

SYSTEM DESCRIPTION

1. POWER WINDOW CONTROL SYSTEM DESCRIPTION

- (a) The power window control system controls the power windows' UP/DOWN function using the regulator motors.

The main controls of this system are: the power window regulator master switch assembly (built into the driver side door) and the power window regulator switches (built into the passenger side door and rear doors). Pressing each regulator switch on the master switch assembly transmits a remote UP/DOWN signal to each door ECU via the BEAN line.

Then each door ECU transmits this signal to the corresponding power window regulator motor.

2. FUNCTION OF MAIN COMPONENT

Component	Outline
Power Window Regulator Master Switch Assy	Controls window operations for all windows. Also, when window lock switch is set to lock position, window operation will only be possible for driver side power window.
Power Window Regulator Switch Assy	Located on passenger side door and rear doors. Each regulator switch assy controls window operations for its respective window.
Power Window Regulator Motor Assy	Receives switch signals and changes signals into motor activation. As a result, window position changes. Also, regulator motor assy uses limit switch and pulse sensor to detect window position.

3. SYSTEM FUNCTION

- (a) The power window control system has the following functions:

Function	Outline
Manual UP/DOWN function	Function that raises window while power window switch is pulled halfway up and lowers window while is pushed halfway down. Window stops as soon as switch is released.
Auto UP/DOWN function	Function that enables window to be fully opened or fully closed by one full push or pull of power window switch.
Jam protection function	Function that automatically stops power window and moves it downward if object is jammed in power window during AUTO UP operation. During key-off operation function, jam protection function works for manual UP and AUTO UP operation. Jam protection function is available for all doors.
Remote control function	Function that allows power window master switch assy to control manual UP/DOWN operations of passenger door power window and rear door power window.
Key-off operation function	Function that makes it possible to operate power window for approximately 43 seconds after ignition switch is turned to ACC or LOCK position and both front are closed.
Window lock function	Function where passenger door power window and rear door power windows' operations are disabled when window lock switch of the master switch assy is pressed. Passenger door power window and rear door power window can be operated when window lock switch is pressed again.
Diagnosis	Function where power window switch can detect malfunctions in power window system and make diagnoses. Power window switch light illuminates or starts blinking to inform driver.
Fail-safe	Function that disables driver side power window AUTO UP/DOWN function if pulse sensor (Hall IC) or limit sensor in power window regulator motor malfunction. Manual operation is possible through power window switches.
Key-linked open and close	When ignition key is not in key cylinder, driver's door is locked, and key in the driver's door key cylinder is turned and maintained in lock position for 1.5 seconds or more, door ECUs activate power window motor to close power window while key is turned. Similarly, when driver's door is unlocked, turning and maintaining driver's door key in unlock position for 1.5 seconds or more will cause power window to be opened.
Transmitter-linked open	When theft deterrent ECU receives unlock signal from transmitter continuously for longer than 2.5 seconds, theft deterrent ECU transmits power window control signal to door ECUs. Upon receiving control signal, door ECUs control power window motor in accordance with signal open power window.