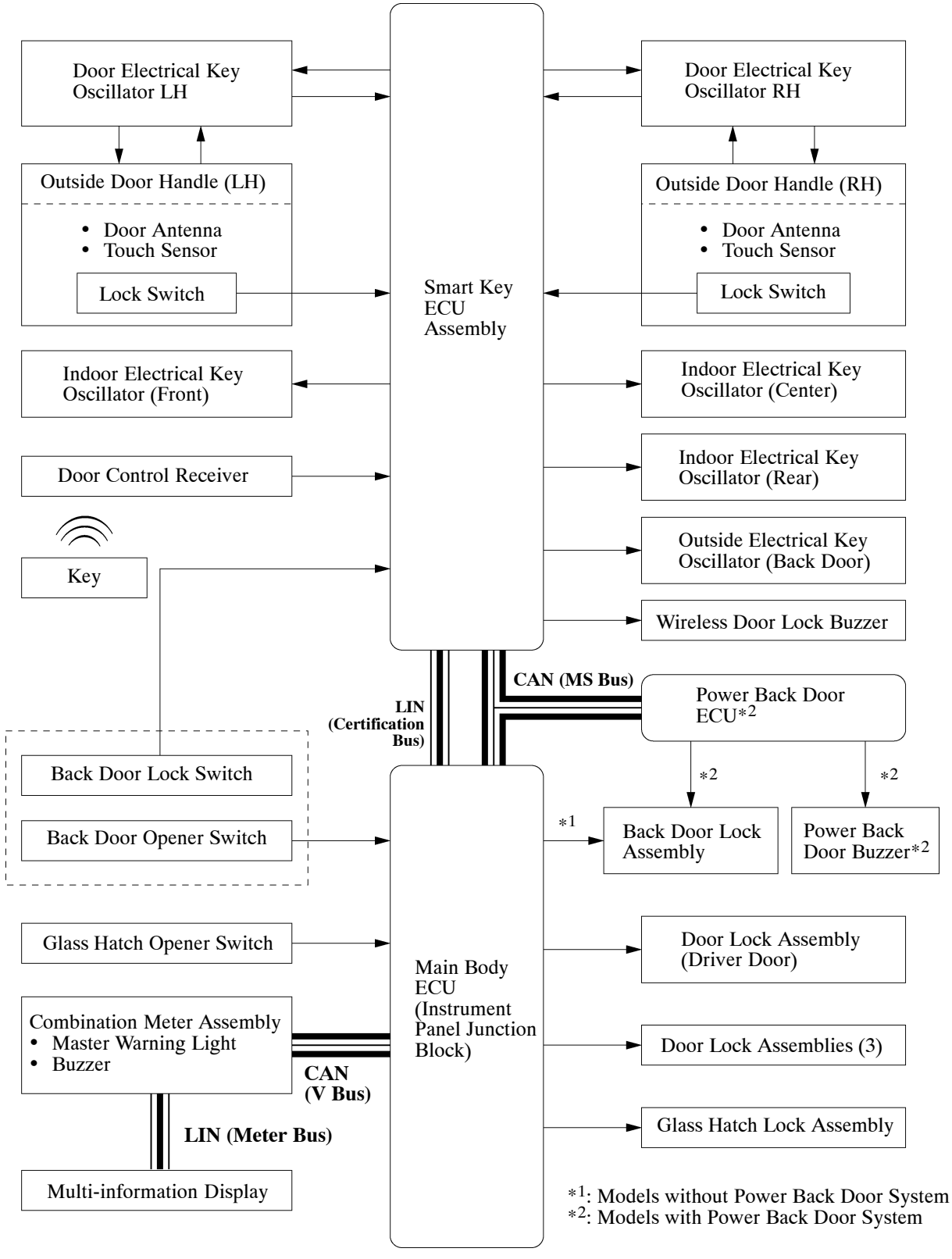
■ ENTRY FUNCTION

1. System Diagram

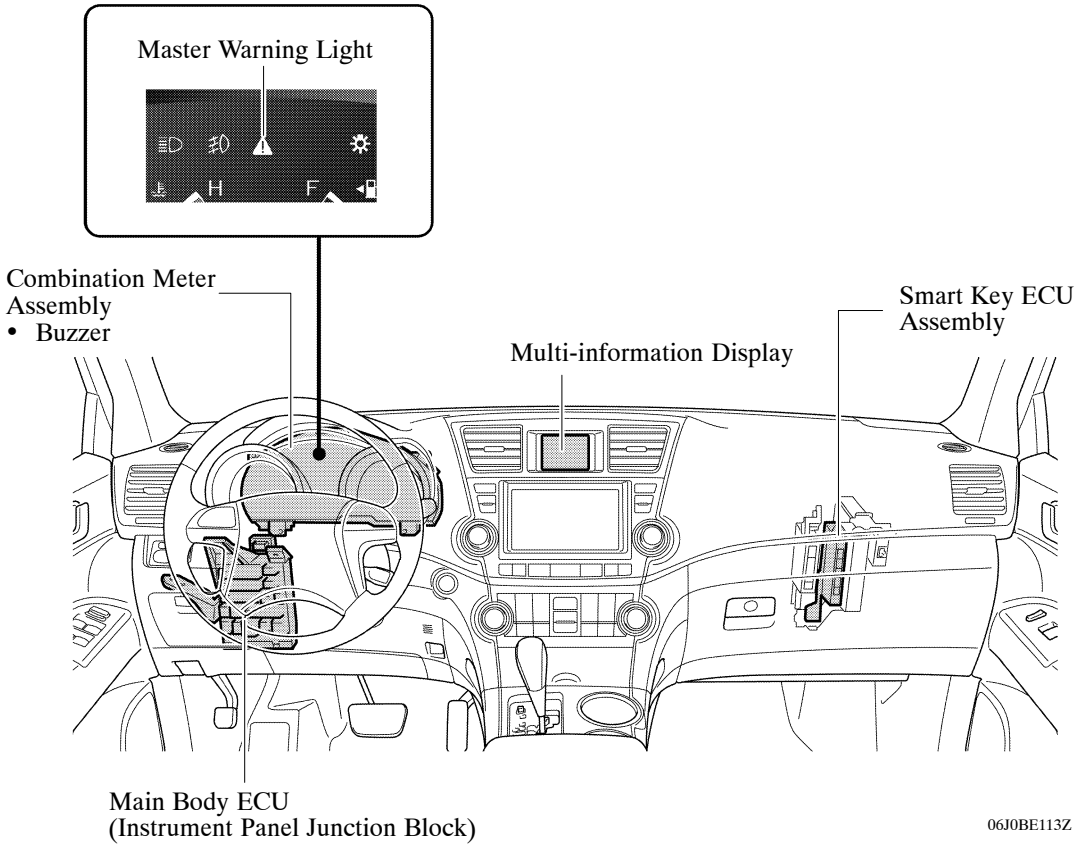
The Smart Key ECU Assembly controls the entry function. The system diagram below shows the components that relate to this function.

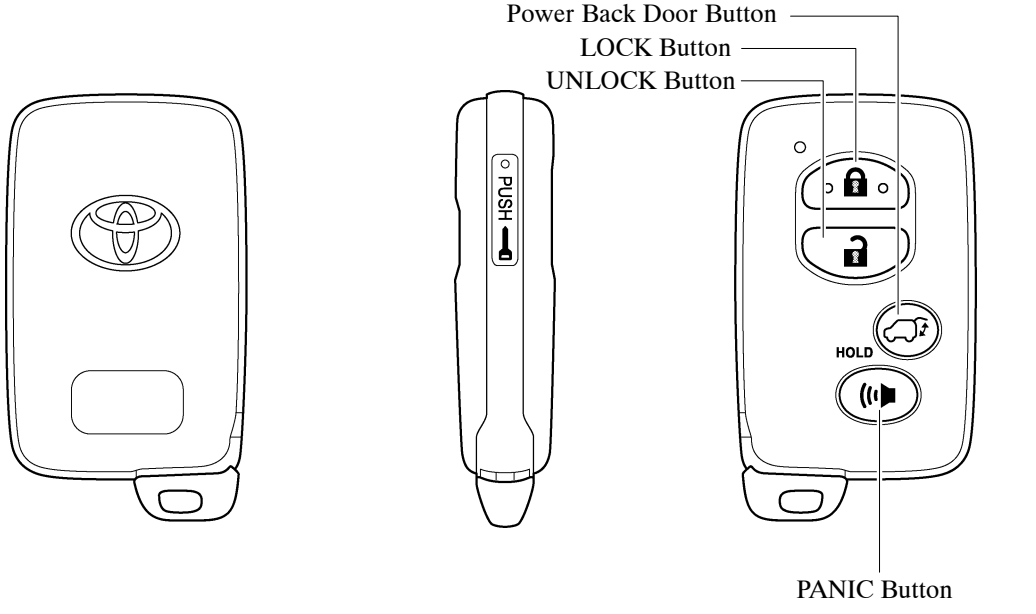


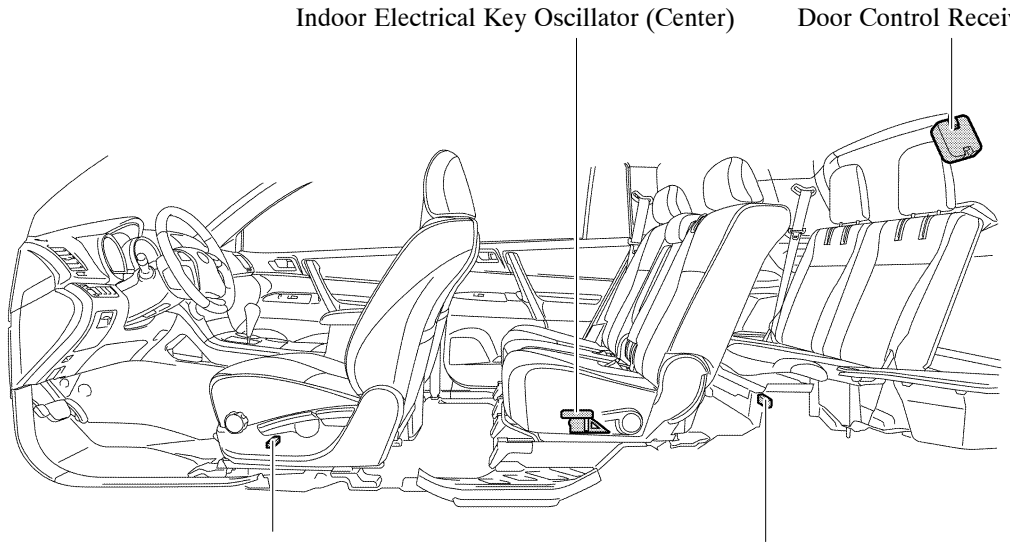
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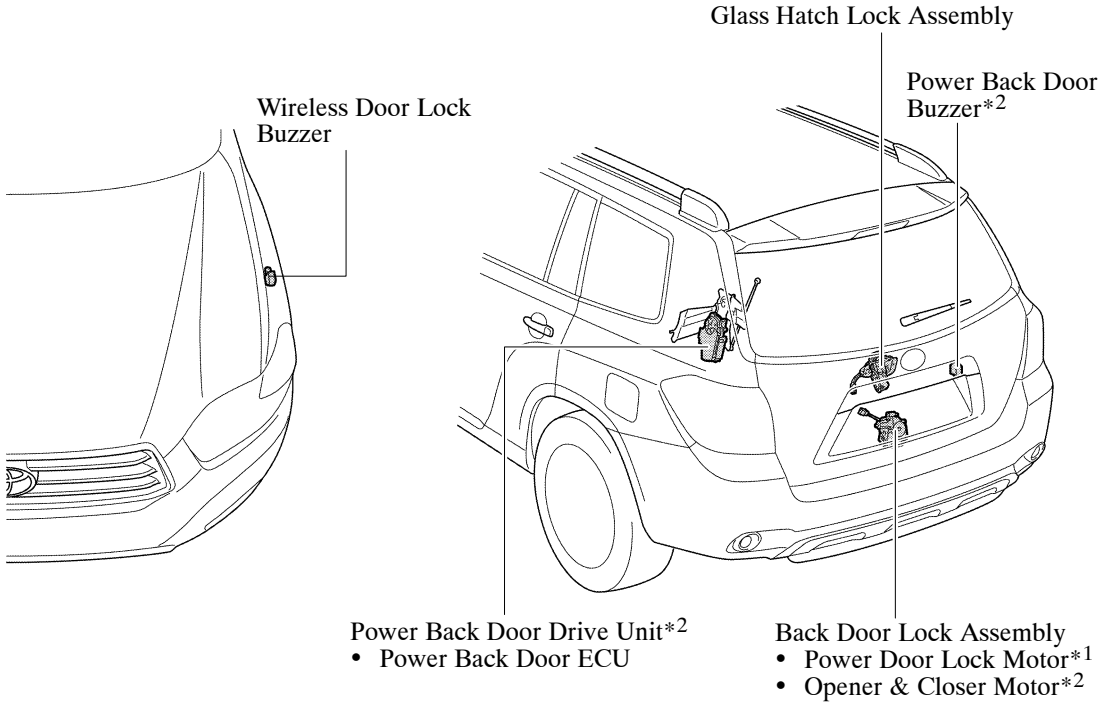
2. Layout of Main Components







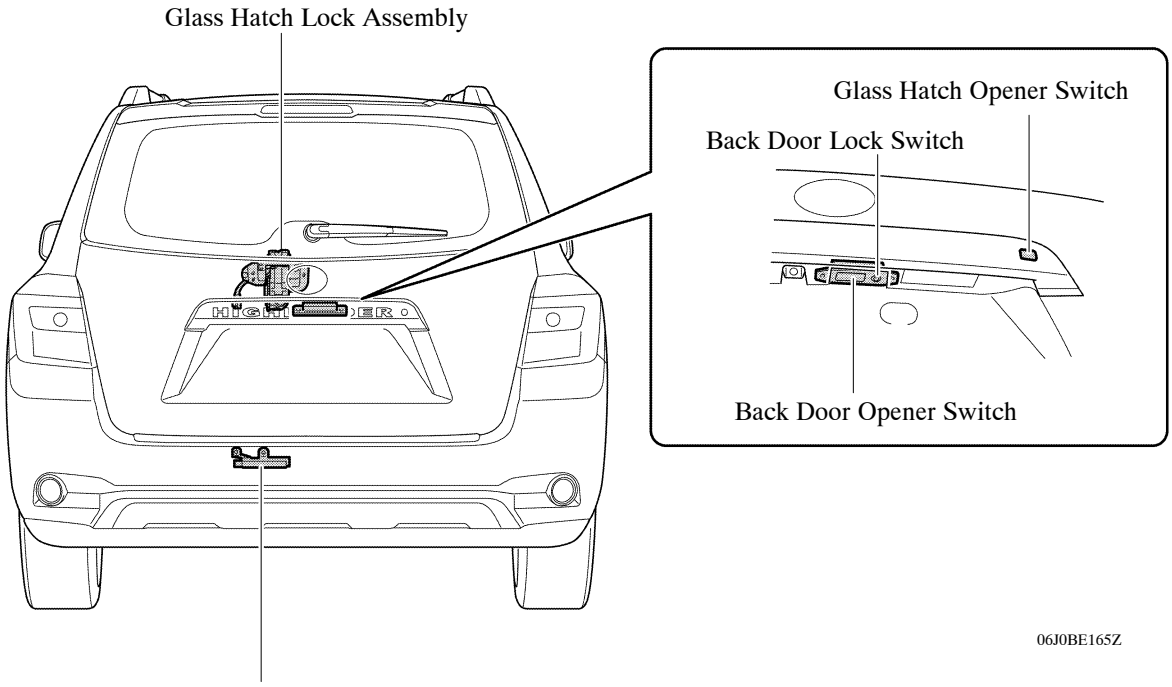
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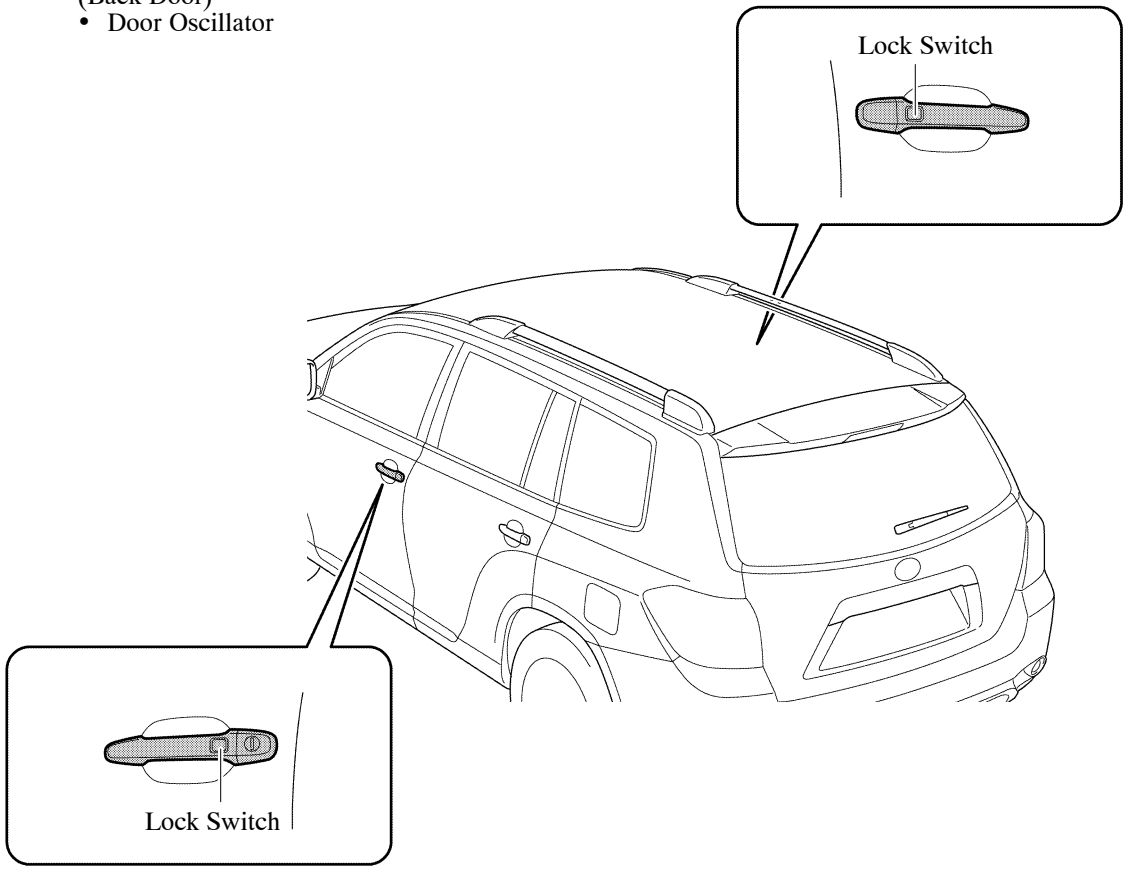
*1: Models without Power Back Door System
*2: Models with Power Back Door System

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3. Function of Main Components

Component		Function
Key		• When receiving the request signals that are output by the room and door oscillators, outputs the information such as the key ID and vehicle ID. • When a driver pushes the LOCK, UNLOCK, PANIC, or power back door button on the key, outputs the request signal. • When receiving the radio wave that is output by the transponder key amplifier in the engine switch, outputs the information such as the key ID and vehicle ID. • Integrates the mechanical key in order to unlock the doors when the key battery is low.
Main Body ECU (Instrument Panel Junction Block)		• Receives the request signal from the Smart Key ECU Assembly and actuates the door lock motor to unlock or lock all the doors, back door, and glass hatch. • Transmits each door condition, back door condition, and glass hatch to the Smart Key ECU Assembly.
Smart Key ECU Assembly		• Certifies the ID code received from the door control receiver and transmits the certification results to the ID code box and Steering Lock ECU. • Controls the oscillators, and the touch sensor. • Transmits the door lock/unlock request signals during the entry function.
Door Electrical Key Oscillator LH and RH		Transmits the request signals.
Outside Door Handle	Door Oscillator	Receives the request signal from the Smart Key ECU Assembly, and creates an actuation area in the around front door.
	Lock Switch	Transmits door lock request signals the Smart Key ECU Assembly.
	Touch Sensor	Detects when a person touches the inside of an outer door handle.
Outside Electrical Key Oscillator		Receives the request signal from the Smart Key ECU Assembly, and creates an actuation area in the around back door.
Indoor Electrical Key Oscillator • Front, Center, Rear		Receives a request signal from the Smart Key ECU Assembly and forms the actuation area in the vehicle interior.
Door Control Receiver		Receives the ID code from the key and transmits it to Smart Key ECU Assembly.
Glass Hatch Opener Switch		Transmits a glass hatch open request signal to the Main Body ECU (Instrument Panel Junction Block).
Back Door Opener Switch		Transmits a back door open request signal to the Main Body ECU (Instrument Panel Junction Block).
Back Door Lock Switch		Transmits a back door lock request signal to the Smart Key ECU Assembly.
Combination Meter Assembly • Master Warning Light • Buzzer		Illuminates simultaneously with a buzzer in combination meter assembly sound to inform the driver of malfunctions in the smart key system.
Multi-information Display		The following warning messages appear to alert the driver. • Key is not Detected • When staring the engine, depress the brake pedal • Low Key Battery • S/T is not Unlocked • Check S/T Lock

(Continued)

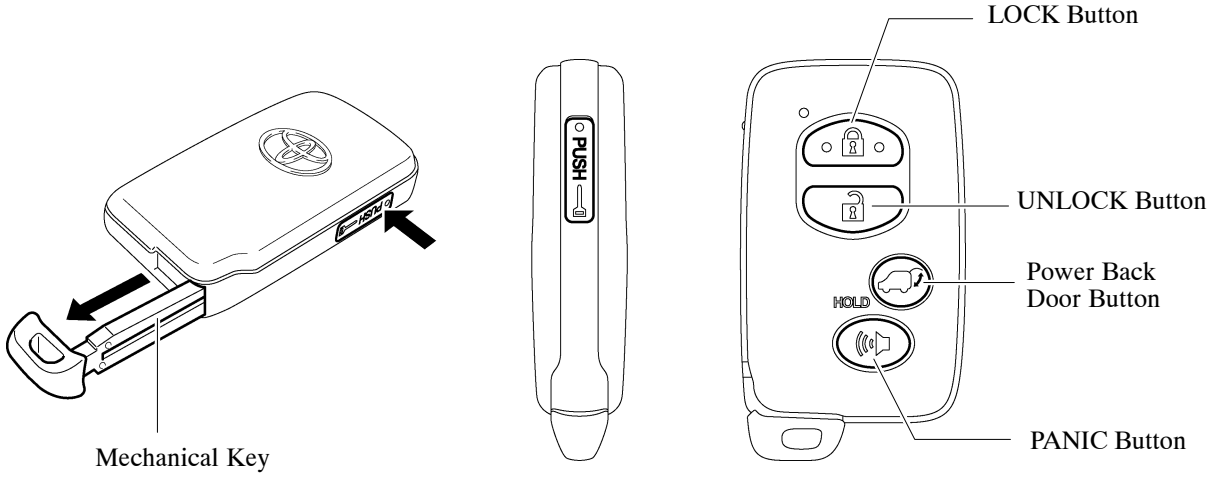
Component	Function
Wireless Door Lock Buzzer	• Sounds as an answer back for entry lock or unlock to inform the driver. • Sounds to inform the driver of malfunctions in the smart key system.
Power Back Door Buzzer	• Sounds to inform the driver that the system is operating. • Sounds if the operating conditions have not been met or if a jammed has been detected.
Power Back Door ECU	Controls the power back door system in accordance with the signals received from the Smart Key ECU Assembly.
Outside Rear View Mirror • Foot Light	When the key enters the exterior actuation area, the foot lights are illuminated in accordance with the request signals of the Smart Key ECU Assembly.

4. Construction and Operation

Key

The key consists of a mechanical key, transmitter for the wireless door lock control, transceiver for the entry function, and transponder chip for the engine immobilizer function.

- This mechanical key operates the driver door lock cylinder and glove box lock cylinder, but cannot be used to start the engine. When the mechanical key is used, the cap of the driver door lock cylinder must be removed.
- The transmitter for the wireless door lock control has a LOCK button, UNLOCK button, PANIC button, and power back door button.
- The transceiver of the key receives the signals from the oscillators and returns the ID code to the door control receiver.
- The transponder chip for the engine immobilizer function returns a signal to the engine switch as a response to the radio wave it received from the engine switch.



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5. Construction of Entry Function

General

The entry function consists of the following functions:

Function	Outline
Wireless Door Lock Control	This function is a convenient system for locking and unlocking all the doors and back door at a distance. The operation of this function is the same as that in the wireless door lock control system. For details, see page BE-164. However, because there is a smart key system glass hatch open function, the door control transmitter does not have a glass hatch open button.
Entry Illumination	When a key enters the exterior actuation area of door electrical key oscillators (LH and RH) the foot lights illuminate.
Entry Unlock	When a key is located in the exterior actuation area any door electrical key oscillator, the door will unlock after the inside of either front outside door handle is touched. • The driver's outside door handle unlocks the driver's door. • The front passenger outside door handle unlocks all doors and the back door.
Entry Unlock Mode Switching	Allows switching of one of 2 modes that can be operated with the entry unlock function. • Driver Door Mode (Default Setting) • All Door Mode
Entry Lock	When a key is located in the exterior actuation area of any electrical key oscillator (driver, front passenger, or back door) and the engine switch is OFF, all doors can be locked by simply pressing the lock switch.
Back Door Open	When a key is in an exterior actuation area of the outside electrical key oscillator (back door), the back door opens manually by simply pressing the back door opener switch.
Glass Hatch Open	When a key is in an exterior actuation area of the outside electrical key oscillator (back door), the back door glass opens manually by simply pressing the glass hatch opener switch.
Prevention of Key Confinement	The key confinement prevention function prevents the key from being locked inside the vehicle. This function operates in 3 different situations: keyless lock, lock switch and glass hatch close. For details, see page BE-170.
Warning	When any of the situations below occur, the smart key system causes the Smart Key ECU Assembly to sound the buzzer in the combination meter and the wireless door lock buzzer, and indicate a warning on the multi-information display in order to the alert the driver. • An exit warning if the shift lever is in a position other than "P" and the power source is a mode other than "OFF". • An exit warning if the shift lever is in "P" and the power source is a mode other than "OFF". • A warning if the occupant leaves with the key in inappropriate circumstances. • A warning if the engine switch is operated while the key is outside the actuation area. • A warning if the lock button is operated while the key is inside the vehicle. • A warning if the key battery is weak.
Battery Saving	If the key remains within the exterior actuation area of any electrical key oscillator (driver, front passenger, or back door), the system maintains periodic communication with key. Therefore, if the vehicle remains parked in that state for a long time, the key battery and the vehicle battery could be drained.

(Continued)

Function	Outline
Key Cancel	The following key functions can be cancelled by following certain procedures. • Entry Unlock/Lock • Back Door Open • Prevention of Key Confinement • Warning
Key Code Registration	A total of 7 keys can be registered. Enables the registering (writing and storing) of transmitter recognition codes in the EEPROM that is contained in the Smart Key ECU Assembly.

Wireless Door Lock Control Function

The wireless door lock control function has the following functions and customizes:

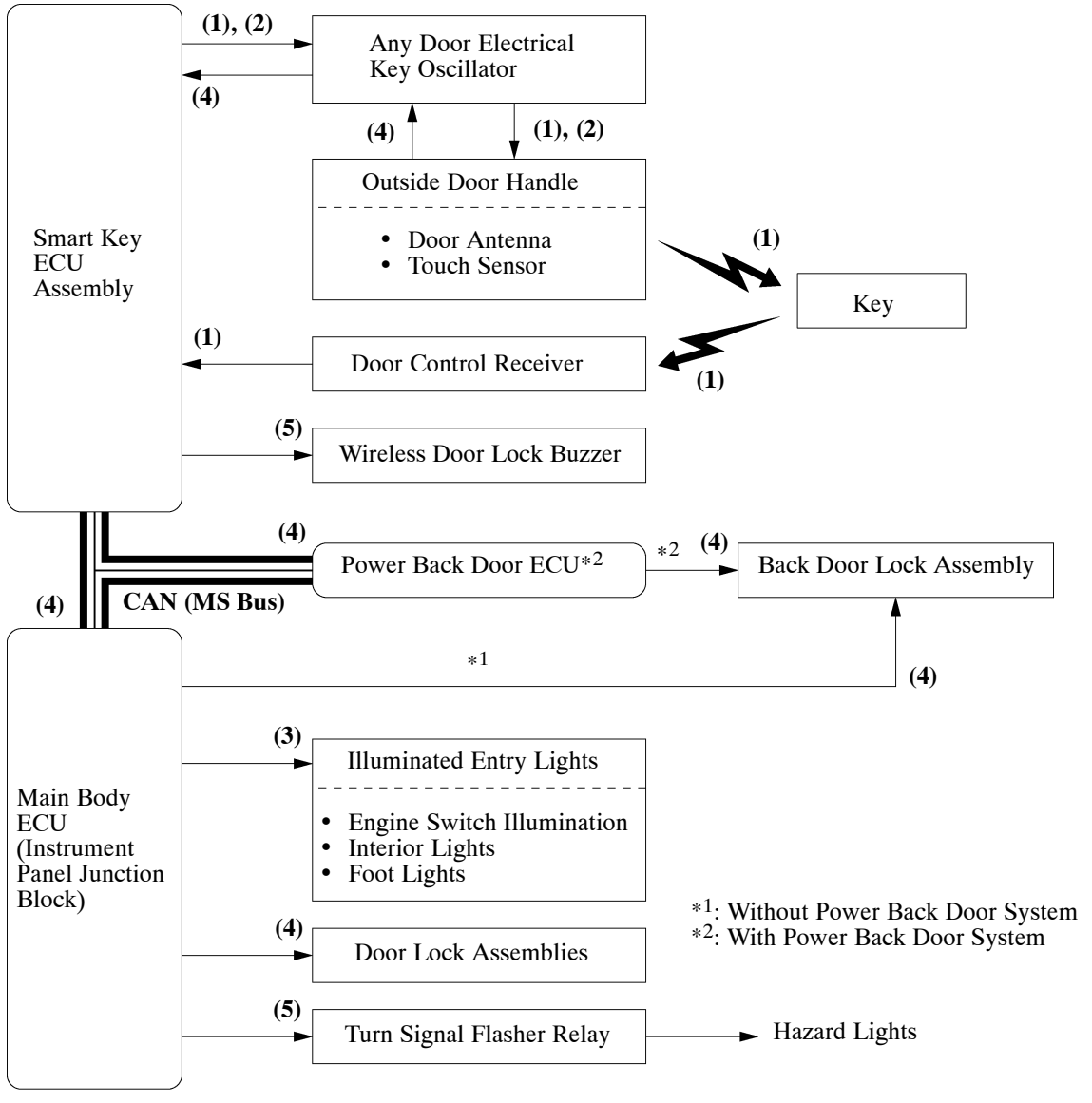
×: Standard (Non customizable) *: Customizable

Function	Outline	Customizable
All Doors Lock	Pressing the LOCK button of the key locks the doors.	*1
All Doors Unlock (2-step Unlock)	Pressing the UNLOCK button of the key twice within 3 seconds unlocks all doors after it first unlocks the driver's door.	*1
All Doors Unlock (1-step Unlock)	This function is provided to unlock all the doors when the key is turned in the key cylinder one time.	*2
Power Back Door Open/Close	Keeping the power back door button of the key pressed longer than about 0.8 seconds opens or closes the back door.	*1
Answer Back	When the doors are being locked or unlocked through the operation of the key, the wireless door lock buzzer sounds and the hazard lights blinks once during locking and twice during unlocking. Also, the answer back function operates when the doors are locked by the auto relock function.	*1
Answer Back (For Power Back Door)	When the key is used for opening or closing the power back door is operated, this function sounds once the wireless door lock buzzer and power back door buzzer to inform the user that the operation has been started.	*1
Panic Alarm	Keeping the PANIC button of the key pressed longer than about 0.8 seconds causes the following to activate as an alarm. • Sounds the horn and security horn. • Flashes the hazard lights, headlights, and taillights. • Illuminates the interior light (Switch is in the DOOR position).	*1
Automatic Relock	If none of the doors are opened within 60 seconds after they are unlocked using the wireless door lock remote control, all the doors will be locked again automatically.	*1
Repeat	If a door is not locked in response to the locking operation of the key, the Main Body ECU (Instrument Panel Junction Block) will output a lock signal again after 1 second passes.	×
Security	Sends a door lock/unlock operation request signal as a rolling code.	×
Door Ajar Warning	If any door is open or ajar, pressing the LOCK button of the key will cause the wireless door lock buzzer to sound for about 10 seconds as a warning.	×

*1: Default setting is on. *2: Default setting is off.

Entry Unlock

(1) When the key enters any exterior actuation area of the front door, the Smart Key ECU Assembly judges and certifies the key ID code received from the door control receiver.
(2) After the key certification OK is confirmed, the Smart Key ECU Assembly transmits an unlock stand-by signal to the touch sensor of the relevant door.
(3) At the same time, the Smart Key ECU Assembly transmits the lighting signals to the foot lights on the outside rear view mirror and interior lights (engine switch illumination and interior lights), and turns ON these illuminations (Entry Illumination Function).
(4) If the touch sensor is touched in this condition, the Smart Key ECU Assembly transmits a door unlock request signal to the Main Body ECU (Instrument Panel Junction Block), and unlocks either the driver's door or all doors.
   – The driver's outside door handle unlocks the driver's door.
   – The front passenger's outside door handle unlocks all doors.
(5) The Smart Key ECU Assembly sounds the wireless door lock buzzer twice, and the Main Body ECU (Instrument Panel Junction Block) flashes the hazard lights twice, as an answer back for entry unlock.

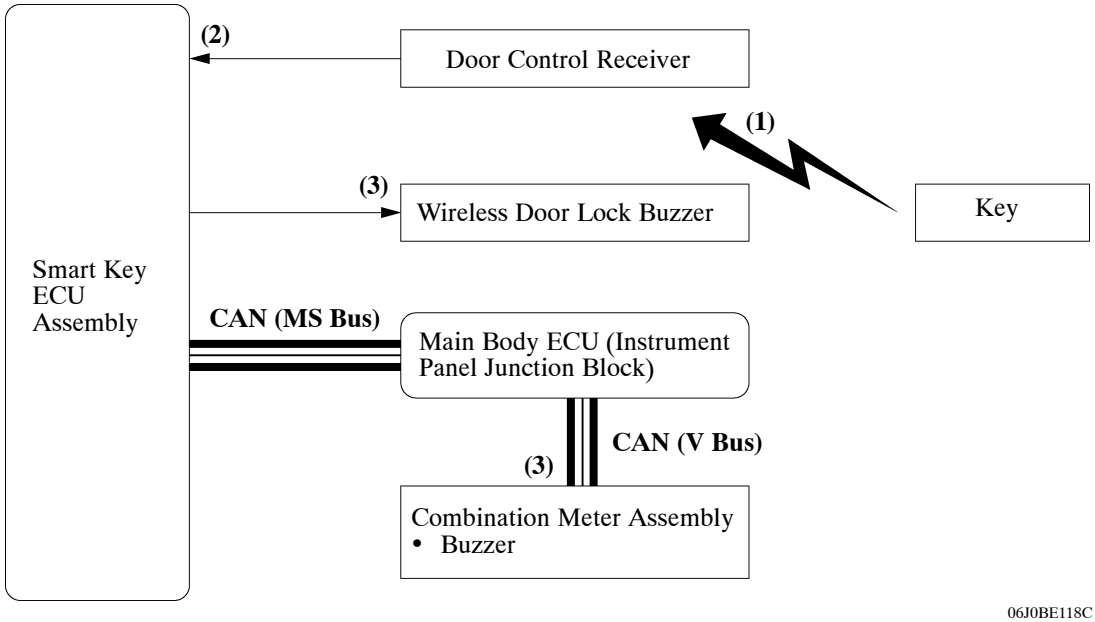


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Entry Unlock Mode Switching

(1) When the engine switch is OFF, press the LOCK button and one of the other buttons on the key at the same time for approximately 5 seconds while the key is in the actuation area.
(2) The Smart Key ECU Assembly receives this signal from the door control receiver and switches the entry unlock mode.
(3) The Smart Key ECU Assembly sounds the wireless door lock buzzer and the buzzer in the combination meter to inform the user that the mode has been switched.
(4) If the entry unlock mode needs to be switched again, press the LOCK button and one of the other three buttons on the key at the same time for approximately 5 seconds after the LED of the key goes off.



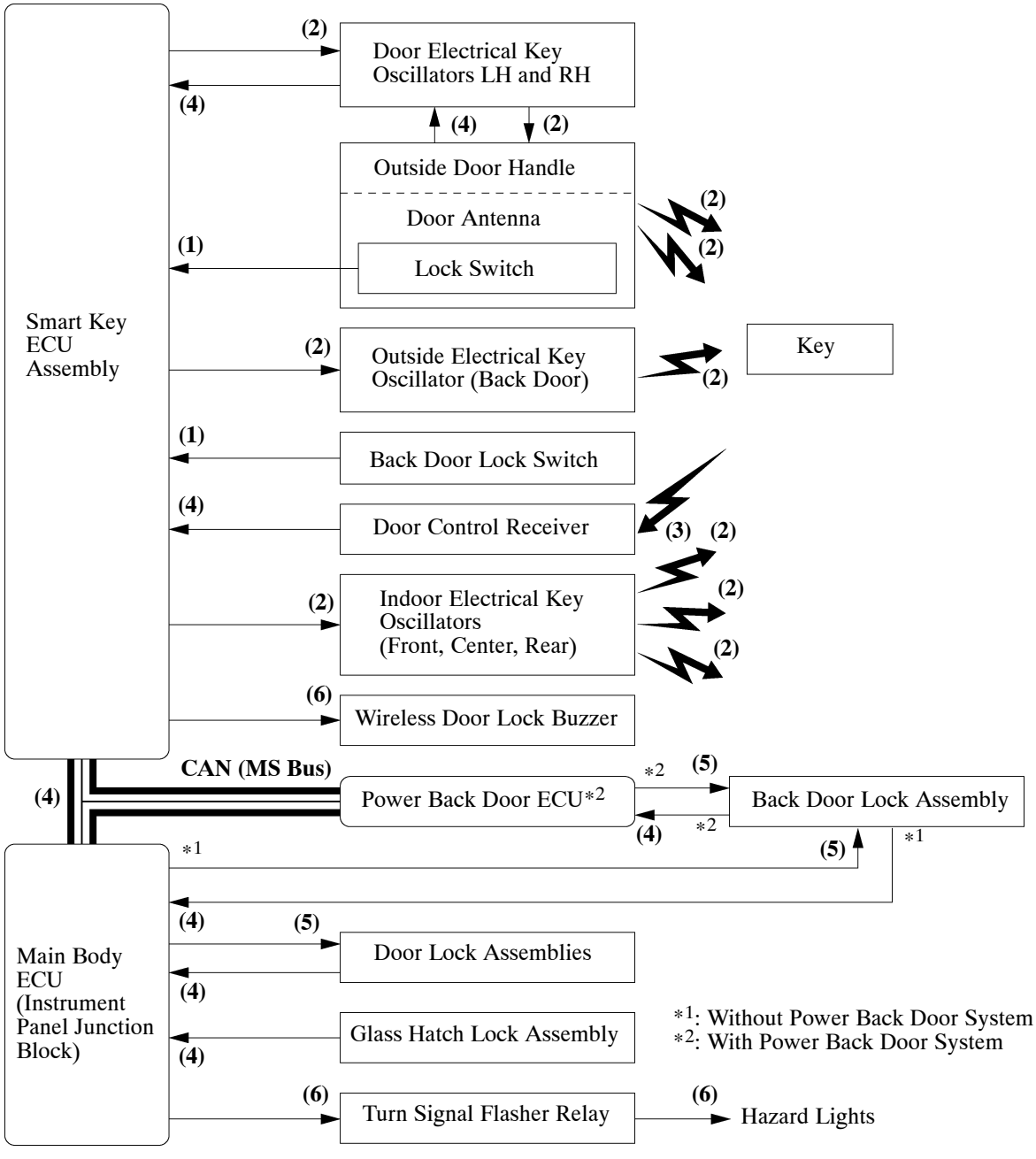
Mode	Wireless Door Lock Buzzer	Buzzer in Combination Meter Assembly	Multi-information Display
Driver Door (Default)	Sounds 3 times	Sounds once	
All Doors (Customized)	Sounds once	Sounds once	

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NOTE: This function only switches the entry unlock mode of the smart key system. It is not applied to the unlock function using the wireless door lock control.

Entry Lock

(1) This signal is transmitted to the Smart Key ECU Assembly when the user (who has the key in their possession), exits the vehicle and presses the lock switch or the back door lock switch.
(2) The Smart Key ECU Assembly transmits a request signal for indoor electrical key oscillators (Front, Center, Rear) and electrical key oscillators (driver, front passenger, back door) to form actuation areas.
(3) The key receives this signal and returns the ID code to the door control receiver.
(4) The Smart Key ECU Assembly judges and certifies the ID code. It then checks the location of the key and, if all the doors are closed, the ECU transmits a door lock signal to the Main Body ECU (Instrument Panel Junction Block).
(5) The Main Body ECU (Instrument Panel Junction Block) receives this signal and actuates the lock motors.
(6) The Main Body ECU (Instrument Panel Junction Block) blinks hazard lights once and the Smart Key ECU Assembly sounds the wireless door lock buzzer once as an answerback for the entry lock function.

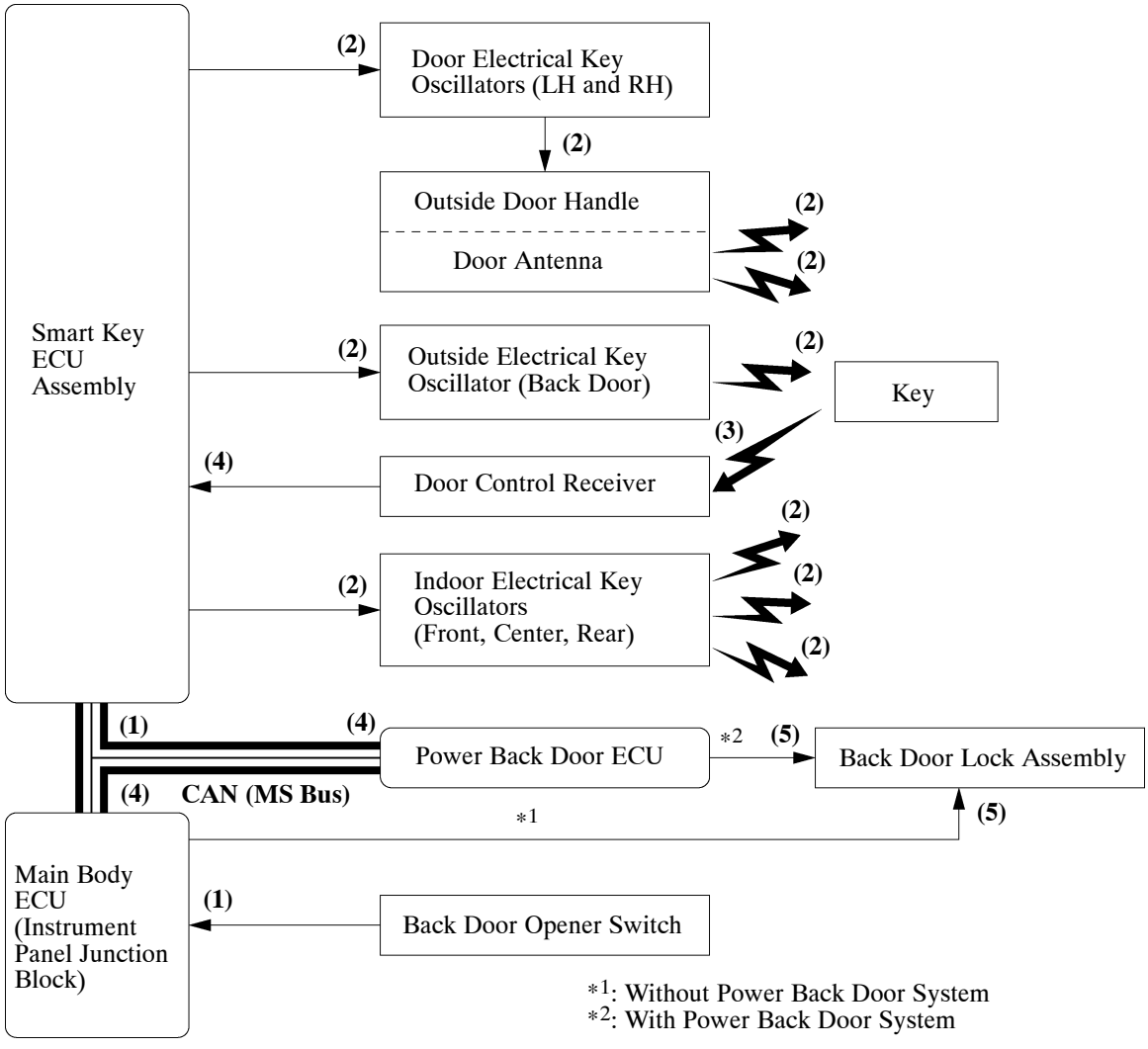


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Back Door Open

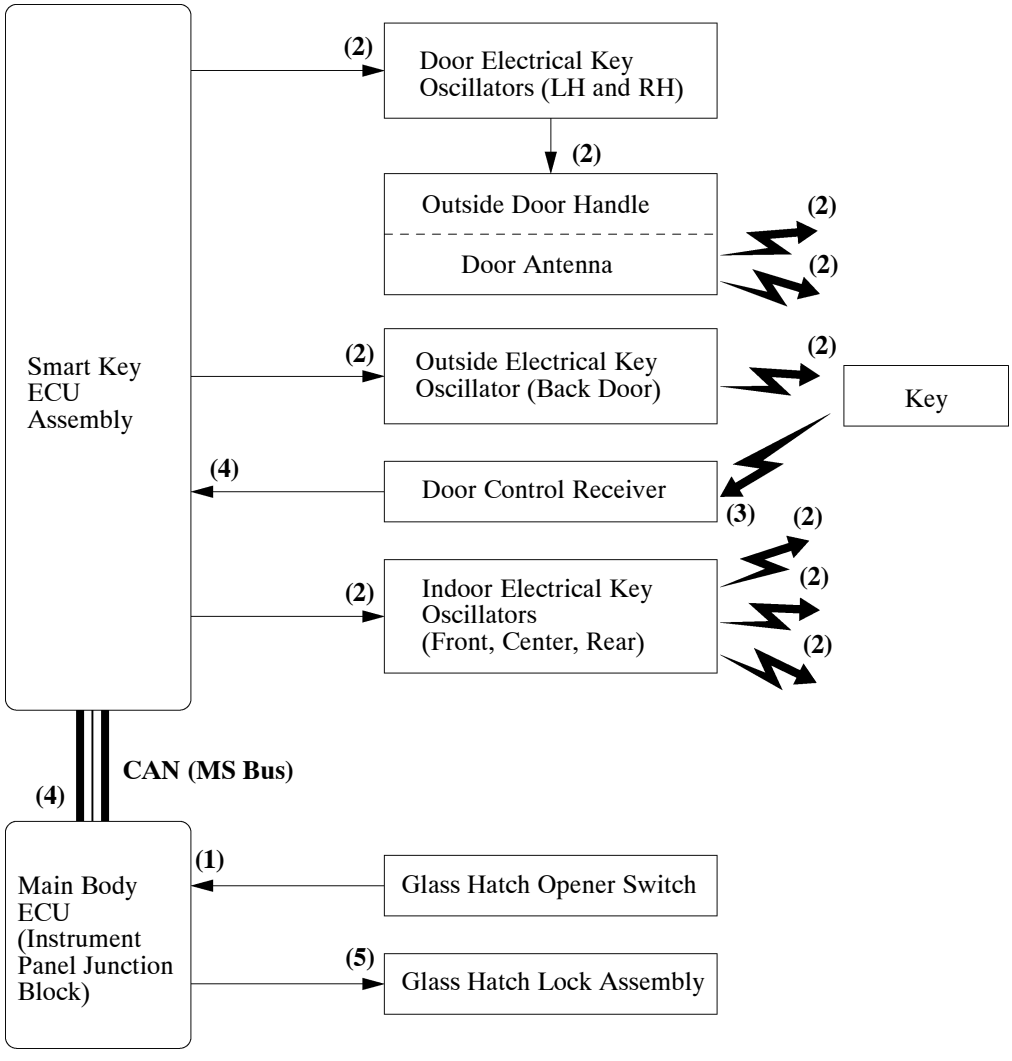
(1) The unlock signal is transmitted to the Smart Key ECU Assembly from the Main Body ECU (Instrument Panel Junction Block) when the driver pushes the back door opener switch with the key carried in the driver's possessions.
(2) The Smart Key ECU Assembly transmits a request signal for indoor electrical key oscillators (Front, Center, Rear) and door electrical key oscillators (LH and RH), outside electrical key oscillator (Back Door) to form actuation areas.
(3) The key receives this signal and returns the ID code to the door control receiver.
(4) The Smart Key ECU Assembly judges and certifies the ID code, and check the location of the key. The ECU transmits a back door open signal to the Main Body ECU (Instrument Panel Junction Block) or Power Back Door ECU.
(5) Any ECU receives this signal and actuates the motor to open manually the back door.



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Glass Hatch Open

(1) The unlock signal is transmitted to the Smart Key ECU Assembly from the Main Body ECU (Instrument Panel Junction Block) when the driver pushes the glass hatch opener switch with the key carried in the driver's possessions.
(2) The Smart Key ECU Assembly transmits a request signal for indoor electrical key oscillators (Front, Center, Rear) and door electrical key oscillators (LH and RH), outside electrical key oscillator (Back Door) to form actuation areas.
(3) The key receives this signal and returns the ID code to the door control receiver.
(4) The Smart Key ECU Assembly judges and certifies the ID code, and check the location of the key. The ECU transmits a glass hatch open signal to the Main Body ECU (Instrument Panel Junction Block).
(5) The Main Body ECU (Instrument Panel Junction Block) receives this signal and actuates the lock motor to open the glass hatch.



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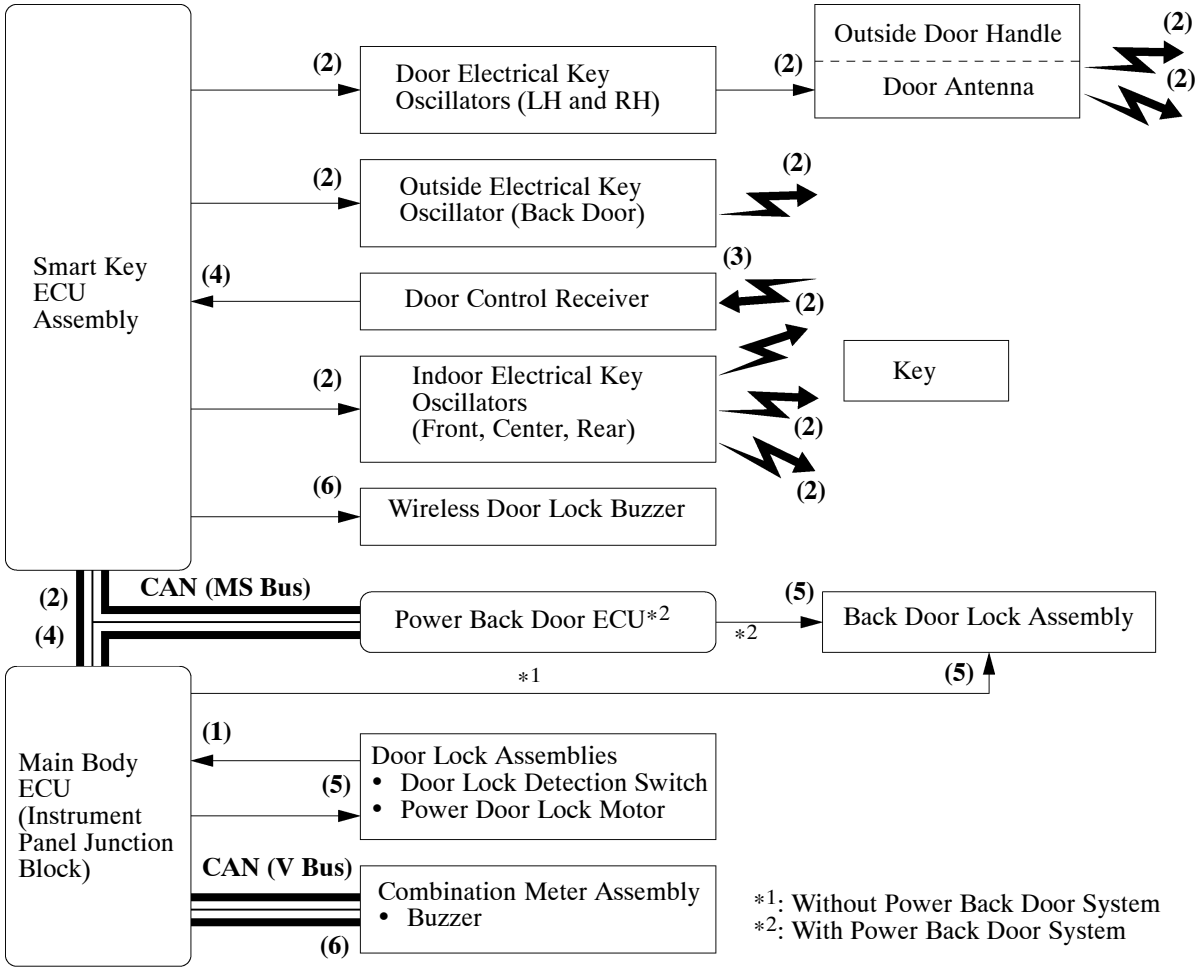
Prevention of Key Confinement

1) General

The key confinement prevention function prevents the key from being locked inside the vehicle. This function operates in 3 different situations: keyless lock, lock switch, glass hatch close.

2) Keyless Lock (Lock Knob)

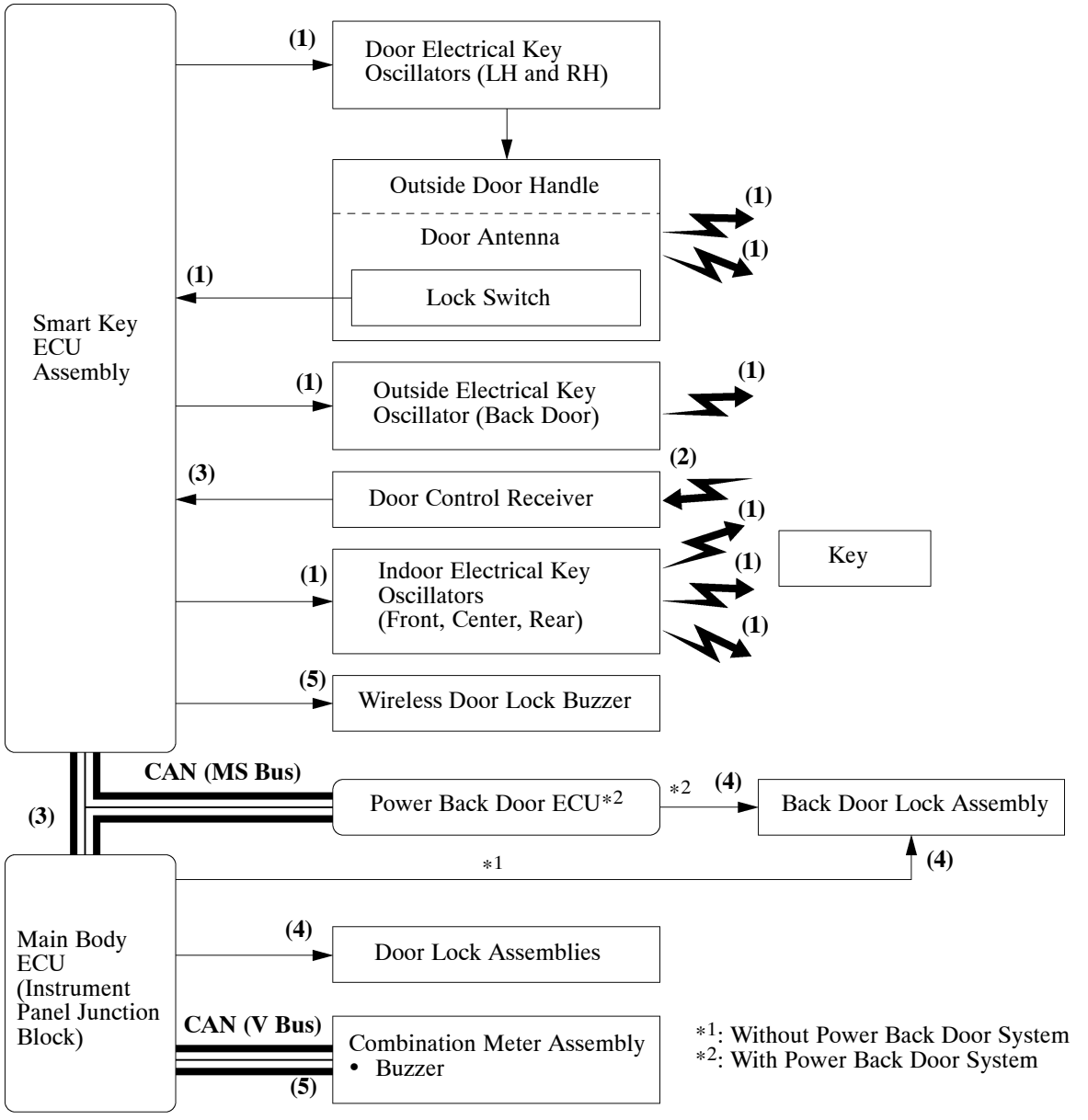
(1) When the door is locked by the lock knob in the inside door handle while the key is still the vehicle interior, the Main Body ECU (Instrument Panel Junction Block) receivers this signal and transmits the door condition signal to the Smart Key ECU Assembly.
(2) The Smart Key ECU Assembly transmits a request signal for indoor electrical key oscillators (Front, Center, Rear) and door electrical key oscillators (LH and RH), outside electrical key oscillator (Back Door) to form actuation areas.
(3) The key receives this signal and returns the ID code to the door control receiver.
(4) The Smart Key ECU Assembly judges and certifies the ID code, and check the location of the key. The ECU transmits a door unlock signal to the Main Body ECU (Instrument Panel Junction Block).
(5) The Main Body ECU (Instrument Panel Junction Block) receives this signal and actuates the all door lock assemblies and back door lock assembly to unlock.
(6) The Smart Key ECU Assembly sounds the wireless door lock buzzer and buzzer in the combination meter as an answer back for unlock.



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3) Lock Switch

(1) When the door is locked from the lock switch while the key is still the vehicle interior, the Smart Key ECU Assembly received this signal and transmits a request signal for indoor electrical key oscillators (Front, Center, Rear) and door electrical key oscillators (LH and RH), outside electrical key oscillator (Back Door) to form actuation areas.
(2) The key receives this signal and returns the ID code to the door control receiver.
(3) The Smart Key ECU Assembly judges and certifies the ID code, and check the location of the key. The ECU transmits a door unlock signal to the Main Body ECU (Instrument Panel Junction Block).
(4) The Main Body ECU (Instrument Panel Junction Block) receives this signal and actuates the all door lock assemblies and back door lock assembly to unlock.
(5) The Smart Key ECU Assembly sounds the wireless door lock buzzer and buzzer in the combination meter as an answer back for unlock.

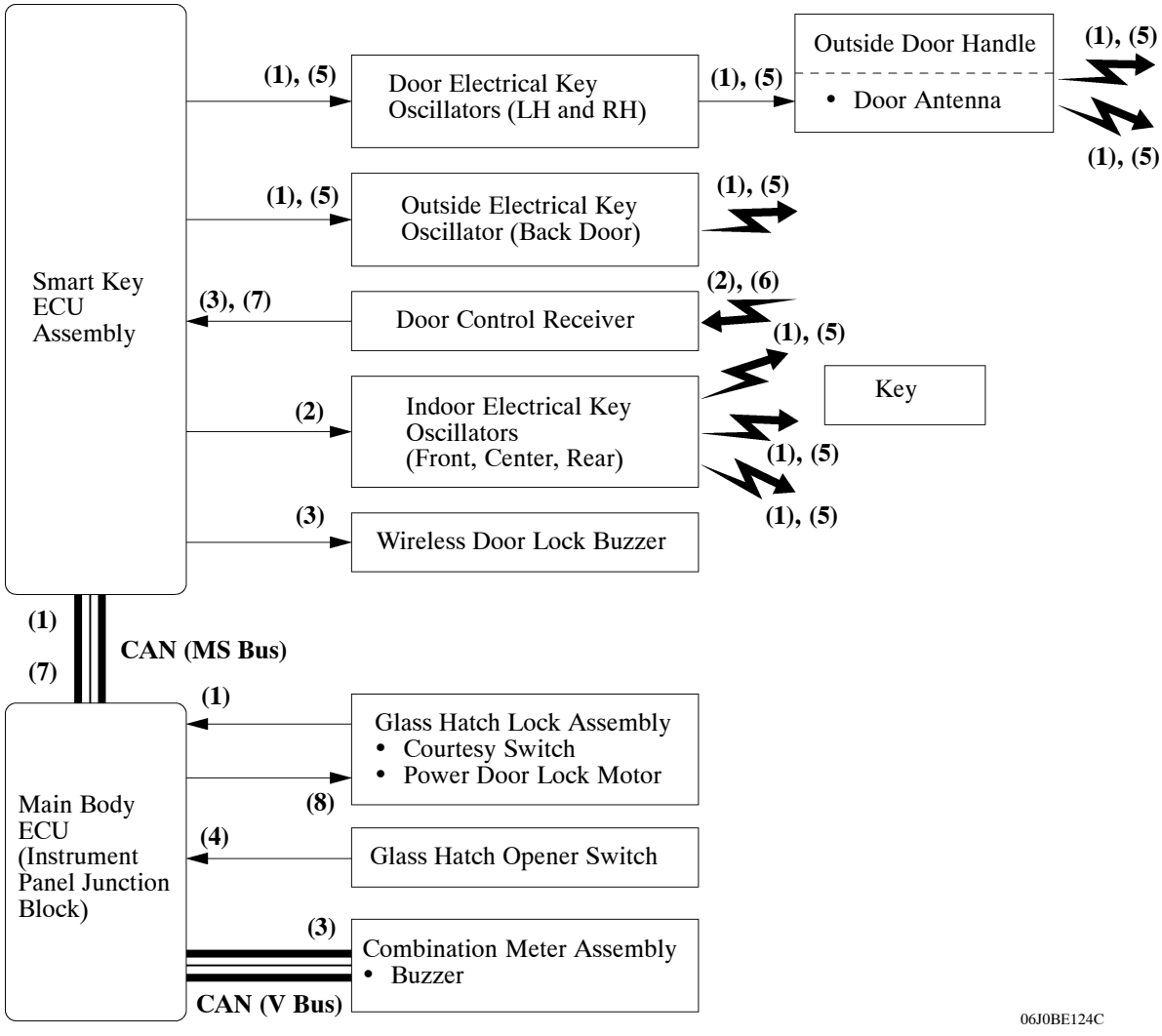


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4) Glass Hatch Close

(1) When the glass hatch is closed at all doors lock while the key is still the vehicle interior, the Smart Key ECU Assembly received this signal and transmits a request signal for indoor electrical key oscillators (Front, Center, Rear) and door electrical key oscillators (LH and RH), outside electrical key oscillator (Back Door) to form actuation areas.
(2) The key receives this signal and returns the ID code to the door control receiver.
(3) The Smart Key ECU Assembly judges and certifies the ID code, and checks the location of the key. The Smart Key ECU Assembly sounds the wireless door lock buzzer and buzzer in the combination meter assembly for 2 seconds.
(4) At same time, the Smart Key ECU Assembly changes the glass hatch opener to the stand-by condition. The driver presses the glass hatch opener switch.
(5) The Smart Key ECU Assembly receives this signal and transmits a request signal for indoor electrical key oscillators (Front, Center, Rear) and door electrical key oscillators (LH and RH), outside electrical key oscillator (Back Door) to form actuation areas.
(6) The key receives this signal and returns the ID code to the door control receiver.
(7) The Smart Key ECU Assembly judges and certifies the ID code, and checks the location of the key. The ECU transmits a glass hatch open signal to the Main Body ECU (Instrument Panel Junction Block).
(8) The Main Body ECU (Instrument Panel Junction Block) receives this signal and actuates the glass hatch lock assembly to open the glass hatch.



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Warning

1) General

When any of the situations below occur, the smart key system causes the Smart Key ECU Assembly to sound a buzzer in the combination meter assembly and the wireless door lock buzzer, appear the multi-information display, and illuminate the engine switch illumination in order to the alert the driver.

Situation (See page)	Condition
A (BE-174)	The engine is left running and the shift lever is in a position other than P when the driver gets out of the vehicle.
B (BE-176)	The driver door is opened while the steering is unlocked.
C (BE-177)	The engine is left running and the shift lever is in the P position when the driver gets out of the vehicle.
D (BE-178)	A door is ajar and lock switch is pushed.
E (BE-179)	The engine is left running when a passenger gets out of the vehicle holding the key.
F (BE-180)	The key is not within the actuation areas.
G (BE-181)	The key is left in the vehicle interior and the lock switch is pushed.
H (BE-181)	The key is left in the vehicle interior and the glass hatch is closed.
I (BE-182)	The key battery is weak.
J (BE-182)	Steering lock does not release.
K (BE-183)	A malfunction of the Steering Lock ECU is detected.
L (BE-183)	The Main Body ECU (Instrument Panel Junction Block) is malfunctioning.
M (BE-184)	An engine start method is displayed.

2) Situation: A

There are 2 patterns for situation A.

- Pattern 1: When the engine is left running and the shift lever is in a position other than P, the driver opens the door and attempts to get out of the vehicle.
- Pattern 2: Under the conditions of pattern 1, the driver closes the door and attempts to leave the vehicle holding the key.

In these situations, the following control is performed:

Pattern 1:		
Possible Effects without Warning	Sudden vehicle start, Vehicle theft, Vehicle roll-away	
Warning Active Condition		
The warning is activated when all of the following conditions are met: • Power source is in a mode other than OFF. • Shift lever is in any position except “P”. • Vehicle speed is 0. • Driver door is opened.		
Waning Method		
Combination Meter Assembly	Buzzer	Continuous sounds
	Master Warning Light	–
Multi-information Display	–	
Wireless Door Lock Buzzer	–	
Engine Switch Illumination	–	
Warning Stop Condition		
The warning is stopped when one of the following conditions is met: • Power source is OFF. • Shift lever is “P”. • Vehicle speed is above 0. • Driver door is closed.		
Pattern 2:		
Possible Effects without Warning	Sudden vehicle start, Vehicle theft, Vehicle roll-away	
Warning Active Condition		
The warning is activated when all of the following conditions are met: • Power source is in a mode other than OFF. • Shift lever is in any position except “P”. • Vehicle speed is 0. • Driver door is opened → closed. • Key is not in the vehicle interior.		
Waning Method		
Combination Meter Assembly	Buzzer	Continuous sounds
	Master Warning Light	Flashes
Multi-information Display	The following warning message are alternately displayed: • SHIFT TO P RANGE • KEY IS NOT DETECTED	
Wireless Door Lock Buzzer	Continuous sound	
Engine Switch Illumination	–	

(Continued)

<table>
<tr><th colspan="4">Warning Stop Condition</th></tr>
<tr><td colspan="4">The warning is stopped when one of the following conditions is met:</td></tr>
<tr><td colspan="4">• Power source is OFF.
All warning operations stop.</td></tr>
<tr><td colspan="4">• Vehicle speed is above 0.</td></tr>
<tr><td rowspan="2">Combination Meter Assembly</td><td>Buzzer</td><td colspan="2">Stops sounding</td></tr>
<tr><td>Master Warning Light</td><td colspan="2">Turns OFF</td></tr>
<tr><td>Multi-information Display</td><td colspan="3">The following warning message is displayed:
• KEY IS NOT DETECTED</td></tr>
<tr><td>Wireless Door Lock Buzzer</td><td colspan="3">Stop sounding</td></tr>
<tr><td colspan="4">• Key is in the vehicle interior.</td></tr>
<tr><td rowspan="2">Combination Meter Assembly</td><td>Buzzer</td><td colspan="2">Stops sounding</td></tr>
<tr><td>Master Warning Light</td><td colspan="2">Turns OFF</td></tr>
<tr><td>Multi-information Display</td><td colspan="3">The following warning message is displayed:
• SHIFT TO P RANGE</td></tr>
<tr><td>Wireless Door Lock Buzzer</td><td colspan="3">Stop sounding</td></tr>
</table>

3) Situation: B

In the situation B (The driver door is opened while the steering is unlocked) the following control is performed.

<table>
<tr><td colspan="2">Possible Effects without Warning</td><td colspan="2">Vehicle theft</td></tr>
<tr><td colspan="4">Warning Active Condition</td></tr>
<tr><td></td><td colspan="3">The warning is activated when one of the following conditions is met:
• Power source is ACC and the driver door is opened.
• Power source is OFF, the steering is unlocked, and the driver door is opened.</td></tr>
<tr><td colspan="4">Waning Method</td></tr>
<tr><td></td><td rowspan="2">Combination Meter Assembly</td><td>Buzzer</td><td>Continuous sounds at short and even intervals</td></tr>
<tr><td>Master Warning Light</td><td>–</td></tr>
<tr><td></td><td>Multi-information Display</td><td colspan="2">–</td></tr>
<tr><td></td><td>Wireless Door Lock Buzzer</td><td colspan="2">–</td></tr>
<tr><td></td><td>Engine Switch Illumination</td><td colspan="2">–</td></tr>
<tr><td colspan="4">Warning Stop Condition</td></tr>
<tr><td></td><td colspan="3">The warning is stopped when one of the following conditions is met:
• Power source is IG-ON or driver door is closed.
• Power source is OFF and steering is locked.</td></tr>
</table>

4) Situation: C

There are 2 patterns for situation C.

- Pattern 1: When the engine is left running and the shift lever is in the P position, the driver closes the driver's door and attempts to leave the vehicle while holding the key.
- Pattern 2: Under the conditions of pattern 1, the driver presses the lock switch.

In these situations, the following control is performed:

Pattern 1:		
Possible Effects without Warning	Vehicle theft, Engine cannot be restarted, Discharged battery	
Warning Active Condition		
The warning is activated when all of the following conditions are met: • Power source is in a mode other than OFF. • Shift lever is in "P". • Key is not in the vehicle interior. • Driver door is opened → closed.		
Waning Method		
Combination Meter Assembly	Buzzer	Sounds once
	Master Warning Light	Flashes
Multi-information Display	The following warning message is displayed: • KEY IS NOT DETECTED	
Wireless Door Lock Buzzer	Sounds 3 times	
Engine Switch Illumination	–	
Warning Stop Condition		
The warning is stopped when one of the following conditions is met: • Power source is OFF. • Key is in the vehicle interior.		
Pattern 2:		
Possible Effects without Warning	Vehicle theft, Discharged battery	
Warning Active Condition		
The warning is activated when all of the following conditions are met: • Power source is in a mode other than OFF. • Shift lever is in "P". • All doors are closed. • The key is not in the vehicle interior (within one of the actuation areas).		
Waning Method		
Combination Meter Assembly	Buzzer	–
	Master Warning Light	–
Multi-information Display	–	
Wireless Door Lock Buzzer	Sounds for 2 seconds	
Engine Switch Illumination	–	
Warning Stop Condition		
The warning is stopped when one of the following conditions is met: • Power source is OFF and the key is not within the actuation areas. • Key is in the vehicle interior.		

5) Situation: D

In the situation D (A door is ajar and lock switch is pushed) the following control is performed.

Possible Effects without Warning	Vehicle theft		
Warning Active Condition			
The warning is activated when all of the following conditions are met: • Power source is OFF. • Any door is opened. • Lock switch is ON.			
Waning Method			
Combination Meter Assembly	Buzzer	–	
	Master Warning Light	–	
Multi-information Display	–		
Wireless Door Lock Buzzer	Continuous sound		
Engine Switch Illumination	–		
Warning Stop Condition			
The warning is stopped when one of the following conditions is met: • Power source is in a mode other than OFF. • All doors are closed. • Wireless door lock function is unlocked. • Entry unlock is operated. • 10 seconds have elapsed after the wireless door lock buzzer was activated.			

6) Situation: E

In the situation E (The engine is left running and when a passenger gets out of the vehicle holding the key) the following control is performed.

Possible Effects without Warning		Engine cannot be restarted	
Warning Active Condition			
	The warning is activated when all of the following conditions are met: • Power source is in a mode other than OFF. • Door except driver door is opened → closed. • Vehicle speed is 0. • Key is not in the vehicle interior.		
Waning Method			
	Combination Meter Assembly	Buzzer	Sounds once
		Master Warning Light	Flashes
	Multi-information Display	The following warning message is displayed: • KEY IS NOT DETECTED	
	Wireless Door Lock Buzzer	Sounds 3 times	
	Engine Switch Illumination	–	
Warning Stop Condition			
	The warning is stopped when one of the following conditions is met: • Power source is OFF. • Vehicle speed is above 0. • Key is in the vehicle interior.		

7) Situation: F

In the situation F (The key is not within the actuation areas) the following control is performed.

Possible Effects without Warning		Confuses the user	
Warning Active Condition			
	The warning is activated when all of the following conditions are met: • Engine switch is pushed. • Key is not in the vehicle interior.		
Waning Method			
	Combination Meter Assembly	Buzzer	Sounds once
		Master Warning Light	Flashes
	Multi-information Display	The following warning message is displayed for 8 seconds (and then automatically turned off). • KEY IS NOT DETECTED	
	Wireless Door Lock Buzzer	–	
	Engine Switch Illumination	–	
Warning Stop Condition			
	Check if the key is in the detection area. If the key is in the detection area, press the wireless door lock switch and confirm that the indicator comes on. If the indicator does not come on, replace the key battery with a new one.		

8) Situation: G

In the situation G (The key is left in the vehicle interior and the lock switch is pushed) the following control is performed.

Possible Effects without Warning	Vehicle theft		
Warning Active Condition			
The warning is activated when all of the following conditions are met: • Power source is OFF. • All doors are closed. • Key is not in the vehicle interior. • Lock switch is ON.			
Waning Method			
Combination Meter Assembly	Buzzer	–	
	Master Warning Light	–	
Multi-information Display	–		
Wireless Door Lock Buzzer	Sounds for 2 seconds		
Engine Switch Illumination	–		
Warning Stop Condition			
The key is removed from the vehicle interior and the lock switch is ON.			

9) Situation: H

In the situation H (The key is left in the vehicle interior and the glass hatch is closed) the following control is performed.

Possible Effects without Warning	Key confinement		
Warning Active Condition			
The warning is activated when all of the following conditions are met: • Vehicle speed is 0. • All doors are closed. • Key is in the vehicle interior. • Glass hatch is closed.			
Waning Method			
Combination Meter Assembly	Buzzer	–	
	Master Warning Light	–	
Multi-information Display	–		
Wireless Door Lock Buzzer	Sounds for 2 seconds		
Engine Switch Illumination	–		
Warning Stop Condition			
The glass hatch open is ON.			

10) Situation: I

In the situation I (The key battery is weak) the following control is performed.

Possible Effects without Warning	Smart key system does not function		
Warning Active Condition			
	The warning is activated when all of the following conditions are met: • Power source switches to OFF after being left in IG-ON for over 20 minutes. • Key battery voltage is low. • Key is not in the vehicle interior.		
Waning Method			
	Combination Meter Assembly	Buzzer	Sounds once
		Master Warning Light	Flashes
	Multi-information Display	The following warning message is displayed: • LOW KEY BATTERY	
	Wireless Door Lock Buzzer	–	
	Engine Switch Illumination	–	
Warning Stop Condition			
	The key battery is replaced with a new one.		

11) Situation: J

In the situation J (Steering lock does not release) the following control is performed.

Possible Effects without Warning	Steering usability function		
Warning Active Condition			
	The steering lock does not release, thus the engine is prevented from starting.		
Waning Method			
	Combination Meter Assembly	Buzzer	–
		Master Warning Light	Flashes
	Multi-information Display	The following warning message is displayed for 15 seconds (and then automatically turned off). • KEY IS NOT DETECTED	
	Wireless Door Lock Buzzer	–	
	Engine Switch Illumination	The green indicator blinks at 1-second intervals (and goes off automatically turned off).	
Warning Stop Condition			
	The engine switch is pressed while the steering wheel is tuned left and right, and the steering lock successfully disengages.		

12) Situation: K

In the situation K (A malfunction of the Steering Lock ECU is detected) the following control is performed.

Possible Effects without Warning	Malfunction detection	
Warning Active Condition		
A malfunction of the Steering Lock ECU is detected.		
Waning Method		
Combination Meter Assembly	Buzzer	Sounds once
	Master Warning Light	Flashes
Multi-information Display	The following warning message is displayed: • CHECK S/T LOCK	
Wireless Door Lock Buzzer	–	
Engine Switch Illumination	The amber indicator blinks at 2-second intervals.	
Warning Stop Condition		
The Steering Lock ECU returns normal.		

13) Situation: L

In the situation L (The Main Body ECU (Instrument Panel Junction Block) is malfunctioning) the following control is performed.

Possible Effects without Warning	Malfunction detection	
Warning Active Condition		
A malfunction of the Main Body ECU (Instrument Panel Junction Block) is detected.		
Waning Method		
Combination Meter Assembly	Buzzer	–
	Master Warning Light	–
Multi-information Display	–	
Wireless Door Lock Buzzer	–	
Engine Switch Illumination	The amber indicator blinks at 2-second intervals.	
Warning Stop Condition		
The Main Body ECU (Instrument Panel Junction Block) returns normal.		

14) Situation: M

In the situation M (An engine start method is displayed) the following control is performed.

Possible Effects without Warning		Usability function	
Warning Active Condition			
	The warning is activated when all of the following conditions are met: • Any door is opened → closed. • Power source is changed from OFF to ACC more than once with the engine off and brake pedal not depressed.		
Waning Method			
	Combination Meter Assembly	Buzzer	Sounds once
		Master Warning Light	–
	Multi-information Display	The following warning message is displayed for 10 seconds (and then automatically turned off). • WHEN STARTING THE ENGINE, DEPRESS THE BRAKE PEDAL	
	Wireless Door Lock Buzzer	–	
	Engine Switch Illumination	–	
Warning Stop Condition			
	The engine switch is pushed with the brake pedal depressed or the power source is OFF.		

Battery Saving

Battery saving preserves the vehicle and key batteries. It is activated when the vehicle remains parked for a long time and when the key is left inside the exterior actuation area.

When the vehicle remains parked for a long time
Step 1: No response from key for more than 5 days
Signal transmission interval is extended from 250 msec. to 750 msec.
Step 2: No response from key for more than 14 days
Automatically deactivates the smart key system.
These controls are stopped when one of the following conditions is met: • A wireless door lock control signal of the key is input and the ID matches. • A user carries the key and pushes a lock switch. • A door is locked or unlocked using the mechanical key.
When the key is left inside the exterior actuation
Step 1: This state continues longer than 10 minutes
The smart key system automatically becomes deactivated.
The control is stopped when one of the following conditions is met: • A wireless door lock control signal of the key is input and the ID matches. • A user carries the key and pushes a lock switch. • A door is locked or unlocked using the mechanical key.

Key Cancel

- It is possible to deactivate the following smart key system functions.
  - Entry Lock
  - Entry Unlock
  - Entry Unlock Mode Switching
  - Back Door Open
  - Glass Hatch Open
  - Prevention of Key Confinement
  - Warning
- Key cancel is operated when certain operations are performed with the vehicle in the following condition:
  - Power source is OFF.
  - Driver door is closed.
  - Driver door is unlocked.

Service Tip

The operation procedure is as follows:

1) Unlock once with the UNLOCK button of the key.
2) Open the driver door within 5 seconds.
3) Unlock twice with the UNLOCK button of the key within 5 seconds.
4) Repeat open → close twice for the driver door within 30 seconds, and open again. (Driver Door: Open → Close → Open → Close → Open)
5) Unlock twice with the UNLOCK button of the key within 30 seconds.
6) Repeat open → close once for the driver door within 30 seconds, and open again. (Driver Door: Open → Close → Open)
7) Close the driver door within 5 seconds.

When key cancel is activated, the wireless door lock buzzer sounds once.
To return to the original condition, perform the procedures again. When key cancel is returned, the wireless door lock buzzer sounds twice.

Key Code Registration Function

The table below shows the four special coded ID registration function modes through which up to four different codes can be registered. The codes are electronically registered (written to and stored) in the EEPROM. For details of the recognition code registration procedure, refer to the 2008 HIGHLANDER Repair Manual (Pub. No. RM06J0U).

Mode	Function
Rewrite	Erases all previously registered codes and registers only the newly received codes. This mode is used whenever a transmitter or the integration relay is replaced.
Add	Adds a newly received code while preserving previously registered codes. This mode is used when adding a new transmitter. If the number of codes exceeds 4, the oldest registered code is erased first.
Confirm	Confirms how many codes are currently registered. When adding a new code, this mode is used to check how many codes already exist.
Prohibit	To delete all the registered codes and to prohibit the wireless door lock function. This mode is used when a key is lost.