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2015 FORD Ranger Regular Cab OEM Service and Repair Workshop Manual

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Roof Opening Panel - Component Location

<i>501-17 Roof Opening Panel</i>	<i>2022 F-150</i>
<i>Description and Operation</i>	<i>Procedure revision date: 10/2/2020</i>

Roof Opening Panel - Component Location

NOTE

LH (left-hand) side shown, RH (right-hand) side similar.

Roof Opening Panel Drain Tubes



E336699



Roof Opening Panel - Overview

501-17 Roof Opening Panel	2022 F-150
Description and Operation	Procedure revision date: 10/2/2020

Roof Opening Panel - Overview

Overview

The convertible top system is controlled by 2 smart electric motors called the roof opening panel motor and the shield motor. The roof opening panel motor is the primary motor and the shield motor is the secondary motor, with both motors being exactly the same. The shield motor has a second ground circuit which in the motors software identifies it as the shield motor. The 2 motors communicate on a K Bus which is only for motor communication and not for any service capabilities. If this K Bus circuit is interrupted the system will immediately shut down except to allow the roof opening panel motor to fully close 1 time. All functions of the sunroof system are controlled by the sunroof and shield switches located in the overhead console. The close switch will close the glass from any glass open position including vent. The switch is serviced as an assembly with the overhead console. One touch operation is accomplished by pressing the switch for less than 1 second and releasing. The roof opening panel open switch will activate the shield to open before the roof opening panel will open in either one touch or manual operation. Closing the shield will not cause the roof opening panel to close, therefore if the roof opening panel is open at all the shield will only close to the comfort stop position. For manual operation, press and hold the switch, and release at the desired position. For more information on the roof opening panel operation,

Refer to: [Roof Opening Panel - System Operation and Component Description](#)

(501-17 Roof Opening Panel, Description and Operation).

Vista Roof Panel Glass The roof opening panel system on this vehicle includes a fixed vista roof panel glass behind the front sliding glass panel. Any time this panel is removed or adjusted the front sliding glass panel will need to be initialized.

K Bus Communication There is a communication circuit (K Bus) between the roof opening panel motor and the shield motor that is only for communication between the motors and not for service diagnostics. If this



Roof Opening Panel - System Operation and Component Description

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Roof Opening Panel - System Operation and Component Description

System Operation

Sunroof System Function

The roof opening panel motor and the shield motor are hard wired to both the BCM (body control module) and the roof opening panel control switch. The only function of the BCM (body control module) is to provide battery voltage and accessory delay voltage to the roof opening panel motor and battery voltage only to the shield motor. Both motors are interchangeable with the shield having one extra ground circuit which determines that it is the shield motor and that the roof opening panel motor is the master motor. The 2 motors communicate on a K Bus for interaction but there is no vehicle communication with the motors. The K Bus is only for communication between the motors and is not used for diagnostics. The roof opening panel control switch is hard wired to the roof opening panel motor with a sunroof open circuit, sunroof close circuit and a tilt/vent switch circuit. When the roof opening panel control switches are pressed a ground signal is sent to the roof opening panel motor to activate the respective switch request. The shield open and close switches are hard wired to the shield motor and operate the same as the roof opening panel motor.

Switch Operation

The sunroof opening panel switches are located in the overhead console in the center of the overhead console switch bank. The sliding glass panel has 2 switches in-line, in the center of the switch bank, The forward switch is the close/vent switch and the rear switch is the open switch. The two switches to the right side of the roof opening panel switches are the shield switches the first being shield close and then shield open. All of the roof opening panel switches are single position switches that can achieve one touch operation in either direction by pressing the switch for less than 1 second. For manual operation, simply press and hold the switch until the roof opening panel or shield is in the desired position and release the switch. When the front roof opening panel is in the fully closed or between fully closed and full vent position the vent switch operates in either manual or one touch operation similar to the roof opening panel and shield switches. If the

The front sliding glass panel and shield has a bounce back feature. If an obstacle has been detected as the front sliding glass panel or shield is closing, operation will automatically reverse and stop at a predetermined position.

Security Override

To override a bounce back condition (to overcome the resistance of ice on the front sliding glass panel seal for example), within 2 seconds of a bounce back event, press and hold the front sliding glass panel close switch. The front sliding glass panel will operate in manual mode with bounce back detection disabled until the switch is released.

Vista Roof Panel Glass

The roof opening panel system on this vehicle includes a fixed vista roof panel glass behind the front sliding glass panel. Any time this panel is removed or adjusted the front sliding glass panel will need to be initialized.

Refer to: [Power Roof Opening Panel Initialization](#)

(501-17 Roof Opening Panel, General Procedures).

K Bus Communication

There is a communication circuit (K Bus) between the roof opening panel motor and the shield motor that is only for communication between the motors and not for service diagnostics. If this circuit is opened or shorted the sunroof system will not operate. When the K Bus circuit is repaired, normal system function will return.

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Symptom Chart: NVH

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#)

(100-00 General Information, Description and Operation).

Condition	Actions
The roof opening panel has excessive wind noise	<ul style="list-style-type: none">• GO to Pinpoint Test A
The roof opening panel rattles	<ul style="list-style-type: none">• GO to Pinpoint Test C
Roof opening panel is noisy during operation	<ul style="list-style-type: none">• GO to Pinpoint Test D

Symptom Chart: Shield (Sunshade)

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#)

(100-00 General Information, Description and Operation).

Condition	Actions
The Shield (Sunshade) Does Not Open or Close	<ul style="list-style-type: none">• GO to Pinpoint Test F

Pinpoint Tests

PINPOINT TEST A : THE ROOF OPENING PANEL HAS EXCESSIVE WIND NOISE

Normal Operation and Fault Conditions

The roof opening panel motor must be initialized when repairs are carried out on any part of the roof opening panel system or when the roof opening panel motor, glass, assembly, or air deflector has been removed or replaced for any reason. REFER to: [Power Roof Opening Panel Initialization](#)(501-17 Roof Opening Panel, General Procedures).

During normal operation the sunroof seals against the roof opening tightly and evenly preventing wind noise. Any variation in alignment or failure to seal will cause wind noise.

Possible Sources

- Incorrect roof opening panel alignment
- Roof opening panel glass seals

Visual Inspection and Pre-checks

them from entering the passenger compartment. A damaged, deformed or incorrectly installed weatherstrip is unable to seal the glass efficiently. The roof opening panel trough assembly and drain hoses provide a route for water to drain away from the opening panel, damaged or obstructed drain hoses or trough assembly will allow water to collect and possibly leak into the passenger compartment.

Possible Sources

- Incorrect roof opening panel glass alignment
- Roof opening panel drain hoses
- Roof opening panel glass seals
- Damaged roof opening panel frame
- Incorrect position of the roof opening panel glass

Visual Inspection and Pre-checks

- Roof opening panel seals

B1 VERIFY CUSTOMER OPERATION OF THE ROOF OPENING PANEL WHEN PARKED

- Make sure the customer is parking with the roof opening panel correctly in the closed position.

Is the customer parking with the roof opening panel in the closed position?

Yes	GO to B2
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No	Instruct the customer to REFER to the Owner's Literature for correct operation of the roof opening panel.
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B2 CHECK THE ALIGNMENT OF THE ROOF OPENING PANEL

- Make sure the roof opening panel glass is centered and flush with the roof line.

Is the roof opening panel aligned correctly?

Yes	GO to B3
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No	ALIGN the roof opening panel. REFER to: Roof Opening Panel Alignment (501-17 Roof Opening Panel, General Procedures).
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B3 CHECK THE WEATHERSTRIP CONDITION

No	REPAIR or INSTALL a new drain hose(s).
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B6 CHECK THE DRAIN HOSES FOR CORRECT FLOW

NOTE

Drain hoses must flow downhill and cannot be pinched or restricted by headliner or any other trim components.

- With the panel open, slowly pour water into the water trough area and make sure that the same amount of water exits the vehicle at the bottom of the A and C-pillars.
- Check drain hoses for obstructions by blowing compressed air through the drain spouts in the water trough area, then retest with water.

Are the drain hoses operating correctly?

Yes	INSPECT other areas of the vehicle that may cause water to enter the roof area such as the windshield or luggage rack, if equipped, and REPAIR as necessary. TEST the system for normal operation, if the condition still exists, GO to B7
No	LOWER the headliner and INSPECT the drain hoses for correct routing. REPAIR or INSTALL a new drain hose(s) as necessary.

B7 CHECK THE CONDITION OF THE ROOF OPENING PANEL FRAME

C1 CHECK THE ROOF OPENING PANEL GLASS OPERATION

- Check the roof opening panel glass during operation.

Is the roof opening panel glass loose?

Yes	ALIGN the roof opening panel. REFER to: Roof Opening Panel Alignment (501-17 Roof Opening Panel, General Procedures).
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No	GO to C2
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C2 CHECK THE ROOF OPENING PANEL TRACKS

- Open the roof opening panel glass.
- Check the tracks for obstructions or signs of damage.

Are the tracks OK?

Yes	GO to C3
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No	REMOVE any obstructions. REPAIR the roof opening panel tracks as necessary.
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C3 CHECK THE DRAIN CHANNELS AND GUIDES

- Check the drain channel and channel guides for any loose fasteners or obstructions.

Is the drain channel installed securely and free from foreign material?

Yes	GO to C4
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No	REMOVE all foreign material from the drain channel and INSTALL securely.
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C4 CHECK THE ROOF OPENING PANEL SHIELD (SUNSHADE)

- Check the shield (sunshade) for correct installation.

Is the shield (sunshade) installed correctly?

D1 CHECK THE ROOF OPENING PANEL GLASS FOR OBSTRUCTIONS OR DAMAGE

- Check the roof opening panel for any obstructions and damage.

Are there any obstructions and/or damage?

Yes

REMOVE all obstructions. REPAIR the roof opening panel as necessary.

No

GO to [D2](#)

D2 CHECK THE ROOF OPENING PANEL GLASS OPERATION

- Check the roof opening panel glass during operation.

Is the roof opening panel loose or incorrectly aligned?

Yes

ALIGN the roof opening panel.
REFER to: [Roof Opening Panel Alignment](#)
(501-17 Roof Opening Panel, General Procedures).

No

GO to [D3](#)

D3 CHECK THE ROOF OPENING PANEL TRACKS

- Open the roof opening panel glass.
- Check the roof opening panel tracks for obstructions and damage.

Are the roof opening panel tracks OK?

Yes

GO to [D4](#)

No

REMOVE all obstructions. REPAIR any damage as necessary.

D4 CHECK THE ROOF OPENING PANEL SHIELD (SUNSHADE)

- Check the roof opening panel shield (sunshade) for correct movement.

Is the roof opening panel shield moving correctly?