BACKGROUND

The power sliding door system has a number of electrical and mechanical components that must work in synchronization with each other for the doors to open and close properly.

COMPONENTS

Power Sliding Door Control Unit  (behind rear inner trim panel)

This unit receives inputs from the switches and sensors in the sliding door system and from B-CAN. It outputs to the slide motor, release actuator, and closer motor to control the movement of the doors. It also controls the sliding door beeper and indicator.

Slide Motor  (behind rear inner trim panel)

This motor moves the door in both directions. It includes a power slide door pulser, an electromagnetic clutch and a cable tension adjuster.

- **Power Slide Door Pulser (A)**—The power slide door pulser generates pulses that are sent to the power sliding door control unit as the sliding door moves. The power sliding door control unit uses these pulses to determine the speed and position of the door.
- **Electromagnetic Clutch (B)**—This clutch engages the motor to the sliding door cables.
Remote Control Assembly

This assembly operates cables that release the front and rear slide door latches, pulls the inner handle lower roller latch release cable, triggers the 3 remote control switches, and activates the failsafe lever cable. The assembly includes the remote control switches, the door lock actuator, the door lock, the child-proof lock, and the inside door handle linkage.

- Remote Control Switch 1 (A)—This switch signals the power sliding door control unit that the outside door handle is being pulled or the inside door handle is being pulled toward the open direction while the child safety lock is OFF.

- Remote Control Switch 2 (B)—This switch signals the power sliding door control unit that the inside door handle is being pulled toward the close position.

- Remote Control Switch 3 (C)—This switch signals the power sliding door control unit that the inside door handle is being pulled toward the open position while the child safety lock is ON. This switch is used for safety reasons because remote control switch 1 is not actuated when the child safety lock is ON and the inner handle is pulled toward the open position.

Outer Handle Crank Assembly

This assembly operates the lower roller latch cable when the inner handle lower roller latch release cable is pulled by the remote control assembly, the outer handle cable A is pulled by the outer handle or the release actuator is operated. This assembly also operates the outer handle cable B when the outer handle cable A is pulled by the outer handle or the release actuator is operated. This assembly includes the release actuator.

Release Actuator (A)—When the dashboard switch, the remote transmitter, or either the inside or outside door handle is used to open or close the door, the release actuator rotates the outer handle crank assembly linkage, pulling the lower roller latch cable and the outer handle cable B.
Rear Latch Assembly

This assembly mechanically latches the rear of the door in the closed position. It contains the closer motor, the half-latch/full-latch switch, the base position switch, ratchet switch, and the failsafe lever.

- Closer Motor (A)—This motor moves the latch from the half-latched to the fully latched position to complete closing the door.
- Half-Latch Switch/Full-Latch Switch (B)—These switches signal the power sliding door control unit that the door has reached the half-latched position and the fully latched position—the door is fully closed.
- Base Position Switch (C)—This switch signals the power sliding door control unit that the closer motor is in its normal, off position.
- Ratchet Switch (D)—This switch provides a confirmation signal to the control unit that the operation of the half-latch and full-latch switches is accurate.
- Failsafe Lever (E)—This lever mechanically disconnects the closer motor from the door latch. See Emergency Stop Operation.

Lower Roller Latch and Stopper Assembly (attached to lower front of slide door)

This assembly is attached to the lower roller's bracket. The lower roller latch latches the door in the open position when it is fully opened. The lower roller stopper stops the door at the “open window” position for safety. It contains the lower roller latch and the lower roller lever as well as the lower rollers.
Sliding Door  Power Window Regulator Assembly

This assembly moves the sliding door window in the window run channels, actuates the sliding door window position switch, and pulls the lower roller stopper cable. It contains a power window motor, position plate, and sliding door window position switch.

Sliding Door Window Position Switch—This switch signals the power window control unit that the window is open at about 4 inches (about 100 mm) or more.

Front Latch  Assembly

This assembly mechanically latches the front of the door in the closed position.

Rear Latch Cable

This cable is routed between the remote control assembly and the rear latch assembly. It is pulled by the remote control assembly and releases the rear latch to open the door.

Front Latch Cable
This cable is routed between the remote control assembly and the front latch assembly. It is pulled by the remote control assembly and releases the front latch to open the door.

**Failsafe Lever Cable**

This cable is routed between the remote control assembly and the latch assembly. It is pulled by the remote control assembly and activates the failsafe lever.

**Outer Handle Cable A**

This cable is routed between the outer slide door handle and the outer handle crank assembly. It is pulled by the outside handle and rotates the linkage of the outer handle crank assembly.

**Outer Handle Cable B**

This cable is routed between the outer handle crank assembly and the remote control assembly. It is pulled by the outer handle crank assembly and rotates the linkage on the remote control assembly.

**Lower Roller Latch Cable**

This cable is routed between the outer handle crank assembly and the lower roller latch assembly. It is pulled by the outer handle crank assembly and releases the lower roller latch.

**Inner Handle Lower Roller Latch Release Cable**

This cable is routed the remote control assembly and the outer handle crank assembly. It is pulled by the remote control assembly and rotates the linkage on the outer handle crank assembly.

**Lower Roller Stopper Cable**

This cable is routed between the power window regulator and the lower roller lever. It is pulled by the power window regulator when the window is about 4 inches (about 100 mm) from the top and it pulls the lower roller stopper.

**SWITCHES AND INDICATORS**

**Main Switch**

This switch, when it is OFF, turns off the power slide function of the door, and disables the sliding door beeper. The doors can only be opened and closed manually. The closer function will continue to operate once the door is manually moved to the half-latched position.

**Power Sliding Door Switches**

There is one rocker switch for each door. Each switch signals its respective power sliding door control unit that the driver wants to open or close that door.

**Sliding Door Indicator (EX and EX-L)**

This indicator normally lights for about 2 seconds when the ignition switch is turned to ON (II). If it comes on at any other time, it is signaling the driver that there is a problem with the power sliding door system. The door with the problem will no longer operate electrically, only manually. The technician can use this indicator to read out trouble codes stored in the power sliding door system.

**NOTE:** Touring model uses the MID to inform the driver of a fault in the power sliding door system.

**Sliding Door Beeper**

This beeper alerts the driver and occupants that the sliding door system requires attention for safety reasons.

**BASIC OPERATION**

**Opening a Door with the Power Sliding Door Switch or the Remote Transmitter**

To open a door electrically:

- The main switch must be ON.
- If the ignition switch is ON (II), the shift lever must be in Park or in Neutral with the foot brake or parking brake ON.
- If the ignition switch is turned to LOCK (0), the shift lever must be in Park.
• The door must be unlocked, and the fuel fill door must be closed (left door only).

• If the power sliding door switch is used, the switch sends a signal to the power sliding door control unit for that door. If the remote transmitter is used, the door multiplex sends an open message to the power sliding door control unit for that door.

• The power sliding door control unit sends a signal to the release actuator to unlatch the door.

• The release actuator rotates the linkage on the outer handle crank which pulls the outer handle cable B. Outer handle cable B rotates the linkage on the remote control assembly, which pulls the front and rear latch cables. This releases the front and rear latches mechanically unlatching the door.

• The power sliding door control unit then activates the electromagnetic clutch and starts the slide motor. The slide motor moves the cables that move the door.

• The power slide door motor pulser senses the movement of the slide motor, and sends pulses to the power sliding door control unit. The control unit uses these pulses to judge the speed and position of the door.

• When the power sliding door control unit judges that the door is fully open, it turns off the slide motor and the electromagnetic clutch.

**Opening a Door with the Inside or Outside Handle**

To open a door electrically:

• The main switch must be ON.

• If the ignition switch is ON (II), the shift lever must be in Park or in Neutral with the foot brake or parking brake ON.

• If the ignition switch is turned to LOCK (0), the shift lever must be in Park.

• The door must be unlocked, and the fuel fill door must be closed (left door only).

• The inside door handle is mechanically linked to the remote control assembly. The outside door handle is linked via the outer door handle cable A, outer handle crank, and outer handle cable B.

  • Inner handle, child safety lock OFF — The inner handle rotates the linkage on the remote control assembly, which pulls the front and rear latch cables. This releases the front and rear latches, mechanically unlatching the door.

  • Inner handle, child safety lock ON — The inner handle rotates the linkage on the remote control assembly, which only pulls the fail safe cable; the front and rear latch cables are mechanically disengaged from the linkage.

  • Outer handle — The outer handle pulls the outer handle cable A, which rotates the outer handle crank. The outer handle crank assembly pulls the outer handle cable B. Outer handle cable B rotates the linkage on the remote control assembly, which pulls the front and rear latch cables. This releases the front and rear latches, mechanically unlatching the door.

• Remote control switch 1 or 3 is closed by the rotated linkage on the remote control assembly.

  • Inner handle, child safety lock OFF — The linkage on the remote control assembly closes remote control switch 1, signaling the power slide door control unit to open the door.

  • Inner handle, child safety lock ON — The linkage on the remote control assembly is mechanically disengaged and cannot close remote control switch 1. The child safety lock linkage is engaged and closes remote control switch 3, signaling the power slide door control unit to NOT open the door and the operation is ended.

  • Outer handle — The linkage on the remote control assembly closes remote control switch 1, signaling the power slide door control unit to open the door.
The power sliding door control unit sends a signal to the release actuator to unlatch the door.

The release actuator rotates the linkage on the outer handle crank, which pulls the outer handle cable B. Outer handle cable B rotates the linkage on the remote control assembly, which pulls the front and rear latch cables. (This keeps the front and rear latches mechanically unlatched in the event that the inner or outer handle is not held long enough for the electromagnetic clutch and slide motor to open the door.)

The power sliding door control unit then activates the electromagnetic clutch and starts the slide motor. The slide motor moves the cables that move the door.

The power sliding door motor pulser senses the movement of the slide motor, and sends pulses to the power sliding door control unit. The control unit uses these pulses to judge the speed and position of the door.

When the power sliding door control unit judges that the door is fully open, it turns off the slide motor and the electromagnetic clutch.

**Closing a Door with the Power Sliding Door Switch or the Remote Transmitter**

To close a door electrically:

- The main Switch must be ON.
- The fuel fill door must be closed (left door only).

If the power sliding door switch is used, the switch sends a signal to the power sliding door control unit for that door. If the remote transmitter is used, the door multiplex sends an open message to the power sliding door control unit for that door.

The power sliding door control unit sends a signal to the release actuator to unlatch the door.

The release actuator rotates the linkage on the outer handle crank, which pulls the lower roller latch cable. The lower roller latch cable releases the lower roller latch, which mechanically unlatches the door.

The power sliding door control unit then activates the electromagnetic clutch and starts the slide motor. The slide motor moves the cables that move the door.

The power sliding door motor pulser senses the movement of the slide motor, and sends pulses to the power sliding door control unit. The control unit uses these pulses to judge the speed and position of the door.

When the power sliding door nears closed, the slide motor pulls the door in enough to latch the rear door latch in the half-latch position. This closes the half-latch switch and the ratchet switch.

The half-latch switch sends a signal to the sliding door control unit and the control unit starts the closer motor operation to pull the door in to the full-latch position.
The closer motor rotates the closer motor linkage on the rear latch assembly, which closes the base position switch, and once the door is fully closed, the full-latch switch.

- The full-latch switch sends a signal to the sliding door control unit, which then reverses the slide motor's direction of rotation until the base switch opens again and turns off the slide motor and electromagnetic clutch.

- When the door is fully latched, the full-latch switch sends a signal through the junction switch to the power sliding door control unit. The control unit stops the slide motor, stops the closer motor, and returns the closer motor to its start position.

**Closing a Door with the Inside or Outside Handle**

To close a door electrically:

- The Main Switch must be ON.
- The fuel fill door must be closed (left door only).

- The inside door handle is mechanically linked to the remote control assembly. The outside door handle is linked via the outer door handle cable A, outer handle crank, and outer handle cable B.

  - Inner handle pulled toward closed—The inner handle rotates the linkage on the remote control assembly, which pulls the inner handle lower roller latch release cable. This rotates the linkage on the outer handle crank, which pulls the lower roller latch cable. The lower roller latch cable releases the lower roller latch, which mechanically unlatches the door.
  - Inner handle pulled toward open, child safety lock OFF—The inner handle rotates the linkage on the remote control assembly.
  - Inner handle pulled toward open, child safety lock ON—The inner handle rotates the linkage on the remote control assembly.
  - Outer handle—The outer handle pulls the outer handle cable A, which rotates the outer handle crank. The outer handle crank assembly pulls the outer handle cable B. Outer handle cable B rotates the linkage on the remote control assembly.

- Remote control switch 1, 2, or 3 is closed by the rotated linkage on the remote control assembly.

  - Inner handle pulled toward closed—The linkage on the remote control assembly closes remote control switch 2, signaling the power sliding door control unit to close the door.
  - Inner handle pulled toward open, child safety lock OFF—The linkage on the remote control assembly closes remote control switch 1, signaling the power slide door control unit to close the door.
  - Inner handle pulled toward open, child safety lock ON—The linkage on the remote control assembly closes remote control switch 3, signaling the power sliding door control unit to close the door.
  - Outer handle—The linkage on the remote control assembly closes remote control switch 1, signaling the power sliding door control unit to close the door.

- From this point, the door closing operation is the same as steps 15 through 23 in the previous description.

**Opening or Closing a Door Without Power**

The power sliding door operation is disabled if the main switch is OFF, or if there is a problem with the door that has turned on the sliding door indicator or MID message. In those cases, the door can be opened and closed by moving it manually, though the door does continue to operate some features:

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The power sliding door automatically closes when halfway latched. Be careful not to pinch your fingers during this process or serious injury may occur. Make sure to disconnect the battery or remove the fuse before doing any repair or adjustments.

- **Auto Closer** - While operating in the manual mode, if the door is closed to the half-latch position, the half-latch switch and ratchet switch will close, signaling the power sliding door control unit to activate the closer motor in order to complete the latching sequence.

- **Unintentional Slide Prevention (USP), Manual Mode** — If the main switch is turned OFF while the door is neither fully open nor fully closed, the power sliding door control unit will monitor the power sliding door motor pulser for two seconds after the electromagnetic clutch is turned OFF. If the door begins to move rapidly within that time period, the power sliding door control unit will reengage the electromagnetic clutch and turn on the power sliding door beeper. This feature prevents the door from sliding open or closed unintentionally if the main switch is turned OFF while parked on a hill. The USP feature will time out after 30 minutes unless the main switch is turned back on or the inner or outer handle is operated.

**Trap Detection Operation**

Trap Detection is the feature that detects an obstacle in the door’s path as it opens or closes. This detection is disabled when the door is closing and reaches the half-latch position. The trap detection system has three detection modes:

**Door speed detection** —

- The power sliding door control unit monitors the pulses from the power sliding door motor pulser as the door moves.

- If, from these pulses, the control unit detects that the door has slowed down (a sudden decrease in pulse frequency), the control unit stops the slide motor.

- The sliding door beeper sounds three times.

- The control unit reverses the slide motor’s direction, and moves the door to its previous position (open or closed). However, while closing, if the shift lever is not in park, or is not in neutral with the foot brake or parking brake applied, the door will stop and will not return to its previous position.

**Sliding door motor current detection** —

- The power sliding door control unit monitors the current being used by the power sliding door motor as the door moves.

- If the current increases by more than a certain amount for the situation, which is learned as the door begins to move (such as on a hill), the control unit stops the slide motor.

- The sliding door beeper sounds three times.

- The control unit reverses the slide motor’s direction, and moves the door to its previous position (open or closed). However, while closing, if the shift lever is not in park, or is not in neutral with the foot brake or parking brake applied, the door will stop and will not return to its previous position.

**Pinch sensor detection** —

- The power sliding doors each have a pinch sensor along the leading edge of the door.

- The power sliding door control unit monitors the pinch sensor only when the door is closing.

- If the pinch sensor closes (resistance drops from the normal 1000 Ω level to less than 120 Ω) the slide door control unit stops the slide motor.

- The sliding door beeper sounds three times.

- The control unit reverses the slide motor’s direction, and moves the door to its previous position (open or closed). However, while closing, if the shift lever is not in park, or is not in neutral with the foot brake or parking brake applied, the door will stop and will not return to its previous position.
Emergency Stop Operation

The Emergency Stop feature allows the operator to stop the door for any reason when it is opening or closing. It can be activated at any time using any of the following:

- The power sliding door switch (OPEN or CLOSE) on the dashboard
- The remote transmitter (button for the door that is to be stopped)
- The inner door handle
- The outer door handle

Turning the main switch OFF also stops door movement (see Unintentional Slide Prevention (USP) Manual Mode).

If, while the door is moving, the power sliding door control unit receives an open or close signal from any of the switches above, it immediately stops the slide motor. The sliding door beeper sounds three times (if the Main switch was not used to stop door movement). Depending on which operation is used to resume door operation, the door will operate differently.

- If the remote transmitter is used to move the door after it has stopped, the door will move in the opposite direction.
- If the power sliding door switch or the inner handle is used, the door will move in the direction selected.
- If the outer handle is used, the door will move toward the open position.

Unintentional Slide Prevention (USP), Power Mode—If the emergency stop operation is activated while the door is neither fully open nor fully closed, the power sliding door control unit will keep the electromagnetic clutch activated for up to 30 minutes (depending on whether or not the engine is running in order to preserve the battery). Once the electromagnetic clutch is turned off, the control unit monitors the power sliding door motor pulser for two seconds for rapid movement of the door. If rapid movement is detected, the power sliding door control unit reengages the electromagnetic clutch and then the slide motor to move the door back to its original position and the power sliding door beeper sounds a continuous tone. The power sliding door control unit then releases the electromagnetic clutch and monitors the power sliding door motor pulser again. If the door begins to move, it repeats this operation one more time. If, after disengaging the electromagnetic clutch a third time, the sliding door still moves, the power sliding door control unit will reengage the electromagnetic clutch and the sliding motor and move the door to the fully open or closed position, depending on which direction the door was moving when the clutch was disengaged, then the power sliding door beeper is turned OFF.

Fuel Fill Door Operation

The left door locks automatically when the fuel fill door is opened.

- When the fuel fill door is opened, the fuel fill door switch closes and sends a signal to the MICU-rear junction box.

The MICU-rear junction box stores the current position of the left slide door lock knob and then locks the left rear sliding door.

- The MICU-rear junction box sends a fuel fill door status message to the left slide door control unit.

Once the fuel fill door is closed the fuel fill switch opens. The MICU-rear junction box returns the left rear door lock to its previous position (if previously unlocked, the door will be unlocked; if previously locked, it will remain locked).

If a passenger attempts to manually unlock the left rear sliding door while the fuel fill door is open, it will lock again. This automatic lock function can be overridden by pushing the lock knob to the unlock position and holding it there for several seconds. The power sliding door control unit will not open the door while the fuel fill door is open. If the door is manually opened past the lower roller stopper position, and a power close operation is requested, the power sliding door control unit will move the door closed to the stopper position, then beep three times and turn off the electromagnetic clutch. Unintentional slide prevention is then active (see unintentional slide prevention (USP), Power Mode). Serious damage to the power sliding door or the fuel fill door may be caused by opening the sliding door while the fuel fill door is open.

SLIDING DOOR BEEPER LOGIC

This beeper alerts the driver and occupants that the sliding door system requires attention for safety reasons. There is one beeper that is shared between both power sliding door control units and is part of the right power sliding door control unit. The left power sliding door

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control unit sends a message to the right power sliding door control unit to request beeper operation. The beeper operates in three modes:

Three Beep—The beeper sounds for 0.5 seconds in quick succession three times. This tone applies during the following conditions:

- Trap detection operation
- Emergency stop operation
- Power sliding door open operation is requested from the remote transmitter or power sliding door switches on the dashboard while the door is locked.
- Power sliding door close operation is requested while the pinch sensor is ON.
- Power sliding door open operation is requested while the fuel fill door is open.

Continuous Tone—The beeper sounds a solid, continuous tone until the condition causing the warning is eliminated. This tone applies during the following conditions:

- The door is neither fully open nor fully closed, the vehicle is stopped, and the shift lever is out of Park or the shift lever is in Neutral and the foot brake or parking brake is OFF.
- The door is not fully closed and the vehicle speed (VSP) or wheel speed (VSPWHEEL) is not zero.
- Unintentional Slide Prevention is active (electromagnetic clutch is on).
- Unintentional Slide Prevention has been canceled by the inner or outer handle, but the door is still not in the fully open or fully closed position.

Continuous Beep—The beeper sounds for 0.5 seconds in quick succession continuously until the problem causing the warning is resolved. This tone applies during the following conditions:

- The door is closing while the vehicle speed (VSP) or wheel speed (VSPWHEEL) is not zero.
- The door is closing while the shift lever is out of park.

**RETRIEVING DIAGNOSTIC TROUBLE CODES**

Power sliding door DTCs can be retrieved using the HDS. Refer to B-CAN System Diagnosis Test Mode A.

**CLEARING DIAGNOSTIC TROUBLE CODES**

Power sliding door DTCs can be cleared by removing the No. 7 fuse from the under-dash fuse/relay box. Once the DTCs have been cleared, re-home the power sliding door.