

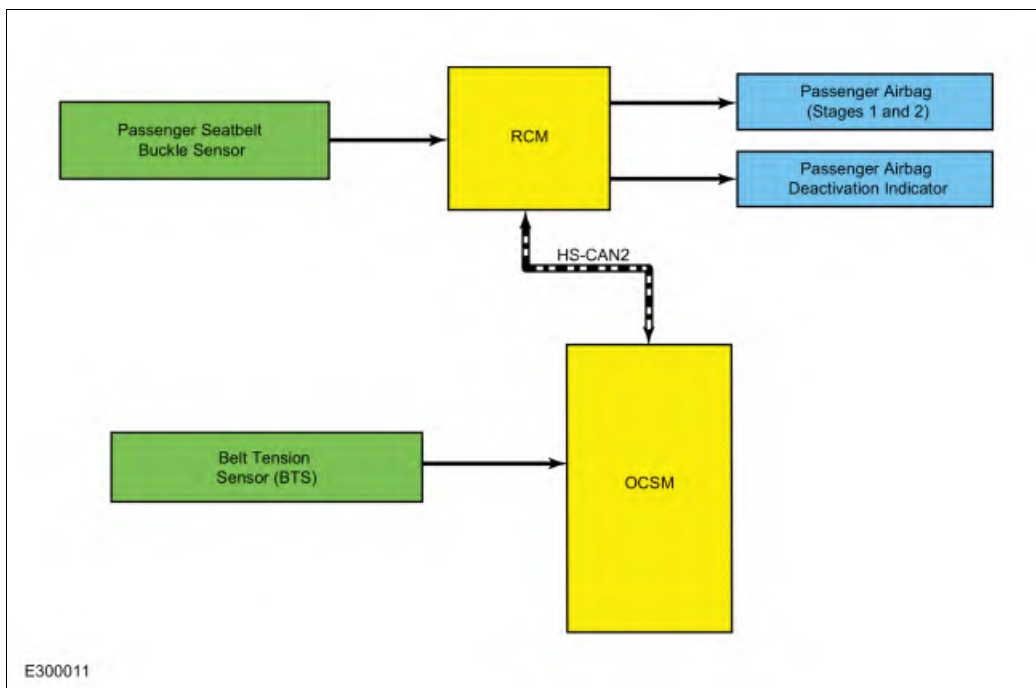
|    |                                           |
|----|-------------------------------------------|
| 3  | Driver Seatbelt Retractor Pretensioner    |
| 4  | Passenger Side Curtain Airbag             |
| 5  | Driver Side Curtain Airbag                |
| 6  | Passenger Side Airbag                     |
| 7  | Driver Side Airbag                        |
| 8  | Passenger Airbag (Stages 1 and 2)         |
| 9  | Driver Airbag (Stages 1 and 2)            |
| 10 | RCM                                       |
| 11 | BCM                                       |
| 12 | Passenger Seatbelt Adaptive Load Limiter  |
| 13 | Passenger Seatbelt Retractor Pretensioner |
| 14 | Passenger Load Limiting Retractor         |
| 15 | Passenger Airbag Vent (if equipped)       |
| 16 | Passenger Knee Airbag                     |
| 17 | Driver Knee Airbag (if equipped)          |
| 18 | Driver Second Row Seatbelt Retractor      |
| 19 | Passenger Second Row Seatbelt Retractor   |

#### Network Message Chart - Supplemental Restraint System (SRS)

##### Module Network Input Messages - RCM

| Broadcast Message               | Originating Module | Message Purpose                                                                                                         |
|---------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------|
| eCall confirmation              | APIM               | Used for SYNCÂ® 911 AssistÂ© operation. Indicates whether eCall notification is in progress after an airbag deployment. |
| Ignition status                 | BCM                | Qualifies certain faults during RCM self-diagnostics.                                                                   |
| Airbag warning indicator status | IPC                | Confirms airbag warning indicator status to the RCM.                                                                    |
| OCS vehicle calibration data    | OCSM               | Shares application-specific data for comparison purposes to make sure the correct OCSM and RCM are installed.           |
| OCS fault status                | OCSM               | Indicates an OCS fault, if present.                                                                                     |
| OCS sensor data                 | OCSM               | OCS sensor readings.                                                                                                    |
| OCS serial number               | OCSM               | OCSM serial number.                                                                                                     |
| Restraints module power status  | BCM                | Communicates BCM fault status to the RCM.                                                                               |
| Vehicle configuration data      | BCM                | Verifies vehicle configuration data.                                                                                    |

#### System Diagram - Occupant Classification System (OCS)



| Item | Description                       |
|------|-----------------------------------|
| 1    | Belt Tension Sensor (BTS)         |
| 2    | OCSM                              |
| 3    | Passenger Seatbelt Buckle Sensor  |
| 4    | Passenger Airbag (Stages 1 and 2) |
| 5    | RCM                               |
| 6    | PAD Indicator                     |

## Network Message Chart - Occupant Classification System (OCS)

### Module Network Input Messages

| Broadcast Message                      | Originating Module | Message Purpose                             |
|----------------------------------------|--------------------|---------------------------------------------|
| Front passenger seatbelt buckle status | RCM                | Determines passenger airbag disable status. |
| RCM serial number                      | RCM                | RCM serial number.                          |

## Supplemental Restraint System

The SRS is controlled by the RCM, which continually monitors various inputs. When these inputs indicate a front, side, or rollover crash, the RCM deploys some components based upon the severity of the crash and the sensor inputs.

Although some deployable devices may not have activated for all occupants during a crash, it does not mean that something is wrong with the SRS.

The RCM performs a self-test of the complete SRS during each startup. In addition to the self-test at start up, the RCM continually monitors all of the SRS components and circuitry for correct operation.

### Airbag Warning Indicator

The airbag warning indicator:

- proves out by lighting for 6 seconds and then turning off.
- flashes and/or illuminates based on the message the IPC receives from the RCM.
- illuminates if the IPC does not receive a message from the RCM.

When the ignition is turned on, the IPC illuminates the airbag warning indicator continuously for 6 seconds. If the SRS is free of faults, the airbag warning indicator turns off and remains off. If a SRS fault exists, the airbag warning indicator illuminates and remains illuminated for the rest of the

ignition cycle. The RCM communicates with the IPC via the HS-CAN. The IPC illuminates the airbag warning indicator based on messaging from the RCM. The IPC also illuminates the airbag warning indicator if there is no communication between the RCM and IPC.

### Event Notification Signal

The event notification feature provides other vehicle subsystems with information pertaining to SRS deployment or fuel cutoff status. When an impact occurs which exceeds a pre-determined threshold, the RCM sends a signal on a dedicated circuit to the BCM.

When the BCM receives the crash signal input, it initiates fuel cutoff to disable the fuel system.

After the fuel system is disabled, the vehicle can be re-started after carrying out the following steps:

- Turn the ignition on and wait 10 seconds.
- Turn the ignition off.
- Turn the ignition on.
- Turn the ignition off.
- Turn the ignition on.

### Occupant Classification System (OCS)

The OCS classifies the size of the front passenger seat occupant and provides this information to the RCM.

Pressure is applied to the OCS bladder when weight of any occupant or object on the front passenger seat is present. The pressure is then transferred through a tube and sensed by the OCS pressure sensor within the OCSM. The OCSM sends information concerning the weight of any occupant or object on the front passenger seat to the RCM via the HS-CAN2. The RCM uses this information to determine if the passenger airbag needs to be deployed in the event of a crash.

The OCS is also used for operation of the passenger Belt-Minder®. For information about Belt-Minder®, Refer to: Seatbelt Systems - System Operation and Component Description (501-20A Seatbelt Systems, Description and Operation).

To deactivate or reactivate the passenger Belt-Minder® feature, Refer to: Seatbelt Minder Deactivating/Activating (413-01 Instrumentation, Message Center and Warning Chimes, General Procedures).

### Passenger Airbag Deactivation (PAD) Indicator

The RCM controls the PAD indicator through 2 hardwired circuits and messages sent on the HS-CAN2 and MS-CAN, based on information provided by the OCS. The PAD indicator illuminates to indicate the passenger airbag is disabled.

The RCM briefly activates the PAD indicator during prove out to verify the indicator function and confirm proper functional operation of the PAD indicator to the front occupants.

The following table indicates the passenger airbag and PAD indicator status based on the size of the front passenger occupant.

| Occupant Size | Passenger Seatbelt Buckle Status | Passenger Airbag Status | PAD Indicator Status |
|---------------|----------------------------------|-------------------------|----------------------|
| Empty         | Buckled or Unbuckled             | Disabled                | OFF: Lit             |
|               |                                  |                         | ON: Unlit            |
| Small         | Buckled or Unbuckled             | Disabled                | OFF: Lit             |
|               |                                  |                         | ON: Unlit            |
| Large         | Buckled or Unbuckled             | Enabled                 | OFF: Unlit           |
|               |                                  |                         | ON: Lit              |

### Airbag Second Stage Deployment Check

The driver and passenger front airbags each have 2 deployment stages. After an airbag deployment, it is possible that stage 1 has deployed and stage 2 has not. If a front airbag has deployed, the front airbag must be remotely deployed using the appropriate airbag disposal procedure to make sure both stages have deployed. For information on driver airbag and/or passenger airbag remote deployment, Refer to: Pyrotechnic Device Disposal (501-20B Supplemental Restraint System, General Procedures).

### SOS Post-Crash Alert System

The SOS Post-Crash Alert System is controlled by the BCM, but initiated by the RCM.

When a deployment or fuel cutoff event occurs, the RCM sends a message on the HS-CAN2 (via the GWM) to the BCM. The BCM flashes the turn signal lamps and sounds the horn (except when 911 Assist<sup>®</sup> is active) until it is turned off. The system can be turned off 10 seconds after a crash event by pressing the hazard switch. The BCM also unlocks the doors and illuminates the courtesy lamps after a crash event.

### **Vehicle Spin-out Detection**

When internal RCM sensors detect the vehicle has spun out, the BCM activates the hazard warning flashers and displays a message in the IPC to indicate the hazard warning flashers are activated due to the spin-out.

### **Body Control Module (BCM)**

The BCM provides system voltage to the RCM and OCSM when the ignition is ON. Additionally, the BCM is designed to ensure the RCM and OCSM remain powered on if the ignition is turned off while the vehicle is moving at a speed greater than 4 km/h (2.5 mph).

If the ignition signal is active / high while the vehicle is travelling at a speed above 4 km/h (2.5 mph) the BCM maintains system voltage on the RCM and OCSM power supply circuits. If the ignition signal is lost, missing, or below a certain threshold while the vehicle is travelling at a speed above 4 km/h (2.5 mph), the BCM maintains system voltage on the RCM and OCSM power supply circuits and a telltale appears in the IPC. If the vehicle speed rises above the threshold again, the BCM does not reactivate the power supply to the RCM and OCSM. They remain off until the ignition is turned on again.

If a vehicle is parked with the ignition off, the BCM does not provide power to the RCM and OCSM. If the vehicle begins to move while the ignition is still off, the BCM does not power the RCM or OCSM.

When the vehicle has been started using the remote start feature (if equipped), the ignition status is off, but the BCM powers the RCM in order to detect a collision and disable the fuel pump, if necessary.

### **Component Description**

#### **C-pillar Side Impact Sensors**

The C-pillar side impact sensors are located at the base of the last pillar. The C-pillar side impact sensors measure acceleration (g-rate), and are hardwired to the RCM. Mounting position and orientation is critical for correct operation of the C-pillar side impact sensors.

#### **Belt Tension Sensor (BTS)**

The Belt Tension Sensor (BTS) is a 3-wire Hall-effect sensor that is part of the front passenger seatbelt buckle and cannot be serviced separately from the front passenger seatbelt buckle assembly.

### **Body Control Module (BCM)**

The BCM supplies system voltage to the RCM and OCSM based on HS-CAN1 inputs and the ignition input.

### **Clockspring**

The clockspring allows for continuous electrical connections between the driver airbag and the RCM. A spiral-wound cable wraps around the center of the clockspring and as the steering wheel is turned, the spiral cable inside expands or contracts in diameter as the 2 halves of the clockspring turn.

### **Driver Airbag**

The driver airbag is a dual-stage airbag. Upon receiving a flow of current, it deploys at 1 of 2 different rates, depending upon vehicle impact severity and sensor input.

#### **Driver Knee Airbag (If Equipped)**

The driver knee airbag is below the steering column opening trim panel and deploys upon receiving current flow from the RCM.

### **Front Door Side Impact Sensors**

The front door side impact sensors monitor air pressure within the door in order to detect certain crashes, such as a side impact. They are hardwired to the RCM. Mounting position and orientation is critical for correct operation of the front door side impact sensors.

### **Front Impact Severity Sensors**

The front impact severity sensors measure acceleration (g-rate) and are hardwired to the RCM. Mounting position and orientation is critical for correct operation of the front impact severity sensors.

### **Occupant Classification System (OCS)**

The OCS is found only on the front passenger seat. The OCS classifies the size of the front passenger seat occupant.

The OCS is comprised of a silicone gel-filled bladder mounted between the seat cushion foam and pan, an OCSM which is mounted to the seat frame, and a pressure sensor that is internal to the OCSM. Pressure is applied to the OCS bladder when weight of any occupant or object on the front passenger seat is present. The pressure is then transferred through a tube and sensed by the OCS pressure sensor and OCSM. The components of an OCS bladder system (bladder, tube, and OCSM with integrated pressure sensor) are serviced as an assembly, and the OCS bladder system is serviced as a kit with the seat cushion and seat heater mat (if applicable).

### **Passenger Airbag**

The passenger airbag is a dual-stage airbag which deploys at 1 of 2 different rates depending upon vehicle impact severity and sensor input.

### **Passenger Airbag Canister Vent (If Equipped)**

The passenger airbag canister vent is a deployable device that is part of the passenger airbag. Canister venting controls the inflation rate of the passenger airbag and the escape rate of gases from the airbag. The canister vent cannot be serviced separately from the passenger airbag.

### **Passenger Knee Airbag**

The passenger knee airbag is below the glove compartment door and deploys upon receiving current flow from the RCM.

### **Passenger Airbag Deactivation (PAD) Indicator**

The PAD indicator is a LED which is part of the overhead console. The PAD indicator indicates if the passenger side airbag is active (on) or deactivated (off).

### **Restraints Control Module (RCM)**

**NOTE:** This vehicle may be equipped with SYNCÂ® which contains the 911 AssistÂ,,ç option. Refer to the Owner's Literature for information about this feature.

The RCM monitors various sensor inputs and uses that data for controlling SRS outputs such as the event notification function and airbag deployment.

The RCM includes a backup power supply. This feature provides sufficient backup power to deploy the airbags in the event the ignition circuit is lost or damaged during impact. The backup power supply depletes its stored energy approximately one minute after power and/or ground has been removed from the RCM.

The RCM requires PMI when being replaced. Refer to the diagnostic scan tool instructions to carry out PMI.

### **Seat Position Sensor**

The seat position sensor is a Hall-effect sensor which indicates the position of the seat along the seat track. The sensor detects the presence of a shunt bracket on the track, indicating the seat has moved past a certain point in the adjustment range.

### **Seatbelt Buckle Sensors**

The seatbelt buckles contain integrated sensors that are Hall-effect switches. The seatbelt buckle sensors are serviced with the seatbelt buckle.

### **Seatbelt Anchor Pretensioners**

A seatbelt anchor pretensioner is a pyrotechnic device that removes slack from the seatbelts when deployed. One is included as part of each front row outboard seatbelt assembly and cannot be serviced separately.

To diagnose any pretensioner Diagnostic Trouble Codes (DTCs),  
Refer to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing).

### **Seatbelt Retractor and Adaptive Load Limiter**

The front passenger seatbelt retractor is equipped with the adaptive load limiting feature that works in conjunction with the seatbelt buckle pretensioner to control the tension of the front passenger seatbelt in the event of a crash. The front passenger seatbelt retractor is also referred to as the seatbelt load limiter.

To diagnose any pretensioner Diagnostic Trouble Codes (DTCs),  
Refer to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing).

For any concerns regarding seatbelt retractor function,  
Refer to: Seatbelt Systems (501-20A Seatbelt Systems, Diagnosis and Testing).

### **Seatbelt Retractor Pretensioner**

The seatbelt retractor pretensioner is a pyrotechnic device that removes slack from the seatbelts when deployed.

To diagnose any pretensioner Diagnostic Trouble Codes (DTCs),

Refer to: Airbag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing).

For any concerns regarding seatbelt retractor function,

Refer to: Seatbelt Systems (501-20A Seatbelt Systems, Diagnosis and Testing).

### **Side Airbag**

The side airbags are single-stage airbags designed to provide protection for the seat occupant's torso. They deploy upon receipt of current flow and are attached to the outboard side of each front seat. They are used in conjunction with the side air curtain.

### **Side Curtain Airbag**

The side curtain airbags are single-stage airbags designed to provide head and upper body protection to the vehicle occupant(s) during side impact crashes.

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