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2008 FORD Ranger Regular Cab OEM Service and Repair Workshop Manual

Go to manual page

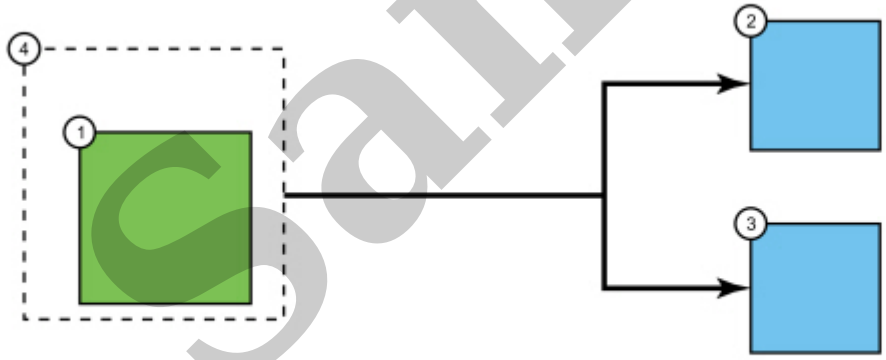
Rear View Mirrors - System Operation and Component Description

501-09 Rear View Mirrors	***2022 F-150***
Description and Operation	***Procedure revision date: 07/29/2022***

Rear View Mirrors - System Operation and Component Description

System Operation

System Diagram - Exterior, Power, Without Memory, For Vehicle Without DDM (driver door module) / PDM (passenger door module)



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Item	Description
1	Exterior Mirror Control Switch
2	LH (left-hand) Exterior Mirror

5	DDM (driver door module)
6	PDM (passenger door module)

Network Message Chart

Module Network Input Messages — PDM (passenger door module)

Broadcast Message	Originating Module	Message Purpose
Passenger mirror command	DDM (driver door module)	Contains the movement requests for the RH (right-hand) exterior mirror glass generated by the exterior mirror control switch.

System Operation - Exterior, Power, Without Memory, For Vehicle With DDM (driver door module) / PDM (passenger door module)

All functions of the power mirror feature are integrated into one switch module (integral to the LH (left-hand) front door window control switch). The left and right side selection buttons have an LED (light emitting diode) 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 (left-hand) or RH (right-hand) exterior mirror selected, the movement request is sent to the DDM (driver door module) through a LIN (local interconnect network) circuit. If the LH (left-hand) mirror is selected, the DDM (driver door module) supplies voltage and ground to the appropriate LH (left-hand) exterior mirror motor. If the RH (right-hand) mirror is selected, the DDM (driver door module) sends the passenger mirror command message with the input from the exterior mirror control switch to the PDM (passenger door module) . The PDM (passenger door module) then supplies voltage and ground to the appropriate RH (right-hand) exterior mirror motor. The DDM (driver door module) and PDM (passenger door module) controls the glass movements by reversing polarity of the voltage and ground circuits being supplied to each motor.

System Diagram - Exterior, Power, With Memory (If equipped)

6	Position Sensor
7	Exterior Mirror Control Switch
8	DDM (driver door module)
9	PDM (passenger door module)
10	DSM (driver front seat module)
11	LH (left-hand) Front Window Control Switch

Network Message Chart

Module Network Input Messages — PDM (passenger door module)

Broadcast Message	Originating Module	Message Purpose
Passenger mirror command	DDM (driver door module)	Contains the movement requests for the RH (right-hand) exterior mirror glass generated by the exterior mirror control switch.

Module Network Input Messages — DDM (driver door module) and PDM (passenger door module)

Broadcast Message	Originating Module	Message Purpose
Memory command	DSM (driver front seat module)	Commands the door modules to initiate a memory save or recall and is used to abort a memory recall that is in progress.

System Operation - Exterior, Power, With Memory (If equipped)

NOTE

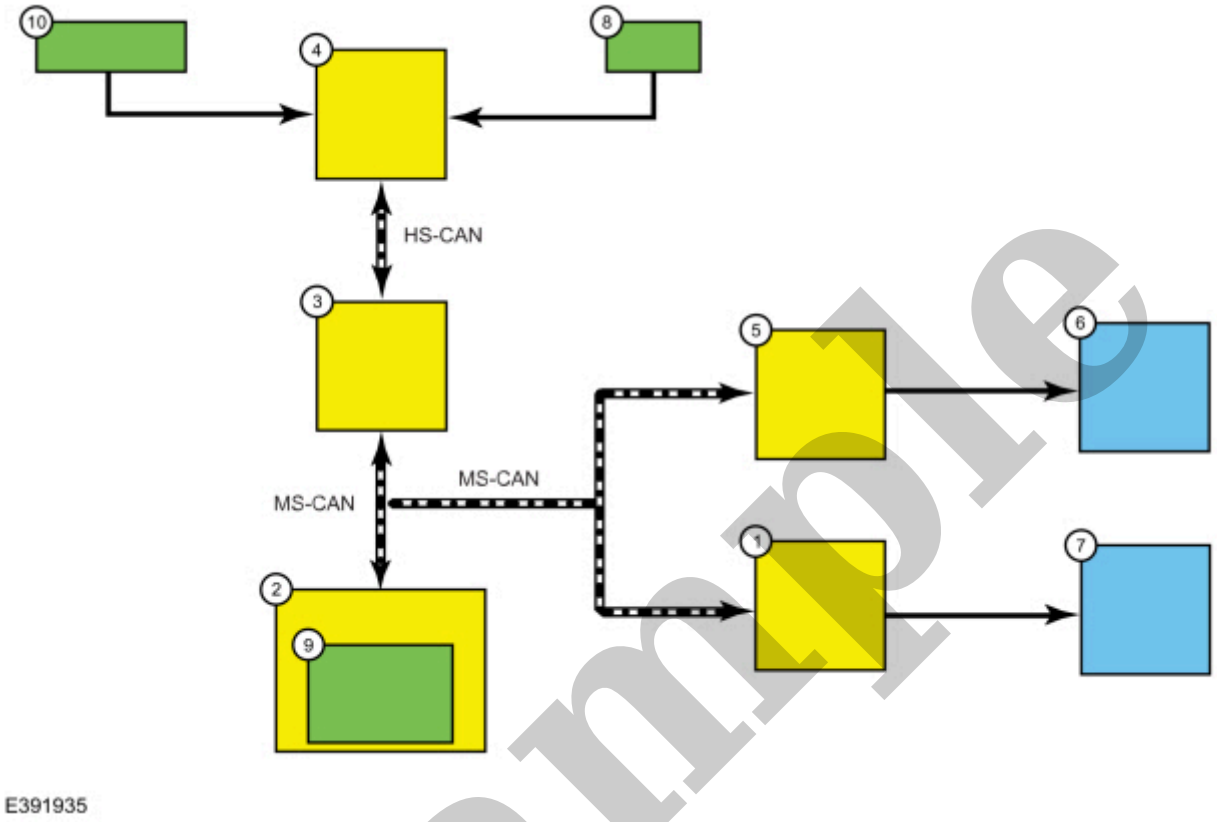
If the DDM (driver door module) or PDM (passenger door module) detects a mirror motor feedback circuit fault, a timeout strategy disables the memory operations for 30 seconds to prevent system damage. After the 30 second timeout, normal operation resumes.

For additional information on the memory feature function,

Refer to: Front Seats - System Operation and Component Description

(501-10A Front Seats, Description and Operation).

System Diagram - Exterior, Heated (If equipped)



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Item	Description
1	PDM (passenger door module)
2	FCIM (front controls interface module)
3	GWM (gateway module A)
4	APIM (SYNC module)
5	DDM (driver door module)
6	LH (left-hand) Heated Mirror
7	RH (right-hand) Heated Mirror

The rear window defrost system controls operation of the heated exterior mirror glass. The heated exterior mirror glass only operates when the rear window defrost system is active. The heated exterior rear view mirror glass deactivates when the rear window defrost deactivates.

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

When the rear window defrost button (integral to the FCIM (front controls interface module)) is pressed, the mirror heat on request message is sent from the FCIM (front controls interface module) to the DDM (driver door module) and PDM (passenger door module) over the MS-CAN (medium speed-controller area network) . The DDM (driver door module) supplies voltage and ground to the LH (left-hand) exterior mirror heater circuits and the PDM (passenger door module) supplies voltage and ground to the RH (right-hand) exterior mirror heater circuits when the exterior mirror heaters are commanded on by the FCIM (front controls interface module) .

When a concern exists, the DDM (driver door module) and PDM (passenger door module) are capable of setting and storing Diagnostic Trouble Codes (DTCs) for the mirrors heater element circuits.

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 FDIM (front display interface module) . 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 - Vehicles With: One-Touch Open and Close Front Windows - System Operation and Component Description

(501-11 Glass, Frames and Mechanisms, Description and Operation).

System Diagram - Exterior, Power Fold (If equipped)

Network Message Chart

Module Network Input Messages — DDM (driver door module)

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

Module Network Input Messages — PDM (passenger door module)

Broadcast Message	Originating Module	Message Purpose
Passenger mirror command	DDM (driver door module)	Used by the PDM (passenger door module) to control operation of the RH (right-hand) power folding exterior mirror.

System Operation - Exterior, Power Fold (If equipped)

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 (left-hand) , RH (right-hand) 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 in this section.

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 (left-hand) front door window control switch). The LH (left-hand) and RH (right-hand) power folding mirrors fold or unfold at the same time and cannot be controlled independently.

On vehicles equipped with trailer tow mirrors or areo 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

4	RH (right-hand) Exterior Mirror
5	LH (left-hand) Front Window Control Switch
6	PDM (passenger door module)
7	DDM (driver door module)
8	Telescoping Mirror Control Switch

System Operation - Exterior, Power Telescoping (If equipped)

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 (left-hand) , RH (right-hand) 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 in this section.

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

When the ignition is ON, or the accessory delay feature is active, and the telescoping exterior mirror switch is pressed in the extend or retract position, the switch supplies voltage to the DDM (driver door module) . DDM (driver door module) or PDM (passenger door module) then provides voltage to the LH (left-hand) and RH (right-hand) 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.

System Operation - Exterior Auto-Dimming (If equipped)

The exterior mirror control switch provides voltage and ground to the selected exterior mirror motor to move the exterior mirror glass to the desired position.

Exterior Mirror Control Switch, For Vehicle With DDM (driver door module) / PDM (passenger door module)

The exterior mirror control switch is a momentary contact switch that is integral to the LH (left-hand) front door window control switch, which is connected to the DDM (driver door module) through a LIN (local interconnect network) circuit. The LED (light emitting diode) on each exterior mirror selection button illuminates to indicate which exterior mirror is selected for adjustment.

Exterior Mirror Fold Switch (If equipped)

The exterior power folding mirror control switch is integral to the LH (left-hand) front window control switch, which is connected to the DDM (driver door module) through a LIN (local interconnect network) circuit.

Exterior Mirror Telescoping Switch (If equipped)

The exterior power telescoping mirror control switch is integral to the LH (left-hand) front window control switch, which is connected to the DDM (driver door module) through a LIN (local interconnect network) 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 (left-hand) or RH (right-hand) 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 (left-hand) exterior auto-dimming mirror, the LH (left-hand) 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 (driver door module) (LH (left-hand) mirror) or PDM (passenger door module) (RH (right-hand) 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 (left-hand) 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 (left-hand) 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,

ground to the LH (left-hand) exterior mirror folding motor. When the exterior mirror fold switch is utilized again, the DDM (driver door module) reverses the polarity of the voltage supplied to the LH (left-hand) exterior mirror folding motor. The DDM (driver door module) sends RH (right-hand) exterior mirror fold requests to the PDM (passenger door module) through the MS-CAN (medium speed-controller area network) .

If the vehicle is equipped with memory mirrors, the DDM (driver door module) monitors the potentiometers in the LH (left-hand) exterior mirror to determine the position of the exterior mirror glass. Preset memory positions for the LH (left-hand) exterior mirror glass are stored in the DDM (driver door module) .

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

PDM (passenger door module) (If equipped)

For the exterior power functions, when the RH (right-hand) exterior mirror is selected, the PDM (passenger door module) supplies voltage and ground to the appropriate RH (right-hand) exterior mirror motor to drive the mirror glass in the desired direction based on messages received from the DDM (driver door module) through the MS-CAN (medium speed-controller area network) .

If the vehicle is equipped with exterior power folding mirrors, when the PDM (passenger door module) receives the RH (right-hand) exterior mirror movement requests from DDM (driver door module) over the MS-CAN (medium speed-controller area network) , it provides voltage and ground to the RH (right-hand) exterior mirror folding motor.

If the vehicle is equipped with memory mirrors the PDM (passenger door module) monitors the potentiometers in the RH (right-hand) exterior mirror to determine the position of the exterior mirror glass. Preset memory positions for the RH (right-hand) exterior mirror glass are stored in the PDM (passenger door module) .

When a concern exists, the PDM (passenger door module) is capable of setting and storing Diagnostic Trouble Codes (DTCs) for the RH (right-hand) 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