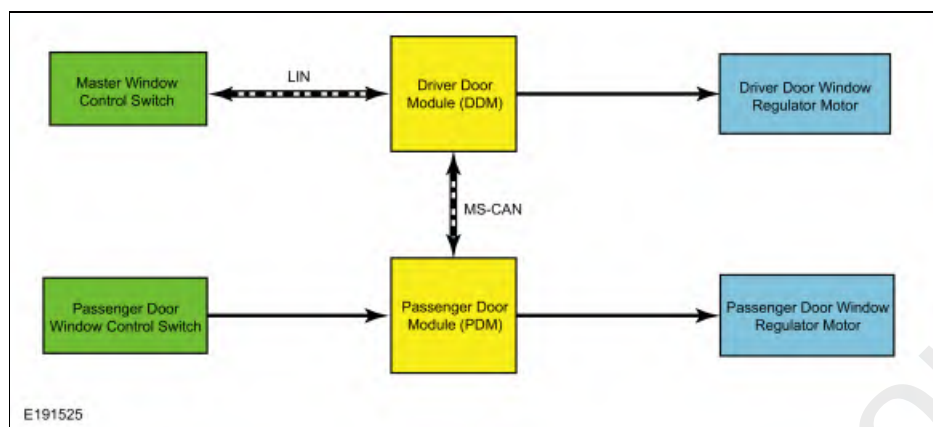


Glass, Frames and Mechanisms - System Operation and Component Description

System Operation

System Diagram - Power Windows

Front Power Windows



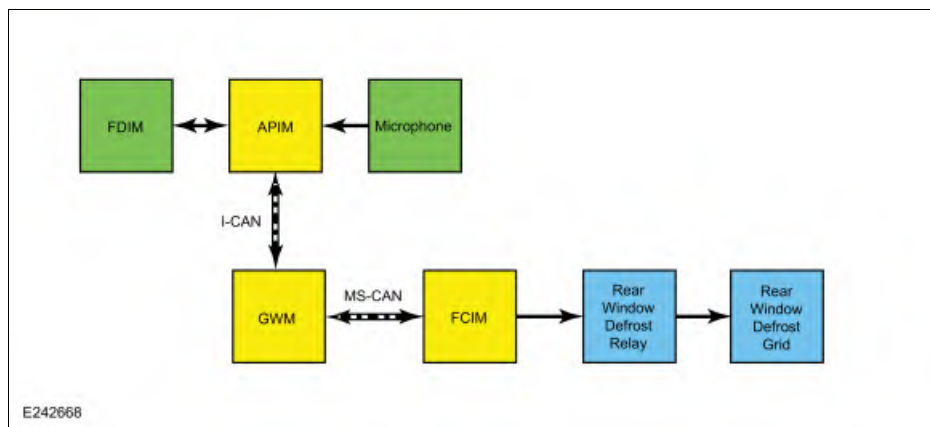
Item	Description
1	Master Window Control Switch
2	Driver Door Window Regulator Motor
3	Passenger Door Module (PDM)
4	Passenger Door Window Control Switch
5	MS-CAN
6	LIN
7	Driver Door Module (DDM)
8	Passenger Door Window Regulator Motor

Network Message Chart - Power Windows

Passenger Door Module (PDM) Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Passenger window command	DDM	When activating the front passenger window from the master window control switch, the passenger window command is sent from the DDM to the PDM.

System Diagram - Rear Window Defrost



Item	Description
1	FDIM
2	APIM
3	Microphone
4	Rear Window Defrost Relay
5	Rear Window Defrost Grid
6	GWM
7	FCIM
8	I-CAN
9	MS-CAN

Network Message Chart - Rear Window Defrost

Front Controls Interface Module (FCIM) Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Climate control requests	APIM (if equipped with touchscreen)	The climate control requests message contains the rear window defrost request information. When the rear window defrost function is requested using voice command or the button is selected on the touchscreen, this input activates the rear window defrost system.

Power Window Operation - Front

NOTE: If the vehicle battery is disconnected while the window is moving, the one-touch up and one-touch down feature (and obstacle detection) is disabled prior to initialization.

Refer to: Power Door Window Initialization (501-11 Glass, Frames and Mechanisms, General Procedures).

The power windows operate when the delayed accessory relay is active. The delayed accessory relay (non-serviceable) is located in the BCM. Both front windows are equipped with obstacle detection and one-touch up and one-touch down functionality. If an obstacle is detected as the window glass is moving upward, the window motor automatically reverses direction and moves the glass downward.

Driver Door Window Operation

The master window control switch communicates to the DDM through a LIN. When commanded by the master window control switch, the DDM supplies power and ground to operate the driver door window regulator motor in the desired direction. The DDM monitors the window glass position through feedback from 2 Hall-effect sensors (integral to the driver door window regulator motor). If there is an issue with the Hall-effect sensor circuit(s), the DDM only moves the window in 500 ms intervals (the master window control switch must be released and activated again to move the window).

Passenger Door Window Operation

The master window control switch communicates to the DDM through a LIN. The DDM communicates to the PDM through the MS-CAN.

When commanded by the master window control switch or the passenger door window control switch, the PDM supplies power and ground to operate the passenger door window regulator motor in the desired direction. The PDM monitors window glass position through feedback from 2 Hall-effect sensors (integral to the passenger door window regulator motor). If there is an issue with the Hall-effect sensor circuit(s), the PDM only moves the window in 500 ms intervals (the passenger or master window control switch must be released and activated again to move the window).

Rear Door Window Operation - Super Cab and Crew Cab

The rear window control switches contain 2 relays, which when at rest (inactive), provide a ground path to their respective power window motor circuit(s). The rear window control switches receive voltage (high current circuit) from the delayed accessory relay whenever it is active. When the rear window control switches receive a voltage signal from the master window control switch and/or when the rear door window control switch is activated, the rear door window control switch supplies high current voltage (and ground) to operate the power window motor in the desired direction.

Rear Door Window Lock-Out - Super Cab and Crew Cab

When the lock-out switch (part of the master window control switch) is in the LOCK position, the rear passenger power windows only operate from the master window control switch.

Power Sliding Rear Window

When the power sliding rear window control switch (part of the overhead console) is activated, voltage is supplied to activate either the power sliding rear window open or close relays (integral to the BJB). When the power sliding rear window open or close relay is activated, voltage is supplied to operate the power sliding rear window motor. Ground is supplied to the power sliding rear window motor through the inactive (normally closed) contacts of the power sliding rear window open or close relay. Window direction is determined by the polarity of the voltage and ground being supplied to the motor.

Rear Window Defrost

When the rear window defrost switch (integral to the FCIM) is activated, the FCIM activates the rear window defrost relay (located in the BJB).

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.

The FCIM deactivates the rear window defrost relay when one of these conditions is met:

- The rear window defrost switch is pressed when the feature is active.
- If equipped, the rear window defrost is commanded off using voice command or the touchscreen interface when the feature is active.
- Ignition state is changed from ON to OFF.
- A predetermined timer completes.
- Battery voltage has dropped below a specified threshold (load management strategy).

Remote Start - Rear Window Defrost Operation

The customer can select different climate control modes/preferences when the vehicle is started using the remote start feature. This can be accessed through the message center. For additional information on setting the remote start preferences, refer to the Owner's Literature. When the rear defrost is set to AUTO mode, the rear window defrost activates when the outside temperature is less than 0°C (32°F) and the vehicle is started using the remote start feature. No climate control adjustments are recognized during remote start operation. Once the ignition is cycled to the ON position, the climate control system returns to the previous settings (last ignition ON cycle) and adjustments can be made normally. If the previous setting was off, the climate control system turns off.

Component Description

Master Window Control Switch

The master window control switch receives voltage whenever the delayed accessory relay is active. The master window control switch is grounded through the DDM. The master window control switch communicates to the DDM through a LIN.

For Super Cab and Crew Cab, the master window control switch supplies low current voltage signal through momentary contacts to activate the internal relays within each of the rear passenger window control switches to operate the rear windows.

Passenger Door Window Control Switch

The passenger door window control switch contains momentary contacts (one for each window switch direction). The PDM provides a return (ground) for the passenger door window control switch. When the control switch is activated, a ground signal is supplied to the PDM to operate the passenger door window regulator motor in the desired direction.

Rear Door Window Control Switch - Super Cab and Crew Cab

The rear window control switches receive voltage (high current circuit) from the delayed accessory relay whenever it is active. The rear window control switches receive voltage (low current circuit) from the master window control switch when the lock-out switch is in the UNLOCK position. The rear window control switches each have a dedicated ground circuit. The rear window control switches contain 2 relays, which when at rest (inactive), provide a ground path to their respective power window motor circuit(s).

When a rear window control switch is activated, the corresponding relay located within the rear window control switch is energized which supplies voltage (high current) to operate the power window motor in the desired direction.

Front Door Window Regulator Motor

The door window regulator motor(s) are bi-directional. Window direction is determined by the polarity of the voltage being supplied to the motor from the associated door module. The door window regulator motor contains 2 Hall-effect sensors. The Hall-effect sensor power supply and return circuits are provided by the associated door module.

Rear Door Window Regulator Motor - Super Cab and Crew Cab

The rear door window regulator motors are bi-directional. Window direction is determined by the polarity of the voltage and ground being supplied to the motor from the window control switch.

Front Controls Interface Module (FCIM)

The FCIM contains the rear window defrost button and also controls the rear window defrost relay.

Front Display Interface Module (FDIM)

The FDIM contains a redundant rear window defrost button on the touchscreen display. The FDIM plugs directly into the APIM, and does not communicate directly on any network.

Driver Door Module (DDM)

The DDM receives power window commands from the master window control switch through a LIN. The DDM supplies voltage and ground to operate the driver door window regulator motor.

The DDM also communicates master window control switch requests to the PDM through the Medium Speed Controller Area Network (MS-CAN) to operate the passenger door window regulator motor.

Passenger Door Module (PDM)

The PDM receives power window commands from the passenger door window control switch or from the DDM through the Medium Speed Controller Area Network (MS-CAN). The PDM supplies voltage and ground to operate the passenger door window regulator motor.

Power Sliding Rear Window Motor

The power sliding rear window motor is bi-directional. Window direction is determined by the polarity of the voltage being supplied to the motor. When the power sliding window switch is activated, voltage is supplied to activate either the power sliding window open relay or the power sliding window close relay (both relays are integral to the BJB). When the power sliding window open (or close) relay is active, voltage is supplied to one side of the power sliding window motor while ground is supplied through the normally closed relay contacts of the opposing/inactive power sliding window open (or close) relay.
