

## Power Windows Description and Operation

### Power Windows System Components

The power window system consists of the following components:

- Driver window switch
- Passenger window switch
- Left rear window switch
- Right rear window switch
- Window motors in each of the doors
- F24UA 30A Fuse
- F55UA 7.5A Fuse
- F21UA 7.5A Fuse
- Body control module (BCM)

### Power Window System

This vehicle can be configured as follows:

- Driver and passenger express up and express down power windows and manual crank rear windows.
- Driver express up and express down power window motor and passenger, left rear, right rear express down window motors
- All doors with express up and express down window motors

### Driver and Passenger Express Up and Express Down Power Windows With Manual Crank Rear Windows

The driver and passenger doors contain smart motors that will detect excessive resistance while performing the express up function and automatically reverse direction to prevent injury to any occupants that may become trapped between the closing window and the door frame. The automatic reverse safety feature can be overridden by pulling and holding the window switch.

The logic circuit within the window motors monitor the up, down and express signal circuits which are normally equal to B+ voltage. When a switch is used on the driver or passenger switch, the contacts close causing a voltage drop within the appropriate signal circuit. The window motor will detect the voltage drop and will command the window to move in the direction requested.

### Driver Express Up and Express Down Power Window Motor and Passenger, Left Rear, Right Rear Express Down Window Motors

The driver door contains a window motor is smart motor that will detect excessive resistance while performing the express up function and automatically reverse direction to prevent injury to any occupants that may become trapped between the closing window and the door frame. The automatic reverse safety feature can be overridden by pulling and holding the window switch.

The logic circuit within the driver window motor monitors the up, down and express signal circuits which are normally equal to B+ voltage. When a switch is used on the driver window switch, the contacts close causing a voltage drop within the appropriate signal circuit. The window motor will detect the voltage drop and will command the window to move in the direction requested.

For the passenger, right rear and left rear doors, when their window switch is pressed in the down position, battery positive voltage is applied to their respective window motor control circuit and ground to the other window motor control circuit causing that window to open. When the individual window switch is pulled in the up position, voltage and ground is applied to the window motor in the opposite direction causing that window to close. The return path to ground is supplied through the inactive control circuit being normally grounded through the window switch.

Each window switch communicates to the BCM by a serial data circuit. When the driver wishes to control the passenger, left rear or right rear window, the driver will use the appropriate switch on the driver window switch. When this switch is used, a serial data message is sent to the BCM requesting a window motor command, the BCM will then send a serial data message to the appropriate door window switch which will then command that window to move in the direction requested.

### All Doors with Express Up and Express Down Window Motors

The driver and passenger, left rear and right rear doors contain smart motors that will detect excessive resistance while performing the express up function and automatically reverse direction to prevent injury to any occupants that may become trapped between the closing window and the door frame. The automatic reverse safety feature can be overridden by pulling and holding the window switch.

The logic circuit within the window motors monitor the up, down and express signal circuits which are normally equal to B+ voltage. When a switch is used on the driver, passenger, left rear or right rear window switch, the contacts close causing a voltage drop within the appropriate signal circuit. The window motor will detect the voltage drop and will command the window to move in the direction requested.

Each window motor communicates to the body control module (BCM) by a serial data circuit. When the driver wishes to control the passenger, left rear or right rear window, the driver will use the appropriate switch on the driver window switch. When this switch is used, a serial data message is sent to the BCM requesting a window motor command, the BCM will then send a serial data message to the appropriate window motor which will then move in the direction requested.

### Lockout Switch Feature

The driver power window switch contains a window lockout switch, when the driver presses the window lockout switch, a serial data message is sent to the BCM which will send a disable command to the rear window switches, deactivating them. The rear windows will still function normally from the switches on the driver window switch.