05IN9–01

SYSTEM DESCRIPTION

1. SES AIRBAG SYSTEM OUTLINE

(a) FRONTAL COLLISION

(1) The driver and front passenger airbags were designed to supplement seat belts in the event of a front collision in order to help reduce shock to the head and chest of the driver and front passenger.

(2) Frontal collisions are detected by the airbag ECU assy and two front airbag sensors. The driver and front passenger airbags and the seat belt pretensioner then operate simultaneously.

(3) Electrical deceleration sensors are built into the two front airbag sensors in the engine compartment in order to detect the severity of the impact during the initial stage of the collision. The deployment of the driver and front passenger airbags in controlled in two stages according to the severity of the impact.

(b) SIDE COLLISION

(1) The front seat airbag assy and curtain shield airbag assy were designed to help reduce shock to the driver, front passenger and rear outer passenger. The curtain shield airbag assy was designed to help reduce shock to the front and rear passengers in the event of a side collision.

(2) Side collisions are detected by the side airbag sensor assy installed in the bottom of the center pillar and the airbag sensor rear installed in the bottom of the rear pillar. Front side collisions are detected by the side airbag sensor assy, causing the front seat airbag assy and curtain shield airbag assy to deploy simultaneously. Rear side collisions are detected by the airbag sensor rear to deploy only the curtain shield airbag assy.

2. CONSTRUCTION AND OPERATION

(a) AIRBAG SENSOR FRONT

(1) The front airbag sensor assy's are installed on the right and left side members.

(2) The deceleration sensor is built into the airbag sensor front and distortion that is created in the sensor is converted into an electric signal based on the vehicle deceleration rate during a frontal collision Accordingly, the extent of the initial collision can be detected in detail.

(b) SIDE AIRBAG SENSOR ASSY

(1) The side airbag sensor assy's are installed on the right and left center pillars.

(2) The side airbag sensor assy consists of the deceleration sensor, ignition control circuit, and diagnostic circuit. The side airbag sensor assy receives signals from the deceleration sensor and determines whether the front seat airbag assy and curtain shield airbag assy should be activated, and diagnoses system malfunctions simultaneously.

(c) AIRBAG SENSOR REAR

(1) The airbag sensor rear is installed on the bottom of the right and left rear pillars respectively.

(2) The deceleration sensor is built into the airbag sensor rear and the distortion that is created in the sensor is converted into an electric signal based on the vehicle deceleration rate during a rear side collision.

(d) AIRBAG ECU ASSY

(1) General

- The airbag ECU assy is installed on the center floor under the instrument panel.
- The airbag ECU assy consists of the deceleration sensor, safing sensor, electrical safing sensor, ignition control circuit and diagnostic circuit.
- The airbag ECU assy receives signals from the safing sensor built into the airbag ECU assy and from the deceleration sensor and safing sensor built into the airbag sensor front. The the airbag ECU assy determines whether or not the driver and front passenger airbags and the seat belt pretensioner should be activated, and diagnoses system malfunctions.
- The airbag ECU assy causes the front seat airbag assy and the curtain shield airbag assy to deploy when receiving signals from the deceleration sensor and the safing sensor built into the side airbag sensor assy.
- The airbag ECU assy receives signals from the deceleration sensors and the electrical safing sensors built into the airbag ECU assy and the airbag sensor rear, and determines whether or not the curtain shield airbag assy should be activated, and then diagnoses system malfunctions.
- The airbag ECU assy is operable using check mode, which can detect and output DTCs. If the mal function does not recur during troubleshooting, joggling each connector or driving on a city or rough road with the airbag ECU assy in check mode as a simulation method makes it possible to obtain more accurate information.

(2) Deceleration sensor and ignition control circuit

- The deceleration sensor is built into the airbag ECU assy, and the distortion created during a frontal or rear side collision based on the deceleration of the vehicle is converted into an electric signal.
- The ignition control circuit performs calculations based on the signal output from the deceleration sensors of the airbag ECU assy and airbag sensor front. If the calculated values are greater than the specified values, the airbag deploy.

(3) Safing sensor

- The safing sensor is built into the airbag ECU assy. During a frontal collision, the sensor turns on and outputs an ON signal to the airbag ECU assy if a deceleration rate greater than the specified value is applied to the safing sensor.

(4) Electronic safing sensor

- The electronic safing sensor is built into the airbag ECU assy. During a rear side collision, the sensor turns on and outputs an ON signal to the airbag ECU assy if a deceleration rate greater than the specified value is applied to the electronic safing sensor.

(5) Back–up power source

- The back–up power source consists of a condenser and a DC–DC converter. When the power system does not function during a collision, the condenser discharges and supplies electric power to the system. The DC–DC converter operates as a boosting transformer when the battery voltage falls below a predetermined level.

(6) Diagnostic circuit

- This circuit constantly diagnoses the system malfunctions. When a malfunction is detected, it lights up the SRS warning light on the combination meter assy to inform the driver.

(7) Memory circuit

- When a malfunction is detected in the diagnostic circuit, it is coded and stored in the memory circuit.

(e) SRS WARNING LIGHT

(1) The SRS warning light is located on the combination meter assy. The SRS warning light informs the driver of detected malfunctions in the diagnostic circuit of the airbag ECU assy or the SRS airbag system. Under formal operating conditions when the power switch is turned on, the SRS warning light comes on for approximately 6 seconds and then goes off.

3. IGNITION JUDGEMENT AND CONDITIONS

(a) FRONTAL COLLISION

(1) When the vehicle collides in the hatched are (Fig.1) and shock is greater than the specified value, the driver and front passenger airbags are activated automatically. The deceleration sensor of the airbag ECU assy determines whether or not ignition in necessary based on signals from the deceleration sensor of the airbag sensor front.

(2) The safing sensor of the airbag ECU assy was designed to be turned on at a smaller deceleration rate than the deceleration sensor. If the safing sensor and the deceleration sensor turn on simultaneously, current flows to the squib and deploys the driver and front passenger airbags as shown in illustration Fig.2.

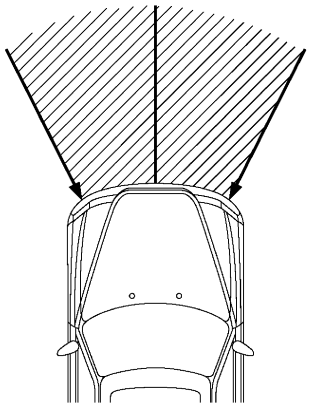
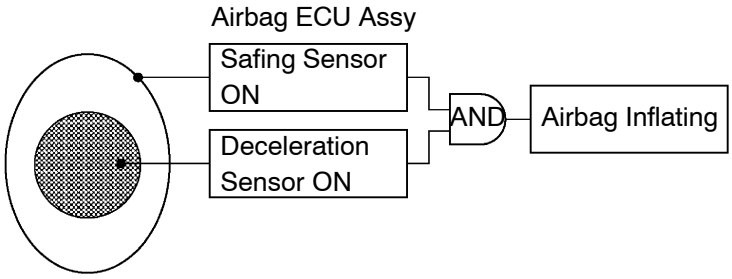


Fig.1

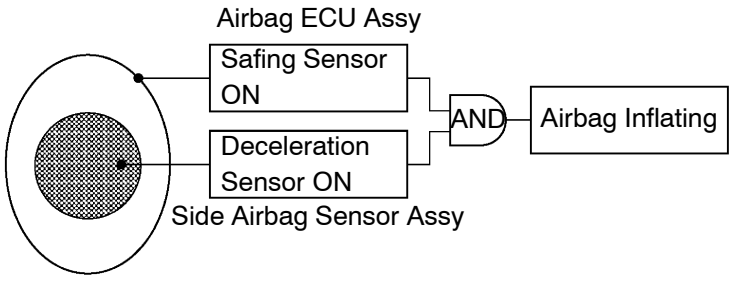


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(b) FRONT SIDE COLLISION

(1) The safing sensor of the side airbag sensor assy was designed to be turned on at a smaller deceleration rate than the deceleration sensor of the deceleration sensor. If the safing sensor and the deceleration sensor turn on simultaneously, current flows to the squib and deploys the driver and front passenger side airbags and curtain shield airbag as shown in the illustration below



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(c) REAR SIDE COLLISION

(1) The curtain shield airbag deploys if the curtain shield airbag assy receives the ignition signal for the front seat airbag assy or for the curtain shield airbag assy (transmitted from the airbag sensor rear) as shown in the illustration below.

