



NOTE: Covering the sensor(s) with a finger or hand is not adequate for this step.

Continue to illuminate the rearward facing sensor with the forward facing sensor covered.



E149156

Select REVERSE.

Did the mirror adjust to a high reflectance (clear) state after reverse was selected?

Yes	Select PARK. The system is operating correctly at this time. REVIEW the operation of the interior auto-dimming mirror feature with the customer.
-----	--

Select PARK. The system is operating correctly at this time. REVIEW the operation of the interior auto-dimming mirror feature with the customer.

No	If the vehicle is equipped with an IPMA, GO to H11 If the vehicle is not equipped with an IPMA, GO to H10
----	---

If the vehicle is equipped with an IPMA, GO to H11 If the vehicle is not equipped with an IPMA, GO to H10

H8 CHECK FOR VOLTAGE TO THE INTERIOR AUTO-DIMMING MIRROR

Ignition OFF.

Disconnect: Interior Auto-Dimming Mirror C9039 (without IPMA) or Interior Auto-Dimming Mirror C9012 (with IPMA).

Ignition ON.

Measure:

Without IPMA

Positive Lead	Measurement / Action	Negative Lead
C9039-1		Ground

With IPMA

Positive Lead	Measurement / Action	Negative Lead

C9012-1



Ground

Is the voltage greater than 11 volts?

Yes	GO to H9
No	VERIFY that BCM fuse 36 (15A) is OK. If the fuse is OK, REPAIR the circuit. If the fuse is not OK, REFER to the OEM WIRING DIAGRAMS to identify the possible causes of the circuit short.

H9 CHECK FOR GROUND AT THE INTERIOR AUTO-DIMMING MIRROR

Ignition OFF.

Measure:

Without IPMA

Positive Lead	Measurement / Action	Negative Lead
C9039-4	Ω	Ground

With IPMA

Positive Lead	Measurement / Action	Negative Lead
C9012-7	Ω	Ground

Is the resistance less than 3 ohms?

Yes	Vehicles with an IPMA, GO to H12 Vehicles without an IPMA, GO to H10
No	REPAIR the circuit.

H10 CHECK THE REVERSE INHIBIT CIRCUIT FOR VOLTAGE AT THE INTERIOR AUTO-DIMMING MIRROR WITH THE VEHICLE IN REVERSE

Ignition ON.

Select REVERSE.

Measure:

Positive Lead	Measurement / Action	Negative Lead
C9039-9		Ground

Is the voltage greater than 11 volts?

Yes	INSTALL a new interior auto-dimming mirror. REFER to: Interior Rear View Mirror .
------------	---

No	REPAIR the circuit.
----	---------------------

H11 PERFORM A NETWORK TEST

Select PARK.

Using a diagnostic scan tool, perform a network test.

Do the PCM, GWM and IPMA pass the network test?

Yes	GO to H12
No	REFER to: Communications Network .

H12 CHECK FOR IPMA (IMAGE PROCESSING MODULE A) DIAGNOSTIC TROUBLE CODES (DTCs)

Ignition ON.

Select REVERSE.

Wait 15 seconds.

Select PARK.

Using a diagnostic scan tool, check the IPMA Diagnostic Trouble Codes (DTCs).

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to: Lane Keeping System .
No	GO to H13

H13 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

Disconnect and inspect all IPMA connectors 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 IPMA connectors and related in-line connectors. Make sure they seat and latch correctly.

Operate the system to determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new IPMA (integral to the interior auto-dimming mirror). REFER to: Interior Rear View Mirror .
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.

GENERAL PROCEDURES > POWER MIRRORS SYNCHRONIZATION

Synchronization



NOTE: The power folding mirrors may need to be synchronized any time the mirrors are folded or unfolded without using the folding switch, or if a new power folding mirror is installed.



NOTE: The power telescoping mirrors may need to be synchronized any time the mirrors are extended or retracted without using the telescoping switch, or if a new power telescoping mirror is installed.



NOTE: If the power folding or power telescoping mirrors are continuously electronically moved, the power lockout feature disables the system for approximately 3-10 minutes to prevent damage to the power fold motors. After 3-10 minutes have elapsed, normal operation resumes.



NOTE: The truck power folding mirror procedure is shown in the videos, other vehicles and power telescoping mirror procedure are similar.

1.

Fold or retract both mirrors by hand.

2.

Using the power folding/power telescoping mirror switch, operate the mirrors until an audible click is heard.

3.

Operate the power folding or power telescoping mirrors an additional 3 to 4 times to synchronize the mirrors.

4.

For vehicles equipped with the mirror control switch integral to the window switch, refer to the video below.

5.

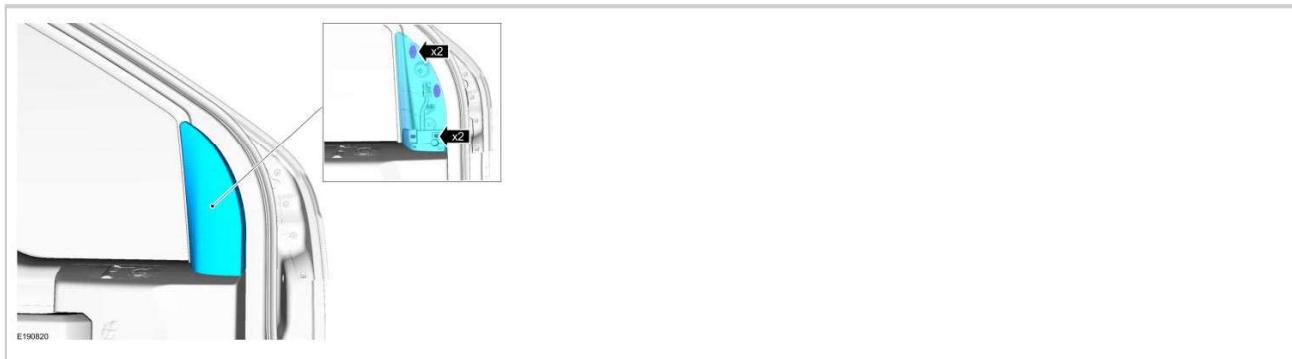
For vehicles equipped with the stand alone mirror control switch, refer to the video below.

REMOVAL AND INSTALLATION > EXTERIOR MIRROR - VEHICLES WITH: LONG ARM MIRRORS > REMOVAL

Exterior mirror

1.

Remove the sail panel trim panel.



2.

Disconnect the exterior mirror electrical connectors and separate the wiring harness guide.



3.

 **NOTE:** The mirror assembly has a clip for assembly aid at the factory. If the clip is damaged during mirror removal, remove the clip from the door panel and reuse the mirror.

Remove the exterior mirror.

1.

Remove the bolts.

Torque

: 80 lb.in (9 Nm)

2.

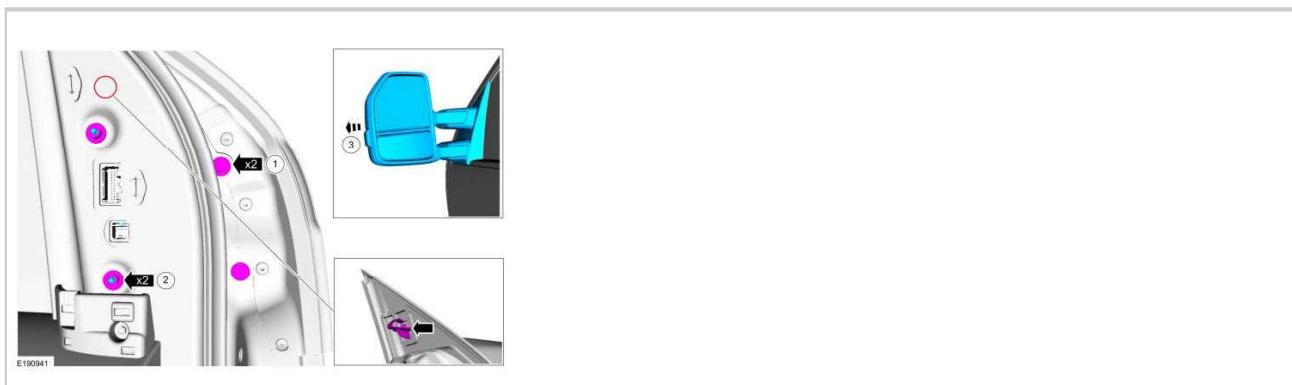
Remove the nuts.

Torque

: 80 lb.in (9 Nm)

3.

Slide the exterior mirror outward.



Exterior mirror glass lower

4.

Remove the exterior mirror lower glass.

1.

Separate the exterior mirror lower glass from the exterior mirror glass mount.

2.

Disconnect the exterior mirror lower glass electrical connectors.



Exterior mirror glass upper

5.

 **NOTE:** Position the screwdriver using the service slot in the mirror glass backing plate to remove the mirror glass. Prying on the backing plate in other locations may damage the mirror glass.

Remove the exterior mirror upper glass.

1.

Position the mirror glass in and up.

2.

Using a flat blade screwdriver separate the exterior mirror upper glass from the exterior mirror motor.

3.

 **NOTE:** The number and location of the electrical connectors will vary based on mirror option content.

Disconnect the exterior mirror upper glass electrical connectors.



Exterior mirror motor

6.

Remove the exterior mirror upper glass.

7.

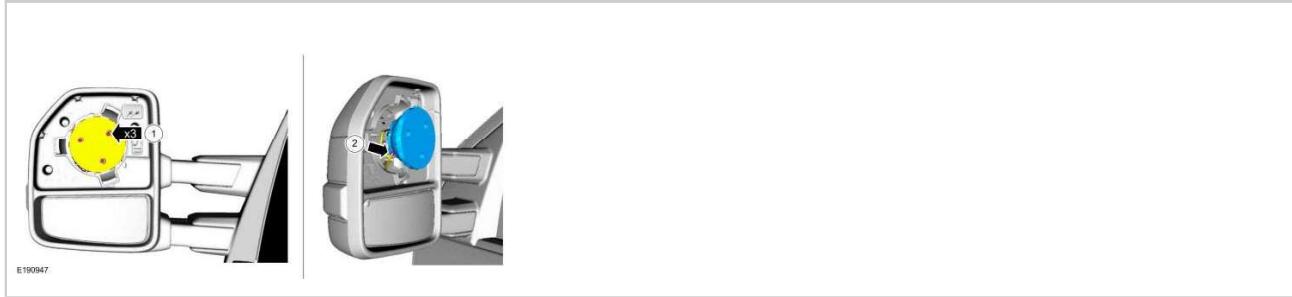
Remove the exterior mirror motor.

1.

Remove the screws and position the exterior mirror motor aside.

2.

Disconnect the exterior mirror motor electrical connectors.



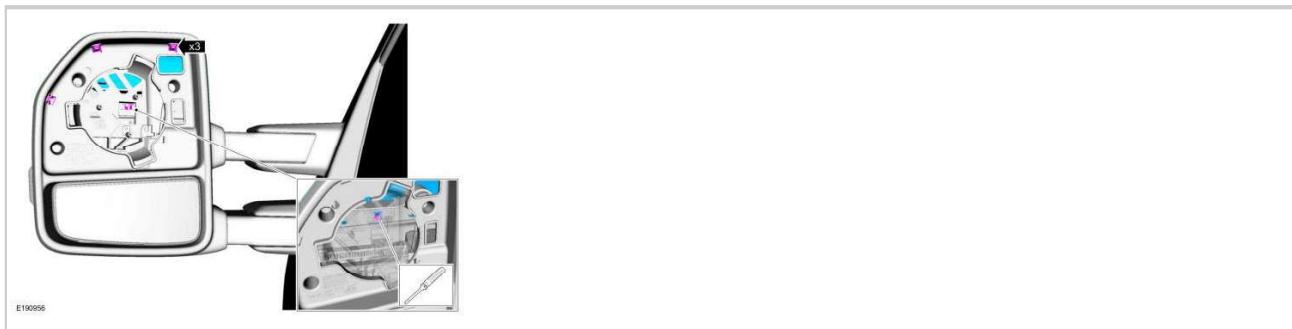
Exterior mirror cover

8.

Remove the exterior mirror upper glass.

9.

Release the tabs and remove the upper exterior mirror cover.



10.

Remove the exterior mirror lower glass.

11.

Remove the exterior mirror lower cover screws.



12.

Release the tabs and remove the exterior mirror lower cover.



Exterior mirror mounted turn signal

13.

Remove the exterior mirror upper and lower covers.

14.



NOTE: The turn signal assembly also contains the spotlamp and parking lamp functions depending on option content.

Remove the exterior mirror mounted turn signal.

1.

Position the exterior mirror mounted turn signal aside.

2.

Disconnect the exterior mirror mounted turn signal electrical connector.



Puddle lamp

15.

1.

Using a small flat blade screwdriver, release the puddle lamp retaining tab.

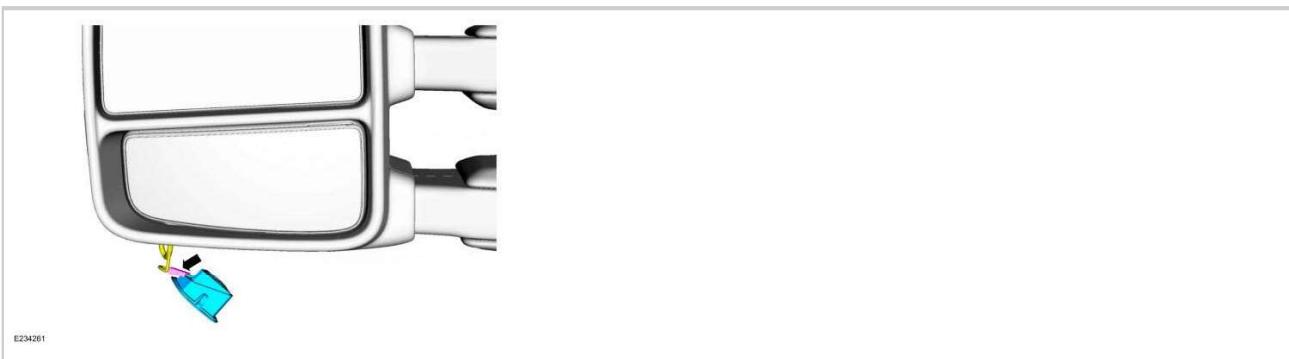
2.

Position the puddle lamp down.



16.

Disconnect the electrical connector and remove the puddle lamp.



REMOVAL AND INSTALLATION > EXTERIOR MIRROR - VEHICLES WITH: LONG ARM MIRRORS > INSTALLATION

1.

To install, reverse the removal procedure.

REMOVAL AND INSTALLATION > EXTERIOR MIRROR - VEHICLES WITH: SHORT ARM MIRRORS > REMOVAL

Exterior mirror

1.

Remove the sail panel trim panel.



2.

Disconnect the exterior mirror electrical connectors and separate the wiring harness guide.



3.

 **NOTE:** The mirror assembly has a molded hook for assembly aid at the factory. If the hook is damaged during mirror removal, remove the hook from the door panel and reuse the mirror.

Remove the exterior mirror.

1.

Remove the bolts.

Torque

: 80 lb.in (9 Nm)

2.

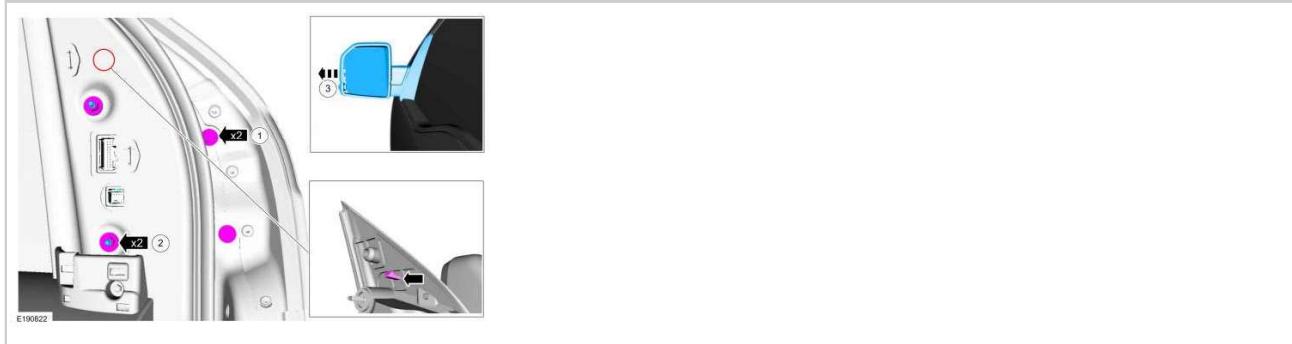
Remove the nuts.

Torque

: 80 lb.in (9 Nm)

3.

Slide the exterior mirror outward.



Exterior mirror glass

4.

NOTE: Position the screwdriver using the service slot in the mirror glass backing plate to remove the mirror glass. Prying on the backing plate in other locations may damage the mirror glass.

Remove the exterior mirror glass.

1.

Position the mirror glass in and up.

2.

Using a flat blade screwdriver separate the exterior mirror glass from the exterior mirror motor.

3.

NOTE: The number and location of the electrical connectors will vary based on mirror option content.

Disconnect the exterior mirror glass electrical connectors.



Exterior mirror motor

5.

Remove the exterior mirror glass.

6.

Remove the exterior mirror motor.

1.

Remove the screws and position the exterior mirror motor aside.

2.

Disconnect the exterior mirror motor electrical connectors.



Exterior mirror cover

7.

Remove the exterior mirror glass.

8.

Remove the exterior mirror bezel.

1.

Remove the exterior mirror bezel screws.

2.

Release the exterior mirror bezel tabs.

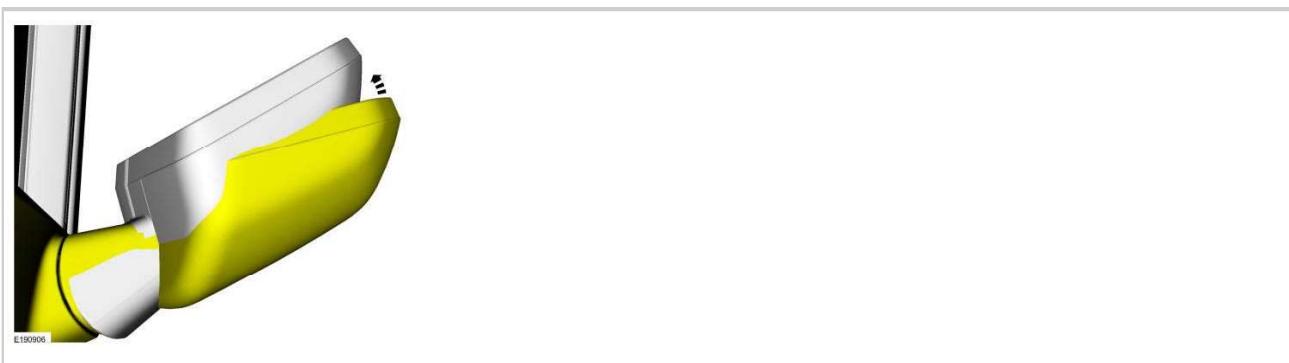
3.

Slide the exterior mirror bezel outward off the tabs.



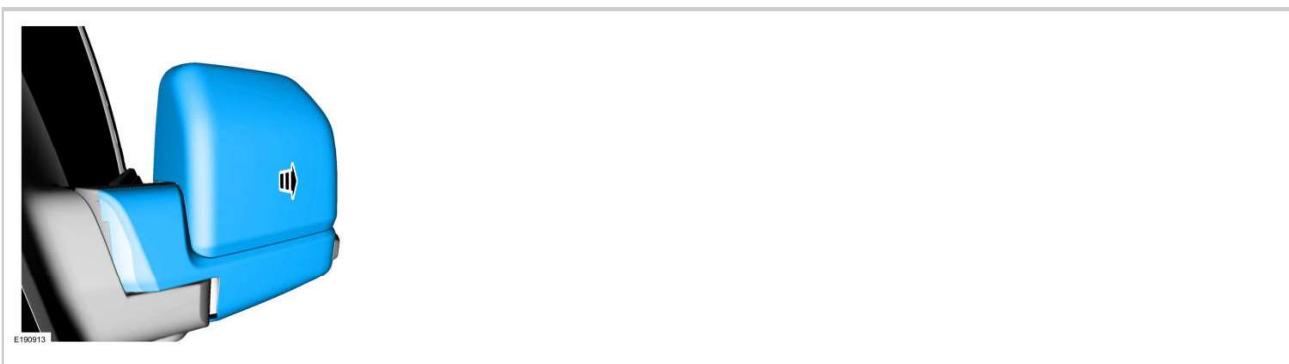
9.

Position the mirror arm in slightly.



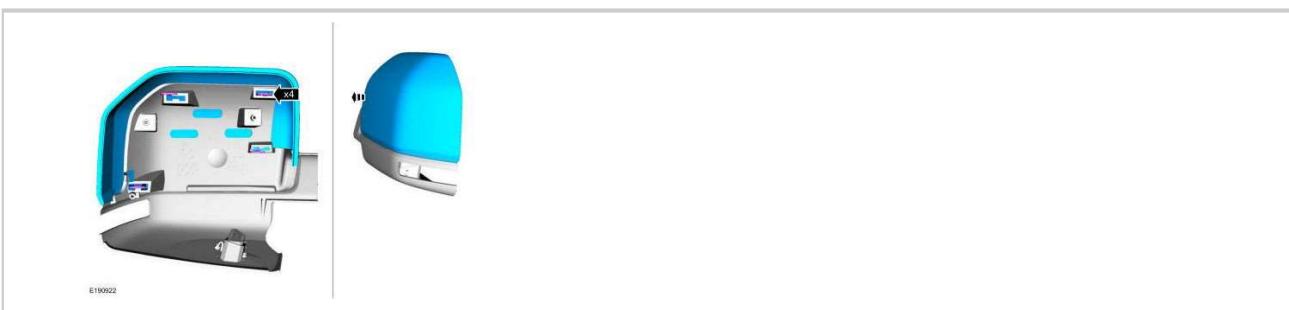
10.

Remove the exterior mirror cover assembly.



11.

Release the tabs and remove the exterior mirror cover.

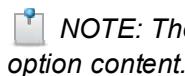


Exterior mirror mounted turn signal

12.

Remove the exterior mirror cover assembly.

13.



NOTE: The turn signal assembly also contains the spotlamp function depending on option content.

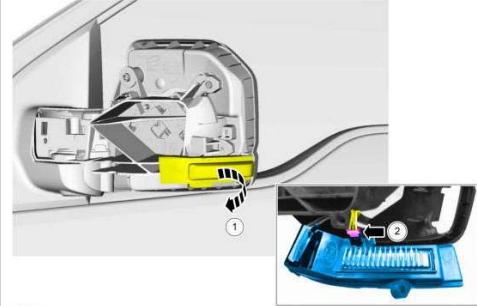
Remove the exterior mirror mounted turn signal.

1.

Position the exterior mirror mounted turn signal aside.

2.

Disconnect the exterior mirror mounted turn signal electrical connector.



Puddle lamp

14.

1.

Using a small flat blade screwdriver, release the puddle lamp retaining tab.

2.

Position the puddle lamp down.



15.

Disconnect the electrical connector and remove the puddle lamp.



REMOVAL AND INSTALLATION > EXTERIOR MIRROR - VEHICLES WITH: SHORT ARM MIRRORS > INSTALLATION

Exterior mirror

1.

To install, reverse the removal procedure.

Exterior mirror glass

2.

To install, reverse the removal procedure.

Exterior mirror motor

3.

To install, reverse the removal procedure.

Exterior mirror cover

4.

To install, reverse the removal procedure.

5.

On vehicles equipped with power fold mirrors synchronize the mirrors. Refer to: Power Mirrors Synchronization .

Exterior mirror mounted turn signal

6.

To install, reverse the removal procedure.

7.

On vehicles equipped with power fold mirrors synchronize the mirrors. Refer to: Power Mirrors Synchronization .

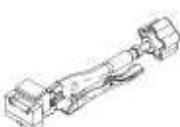
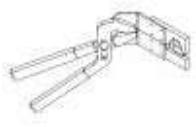
Puddle lamp

8.

To install, reverse the removal procedure.

REMOVAL AND INSTALLATION > INTERIOR REAR VIEW MIRROR

Special Tool(s) / General Equipment

 E161639	501-025 Installer, Rear View Mirror
 E224356	501-190 Remover, Auto Dimming Rear View Mirror
 E224356	501-191 Installer, Rear View Mirror
 E161640	501-D118A (501-D118) Mirror Remover

REMOVAL AND INSTALLATION > INTERIOR REAR VIEW MIRROR > REMOVAL



NOTE: Removal steps in this procedure may contain installation details.

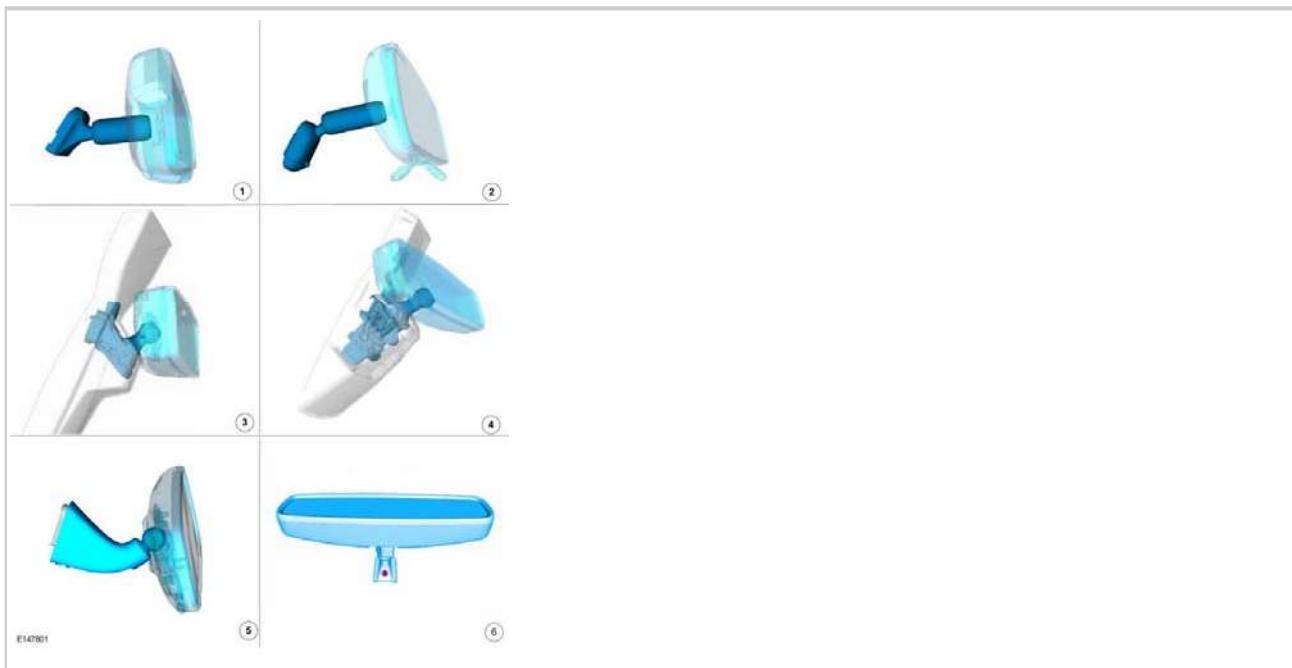
1.

WARNING: Before beginning any service procedure in this article, refer to Safety Warnings in GENERAL INFORMATION . Failure to follow this instruction may result in serious personal injury.

Refer to: Health and Safety Precautions .

2.

Mirror Types

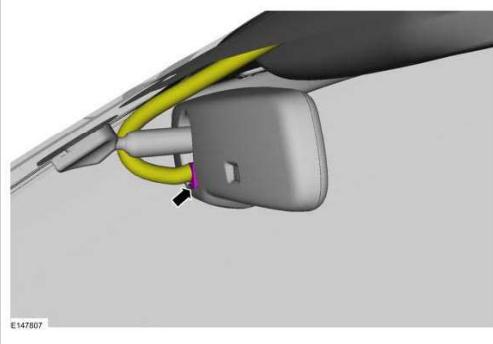


Mirror type 1

3.

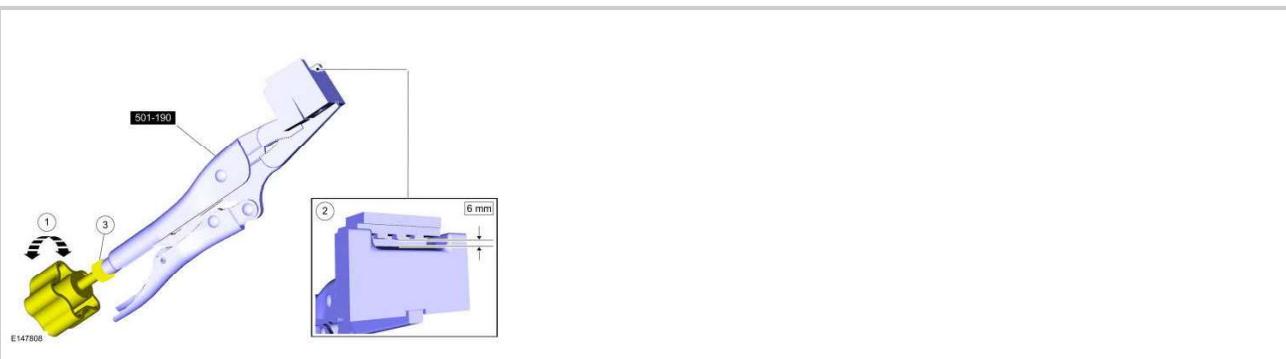
4.

If equipped, disconnect the interior mirror electrical connector.



5.

Adjust the jaws on the interior mirror remover. Use Special Service Tool: 501-190 Remover, Auto Dimming Rear View Mirror.



6.

 **NOTE:** Make sure the interior mirror remover is fully inserted into the rear view mirror mount access hole. Otherwise, damage to the windshield glass may occur.

Using the interior mirror remover, release the locking tab.



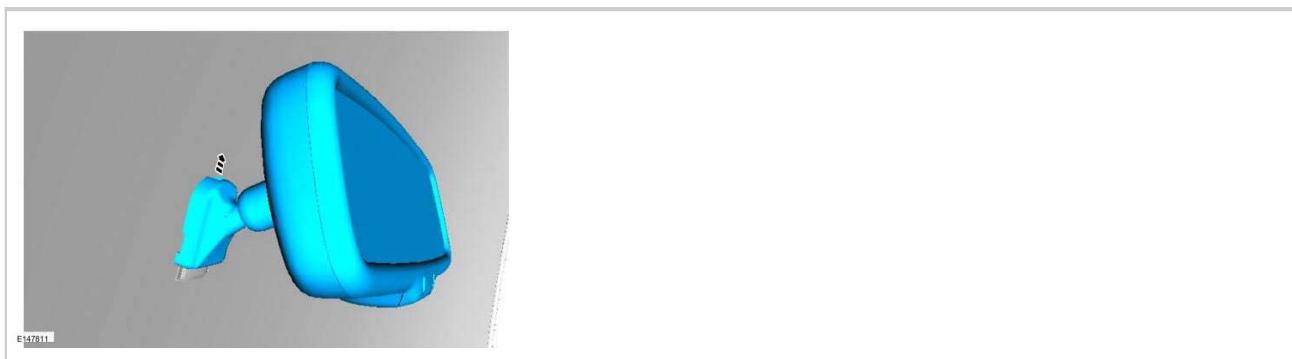
7.

Using a closed hand, bump the adjustment handle of the interior mirror remover to slide the mirror upward on the mirror mount.



8.

Slide the interior mirror off the interior mirror mount.



Mirror type 2

9.

Remove the interior mirror.

1.

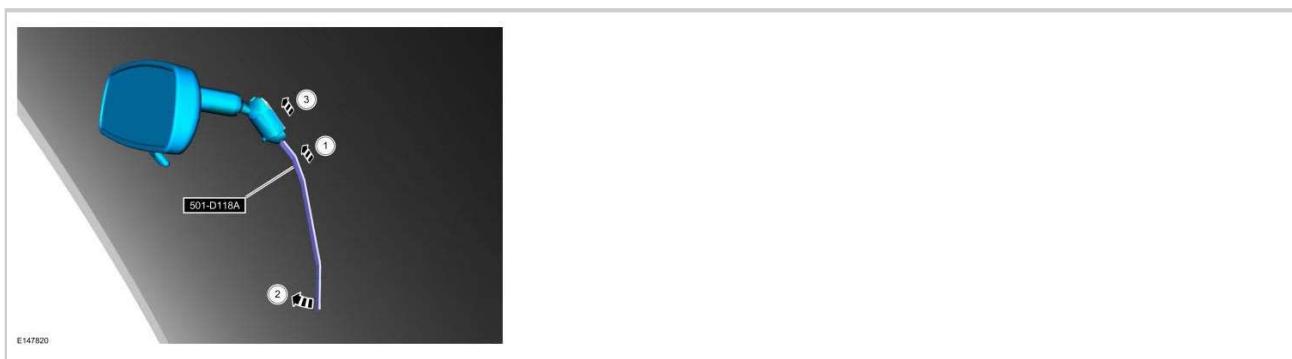
Insert the interior mirror remover into the release tab. Use Special Service Tool: 501-D118A (501-D118) Mirror Remover.

2.

Pull the lower edge of the interior mirror remover away from the windshield.

3.

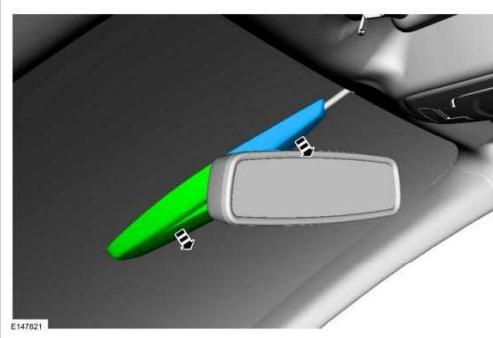
Slide the interior mirror off the mirror mount.



Mirror type 3

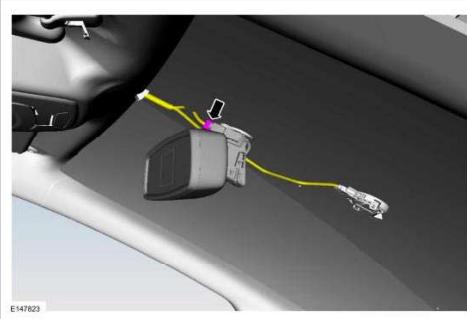
10.

Remove the rain sensor covers.



11.

Disconnect the interior mirror electrical connector.



12.

Remove the interior mirror.

1.

Position the interior mirror assembly to release the indexing tab.

2.

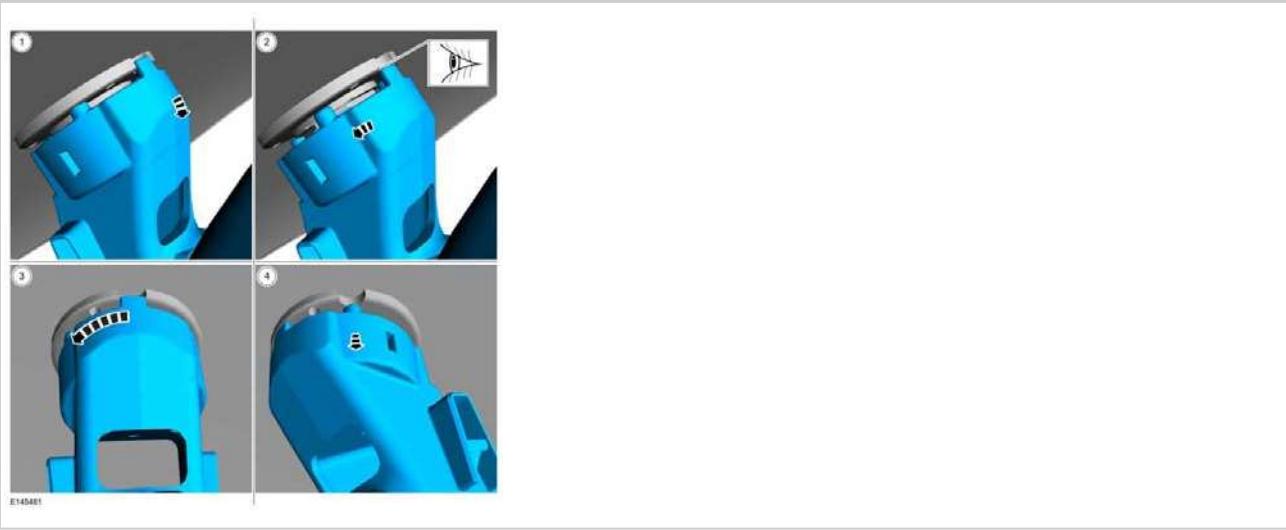
Inspect the indexing tab and turn the interior mirror slightly counter clock-wise.

3.

Turn the interior mirror 45 degrees counter clock-wise.

4.

Pull the interior mirror off the mirror mount.



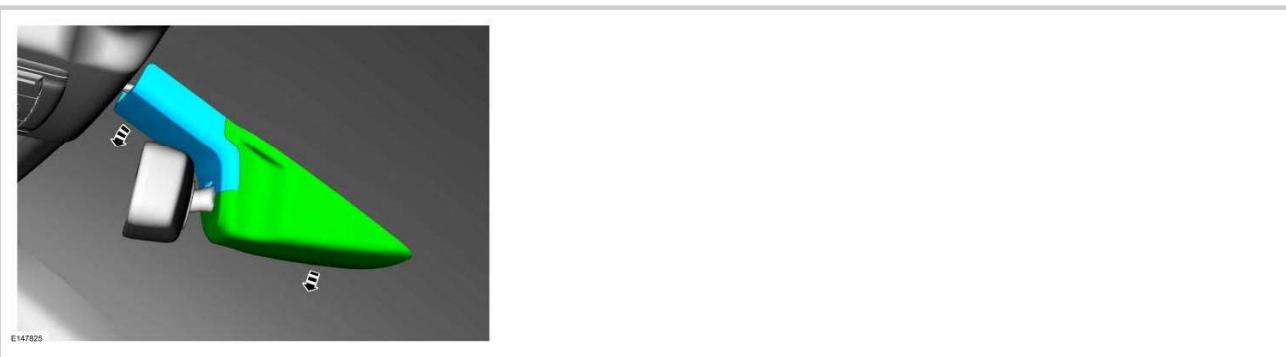
Mirror type 4

13.

If a new mirror is being installed, use a diagnostic scan tool, begin the PMI process for the IPMA following the on-screen instructions.

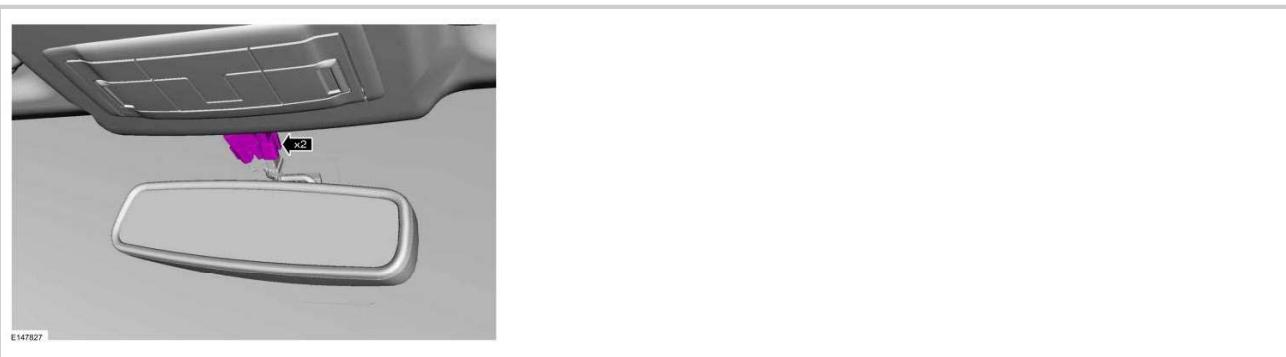
14.

Remove the rain sensor covers.



15.

Disconnect the interior mirror electrical connector.



16.

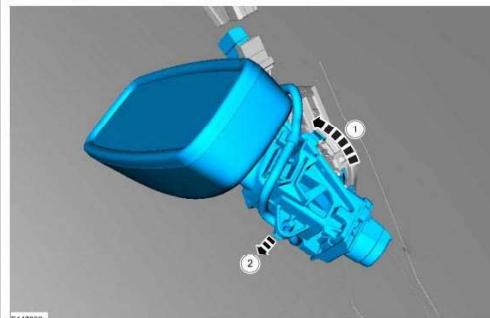
Remove the interior mirror.

1.

Turn the interior mirror assembly counter clock-wise.

2.

Remove the interior mirror off the mirror mount.



Mirror type 5

17.

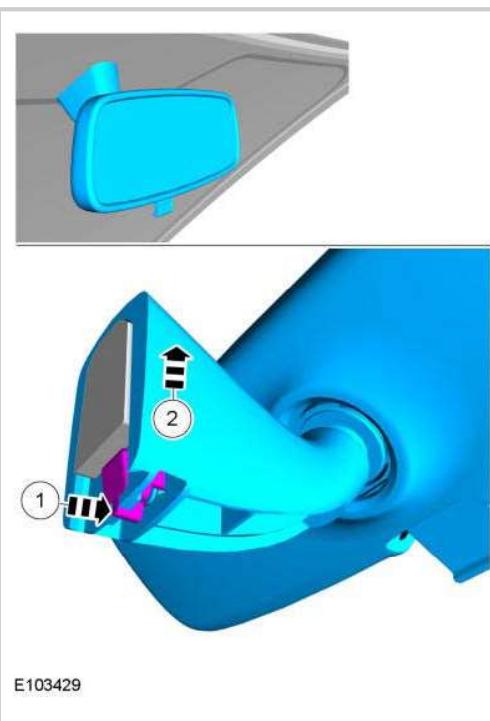
Remove the interior mirror.

1.

Release the locking tab.

2.

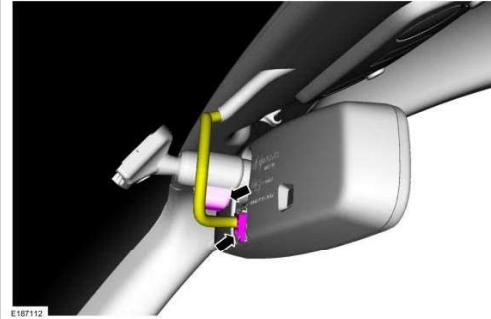
Slide the interior mirror off the mirror mount.



Mirror type 6

18.

Disconnect the electrical connector and unclip the wiring harness.



19.

Remove the interior mirror.

1.

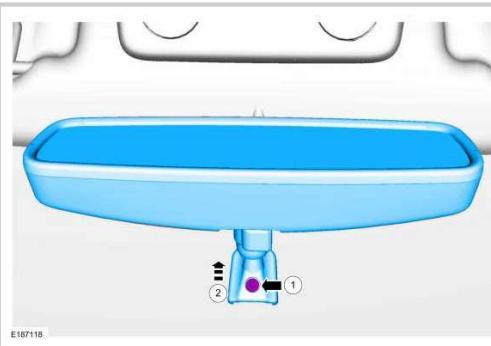
Loosen the set screw.

Torque

: 16 lb.in (1.8 Nm)

2.

Slide the interior mirror upward.



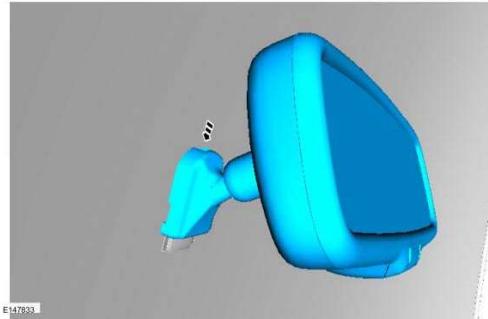
REMOVAL AND INSTALLATION > INTERIOR REAR VIEW MIRROR > INSTALLATION

Mirror type 1

1.

2.

Slide the interior rear view mirror over the windshield bracket from the top.

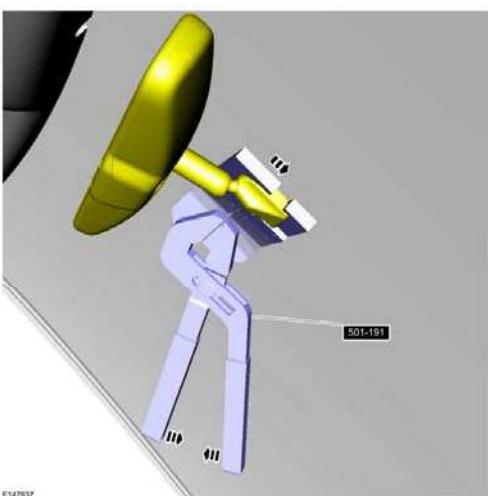


3.



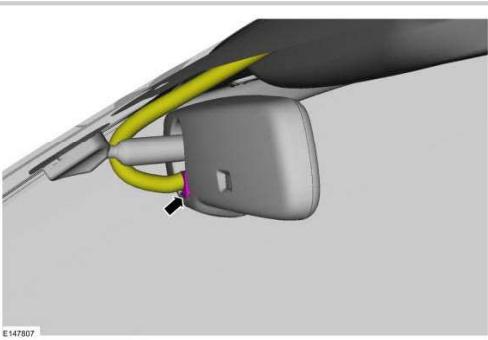
NOTE: An audible click will be heard as the mirror fully seats.

Using the interior mirror installer, fully seat the interior mirror. Use Special Service Tool: 501-191 Installer, Rear View Mirror.



4.

If equipped, connect the electrical connector.



5.

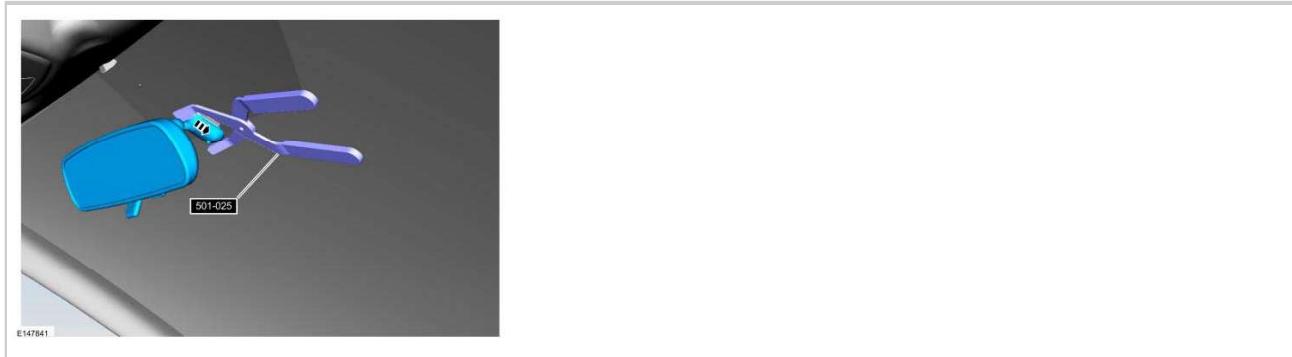
If equipped with a compass module which requires calibration, check the compass zone and

calibration.

Mirror type 2

6.

Using the interior mirror installer, fully seat the interior mirror. Use Special Service Tool: 501-025 Installer, Rear View Mirror.



7.

If equipped with a compass module which requires calibration, check the compass zone and calibration.

Mirror type 3

8.

To install, reverse the removal procedure.

Mirror type 4

9.

To install, reverse the removal procedure.

10.

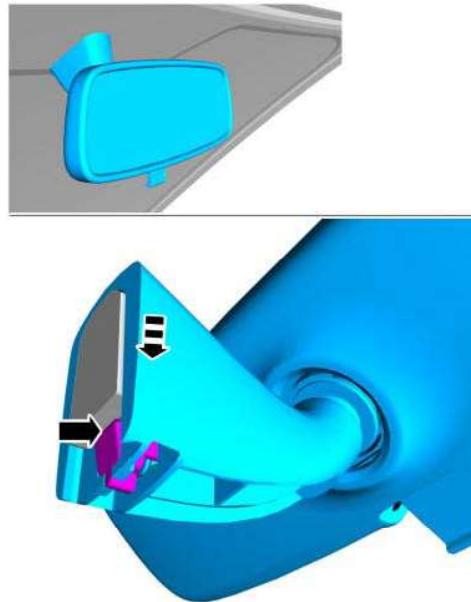
If a new mirror has been installed, use diagnostic scan tool, complete the PMI process for the IPMA following the on-screen instructions.

If a new mirror has been installed, carry out the camera alignment using a scan tool.

Mirror type 5

11.

Slide the interior mirror onto the mirror mount until the locking tab is engaged.



E103502

Mirror type 6

12.

To install, reverse the removal procedure.