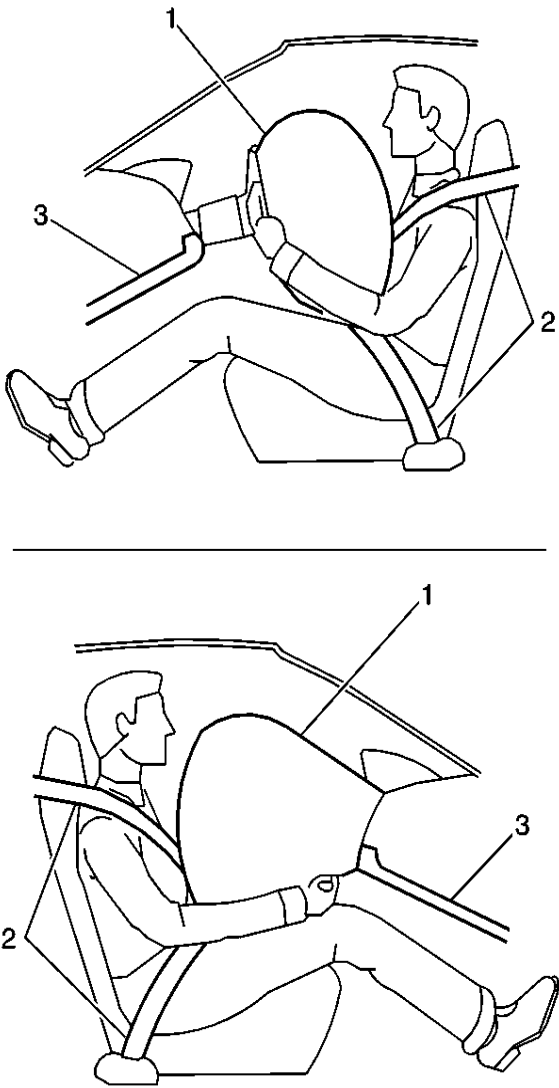


SIR System Description and Operation

SIR System Overview



The supplemental inflatable restraint (SIR) system supplements the protection offered by the occupants Seat Belt System (2). The SIR system may contain several inflator modules located throughout the vehicle, i.e. steering wheel module (1), instrument panel module (1), or roof rail modules (1). In addition to inflator modules, the vehicle may contain seat belt pretensioners (2) that tighten the seat belt in the event of a collision, thus reducing the distance between the occupant and the seat belt when an inflator module is deployed. Each inflator module has a deployment loop that is controlled by the inflatable restraint sensing and diagnostic module (SDM) mounted inside the vehicle. The SDM determines the severity of a collision with the assistance of various sensor inputs located at strategic points on the vehicle. When the SDM detects a collision, it will process the information provided by the sensors to further support air bag or pretensioner deployment. The SDM will deploy the frontal air bags and pretensioners if it detects a collision of sufficient force. If the force of the impact is not sufficient to warrant inflator module deployment, the SDM may still deploy the seat belt pretensioners. The SDM performs continuous diagnostic monitoring of the SIR system electrical components. Upon detection of a circuit malfunction, the SDM will set a DTC and inform the driver by illuminating the AIR BAG indicator. The steering column (3) and knee bolsters (3) are designed to absorb energy and compress during frontal collisions in order to limit leg movement and decrease the chance of injury to the driver and passenger.

Frontal SIR System Description

The frontal supplemental inflatable restraint (SIR) system consists of the following components:

- AIR BAG indicator located in the instrument cluster
- Inflatable restraint sensing and diagnostic module (SDM)
- Inflatable restraint passenger presence detection system
- Inflatable restraint Passenger AIR BAG ON/OFF indicator
- Inflatable restraint passenger frontal air bag module
- Inflatable restraint seat position sensors
- Inflatable restraint driver frontal air bag module
- Inflatable restraint steering wheel module coil
- Inflatable restraint seat belt retractor pretensioners
- Inflatable restraint wiring harnesses
- Steering wheel and column
- Driver and front passenger knee bolsters

A frontal collision of sufficient force will deploy the frontal air bags and/or pretensioners. The inflatable restraint sensing and diagnostic module (SDM) contains a sensing device that converts vehicle velocity changes to an electrical signal. The SDM compares these signals to values stored in memory. If the signals exceed a stored value, the SDM will determine the severity of the impact and either cause current to flow through the frontal deployment loops deploying the frontal air bags and pretensioners, or it will deploy the pretensioners only. The SDM, instrument panel module, steering wheel module, steering wheel module coil, seat belt retractor pretensioners, and the connecting wires make up the frontal deployment loops. The SDM continuously monitors the deployment loops for malfunctions and illuminates the AIR BAG indicator if a fault is detected.