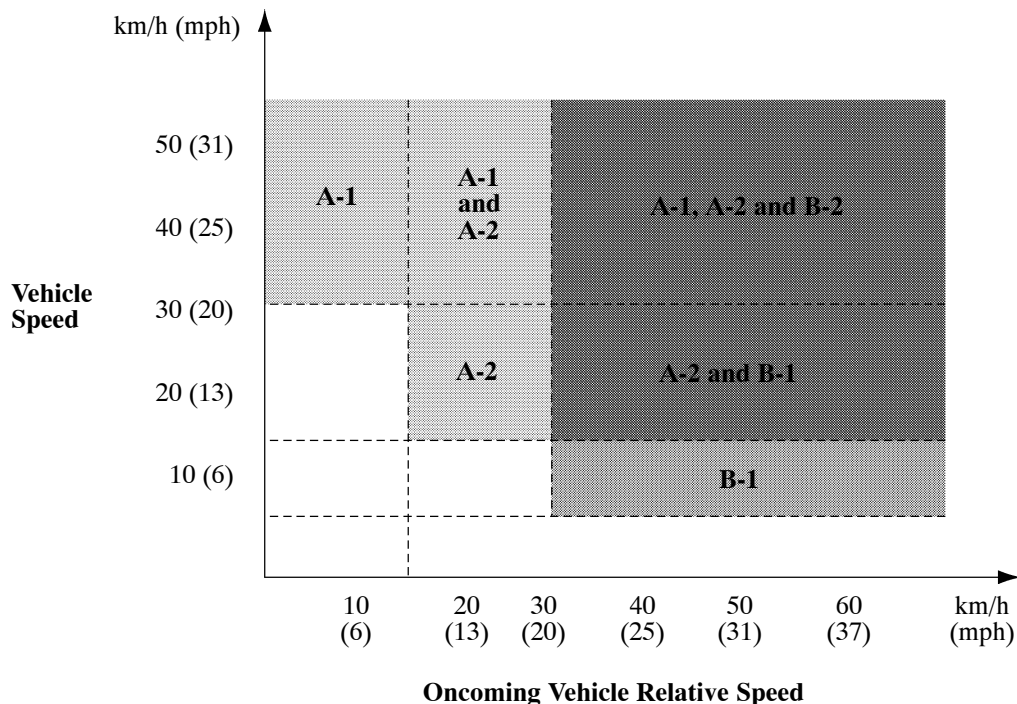


## SYSTEM OPERATION

### 1. General

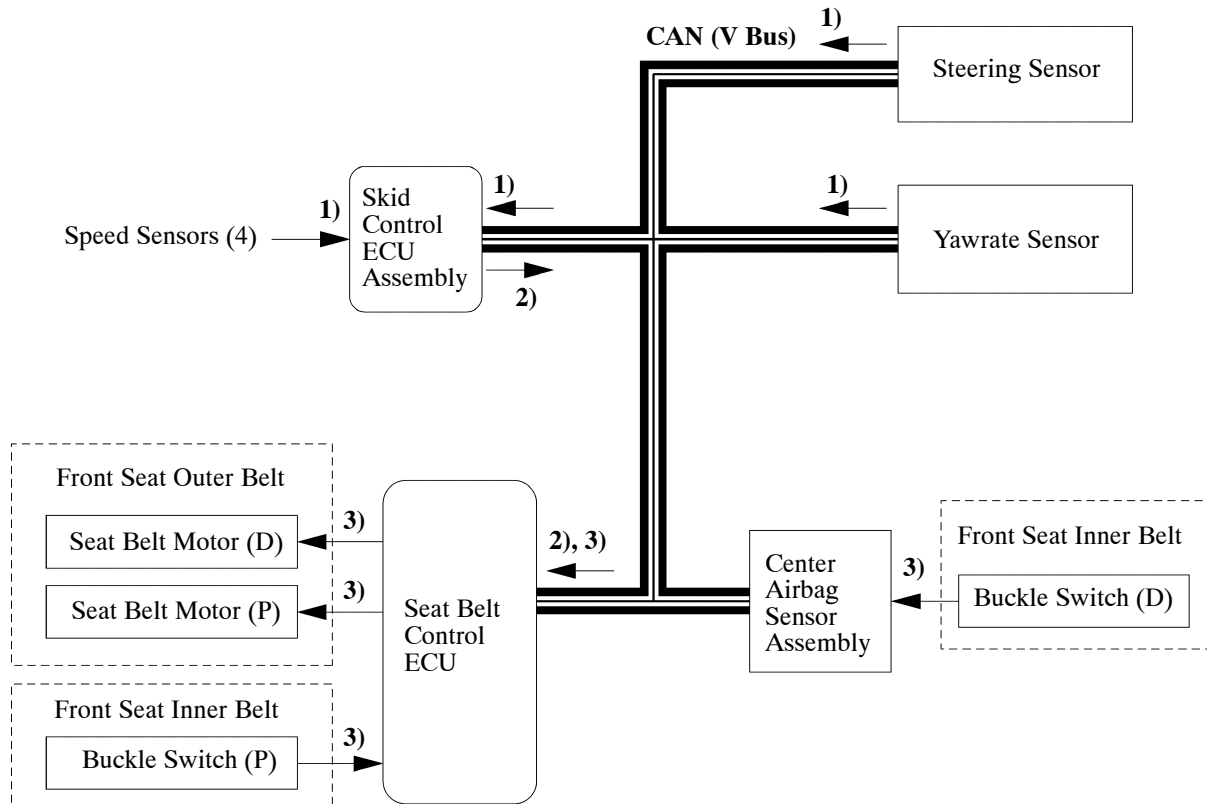
The pre-crash safety system can perform the following three operations: a pre-crash safety (unavoidable collision) operation, front or rear wheel skid tendency operation and sudden braking operation. The impact dampening actions are performed as indicated below.

Range	Operation	Operation Condition	Impact Dampening Component
A-1	Front or Rear Wheel Skid Tendency Operation	<ul style="list-style-type: none"> <li>Engine switch is on (IG).</li> <li>Seat belt is buckled.</li> <li>Vehicle speed is approx. 30 km/h (20 mph) or above.</li> </ul>	<ul style="list-style-type: none"> <li>Seat Belt Retracting Operation</li> </ul>
	Sudden Braking Operation		
A-2	Pre-crash safety Operation	<ul style="list-style-type: none"> <li>Engine switch is on (IG).</li> <li>Seat belt is buckled.</li> <li>Vehicle speed is approx. 15 km/h (10 mph) or above.</li> <li>Oncoming vehicle relative speed is approx. 15 km/h (10 mph) or above.</li> </ul>	<ul style="list-style-type: none"> <li>Pre-crash Brake Operation</li> </ul>
B-1	Pre-crash safety Operation	<ul style="list-style-type: none"> <li>Engine switch is on (IG).</li> <li>Seat belt is buckled.</li> <li>Vehicle Speed is approx. 5 km/h (3 mph) or above.</li> <li>Oncoming vehicle relative speed is approx. 30 km/h (20 mph) or above.</li> </ul>	<ul style="list-style-type: none"> <li>Seat Belt Retracting Operation</li> </ul>
B-2	Pre-crash safety Operation	<ul style="list-style-type: none"> <li>Engine switch is on (IG).</li> <li>Seat belt is buckled.</li> <li>Vehicle Speed is approx. 30 km/h (20 mph) or above.</li> <li>Oncoming vehicle relative speed is approx. 30 km/h (20 mph) or above.</li> </ul>	<ul style="list-style-type: none"> <li>Seat Belt Retracting Operation</li> <li>Brake Assist Standby Condition</li> <li>Pre-crash Brake Operation</li> </ul>
	Sudden Braking Operation		



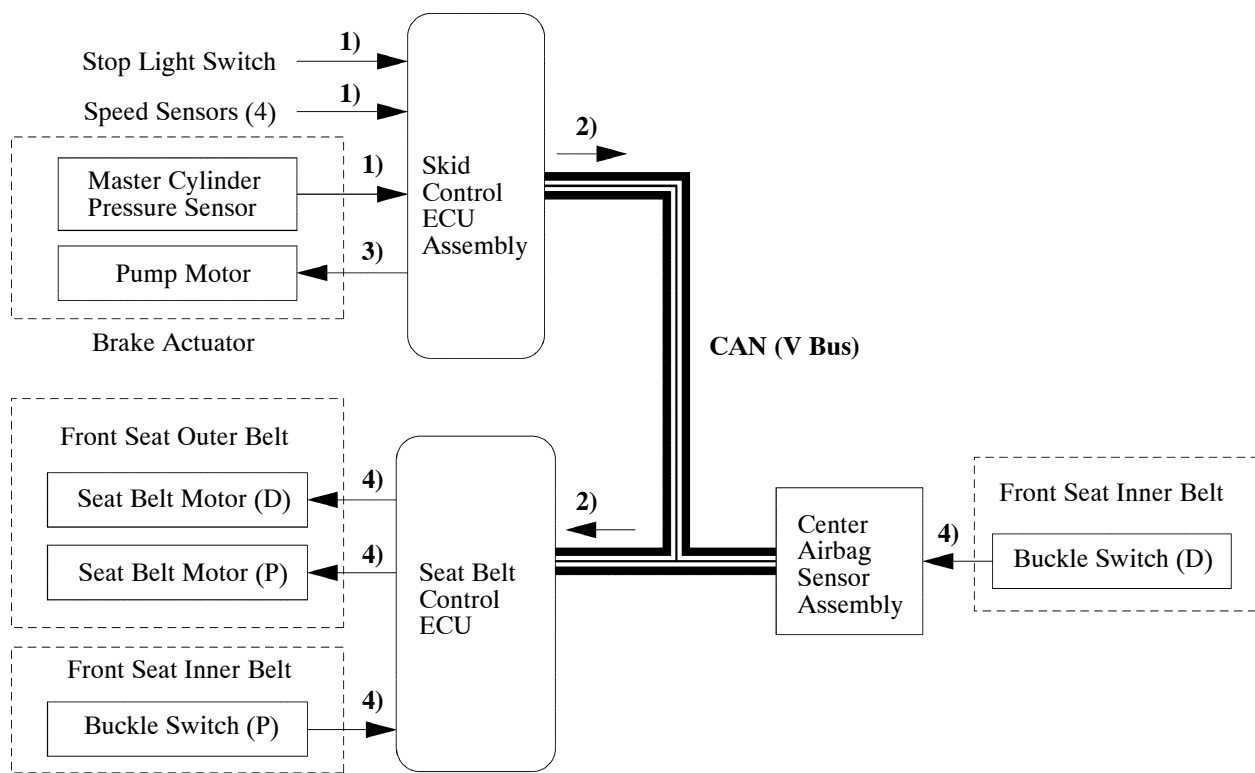
## 2. Front or Rear Wheel Skid Tendency Operation

- 1) While the vehicle is traveling at approx. 30 km/h (20 mph) or above, the skid control ECU assembly determines a front or rear wheel skid tendency based on the signals from the steering sensor, yawrate sensor and speed sensors.
- 2) The skid control ECU assembly outputs a seat belt operation request signal to the seat belt control ECU.
- 3) The seat belt control ECU determines the seat belt motor operation conditions based on this signal and the seat belt buckle switch signal. Then, it retracts slack in the seat belts by operating the seat belt motors.
- 4) The seat belts return to a normal state when the relevant conditions of the vehicle have stabilized.



### 3. Sudden Braking Operation

- 1) While the vehicle is traveling at approx. 30 km/h (20 mph) or above, the skid control ECU assembly determines a sudden braking condition based on the signals from the master cylinder pressure sensor, stop light switch and speed sensors.
- 2) At this time, the skid control ECU assembly operates the brake assist, and outputs a seat belt operation request signal to the seat belt control ECU.
- 3) Brake assist control enters standby mode according to the determination of the skid control ECU assembly.
- 4) The seat belt control ECU determines the seat belt motor operation conditions based on this signal and the seat belt buckle switch signal. Then, it retracts slack in the seat belts by operating the seat belt motors.
- 5) The seat belts return to a normal state when the brake pedal is released.



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#### 4. Pre-crash safety Operation

- 1) The distance control ECU assembly determines that the possibility of a collision is high based on the signals received from the millimeter wave radar sensor, steering sensor, speed sensor, and yawrate sensor.
- 2) The distance control ECU assembly outputs a brake warning buzzer request signal to the skid control ECU assembly.
- 3) The skid control ECU assembly outputs a BRAKE! warning display request signal to the multi-information display.
- 4) The distance control ECU assembly determines that an unavoidable collision condition exists based on signals received from the millimeter wave radar sensor, speed sensor, steering sensor, and yawrate sensor.
- 5) The distance control ECU assembly outputs a seat belt operation request signal to the seat belt control ECU, a brake assist standby request signal to the skid control ECU assembly.
- 6) Upon receiving this signal, the skid control ECU assembly switches the brake assist to the standby mode.
- 7) When the brake assist is in the standby mode and the stop light switch ON signal is input into the skid control ECU assembly, the ECU operates the brake assist based on the master cylinder pressure sensor signal.
- 8) The seat belt control ECU determines the seat belt motor operation condition based on a seat belt operation request signal and the seat belt buckle switch signal, and retracts the slack in the seat belts by operating the seat belt motors.
- 9) If no collision occurs, the seat belts and the brake assist will return to their normal states.

