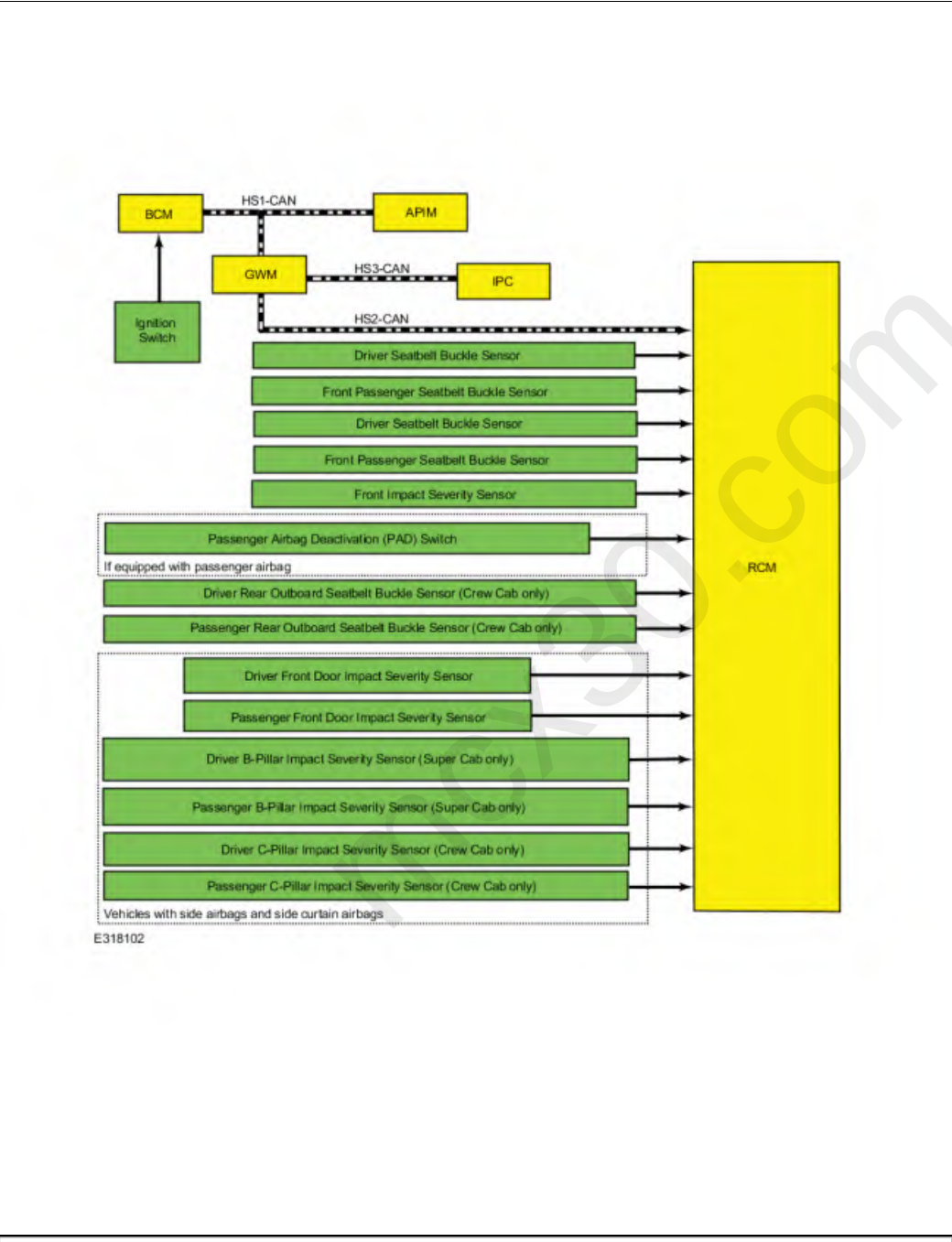


Airbag and Seatbelt Pretensioner Supplemental Restraint System (SRS) - System Operation and Component Description

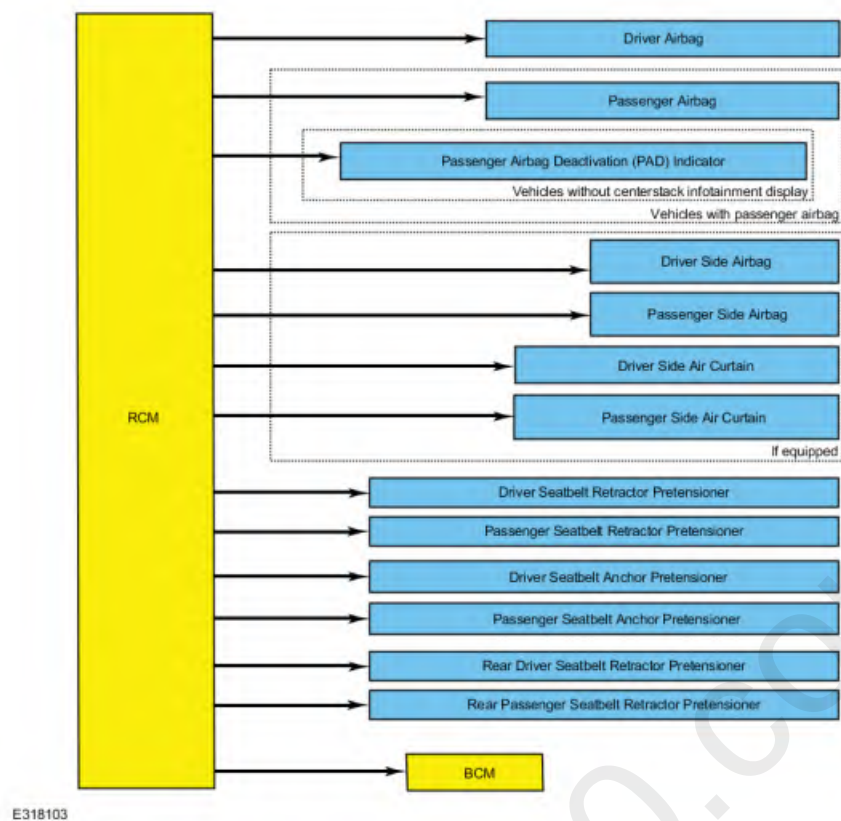
System Operation

System Diagram - Supplemental Restraint System (SRS)



Item	Description
1	HS-CAN2
2	HS-CAN1
3	HS-CAN3
4	(If equipped with passenger airbag)
5	(Vehicles with side airbags and side curtain airbags)

6	RCM
7	Driver Seatbelt Buckle Sensor
8	Front Passenger Seatbelt Buckle Sensor
9	Passenger Front Door Impact Severity Sensor
10	Driver Front Door Impact Severity Sensor
11	Driver C-Pillar Impact Severity Sensor (Crew Cab only)
12	Passenger C-Pillar Impact Severity Sensor (Crew Cab only)
13	Ignition Switch
14	BCM
15	APIM
16	GWM
17	IPC
18	Driver B-Pillar Impact Severity Sensor (Super Cab only)
19	Passenger B-Pillar Impact Severity Sensor (Super Cab only)
20	Driver Rear Outboard Seatbelt Buckle Sensor (Crew Cab only)
21	Passenger Rear Outboard Seatbelt Buckle Sensor (Crew Cab only)
22	PAD Switch
23	Driver Seatbelt Buckle Sensor
24	Front Passenger Seatbelt Buckle Sensor
25	Front Impact Severity Sensor



Item	Description
1	(If equipped)
2	(Vehicles with passenger airbag)
3	(Vehicles without centerstack infotainment display)
4	BCM
5	Passenger Seatbelt Anchor Pretensioner
6	Driver Seatbelt Anchor Pretensioner
7	Driver Seatbelt Retractor Pretensioner
8	Passenger Side Air Curtain
9	Driver Side Air Curtain
10	Passenger Side Airbag
11	Driver Side Airbag
12	Passenger Airbag
13	Driver Airbag
14	RCM

15	PAD Indicator
16	Rear Driver Seatbelt Retractor Pretensioner
17	Rear Passenger Seatbelt Retractor Pretensioner
18	Passenger Seatbelt Retractor Pretensioner

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	Used to qualify certain faults during RCM self-diagnostics.
Airbag warning indicator status	IPC	Confirms airbag warning indicator status to the RCM.
Vehicle configuration data	BCM	Used for verifying vehicle configuration data.

Supplemental Restraint System

The SRS is controlled by the RCM, which continually monitors various inputs. When these inputs indicate a frontal or side crash, the RCM may deploy 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 continuously 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.

Body Control Module (BCM)

The BCM provides system voltage to the RCM when the ignition is ON. Additionally, the BCM is designed to ensure the RCM 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 power supply circuit. 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 power supply circuit 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. 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. If the vehicle begins to move while the ignition is still off, the BCM does not power the RCM.

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.

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.

Passenger Airbag Deactivation (PAD) Switch and Indicator (vehicles with passenger airbag)

The PAD switch allows the passenger airbag deployment circuit to be disabled using the ignition key. The RCM then controls the state of the PAD indicator based on information provided by the PAD switch. When the ignition is first turned ON, the RCM briefly activates the PAD indicator to prove-out the indicator function and verify correct functional operation of the PAD indicator.

For vehicles without a centerstack display, the PAD indicator illuminates to indicate the passenger airbag is disabled, and is off when the passenger airbag is enabled. The PAD indicator is located in the instrument panel and is controlled through a direct, hard-wired connection.

For vehicles with a centerstack display, the PAD indicator illuminates 1 of 2 Light Emitting Diodes (LEDs) to indicate whether the passenger airbag is enabled or disabled. The PAD indicator is located in the instrument panel as part of the FCIM. The RCM controls the state of the PAD indicator via the HS-CAN2 and MS-CAN.

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[™],[®] 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.

Component Description

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 single-stage airbag which deploys upon receipt of current flow from the RCM.

Front Impact Severity Sensor

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

Seatbelt Buckle Sensor

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

Side Impact Sensor - Front Door (if equipped)

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

Side Impact Sensor - Second Row (Super Cab and Crew Cab only, if equipped)

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

Passenger Airbag (if equipped)

The passenger airbag is a single-stage airbag which deploys when activated by the RCM.

Passenger Airbag Deactivation (PAD) Indicator

On vehicles without a centerstack display, the PAD indicator is a stand-alone component which is comprised of 2 Light Emitting Diodes (LEDs) controlled by the RCM through a direct, hard-wired connection.

On vehicles with a centerstack display, the PAD indicator is an LED which is part of the FCIM. The PAD indicator cannot be serviced separately from the FCIM.

Passenger Airbag Deactivation (PAD) Switch

The PAD switch is a two-position switch which requires using a key to enable or disable the passenger airbag. Each switch position has a resistor that, when selected, allows a specific amount of current to flow from the RCM to ground. The PAD switch is grounded through the RCM.

Seatbelt Anchor and Pretensioner

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

Seatbelt Retractor and Pretensioner

A seatbelt retractor and pretensioner is a pyrotechnic device that removes excess webbing slack from the seatbelts when deployed. The retractor and pretensioner are serviced together with the outboard seatbelt assemblies.

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 Air Curtain (if equipped)

The side air curtain is a single-stage airbag which is designed to provide head and upper body protection to the vehicle occupant(s) during certain crashes.

Side Airbag (if equipped)

The side airbag is a single-stage airbag which is designed to provide protection for the seat occupant's torso. It deploys upon receipt of current flow and is attached to the outboard side of each front seat. It is used in conjunction with the side air curtain.

Restraints Control Module (RCM)

NOTE: This vehicle may be equipped with SYNCÂ®, which contains the 911 AssistÂ,, 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 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.
