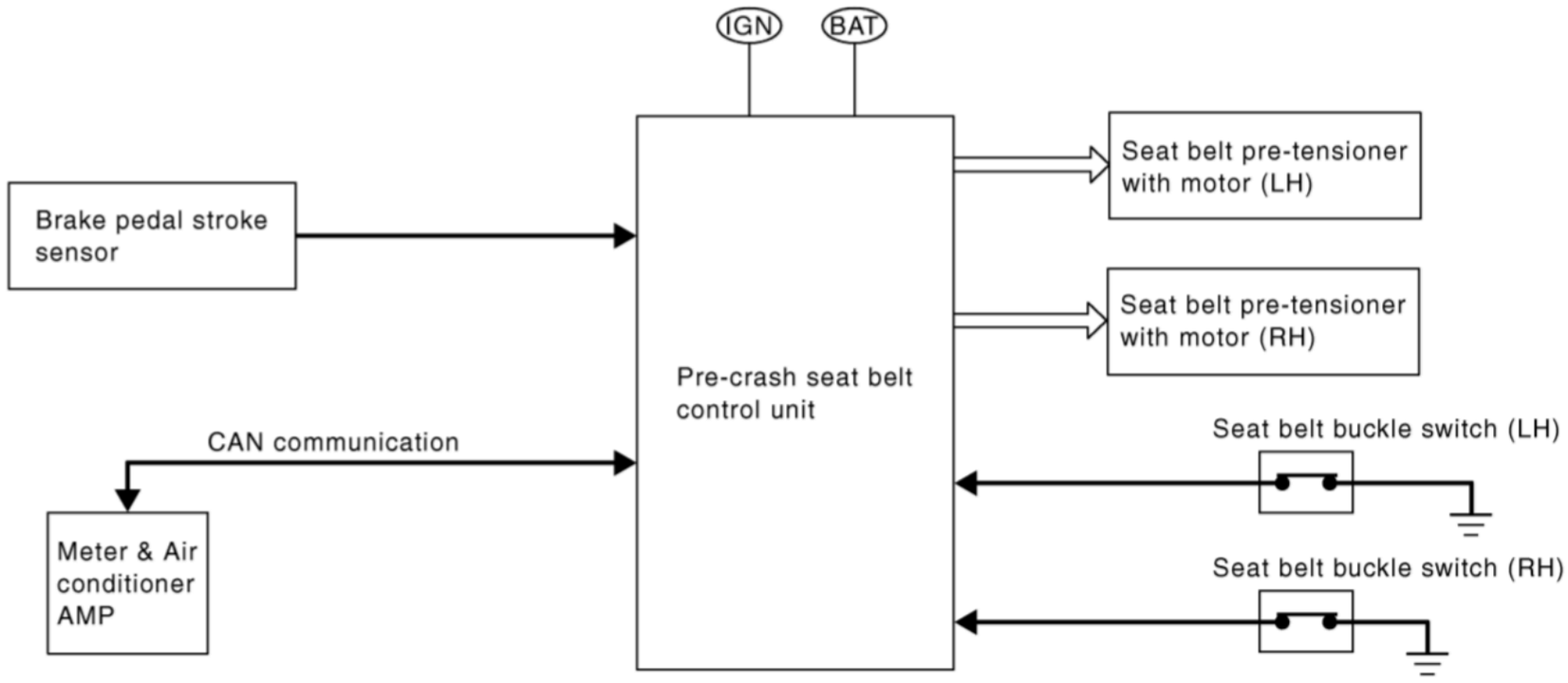
Pre Crash Seat Belt System Unit

Pre Crash Seat Belt System Unit



System Description

INFOID:0000000001711969

- Pre-crash seat belt has been adopted to RH/LH seat belts.
- When the pre-crash seat belt control unit judges the emergency braking operation, the motor built into the pre-crash seat belt retract the shoulder belt to protect the passenger in case of collision, also give a sense of security.

FUNCTION DESCRIPTION

Operation Condition

- Pre-crash seat belt operates under the following conditions.

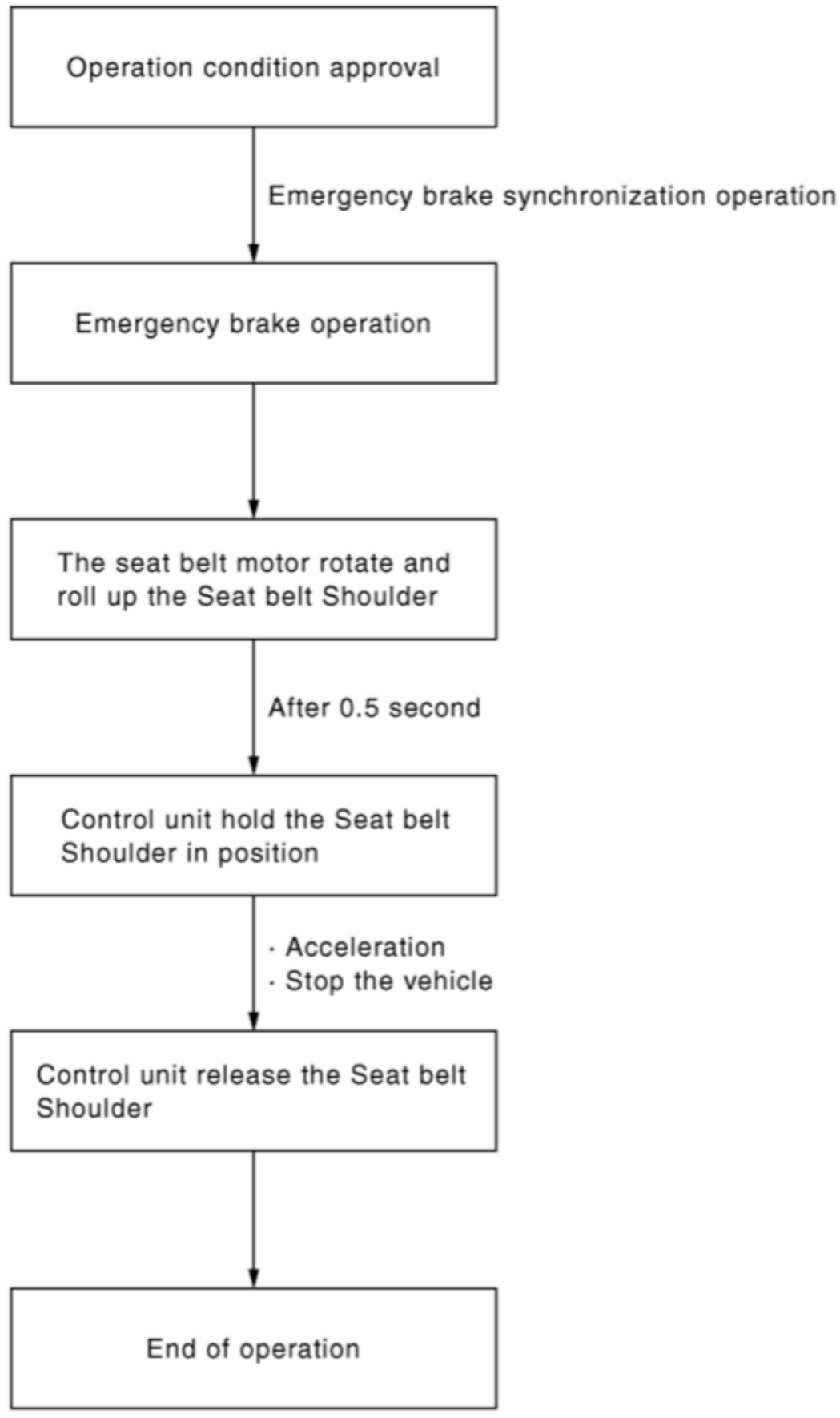
Condition	• During emergency brake operation • When operation prohibition condition is not satisfied

Operation Prohibition Condition

- Pre-crash seat belt does not operate under the following conditions.

Condition	• When seat belt is not fastened (Only the seat belt that is not fastened does not operate) • When the vehicle speed is 15 km/h or less • When pre-crash seat belt continuously operates 3 times or more *1 • At fail-safe condition *2

*1 Then pre-crash seat belt does not operate after it continuously operates 3 times or more, operation can be performed again by stopping operation for approximately 7 minutes


Operation condition approval
Emergency brake synchronization operation
Emergency brake operation
The seat belt motor rotate and roll up the Seat belt Shoulder
After 0.5 second
Control unit hold the Seat belt Shoulder in position
· Acceleration
· Stop the vehicle
Control unit release the Seat belt Shoulder
End of operation

Signals

Component	Function
Pre-crash seat belt control unit	It controls pre-crash seat belt motor according to input signal.
Pre-crash seat belt motor (Seat belt motor [RH/LH])	It is built into seat belt retractor, and it pulls, returns, and maintains according to the motor rotation.
Brake pedal stroke sensor	• It changes voltage according to brake pedal depressed amount and sends the signal to pre-crash seat belt control unit. • There are 2 signals (brake pedal stroke sensor 1 and 2) sent from the brake pedal stroke sensor. Pre-crash seat belt control unit will judge the stroke amount and the speed of the brake pedal according to the voltage of the signal sent by each side.
Seat belt buckle switch	It is arranged in the seat belt buckle and judges whether the seat belt is fastened or not fastened.
CAN system: Unified meter and A/C amp	It transmits the vehicle status to pre-crash seat belt control unit using the CAN communication system.

Test case

- Pre Crash Seat Belt System Unit continuously listens to the CAN Bus.
- It gets CAN messages from the brake pedal stroke sensor
- The brake pedal stroke sensor changes the voltage according to the pedal depressed amount.
- On reception of particular value of voltage from the break pedal stroke sensor - **the seat belt is fastened in 0.5s**.

Pre crash Detect ECU

ECU
Step1: Listens to the CAN bus
Step2: On receiving a value from brake stroke sensor activates seat belt
Step 3: On receiving a value from Accelerator node==0; releases the seat belt

Tester 1
Step1: Sends periodic messages on CAN bus
Step2: Sends value 15 in the MSB.
Step3: Checks if ECU has activated the Seat belt
Step 3: Sends value from another ID for acceleration
Step4: Checks if tester has updated reset the

Brake pedal stroke sensor Tester 1

Brake pedal stroke sensor Tester 2

Messages:
Seat belt - 1. seat belt lock signal
2. rotation signal
Brake - brake signal-value of signal in brake will be updated
Accelerator- Acceleration signal value will be updated.