

AIR BAG**8810-03****GENERAL****1. OVERVIEW**

The air bag systems for this vehicle are not much different from the previous air bag system installed in other vehicles. The curtain air bags are installed at the bottom of the roof trim instead of the side air bag and they enhance the passenger's safety. The driver's and passenger's curtain air bags individually deploy.

When the front air bags deploy, the seat belt pretensioners retract the seat belts too.

Collision sensors, a kind of impact G (acceleration) sensor, detect the front and longitudinal collisions and determine whether or not to deploy air bags. The roles of each collision sensor are as below:

Front G sensors (inside the air bag unit)

1. Send signals to the front air bags and the driver's and front passenger's seat belt pretensioners.
2. By the signal from this sensor, front air bags (driver's and passenger's air bags) deploy and the seat belt pretensioners of the driver's and passenger's seat belts retract seat belts.

Once an air bag deploys, its repair parts vary according to the deployment situation and damage to the vehicle from collision. Needed repairs also slightly vary between the front air bags and the curtain air bags. The following are the differences:

Replacement parts when the front air bags deploy: the air bag units and their connection wires (connectors included), the seat belt pretensioners and their connection wires (connectors included), the entire front air bags, and the instrument panel (IP).

Replacement parts when a curtain air bag deploys: the new curtain air bag for the deployed side, the air bag unit and its connection wires (connectors included), the collision G sensor assembly for the curtain air bag, and the trims and roof headlining for the broken parts.

Modification basis	
Application basis	
Affected VIN	

AIR BAG

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AIR BAG

SEAT

BODY
INTERIORBODY
EXTERIORBODY
REPAIRAIR
CONDITIO

OVERVIEW AND OPERATION PROCESS

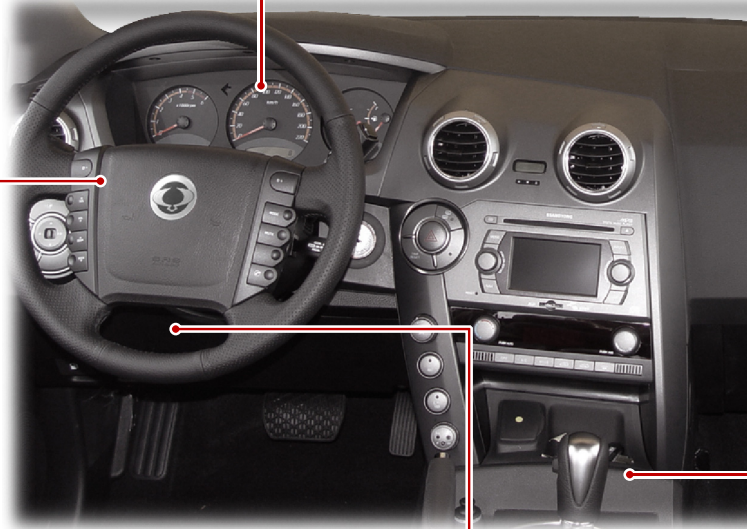
1. LOCATIONS AND RELATED COMPONENTS

1) LH

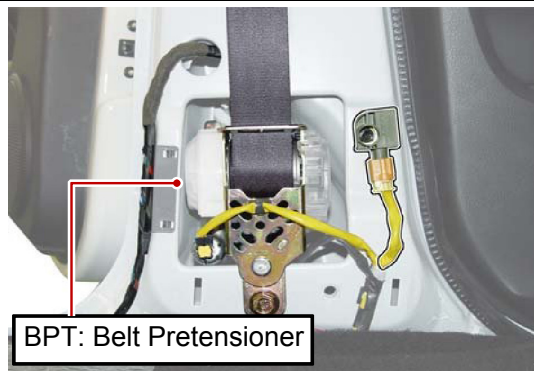
DAB: Driver Air Bag



Air Bag Warning Lamp (Cluster)

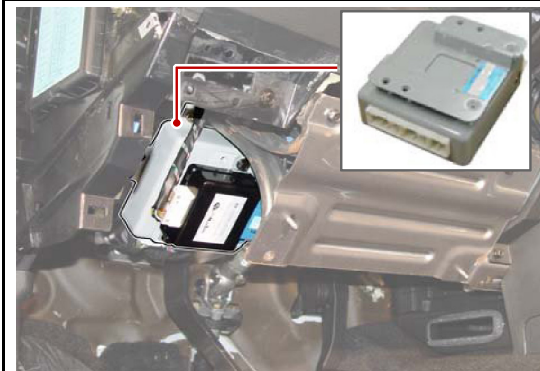


Driver side



BPT: Belt Pretensioner

STICS



40 ms after receiving the air bag deployment signal at the vehicle speed 3 km/h or higher, it sends out the door UNLOCK signal for 5 seconds.

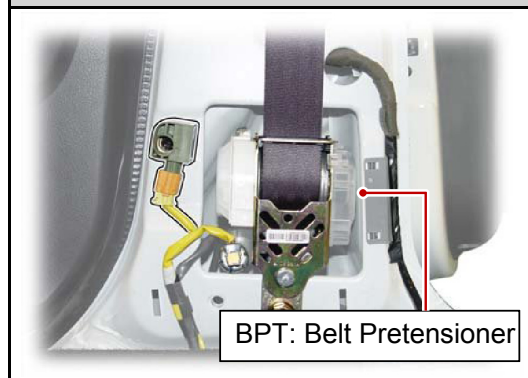
Modification basis	
Application basis	
Affected VIN	

2) RH

PAB: Passenger Air Bag



Passenger side



BPT: Belt Pretensioner

Air Bag Unit (SDM)



The collision G sensor is installed inside this. And it sends out signals to deploy the front air bags (driver's and passenger's air bags) and (or) the driver's and passenger's seat belt retensioners. When the front collision G sensor sends out only the air bag deployment signal, the signal deploys the two front air bags and ctivates their seat belt pretensioners.

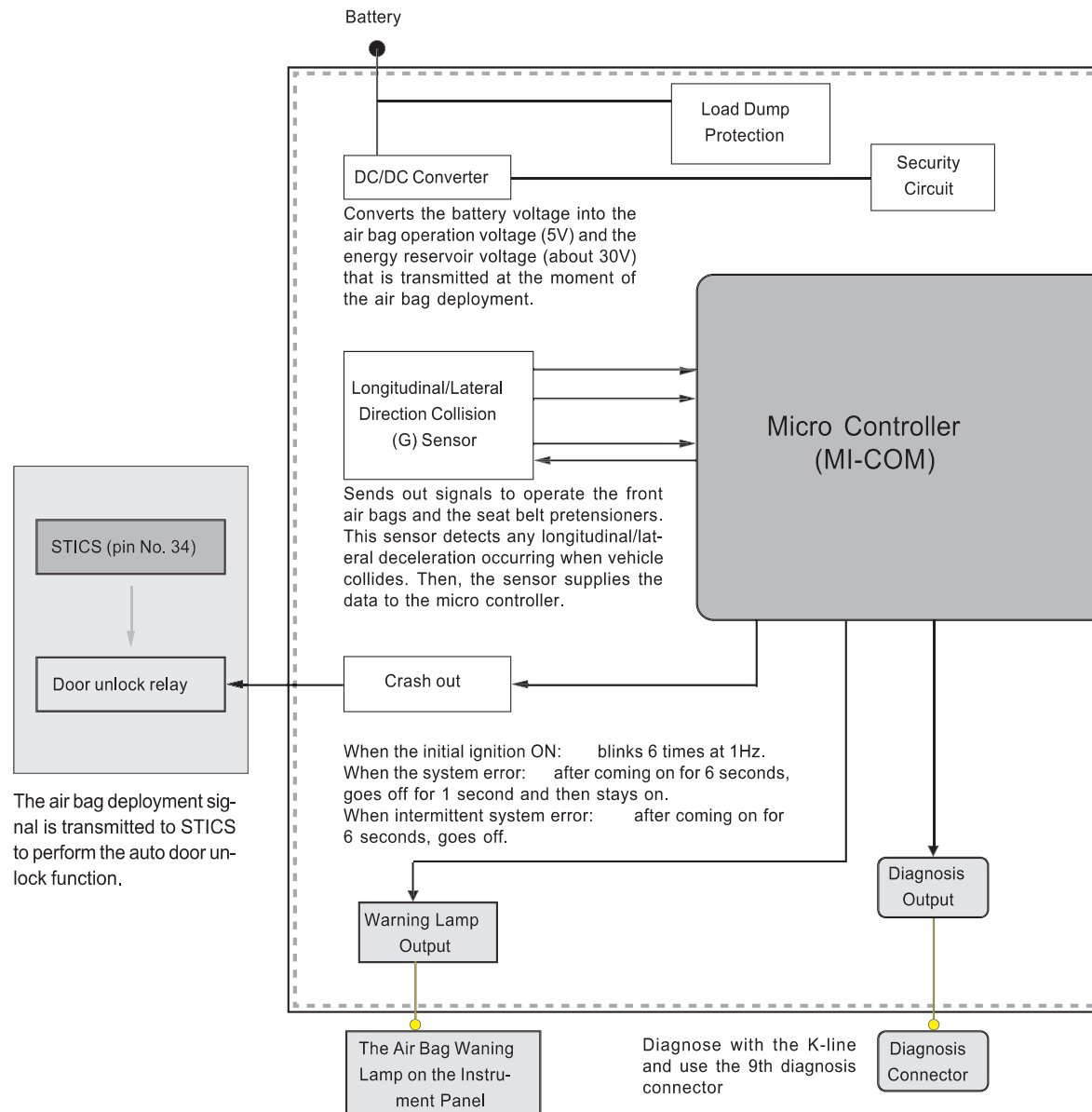
Modification basis	
Application basis	
Affected VIN	

2. AIR BAG SYSTEM OPERATION PROCESS

The overall air bag operation process and its functions and roles are broadly explained in this block diagram.

This diagram summarizes and highlights the functions adopted by Ssangyoung Motors.

1) Air Bag System Block Diagram (Functions and Roles Included)

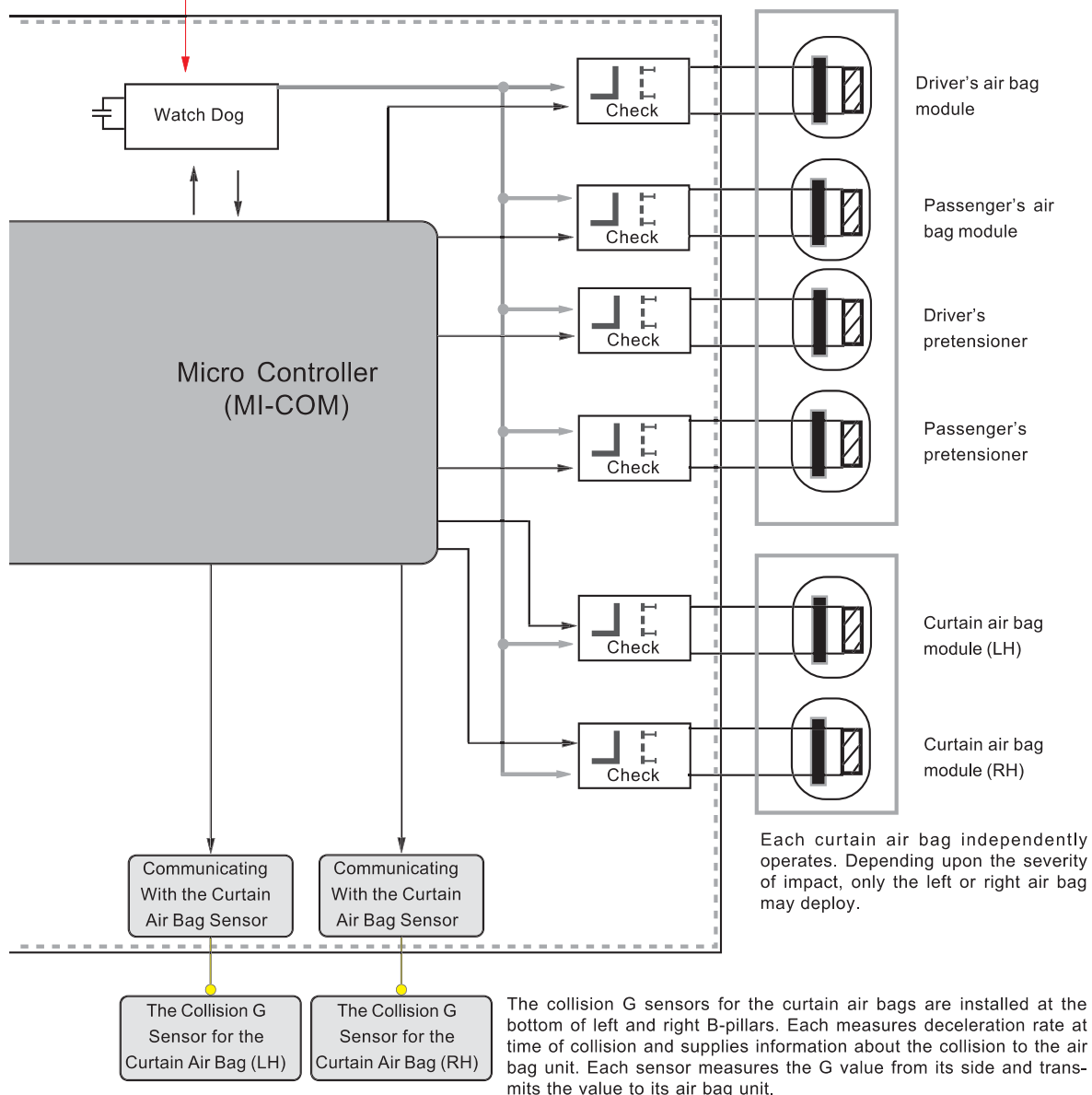


Modification basis	
Application basis	
Affected VIN	

The watch dog monitors the micro controller, the air bags, and the seat belt pretensioners in the air bag unit. When any error occurs, it turns on the air bag warning lamp.

When the front air bags deploy, the driver's air bag and the front passenger's air bag deploy simultaneously and their seat belt pretensioners also simultaneously retract their seat belts.

The air bag unit monitors conditions of the air bags and the seat belt pretensioners. When any error occurs, it stores the failure diagnostic code or turns on the air bag warning lamp on the instrument panel.



Modification basis	
Application basis	
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2) Air Bag System Deployment (Firing Loop)

According to the collision deceleration rate that each collision G sensor reads, the air bag unit sends out about 2~4 or higher Amp current. This current generates some heat, which fires the detonator in the inflator.

This table shows the basic inner resistance of the air bag related module and the basic instant current necessary for firing.

Air bag module	Driver/passenger air bag (DAB / PAB)	Belt pretensioner (BPT)	Curtain air bag (CAB)
Resistance (at -30 ~ 85°C)	$2 \pm 0.3 \Omega$	$2.15 \pm 0.35 \Omega$	$2 \pm 0.3 \Omega$
Firing current	1.2 Amp	0.8 Amp	1.0 Amp

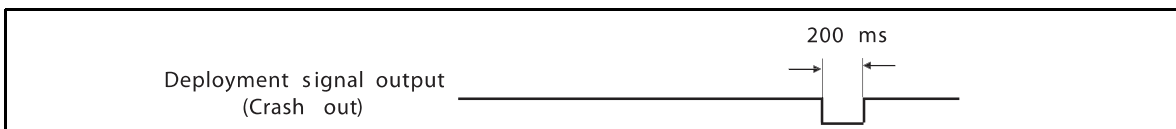


CAUTION

- Please do not connect a tester to any air bag connector or single item to measure the supplied power or resistance. The detonator may explode due to a sudden extra power supplied by the tester.
- Before removing or installing any air bag related components, disconnect the negative battery cable.

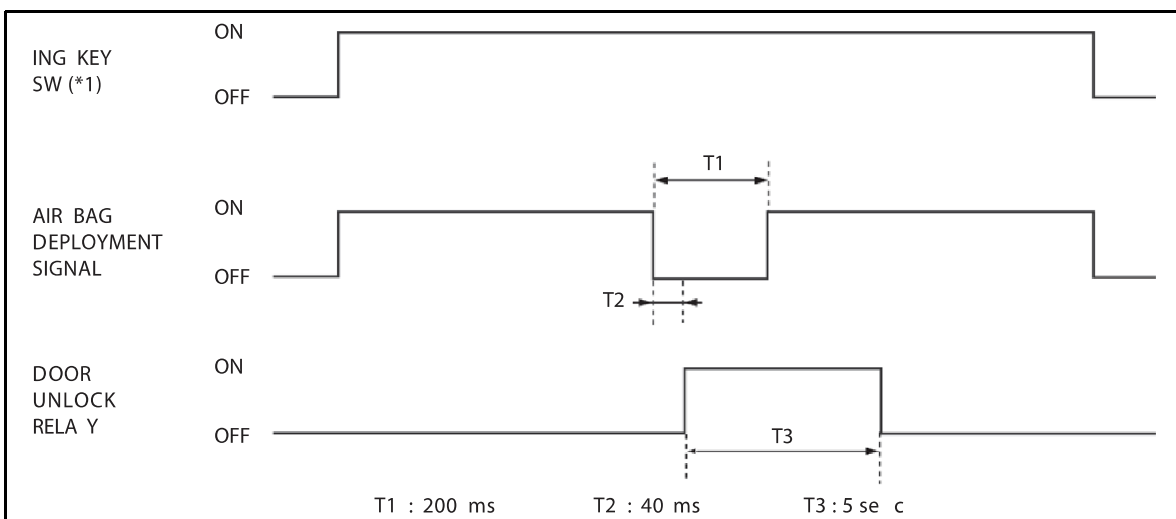
3) Air Bag Deployment Signal Output (Crash Out)

When the air bag deploys, the signal is sent to STICS to perform the basic security operation which is the automatic door unlock function that release the automatic door lock mode.



(1) Automatic Door Unlock (Crash unlock: unlock when colliding)

1. When the ignition key is the ON position, the air bag signal is not accepted for the first 7 seconds.
2. When the ignition key is the ON position and the vehicle speed is 3 km/h or higher, 40 ms after receiving the air bag deployment signal, the STICS sends out the door UNLOCK signal for 5 seconds.
3. Even though the ignition switch is turned off in the middle of the unlock signal being sent out, the unlock signal continues for the remaining time.
4. This function cancels when the ignition key is withdrawn.



CAUTION

Reminder for door lock/unlock control

- The unlock function by the air bag signal takes priority over any other lock/unlock operations.
- While or after the automatic unlock is made by the air bag system, any lock or unlock request by other functions is ignored unless the ignition key switch is turned off.
- When another lock or unlock output is requested while the door is being either locked or unlock, the new request will be ignored. But, if an unlock request is made by the air bag signal or the remote control key, the request will be accepted.
- When the lock and unlock functions are simultaneously requested, the lock function will be performed and the unlock function will be ignored.

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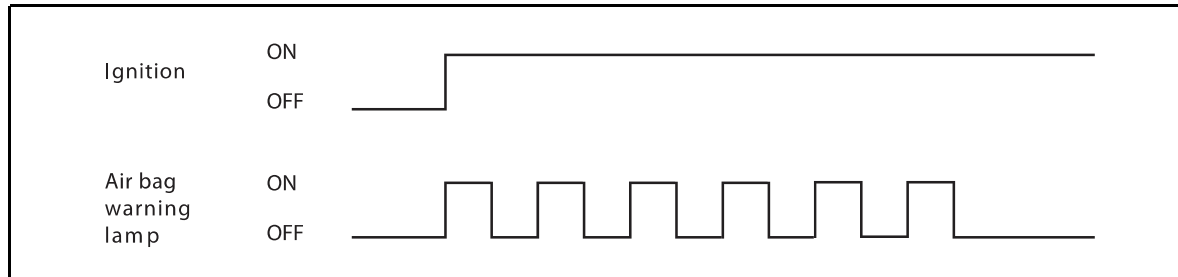
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4) Air Bag Warning Lamp Operational Conditions

The air bag warning lamp on the instrument panel has a few operational conditions. The following are the conditions:

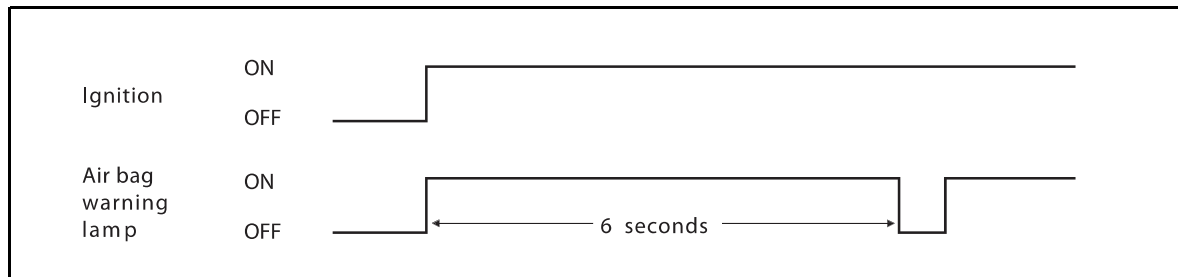
(1) When Turning the Ignition Switch to ON Position

The air bag unit performs a turn-on test when the ignition is turned on. The air bag unit flashes the air bag warning lamp six times at 1Hz interval. After flashing it six times, the air bag warning lamp will turn off if no malfunction have been detected.



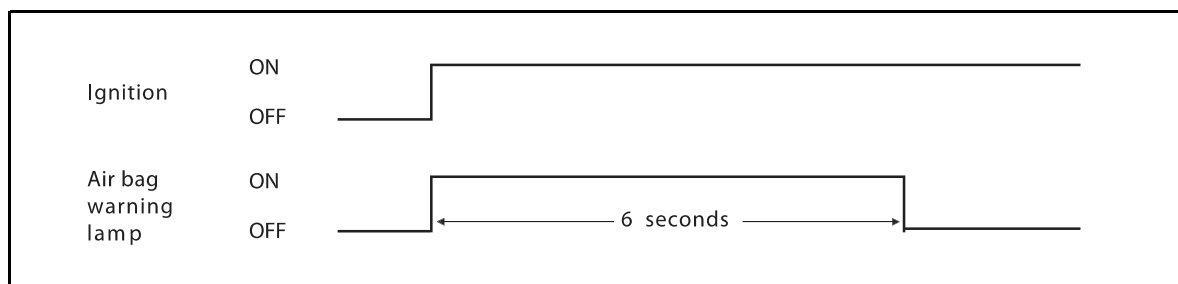
(2) When the Air Bag Unit Detects Any Malfunctions in Unit

When it is recorded as a system failure in the air bag unit, the air bag warning lamp on the instrument panel comes on for about 6 seconds and goes off for 1 second. Then the warning lamp stays on.

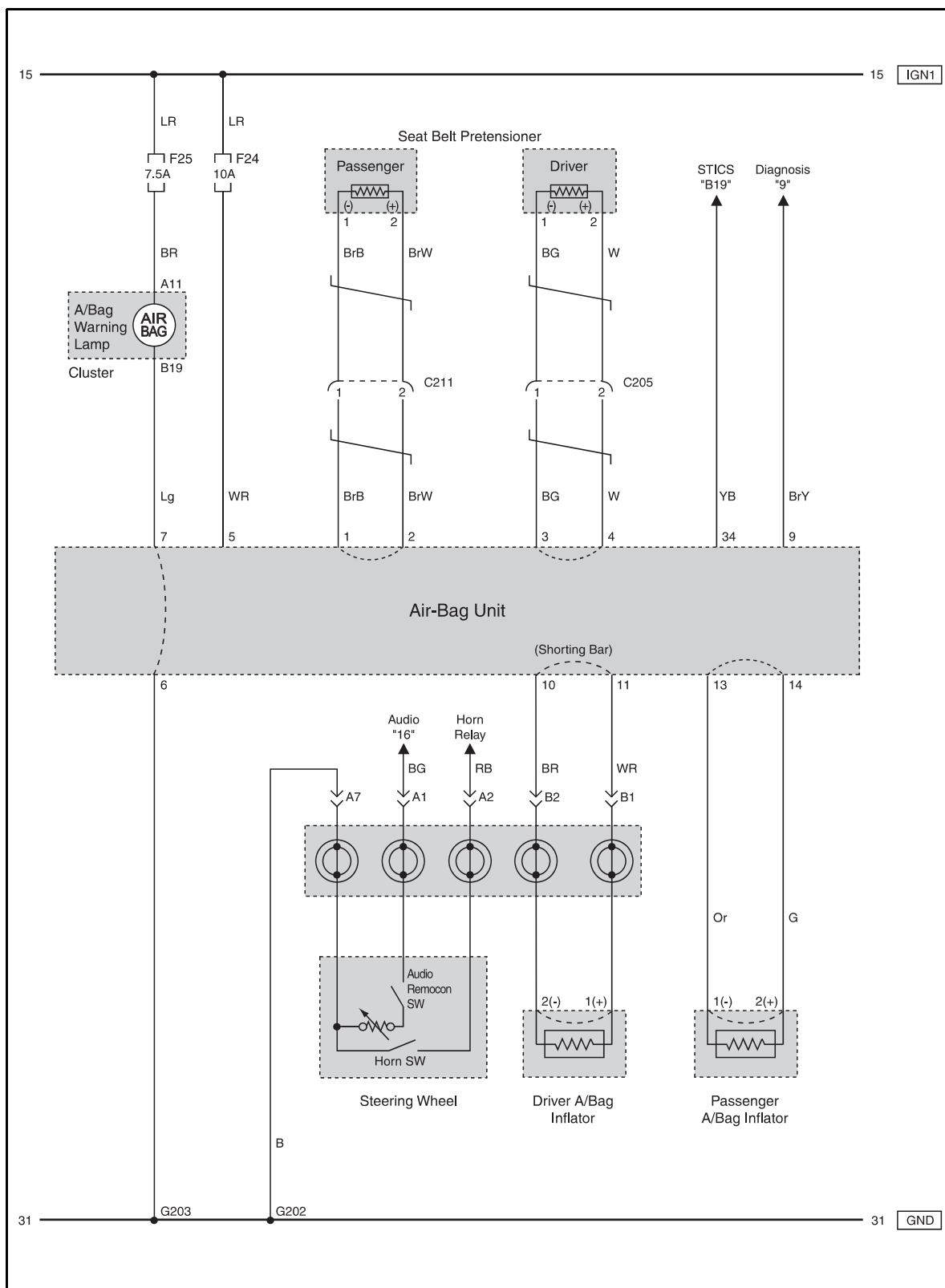


(3) When the Air Bag Unit Receives Any Malfunction Signals from the Other Systems

When, due to an error from outside the system, the intermittent failure signal is received 5 times or less, the air bag warning lamp comes on for about 6 seconds and then, goes off.



5) Electrical Wiring Diagram



Modification basis	
Application basis	
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3. AIR BAG MODULE AND RELATED COMPONENTS

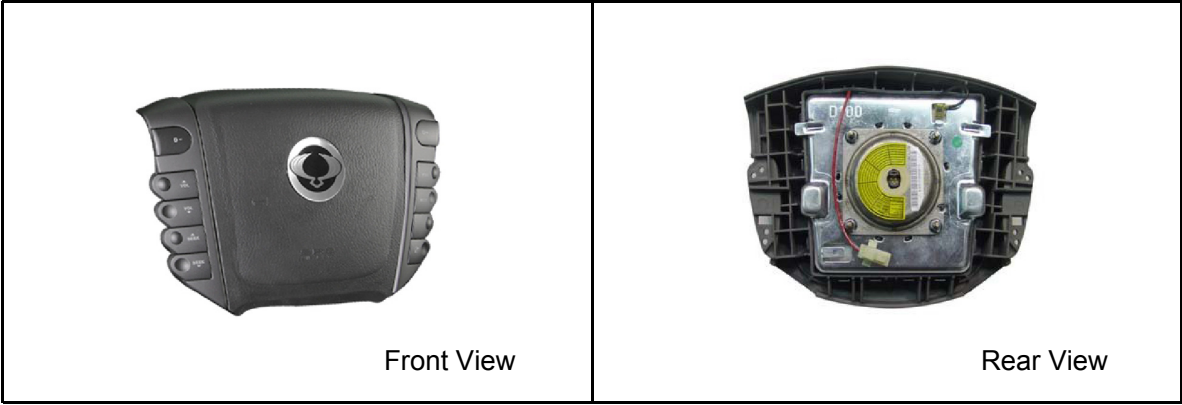
This section describes the air bag module installed in ACTYON. The module consists of the inflator, the cushion, and the mounting cover.

1) DAB (Driver Air Bag)

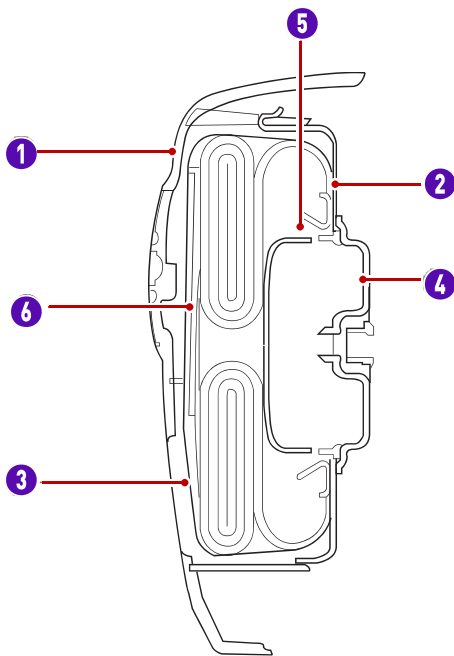
The driver's air bag is installed inside the steering wheel. If the acceleration sensor (inside the air bag unit) is activated by the deceleration from vehicle collision, the detonation is fired by the electrical signal of the air bag unit.

Then, the detonation sets off explosives and nitrogen gas is generated.

At this point, the air bag very quickly deploys and the gas is emitted from the relieving hole to absorb impact upon the driver.



(1) Components



- 1. Air bag cover
- 2. Air bag housing
- 3. Air bag cushion (approx. 50 liters)
- 4. Inflator* (approx. 190 Kpa)
- 5. Retainer ring
- 6. Horn switch

Inflator*
The inflator is composed of the detonator, explosives, and the gas generator. It inflates air bag when vehicle collides.

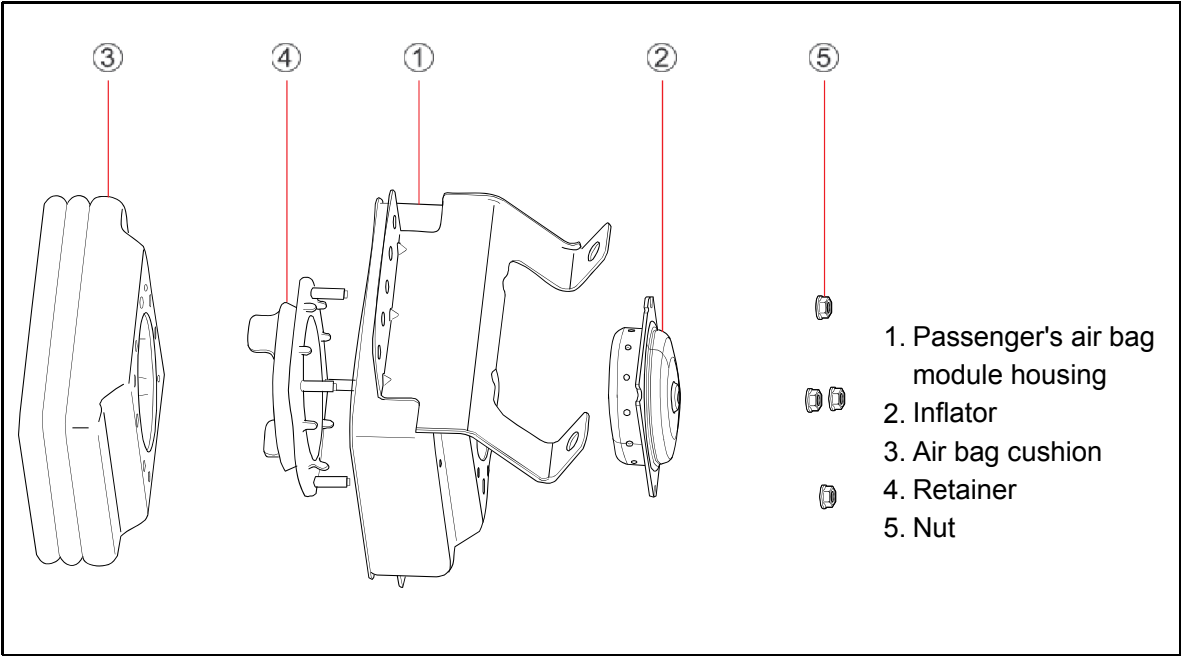
Modification basis	
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2) PAB (Passenger Air Bag)

The passenger's air bag is installed inside the instrument panel above the glove box. Its operation process is the same as the driver's one. The driver's air bag, the passenger's air bag, and the seat belt pretensioners on both seats are made to operate together. When the collision G sensor inside the air bag unit sends a collision signal, the air bag unit instantaneously applies a high current to the driver's and passenger's air bags and the seat belt pretensioners on both seats, fires the detonator in the inflator, and inflates the air bag cushions (curtain air bags independently operate in case of the side collisions).



(1) Components



Modification basis	
Application basis	
Affected VIN	

3) Driver and Passenger BPT (Belt Pre-Tensioner)

The belt pretensioner is installed at the lower side of the B-pillar and operates simultaneously when the front air bags deploy. When a collision occurs or when brakes are applied, a seat belt with a pretensioner detects the stopping action and tightens the belt before the wearer is propelled forward. This holds the occupant more securely in the seat.

Belt Pretensioner (Driver Side)

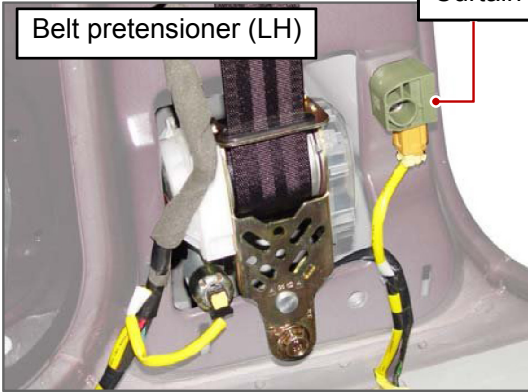


Belt Pretensioner (Passenger Side)



Tightening torque 35 ~ 55 Nm

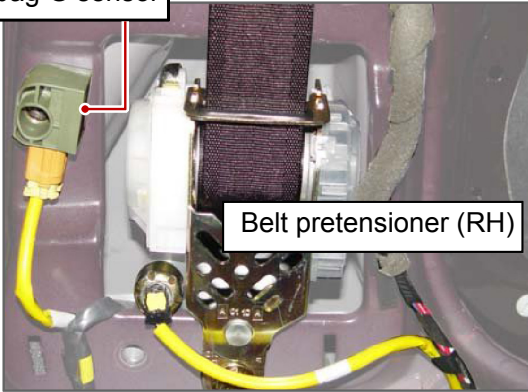
Belt pretensioner (LH)



Curtain air bag G sensor

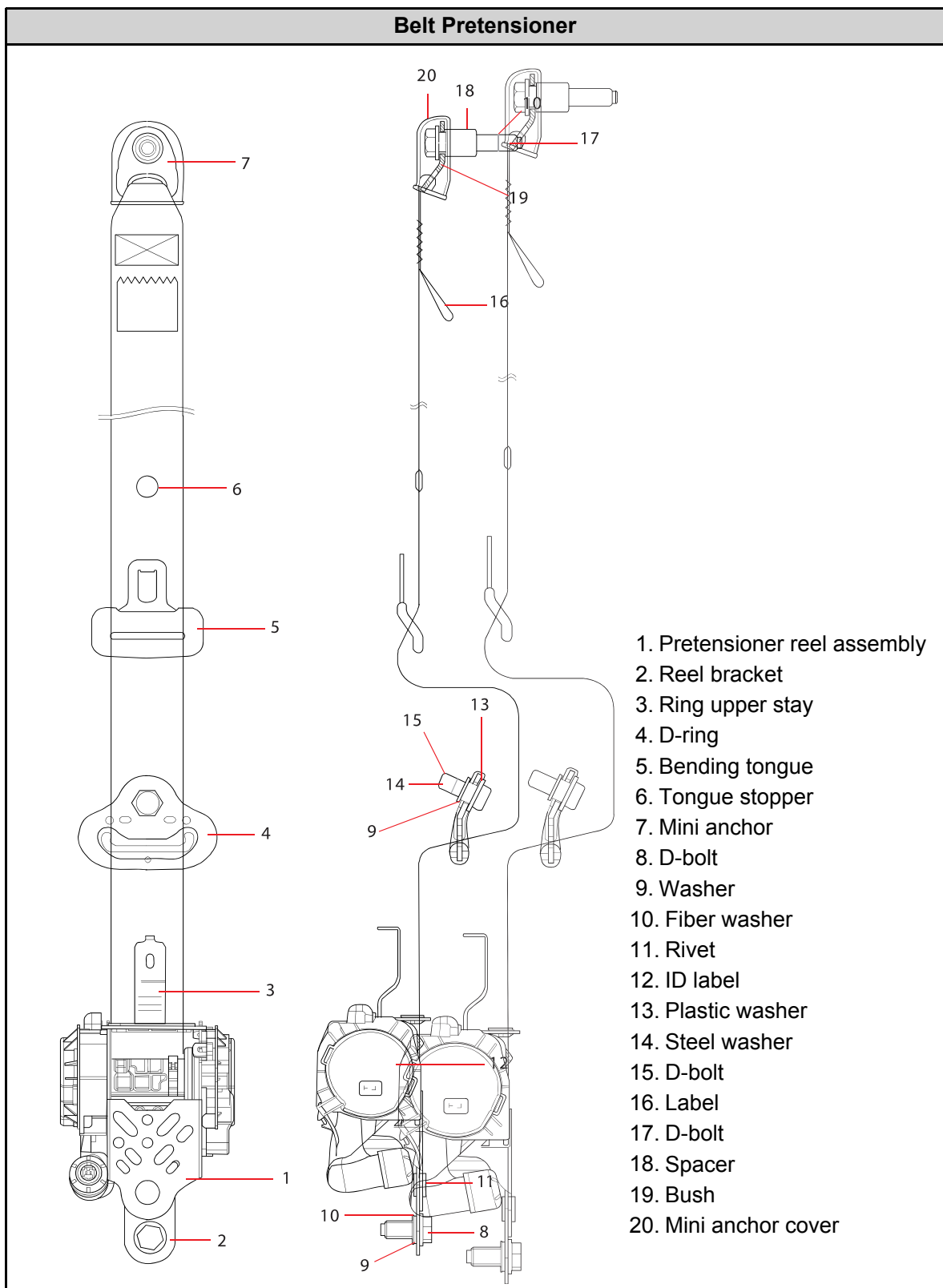


Belt pretensioner (RH)



Modification basis	
Application basis	
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(1) Components

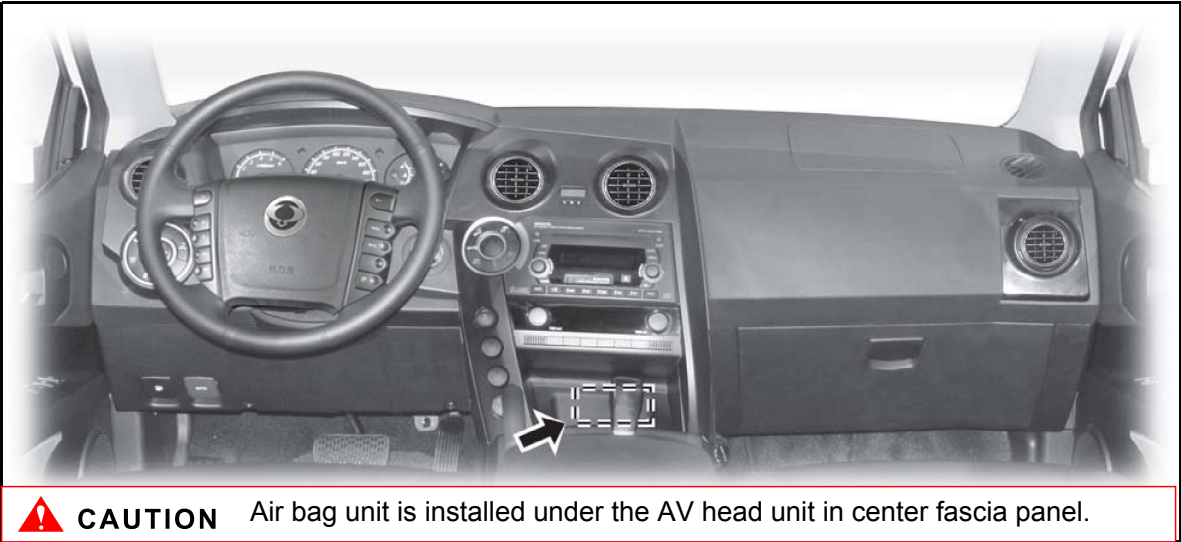


Modification basis	
Application basis	
Affected VIN	

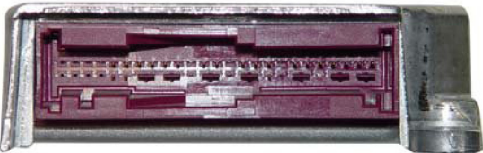
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4) Air Bag Unit



The sensor that detects collision is integrated into the air bag unit.

Air Bag Unit	connector
	

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Application basis	
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