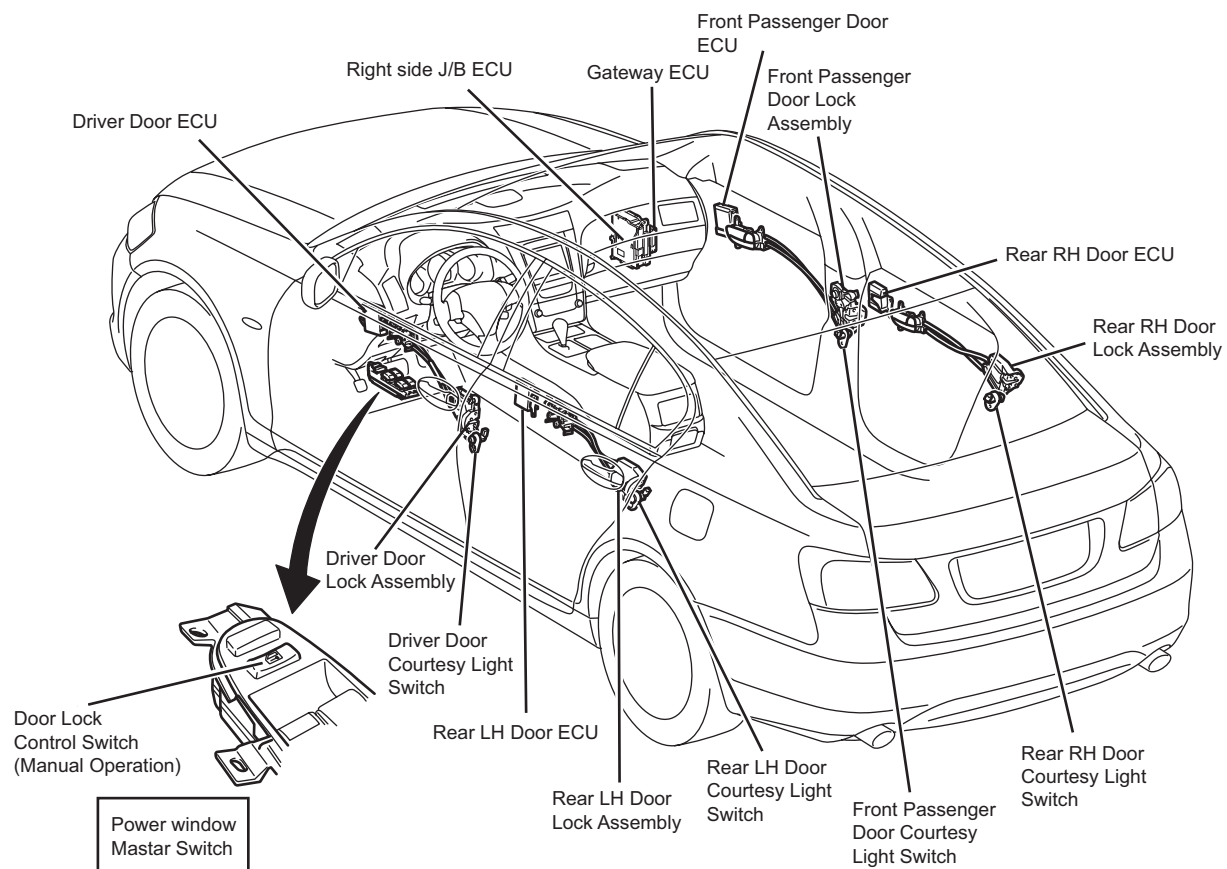


DOOR LOCK

Door Lock Control System

- As on the previous model, power door lock system is provided as standard equipment on all vehicles.
This system is provided with a key lockout prevention function, shift linked door unlock function, etc.
- A user-customizable function can be used. With this function, the user can set/cancel a function such as a vehicle speed-sensing auto lock function at will, through the operation of the door lock control switch (for manual operation).

Auto Power Door Lock System Main Composition Parts



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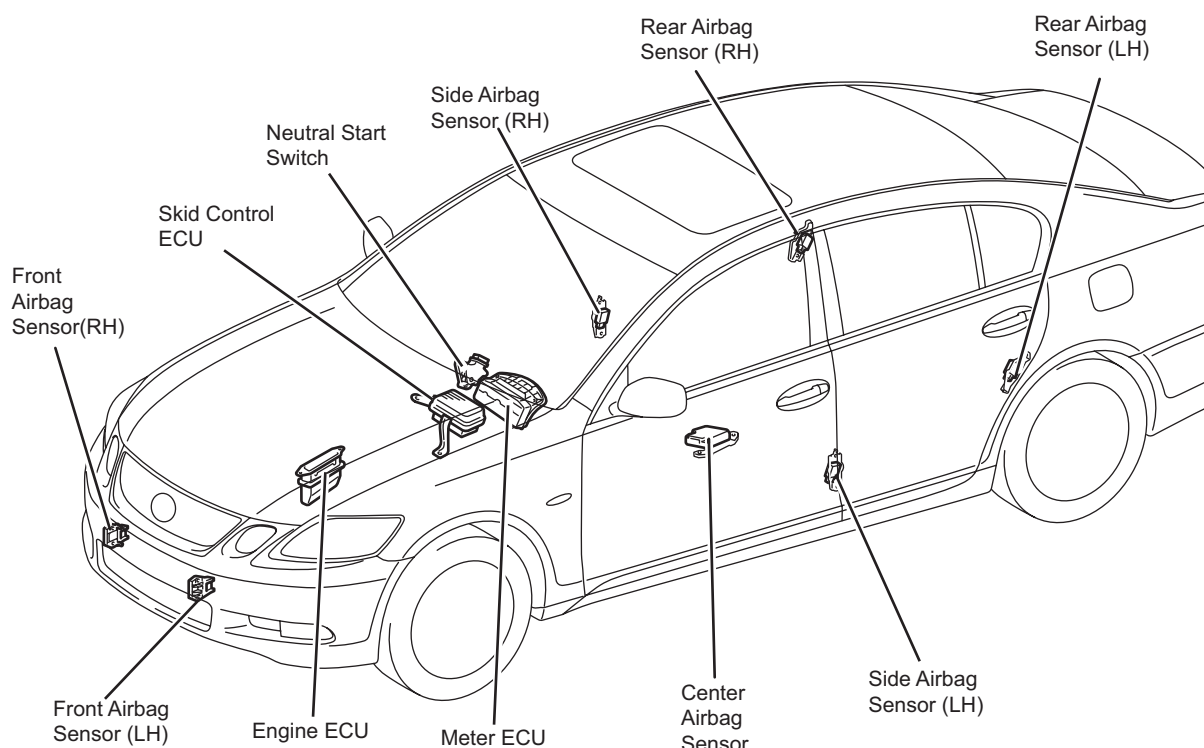
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List power door lock system main composition parts function

Composition parts	Main function
Right side J/B ECU]	• Detects the conditions of the vehicle through the use of the signals from various switches, vehicle speed, and impact detection data, and transmits them to various ECUs via BEAN (Body Electronics Area Network).
MPX driver door /passenger door/ rear RH/rearLH door ECU (driver door /passenger door/rear RH/rearLH door ECU)	• Controls the locking and unlocking of the individual doors in accordance with the instructions from the right side J/B ECU. • Detects the state of the individual door lock position switches and transmits this information to the right side J/B ECU via BEAN (Body Electronics Area Network).

Composition parts	Main function
Individual door lock ASSY(driver door /passenger door/rear RH/rearLH)	• Locks and unlocks the respective door through the normal rotation or reverse rotation of the door lock motors that are built into the individual doors. • Detects the locked and unlocked states (locked: OFF, unlocked: ON) of the individual doors by way of the door lock position switches that are built into the individual door locks.
Power window master switch	• Detects the states of the individual door lock control switches (for manual operation) and of the driver's door lock position switch and transmits them to the right side J/B ECU via BEAN (Body Electronics Area Network).
Individual door courtesy light switch(driver door /passenger door/rear RH/rearLH)	• Detects the open and closed states (door open: ON, door closed: OFF) of the individual doors and transmits this information to the right side J/B ECU.
Gateway ECU	• Serves as a connecting point to relay communication data between the communication networks (BEAN {Body Electronics Area Network} ,CAN {Controller Area Network} and AVC-LAN.

Composition parts 2



List auto power door lock system main composition parts Function

Composition parts	Main function
Meter ECU	• Calculates the vehicle speed based on the vehicle speed signal provided by the skid control ECU, and transmits it to the right side J/B ECU via BEAN (Body Electronics Area Network).
Skid control ECU	• Averages the vehicle wheel speed pulses provided by the wheel speed sensors and outputs the vehicle speed data to the meter ECU. [Vehicle speed-sensing auto lock function]
Wheel speed sensors(FR/FF/RR/RL)	• Detects the speeds of the wheels and outputs the information to the skid control ECU.
Center airbag sensor assembly	• Detects the impact that is applied to the vehicle by way of the signals from the individual airbag sensors and the built-in impact detection sensor, and outputs it to the right side J/B ECU.
Individual airbag sensor	• Detects an impact and outputs it to the center airbag sensor assembly.
Engine ECU	• Transmits the shift position state that is input by the neutral start switch (ON or OFF state of the "P" position) and transmits it to the right side J/B ECU via BEAN (Body Electronics Area Network).
Neutral start switch	• Detects the shift position (ON or OFF state of the "P" position) and outputs it to the ECM.

Manual Lock & Manual Unlock Function

- When the user pushes the lock or unlock side of the door lock control switch (for manual operation), this operation is linked to lock or unlock all the doors.

Door Key Linked Lock and UnLock Function

- When the user inserts a mechanical key into the driver's door key cylinder and turns it towards the front or the back of the vehicle, this operation is linked to lock or unlock all the doors.
- The door key-linked lock and unlock operations through the foregoing operations will be canceled when the driver's seat belt is buckled.*

❖REFERENCE❖

* When the driver's seat belt is buckled, the system determines that an occupant is present in the vehicle. Thus, it prevents the door key-linked function from operating against the intention of the user, such as when an impact is applied to the door during a collision.

Key Lockout Prevention Function

- When the driver's door is open while the smart key is located in the vehicle interior, this function prevents the doors from being locked through the operation of the door control switch (for manual operation or key-linked operation) or the door lock knob. Thus, it prevents the user from being locked out with a key in the vehicle.

Impact Sensing Door Unlock Function

- When the vehicle is involved in a collision, this function automatically unlocks the door locks of all the doors to facilitate the escape or rescue operation.

Door Lock Security Function

- Locking the doors through the use of the door lock function (including wireless remote control) sets the door lock security function, which prohibits* the doors from being unlocked through the use of the door lock control switch (for manual operation).*
- The door lock security function supports the customizable function through the use of the Intelligent tester II diagnostic tool.

❖REFERENCE❖

*This function prevents the doors from being unlocked by operating the door lock control switch (for manual operation) by inserting a rod or the like from a clearance between the door glass and the door frame, such as when the door glass is inadvertently left slightly open.

Door lock security set conditions

- The driver's door is locked through the key-linked operation.
- The driver's door is locked through a keyless lock operation (by locking the inside door lock knob and closing the door). (However, the security function sets only if the driver's door is locked and the door is closed 0.25 seconds later.)
- The doors are locked through the use of the wireless remote control or the door lock function (including the 30-second auto lock function).

Door lock security cancel conditions

- The ignition is turned from OFF to ON.
- The driver's door is unlocked through the key-linked operation.
- The doors are unlocked through the use of the wireless remote control or the door lock function
- The doors are unlocked through the operation of the door lock control switch (for manual operation), after the driver's door lock knob has been unlocked.

Driver's Door Key Twice Operation Unlock

- Inserting a mechanical key in the driver's door key cylinder and turning it once in the unlocking direction unlocks only the driver's door. Turning the key once again in the unlocking direction unlocks all the doors.(excluding the Europe and China)
- The driver's door key twice operation unlock function can be switched alternately to the door key-linked all-door unlock function by performing a customize function on a Intelligent tester II.

Dabble lock Function

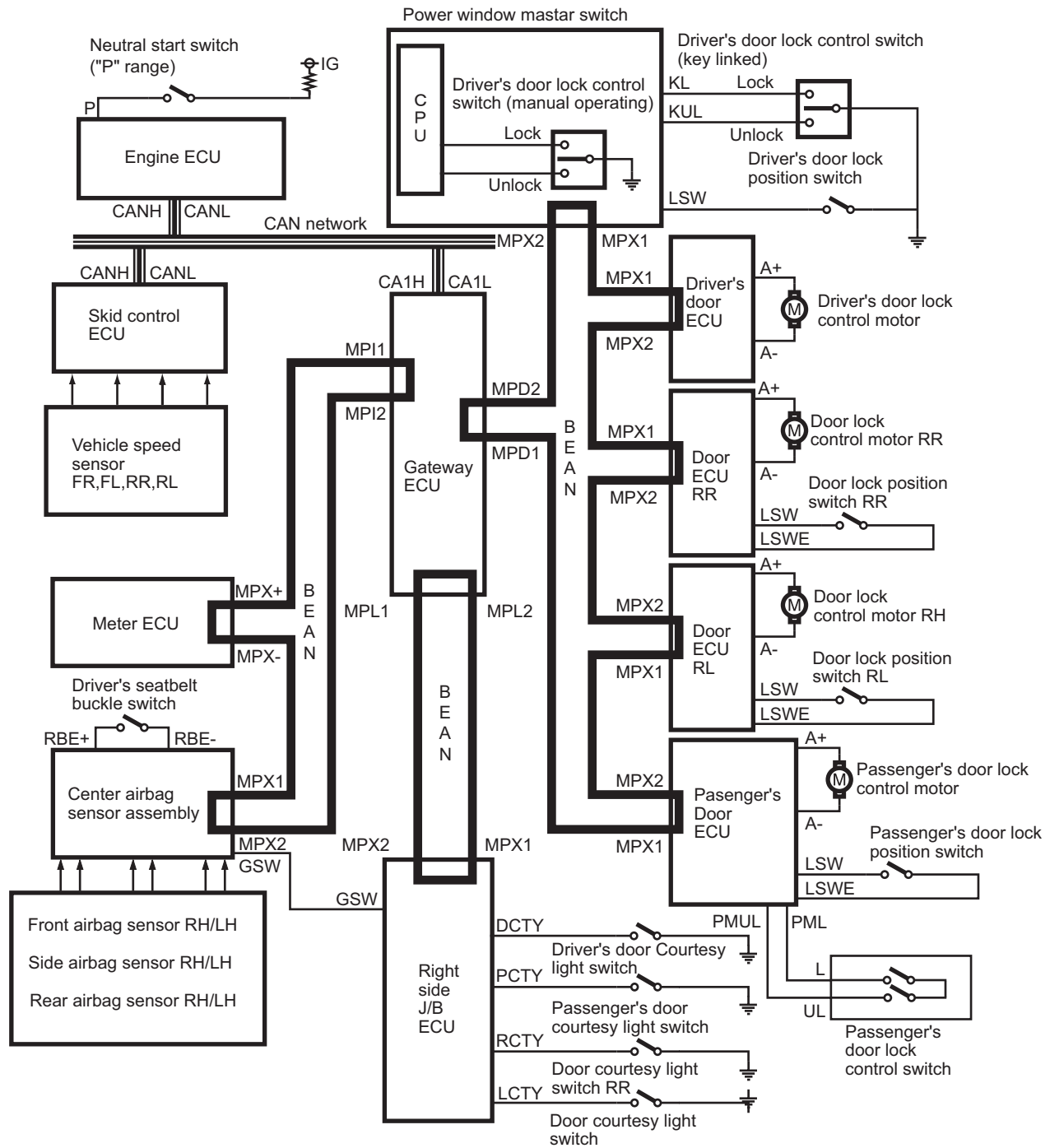
- The double-lock function is a theft deterrent device with an additional, dedicated locking mechanism. It prevents the doors from being unlocked through the operation of the lock knobs from the vehicle interior. This door locking device aims at deterring unauthorized persons from entering the vehicle.
- When the wireless lock switch of an electronic key is operated (including the locking operation of the lock switch on the door outside handle), this function sets the double lock. When a wireless unlock switch, touch sensor unlock, or key-linked unlock operation is performed, this function unsets the double lock and unlocks the doors.
- When a electronic key is used to perform a wireless door lock operation twice within a predetermined length of time after all of the conditions indicated below has been met, the system will set the double-lock function. Thus, the system will effect control to prevent the doors from being unlocked through the use of all door lock switches inside or outside of the vehicle.

Double-Lock Set Standby Conditions

- | |
|-----------------------|
| • IG OFF -> door open |
| • All Door close |
| • window fully close |

- The double-lock and ordinary door lock functions can be canceled at once by performing an unlock operation with a wireless key.
- To ensure safety while the vehicle is being driven, the system automatically cancels the double-lock function if any one of the doors is set to double-lock if the vehicle is being driven.
- In case of an emergency, such as a depleted battery in the electronic key or a malfunction in the ECU, insert a mechanical key in the key cylinder of the This will cancel the double-lock function. driver's door to unlock the door.

Auto Power Door Lock System Circuit



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Manual Lock (Unlock) Operation

- When the driver operates the door lock control switch (for manual operation) on the MPX master switch to the lock (or unlock) side, the MPX master switch transmits a driver's door manual lock (unlock) switch signal to the right side J/B ECU via BEAN (Body Electronics Area Network).
- Upon receiving this signal, the right side J/B ECU transmits a door lock (or unlock) request signal to the ECUs of the individual doors through BEAN (Body Electronics Area Network).
- Upon receiving this signal, the ECUs of the individual doors turn ON their lock (or unlock) relays in order to lock (or unlock) the doors by actuating their respective door lock motors.

Door Key Linked Lock (Unlock) Operation

- When a mechanical key is inserted in the driver's door key cylinder and turned to the lock (or unlock) side, the door lock control switch (for key linked operation) turns ON to the lock (or unlock) side. As a result, the MPX master switch transmits a driver's door key-linked lock (or unlock) switch signal to the right side J/B ECU via BEAN (Body Electronics Area Network). This causes the individual doors to lock (or unlock) in the same way as the manual lock (or unlock) operation.

Key Lockout Prevention Operation

- This function operates under the following conditions: the electronic key is located in the vehicle interior, the ON signal of the driver's door courtesy light switch is input in the right side J/B ECU, and a vehicle speed signal of approximately 3 mph(5km/h) or below is received from the meter ECU. Then, when the driver's door lock knob is turned to the lock side, the power window master switch detects that the driver's door lock position switch is OFF.
- Upon receiving this signal, the right side J/B ECU transmits a door unlock request signal to the ECUs of the individual doors via BEAN (Body Electronics Area Network).
- Upon receiving this signal, the ECUs of the individual doors turn ON the unlock relays for the respective doors in order to lock (or unlock) the doors by actuating their respective door lock motors.

Impact Sensing Door Unlock Operation

Operation outline

- Upon receiving impact-sensing information from the center airbag sensor assembly, the right side J/B ECU effects control to unlock all the doors.

Operation

- When an impact that is greater than a predetermined value is applied to the vehicle within approximately 4 seconds after the ignition is turned ON or is turned from ON to OFF, the center airbag sensor assembly detects this impact and outputs an impact-sensing signal to the right side J/B ECU.
- Upon receiving the impact-sensing signal from the center airbag sensor assembly, and after the impact-sensing unlock delay time (approximately 10 seconds) has elapsed, the right side J/B ECU transmits an unlock request signal to the ECUs of the individual doors via BEAN (Body Electronics Area Network). Upon receiving this signal, the ECUs of the individual doors turn ON the unlock relay for the respective unlock relays in order to unlock* the doors by actuating their respective door lock motors.
- For approximately 5 seconds after the ignition is turned ON, the right side J/B ECU determines whether the impact-sensing sensor is normal or abnormal. If it determines that the sensor is abnormal, the system will prohibit the operation of all auto lock functions.

❖REFERENCE❖

*The right side J/B ECU receives the lock position signals from the doors for approximately 1 second after the unlock operation. If the right side J/B ECU receives a signal indicating that any door is locked (its door lock position switch is OFF), it will transmit a unlock request signal again.

Prohibition of Door Lock Signal Input During Impact-Sensing Unlock Operation

- After the unlock operation is completed, the right side door J/B ECU prohibits the input of all door lock signals. It permits the input of lock signals if the conditions listed below have been met.

Lock Signal Input Permission Conditions

- The ignition is turned from OFF to ON, and the vehicle speed of below 10 mph(16km/h) has changed to approximately 12 mph(20km/h) and continued for 5 seconds or more.
- The doors are locked through the use of the door lock control switch (for manual operation).
- The ignition is turned from ON to OFF, and the driver's door that is open is closed (the driver's door courtesy light switch is turned from ON to OFF).

SMART ENTRY & START SYSTEM

- The SMART ENTRY & START SYSTEM is used on all models. An extremely convenient feature, this system also showcases the innovative aspect of the vehicle.
- The SMART ENTRY & START SYSTEM effects various types of controls based on the check results of the electronic ID codes exchanged wirelessly between the electronic key and the vehicle. The user can perform these controls without the need to handle the key.
- This system provides a convenient warning function that alerts the user of various problems that could arise if the user's awareness of the electronic key in his/her possession recedes.
- A cancel function is provided to enable the user to cancel the system control at will.
- It uses an ID code registration function to support the use of multiple electronic keys.
- Through the use of the hand-held tester diagnostic tool, the functions that support the customizable function can be changed in accordance with the user's preference.