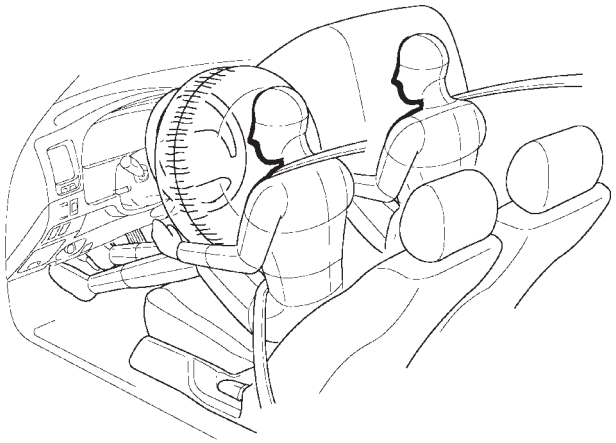
■ SRS AIRBAG

1. General

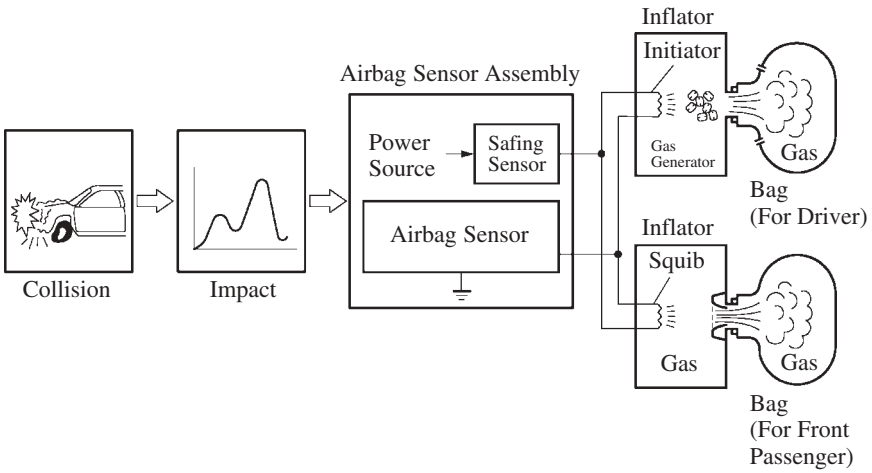
- The SRS (Supplemental Restraint System) airbag is designed to help lessen the shock to the driver and front passenger as a supplement to the seat belt.
  In a collision, the airbag sensor detects the shock and if the front-to-rear shock is greater than a specified value, the airbags stored in the steering wheel pad for the driver and above the glove box for the front passenger inflate instantly to help reduce the likelihood of the driver's or front passenger's head and chest directly hitting the steering wheel or instrument panel.
- A 1-sensor type airbag system is used, in which the detection of deceleration during a collision is accomplished by the airbag sensor enclosed in the airbag sensor assembly.
- The airbag system is controlled by the airbag sensor assembly. It has a self-diagnosis function. When it detects a system malfunction, it lights up the SRS warning light on the combination meter to alert the driver.
- The seat belt pretensioner is controlled by the airbag sensor assembly. For construction and operation of the seat belt pretensioner, see page 138.



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▶ System Diagram ◀

The activation processes of the SRS airbag is as illustrated below.

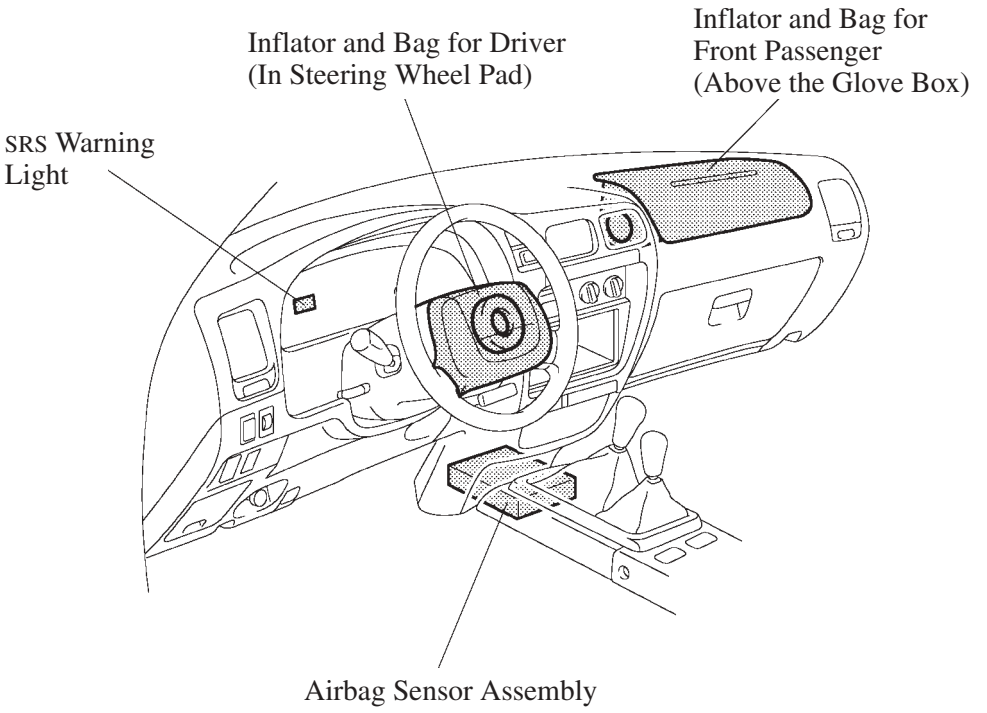


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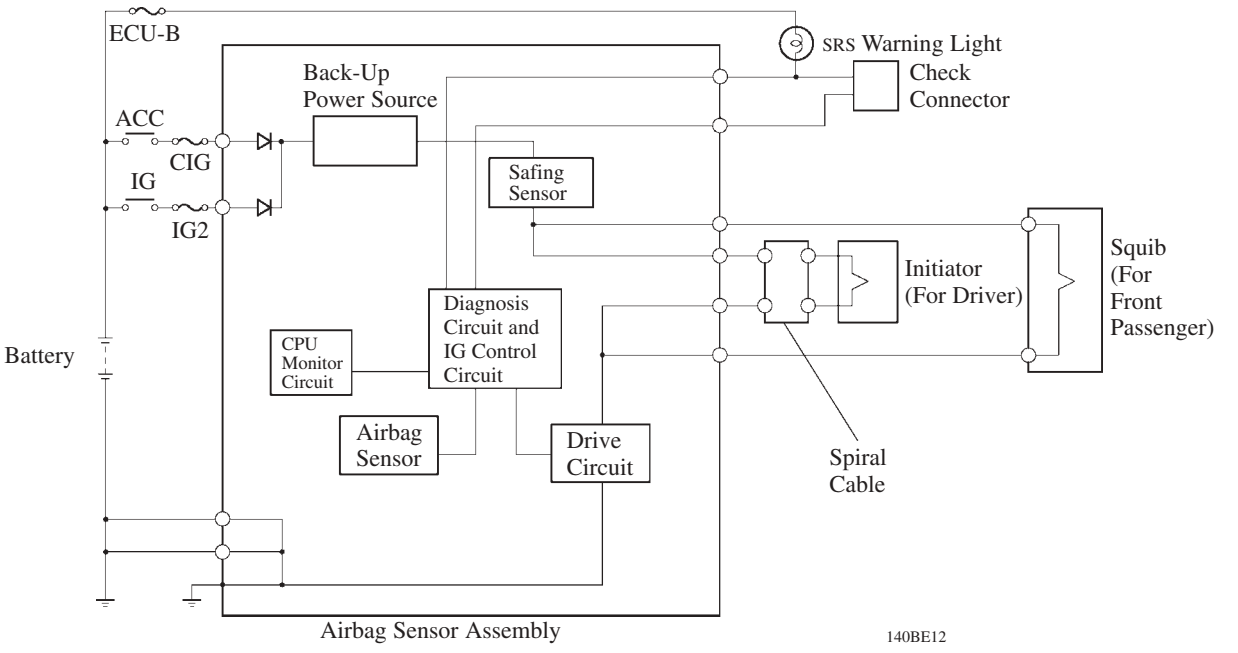
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2. Layout of Components

The major functioning parts of the airbag systems are shown below.



3. Wiring Diagram



4. Construction and Operation

Airbag Sensor Assembly

1) Description

The airbag sensor assembly is mounted on the center floor under the instrument panel. It receives signals from the airbag sensor enclosed in the airbag sensor assembly, judges whether the airbag and seat belt pretensioner must be activated or not, and diagnoses system malfunctions.

2) Construction and Operation

The airbag sensor assembly consists of airbag sensor, safing sensor, ignition control circuit, diagnosis circuit, etc.

a. Airbag Sensor, Ignition Control Circuit

- The airbag sensor is enclosed in the airbag sensor assembly, Based on the deceleration of the vehicle that occurs during a collision, the distortion that is created in the sensor is converted into an electric signal. This signal is a linear representation of the deceleration rate.
- The ignition control circuit performs a prescribed calculation based on the signal output by the airbag sensor. If the calculated value is larger than a predetermined value, it activates the ignition operation.

b. Safing Sensor

The safing sensor is enclosed in the airbag sensor assembly. The sensor turns ON and outputs an ON signal to the airbag sensor assembly if a deceleration force that is higher than a predetermined value is applied to the safing sensor as a result of a frontal collision.

c. Back-up Power Source

The back-up power source consists of a back-up capacitor and a DC-DC converter. In case of a power system failure during a collision, the back-up capacitor discharges and supplies electric power to the system. The DC-DC converter is a boosting transformer when the battery voltage drops below a certain level.

d. Diagnosis Circuit

This circuit constantly diagnoses the system for any malfunction. When a malfunction is detected, it lights up the SRS warning light on the combination meter to alert the driver.

e. Memory Circuit

When a malfunction is detected by the diagnosis circuit, it is coded and stored in this memory circuit. However, if the power supply is cut off by turning the ignition switch OFF or by disconnecting the battery terminal, the diagnosis code will be deleted from the memory circuit.

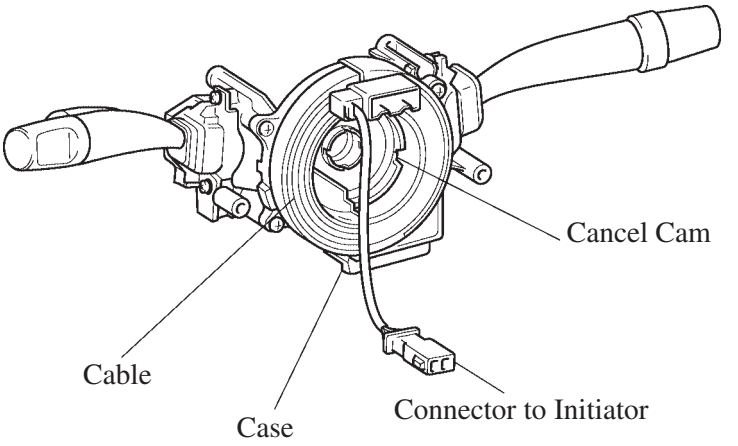
Spiral Cable

1) Description

The spiral cable is an electrical joint that connects the airbag sensor assembly with the inflator in the steering wheel pad.

2) Construction

- The spiral cable is made up of a rotator, case, cable and cancel cam, etc.
- The cancel cam and the rotator are meshed to one another by their respective protrusion and groove. These components move in unison when the steering wheel is rotated.
- The cable is placed in a case spirally so that the rotator can be turned 2.5 turns in either direction from the neutral position without pulling the cable.



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NOTICE

The steering wheel must be fitted correctly to the column at the neutral position during vehicle servicing; otherwise, cable disconnection and other trouble may result. Refer to the repair manual about correct steering wheel installation.

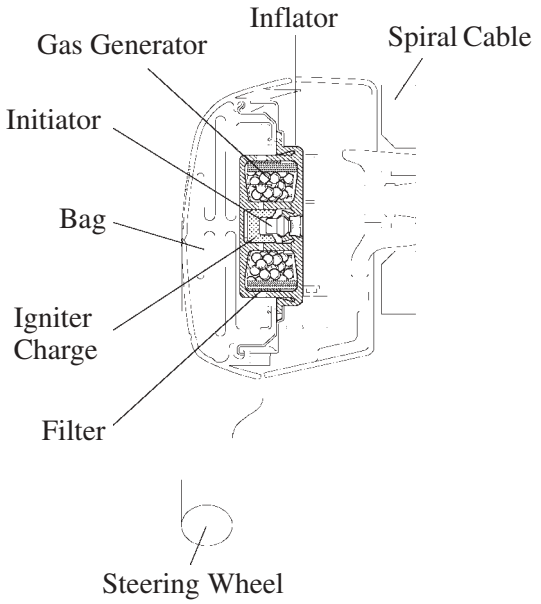
4. Construction and Operation

Inflator and Bag

1) For Driver

a. Construction

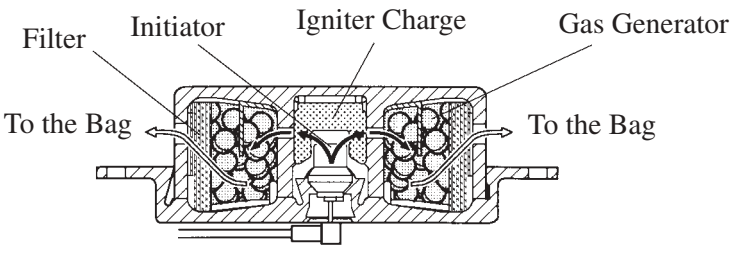
The inflator and bag are stored in the steering wheel pad and cannot be disassembled. The inflator contains a initiator, gas generator, etc., and inflates the bag in case of collision. The bag is made of strong nylon cloth.
Also, there are 2 gas exhaust ports provided at the back of the airbag to release the nitrogen gas quickly after the airbag has been deployed.



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b. Operation

It the airbag sensor is activated by deceleration due to frontal collision, electric current then ignites the initiator located in the inflator. The flame spreads instantaneously to the gas generator, and a large amount of nitrogen gas is generated from the gas generator. The gas flows through the filter where cinders are removed and the gas is cooled before filling the bag. Then, as it expands, the driver's bag tears open the wheel pad outer layer to expand further and to help to restrain the impact applied to the head and chest of the driver.



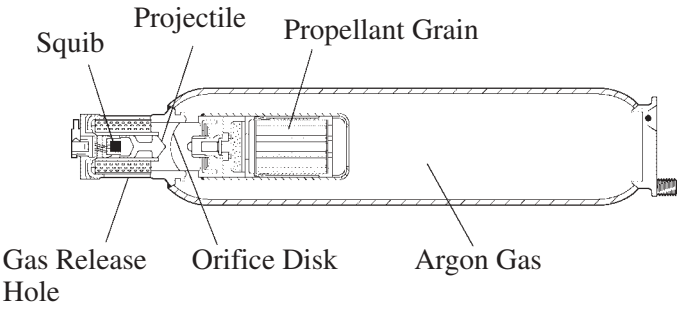
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→ : Propagation of Fire
⇨ : Flow of Gas

2) For Front Passenger

a. Construction

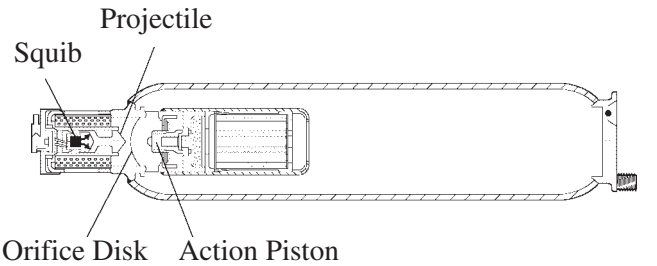
The inflator and bag for front passenger are inserted inside the case and located in the passenger side instrument panel. The bag is made of strong nylon cloth and becomes inflated by the argon gas flowed from the inflator.
The inflator of Morton made is comprised of a squib, projectile, orifice disk, propellant grain, high pressure argon gas and etc.



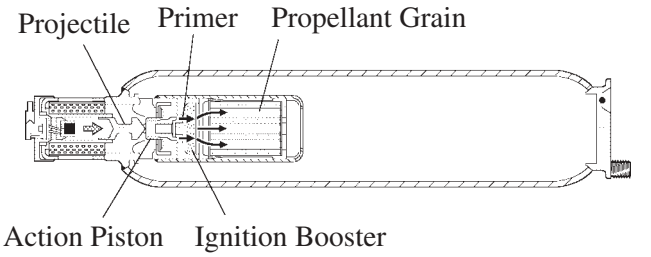
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b. Operation

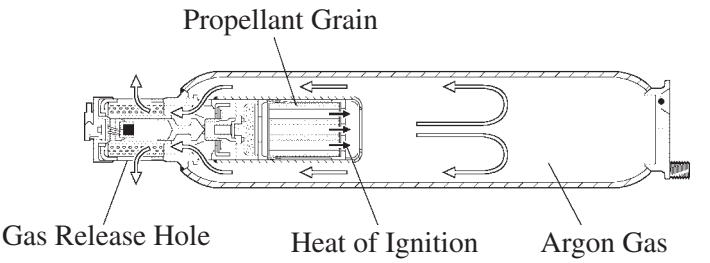
If the airbag sensor is turned on by deceleration due to frontal collision, electric current then ignites the squib located in the inflator. The projectile which fired by the ignition of the squib pierces through the orifice disk and collides with the action piston which causes the primer to ignite. The flame of the primer spreads instantaneously to the ignition booster and to the propellant grain. The gas which expanded by the heat of the ignition of the propellant grain flows into the airbag via the gas release hole, thus inflating the airbag.



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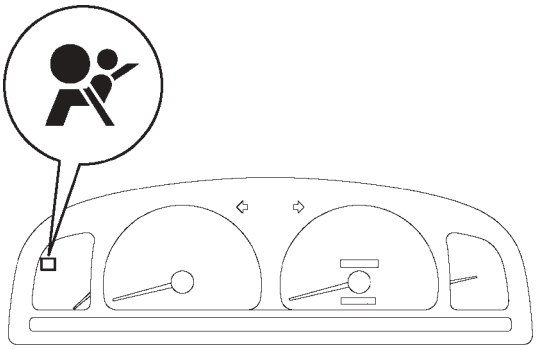
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SRS Warning Light

The SRS warning light is located on the combination meter:
It comes on to alert the driver about system trouble when a malfunction is detected in selfdiagnosis of the airbag sensor assembly.
In normal operating conditions when the ignition switch is turned to the ACC or ON position, the light comes on for about 6 seconds and then goes off.



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5. System Operation

Ignition Judgement and Conditions

- When the vehicle collides in the hatched area (Fig. 1) and the shock is larger than a predetermined level, the airbag and the seat belt pretensioner are activated automatically. The airbag sensor is characteristically turned such a way that it can judge the need for ignition in collisions within the hatched area.
- The safing sensor is designed to be activated by a smaller deceleration rate than the airbag sensor. As illustrated in Fig. 2 below, ignition is caused when current flows to the squib, which happens when a safing sensor and the airbag sensor go on simultaneously.

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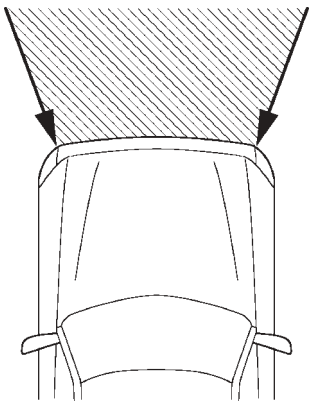


Fig. 1

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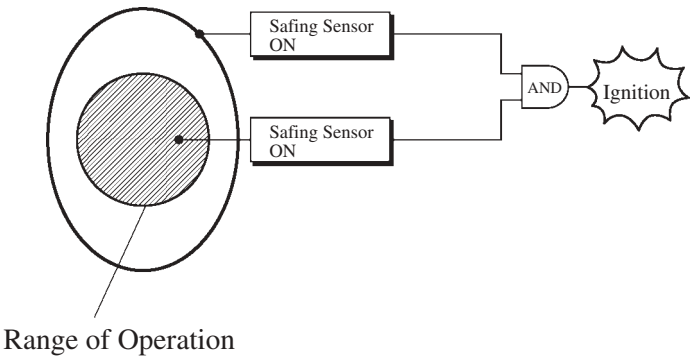


Fig. 2

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