

Component Procedures: Collision Avoidance Module

Table of Contents

1. Body Control Module (BCM) - Description and Operation (Article 44809)
2. Body Control Module (BCM) - Components and Components Location (Article 44804)
3. Body Control Module (BCM) - Repair Procedures (Article 44812)
4. All Technical Service Bulletins (itype_100)
5. Front View Camera System - Repair Procedures (Article 44722)
6. OEM Policies and Procedures (itype_120)

Component Procedures: Collision Avoidance Module

Body Control Module (BCM) - Description and Operation (Article 44809)

- Description

Body Control Module (BCM) function

No Item Description

1 Washer Linked Wiper If the washer switch is pressed ON for 0.06-0.2 second with the vehicle mode in IGN2, the wiper relay is turned ON 0.3±0.1 second after washer switch ON, and then the wiper relay is turned OFF 0.7±0.1 second later. If the washer switch is pressed ON for over 0.2 second with the vehicle mode in IGN2, the wiper relay is turned ON 0.3±0.1 second after washer switch ON, and then the wiper relay is turned OFF 2.5-3.8 seconds (wiper activates 2-3 times) after washer switch OFF.

- If the washer switch is pressed ON for 0.06-0.2 second with the vehicle mode in IGN2, the wiper relay is turned ON 0.3±0.1 second after washer switch ON, and then the wiper relay is turned OFF 0.7±0.1 second later.

- If the washer switch is pressed ON for over 0.2 second with the vehicle mode in IGN2, the wiper relay is turned ON 0.3±0.1 second after washer switch ON, and then the wiper relay is turned OFF 2.5-3.8 seconds (wiper activates 2-3 times) after washer switch OFF.

2 MIST Linked Wiper If the wiper mist switch is pressed ON for 0.7 second with the vehicle mode in IGN2, the wiper relay is turned ON, and then OFF 0.7 second later. If the wiper mist switch is pressed ON for over 0.7 second with the vehicle mode in IGN2, the wiper relay is turned ON, and then turned OFF 0.7 second after wiper mist switch OFF.

- If the wiper mist switch is pressed ON for 0.7 second with the vehicle mode in IGN2, the wiper relay is turned ON, and then OFF 0.7 second later.

- If the wiper mist switch is pressed ON for over 0.7 second with the vehicle mode in IGN2, the wiper relay is turned ON, and then turned OFF 0.7 second after wiper mist switch OFF.

3 Variable INT Wiper If the INT wiper switch is turned ON with the vehicle mode in IGN2, INT wiper operates intermittently (10 -2.2 sec.) based on the INT volume setting.

- If the INT wiper switch is turned ON with the vehicle mode in IGN2, INT wiper operates intermittently (10 -2.2 sec.) based on the INT volume setting.

4 Rear Defogger Deicer Timer If the defogger switch is turned ON with the vehicle mode in alternator ON, defogger relay is turned ON for 20 minutes. If the defogger switch is pressed one more time or if alternator mode is turned OFF while the defogger is ON, then the defogger relay is turned OFF.

- If the defogger switch is turned ON with the vehicle mode in alternator ON, defogger relay is turned ON for 20 minutes.

- If the defogger switch is pressed one more time or if alternator mode is turned OFF while the defogger is ON, then the defogger relay is turned OFF.

5 KEY Inter Lock If the KEY INTER LOCK switch is turned OFF with the vehicle mode in IGN1 ON or ACC ON, the key solenoid output is turned ON and prevents the key from being removed.

- If the KEY INTER LOCK switch is turned OFF with the vehicle mode in IGN1 ON or ACC ON, the key solenoid output is turned ON and prevents the key from being removed.

6 ATM Shift Lock If brake switch is turned ON with the vehicle mode in IGN1 ON and the shift lever in P position, ATM solenoid is turned ON to unlock the shift lever.

- If brake switch is turned ON with the vehicle mode in IGN1 ON and the shift lever in P position, ATM solenoid is turned ON to unlock the shift lever.

7 Trunk Release Trunk release relay is turned ON for 0.2±0.02 second if TX trunk signal is received. If trunk release switch is turned ON with all doors unlocked, trunk releaserelay is turned ON for 0.2±0.02 second. (However, Trunk release switch is ignored when in ARMWAIT, ARM, REARM, or ALARM mode.) If Interior trunk release switch is turned ON, trunk release relay is turned ON for 0.2±0.02 second. (However, Trunk release relay is NOT turned ON of the vehicle speed is over 5km/h(3.1mi/h), or if the vehicle is in ARMWAIT, ARM, REARM, or ALARM mode.)

- Trunk release relay is turned ON for 0.2±0.02 second if TX trunk signal is received.

- If trunk release switch is turned ON with all doors unlocked, trunk releaserelay is turned ON for 0.2±0.02 second. (However, Trunk release switch is ignored when in ARMWAIT, ARM, REARM, or ALARM mode.)

- If Interior trunk release switch is turned ON, trunk release relay is turned ON for 0.2±0.02 second. (However, Trunk release relay is NOT turned ON of the vehicle speed is over 5km/h(3.1mi/h), or if the vehicle is in ARMWAIT, ARM, REARM, or ALARM mode.)

8 Power Window Timer Power wIndicatorow relay is turned ON when the vehicle mode is switched to IGN ON. When the vehicle mode is switched IGN ON → OFF, power window relay is turned ON for 30 seconds. If a door is opened during the 30 second power window relay ON period, the power window relay is immediately turned OFF. If a door is opened and the vehicle mode is switched IGN ON → OFF, power window relay is immediately turned OFF.

- Power wIndicatorow relay is turned ON when the vehicle mode is switched to IGN ON.

- When the vehicle mode is switched IGN ON → OFF, power window relay is turned ON for 30 seconds.
- If a door is opened during the 30 second power window relay ON period, the power window relay is immediately turned OFF.
- If a door is opened and the vehicle mode is switched IGN ON → OFF, power window relay is immediately turned OFF.

9 Seat Belt Reminder (Driver Side) If Seat belt is not fastened, Indicator is turned ON at the first IGN ON, then turned OFF when the seat belt is fastened. If the vehicle speed is over 20Km/h with Seat belt unfastened, Indicator blinks and chime buzzer is activated for 100 seconds. While the vehicle speed is over 20Km/h with the seat belt fastened, then the seat belt is unfastened, Indicator blinks and chime buzzer is activated for 100 seconds. (Reminder) If the Seat belt is fastened or the vehicle mode is switched to IGN OFF while 100 sec. buzzer is activating, the Indicator blinking and the buzzer is turned OFF. If the vehicle mode is switched to IGN ON with Seat belt unfastened, and vehicle speed exceeds 20Km/h with Indicator ON, Indicator blinks and chime buzzer is activated for 100 seconds.

- If Seat belt is not fastened, Indicator is turned ON at the first IGN ON, then turned OFF when the seat belt is fastened.
- If the vehicle speed is over 20Km/h with Seat belt unfastened, Indicator blinks and chime buzzer is activated for 100 seconds.
- While the vehicle speed is over 20Km/h with the seat belt fastened, then the seat belt is unfastened, Indicator blinks and chime buzzer is activated for 100 seconds. (Reminder)
- If the Seat belt is fastened or the vehicle mode is switched to IGN OFF while 100 sec. buzzer is activating, the Indicator blinking and the buzzer is turned OFF.
- If the vehicle mode is switched to IGN ON with Seat belt unfastened, and vehicle speed exceeds 20Km/h with Indicator ON, Indicator blinks and chime buzzer is activated for 100 seconds.

10 Seat Belt Reminder (Passenger Side) If there is no one in the passenger seat, then the system operates as if seat belt is fastened. If Seat belt is not fastened, Indicator is turned ON at the first IGN ON, then turned OFF when the seat belt is fastened. If the vehicle speed is over 20Km/h with seat belt unfastened, Indicator blinks and chime buzzer is activated for 100 seconds. While the vehicle speed is over 20Km/h with the Seat belt fastened, then the seat belt is unfastened, Indicator blinks and chime buzzer is activated for 100 seconds. (Reminder) If the seat belt is fastened or the vehicle mode is switched to IGN OFF while 100 sec. buzzer is activating, the Indicator blinking and the buzzer is turned OFF. If the vehicle mode is switched to IGN ON with Seat belt unfastened, and vehicle speed exceeds 20Km/h with Indicator ON, Indicator blinks and chime buzzer is activated for 100 seconds.

- If there is no one in the passenger seat, then the system operates as if seat belt is fastened.
- If the vehicle speed is over 20Km/h with seat belt unfastened, Indicator blinks and chime buzzer is activated for 100 seconds.
- While the vehicle speed is over 20Km/h with the Seat belt fastened, then the seat belt is unfastened, Indicator blinks and chime buzzer is activated for 100 seconds. (Reminder)
- If the seat belt is fastened or the vehicle mode is switched to IGN OFF while 100 sec. buzzer is activating, the Indicator blinking and the buzzer is turned OFF.

11 Seat Belt Reminder (Rear) If Seat belt is not fastened, Indicator is turned ON for 35 seconds at the first IGN ON, then turned OFF when the seat belt is fastened. If the vehicle speed is over 20Km/h with seat belt unfastened, Indicator blinks and chime buzzer is activated for 35 seconds. If the vehicle speed is over 20Km/h with the seat belt fastened, then the seat belt is unfastened, Indicator blinks and chime buzzer is activated for 35 seconds. (Reminder) If the seat belt is fastened or the vehicle mode is switched to IGN OFF while 35 sec. buzzer is activating, the Indicator blinking and the buzzer is turned OFF. If the vehicle mode is switched to IGN ON with seat belt unfastened, and vehicle speed exceeds 20Km/h with Indicator ON, Indicator blinks and chime buzzer is activated for 35 seconds.

- If Seat belt is not fastened, Indicator is turned ON for 35 seconds at the first IGN ON, then turned OFF when the seat belt is fastened.
- If the vehicle speed is over 20Km/h with seat belt unfastened, Indicator blinks and chime buzzer is activated for 35 seconds.
- If the vehicle speed is over 20Km/h with the seat belt fastened, then the seat belt is unfastened, Indicator blinks and chime buzzer is activated for 35 seconds. (Reminder)
- If the seat belt is fastened or the vehicle mode is switched to IGN OFF while 35 sec. buzzer is activating, the Indicator blinking and the buzzer is turned OFF.
- If the vehicle mode is switched to IGN ON with seat belt unfastened, and vehicle speed exceeds 20Km/h with Indicator ON, Indicator blinks and chime buzzer is activated for 35 seconds.

12 KEY Operated Warning If the driver door is opened with the KEY IN, buzzer is continuously activated at 1 second interval. The buzzer is turned OFF if KEY OUT or the door is closed while the chime buzzer is activated.

- If the driver door is opened with the KEY IN, buzzer is continuously activated at 1 second interval.
 - The buzzer is turned OFF if KEY OUT or the door is closed while the chime buzzer is activated.
- 13 Parking Brake Warning If the vehicle speed exceeds 5Km/h(3.1mi/h) while the vehicle mode is in IGN1 and the parking brake is engaged, buzzer is sounded until the parking brake is released. (Buzzer activates at 0.6 second ON and 0.4 second OFF at 1 second interval until the parking brake is released.)
- If the vehicle speed exceeds 5Km/h(3.1mi/h) while the vehicle mode is in IGN1 and the parking brake is engaged, buzzer is sounded until the parking brake is released. (Buzzer activates at 0.6 second ON and 0.4 second OFF at 1 second interval until the parking brake is released.)
- 14 Decayed Room Lamp If a door is opened with the vehicle mode in IGN OFF, the room lamp is turned ON. If the door is closed, the room lamp is remained ON for 30 seconds then turned OFF. (dimmer 2±0.2 sec.) If the door is remained opened, the room lamp is remained ON for 20 minutes, then turned OFF. (dimmer 2±0.2 sec.)
- If a door is opened with the vehicle mode in IGN OFF, the room lamp is turned ON. If the door is closed, the room lamp is remained ON for 30 seconds then turned OFF. (dimmer 2±0.2 sec.)
 - If the door is remained opened, the room lamp is remained ON for 20 minutes, then turned OFF. (dimmer 2±0.2 sec.)
- 15 KEY Hole Illumination Key illumination Lamp is turned ON if a door is opened while the vehicle mode in IGN1 switch OFF, and the Key illumination Lamp is turned OFF 30 seconds after the door is closed. If the vehicle mode is switched to IGN1 ON while Key illumination lamp is ON, then the lamp is immediately turned OFF. If the vehicle mode is switched to ARMWAIT while Key illumination lamp is ON, then the lamp is immediately turned OFF.
- Key illumination Lamp is turned ON if a door is opened while the vehicle mode in IGN1 switch OFF, and the Key illumination Lamp is turned OFF 30 seconds after the door is closed.
 - If the vehicle mode is switched to IGN1 ON while Key illumination lamp is ON, then the lamp is immediately turned OFF.
 - If the vehicle mode is switched to ARMWAIT while Key illumination lamp is ON, then the lamp is immediately turned OFF.
- 16 Tail Lamp Auto Cut If Tail switch is switched OFF⇒ ON, the tail relay is turned ON. If Tail switch is turned OFF, then the tail relay is turned OFF. If KEY IN switch OFF & Tail switch ON & Driver Door OPEN while in KEY IN switch ON & Tail switch ON, the tail relay is turned OFF. (Auto OFF) If KEY IN switch is turned ON after Auto OFF, then the tail relay is turned ON. Tail relay does not turn back ON even if the driver side door is opened ⇒ closed.
- If Tail switch is switched OFF⇒ ON, the tail relay is turned ON.
 - If Tail switch is turned OFF, then the tail relay is turned OFF.
 - If KEY IN switch OFF & Tail switch ON & Driver Door OPEN while in KEY IN switch ON & Tail switch ON, the tail relay is turned OFF. (Auto OFF)
 - If KEY IN switch is turned ON after Auto OFF, then the tail relay is turned ON. Tail relay does not turn back ON even if the driver side door is opened ⇒ closed.
- 17 Head Lamp Escort If the vehicle mode is switched from IGN1 to IGN1 OFF, and the haed lamp is turned ON by haed lamp switch or autolight, then the haed lamp is remained ON. Haed lamp is turned OFF in case of any of the following conditions. ① 15 seconds after driver side door is opened ⇒ closed. ② Haed lamp or Autolight is not turned ON. ③ If driver side door is remained opened for over 5 minutes. ④ 20 minutes after the vehicle mode switching from IGN1 ON to IGN OFF. ⑤ If TX lock signal is received 2 times while H/Lamp is ON.
- If the vehicle mode is switched from IGN1 to IGN1 OFF, and the haed lamp is turned ON by haed lamp switch or autolight, then the haed lamp is remained ON.
 - Haed lamp is turned OFF in case of any of the following conditions. ① 15 seconds after driver side door is opened ⇒ closed. ② Haed lamp or Autolight is not turned ON. ③ If driver side door is remained opened for over 5 minutes. ④ 20 minutes after the vehicle mode switching from IGN1 ON to IGN OFF. ⑤ If TX lock signal is received 2 times while H/Lamp is ON.
- 18 Head Lamp LOW / HIGH If Haed lamp low is turned ON with head lamp low switch ON or autolight function, and head lamp high switch is ON (Self return), then the head lamp high is turned ON. Head lamp high can only be turned OFF with the passing switch.
- If Haed lamp low is turned ON with head lamp low switch ON or autolight function, and head lamp high switch is ON (Self return), then the head lamp high is turned ON.
 - Head lamp high can only be turned OFF with the passing switch.
- 19 Head Lamp PASSING Head lamp high activates only when the passing switch is turned ON and the vehicle mode is in IGN2 ON. The switch is used to turn OFF when the head lamp high is ON.
- Head lamp high activates only when the passing switch is turned ON and the vehicle mode is in IGN2 ON.
 - The switch is used to turn OFF when the head lamp high is ON.
- 20 Front Fog Lamp If the front fog is turned ON while tail lamp is ON, then the front fog lamp is turned ON. If the front fog is turned OFF while the front fog lamp is ON, then the lamp is turned OFF. If the head lamp

low is turned ON while front fog is ON, then the front fog lamp is turned ON. If the front fog is turned OFF while the front fog lamp is ON, then the lamp is turned OFF.

- If the front fog is turned ON while tail lamp is ON, then the front fog lamp is turned ON.
- If the front fog is turned OFF while the front fog lamp is ON, then the lamp is turned OFF.
- If the head lamp low is turned ON while front fog is ON, then the front fog lamp is turned ON.

21 Auto Light Control If Auto light sensor is detects light ON condition, then the light is turned ON 2.5 seconds later. If the sensor detects light OFF condition, then the light is turned OFF 2.5 seconds later. If the sensor detects tail light ON condition, then only the tail lamp is turned ON. If the sensor detects head lamp ON condition, then both the tail lamp and the head lamp are turned ON. In case of head lamp ON condition, both the tail lamp and head lamp are turned ON regardless of tail switch ON/OFF status.

- If Auto light sensor is detects light ON condition, then the light is turned ON 2.5 seconds later.
- If the sensor detects light OFF condition, then the light is turned OFF 2.5 seconds later.
- If the sensor detects tail light ON condition, then only the tail lamp is turned ON. If the sensor detects head lamp ON condition, then both the tail lamp and the head lamp are turned ON.
- In case of head lamp ON condition, both the tail lamp and head lamp are turned ON regardless of tail switch ON/OFF status.

22 Daytime Running Light (DRL) DRL Lamp is turned ON when the engine is started. DRL Lamp is turned OFF if head lamp low or front fog lamp is turned ON.

- DRL Lamp is turned ON when the engine is started.
- DRL Lamp is turned OFF if head lamp low or front fog lamp is turned ON.

23 Head Lamp Welcome If the vehicle mode is switched to KEY OFF, all doors are closed and locked while the Head lamp is turned ON (Head lamp switch or AUTO switch + night time), then RKE unlock is activated, the Head lamp is turned ON for 15 seconds.

- If the vehicle mode is switched to KEY OFF, all doors are closed and locked while the Head lamp is turned ON (Head lamp switch or AUTO switch + night time), then RKE unlock is activated, the Head lamp is turned ON for 15 seconds.

24 AV Tail Linked When the vehicle mode is switched to ACC ON, the auto light sensor ambience is reflected. If Auto light ambience level is tail lamp ON condition for over 2.5 seconds, then ON signal is sent. If Auto light ambience level is tail lamp OFF condition for over 2.5 seconds, then OFF signal is sent.

- When the vehicle mode is switched to ACC ON, the auto light sensor ambience is reflected.
- If Auto light ambience level is tail lamp ON condition for over 2.5 seconds, then ON signal is sent.
- If Auto light ambience level is tail lamp OFF condition for over 2.5 seconds, then OFF signal is sent.

25 RPAS If the shift lever is switched to R position while the vehicle mode is in IGN1 ON, then buzzer is activated 0.5 second later. Warning level is displayed in the cluster and buzzer is activated corresponding to the warning condition.

- If the shift lever is switched to R position while the vehicle mode is in IGN1 ON, then buzzer is activated 0.5 second later.
- Warning level is displayed in the cluster and buzzer is activated corresponding to the warning condition.

26 Normal/ARMWAIT/Relock Mode If TX lock signal is received with KEY IN switch removed from the cylinder indicator and all doors are closed, then all doors lock signal is outputted, and when all door lock switch is locked, then hazard lamp is turned ON 1 time, and the vehicle enters ARM mode after expiration of ARMWAIT time (30 sec.). If TX lock signal is received while any one of the doors, hood, or trunk is opened, then only the lock signal is outputted. Hazard lamp is not turned ON and the vehicle does not enter the ARM mode. If any of the doors is not opened or KEY IN is not detected within 30 seconds after receiving TX unlock signal, then the vehicle returns to ARM mode.

- If TX lock signal is received with KEY IN switch removed from the cylinder indicator and all doors are closed, then all doors lock signal is outputted, and when all door lock switch is locked, then hazard lamp is turned ON 1 time, and the vehicle enters ARM mode after expiration of ARMWAIT time (30 sec.).
- If TX lock signal is received while any one of the doors, hood, or trunk is opened, then only the lock signal is outputted. Hazard lamp is not turned ON and the vehicle does not enter the ARM mode.
- If any of the doors is not opened or KEY IN is not detected within 30 seconds after receiving TX unlock signal, then the vehicle returns to ARM mode.

27 Security Indicator Control If the vehicle is in ARMWAIT mode while KEY OUT, then Indicator is remained ON. Indicator blinks in interval if the vehicle is in any mode other than ARMWAIT. (Blink Interval: 2 sec. OFF, 0.3 sec. ON)

- If the vehicle is in ARMWAIT mode while KEY OUT, then Indicator is remained ON. Indicator blinks in interval if the vehicle is in any mode other than ARMWAIT. (Blink Interval: 2 sec. OFF, 0.3 sec. ON)

28 Alarm Condition If Alarm activation condition is detected, then start inhibit is turned ON to prevent engine start and the alarm is activated.

- If Alarm activation condition is detected, then start inhibit is turned ON to prevent engine start and the

alarm is activated.

29 DISARM/Alarm Deactivation Condition If TX UNLOCK/LOCK switch signal is received, unlock/lock signal is outputted for 0.5 second, and START INHIBIT is turned OFF. If KEY IN switch ON & IGN1 switch ON & IGN2 switch ON & alternator ON is maintained for 30 seconds, then start inhibit is turned OFF and the vehicle mode is switched to DISARM.

- If TX UNLOCK/LOCK switch signal is received, unlock/lock signal is outputted for 0.5 second, and START INHIBIT is turned OFF.

- If KEY IN switch ON & IGN1 switch ON & IGN2 switch ON & alternator ON is maintained for 30 seconds, then start inhibit is turned OFF and the vehicle mode is switched to DISARM.

30 RESET If the battery is disconnected while the alarm is activating, and then reconnected, then the alarm also reactivates. If the battery is disconnected while the vehicle is in ARM mode, and then reconnected, the vehicle maintains ARM mode.

- If the battery is disconnected while the alarm is activating, and then reconnected, then the alarm also reactivates.

- If the battery is disconnected while the vehicle is in ARM mode, and then reconnected, the vehicle maintains ARM mode.

31 Central Door Lock/Unlock If Driver/Passenger side door KEY lock/unlock switch is turned ON within 3 seconds, then all door lock/unlock signal is outputted for 0.5 second. If TX lock/unlock signal is received, then all door lock/unlock signal is outputted for 0.5 second. If Driver door lock switch (Power window) is Lock/Unlock, then all door lock/unlock signal is outputted for 0.5 second.

- If Driver/Passenger side door KEY lock/unlock switch is turned ON within 3 seconds, then all door lock/unlock signal is outputted for 0.5 second.

- If TX lock/unlock signal is received, then all door lock/unlock signal is outputted for 0.5 second.

- If Driver door lock switch (Power window) is Lock/Unlock, then all door lock/unlock signal is outputted for 0.5 second.

32 Auto Door Lock If the vehicle mode is in IGN1 ON & alternator ON, and the vehicle speed is over 15km/h (9.3mi/h), all doors are locked within 1.5 seconds. (However, if all doors are already locked or in case all door fail condition, then all door lock function is not executed.) If any one of the doors is unlocked after locking via above condition, then lock command is executed 3 times. (at 1 sec. interval). Unlocked door that is locked during the 3 attempts is ignored. Auto door lock function is not engaged in case of crash unlock condition.

- If the vehicle mode is in IGN1 ON & alternator ON, and the vehicle speed is over 15km/h (9.3mi/h), all doors are locked within 1.5 seconds. (However, if all doors are already locked or in case all door fail condition, then all door lock function is not executed.)

- If any one of the doors is unlocked after locking via above condition, then lock command is executed 3 times. (at 1 sec. interval). Unlocked door that is locked during the 3 attempts is ignored.

- Auto door lock function is not engaged in case of crash unlock condition.

33 Auto Door Unlock If KEY OFF after KEY IN, then all door unlock is executed. (However, if all doors are already unlocked, then the unlock command is not executed.)

- If KEY OFF after KEY IN, then all door unlock is executed. (However, if all doors are already unlocked, then the unlock command is not executed.)

34 Driver Door Unlock Switch Synchronized Auto Door Unlock If All doors are closed, and driver door unlock switch is switched from locked to unlocked, then all door unlock signal is outputted 1 time for 0.25 second.

- If All doors are closed, and driver door unlock switch is switched from locked to unlocked, then all door unlock signal is outputted 1 time for 0.25 second.

35 IGN KEY Reminder This function does not activate if the vehicle speed is over 3Km/h (1.86mi/h). If IGN KEY ON, Driver door switch open & Driver door unlock state becomes locked, all door unlock is executed for 1 second after 0.5 second delay. IGN KEY ON, Assist door switch open & Assist door unlock state becomes locked, all door unlock is executed for 1 second after 0.5 second delay. If Driver door switch is closed within 0.5 second from driver door unlock state switchitching UNLOCK → LOCK when the vehicle is in IGN KEY ON mode, all door unlock is executed only 1 time for 1 second. If unlock condition is satisfied, then unlock is executed even if the condition is not maintained for 0.5 second.

- If IGN KEY ON, Driver door switch open & Driver door unlock state becomes locked, all door unlock is executed for 1 second after 0.5 second delay.

- IGN KEY ON, Assist door switch open & Assist door unlock state becomes locked, all door unlock is executed for 1 second after 0.5 second delay.

- If Driver door switch is closed within 0.5 second from driver door unlock state switchitching UNLOCK → LOCK when the vehicle is in IGN KEY ON mode, all door unlock is executed only 1 time for 1 second.

- If unlock condition is satisfied, then unlock is executed even if the condition is not maintained for 0.5 second.

36 Passive KEY Reminder This function does not activate if the vehicle speed is over 3Km/h(1.86mi/h). If KEY Reminder signal is received from SMK, then all door unlock command is outputted for 1 second. If the door remains locked even if unlock command is outputted for 1 second as stated above, then unlock is attempted for up to 3 times (excluding the 1st output) (1 sec. interval: 0.5 sec. ON/OFF)

- This function does not activate if the vehicle speed is over 3Km/h(1.86mi/h).
- If KEY Reminder signal is received from SMK, then all door unlock command is outputted for 1 second.
- If the door remains locked even if unlock command is outputted for 1 second as stated above, then unlock is attempted for up to 3 times (excluding the 1st output) (1 sec. interval: 0.5 sec. ON/OFF)

37 Crash Door Unlock Unlock is executed every time ACU signal is inputted when IGN switch is turned ON. Unlock output continues for the set duration even if the vehicle mode is switched from IGN KEY ON to OFF. If the Driver/Assist/Rear door lock switch is switched from unlock to lock after executing unlock, then unlock command is executed again for 5 seconds. Auto Door Lock function is not engaged in case of crash unlock condition.

- Unlock is executed every time ACU signal is inputted when IGN switch is turned ON. Unlock output continues for the set duration even if the vehicle mode is switched from IGN KEY ON to OFF.
- If the Driver/Assist/Rear door lock switch is switched from unlock to lock after executing unlock, then unlock command is executed again for 5 seconds.
- Auto Door Lock function is not engaged in case of crash unlock condition.

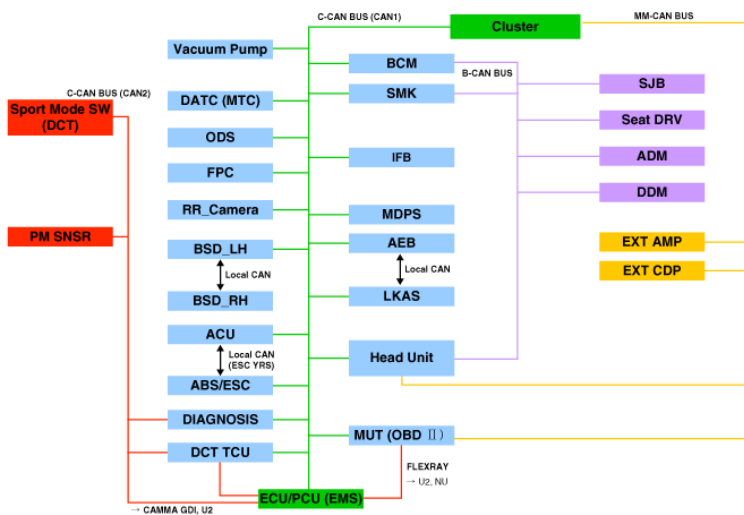
38 HBA (High Beam Assist) If Head lamp high switch is turned ON with AUTO switch night condition, HBA mode is activated. If oncoming vehicle or vehicle in front is detected (signal input from LDWS) while in HBA mode, then head lamp high is turned OFF. If oncoming vehicle or vehicle in front is not detected, then head lamp high is turned ON automatically.

- If Head lamp high switch is turned ON with AUTO switch night condition, HBA mode is activated.
- If oncoming vehicle or vehicle in front is detected (signal input from LDWS) while in HBA mode, then head lamp high is turned OFF.
- If oncoming vehicle or vehicle in front is not detected, then head lamp high is turned ON automatically.

39 FOLD / UNFOLD Fold/Unfold is engaged when Fold/Unfold switch is activated. If Auto switch is activated, then Fold/Unfold is engaged automatically in case of any of below conditions. If RKE Lock/Unlock. If Passive Lock/Unlock. If Smart Key approach/away signal is detected.

- Fold/Unfold is engaged when Fold/Unfold switch is activated.
- If Auto switch is activated, then Fold/Unfold is engaged automatically in case of any of below conditions.
- If RKE Lock/Unlock.
- If Passive Lock/Unlock.
- If Smart Key approach/away signal is detected.

Communication Network Diagram



※ CAN : Controller Area Network

Abbreviation Expalnation

ACU Airbag Control Unit

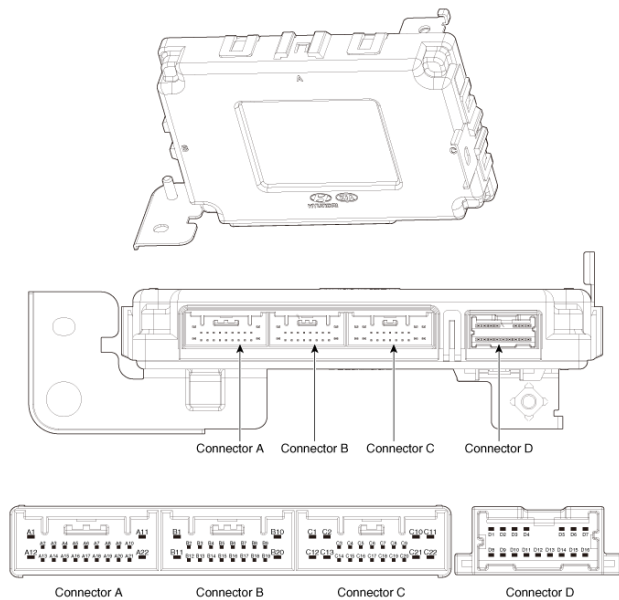
ADM Assist Door Module

B_CAN Body Controller Area Network

BCM Body Control Module
 BSD Blind Spot Detection
 C_CAN Chassis Controller Area Network
 CLU Cluster Module
 DATC Dual Automatic Temp Control
 DDM Driver Door Module
 ESC Electronic Stability Program
 EMS Engine Management System
 LKAS Lane Keeping Assist System
 M_CAN Multi media Controller Area Network
 MDPS Motor Driven Power Steering
 P_CAN Powertrain Controller Area Network
 PSM Power Seat Module
 SAS Steering Angle Sensor
 SJB Smart Junction Block
 SMK Smart Key Unit
 PAS Parking Assist System
 TCU Transmission Control Unit
 TPMS Tire Pressure Monitoring System
 VDC Vehicle Dynamic Control
 TMU Telematics System
 ABS Anti-lock Brake System

Body Control Module (BCM) - Components and Components Location (Article 44804)

- Components



No Connector A Connector B Connector C Connector D
 1 Batt (+) Blade position (Low) Rain sensor (LIN) Airbag unit (LIN)
 2 IGN 1 Front wiper switch (High) - RPAS (LIN)
 3 IGN 2 Light switch - Puddle lamp
 4 Brake switch Head lamp switch (High) - ATM solenoid
 5 Front wiper switch (Low) Auto light power - Power window (Enable)
 6 - Body CAN (High) - Wiper relay (High)
 7 Heated steering switch Body CAN (Low) RPAS Buzzer Key solenoid
 8 PAS Switch - IGN 1 -
 9 Rear defogger switch Chassis CAN (Low) PAS Front sensor power PAS Switch indicator
 10 Window lock switch Chassis CAN (High) RPAS Front sensor power Heated steering indicator
 11 Rain sensor input - Heated steering output -
 12 ACC Auto light sensor GND Key hole illumination
 13 Front washer switch Front wiper int vol switch Rear center seat belt indicator Passenger seat belt

indicator

14 - Fog lamp switch Rear left seat belt indicator Wiper relay (Low)

15 Key in switch NTC Sensor signal input Rear right seat belt indicator Tail lamp

16 - Airbag signal - Room lamp

17 - - Security indicator

18 Sunroof open switch - -

19 PAS Input Multifunction switch ground -

20 Ket inter lock switch Auto light ground -

21 NTC Ground -

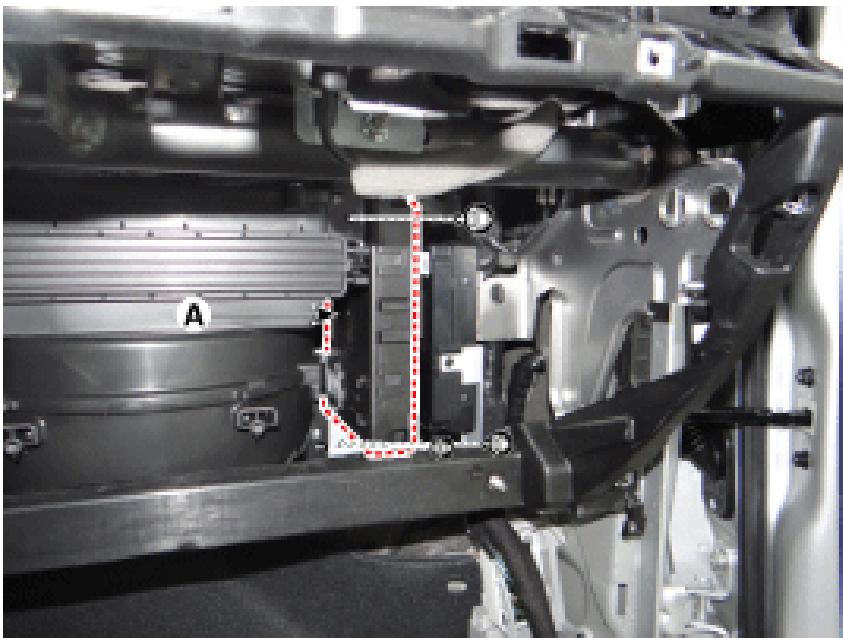
22 Ground IGN 2 Heated steering power

Body Control Module (BCM) - Repair Procedures (Article 44812)

- Removal
- Disconnect the negative (-) battery terminal.
- Remove the glove box. (Refer to Body - "Glove Box Upper Cover Assembly")
- Remove the smart key unit. (Refer to Body - "Smart Key Unit")
- Disconnect the body control module connectors (A).



- Remove the body control module (A) after loosening the mounting nuts.

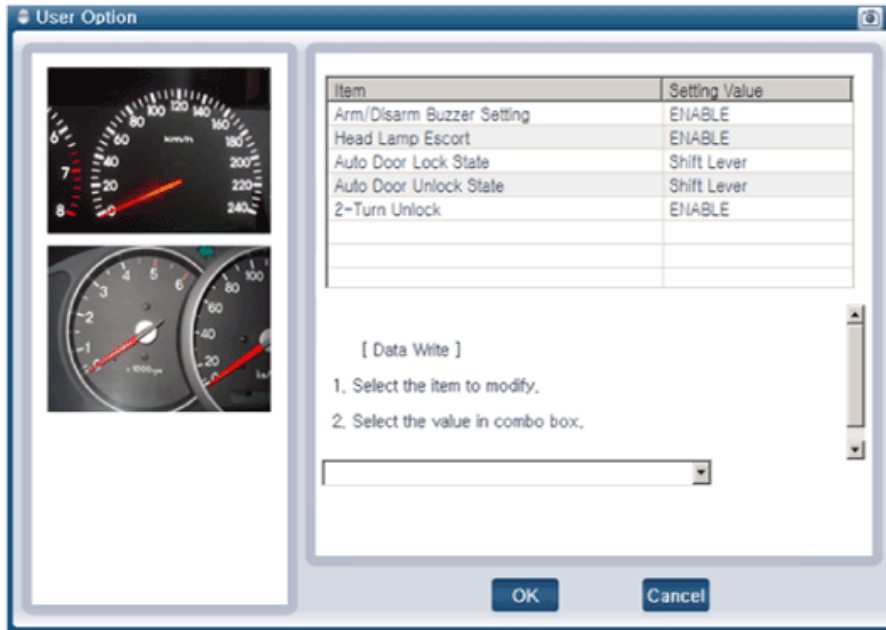


- Installation
- Install the body control module.
- Connect the body control module.
- Install the glove box upper cover assembly.
- BCM Diagnosis with GDS
- The body electrical system can be quickly diagnosed failed parts with vehicle diagnostic system (GDS). The diagnostic system (GDS) provides the following information. Self examination : Checking the failure code (DTC) and display. Current data : Checking the system input/output data state. Actuator test : Checking the system operation condition. Additional function : Other controlling such as he system option and zero point adjustment.
- Self examination : Checking the failure code (DTC) and display.
- Current data : Checking the system input/output data state.
- Actuator test : Checking the system operation condition.
- Additional function : Other controlling such as he system option and zero point adjustment.
- Select the "Car model" and the system to be checked in order to check the vehicle with the tester.
- Select the "Body Control Module (BCM)" to check body control module.
- Select the "Current data" menu to search the current state of the input/output data. The input/output data for the sensors corresponding to the "Body Control Module (BCM)" can be checked.

Sensor Name	Value	Unit
<input type="checkbox"/> Arm/Disarm Buzzer Setting	ON	-
<input type="checkbox"/> Head Lamp Escort	ON	-
<input type="checkbox"/> Auto Door Lock State	15km/h	-
<input type="checkbox"/> Auto Door Unlock Status	Shift-lever	-
<input type="checkbox"/> 2-Turn Unlock	OFF	-
<input type="checkbox"/> RK Trunk Button Function Lock	OFF	-
<input type="checkbox"/> SMK Welcome Option	ON	-
<input type="checkbox"/> Battery Voltage Monitoring Input	11.4	V
<input type="checkbox"/> Auto Light Sensor (Option)	0.4	V
<input type="checkbox"/> Light Switch Voltage(Voltage Divided)	5.0	V
<input type="checkbox"/> Head Lamp High Switch Voltage(Voltage Divided)	5.0	V
<input type="checkbox"/> Fog Lamp Switch Voltage(Voltage Divided)	5.0	V
<input type="checkbox"/> Front Wiper Switch Voltage(Voltage Divided)	5.0	V
<input type="checkbox"/> Wiper INT Volume Voltage(Voltage Divided)	3.6	V
<input type="checkbox"/> ACC	ON	-
<input type="checkbox"/> IGN1	ON	-
<input type="checkbox"/> IGN2	ON	-
<input type="checkbox"/> Defogger / Deicer Switch	OFF	-
<input type="checkbox"/> Washer Switch	OFF	-
<input type="checkbox"/> INT Switch	OFF	-
<input type="checkbox"/> Mist Switch	OFF	-
<input type="checkbox"/> Wiper Stop Position Switch	ON	-
<input type="checkbox"/> Wiper Low Relay	OFF	-

- If you want to change user option, select "User Option".





All Technical Service Bulletins (itype_100)

Tsbs

- BLIND-SPOT COLLISION WARNING (BCW) MODULE REPLACEMENT INFORMATION (19-BE-008H, 2019/05/01)

Front View Camera System - Repair Procedures (Article 44722)

- Service Point Target Auto Calibration (SPTAC)

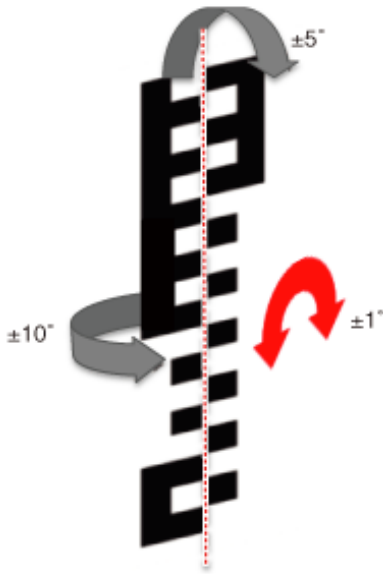
When you need calibration :

- Front view camera is removed and mounted
- Replace front view camera with a new one
- Windshield glass changed
- Front view camera coupler of the windshield glass is deformed

Service Point Target Auto Calibration (SPTAC)

- Method for Correct Alignment of Calibration Target In order to complete the calibration of the front view camera successfully, install the calibration target as follows: Install the target (SST: 09890-3V100) vertical to the ground and from the camera referring to the below tolerance angle. The tolerance $\pm 1^\circ$ for the left and right gradient is very important and is sensitive to the flatness of the ground. Install the compensator vertically using the Level Laser (SST: 09958-3T060 or 09964-C1200). Arrange the Level Laser (A) on the center of the vehicle by installing it on the roof center above the vehicle's front windshield (same for both short and long distance calibrations) . Have the laser illuminate starting from the roof center and to all the way to the center of the target, passing through the emblem center. The level laser must be set to 'ON' and the holding (locking) function is not used. Target is mounted to rigid backer material to maintain flatness requirements. Target has reflective (not faded or poorly painted) markings that are unlike from lane features. Target is 30 cm wide and 100 cm tall. Mounting area must NOT have cross hatch patterns or textual markings near the target. Target should be well lit for optimal performance using non-fluctuating illumination. There shall be no continuous shadows cast on the target. The light should be directed toward the target front and the target front should be brighter than the target rear and target.

- Install the target (SST: 09890-3V100) vertical to the ground and from the camera referring to the below tolerance angle.



	L/R torsion	F/B gradient	L/R gradient
Tolerance angle	± 10°	± 5°	± 1°

The tolerance $\pm 1^\circ$ for the left and right gradient is very important and is sensitive to the flatness of the ground. Install the compensator vertically using the Level Laser (SST: 09958-3T060 or 09964-C1200). Arrange the Level Laser (A) on the center of the vehicle by installing it on the roof center above the vehicle's front windshield (same for both short and long distance calibrations) . Have the laser illuminate starting from the roof center and to all the way to the center of the target, passing through the emblem center. The level laser must be set to 'ON' and the holding (locking) function is not used.



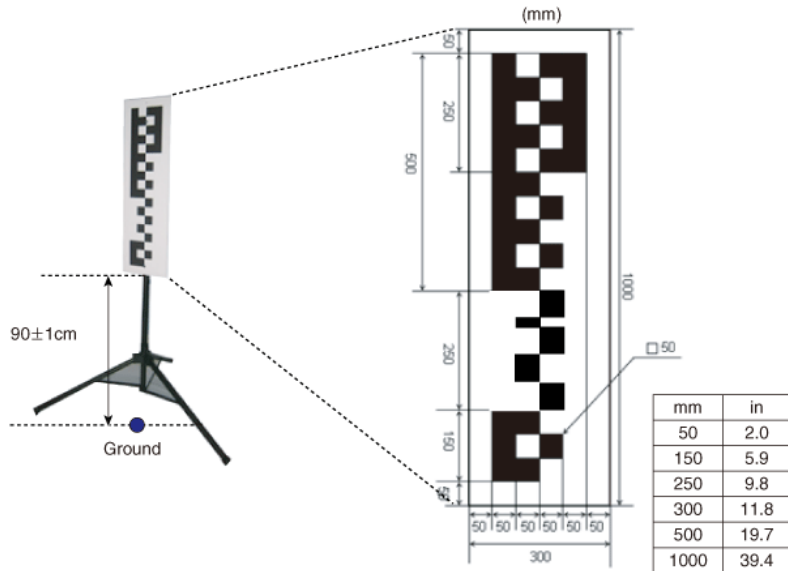


Target is mounted to rigid backer material to maintain flatness requirements. Target has reflective (not faded or poorly painted) markings that are unlike from lane features. Target is 30 cm wide and 100 cm tall. Mounting area must NOT have cross hatch patterns or textual markings near the target. Target should be well lit for optimal performance using non-fluctuating illumination. There shall be no continuous shadows cast on the target. The light should be directed toward the target front and the target front should be brighter than the target rear and target.

NOTICE

- Target has reflective (not faded or poorly painted) markings that are unlike from lane features.
- Target is 30 cm wide and 100 cm tall.

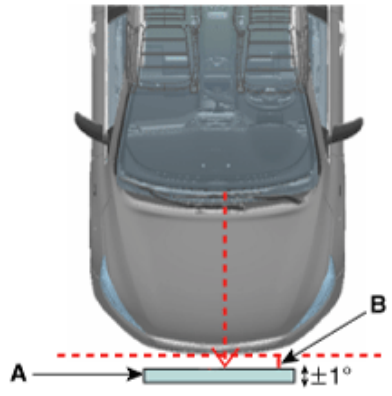
- Mounting area must NOT have cross hatch patterns or textual markings near the target.
- Target should be well lit for optimal performance using non-fluctuating illumination. There shall be no continuous shadows cast on the target.
- The light should be directed toward the target front and the target front should be brighter than the target rear and target.



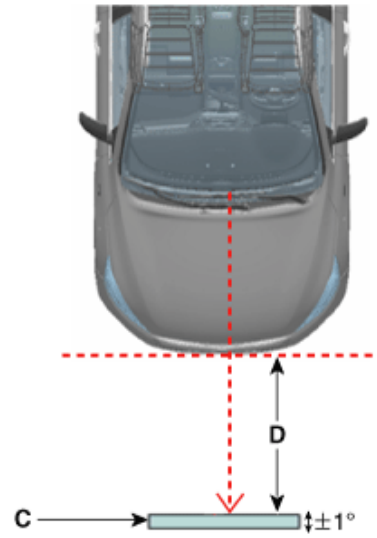
- Service Point Target Auto Calibration (SPTAC) Procedure It is recommended to check vehicle toe-in and tire pressure levels to ensure proper alignment of the camera to the "world" before proceeding with calibration. The vehicle to run the calibration routine is to be at nominal production loading capacity. Windshield must be clean and silk-screen checked so that there is no blockage of the camera. Service technician connects the diagnostic connector and starts the vehicle. The front view camera should not be activated by pressing the switch. The service calibration routine may not run correctly if any system level fault is active. If working with a replacement ECU : the service technician initiates the SPTAC Reset configuration. Service technician either aligns the vehicle to the target or the target to the vehicle. a. Locate the bottom of the target 90cm from the ground (max. tolerance : 1cm). b. Locate so that the central axis of the target and the central axis of the vehicle match (max. tolerance : 3cm). c. Locate the short-distance target (A) so that it adheres by 0cm (B) to the bumper front (max. tolerance : 5cm). d. The location of the long-distance target (C) is 100cm (D) before the bumper (max. tolerance : 5cm). Select Camera Calibration under Option of Global Diagnosis System (GDS). The technician should complete the short-distance calibration after checking the target location and "OK" message on the GDS. The technician should complete the long-distance calibration after checking the target location and "OK" message on the GDS (conduct the calibration twice : short and long distances). If the distance 100 ± 5 cm (39.4 ± 2 inch) is different from the distance indicated on the GDS, calibrate it according to the value indicated on the GDS.

- It is recommended to check vehicle toe-in and tire pressure levels to ensure proper alignment of the camera to the "world" before proceeding with calibration. The vehicle to run the calibration routine is to be at nominal production loading capacity.
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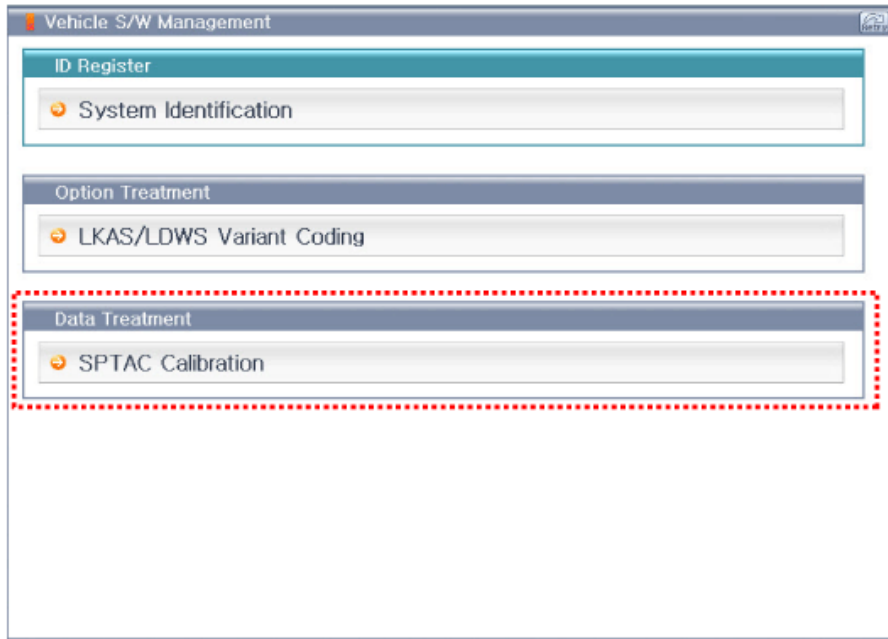
[The position of target in short distance]

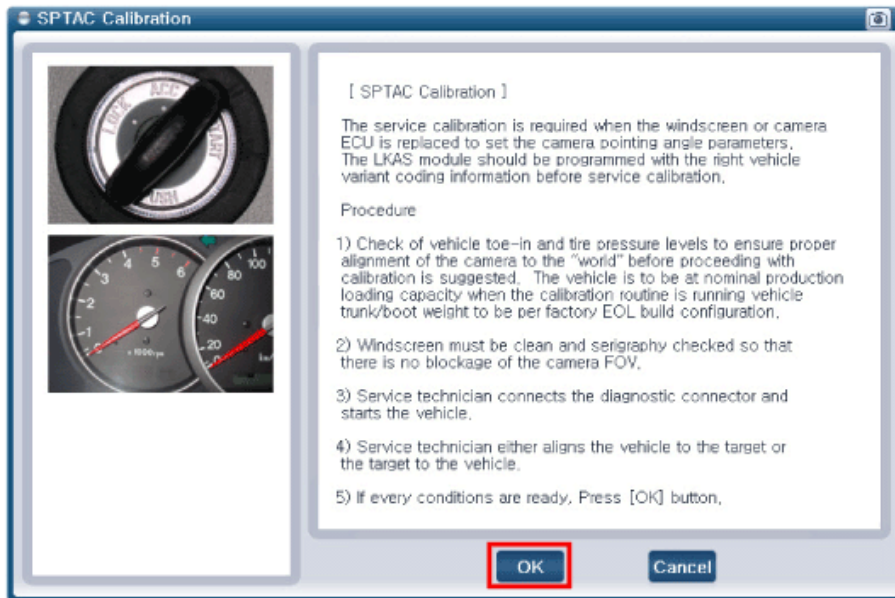


[The position of target in long distance]

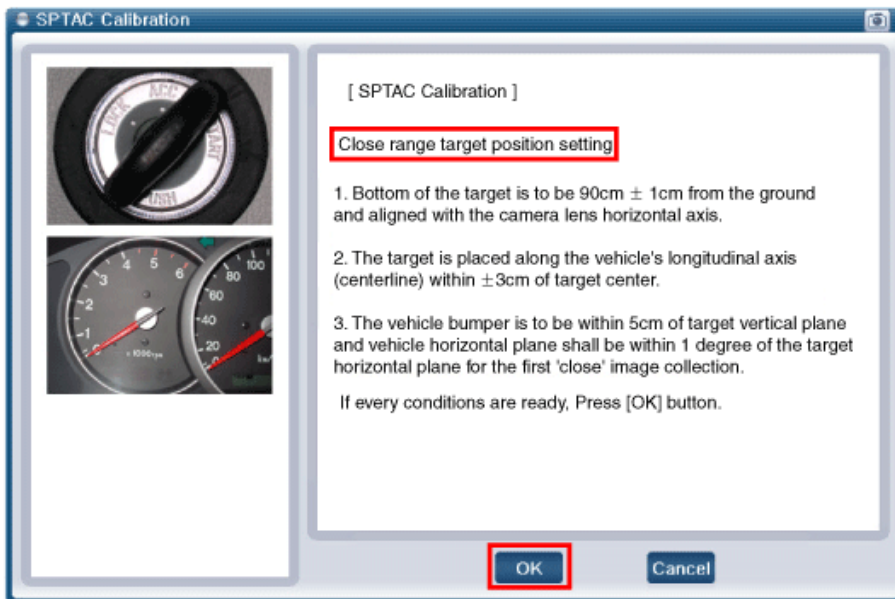


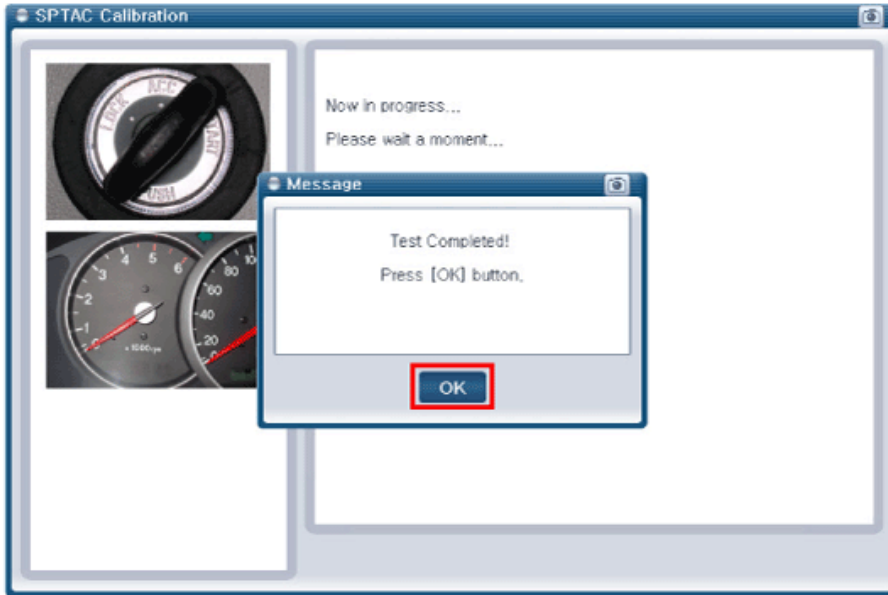
- Select Camera Calibration under Option of Global Diagnosis System (GDS).





- The technician should complete the short-distance calibration after checking the target location and "OK" message on the GDS.



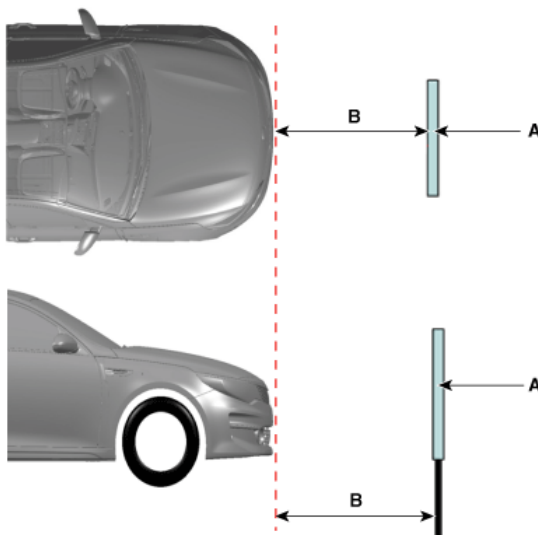


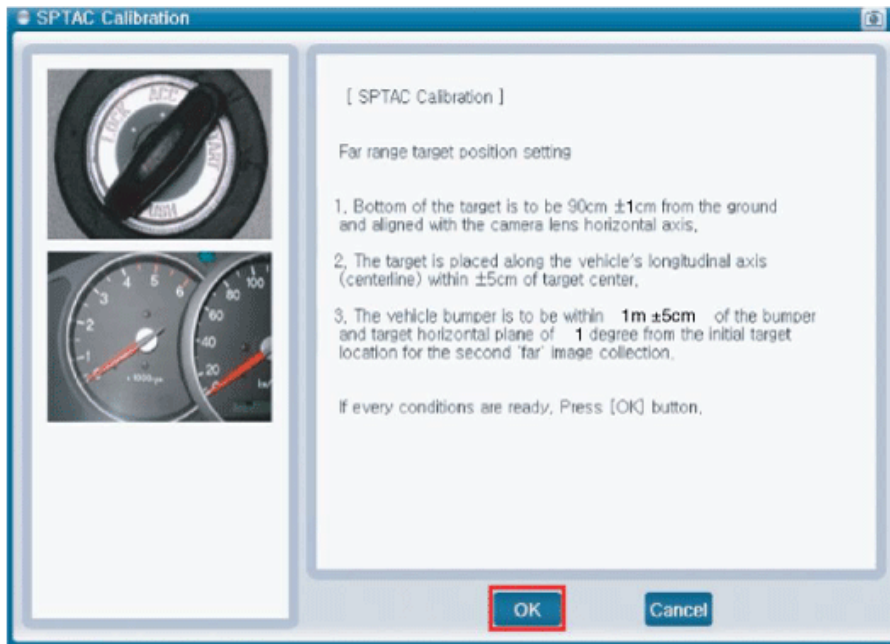
- The technician should complete the long-distance calibration after checking the target location and "OK" message on the GDS (conduct the calibration twice : short and long distances). If the distance 100 ± 5 cm (39.4 ± 2 inch) is different from the distance indicated on the GDS, calibrate it according to the value indicated on the GDS.

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Information





Test Drive

Be sure to perform test drive to check for normal operation after performing calibration. Drive on straight road (of longer than 500 m) with 2 white or yellow lane marks at speed of over 60km/h (64mph), and check for the alert as you intentionally steer close to the lane mark. LKA operates properly if the lane mark segment space is less than 8 m. Perform test drive on car-only road or on a highway.

- Be sure to perform test drive to check for normal operation after performing calibration.
- Drive on straight road (of longer than 500 m) with 2 white or yellow lane marks at speed of over 60km/h (64mph), and check for the alert as you intentionally steer close to the lane mark.
- LKA operates properly if the lane mark segment space is less than 8 m.
- Perform test drive on car-only road or on a highway.

The LKA may not activate properly in the following conditions The LKA may not activate properly when: It is difficult to distinguish the lane from the road due to dust built up on the lane. It is difficult to distinguish the color of the lane line from the road. There is a mark that looks like a lane line near the line. The lane line is indistinct or damaged. The number of lanes increases or decreases or the lane lines are crossing (driving through toll plaza, toll gate, road merging or dividing area, etc.). There are more than two lane lines. The lane is very wide or narrow. The lane is not visible due to snow, rain, stain, a puddle or other factors. Shadows of objects (median strip, guard rail, noise barriers, etc.) surrounding the road are casted on the lane. The lane is congested or it is replaced by a structure in a construction area. There is a indication on the road surface such as crosswalk or road signs. The lane inside the tunnel is covered with dust or oil. The brightness outside changes suddenly such as when entering or exiting a tunnel. The head lamps are not on at night or in a tunnel, or light level is low. There is a boundary structure. Light such as street light, sunlight or oncoming vehicle light reflects from the water on the road. Driving with the sun in front of you. Driving on the bus-only lane or on the left/right of the lane. The lane suddenly disappears at certain locations such as at the intersection. The distance from the vehicle ahead is extremely short or that vehicle drives hiding the lane line. Driving on a steep grade or a sharp curve. The vehicle vibrates heavily. The surrounding of the inside rear view mirror temperature is high due to direct sun light. The lens or windshield is covered with foreign matter. Tthe sensor cannot detect the lane because of fog, heavy rain, or heavy snow. The windshield is fogged by humid air in the vehicle. Putting something on the crash pad.

- It is difficult to distinguish the lane from the road due to dust built up on the lane.
- It is difficult to distinguish the color of the lane line from the road.
- There is a mark that looks like a lane line near the line.
- The lane line is indistinct or damaged.
- The number of lanes increases or decreases or the lane lines are crossing (driving through toll plaza, toll gate, road merging or dividing area, etc.).
- There are more than two lane lines.
- The lane is very wide or narrow.
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- Shadows of objects (median strip, guard rail, noise barriers, etc.) surrounding the road are casted on the lane.

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- The lane inside the tunnel is covered with dust or oil.
- The brightness outside changes suddenly such as when entering or exiting a tunnel.
- The head lamps are not on at night or in a tunnel, or light level is low.
- There is a boundary structure.
- Light such as street light, sunlight or oncoming vehicle light reflects from the water on the road.
- Driving with the sun in front of you.
- Driving on the bus-only lane or on the left/right of the lane.
- The lane suddenly disappears at certain locations such as at the intersection.
- The distance from the vehicle ahead is extremely short or that vehicle drives hiding the lane line.
- Driving on a steep grade or a sharp curve.
- The vehicle vibrates heavily.
- The surrounding of the inside rear view mirror temperature is high due to direct sun light.
- The lens or windshield is covered with foreign matter.
- The sensor cannot detect the lane because of fog, heavy rain, or heavy snow.
- The windshield is fogged by humid air in the vehicle.
- Putting something on the crash pad.

The LKA may not activate properly in the following conditions: The LKA is a system to prevent lane departure and assist steering. In any case, do not rely on the steering assist system, and the driver must take the necessary precautions to determine safety matters. Driver is responsible for being aware of surroundings and steering the vehicle for safe driving practices. Do not steer the steering wheel suddenly when the steering wheel is being assisted by the system. LKA helps prevent the driver from moving out of the lane unintentionally by assisting the driver's steering. LKA is not working if the camera cannot detect the lane or if the vehicle speed does not exceed 64km/h(40mph), Do not disassemble front view camera temporarily for tinted window or attaching any types of coatings and accessories. Do not allow any water or liquid to contact the front view camera. Do not remove the front view camera parts and do not damage the front view camera by a strong impact. Do not put objects that reflect light on the crash pad. Excessive noise can make the LKA alarm sound unheard.

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- Driver is responsible for being aware of surroundings and steering the vehicle for safe driving practices.
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- Do not allow any water or liquid to contact the front view camera.
- Do not remove the front view camera parts and do not damage the front view camera by a strong impact.
- Do not put objects that reflect light on the crash pad.
- Excessive noise can make the LKA alarm sound unheard.

High Beam Assist

The system may not operate normally in the below conditions. When the light from the oncoming or front vehicle is not detected because of lamp damage, hidden from sight, etc. When the lamp of the oncoming or front vehicle is covered with dust, snow or water. When the light from the oncoming or front vehicle is not detected because of exhaust fume, smoke, fog, snow, etc. When the front window is covered with foreign matters such as ice, dust, fog, or is damaged. When there is a similar shape lamp with the front vehicle's lamps. When it is hard to see because of fog, heavy rain or snow. When the headlamp is not repaired or replaced at an authorized dealer. When headlamp aiming is not properly adjusted. When driving on a narrow curved road or rough road. When driving downhill or uphill. When only part of the vehicle in front is visible on a crossroad or curved road. When there is a traffic light, reflecting sign, flashing sign or mirror. When the road conditions are bad such as being wet or covered with snow. When the front vehicle's headlamps are off but the fog lamps on. When a vehicle suddenly appears from a curve. When the vehicle is tilted from a flat tire or being towed. When the LDW /LKA warning light illuminates. Replace MFC with a new one Windshield glass changed

- When the light from the oncoming or front vehicle is not detected because of lamp damage, hidden from sight, etc.
- When the lamp of the oncoming or front vehicle is covered with dust, snow or water.
- When the light from the oncoming or front vehicle is not detected because of exhaust fume, smoke, fog, snow, etc.

- When the front window is covered with foreign matters such as ice, dust, fog, or is damaged.
- When there is a similar shape lamp with the front vehicle's lamps.
- When it is hard to see because of fog, heavy rain or snow.
- When the headlamp is not repaired or replaced at an authorized dealer.
- When headlamp aiming is not properly adjusted.
- When driving on a narrow curved road or rough road.
- When driving downhill or uphill.
- When only part of the vehicle in front is visible on a crossroad or curved road.
- When there is a traffic light, reflecting sign, flashing sign or mirror.
- When the road conditions are bad such as being wet or covered with snow.
- When the front vehicle's headlamps are off but the fog lamps on.
- When a vehicle suddenly appears from a curve.
- When the vehicle is tilted from a flat tire or being towed.
- When the LDW /LKA warning light illuminates.
- Replace MFC with a new one

OEM Policies and Procedures (itype_120)

Tsbs

- BLIND-SPOT COLLISION WARNING (BCW) MODULE REPLACEMENT INFORMATION (19-BE-008H, 2019/05/01)