■AIRBAG FOR FRONTAL COLLISION

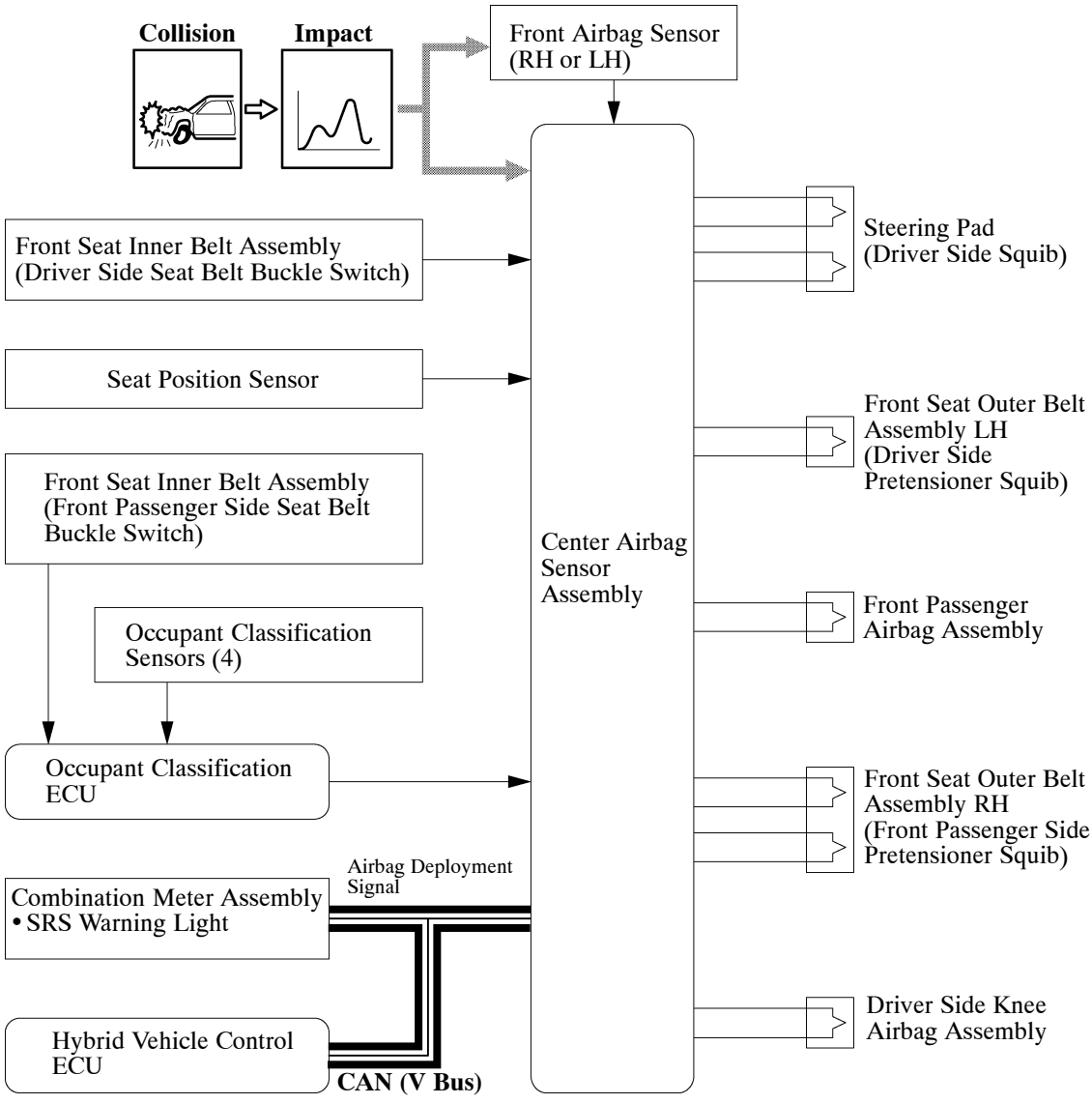
1. General

There are two airbags for frontal collisions: steering pad, front passenger airbag assembly, and driver side knee airbag assembly. These airbags deploy simultaneously. The steering pad and front passenger airbag assembly use a dual-stage control.

- The center airbag sensor assembly detects the information indicated below from various sources in order to activate the dual-stage control.

Airbag	Information	Source
Driver	Extent of Impact	• Front Airbag Sensor (RH or LH) • Center Airbag Sensor Assembly
	Driver Seat Position	Seat Position Sensor
	Seat Belt Condition	Front Seat Inner Belt Assembly (Driver Side Seat Belt Buckle Switch) (Non-contact Type)
Front Passenger	Extent of Impact	• Front Airbag Sensor (RH or LH) • Center Airbag Sensor Assembly
	Occupant Classification	4 Occupant Classification Sensors (Through the occupant classification ECU)
	Seat Belt Condition	Front Seat Inner Belt Assembly (Front Passenger Side Seat Belt Buckle Switch) (Non-contact Type) (Through the occupant classification ECU)

2. System Diagram



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3. Steering Pad and Front Passenger Airbag Assembly

The steering pad and front passenger airbag assembly each contain a set of two initiators and propellants. The center airbag sensor assembly helps optimize the airbag inflation output by controlling the inflation timing of these initiators.

4. Driver Side Knee Airbag Assembly

The driver side knee airbag assembly consists of an airbag door, an inflator, and a bag.

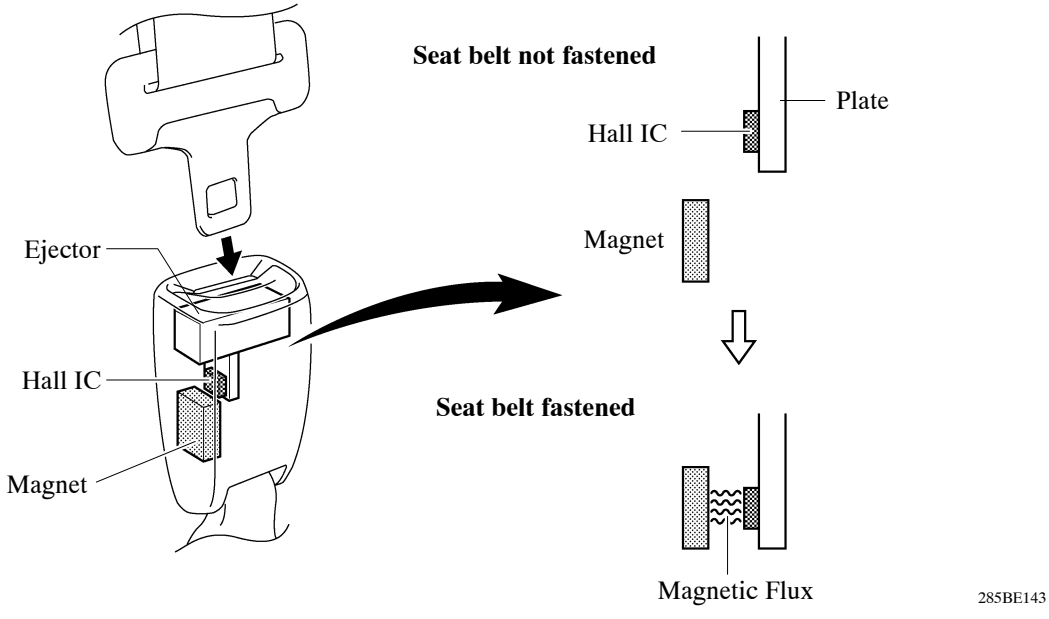
5. Front Airbag Sensor

Front airbag sensor uses an electrical type deceleration sensor. Based on the deceleration of the vehicle during a front collision, a distortion is created in the sensor and converted into an electrical signal. Accordingly, the extent of the initial collision can be detected in detail.

6. Front Seat Inner Belt Assembly (Seat Belt Buckle Switch)

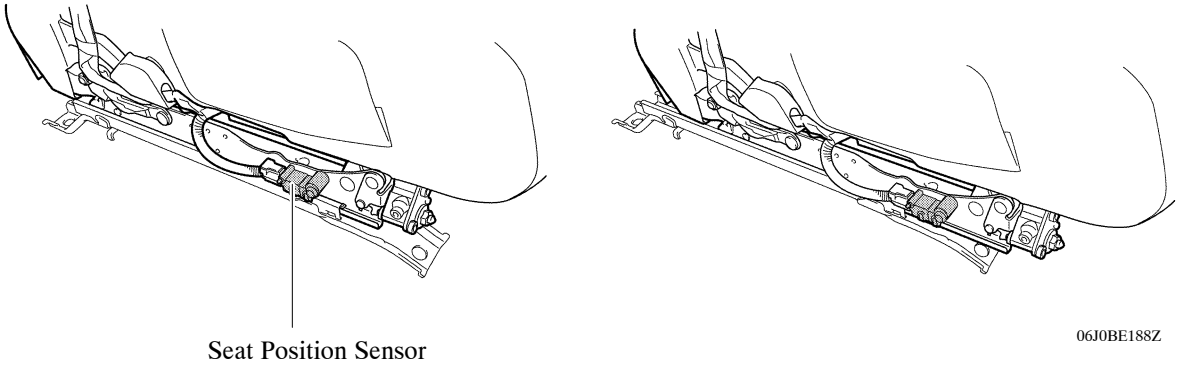
The front seat inner belt assembly (seat belt buckle switch) detects if the seat belt is fastened.

- A non-contact type switch is built in to the front seat inner belt assembly (seat belt buckle switch) on the driver and front passenger side.
- The non-contact type switch contains a Hall IC and magnet.
- The ejector inside the front seat inner belt assembly (seat belt buckle switch) and the plate installed to the ejector move when the seat belt is removed or inserted. The movement of the plate changes the magnetic flux density of the magnet.
- The Hall IC detects changes in the magnetic flux density. These changes indicate that the seat belt is either fastened or unfastened, and the Hall IC outputs a signal to the center airbag sensor assembly (for driver) or occupant classification ECU (for front passenger).



7. Seat Position Sensor

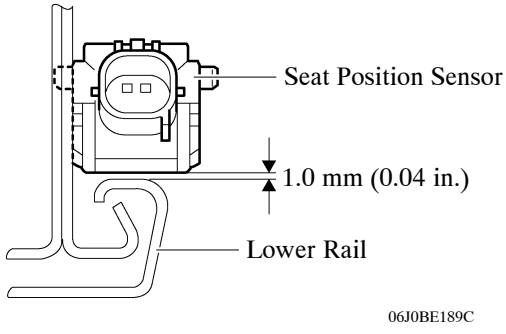
The seat position sensor detects the slide position of the driver seat. This sensor, which uses a Hall IC, detects changes in the magnetic flux that occur due to the movement of the upper rail.



Seat position is rearward **Seat position is frontward**

Service Tip

Follow the procedure indicated below to install the seat position sensor.
1) Insert a 1.0 mm (0.04 in.) feeler gauge between the seat position sensor and the lower rail portion.
2) Tighten the mounting bolt to the specified torque with the seat position sensor pushed down as shown.
For details, see the 2008 HIGHLANDER HYBRID VEHICLE Repair Manual (Pub. No. RM07V0U).



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