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| **Last Modified:** 03-12-2013 | 6.4 F | **Doc ID:** NM1000000005FYP |
| **Model Year:** 2013 | **Model:** RAV4 | **Prod Date Range:** [12/2012 - ] |
| **Title:** DOOR / HATCH: POWER BACK DOOR SYSTEM: POWER BACK DOOR CONTROL; 2013 MY RAV4 [12/2012 - ] | | |

# POWER BACK DOOR CONTROL

### 1. FUNCTION OF MAIN COMPONENTS

(a) The main components of the power back door system have the following functions:

| COMPONENT | | FUNCTION |
|---|---|---|
| Power Back Door Unit Assembly | Motor | Opens and closes the back door when actuated by the power back door ECU. |
| | Hall IC | Detects the operation conditions of the back door and outputs a pulse signal to the power back door ECU. |
| Power Back Door ECU (Multiplex Network Door ECU) | | • Controls the power back door system in accordance with the signals received from the switches, sensors and ECUs.<br>• Receives the signals from the Hall IC to detect the back door position and the opening and closing speed of the back door.<br>• Informs the user by sounding the buzzer and flashing the hazard warning light when each operation switch is pressed. |
| Back Door Lock Assembly | Back Door Lock Motor | Latches and unlatches the back door when actuated by the power back door ECU. |
| | Half-latch Switch | Detects if the back door is ajar. |
| | Position Switch | Detects the initial (neutral) position of the driven gear of the back door lock motor. This switch turns on when the driven gear is in the neutral position and turns off when the driven gear is in any position other than neutral. |
| | Courtesy Switch | Detects whether the back door is open or closed. This switch turns on when the back door is open or ajar and turns off when the back door is closed. |
| Back Door Control Switch | | The back door opens or closes when the back door control switch in the vehicle is turned on. |
| Door Control Switch Assembly | | The power back door closes when the door control switch assembly (on the back door jamb) is turned on (pressed). |
| Back Door Opener Switch Assembly | | The back door opens when the back door opener switch assembly on the outside of the vehicle is turned on (operated). |
| PWR DOOR OFF Switch (Power Back Door Main Switch) | | Setting this switch prohibits system operation. |
| Touch Sensor (Power Back Door Sensor | | Detects if an object is jammed in the back door during the closing operation of the back door. |

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| Assembly) | |
| Back Door Buzzer and Wireless Door Lock Buzzer | When the power back door system starts to operate, the back door buzzer and wireless door lock buzzer sound to inform the user that the system is operating. |
| Combination Meter Assembly | Receives a hazard warning light blinking signal to blink the hazard warning light. |
| Door Control Receiver | Receives the power back door button signal and transmits it to the certification ECU*1 or main body ECU*2. |
| Main Body ECU (Multiplex Network Body ECU) | Transmits a back door lock/unlock control signal, vehicle speed signal and shift position P signal to the power back door ECU via the Controller Area Network (CAN). |
| Electrical Key Transmitter Sub-assembly | Transmits the power back door button signal to the door control receiver. |

*1: Models with smart key system
*2: Models without smart key system

## 2. SYSTEM CONTROL

(a) The power back door system has the following functions:

| FUNCTION | OUTLINE |
|---|---|
| Opener Function | Upon receiving an on signal from the back door control switch or the power back door button with the back door unlocked, the power back door ECU actuates the back door lock motor and the power back door unit assembly in order to release the latch of the back door and open the back door. |
| Closer Function | Upon receiving an on signal from the back door control switch, the door control switch assembly with the back door open or the power back door button, the power back door ECU actuates the power back door unit assembly and the back door lock motor in order to close the back door and engage the latch of the back door lock. |
| Jam Protection Function | Upon receiving the signals from a touch sensor or the Hall ICs of the power back door unit assembly, the power back door ECU detects that an object is jammed in the back door, and the door operation is stopped after moving back a certain distance upward during the closing operation and suspended during the opening operation. The back door buzzer sounds twice when a jammed object is detected. |
| Back Door Open/Close Speed Control Function | In accordance with the signals received from the Hall ICs, the power back door ECU performs control so as to make the opening and closing speed of the back door even. |
| Suspending Control Function | By conducting any of the following operations during the opening or closing operation of the power back door, the operation will be canceled:<br>• The power door off switch is turned off.<br>• The power back door button on the electrical key transmitter sub-assembly is pressed.<br>• The back door control switch is pressed.<br>• The back door opener switch assembly is pressed.<br>• The door control switch is pressed. |

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| Memory Function | • By pressing the back door close switch for 2.8 seconds while holding the back door at the desired back door opening angle by the hand, the back door buzzer sounds 4 times as an answer back and the power back door ECU memorizes the angle. From the next time the back door is opened, the back door will stop at the set angle.<br>• By pressing the back door close switch for 7 seconds after the set angle is memorized, the memorized position is initialized. |
| Assist Function | When the back door is stopped and then manually operated in the closing direction, the power back door ECU drives the power back door unit assembly to operate the back door until it is fully closed. |
| Switch Operation Function | When each operation switch is operated, the following operations are performed in accordance with the back door condition:<br>• When the power back door button on the back door control switch or the electrical key transmitter sub-assembly is pressed, opening operation is performed when the back door is closed and the closing operation is performed when the back door is open.<br>• When the back door opener switch assembly is pressed, the opening operation of the back door is performed.<br>• When the door control switch assembly is pressed, the closing operation of the back door is performed. |

**HINT:**

If power supply is stopped such as when the battery terminals are removed, initialization is required. The back door should be fully closed with power being supplied for initialization.

(b) Opener Function 1

(1) When the back door control switch or the power back door button of the electrical key transmitter sub-assembly is operated, the opener function operates as follows:

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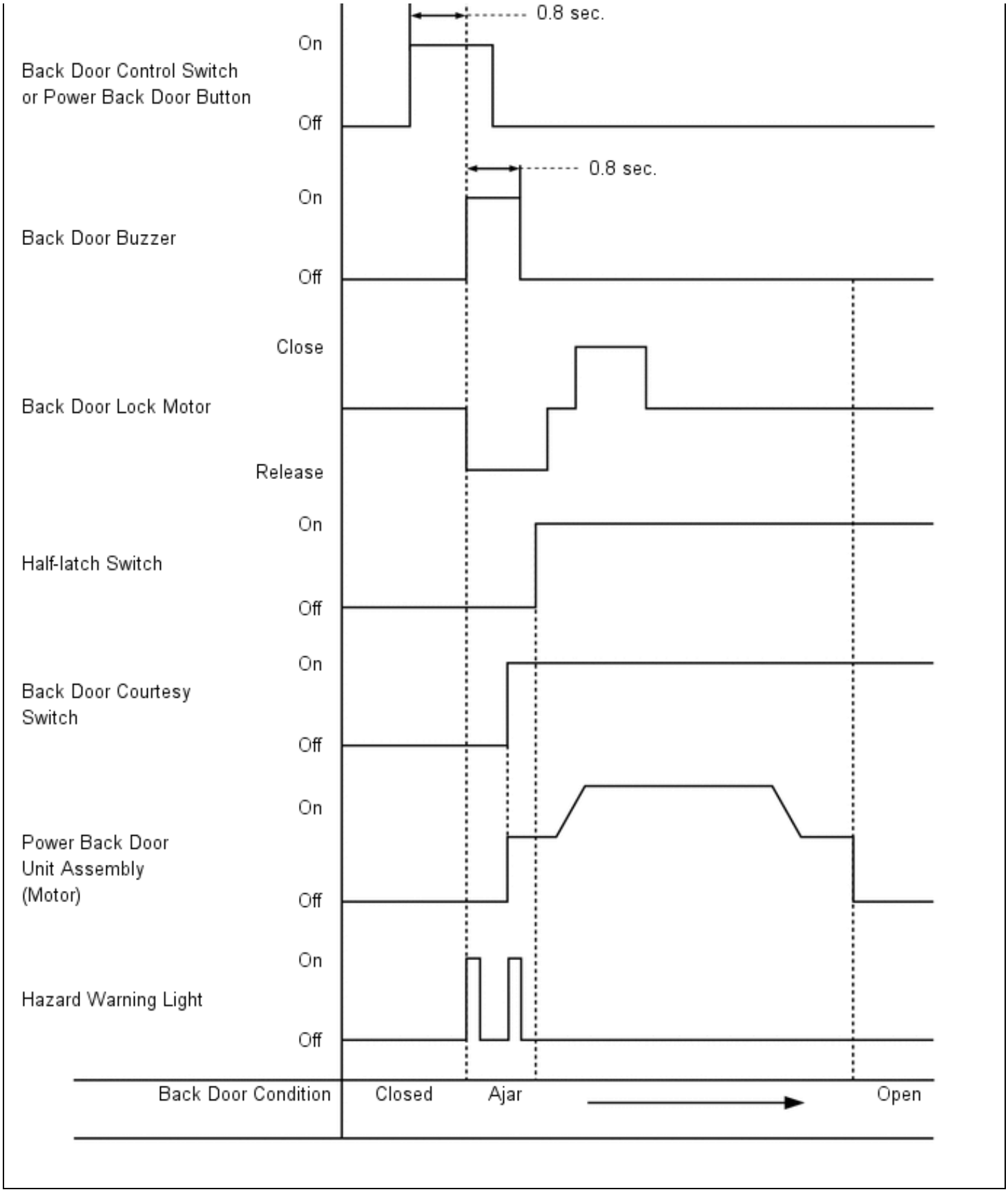
|---|---|
| 1 | After the back door control switch or the power back door button of the electrical key transmitter sub-assembly is pressed for approx. 0.8 seconds, the back door buzzer sounds for 0.8 seconds and the hazard warning light blinks twice. |
| 2 | The back door lock assembly releases the latch. |
| 3 | The back door courtesy switch is turned on and the motor in the power back door unit assembly starts to operate. |
| 4 | The back door lock motor is returned to the initial position and the half-latch switch is turned on. |
| 5 | After the power back door ECU detects a back door stop position pulse, the motor in the power back door unit assembly is stopped. |




(c) Opener Function 2

(1) When the back door opener switch assembly is operated, the opener function operates as follows:

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|---|---|
| 1 | When the back door opener switch assembly is pressed, the back door buzzer sounds for 0.8 seconds and the hazard warning light blinks twice. |
| 2 | After the back door opener switch assembly is pressed, the back door lock assembly releases the latch. |

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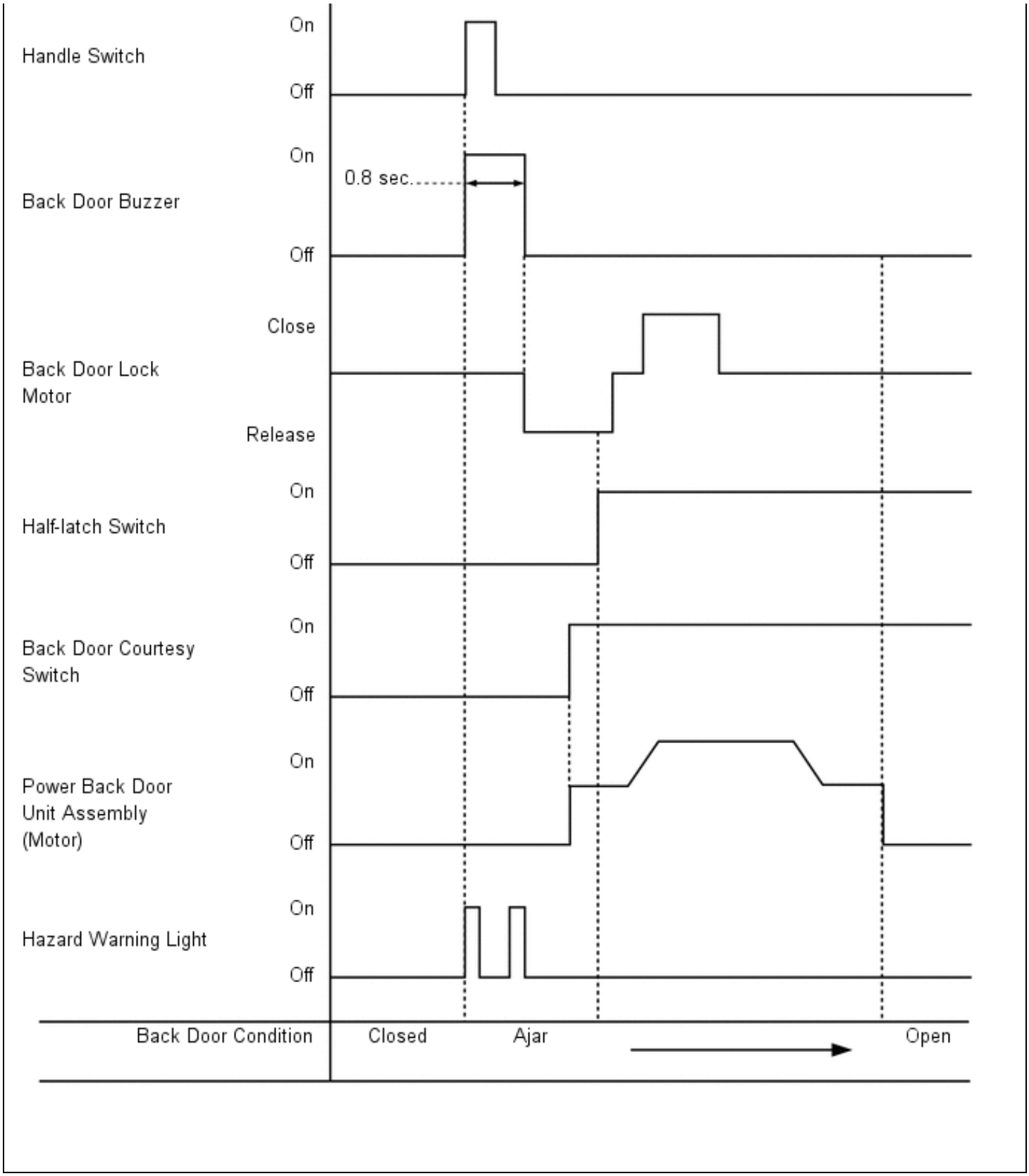
|---|---|
| 2 | After the back door buzzer sounds, the back door lock assembly releases the latch. |
| 3 | When the back door opener switch assembly is not input again before the latch begins to be released, the motor in the power back door unit assembly starts to operate when the back door courtesy switch is turned on. |
| 4 | The back door lock motor is returned to the initial position and the half-latch switch is turned on. |
| 5 | After the power back door ECU detects a back door stop position pulse, the motor in the power back door unit assembly is stopped. |




(d) Closer Function 1

(1) When the back door control switch or the power back door button of the electrical key transmitter sub-assembly is operated, the closer function operates as follows:

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|---|---|
| 1 | After the back door control switch or the power back door button of the electrical key transmitter sub-assembly is pressed for approx. 0.8 seconds, the back door buzzer sounds for 0.8 seconds and the hazard warning light blinks twice |

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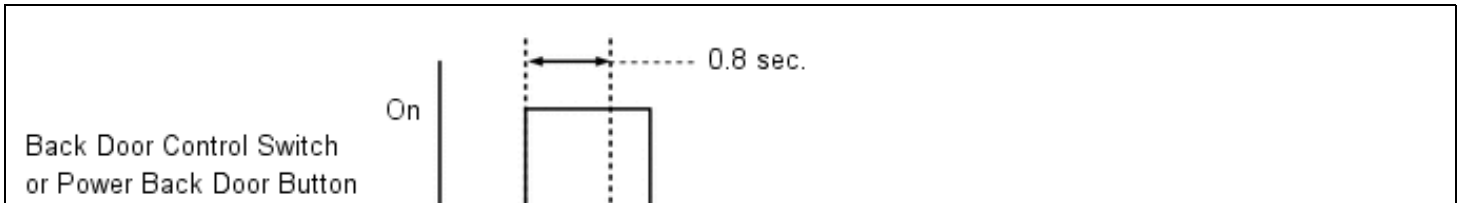
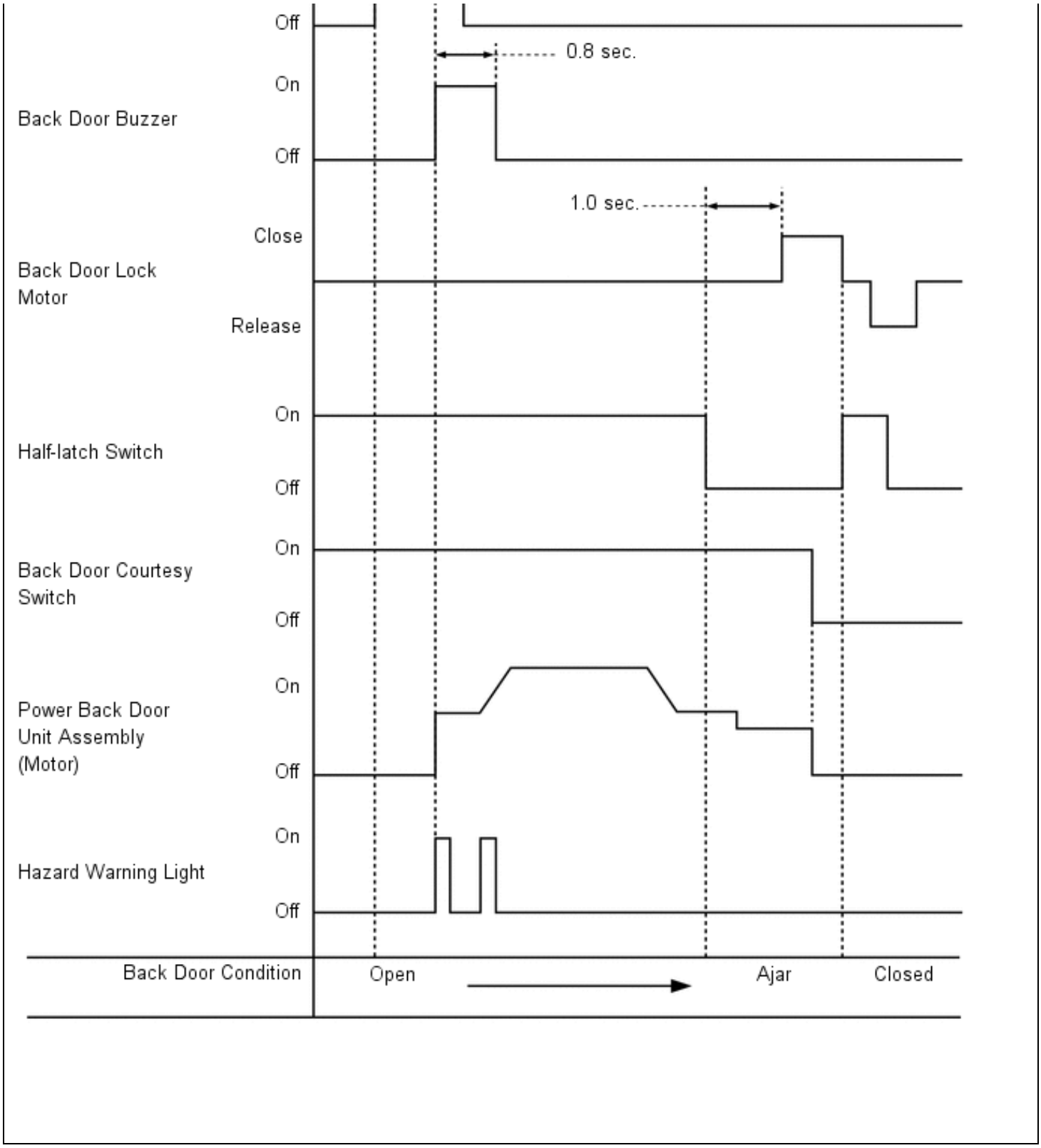
| | blinks twice. |
| 2 | The motor in the power back door unit assembly begins to operate. |
| 3 | When the half-latch switch is turned off, the voltage of the motor is reduced. |
| 4 | The back door lock motor performs the closing operation 1.0 second after the half-latch switch is turned off, and stops the operation when the back door courtesy switch is turned off. |






(e) Closer Function 2

(1) When the door control switch assembly is operated, the closer function operates as follows:

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|---|---|
| 1 | When the door control switch assembly is turned on, the back door buzzer sounds for 0.8 seconds and the hazard warning light blinks twice. |
| 2 | The motor in the power back door unit assembly starts to operate. |
| 3 | When the half-latch switch is turned off, the voltage of the motor is reduced. |
| 4 | The back door lock motor performs the closing operation 1.0 second after the half-latch switch is turned off, and |

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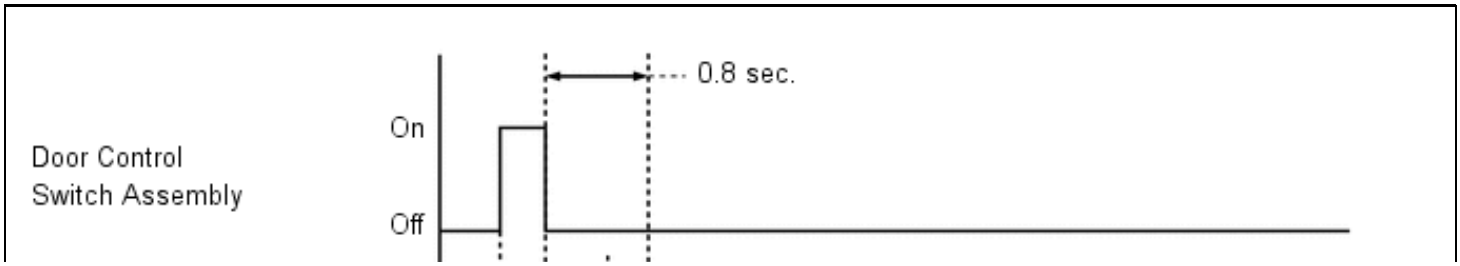
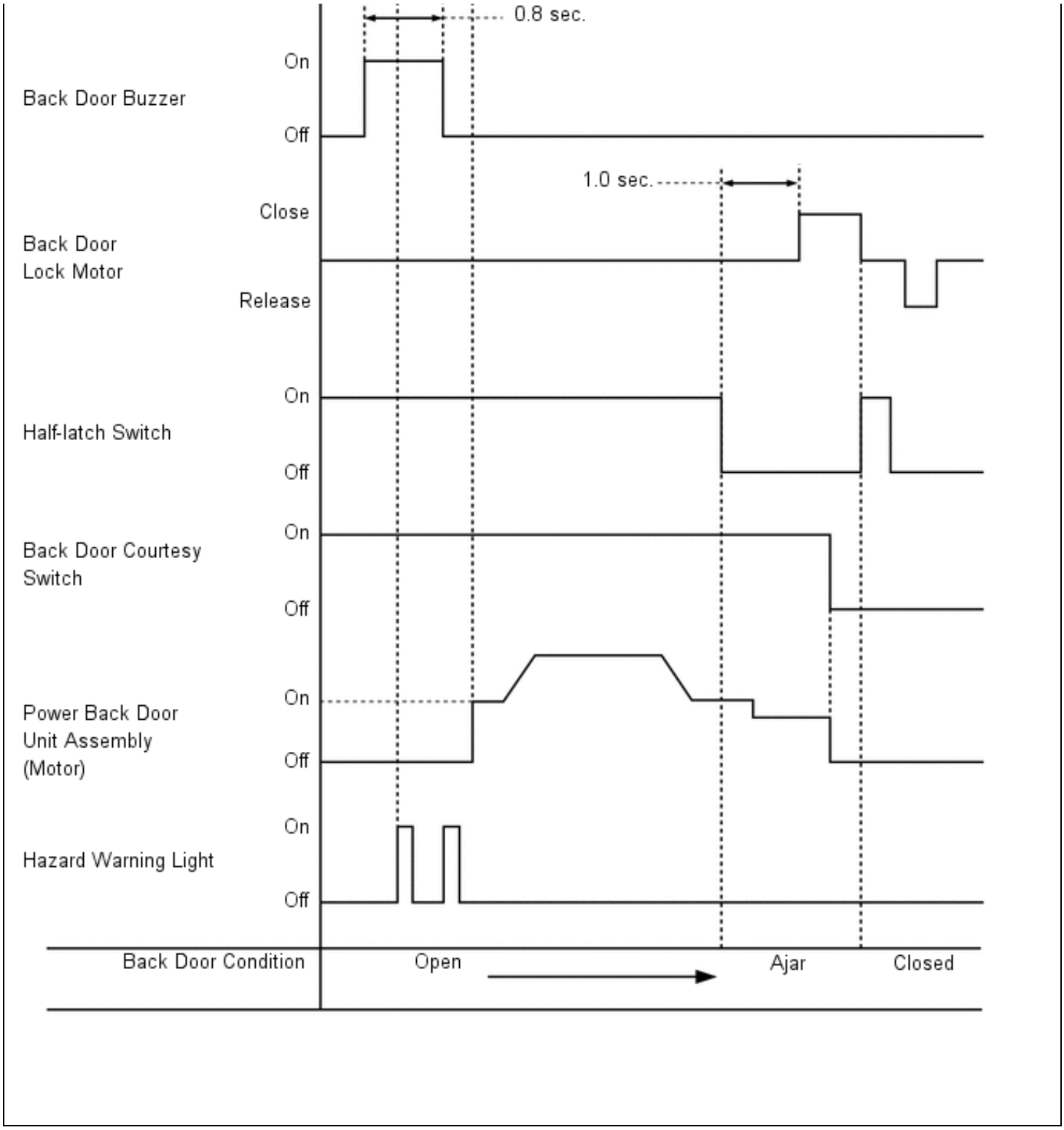
| 4 | The back door lock motor performs the closing operation 1.0 second after the half latch switch is turned on, and stops the operation when the back door courtesy switch is turned off. |




0.8 sec.
On
Back Door Buzzer
Off
1.0 sec.
Close
Back Door
Lock Motor
Release
On
Half-latch Switch
Off
On
Back Door Courtesy
Switch
Off
On
Power Back Door
Unit Assembly
(Motor)
Off
On
Hazard Warning Light
Off
Back Door Condition
Open
Ajar
Closed