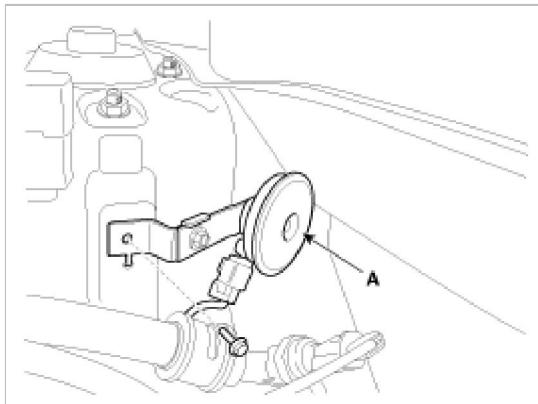


| Terminal Position | 2 | 1 |
|-------------------|---|---|
| Hood open (Free) | ○ | ○ |
| Hood close (Push) | | |

Burglar Horn Inspection

1. Remove the burglar horn (A) after removing 1 bolt and disconnect the 2P connector from the burglar horn.



2. Test the burglar horn by connecting battery power to the terminal 1 and ground the terminal 2.
3. The burglar horn should make a sound. If the burglar horn fails to make a sound replace it.

Body Electrical System > BCM (Body Control Module) > Body Control Module (BCM) > Specifications

Specifications

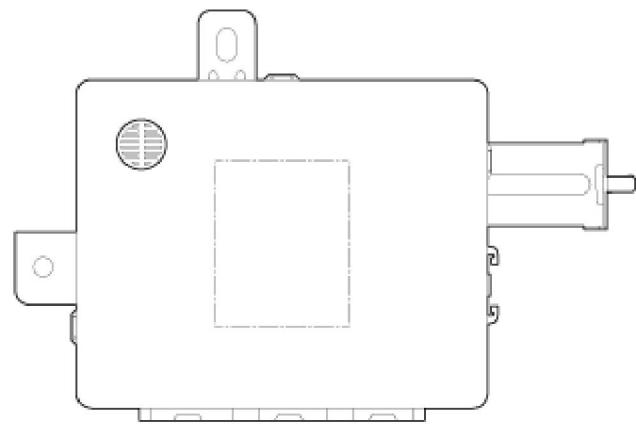
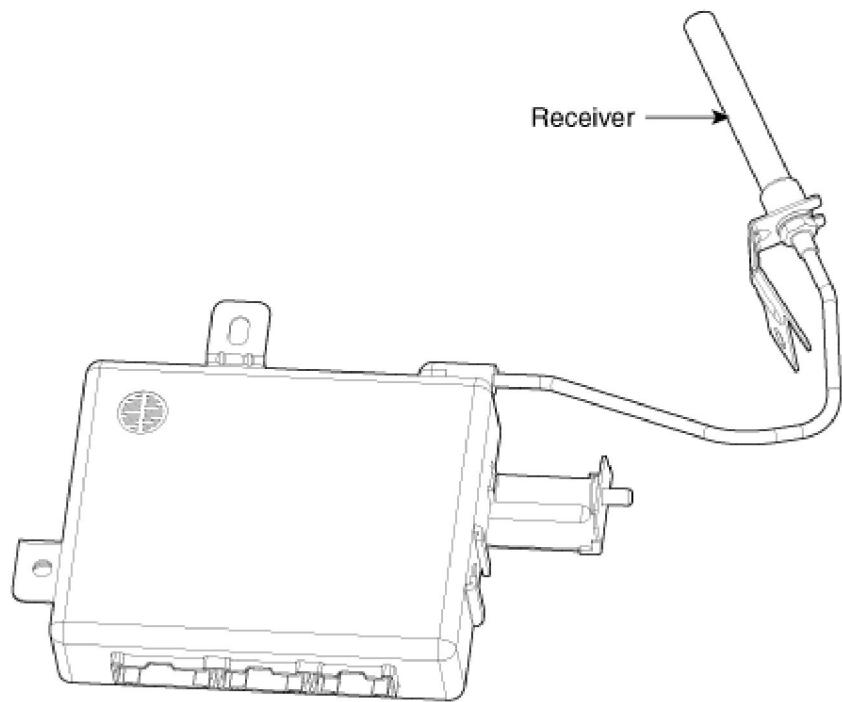
| Items | Specifications |
|-----------------------|----------------------------------|
| Rated voltage | DC 12V |
| Operating voltage | DC 9 ~ 16V |
| Operating temperature | -22° F ~ 176° F (-30° C ~ 80° C) |
| Insulation resistance | 100MΩ or more |
| | BCM & Receiver : 8mA |

Dark current

BCM : 4mA

Body Electrical System > BCM (Body Control Module) > Body Control Module (BCM) > Components and Components Location

Components



Body Electrical System > BCM (Body Control Module) > Body Control Module (BCM) > Schematic Diagrams

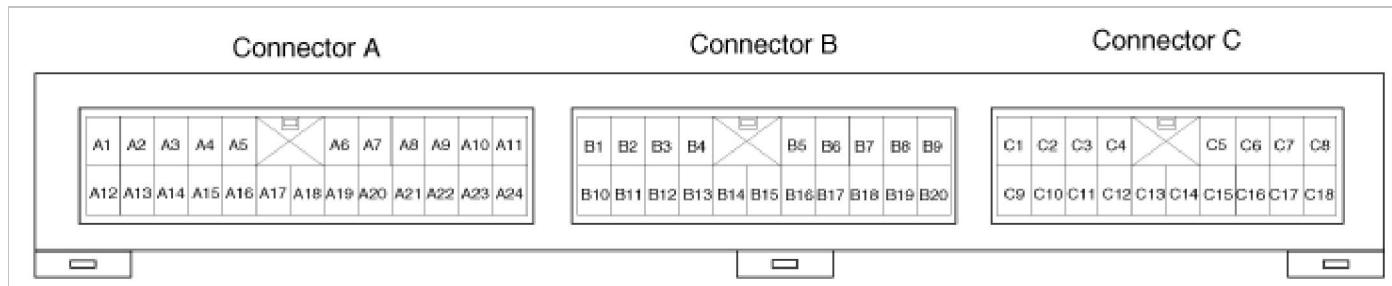
BCM Connector Terminals

BCM Input Signal SPEC

| No | Input signal name | Logic state | ON/OFF voltage recognition level (V) | Remarks |
|-----|-----------------------|--|---|---------|
| A01 | B+ | ON = Battery | 9V ~ 16V | |
| A02 | IGN1 | ON = Battery (IGN KEY is ON or START position) | 7V or more / 4V or less | |
| A03 | IGN2 | ON = Battery (IGN KEY is ON position) | 7V or more / 4V or less | |
| A04 | Brake switch | ON = Battery (Starting state) | 7V or more / 4V or less | |
| A05 | Mist switch | ON = Battery | 7V or more / 4V or less | |
| A06 | Crash unlock input | - | - | PWM |
| A07 | Head lamp low switch | OPEN = GND | 2V or less / OPEN (Reference value:4V or more) | |
| A08 | Head lamp high switch | OPEN = GND | 2V or less / OPEN (Reference value:4V or more) | |
| B03 | Front fog lamp switch | OPEN = GND | 2V or less / OPEN (Reference value:4V or more) | |
| A13 | ACC | ON = Battery | 7V or more / 4V or less | |
| A16 | INH 'R' switch | ON = Battery | 7V or more / 4V or less | |
| A18 | Wiper INT volume | - | - | A/D |
| A23 | Key inter lock switch | ON = GND | 2V or less / OPEN (Reference value:4V or more) | |
| A21 | Key in switch | ON = GND | 2V or less / OPEN (Reference value:4V or more) | |
| | | | 2V or less / OPEN | |

| | | | | |
|-----|----------------------|----------|---|---------------|
| A22 | Tail lamp switch | ON = GND | (Reference value:4V or more) | |
| B01 | LIN (RPAS) | - | - | Communication |
| B11 | Auto light signal | - | - | A/D |
| B13 | Auto light switch | ON = GND | 2V or less / OPEN (Reference value:4V or more) | |
| B14 | Diagnosis (K-Line) | - | - | Communication |
| B15 | Rear defogger switch | ON = GND | 2V or less / OPEN (Reference value:4V or more) | |

Pin Arrangement



Connector A

| No. | Signal Label | Signal Definition |
|-----|-----------------------------|--------------------------------|
| A01 | B+ | Battery |
| A02 | IGN1 | Local ignition1 input in BCM |
| A03 | IGN2 | Local ignition2 input in BCM |
| A04 | Brake switch | Brake switch |
| A05 | Mist switch | Mist switch |
| A06 | Crash unlock input (PWM) | Crash unlock input from airbag |
| A07 | Head lamp low switch | Head lamp low switch |

| | | |
|-----|-----------------------|------------------------|
| A08 | Head lamp high switch | Head lamp high switch |
| A09 | - | - |
| A10 | - | - |
| A11 | - | - |
| A12 | - | - |
| A13 | ACC | Local ACC input in BCM |
| A14 | - | - |
| A15 | - | - |
| A16 | INHIBIT 'R' switch | INHIBIT 'R' switch-h- |
| A17 | Washer switch | Washer switch |
| A18 | Wiper INT switch | Wiper INT switch |
| A19 | - | - |
| A20 | Wiper INT volume | Wiper INT volume |
| A21 | Key in switch | Key in switch |
| A22 | Tail lamp switch | Tail lamp switch |
| A23 | Key inter lock switch | Key inter lock switch |
| A24 | GND (Signal) | Signal ground |

Connector B

| No. | Signal Label | Signal Definition |
|-----|-----------------------|-----------------------|
| B01 | LIN (RPAS) | LIN Communication |
| B02 | - | - |
| B03 | Front fog lamp switch | Front fog lamp switch |
| B04 | Parking brake switch | Parking brake switch |
| B05 | - | - |
| B06 | - | - |

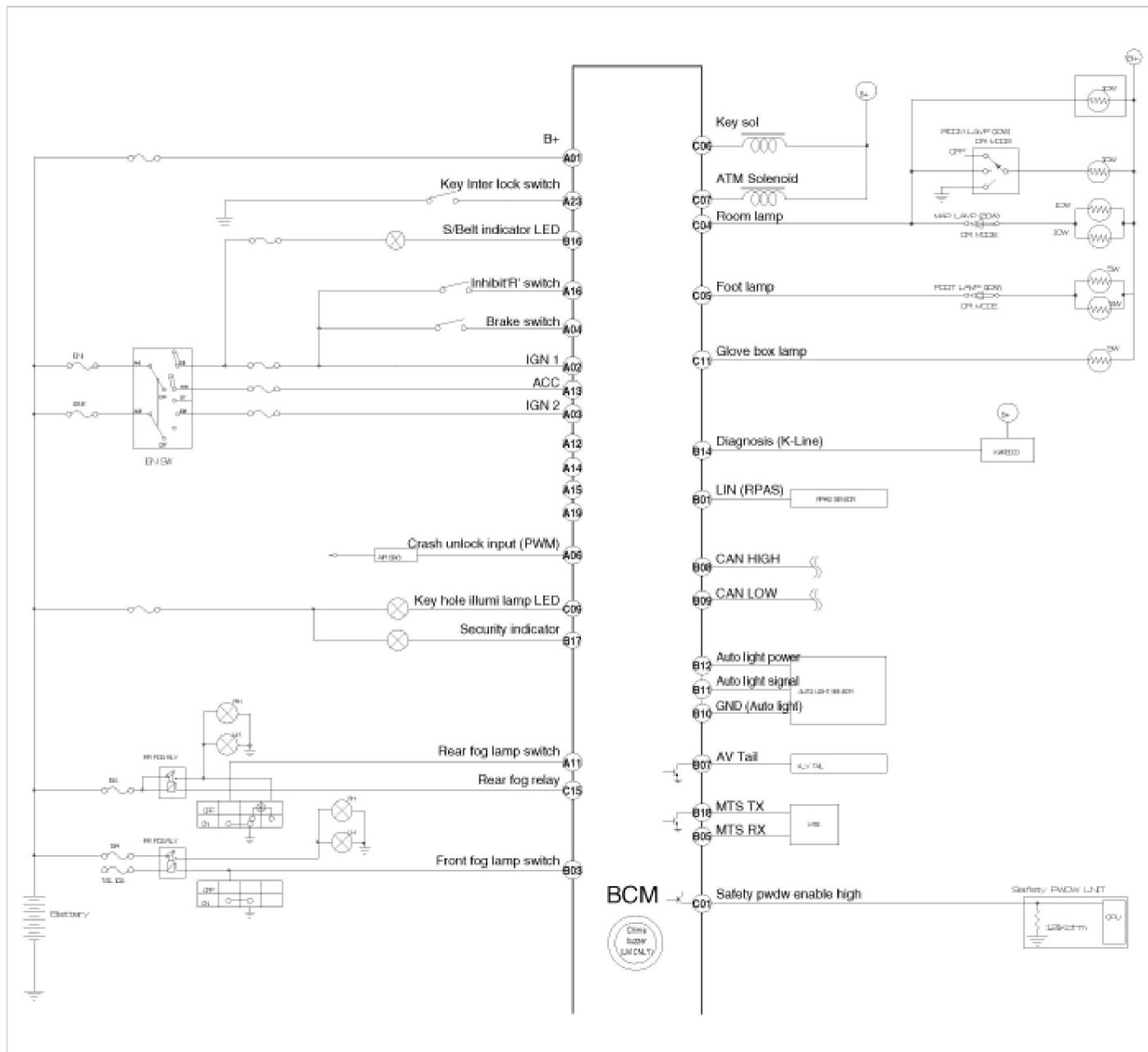
| | | |
|-----|--------------------------------|--------------------------------|
| B07 | AV tail | AV tail |
| B08 | CAN high | CAN high |
| B09 | CAN low | CAN low |
| B10 | GND (Auto light) | Auto light ground |
| B11 | Auto light signal | Auto light signal |
| B12 | Auto light power | Auto light power |
| B13 | Auto light switch | Auto light switch |
| B14 | Diagnosis (K-Line) | K-line communication |
| B15 | Defogger switch | Defogger switch |
| B16 | Assist seat belt indicator LED | Assist seat belt indicator LED |
| B17 | Security indicator LED | Security indicator LED |
| B18 | - | - |
| B19 | Head lamp low signal | Head lamp low signal |
| B20 | Speed IMS | Speed state to IMS |

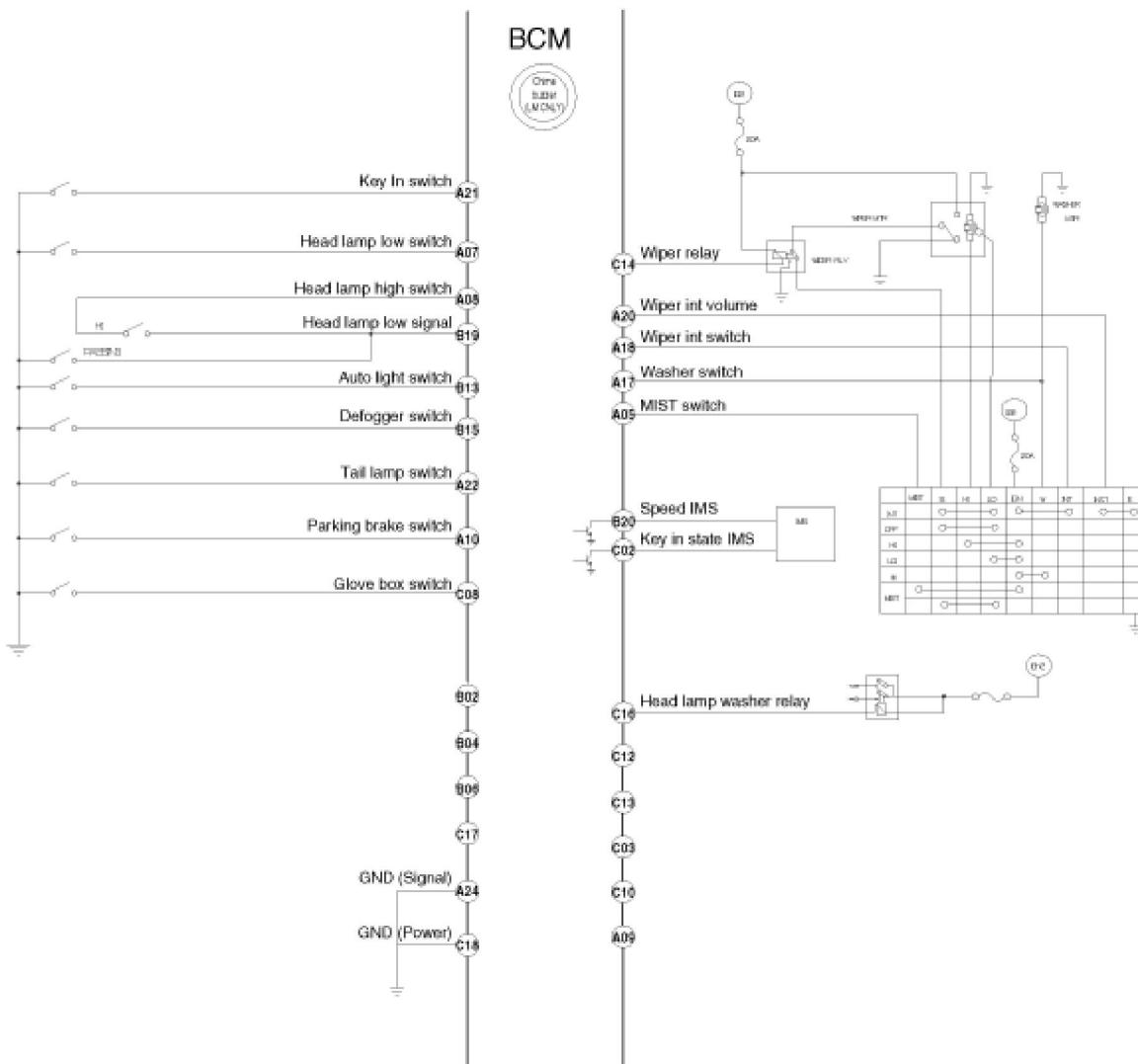
Connector C

| No. | Signal Label | Signal Definition |
|-----|-----------------------------------|-----------------------------------|
| C01 | Safety power window enable high | Safety power window enable high |
| C02 | Key in state IMS | Key in state to IMS |
| C03 | - | - |
| C04 | Room lamp | Room lamp |
| C05 | - | - |
| C06 | Key SOL | Key solenoid |
| C07 | ATM SOL | ATM solenoid |
| C08 | Glove box switch | Glove box switch |
| C09 | Key hole illumination Lamp LED | Key hole illumination Lamp LED |

| | | |
|-----|------------------------|------------------------|
| C10 | - | - |
| C11 | Glove box lamp | Glove box lamp |
| C12 | - | - |
| C13 | - | - |
| C14 | Wiper relay | Wiper relay |
| C15 | - | - |
| C16 | Head lamp washer relay | Head lamp washer relay |
| C17 | - | - |
| C18 | GND (POWER) | Power ground |

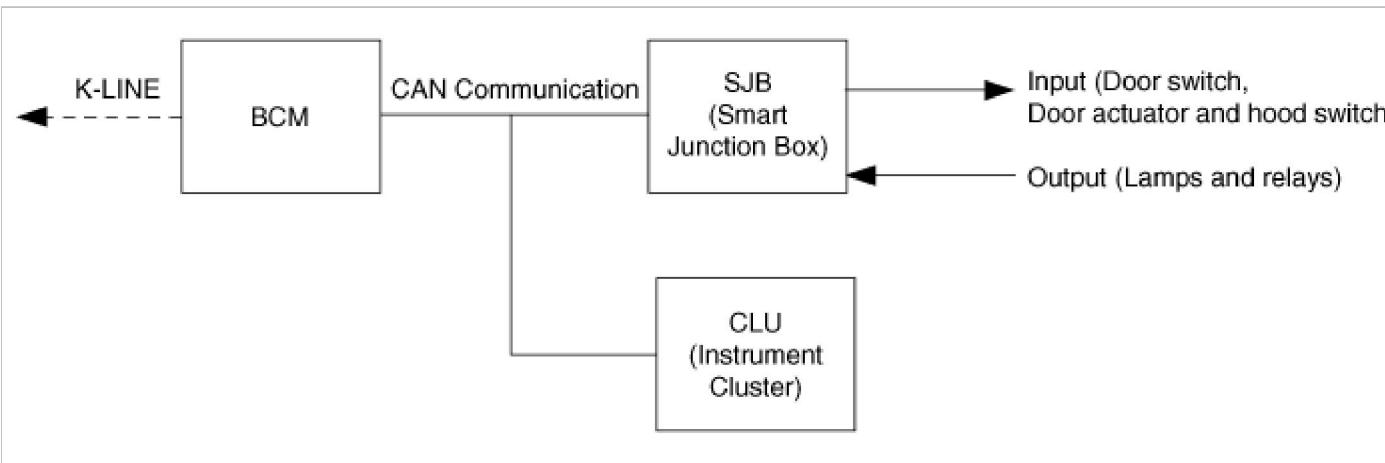
Circuit Diagram





Body Electrical System > BCM (Body Control Module) > Body Control Module (BCM) > Description and Operation

Description



Body control module receives various input switch signals controlling time and alarm functions for the intermittent wiper timer, washer timer, rear defogger timer, seat belts warning, central door lock, ignition key reminder, power window, door warning, tail lamp, crash door unlock, ignition key hole illumination, rear fog lamp control and keyless entry & burglar alarm.

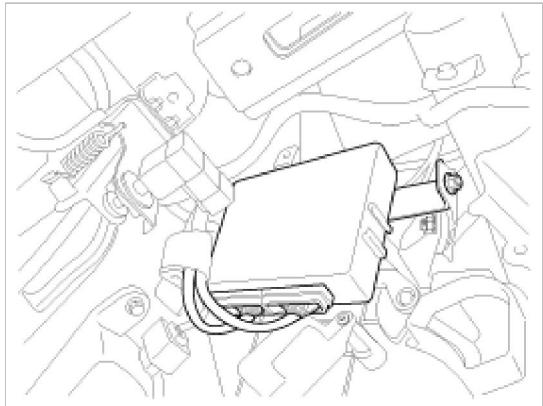
BCM, SJB(Smart Junction Box) and CLU(Instrument Cluster) are connected by CAN line.

The nearest module with input switch or actuator receives the input data to reduce the wiring and then send input data to the others which need them via CAN lines.

In case of sending output, it is used to CAN communication, not wiring.

SJB can also control relays and IPS.

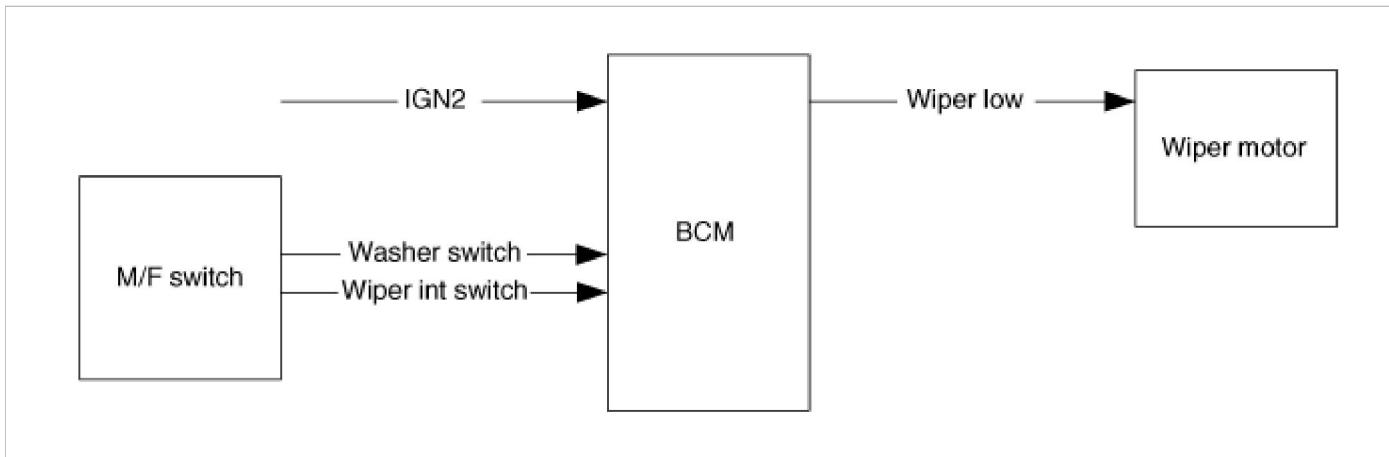
So Each module allots the current data and actuation data.



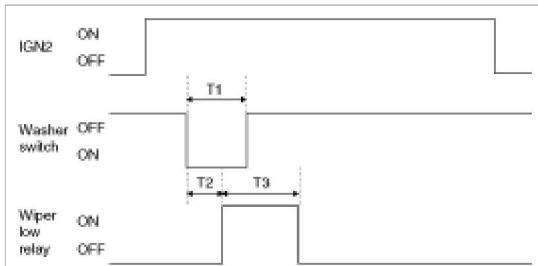
Function

Wiper Control

Washer Control Coupled With Wiper

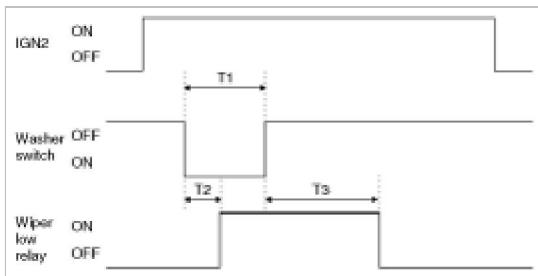


1. Under IGN2 = ON, wiper LOW relay is turned ON after T2 from Washer switch ON if washer switch is ON for T1 and wiper LOW relay is turned OFF after T3.



T1: 0.06s~0.2s, T2: 0.3s \pm 0.1s, T3: 0.7s \pm 0.1s

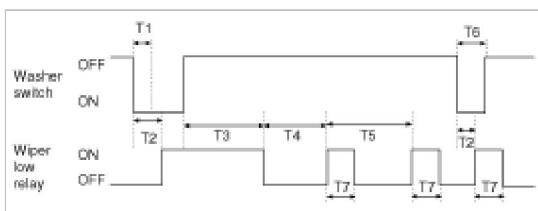
2. Under IGN2 switch ON, wiper LOW relay is turned ON after T2 from Washer switch ON if washer switch is ON for at least T1, and wiper LOW relay is turned OFF after T3 from the moment that Washer switch is turned OFF.



T1: 0.2s(MIN), T2: 0.3s \pm 0.1s

T3: 2.5s~3.8s(2~3 Turn)

3. Operation in Item (2) is performed if Washer switch is ON for at least T1 during WIPER operation with Wiper int switch. Operation in Item (1) is performed if Washer switch is ON for T6.



T1: 0.2s(MIN), T2: 0.3s \pm 0.1s

T3: 2.5s~3.8s(2~3 Turn), T4: T5 - 0.7s

T5: INT TIME, T6: 0.06s ~0.2s, T7: 0.7s \pm 0.1s

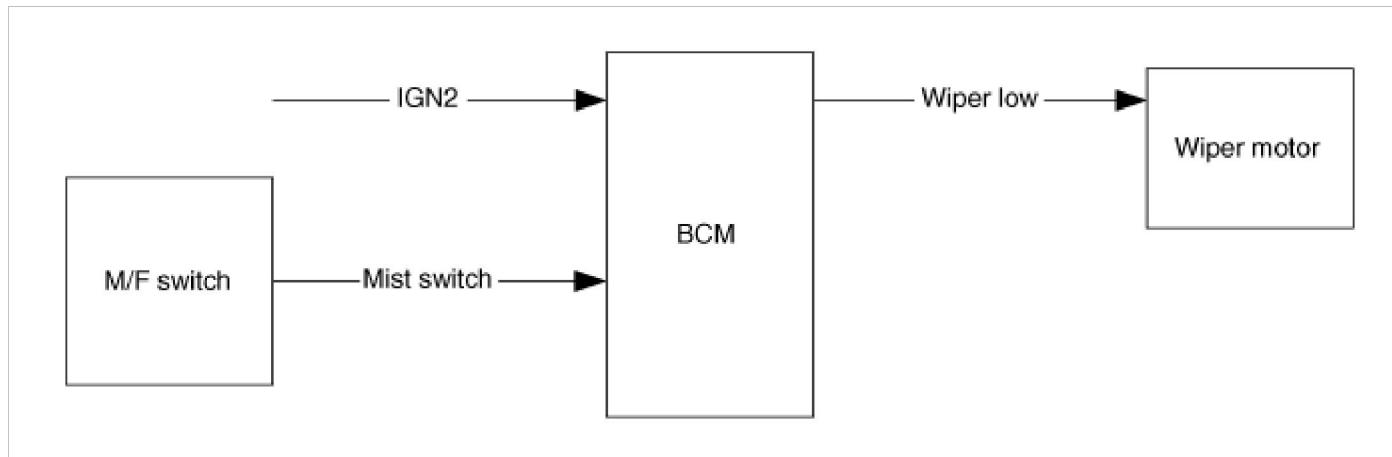
4. Operation is cancelled in case of IGN OFF during T3.

5. Give priority to WASHER interlocking WIPER than Speed sensing INT WIPER function.

6. Washer switch signal input shall be ignored at start-up (IGN1 ON & IGN2 OFF states).

7. Switch ON time includes chattering time

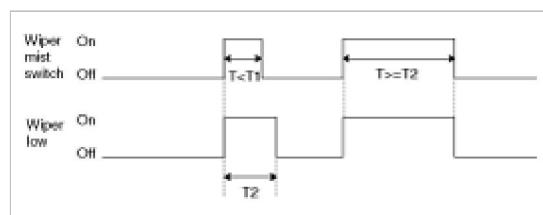
Front Wiper Mist Function Wiper



1. Function Description

In case of IGN2 On (IGN2 ON), if turning on the Wiper Mist switch(Wiper Mist switch On), then Wiper is controlled, by switch on time. Mist operation does not work at Wiper Washer.

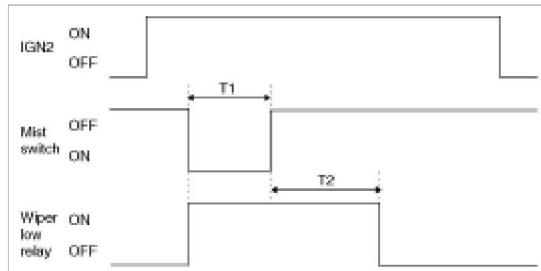
| Mist Switch On Time (TMist) | Action |
|-----------------------------|---|
| TMist < 0sec | No action |
| 0sec ≤ TMist < 0.7sec | After “Mist Out Delay Time” , turn on the Wiper Low Output for “One Wiping” Time (the remaining motor operation to reach wiper park position is done by electrical wiring) |
| 0.7sec ≤ TMist | After “Mist Out Delay Time” , turn on the Wiper Low Output and after Mist switch off, Wiper Low Output is Off immediately (the remaining motor operation to reach wiper park position is done by electrical wiring) |



T1 : One Wiping, T2 : Mist One Time

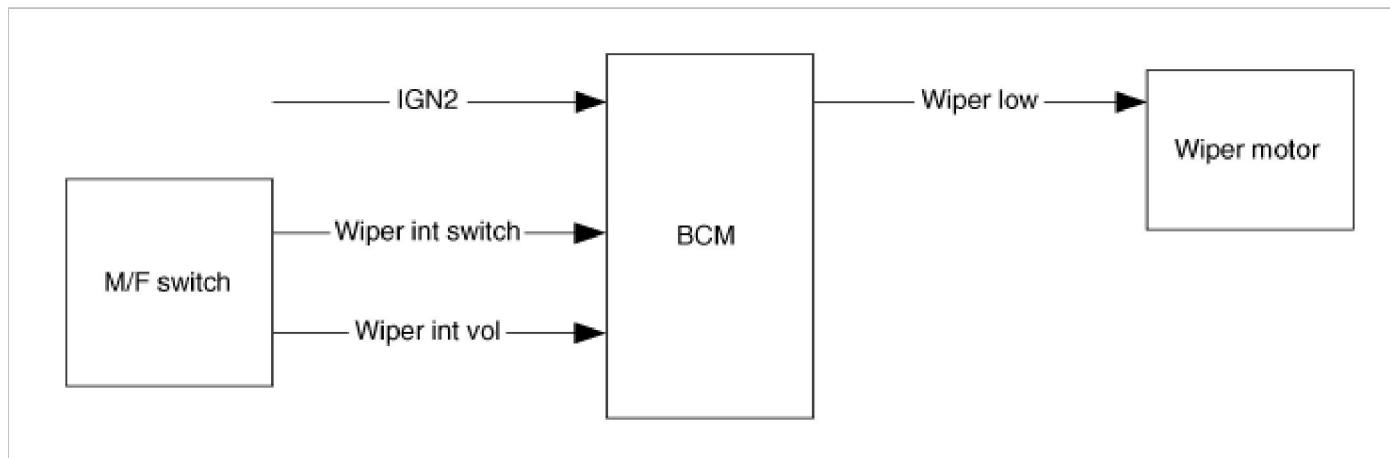
2. Under IGN2 switch ON, Wiper LOW relay is turned ON immediately from Mist switch ON if Mist switch ON for more than T1, Wiper LOW relay is turned OFF after T2

from Mist switch OFF.

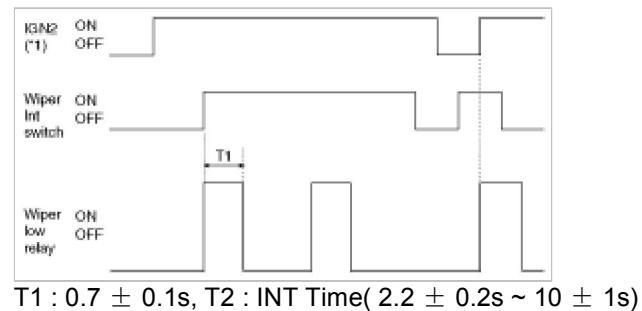


T1 : 0.7s(Min), T2 : 0.7s±0.1s

Variable Int Wiper



1. Under IGN2 switch ON & Wiper Int switch ON states, and wiper int volume value are acquired and intermittent time is calculated. then, wiper intermittent time is automatically converted.



*1 ON : IGN2 = ON OFF: IGN2 = OFF

2. Wiper Control Precaution

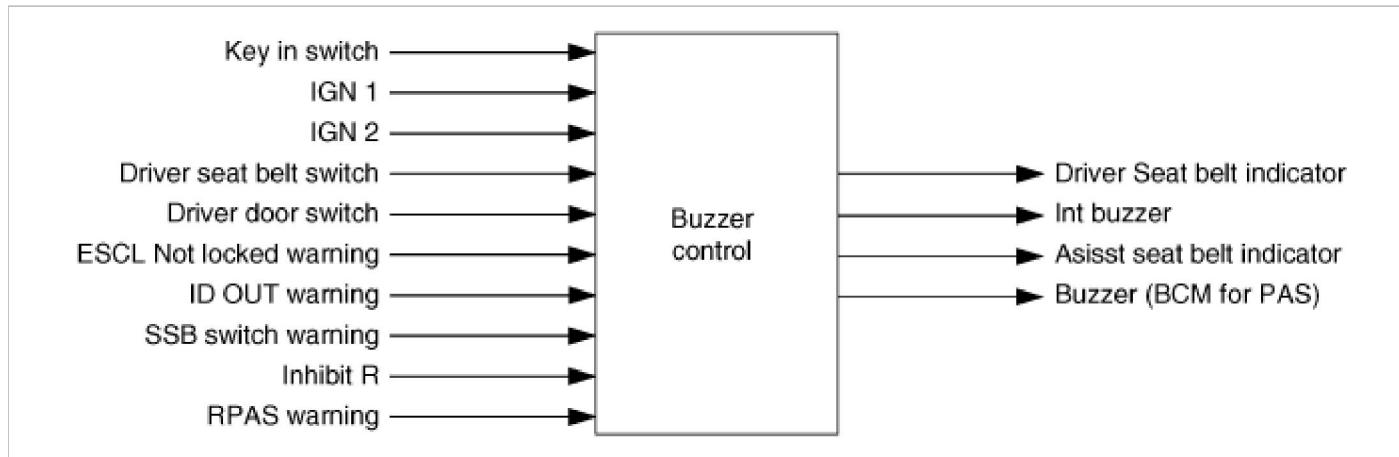
(1) Variable int wiper

- A. Wiper low relay time is 0.7s ±0.1s.
- B. Intermittent time is from output ON to the next output ON.
- C. Wiper low relay output is continued for remaining ON time if INT switch is turned OFF during output.
- D. Intermittent time is restarted when IGN2 switch is ON and wiper Int switch is changed from OFF to ON.
- E. Intermittent time is restarted when wiper int switch is ON and IGN2 switch is changed from OFF to ON
- F. 2.5V is used when volume value is 2.5V or more.

| Input voltage (Volume) | Intermittent time (sec) ±10% | Remarks |
|---------------------------|---------------------------------|---------|
| | Speed is fixed | |
| 0.0V | 2.2 Sec | |
| 1.0V | 3 Sec | |
| 1.5V | 3.8 Sec | |
| 2.0V | 5.6 Sec | |
| 2.5V | 10 Sec | |

Buzzer Control

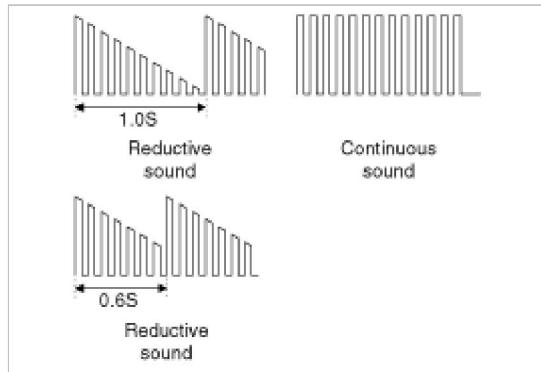
Data Flow



Buzzer Sound

1. Buzzer sound spec

| Priority | Name | Cycle | Duration |
|----------|-------------------------------|------------------|----------|
| 1 | RPAS warning | - | Spec |
| 2 | Seatbelt warning | 1s / Reductive | Spec |
| 3 | Key operated warning | 1s / Reductive | Infinite |
| 4 | Parking brake warning | 0.6s / Reductive | Infinite |
| 5 | Vehicle not P warning | 0.6s / Reductive | Spec |
| 6 | ID out warning | Continuous Sound | Spec |
| 7 | SSB button warning | 0.6s / Reductive | Spec |
| 8 | Key battery discharge warning | 0.6s / Reductive | Spec |
| 9 | Deactivation warning | Continuous Sound | Spec |

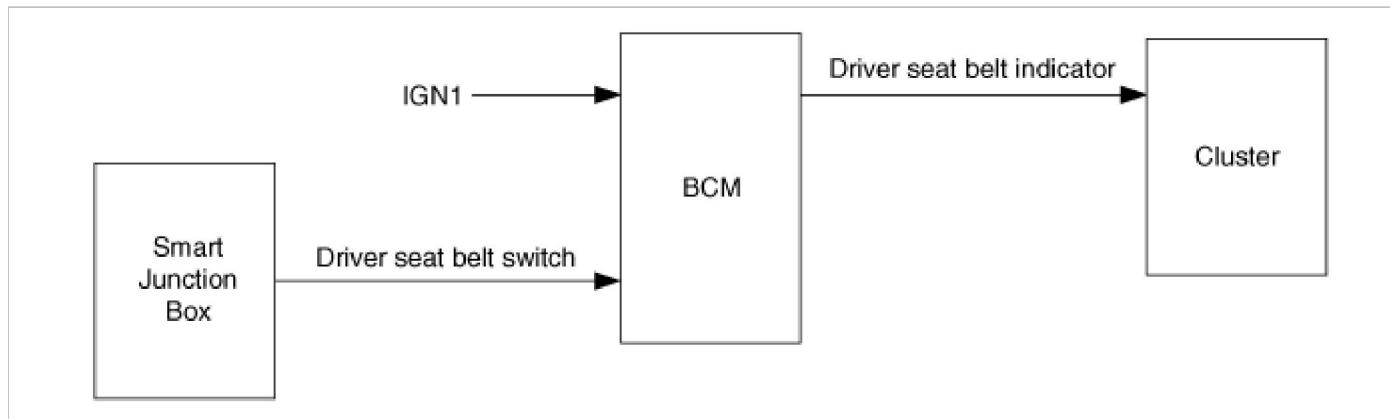


2. Buzzer output

Buzzer output to estimate BCM int buzzer in cluster, and data transmission.

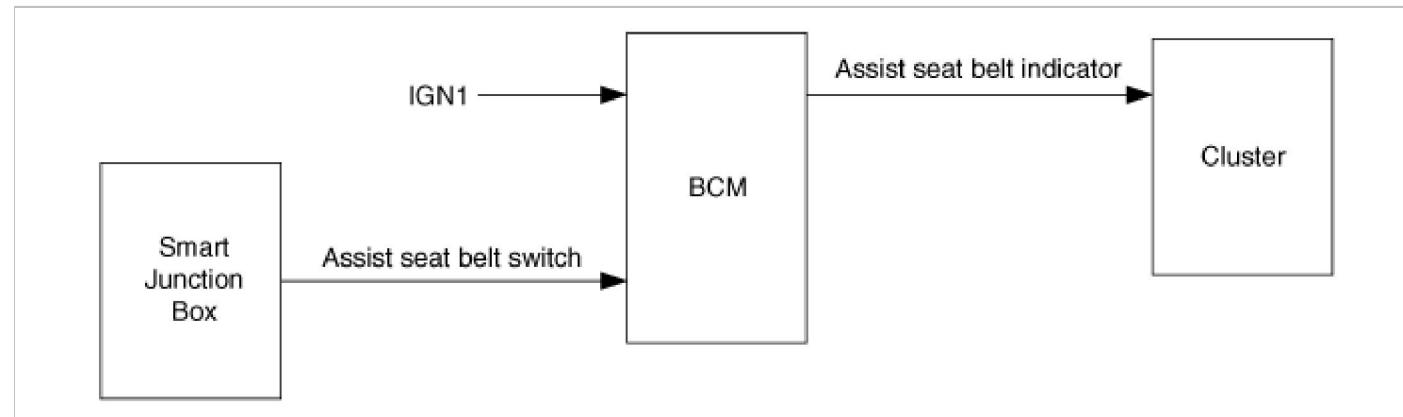
※ Internal buzzer is used for rear parking assist system.

Seat belt reminder (Driver seat)



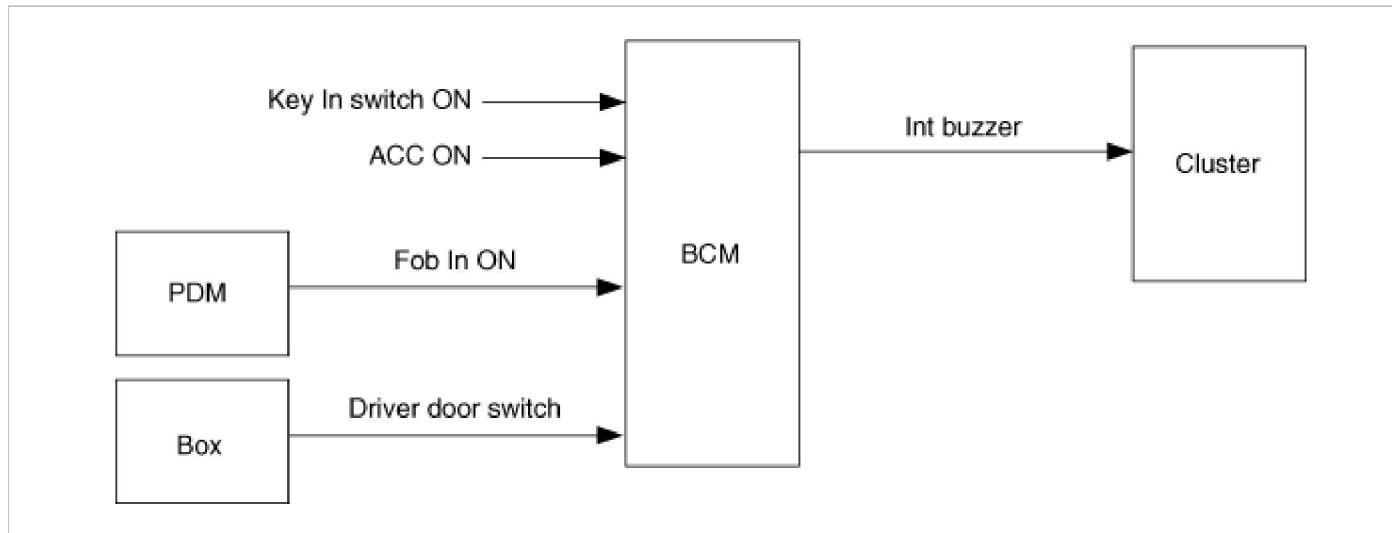
1. From IGN1 switch ON, Warning lamp for 1sec(DUTY 50%) and Chime buzzer for 6 time every 1sec. (in case of S/BELT unfastened state) But, within 6sec in the S/BELT fastened, the Chime buzzer output is stop, and Warning lamp is the remaining time.
2. Lamp and Chime buzzer become output stop when IGN1 is turned OFF within 6sec-output.
3. If vehicle speed over 10Km/h, Warning lamp and Chime buzzer are work for 1time when Seat belt unfastened after IGN ON.
4. If vehicle speed below 5Km/h or IGN OFF or seat belt fastened, pattern is stop when pattern is running.
5. Seat belt fastened→unfastened when IGN1=ON state : if vehicle speed over 10Km/h, 1time output. And if vehicle speed 5~10Km/h, Warning lamp for 1s(DUTY 50%) and Chime buzzer for 6 every 1s. If vehicle speed less than 5Km/h, Warning lamp for 6 every 1s(DUTY 50%)

Seat belt reminder (Assist seat)

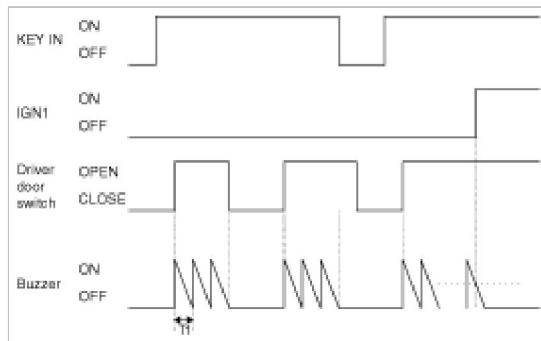


1. Warning lamp lights continuously every 1sec(DUTY 50%) for 6sec when IGN is turned ON under unfastened seat belt.
2. Warning lamp is turned OFF when IGN is turned OFF within in time.
3. When IGN is ON under unfastened seat belt, the warning lamp lights. The lamp continues to light for remaining time of 6sec when seat belt is fastened within 6sec. The lamp is OFF if seat belt is fastened after 6sec.
4. When IGN is ON and vehicle speed becomes 10Km or more and unfastened seat belt, warning lights ON continuously.
5. Under the (4)state, warning lamp is stopped when seat belt is unfastened or vehicle speed becomes under 5Km/h or IGN is turned OFF.

Key Operated Warning



1. Int buzzer every 1sec when driver door switch is on under key in on .
2. Output is off if key in off and driver door switch close are met during Int buzzer output.
3. At IGN1 on, output is off.

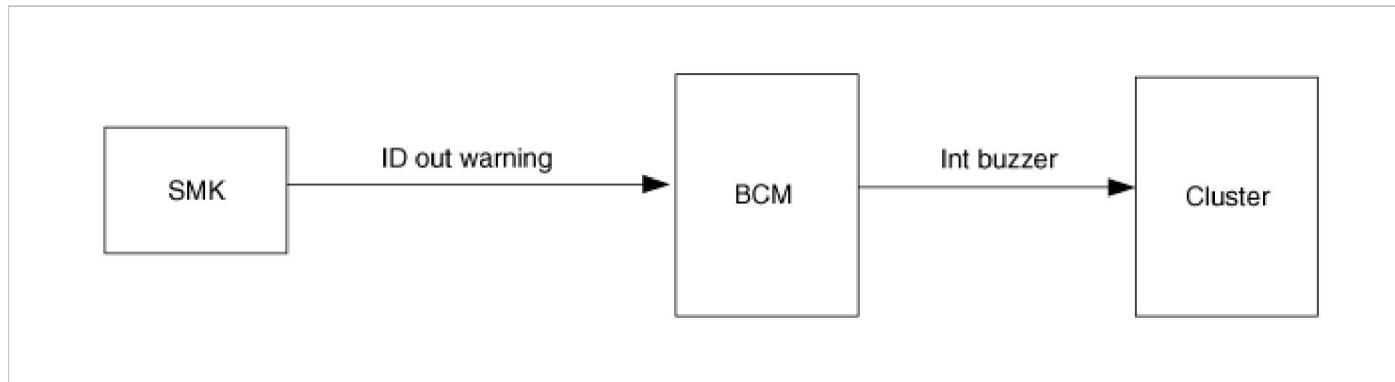


T1 : 1 ± 0.1sec

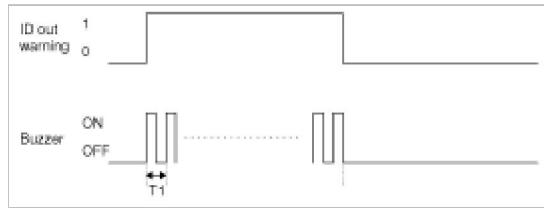
KEY IN ON : Key in switch ON or ACC ON or fob in ON

KEY IN OFF : Key in switch OFF and ACC OFF and fob in OFF

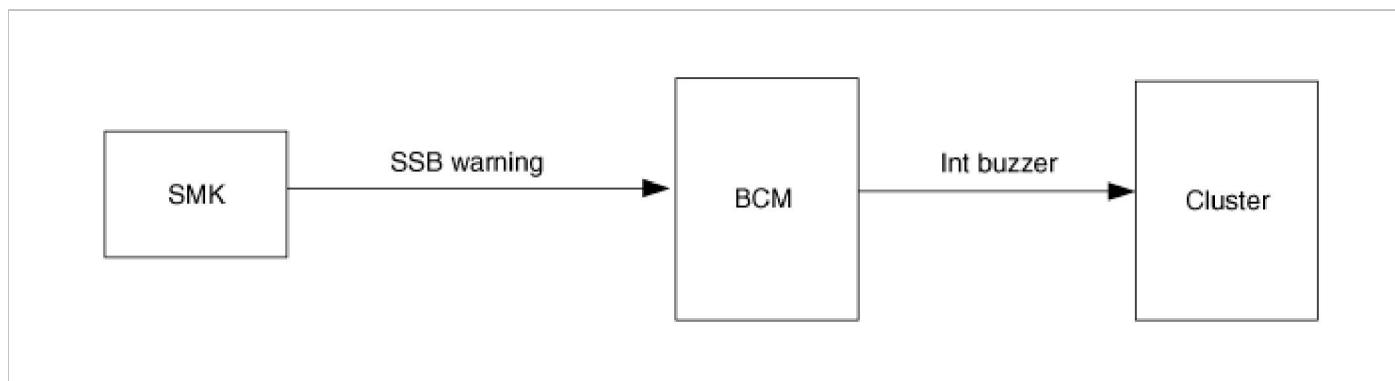
ID Out Warning (SMK)



WARNING BUZZER outputs for the time of reception about ID OUT Warning(CAN) ON.
 WARNING BUZZER OUTPUT STOPS when receiving OFF



SSB Switch Warning (SMK)

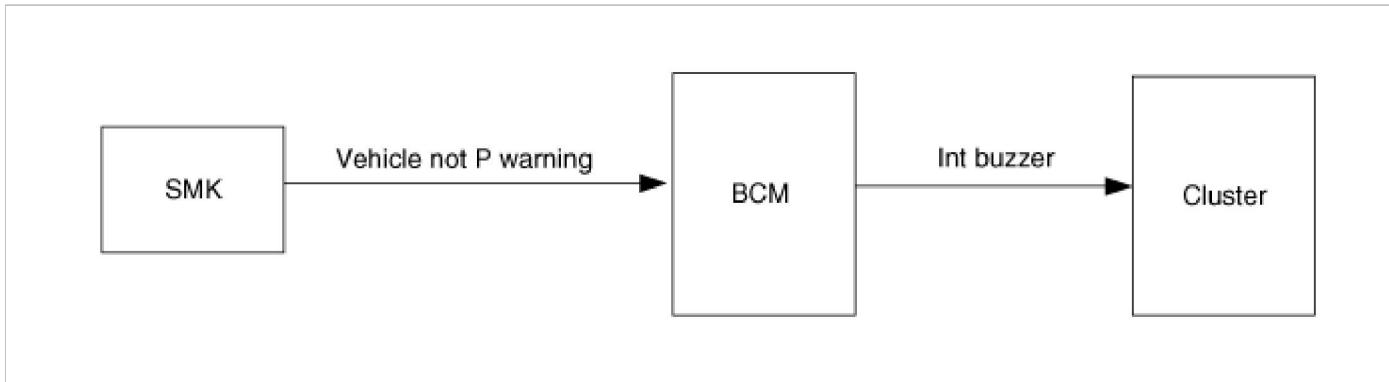


WARNING BUZZER outputs for the time of reception about SSB Warning(CAN) ON.
 WARNING BUZZER OUTPUT STOPS when receiving OFF.

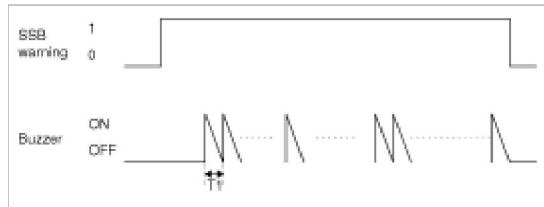


T1 : $0.6 \pm 0.1\text{sec}$

Vehicle Not P Warning (SMK)



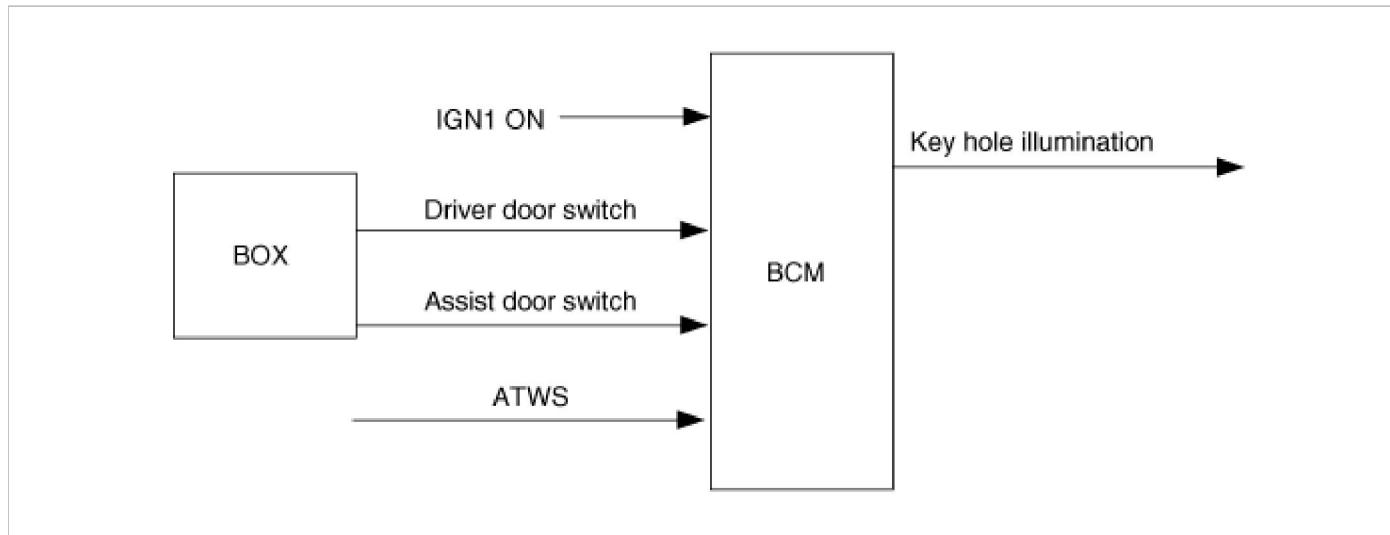
When receiving vehicle Not P Warning(CAN) ON, when releasing while putting a alarm into effect, it'll be canceled immediately.



T1 : $0.6 \pm 0.1\text{sec}$

IGN Key Hole Illumination

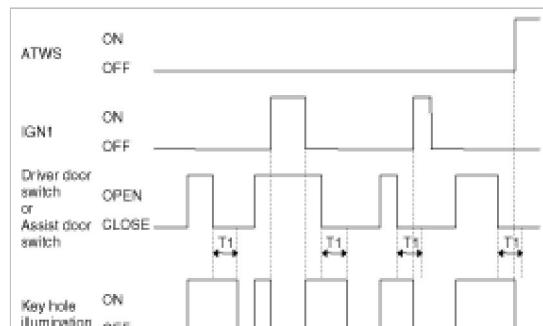
Data Flow



Function Description

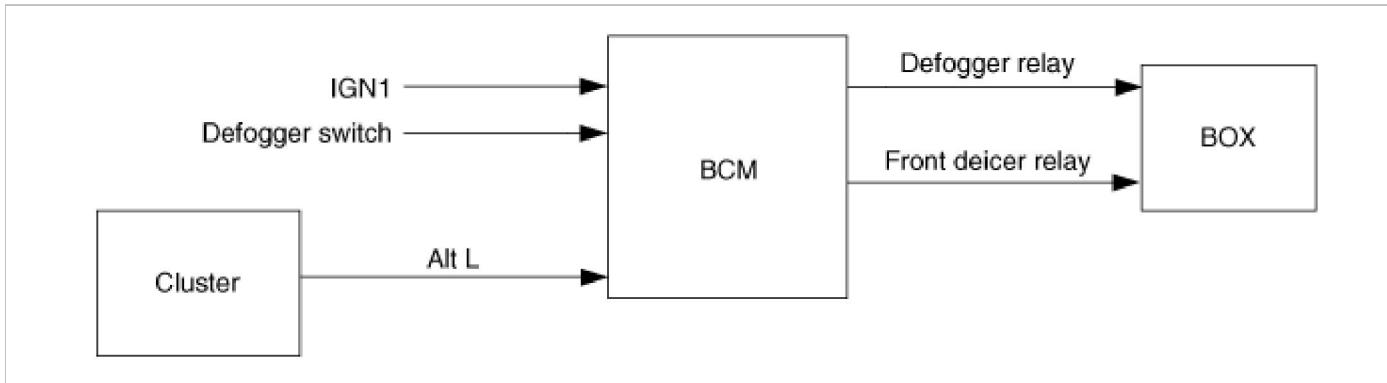
1. Key hole illumination is turned ON at IGN1 OFF and driver door switch(or assist door switch) OPEN.
2. The output of key hole illumination is turned ON for 30s after the OFF state is delayed at (1) state and driver door switch(or assist door switch) CLOSE.
3. Key hole illumination is immediately turned OFF at IGN switch ON during output.
4. If ATWS state is ARMWAIT mode, key hole illumination is immediately turned OFF.

ATWS ON: ARMWAIT mode



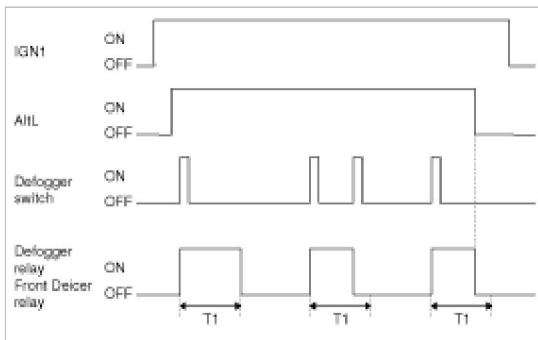
Defogger & Deicer Timer Control

Data Flow



Defogger & Front Deicer Timer

1. Defogger relay & Front deicer relay is turned ON for 20min if defogger switch ON after Alt L ON & IGN1 ON.
2. Defogger relay & Front deicer relay is turned OFF if again defogger switch ON during defogger relay ON.
3. Defogger relay & Front deicer relay is turned OFF if AltL OFF or IGN1 OFF during defogger relay ON.
4. Defogger relay & Front deicer relay and OFF of the output will remain at Defogger switch ON & Alt L ON.

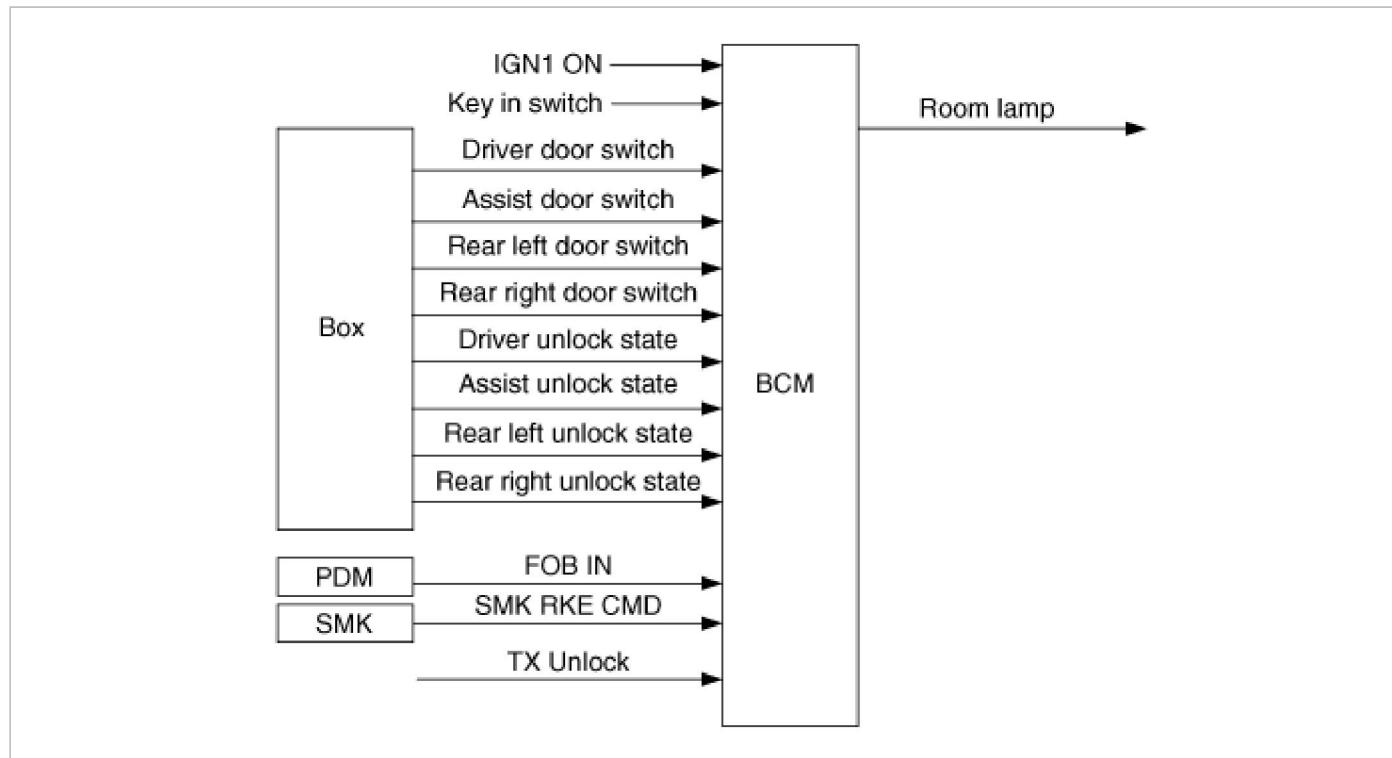


T1 : 20 ± 1min

Decayed Room Lamp & Keyless Unlock Timer

Delay Out Interior Lamp

- IGN1 off the door (Trunk excluded) will be lit to open the room lamp.
- Room lamp 4 Door closes, a 30-second delay will be lights out.
- 4 Door in closed IGN1 off & (Key in → Key out): 30-second delay will be lights out.



※TX UNLOCK : Include Keyless or SMK by UNLOCK.

※IGN KEY IN->OUT

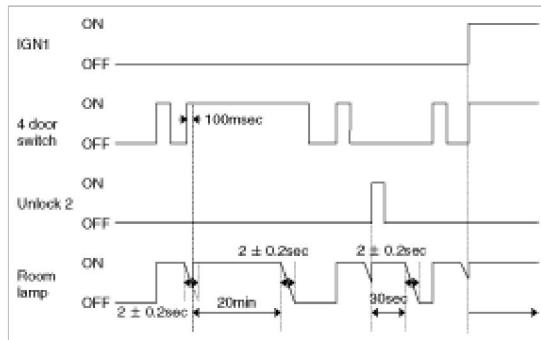
: IGN KEY OFF -> ON or ACC OFF-> ON or IGN1 OFF-> ON or IGN2 OFF->ON(Keyless)

: FOB IN OFF-> ON or ACC OFF -> ON or IGN1 OFF-> ON or IGN2 OFF-> ON(SMK)

Description Of State

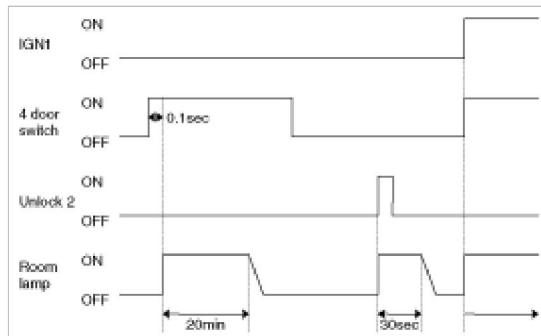
1. Room Lamp off

| State | Description |
|-------------------|--------------------|
| Initial Condition | Room lamp decaying |
| Event | Decay finished |
| Action | Room lamp off |



2. Room Lamp on

| State | Description |
|-------------------|---------------------------|
| Initial Condition | Room Lamp off |
| Event | IGN1 on & 4door switch on |
| Action | Room Lamp on |



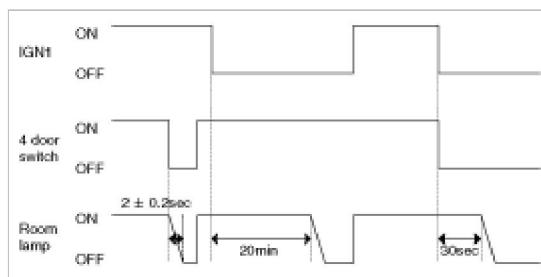
| State | Description |
|-------------------|---------------------------|
| Initial Condition | Room Lamp Decaying |
| Event | IGN1 on & 4door switch on |
| Action | Room Lamp on |

| State | Description |
|-------------------|------------------------|
| Initial Condition | Room Lamp on for 20min |
| Event | IGN1 on |
| Action | Room Lamp on |

3. Room Lamp on for 30s

| State | Description |
|-------------------|-----------------------------------|
| Initial Condition | Room Lamp on for 30s |
| Event | TX Unlock or Key In switch on→off |
| Action | Restart Room Lamp on for 30s |

| State | Description |
|-------------------|-----------------------------|
| Initial Condition | Room Lamp on |
| Event | IGN1 off & 4door switch off |
| Action | Start Room Lamp on for 30s |



NOTE

- The flickering of lamp is not allowed even though IGN1 ON

- The resolution of Decayed Room Lamp must be more than 32 step.

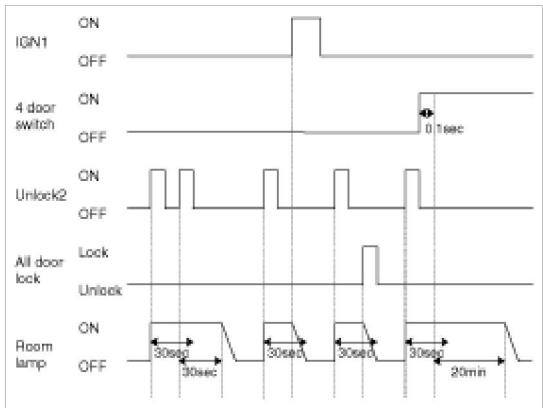
| State | Description |
|-------------------|-----------------------------|
| Initial Condition | Room Lamp on for 20min |
| Event | IGN1 off & 4door switch off |
| Action | Start Room Lamp on for 30s |

| State | Description |
|-------------------|--|
| Initial Condition | Room Lamp Decaying |
| Event | IGN1 off & 4door switch off & (TX Unlock or Key In switch on→off) |
| Action | Start Room Lamp on for 30s |

| State | Description |
|-------------------|--|
| Initial Condition | Room Lamp off |
| Event | IGN1 off & 4door switch off & (TX Unlock or Key In switch on→off) |
| Action | Start Room Lamp on for 30s |

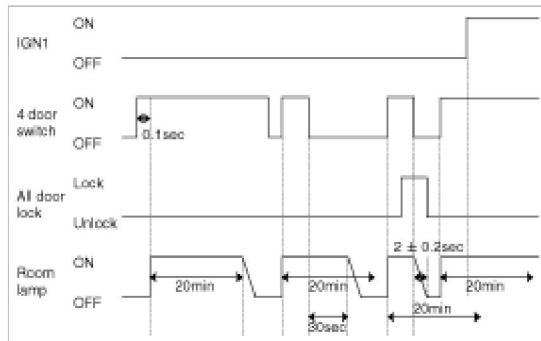
4. Room Lamp Decaying

| State | Description |
|-------------------|---|
| Initial Condition | Room Lamp on for 30s |
| Event | IGN1 on or 30s elapsed or Any Door Unlock→All Door Lock1 |
| Action | Start Room Lamp Decaying |



| State | Description |
|-------------------|-----------------------------|
| Initial Condition | Room Lamp on |
| Event | IGN1 on or 4door switch off |
| Action | Start Room Lamp Decaying |

| State | Description |
|-------------------|---|
| Initial Condition | Room Lamp on for 20min |
| Event | 20min elapsed or (IGN1 off & 4door switch off & All Door Lock1) |
| Action | Start Room Lamp Decaying |



5. Room Lamp on for 20min

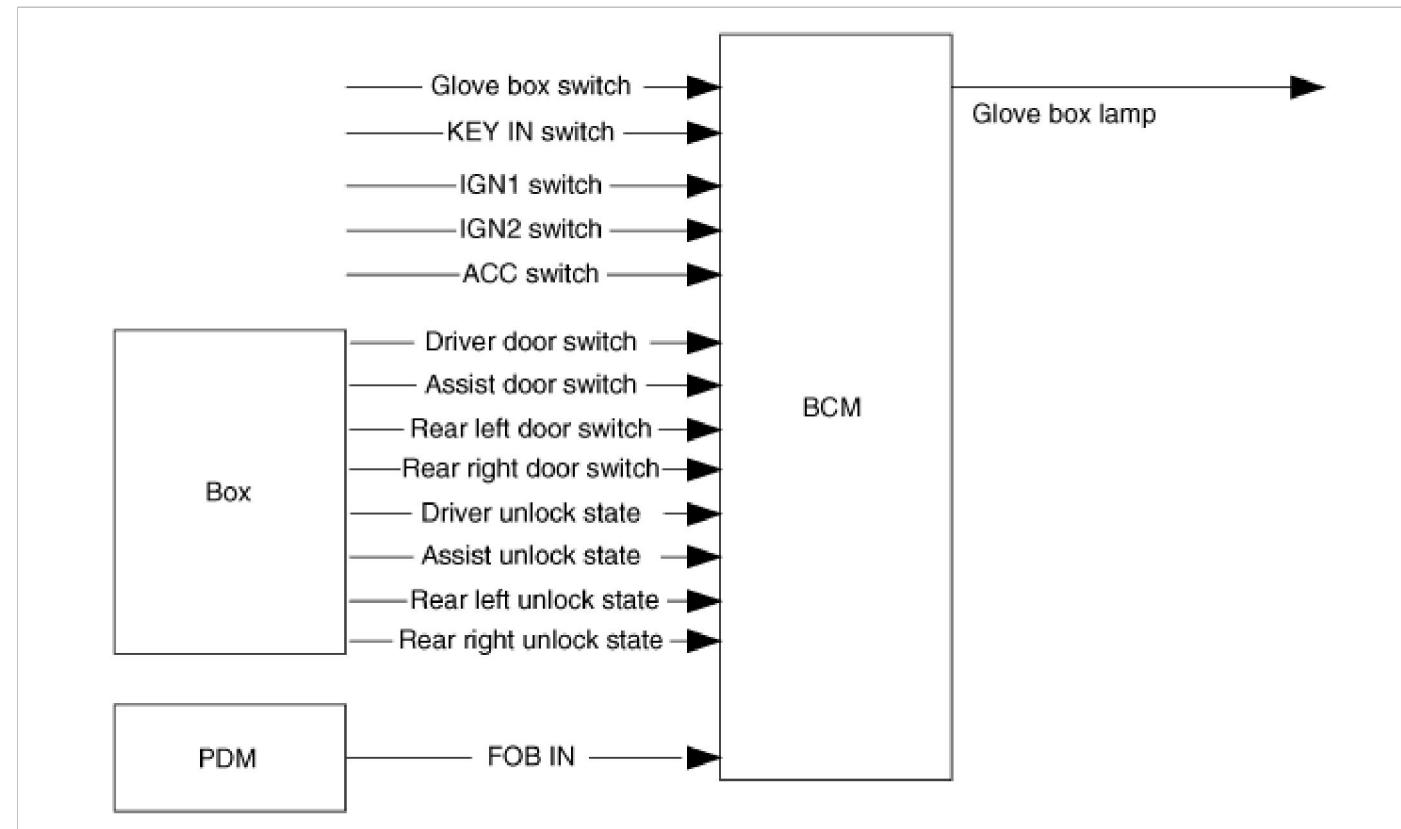
| State | Description |
|-------------------|---|
| Initial Condition | Room Lamp off |
| Event | IGN1 off & (4door switch off→on for 100ms) |
| Action | Start Room Lamp on for 20min |

| State | Description |
|-------------------|---|
| Initial Condition | Room Lamp Decaying |
| Event | IGN1 off & (4door switch off→on for 100ms) |
| Action | Start Room Lamp on for 20min |

| State | Description |
|-------------------|--|
| Initial Condition | Room Lamp on for 30s |
| Event | IGN1 off & (4door switch off→on for 100ms) |
| Action | Start Room Lamp on for 20min |

| State | Description |
|-------------------|------------------------------|
| Initial Condition | Room Lamp on |
| Event | IGN1 off & 4door switch on |
| Action | Start Room Lamp on for 20min |

Glove Box Lamp Control



1. If GLOVE BOX is OPEN, LAMP is turned ON for 15min.

2. (1) state behavior by the conditions during the KEY IN OFF->ON to timer Reset does not.

Glove Box Lamp Off State

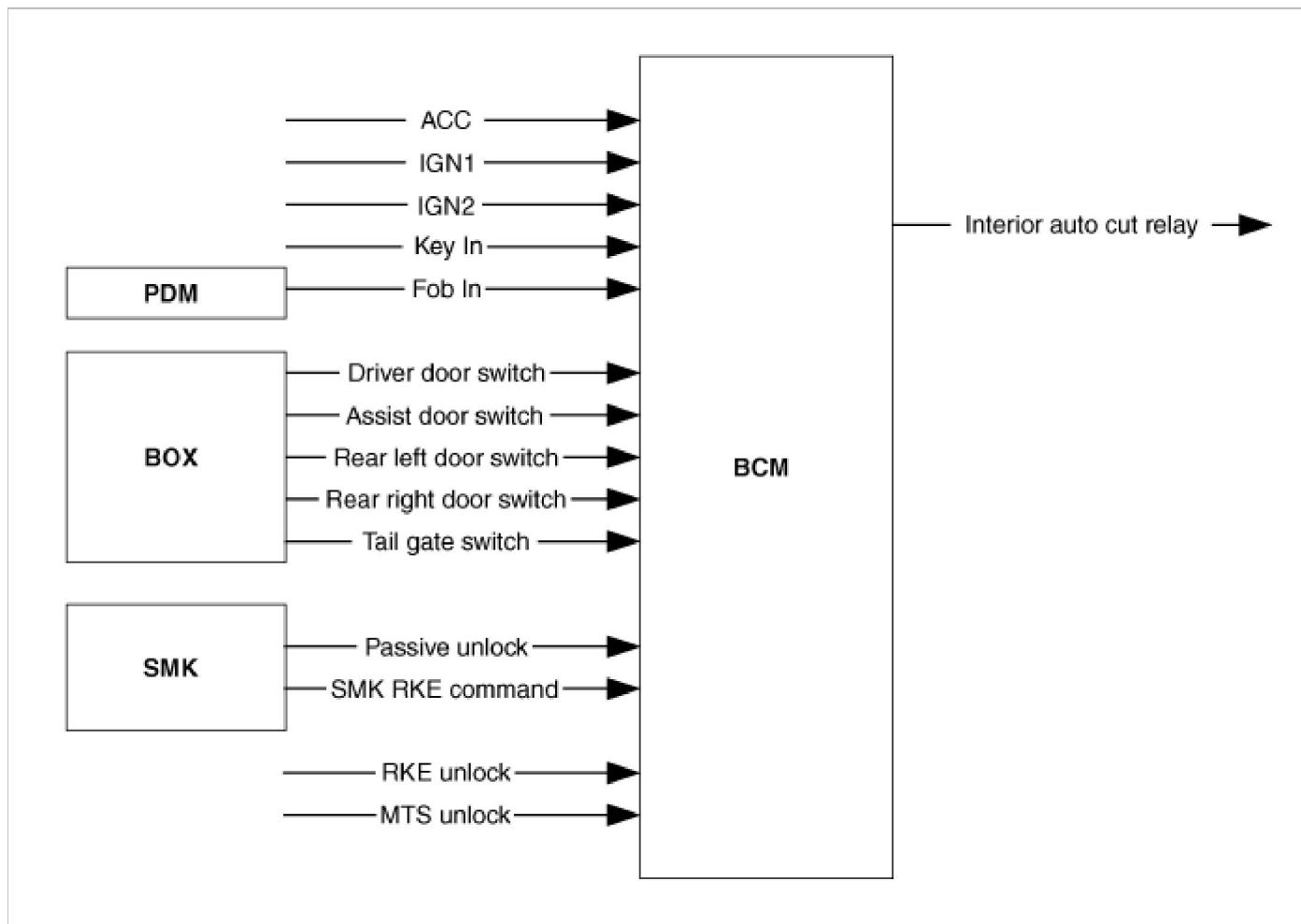
| State | Description |
|-------------------|--|
| Initial Condition | GLOVE BOX LAMP OFF State |
| Event | 1. Glove Box OPEN Event 2. KEY IN OFF to ON & Glove Box OPEN |
| Action | GLOVE BOX LAMP ON FOR 15MIN State Glove box Lamp ON (15min.) |

Glove Box Lamp On For 15Min State

| State | Description |
|-------------------|--|
| Initial Condition | GLOVE BOX LAMP ON FOR 15MIN State |
| Event | 1. Glove Box CLOSE 2. KEY IN OFF & (All Door Lock Event Central Door Lock output) & 4 DOOR CLOSE 3. 15min Timer expired |
| Action | GLOVE BOX LAMP OFF State Glove box Lamp OFF |

Interior Lamp Autocut Control Function

| No | Pre-condition | Event | Result |
|----|-----------------------------------|--|---------------------------------|
| 1 | - | Key Off or KeyIn → ACC, IGN, START | Interior Power On |
| 2 | | Any Door Open | |
| 3 | | Unlock Event | |
| 4 | | Trunk Open | |
| 5 | Interior Power On | All Door Close and Trunk Close and (Key Off or Key In) | Interior Power Cut after 20 min |
| 6 | Interior Power On (During 20 min) | Burglar Alarm state = 0 → 1 | Interior Power Cut after 5 sec |



1. Transitions from “Interior Lamp Autocut Power Off” state:

Condition 1

| State | Description | | |
|-------------------|--|---|---------------------------|
| Initial Condition | “Interior Lamp Autocut Off” state: | | |
| Event | 1. AfterACC = On or4. C_BAState = 1 → 0 | or2. AnyDoorOpen = On or5. C_TGSW = On | or3. AllUnlock = Off → On |

| | |
|--------|---|
| Action | <ul style="list-style-type: none"> State changed to “Interior Lamp Autocut On” • O_InteriorAutoCutRly = On |
|--------|---|

2. Transitions from “Interior Lamp Autocut Power 5 sec On” state:

Condition 1

| State | Description |
|-------------------|---|
| Initial Condition | “Interior Lamp Autocut 5 sec On” state: |
| Event | AutocutTimer >= Autocut5secTime |
| Action | <ul style="list-style-type: none"> State changed to “Interior Lamp Autocut Off” • O_InteriorAutoCutRly = Off |

Condition 2

| State | Description |
|-------------------|---|
| Initial Condition | “Interior Lamp Autocut 5 sec On” state: |
| Event | 1. AfterACC = On or2. AllUnlock = Off → On or3. C_BAState = 1 → 0 |
| Action | <ul style="list-style-type: none"> State changed to “Interior Lamp Autocut On” • O_InteriorAutoCutRly = On • Cancel AutocutTimer |

3. Transitions from “Interior Lamp Autocut Power 20 min On” state:

Condition 1

| State | Description |
|-------------------|--|
| Initial Condition | “Interior Lamp Autocut 20 min On” state: |
| Event | AutocutTimer >= Autocut20minTime |
| Action | <ul style="list-style-type: none"> State changed to “Interior Lamp Autocut Off” • Start AutocutTimer • O_InteriorAutoCutRly = Off |

Condition 2

| State | Description |
|-------------------|---|
| Initial Condition | “Interior Lamp Autocut 20 min On” state: |
| Event | 1. AfterACC = On or or2. AllUnlock = Off → On or3. C_BAState = 1 → 0 |

| | |
|--------|---|
| Action | <ul style="list-style-type: none"> State changed to “Interior Lamp Autocut On” O_InteriorAutoCutRly = On Cancel AutocutTimer |
|--------|---|

Condition 3

| State | Description |
|-------------------|--|
| Initial Condition | “Interior Lamp Autocut 20 min On” state: |
| Event | 1. C_BAState = 1 or2. Dr Key Lock = On (Non-Keyless) |
| Action | <ul style="list-style-type: none"> State changed to “Interior Lamp Autocut 5 sec On” Start AutocutTimer (during Autocut5secTime) |

4. Transitions from “Interior Lamp Autocut Power On” state:

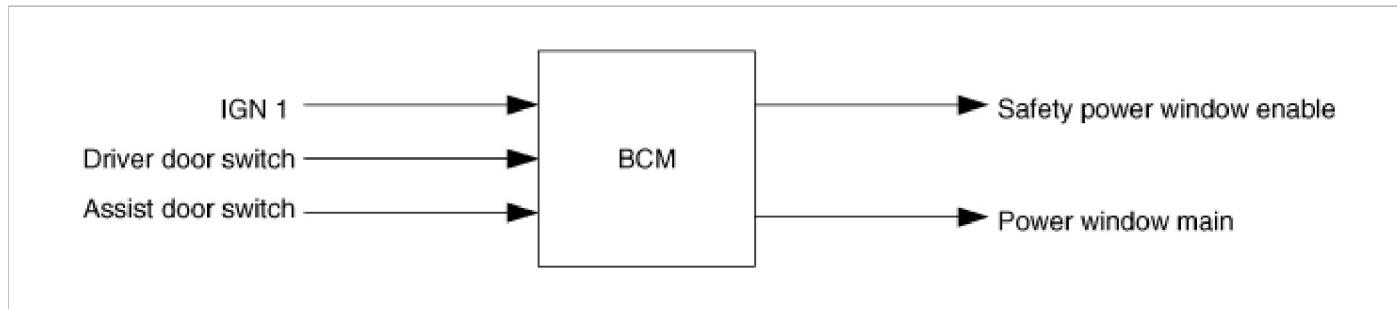
Condition 1

| State | Description |
|-------------------|--|
| Initial Condition | “Interior Lamp Autocut On” state: |
| Event | AfterACC = Off |
| Action | <ul style="list-style-type: none"> State changed to “Interior Lamp Autocut 20 min On” Start AutocutTimer (during Autocut20minTime) |

| Value name | Value |
|------------------|---------------|
| Autocut5secTime | 5sec ± 0.5sec |
| Autocut20minTime | 20min ± 1min |

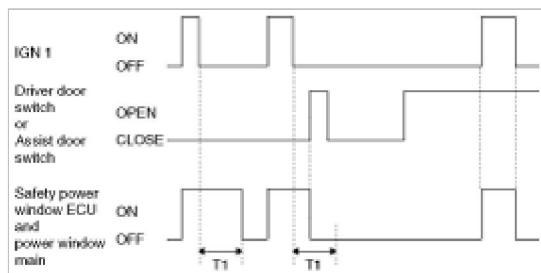
Power Window Timer

Data Flow



Function Description

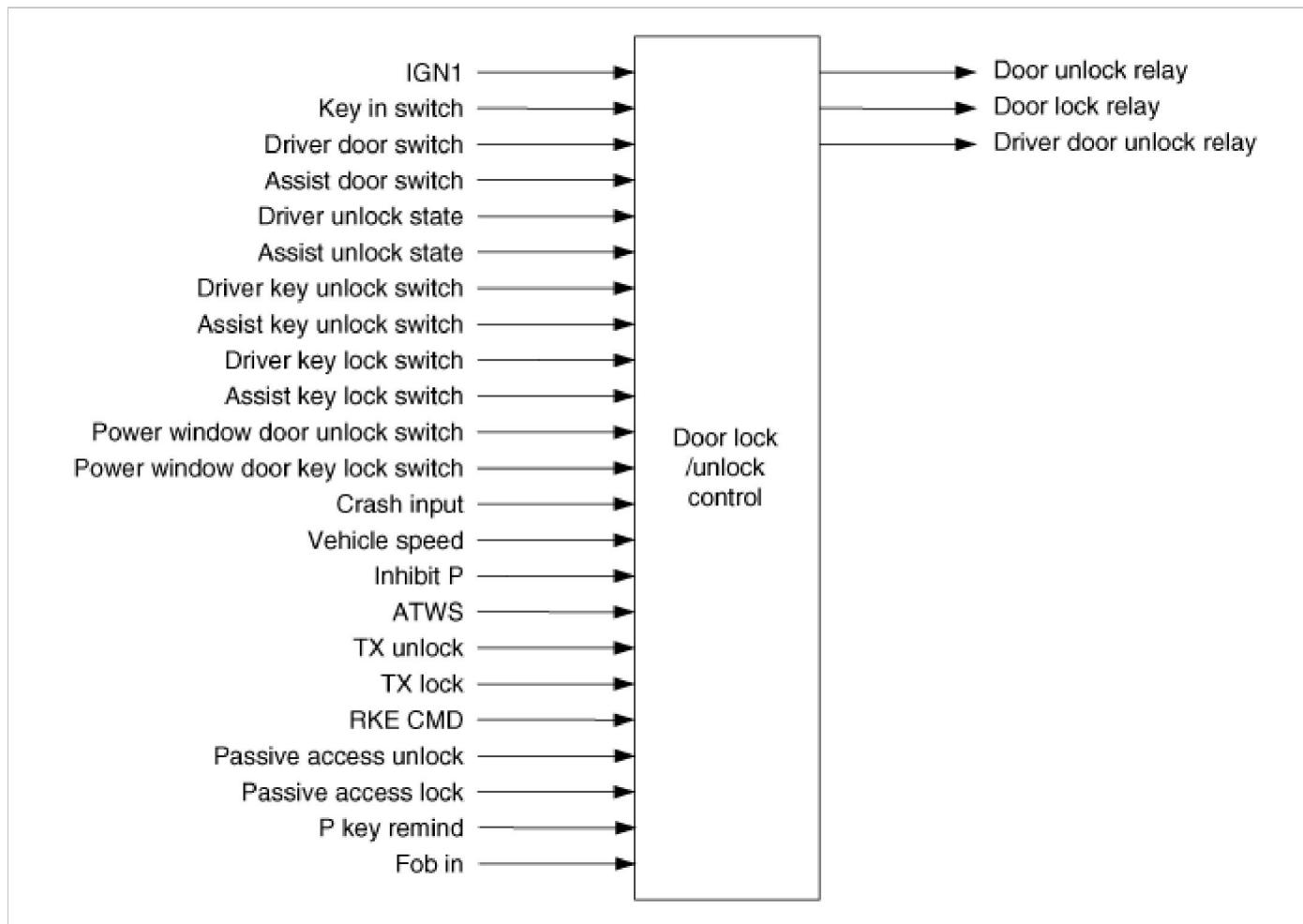
1. Safety Power window Enable and power window main output is turned ON at IGN1 ON.
2. Maintaining output at IGN1 OFF after 30 seconds Safety Power window Enable and power window main, Safety Power window Enable and power window main output is OFF.
3. Above (2) Driver door switch or Assist door switch in protest to the conditions when you OPEN, Safety Power window Enable and power window main output will be OFF immediately.
4. IGN1 OFF when the Safety Power window Enable and power window main output is OFF at driver door switch or Assist door switch OPEN.



$T_1 : 3 \pm 3\text{sec}$

Door Lock/unlock Control

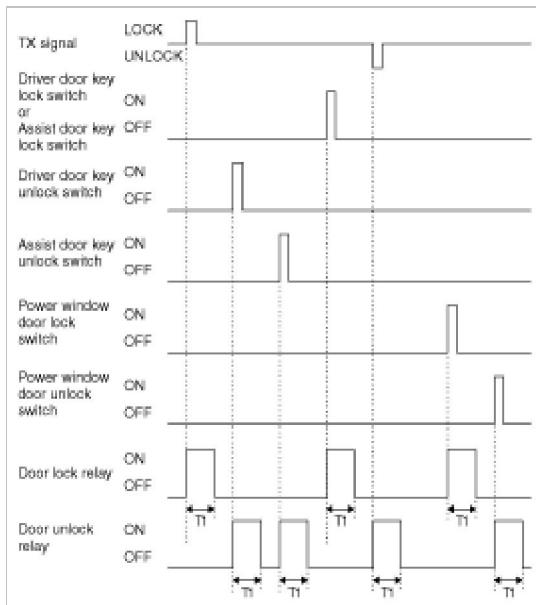
Data Flow



Central Door Lock/unlock

1. ALL DOOR LOCK output is ON during T1(0.5s) if Driver unlock State or Assist Unlock State is LOCK within 3sec after driver Key Lock switch(Assist Key Lock switch) is turned ON. But, IGN1 ON when output is prohibited.
2. ALL DOOR UNLOCK output is ON during T1(0.5s) if Driver Unlock State or Assist Unlock State is UNLOCK within 3sec after Driver Key Unlock switch(Assist Key Unlock switch) is turned ON.
3. ALL DOOR LOCK output is ON during T1 at TX Lock ON or SMK RKE CMD LOCK or Passive Lock ON. But, Passive Lock ON signal and will be ignored at Driver Door SW ON or Assist Door SW ON

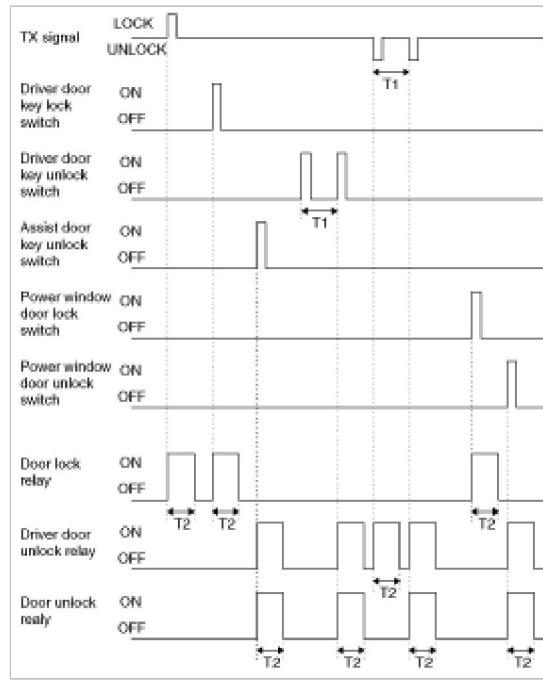
4. ALL DOOR UNLOCK output is ON during T1 at TX Unlock ON or SMK RKE CMD UNLOCK or Passive Unlock ON.
SMK RKE CMD = LOCK : SMK RKE CMD = Lock & No1 or Lock & No2
5. ALL DOOR LOCK output is ON during T1 at Power window door Lock switch ON.
6. ALL DOOR UNLOCK output is ON during T1 at Power window door Unlock switch ON. But, Power window door Unlock switch ON signal and will be ignored in ARM, ARMWAIT, REARM, ALARM state.
7. LOCK/UNLOCK by Driver door Unlock switch, Assist door Unlock switch operation is not interlocked. (mechanical operation)
8. Shall be no malfunction at Battery connection. (Shall be no malfunction even at Key In switch.)
9. When the output of the reverse output requirements and the current output immediately OFF, 100ms delay send output to the reverse. 100ms delay is required during the output when the output needs to eventually send us the output.
10. LOCK output and UNLOCK output conditions at the same time, if the LOCK output is done, and the UNLOCK output is ignored.
11. ALL DOOR LOCK and ALL DOOR LOCK status of the output conditions, the actual output is not, and ALL DOOR UNLOCK and ALL DOOR UNLOCK status of the output conditions, the actual output is not.
12. ALL DOOR LOCK(UNLOCK) switch to LOCK(UNLOCK) to power window door Lock switch(Power window Unlock switch), TX Lock, TX Unlock, SMK RKE CMD LOCK, SMK RKE CMD UNLOCK, Driver door Key Lock switch, Driver door Key Unlock switch, Assist door Key Lock switch, Assist door Key Unlock switch, regardless of the status and needs by the LOCK(UNLOCK) should always output.



SMK RKE CMD = UNLOCK : SMK RKE CMD = UNLOCK & NO1 or UNLOCK & NO2

2-Turn Unlock

1. If Driver Door Key Unlock Switch turns OFF from ON within T1 after Driver Door Key Unlock Switch turns ON from OFF(Driver Door Unlock Switch becomes UNLOCKED mechanically and does not output BCM.), turn Driver Unlock Relay, Unlkck Relay(Central Unlock) output ON during T2.
2. If TX UNLOCK is received within T1 after Driver Door Key Unlock Switch turns ON from OFF (Driver Door Unlkck Switch becomes UNLOCKED mechanically and does not output BCM.), turn Driver Unlock Relay and Unlock Relay(Central Unlock) output ON during T2.
3. Turn Driver Unlock Relay output ON during T2 when receiving TX UNLOCK signal. However, turn Driver Unlock Relay, Unlock Relay (Central Unlock) output during T2 if TX UNLOCK is received within T1.
4. Also, turn Driver Unlock Relay, Unlock Relay (Central Unlock) ON during T2 in case that Driver Door Key Unlock Switch turns ON from OFF within T1 after receiving TX UNLOCK.
5. Regard as the same TX even though different signal which is registered within T1 is received.
6. If turn Lock Relay output ON by TX Lock or Driver/Assist Key lock Switch, T1 is initialized.
7. Assist Key Unlock Switch turns ON from OFF, turn Driver Unlock Relay and Unlock Relay (Central Unlock) output ON during T2.



T1 : 4 ± 1sec, T2 : 0.5 ± 0.1sec

2-Turn Unlock (SMK)

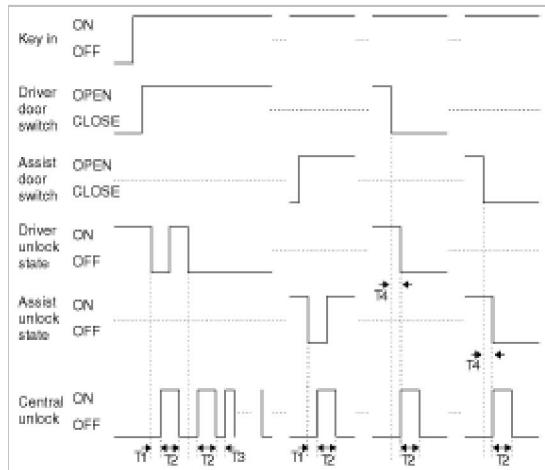
1. All DOOR UNLOCK output are ON during T2 if Driver door unlock switch is unlock within 3s and Driver door key unlock switch is OFF → ON within T1 after Driver door key unlock switch is OFF → ON (mechanically, Driver door unlock switch is unlocked and BCM signal is not output).
2. All DOOR UNLOCK output are ON during T2 if Driver door unlock switch is UNLOCK within 3s and SMK/RKE command= UNLOCK is received within T1 after Driver door key unlock switch is OFF → ON (mechanically, Driver door unlock switch is unlocked and BCM signal is not output).
3. DRIVER DOOR UNLOCK signal is output for T2 when SMK/RKE command=UNLOCK signal is received. But, ALL DOOR UNLOCK signals are output for T2 if SMK/RKE command=UNLOCK signal is received within T1.
4. All DOOR UNLOCK output are ON during T2 if Driver door key unlock switch is OFF → ON (mechanically, Driver door unlock switch is unlocked and BCM signal is not output) within T1 and Driver door unlock switch is UNLOCK within 3s after SMK/RKE command = UNLOCK received.
5. DRIVER DOOR UNLOCK output is ON during T2 when Passive unlock ON & P_FL ON is input. But, ALL DOOR UNLOCK output are ON during T2 if Passive unlock ON & P_FL ON is input within T1.
6. DRIVER DOOR UNLOCK output is ON during T2 when Passive unlock ON & P_FL ON is input. But, ALL DOOR UNLOCK output are ON during T2 if Driver door key unlock switch is OFF → ON within T1.
7. DRIVER DOOR UNLOCK output is ON during T2 when Passive unlock ON & P_FL ON is input. But, ALL DOOR UNLOCK output are ON during T2 if SMK/RKE command = UNLOCK is received within T1.
8. Driver door unlock switch UNLOCK state of the output from the DRIVER DOOR UNLOCK does not require.
9. ALL DOOR UNLOCK output will be according to DRIVER DOOR UNLOCK output when the DRIVER DOOR UNLOCK output of the ALL DOOR UNLOCK output requirements.

IGN Key Reminder

1. This function is not performed when vehicle speed is 3km/h or more.
2. ALL DOOR UNLOCK signals are output for 1s after 0.5s from when the state becomes IGN KEY ON & Driver door SW OPEN & Driver Unlock State LOCK.
3. ALL DOOR UNLOCK signals are output for 1s after 0.5s from when the state becomes IGN KEY ON & Assist door switch OPEN & Assist Unlock State LOCK.
4. ALL DOOR UNLOCK signals are output for 1s after 0.5s from (1),(2) and anti-concurrent satisfaction, (3) paragraph pursuant
5. UNLOCK signal is output 3 times as Max (1s-output is excluded) in case LOCK state is held even when UNLOCK signal is output for 1s in (2),(3). (1s cycle: 0.5s ON/OFF)
6. (5) of Section Driver door switch is CLOSE CENTRAL UNLOCK in the LOCK state, while the one-time attempt.
7. ALL DOOR UNLOCK signal is output (only once) during 1s if Driver door switch is CLOSE within 0.5s from Driver Unlock State UNLOCK → LOCK under IGN KEY ON.
8. ALL DOOR UNLOCK signal is output (only once) during 1s if Assist door switch is CLOSE within 0.5s from Driver Unlock State UNLOCK → LOCK under IGN KEY ON.
9. ALL DOOR UNLOCK signal is output (only once) during 1s if Driver Unlock State is UNLOCK->LCOK within 0.5s from Driver door switch OPEN → CLOSE under IGN KEY ON.
10. ALL DOOR UNLOCK signal is output(only once) during 1s if Assist Unlock State is UNLOCK->LCOK within 0.5s from Assist Door switch OPEN → CLOSE under IGN

KEY ON.

11. IGN KEY ON in Driver door switch or Assist Door switch is OPEN if the Power window door lock switch ON, KEY REMINDER functions to perform.
12. Judgment of the possibility of RETRY signal output is performed at RETRY signal output start. (after 1.5s from the first UNLOCK signal output)
13. After the condition if UNLOCK is met, UNLOCK signal is output if the condition is not held for 0.5s. But, UNLOCK signal is not output if KEY IN is OFF at the moment that 0.5s passes after the condition is met by Driver Unlock State or Assist Unlock State change from UNLOCK to LOCK.



T1, T3 : $0.5 \pm 0.1\text{sec}$, T2 : $1 \pm 0.1\text{sec}$, T4 : 0.5sec Max

KEY IN ON : Key in ON or ACC = 1 or IGN1 ON or IGN2 ON

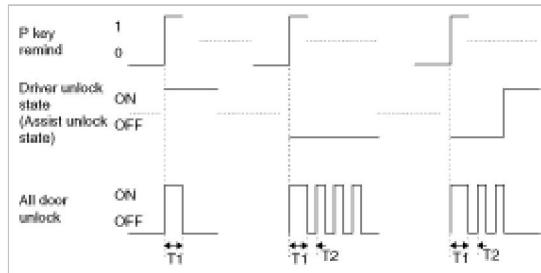
KEY IN OFF : Key in OFF and ACC = 0 and IGN1 OFF and IGN2 OFF

IGN KEY ON : Key in switch(Fob in) ON or ACC ON or IGN1 ON or IGN2 ON

IGN KEY OFF : Key in switch(Fob in) OFF and ACC OFF and IGN1 OFF and IGN2 OFF

Passive Key Reminder Unlock (SMK)

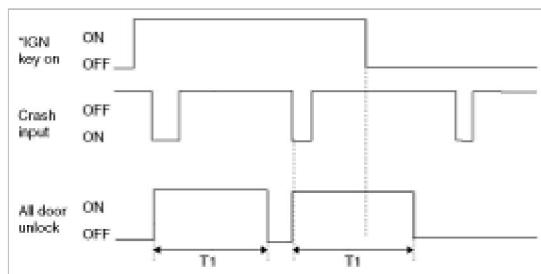
1. This function is not performed when vehicle speed is 3km/h or more.
2. When the driver door switch (Assist door switch) = OPEN and driver unlock state (Assist unlock state) are lock state, passive KEY REMINDER signal received at the output ALL DOOR UNLOCK is for 1s.
3. UNLOCK signal is output 3 times as Max (1s-output is excluded) in case LOCK state is held even when UNLOCK signal is output for 1s in (2). (1s cycle: 0.5s ON/OFF)



T1 : 1 ± 0.1sec, T2 : 0.5 ± 1sec

Crash Door Unlock

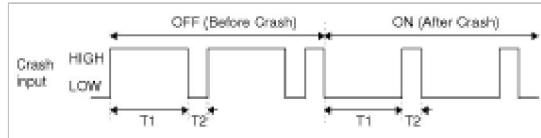
1. FOB IN ON or KEY IN ON or ACC ON or IGN1 ON or IGN2 ON state Crash Input ON signal is ON, T1 is performed for ALL DOOR UNLOCK output. (CRASH UNLOCK output)
 - A. CRASH UNLOCK signal 16ms LOW / 4ms HIGH supposed to be 4 times the input, CRASH UNLOCK ON to be determined.
 - B. BCM CRASH UNLOCK signal is input from the sleep state is ignored.
2. Above (1) Section of the IGN1 CRASH UNLOCK output is even ON → OFF CRASH UNLOCK output is maintained for the remaining time.
3. Above (1) CRASH UNLOCK output port for the T1 input CRASH UNLOCK again during the input signal is ignored.
4. ALL DOOR UNLOCK output to the UNLOCK → LOCK Assist Unlock State, Driver Unlock State or when ALL DOOR UNLOCK output is performed during T2.
5. CRASH DOOR UNLOCK AUTO DOOR LOCK in conditions does not function.
6. CRASH DOOR UNLOCK functions by other functions LOCK / UNLOCK control overrides.
7. CRASH DOOR UNLOCK output after the output of other functions, and by the LOCK / UNLOCK request is ignored. However, KEY IN OFF & ACC OFF & IGN1 OFF & IGN2 OFF when other functions by the LOCK / UNLOCK control stick.



T1 = 5.0sec

* IGN KEY ON : ON - KEY IN or Fob in or ACC ON or IGN1 ON or IGN2 ON
 OFF - KEY OUT or Fob OUT or ACC OFF or IGN1 OFF or IGN2 OFF

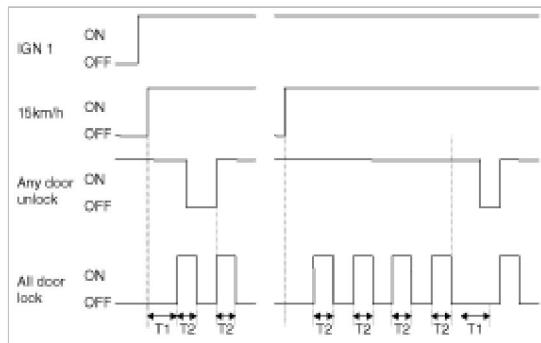
8. Crash Input for the input signal ON / OFF judging criteria are the following figure



T1 : 16 ± 2 msec, T2 : 4 ± 2 msec

Auto Door Lock/unlock Control (User Option)

1. ALL DOOR LOCK signal is output if vehicle speed is 15km/h within T1 under IGN1 ON && Alt L ON. But ALL DOOR LOCK , All DOOR LOCK signal is not output if all DOOR is LOCK or ALL DOOR are FAIL.
2. LOCK signal is output 3 times as Max if either one DOOR is UNLOCK after LOCK signal output in (2).(1s cycle) But, DOOR, which is LOCK from UNLOCK state during 3-time output, is ignored.
3. Relevant DOOR is FAIL if the state is UNLOCK after 3-time output.
4. LOCK signal is output once if the FAIL DOOR is UNLOCK again after the DOOR is LOCK.
5. LOCK signal is output once if locked doors, which are LOCK state after LOCK signal output in (2), are unlocked again. But, LOCK signal is output once for the relevant DOOR even when UNLOCK state continues after LOCK signal output.
6. FAIL DOOR is cleared at IGN switch OFF.
7. AUTO DOOR LOCK function is not performed when CRASH UNLOCK condition is met.



T1 : max 1.5sec, T2 : 0.5 ± 0.1 sec

ANY DOOR UNLOCK ON driver Unlock State Unlock or assist Unlock State Unlock or rear left Unlock State or rear right unlock state
 ANY DOOR UNLOCK OFF driver Unlock State Lock assist Unlock State Lock and rear left Unlock State and rear right unlock state

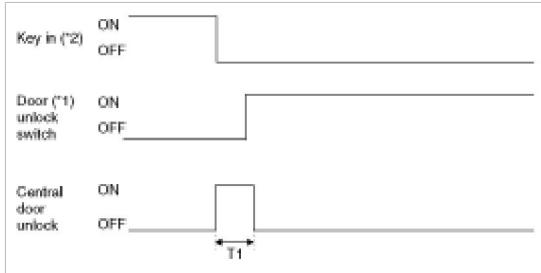
Auto Door Lock By Shift Lever Change

1. IGN1 ON & Alt L ON state of 100msec in the close future, and ANY DOOR UNLOCK ANY DOOR UNLOCK ALL DOOR (Driver door SW & Assist door SW & Rear left door SW & Rear right SW) in the conditions when Inhibit P, ON->OFF, ALL DOOR LOCK to the output.

2. AUTO DOOR LOCK function is not performed when CRASH UNLOCK condition is met.

Auto Door Unlock By Key In Condition

1. ALL DOOR UNLOCK signal is output at IGN KEY IN→OUT. But, UNLOCK state that is ALL DOOR to UNLOCK does not output.



T1 : 0.5 ± 0.1sec

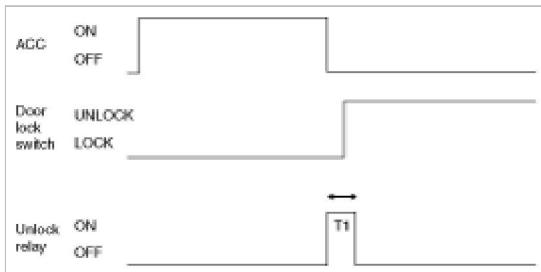
*1 ON(UNLOCK) : Driver Unlock State or assist Unlock State or rear left Unlock state or rear right unlock state = UNLOCK
OFF (LOCK) : Driver Unlock State & assist Unlock State & rear left Unlock state & rear right unlock state = LOCK

*2 KEY IN ON : Key in switch ON or ACC =1 or IGN1 ON or IGN2 ON

KEY IN OFF : Key in switch OFF and ACC =0 and IGN1 OFF and IGN2 OFF

Auto Door Unlock (Only SMK)

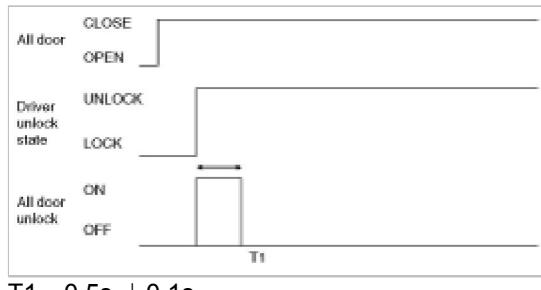
1. Under ANY DOOR LOCK, ALL DOOR UNLOCK signal is output at ACC ON→OFF.



T1: 0.5s ± 0.1s

Auto Door Unlock By Driver Door Unlock State (User Option)

1. ALL DOOR UNLOCK signal is output one-time during T1 if ALL DOOR(Driver Door switch & Assist door switch & Rear left door switch & Rear right door switch) is CLOSED and Driver Unlock State is Lock->Unlock.



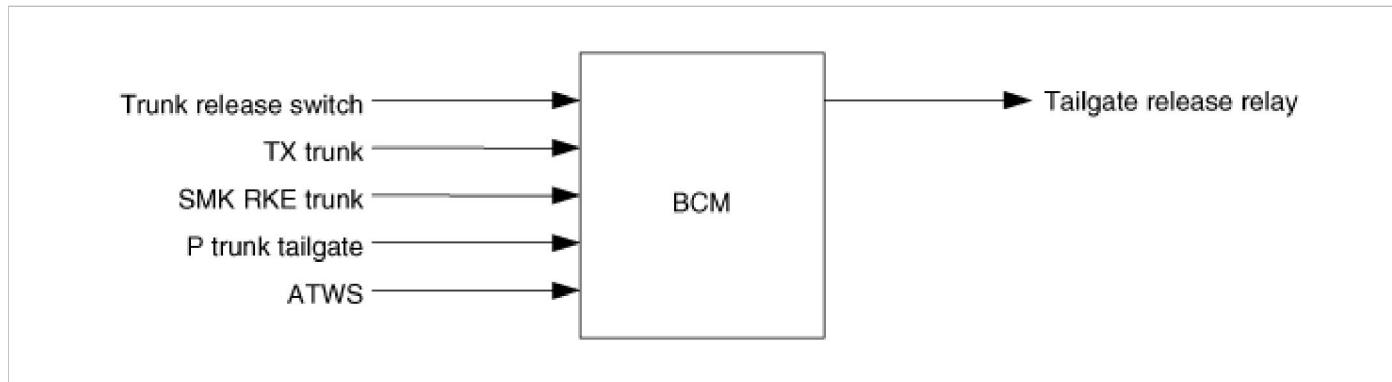
$T_1: 0.5s \pm 0.1s$

Auto Door Unlock By Shift Lever Change

1. ALL DOOR CLOSE & ANY DOOR LOCK state is the state of IGN1 & Alt L ON to OFF->ON when in Inhibit P after 300msec, CENTRAL DOOR UNLOCK is the output.

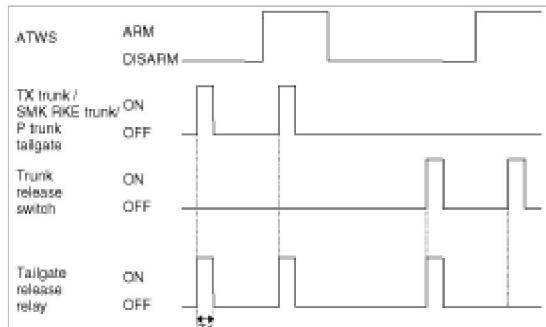
Trunk Release Relay Control

Trunk Release Relay Control Data Flow



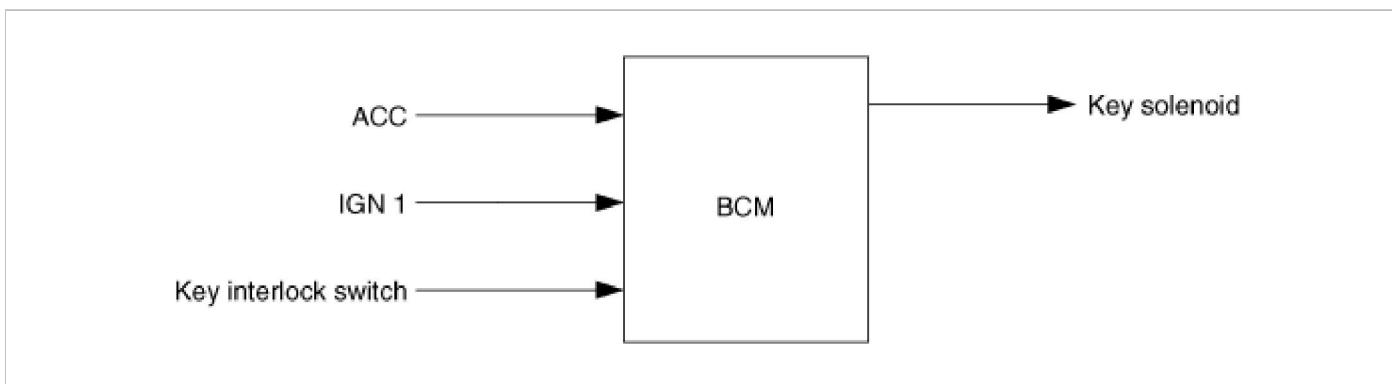
Trunk Release Relay Control

1. Trunk Release Relay is ON during T_1 when TX Trunk signal received.(NON-SMK)
Trunk Release Relay is ON during T_1 when SMK RKE Trunk signal received.(NON-SMK)
2. Trunk Release Relay is ON during T_1 when Trunk Release switch is OFF->ON.
But, ARMWAIT, ARM, REARM, ALARM mode, the Trunk Release switch input of the output does not.

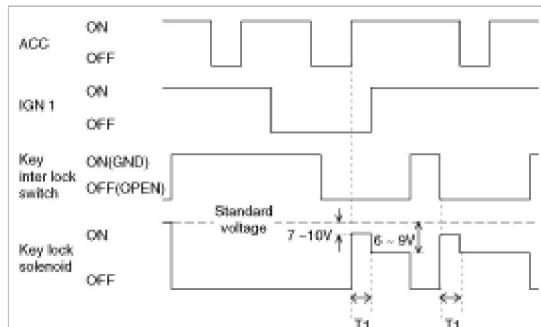


Key Interlock Control

Data Flow

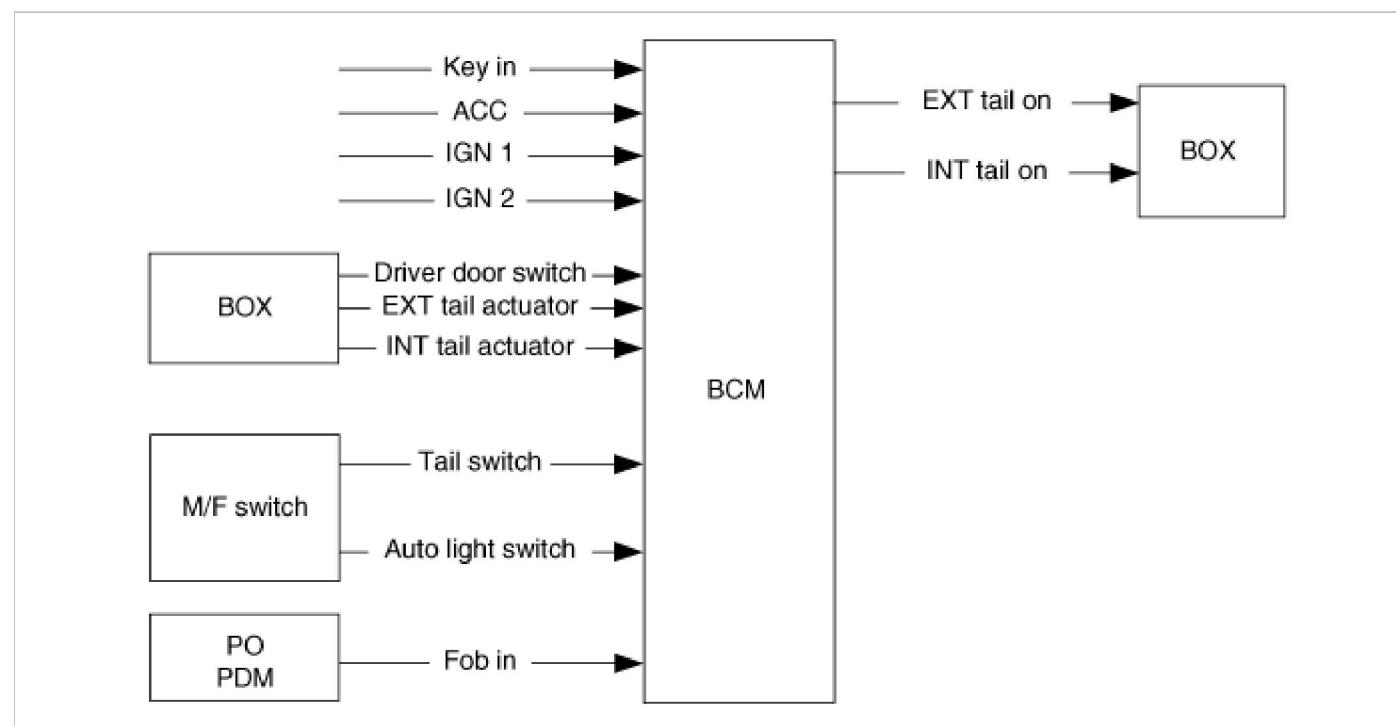


1. Key solenoid to the output of the ON KEY to make the subject does not fall. (If IGN1 ON or ACC subject to the key Interlock switch input is OFF.)
2. In addition to the above conditions, the KEY OFF key solenoid output to fall out, to make conditions.
3. Key solenoid output OFF -> ON operation, 0.9sec ~ 1.5sec for the 7 - 10V and the behavior, then the voltage 6 - 9V to maintain.



Tail Lamp Function In/out

Tail Lamp Function Block Diagram



Function Description

- General Function Condition

In BATTERY ON and Tail Lamp is off state, if user turns on the Tail Lamp switch (Tail switch ON), Tail Lamps are turned on.

1. Tail Auto Cut Function Condition

The “Tail Auto Cut” strategy ensures that Tail lamps are turned off even if a driver forgets to turn them off. When the Tail lamp is turned on by Tail lamp switch, after key insertion, and if a user removes key and opens the driver side door (or vice versa), the Tail lamps are automatically turned off. While “Tail Auto Cut” function is active, if a user turns off the Tail lamp switch or inserts key, “Tail Auto Cut” function will be deactivated and Tail lamps can be turned on.

NOTE

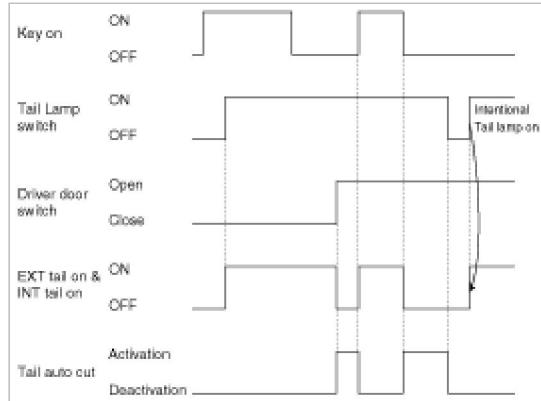
- “Tail Auto Cut” state is memorized in ECU, so even if battery reset, this state is not erased.
- During the activation of Escort function, no Tail Auto Cut mode is possible and it is only after escort function deactivation that Tail Auto Cut mode can be applied.

(1) CAN signal Tail Activity Condition

When tail lamp output condition is met, Tail Lamp activity CAN data (EXT Tail_Act & INT Tail Act) is also turned on. When tail lamp output condition is not met, Tail Lamp activity CAN data (EXT Tail Act & INT Tail Act) is also turned off.

(2) Internal signal Tail Activity Condition

When tail lamp output is on, internal signal Tail Lamp activity (Tail Lamp) is also turned on. When tail lamp output is off, internal signal Tail Lamp activity (Tail Lamp) is also turned off.



2. HEAD LAMP CONTROL

(1) Overview Description

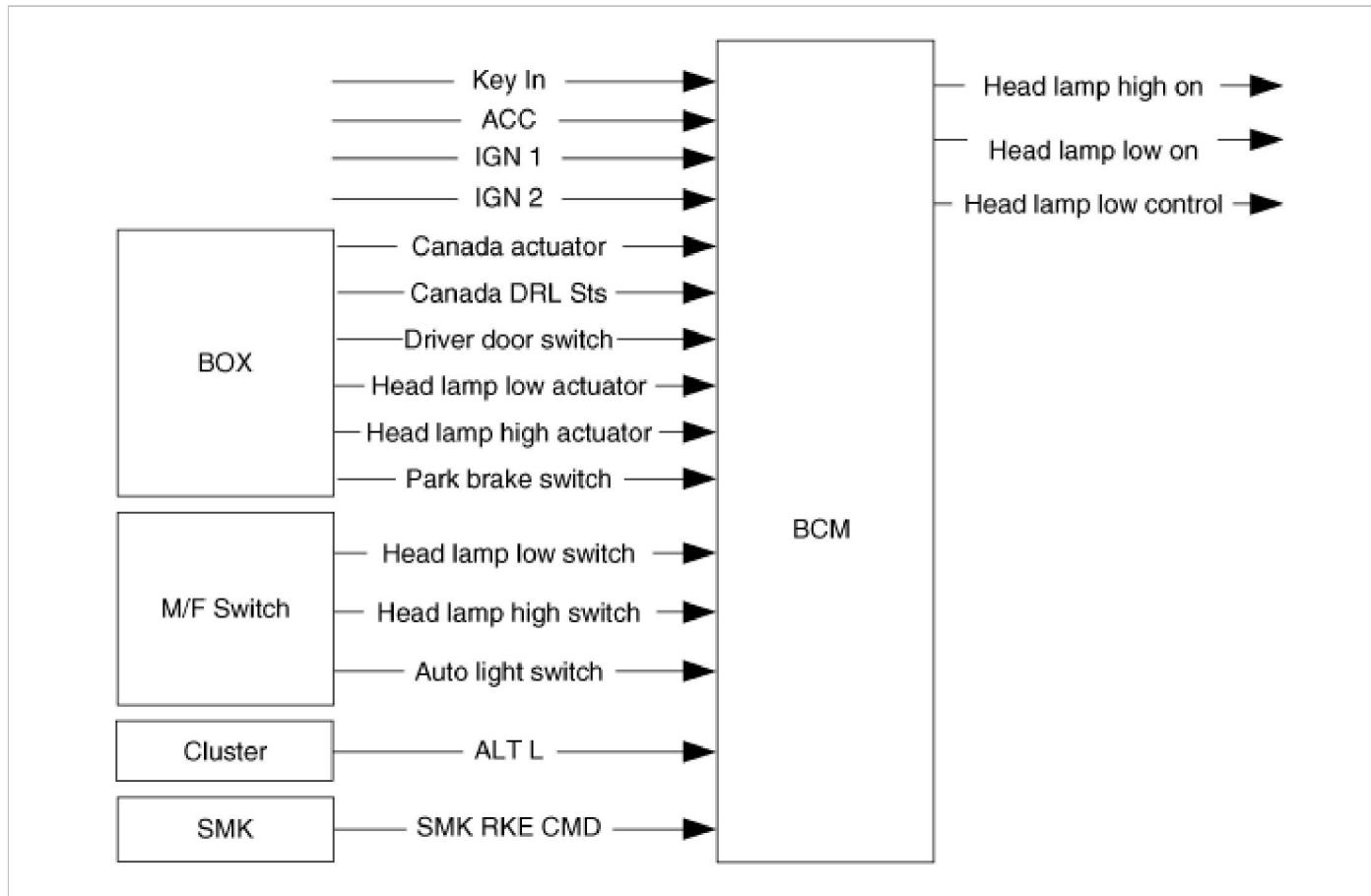
This function describes the following features

- A. Turn on and off Head Lamp Low by Head Lamp Low Switch input.
- B. Turn on and off Head Lamp Low by Escort Function.

- C. Turn on and off Head Lamp Low by Auto Light Control Request.
- D. Turn on and off Head Lamp High by Head Lamp High Switch input.
- E. Turn on and off Head Lamp High and Low by Passing Switch Input.
- F. Output control of Head Lamp Low.
- G. Output control of Head Lamp High.
- H. Output control of Head Lamp High Indicator.
- I. Output control of Head Lamp control for CANADA DRL.

Head Lamp Function IN/OUT

- 1. Head Lamp Function Block diagram



2. Head lamp low signal control

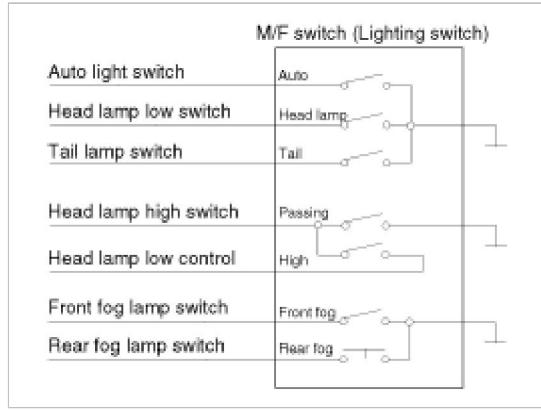
- A. Head Lamp Low control output is ON if HEAD LAMP LOW output is ON by ‘Head Lamp Low switch ON’ or ‘AUTO LIGHT function’ .
- B. Head Lamp Low control output is OFF when HEAD LAMP LOW output is ON->OFF.

3. Head lamp high control

Head Lamp High input and Head Lamp Passing input by M/F is Head Lamp High switch processing for single input same MULTI-FUNCTION WIRING DESCRIPTION as Head Lamp High switch only input.

- A. Head Lamp High Input When Head Lamp High switch ON that in IGN2 ON and Head Lamp Low control output is ON by IMP, Head Lamp High is consider as input.
- B. Head Lamp Passing Input When Head Lamp High switch ON that in IGN2 ON and Head Lamp Low control output is OFF, Head Lamp Passing is consider as input.

4. Multi-function wiring description



Function Description

1. Head Lamp Low Control

In IGN terminal State (IGN ON), if turn on the Head Lamp LOW switch(Head Lamp Low switch ON), Head Lamp LOW outputs are turned on (Head Lamp Low ON).

When Tail lamp Off and headlamp Off conditions are satisfied at the same time, Head Lamp LOW and Tail LAMP turned off simultaneous immediately.

2. Head Lamp High Control

In IGN terminal State(IGN ON) and Head Lamp Low switch On(Head Lamp Low switch ON), if turn on the Head Lamp High switch(Head Lamp High switch ON), Head Lamp High Outputs are turned on (Head Lamp High ON).

3. Passing Control

In IGN terminal State(IGN ON), If Head Lamp Passing switch Input(Head Lamp High switch ON & Head Lamp Low control OFF) is detected then Head Lamp High Output(Head Lamp High ON) are turned on and Head Lamp Low Output(Head Lamp Low ON) at the same time.

4. Canada DRL

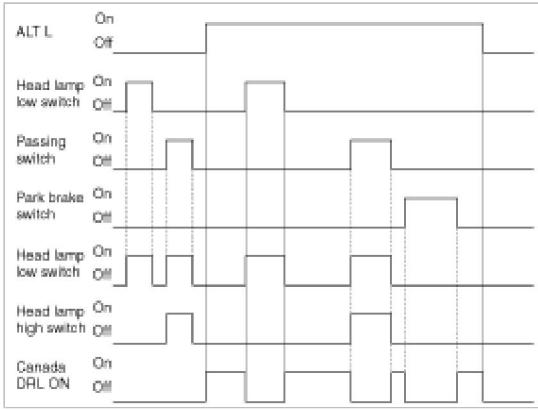
A. If alternator level is high(ALT L=On), BCM activates Canada DRL functionality and turns on the Head lamp high (CANADA DRL=On).

B. Deactivation if:

(1) Head lamp low On request by Head lamp switch or auto light head lamp Low control or

(2) Head high On request by passing switch or

(3) Parking brake switch On



5. Escort Function

After user generates the call of head lamp low light(Head Lamp Low switch On), if switch off ignition(IGN Off and START Off), and then keep Head Lamp Low Output On (Head Lamp Low ON)state during 20min.

And after open and close driver side door(Driver door switch ON -> Driver door switch Off), user will have consequently lighting of head lamp low(Head Lamp Low ON) during only 30sec.

During active “Escort Function” , if receive Lock request 2 times (2 LOCK) or cancel the lighting request of head lamp low (Head Lamp Low switch Off & Auto Light switch Off), this function is released.

Lock request counting for 2 times (2 LOCK) is each follow cases:

- (1) RKE CMD == Lock
- (2) SMK RKE CMD == Lock
- (3) Passive Access Lock== Lock

If open the Driver door(Driver door switch ON) or close(Driver door switch Off), former lock counter is cleared, and start new 2 times lock counting.

6. Head Lamp Welcome Function

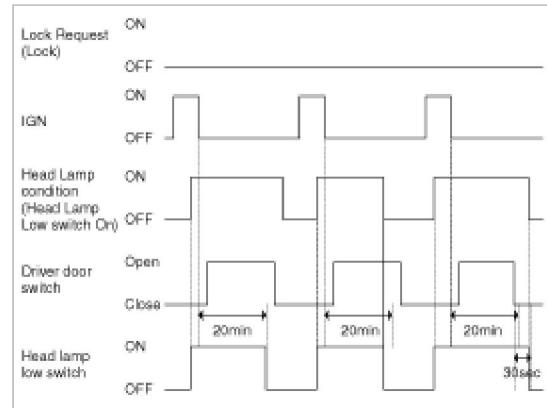
“Multifunction switch head lamp or auto light position and lock stated, if remote unlock, and then keep head lamp output on state during 15second.Lighting state, if remote lock and unlock, immediately light turn off.”

NOTE

- While escort function is activated, Tail lamp is keeping the turn on state and does not go to Auto cut and after finish escort state and user removes key, it can go Auto cut mode.
- While the “Escort Function” is activated by ‘Head Lamp Low Switch’ , if change from ‘Head Lamp Low Switch’ to ‘Lamp Auto Switch’ , “Escort Function” is deactivated, because Lamp Auto mode is ‘Lamp Off’ condition.
- While the “Escort Function” is activated by ‘Lamp Auto Switch’ , if change from ‘Lamp Auto Switch’ to ‘Head Lamp Low Switch’ , “Escort

Function" is keeping the activation state, because of "Head Lamp On" condition.

- After IGN terminal off 20 minute timers is started, but as soon as door is opened and closed then 30sec timer is engaged.



Auto Light Control

1. Overview Description

This function describes the following features.

- A. Input detection by Auto Light Sensor.
- B. Generate Auto Light Out Status data.
- C. Send Auto Light Out Status.
- D. Tail Lamp Control by Auto light Mode.
- E. Head Lamp Low Control by Auto light Mode.
- F. AV Tail Control by Auto Light sensor level.

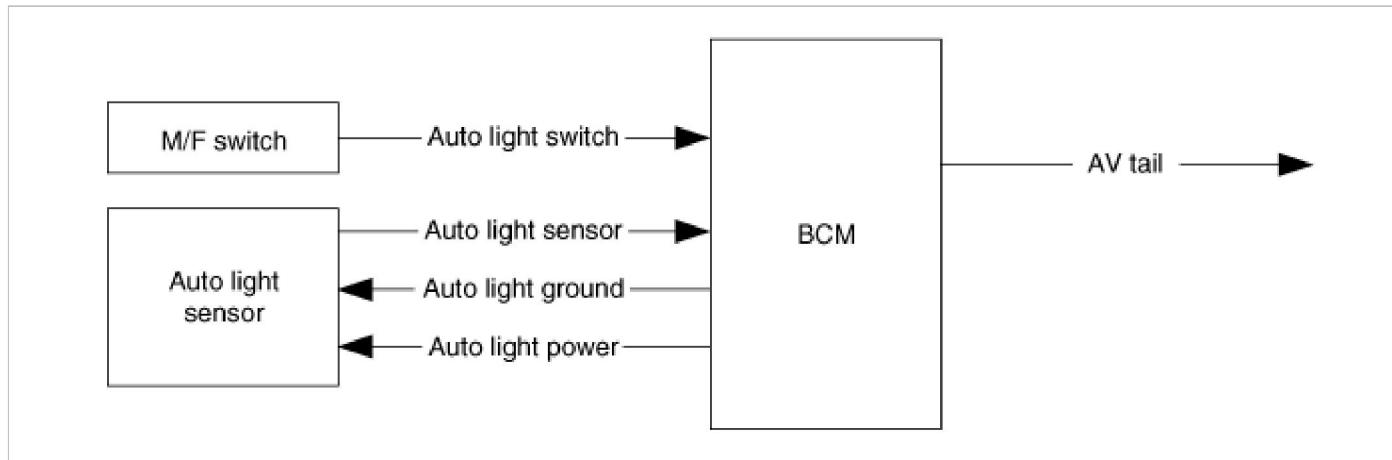
Auto Light Mode State Diagram is based on Auto Light Sensor's level.

Power condition of Auto Light Action.

- G. When ACC, IGN, START terminal states, Auto Light Sensor operates.

Auto Light Control Function In/out

1. Auto Light Control Function Block Diagram



2. Function Description

In ACC, IGN, START terminal states, monitoring of the auto light sensor supply's range (Auto Light Power) is performed and a failure is raised up (Auto Light failure) when the supply's voltage is out of range (outside of range [4V:6V]).

If Auto Light failure occurs and as long as this error is present, the tailLamp and head lamp low must be turned on regardless of the sunlight level provided by the sensor.

When physical Auto Light sensor failure occurs the Lamps are turned on, because a zero voltage level is provided by the sensor when internal failure is present. This is designed to prevent any head lamp cut off when the failure occurs during the night.

AV Tail Output Control is started in ACC, IGN, START regardless of MF switch Auto Light switch. CAN signal AV Tail is set/reset at the same time as AVTail.

| | NAVI | CLUSTER |
|-----|------------------|-----------------|
| ON | 0.4 +/- 0.10[V] | 1.0 +/- 0.10[V] |
| OFF | 0.75 +/- 0.10[V] | 2.3 +/- 0.20[V] |

Front Fog Lamp Control

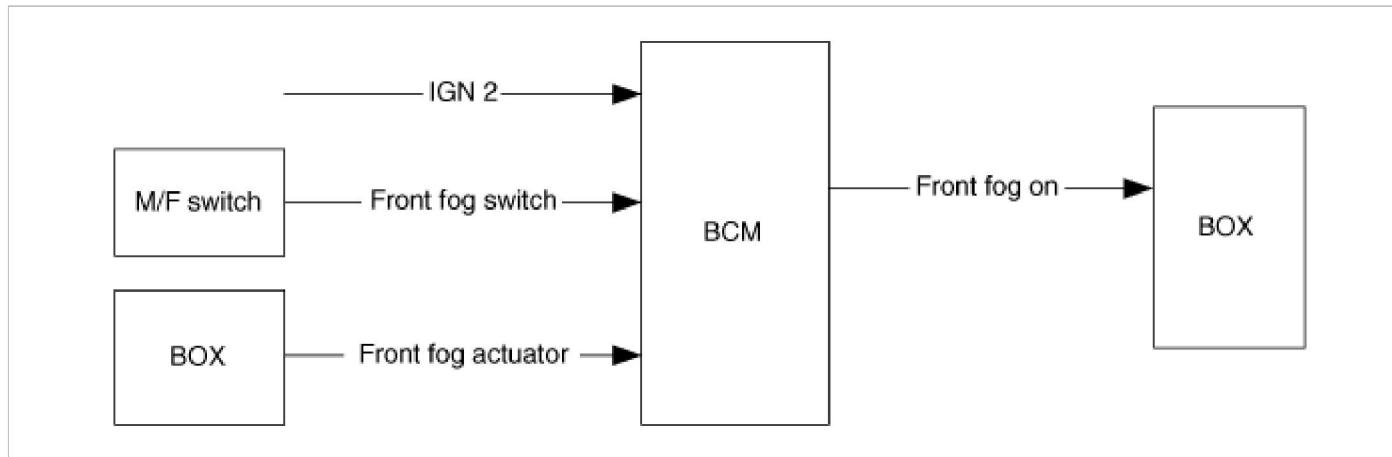
1. Overview Description

This function describes the following features

- A. Turn on and off Front Fog Lamp by Front Fog Lamp switch input.
- B. Versus variant (NA, Non-NA), function description

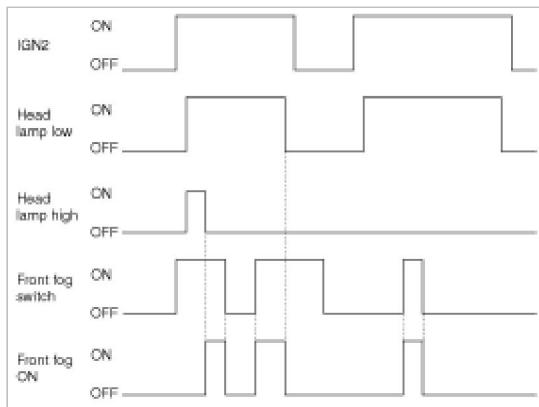
Front Fog Lamp Function In/out

1. Front Fog Lamp Function Block Diagram



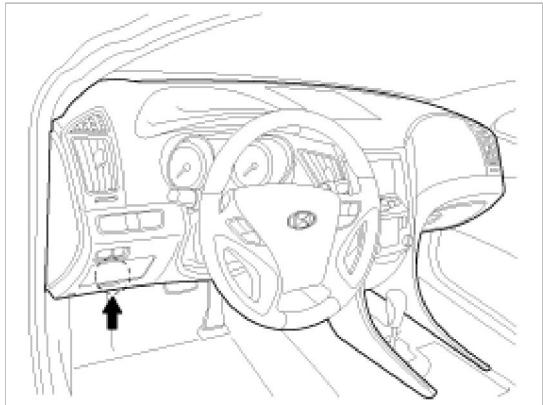
2. Function Description

- (1) In case of (IGN2=ON) & (HeadLampLow=ON) & (HeadLampHigh=Off), if Front fog lamp switch input is detected (FrontFogSW=On), Front fog lamp output (FrontFogON=On) is turned ON.
- (2) If fails to activate front fog lamp output, indicator (FrontFogIND) is also turn off.



Body Electrical System > BCM (Body Control Module) > Body Control Module (BCM) > Repair procedures

Trouble Diagnostics When Using GDS



1. The body control module can diagnose by using the GDS more quickly.
The BCM communicates with the GDS and then reads the input/output value and drives the actuator.
2. To diagnose the BCM function, select the menu of model and body control module.
3. To consult the present input/output value of BCM, "Current DATA". It provides information of BCM input/output conditions of power supply, turn signal/brake lamp, headlamp, door, locks, outside mirror, wiper, auto-light and transmitters etc.
 - A. BCM Service data

Current Data

Standard Display Full List Graph Items List Reset Min.Max. Record Stop

| Sensor Name | Value | Unit |
|--|-------|------|
| <input type="checkbox"/> Key in switch[Manual Key Type] | IN | - |
| <input type="checkbox"/> ACC | ON | - |
| <input type="checkbox"/> IGN1 | ON | - |
| <input type="checkbox"/> IGN2 | ON | - |
| <input type="checkbox"/> Tail Lamp Switch | OFF | - |
| <input type="checkbox"/> Head Lamp Switch | OFF | - |
| <input type="checkbox"/> Auto Light Switch | OFF | - |
| <input type="checkbox"/> Head Lamp High Switch | OFF | - |
| <input type="checkbox"/> Front Fog Switch | OFF | - |
| <input type="checkbox"/> Washer Switch | OFF | - |
| <input type="checkbox"/> INT Switch | OFF | - |
| <input type="checkbox"/> Mist Switch | OFF | - |
| <input type="checkbox"/> Key Inter Lock Switch[Manual Key Type] | ON | - |
| <input type="checkbox"/> Room Lamp Output | ON | - |
| <input type="checkbox"/> Foot Lamp Output | ON | - |
| <input type="checkbox"/> Ignition Key Hole Illumination[Manual Key Type] | OFF | - |
| <input type="checkbox"/> Auto Light Power | ON | - |
| <input type="checkbox"/> AV Tail Output | ON | - |
| <input type="checkbox"/> Key Inter Lock Solenoid[Manual Key Type] | OFF | - |
| <input type="checkbox"/> Security LED | OFF | - |
| <input type="checkbox"/> Navigation wakeup signal | OFF | - |

Current Data

Standard Display Full List Graph Items List Reset Min.Max. Record Stop

| Sensor Name | Value | Unit |
|---|-----------------|------|
| <input type="checkbox"/> Security LED | OFF | - |
| <input type="checkbox"/> Navigation wakeup signal | OFF | - |
| <input type="checkbox"/> Wiper low relay | OFF | - |
| <input type="checkbox"/> Head lamp low signal output | OFF | - |
| <input type="checkbox"/> Parking brake switch | PARK | - |
| <input type="checkbox"/> Defogger SW | OFF | - |
| <input type="checkbox"/> Glove Box Sw | OFF | - |
| <input type="checkbox"/> Inhibit R SW | OFF | - |
| <input type="checkbox"/> Glove Box Lamp Output | OFF | - |
| <input type="checkbox"/> ATM solenoid(Automatic Transmission) | OFF | - |
| <input type="checkbox"/> Battery voltage monitoring input | 13.20 | V |
| <input type="checkbox"/> Int Volume | 2.47 | V |
| <input type="checkbox"/> Auto light sensor | 0.00 | V |
| <input type="checkbox"/> RK RX Status | NO RX | - |
| <input type="checkbox"/> Number of RK(+RK) | 1 | - |
| <input type="checkbox"/> Auto Door Lock Status | DISABLE | - |
| <input type="checkbox"/> Auto door unlock | DR DOOR UNLO... | - |
| <input type="checkbox"/> 2-Turn Unlock | ENABLE | - |
| <input type="checkbox"/> Arm/Disarm by door key(+RK) | ENABLE | - |
| <input type="checkbox"/> Horn answer back(+RK) | DISABLE | - |
| <input type="checkbox"/> Auto Light Control | ENABLE | - |

B. CLU(Cluster) Service data

Current Data

Standard Display Full List Graph Items List Reset Min.Max. Record Stop

| Sensor Name | Value | Unit |
|---|-------|------|
| <input type="checkbox"/> Ignition 1 | ON | - |
| <input type="checkbox"/> Ignition 2 | ON | - |
| <input type="checkbox"/> Cruise Main Indicator | OFF | - |
| <input type="checkbox"/> Front fog Indicator | OFF | - |
| <input type="checkbox"/> High Beam Indicator | OFF | - |
| <input type="checkbox"/> Door open Indicator | ON | - |
| <input type="checkbox"/> P Inhibit output | ON | - |
| <input type="checkbox"/> R Inhibit output | OFF | - |
| <input type="checkbox"/> Seat belt indicator | OFF | - |
| <input type="checkbox"/> N Inhibit output | OFF | - |
| <input type="checkbox"/> D Inhibit output | OFF | - |
| <input type="checkbox"/> FUEL_INPUT | 5.0 | L |
| <input type="checkbox"/> Battery Voltage on CLU | 14.4 | V |

C. SJB(Smart junction box) Service data

Current Data

Standard Display Full List Graph Items List Reset Min.Max. Record Stop

| Sensor Name | Value | Unit |
|---|-----------|------|
| <input type="checkbox"/> Rear Left Door Open Switch | CLOSE | - |
| <input type="checkbox"/> Rear Left Door Actuator Position Switch | LOCK | - |
| <input type="checkbox"/> Rear Right Door Open Switch | CLOSE | - |
| <input type="checkbox"/> Rear Right Door Actuator Position Switch | LOCK | - |
| <input type="checkbox"/> Assist Door Open Switch | CLOSE | - |
| <input type="checkbox"/> Driver Door Open Switch | OPEN | - |
| <input type="checkbox"/> Tailgate/Trunk Open Switch | CLOSE | - |
| <input type="checkbox"/> Hood Switch | CLOSE | - |
| <input type="checkbox"/> Driver Seat Belt Switch | UNBUCKLED | - |
| <input type="checkbox"/> Tail Gate Release Switch | OFF | - |
| <input type="checkbox"/> Ignition 2 | ON | - |
| <input type="checkbox"/> Canada DRL Output | OFF | - |
| <input type="checkbox"/> Front fog lamp relay | OFF | - |
| <input type="checkbox"/> AV Tail Output | ON | - |
| <input type="checkbox"/> Tail Lamp Relay | ON | - |
| <input type="checkbox"/> Head Lamp High Output | OFF | - |
| <input type="checkbox"/> Head Lamp Low Output | OFF | - |
| <input type="checkbox"/> Canada DRL Status | NONE | - |
| <input type="checkbox"/> Front Deicer Relay | OFF | - |
| <input type="checkbox"/> Rear defogger relay | OFF | - |
| <input type="checkbox"/> Burglar Alarm Horn Relay | OFF | - |

Current Data 1/38

Standard Display Full List Graph Items List Reset Min.Max. Record Stop

| Sensor Name | Value | Unit |
|---|--------|------|
| <input type="checkbox"/> Canada DRL Status | NONE | - |
| <input type="checkbox"/> Front Deicer Relay | OFF | - |
| <input type="checkbox"/> Rear defogger relay | OFF | - |
| <input type="checkbox"/> Burglar Alarm Horn Relay | OFF | - |
| <input type="checkbox"/> Start Inhibitor Relay | OFF | - |
| <input type="checkbox"/> Tailgate/Trunk Release Relay | OFF | - |
| <input type="checkbox"/> Central door lock switch | OFF | - |
| <input type="checkbox"/> Power Window Relay | ON | - |
| <input type="checkbox"/> Assist Door Actuator Position Switch | UNLOCK | - |
| <input type="checkbox"/> Driver Door Actuator Position Switch | UNLOCK | - |
| <input type="checkbox"/> Assist Door Key Unlock Switch | OFF | - |
| <input type="checkbox"/> Driver Door Key Lock Switch | OFF | - |
| <input type="checkbox"/> Driver Door Key Unlock Switch | OFF | - |
| <input type="checkbox"/> Turn Left Switch | OFF | - |
| <input type="checkbox"/> Turn Right Switch | OFF | - |
| <input type="checkbox"/> Hazard Switch | OFF | - |
| <input type="checkbox"/> Central door unlock switch | OFF | - |
| <input type="checkbox"/> Driver door unlock relay | OFF | - |
| <input type="checkbox"/> Door unlock relay | OFF | - |
| <input type="checkbox"/> Door lock relay | OFF | - |
| <input type="checkbox"/> HID Option | OFF | - |

4. To perform compulsory operation on BCM input factors, select "ACTUATION TEST".

Actuation Test

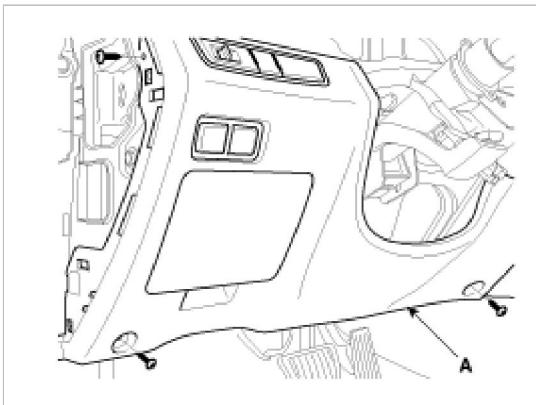
| Test Items |
|---------------------------|
| Rear defogger relay |
| Front deicer relay |
| Central Door Lock Relay |
| Central Door Unlock Relay |
| Driver Door Unlock Relay |
| Power window relay |
| Turn Left Signal |
| Turn Right Signal |
| Flasher Sound Relay |

Duration: 0.5S On 0.5 Off Repeat
Conditions: BATTERY ON
Result: Success

Start **Stop**

Removal

1. Disconnect the negative (-) battery terminal.
2. Remove the crash pad lower panel (A).



3. Remove the reinforce panel after loosening the mounting bolts.
4. Remove the body control module after loosening nut (1EA) and screw (1EA) and disconnecting the connectors (A).