
GROUP 52B

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

CONTENTS

GENERAL INFORMATION	52B-2	FRONT IMPACT SENSOR	52B-6
		SIDE IMPACT SENSOR	52B-7
SYSTEM OPERATION	52B-6	SEAT BELT WITH PRE-TENSIONER	52B-7
DRIVER'S SIDE AIR BAG MODULE	52B-6	SRS-ECU	52B-8
SIDE-AIRBAG MODULE	52B-6	SRS AIR BAG SPECIAL CONNECTOR . . .	52B-12

GENERAL INFORMATION

M2521000100585

- Apart from driver's and front passenger's air bags and seat belts with pre-tensioner fitted as standard, Australia and New Zealand can be equipped with standard or optional side-airbags on both driver's and front passenger's sides, increasing the passive safety level.
- An inflator that does not contain sodium azide has been adopted for all types of the air bag modules.

SRS FRONT AIR BAG

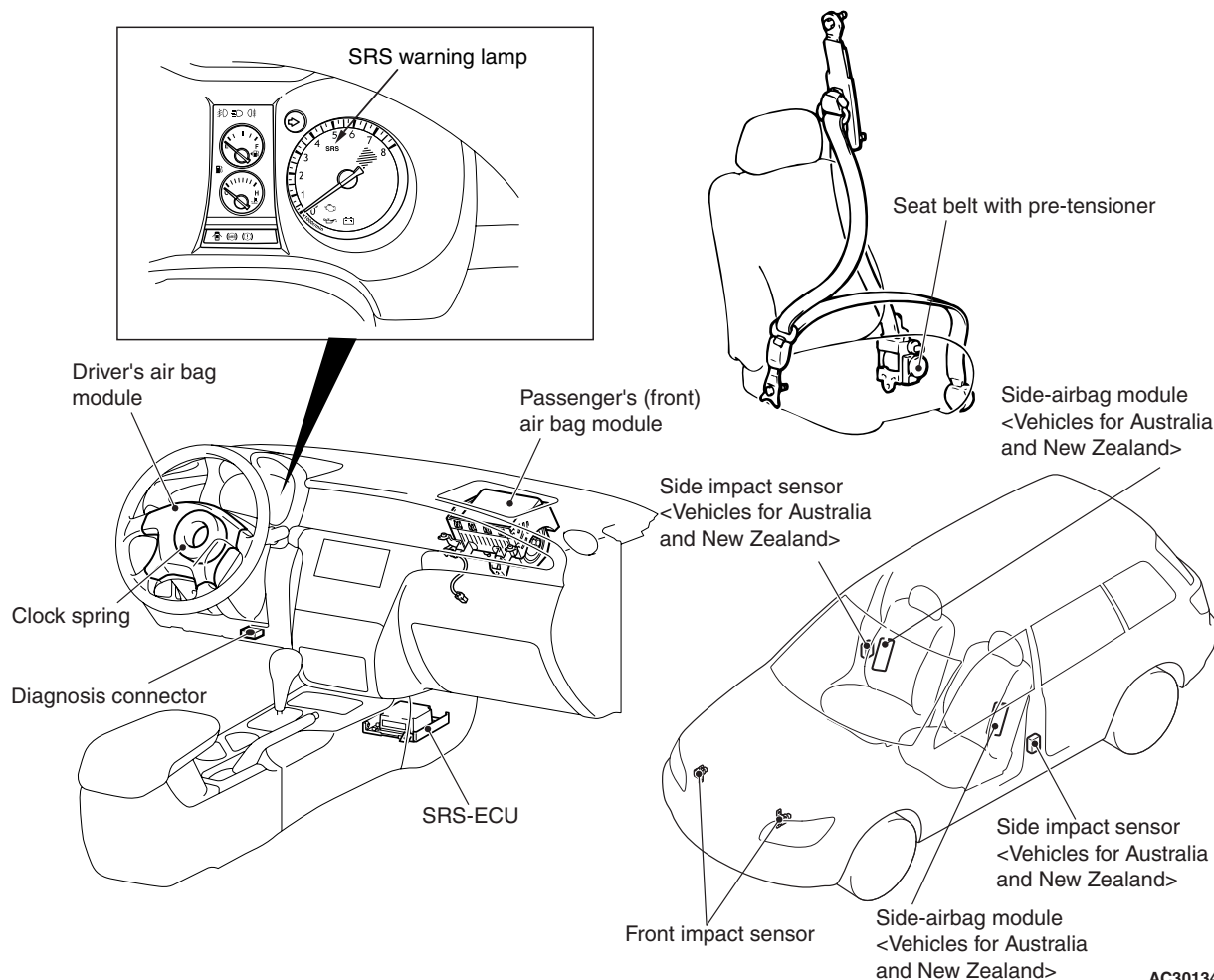
The SRS is designed to supplement the front seat belts. It eliminates or reduces injury to the front passenger(s) by deploying air bag(s) in case of a head-on collision.

SRS SIDE-AIRBAG

Side-airbag systems in the front seats are activated when sideward impacts applied to the vehicle exceed a threshold to protect the occupants' upper bodies.

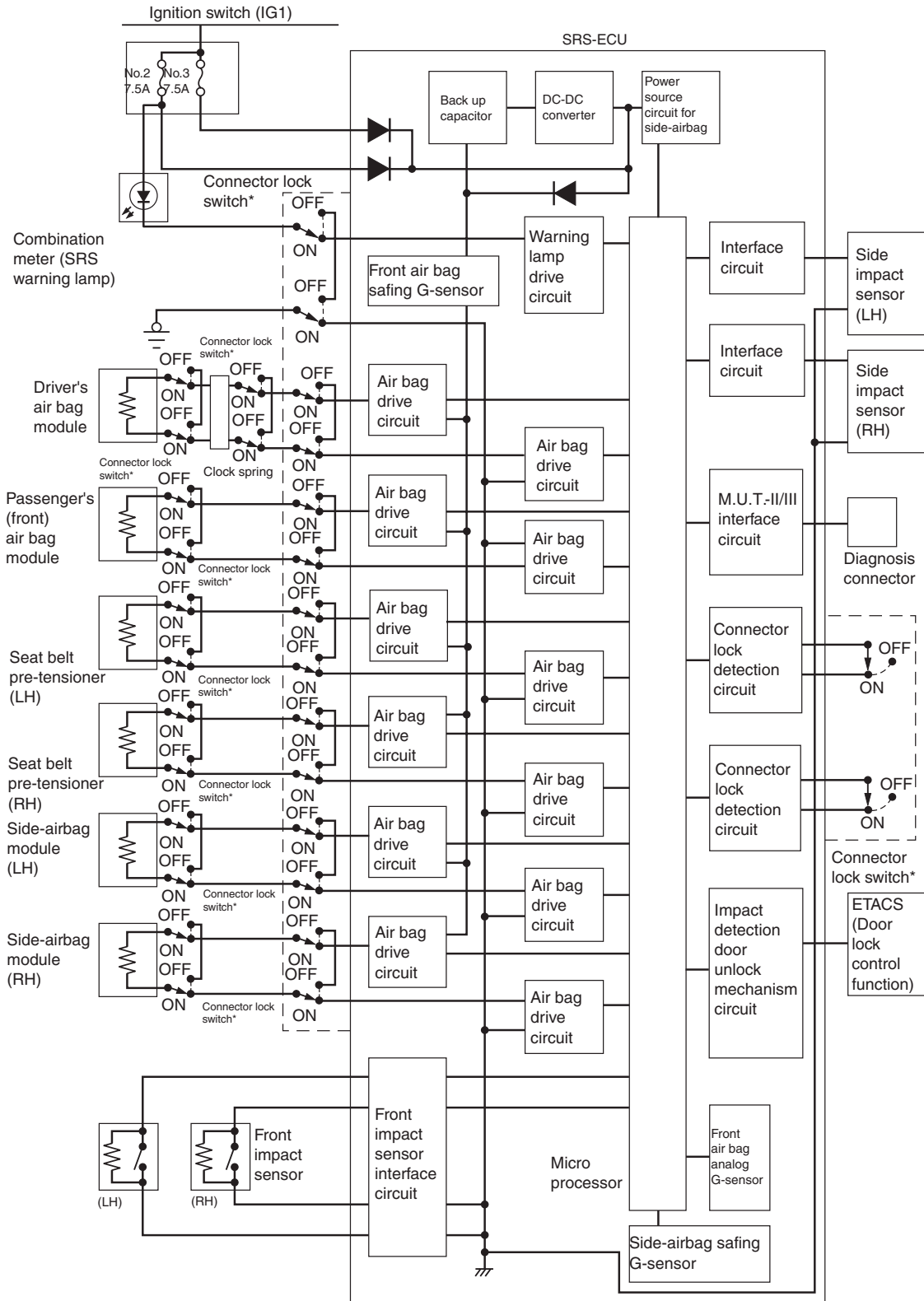
SEAT BELT WITH PRE-TENSIONER

The seat belts with pre-tensioner work simultaneously with the SRS. The pre-tensioner takes up seat belt slack immediately when a collision takes place, restraining the front passengers sooner than the SRS. This prevents the passengers from moving forward.

CONSTRUCTION DIAGRAM

AC301343AF

SRS SYSTEM CIRCUIT DIAGRAM

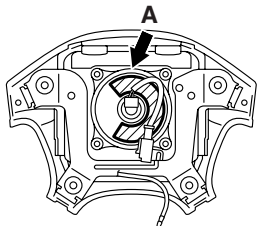
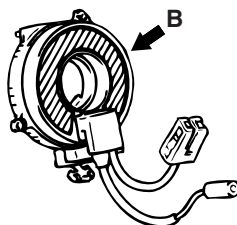
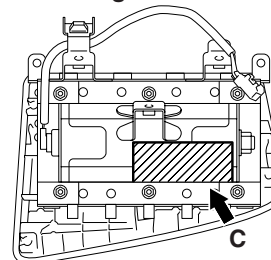
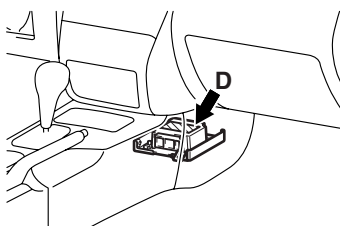
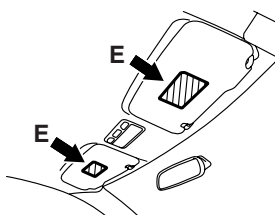
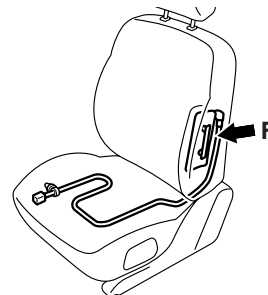
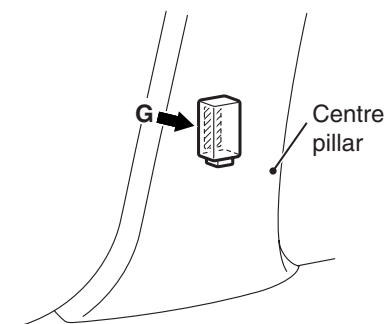
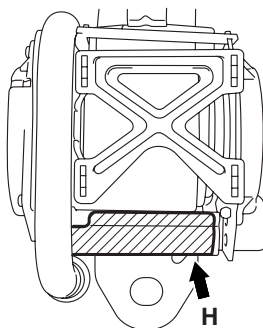
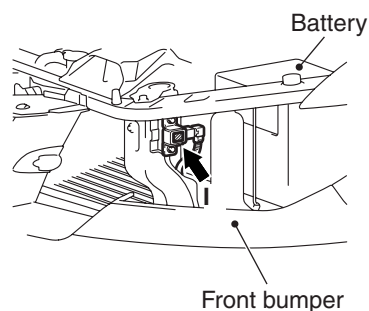
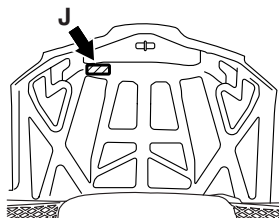
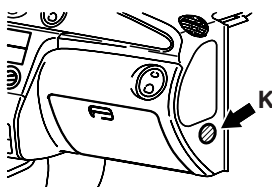


Note


*: Connector connected: ON
Connector disconnected: OFF

CAUTION LABELS

Labels to indicate cautions regarding the handling and the services of SRS air bag are attached on the position shown in the following illustration.

Driver's air bag module**Clock spring****Passenger's (front) air bag module****SRS-ECU****Sun visor****Side-airbag module (driver's and front passenger's seat)****Side impact sensors (left and right)****Seat belt with pre-tensioner (driver's and front passenger's seat)****Front impact sensors (left and right)****Hood****Instrument panel**

Label contents	
A	<p>DANGER</p> <p>CONTENTS ARE EXTREMELY FLAMMABLE.</p> <p>DO NOT PROBE WITH ELECTRICAL DEVICES OR OTHERWISE TAMPER WITH IN ANY WAY.</p>
B	<p>CAUTION: SRS CLOCKSPrING</p> <p>THIS IS NOT A REPAIRABLE PART. IF DEFECTIVE, REPLACE ENTIRE UNIT ACCORDING TO THE SERVICE MANUAL INSTRUCTIONS. TO RE-CENTRE: ROTATE CLOCKWISE UNTIL TIGHT. THEN ROTATE IN OPPOSITE DIRECTION ROUGHLY 3 3/4 TURNS AND ALIGN ARROWS >><<.</p>
C, F	<p>WARNING FLAMMABLE/EXPLOSIVE SRS AIR BAG MODULE</p> <p>TO AVOID SERIOUS INJURY:</p> <ul style="list-style-type: none"> • DO NOT REPAIR, DISASSEMBLE OR TAMPER. • AVOID CONTACT WITH FLAME OR ELECTRICITY. • DO NO DIAGNOSIS/USE NO TEST EQPT OR PROBES. • STORE BELOW 200° F (93° C). • BEFORE DOING ANY WORK INVOLVING MODULE, READ SERVICE MANUAL FOR IMPORTANT FURTHER DATA.
D, G	<p>CAUTION:</p> <p>DO NOT DISASSEMBLE OR DROP. IF DEFECT REFER TO SERVICE MANUAL.</p>
E	<p><Except for GCC></p> <p>WARNING TO AVOID DEATH OR SERIOUS INJURY</p> <ul style="list-style-type: none"> • DO NOT INSTALL REAR-FACING CHILD RESTRAINTS IN THE PASSENGER SEAT. • CHILDREN ARE SAFER IN THE REAR SEAT. • SEE THE OWNER'S MANUAL FOR FURTHER INFORMATION AND EXPLANATIONS. <p><Vehicles for GCC></p> <p>(RH)</p> <ul style="list-style-type: none"> • DO NOT place rear-facing child seat on this seat with airbag. • CHILDREN ARE SAFER IN THE REAR SEAT. • ALWAYS use SEAT BELT and CHILD SEAT. <p>(LH)</p> <ul style="list-style-type: none"> • ALWAYS use SEAT BELT and CHILD SEAT. • DO NOT place rear-facing child seat on the front passenger seat with air bag. • CHILDREN ARE SAFER IN THE REAR SEAT. • DO NOT sit or lean unnecessarily close to the air bag. • DO NOT place or install any objects over the air bag or between the air bag and yourself. • SEE the owner's manual for further information and explanations.
H	<p>DANGER SEAT BELT PRETENSIONER</p> <p>CAUTION THIS ASSEMBLY CONTAINS AN EXPLOSIVE INITIATOR</p> <p>FLAMMABLE MATERIAL</p> <p>TO PREVENT PERSONAL INJURY</p> <ul style="list-style-type: none"> • DO NOT IMPACT, DISMANTLE OR INSTALL IT INTO ANOTHER VEHICLE. • SERVICE OR DISPOSE OF IT AS DIRECTED IN THE REPAIR MANUAL.

Label contents	
I	CAUTION: DO NOT DISASSEMBLE OR DROP.
J	WARNING THIS VEHICLE HAS AN AIR BAG SYSTEM. REFER TO SERVICE MANUAL BEFORE SERVICING OR DISASSEMBLING UNDERHOOD COMPONENTS. READ THE "SRS" SECTION OF MANUAL FOR IMPORTANT INSTRUCTIONS. IMPROPER SERVICE PROCEDURES CAN RESULT IN THE AIR BAG FIRING OR BECOMING INOPERATIVE, POSSIBLY LEADING TO INJURY.
K	<For South Africa, Argentina, Australia, New Zealand>  AC300151

SYSTEM OPERATION

DRIVER'S AIR BAG MODULE, CLOCK
SPRING AND PASSENGER'S (FRONT)
AIR BAG MODULE

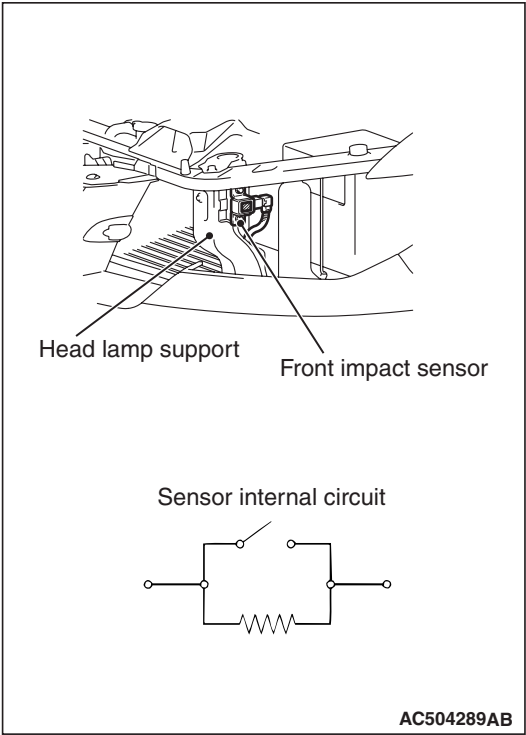
M2521002000283
In structure and operation, the driver's air bag module, clock spring and passenger's (front) air bag module are the same as those for 2001 LANCER.

SIDE-AIRBAG MODULE

M2521004000193
The side-airbag module structure is the same as that for 1999 PAJERO io.

FRONT IMPACT SENSOR

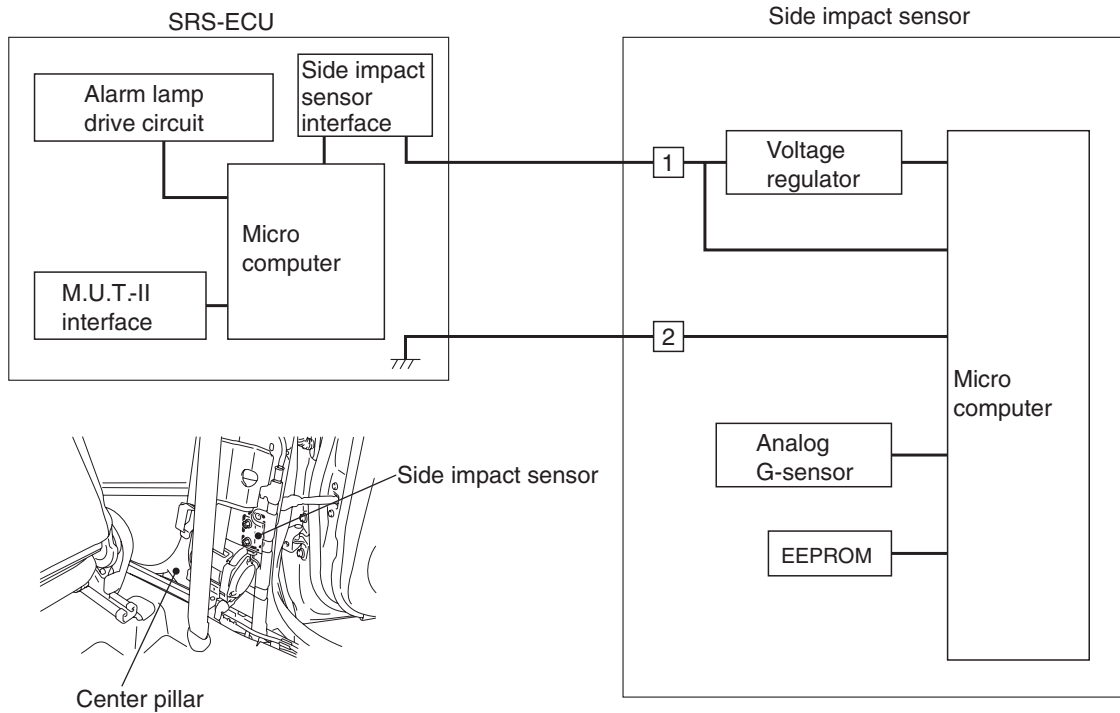
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The front impact sensor for 2400 engine is installed on the outside of the headlamp support in the engine room.
In a collision, the contact in the front impact sensor turns ON and an output signal is send to the SRS-ECU. A resistor is connected to the front impact sensor in parallel with the contact for fault diagnosis.

SIDE IMPACT SENSOR

M2521006000036



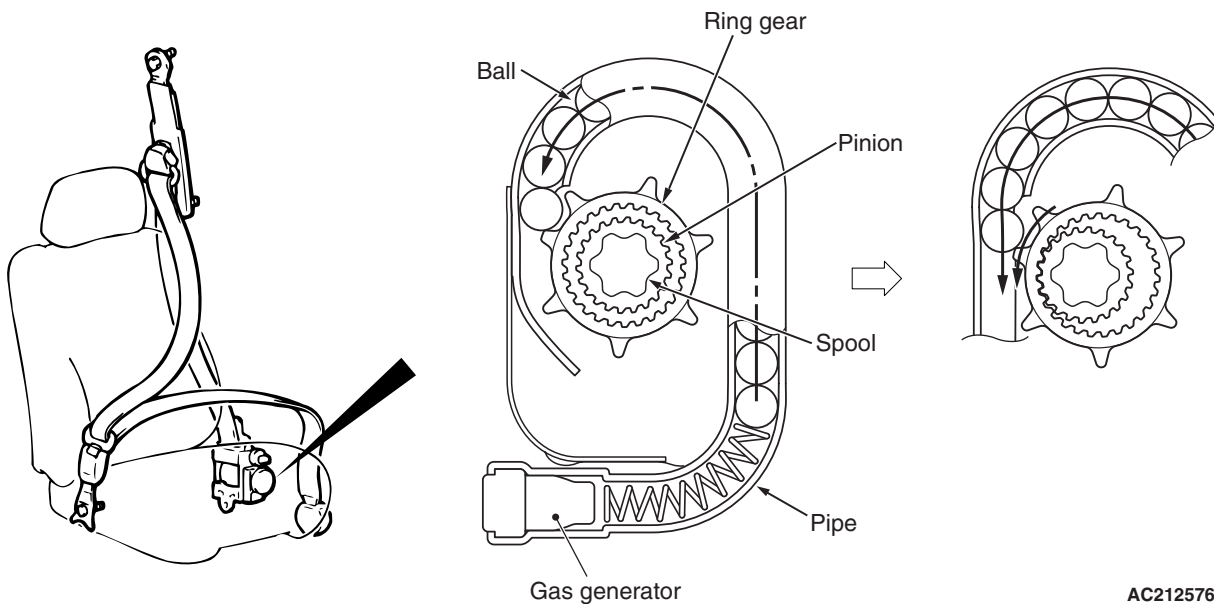
AC212573 AB

The side impact sensors are installed in the bottom sections of the right and left center pillars. Each sensor incorporates an analog G-sensor, micro computer, and other electrical parts. The micro computer always monitors the analog G-sensor's output. If the micro computer determines that deployment of the side air bag is required, it sends a signal to the SRS-ECU, requesting ignition of the air bag inflator.

The micro computer also performs diagnosis of the side impact sensor components. If any fault is detected, the micro computer sends the corresponding diagnosis code to the SRS-ECU.

SEAT BELT WITH PRE-TENSIONER

M2521008000087



AC212576 AB

The seatbelt incorporating the pretensioner automatically winds the seat belt upon front impact to reduce forward shifting of the passenger.

The seat belt pre-tensioner is built into the driver's and passenger's front seat belt retractor.

Upon front impact the pre-tensioner ignites the gas alternator and emits gas with the SRS-ECU signal when the front impact sensor, attached to the front of the body, detects an impact that exceeds the threshold. The gas pressure moves the ball in the pipe and the balls come in contact with the protrusion of the ring gear, push the ring gear and then it is interlocked with the pinion. The ring gear rotation forces the pinion to turn the spool toward the belt wind direction to wind the webbing.

SRS-ECU

The SRS-ECU incorporates an analogue G-sensor and safing G-sensor for frontal collisions.

M2521007000404

In frontal collisions, the driver's and front passenger's air bags deploy only when both the analogue and safing G-sensors detect simultaneously a collision-induced G of a level exceeding the threshold as in the case with the conventional system.

The SRS-ECU incorporates the impact detection door unlock signal process circuit.

The SRS-ECU is provided with the following capabilities:

- Backup power supply in case of power failure in collisions: Back up capacitor
- Boosting function in case of battery voltage drop: DC - DC converter
- Self-diagnosis function to avoid system's operation errors and improve its reliability

CAUTION

Never disassemble the SRS-ECU.

DIAGNOSIS FUNCTION

The SRS-ECU has the following functions to make system checking using M.U.T.-II/III easy.

- Diagnosis code output
- Service data output

DIAGNOSIS CODE OUTPUT

The SRS-ECU diagnoses the following items and stores a diagnosis code in the non-volatile memory (EEPROM*1) when a problem is detected.

Therefore, the memory is not deleted after a battery terminal is disconnected. (The diagnosis code memory can be deleted by the M.U.T.-II/III.)

CODE NO.	MAJOR CONTENTS OF DIAGNOSTICS	
1A*4	Front impact sensor LH system	Short circuit in the sensor
1B*4		Open circuit in the sensor
1C*4		Short circuit in the power supply
1D*4		Short circuit in the earth
2A*4	Front impact sensor RH system	Short circuit in the sensor
2B*4		Open circuit in the sensor
2C*4		Short circuit in the power supply
2D*4		Short circuit in the earth
11*5	Front impact sensor short-circuited	
12*5	One front impact sensor open-circuited	
13*5	Two front impact sensor open-circuited	
14	Analogue G-sensor malfunction	
15	Safing G-sensor short-circuited (for frontal collision)	
16	Safing G-sensor open-circuited (for frontal collision)	
17*5	Safing G-sensor malfunction (for side collision)	
21*3	Driver's air bag squib short-circuited	
22*3	Driver's air bag squib open-circuited	
24*3	Passenger's (front) air bag squib short-circuited	
25*3	Passenger's (front) air bag squib open-circuited	
26*3	Driver's pre-tensioner squib short-circuited	
27*3	Driver's pre-tensioner squib open-circuited	
28*3	Passenger's (front) pre-tensioner squib short-circuited	
29*3	Passenger's (front) pre-tensioner squib open-circuited	
31	SRS-ECU capacitor circuit voltage too high	
32	SRS-ECU capacitor circuit voltage too low	
34*2	SRS-ECU connector lock out of order	
35	Ignition of the air bag completed	
39*4	Simultaneous deployed	

CODE NO.	MAJOR CONTENTS OF DIAGNOSTICS
41*2	Power supply voltage (IG1 (A) voltage) drops abnormally.
42*2	Power supply voltage (IG1 (B) voltage) drops abnormally.
43*2	SRS warning lamp circuit open-circuited
44*2	SRS warning lamp circuit malfunction
45	SRS-ECU non-volatile memory (EEPROM*1) and A/D converter system
46*2*4	Faulty installation
51	Driver's air bag squib activating circuit short-circuited
52	Driver's air bag squib activating circuit open-circuited
54	Passenger's (front) air bag squib activating circuit short-circuited
55	Passenger's (front) air bag squib activating circuit open-circuited
56	Driver's seat belt pre-tensioner squib activating circuit short-circuited
57	Driver's seat belt pre-tensioner squib activating circuit open-circuited
58	Passenger's seat belt pre-tensioner squib activating circuit short-circuited
59	Passenger's seat belt pre-tensioner squib activating circuit open-circuited
61	Driver's air bag squib drive circuit (power supply side) short-circuited
62	Driver's air bag squib drive circuit (earth side) short-circuited
64	Passenger's (front) air bag squib drive circuit (power supply side) short-circuited
65	Passenger's (front) air bag squib drive circuit (earth side) short-circuited
66	Driver's pre-tensioner squib (power supply side) short-circuited
67	Driver's pre-tensioner squib (earth side) short-circuited
68	Passenger's (front) pre-tensioner squib drive circuit (power supply side) short-circuited
69	Passenger's (front) pre-tensioner squib drive circuit (earth side) short-circuited
71*3*5	Side-airbag squib (RH) short-circuited
72*3*5	Side-airbag squib (RH) open-circuited
73*5	Side-airbag squib (RH) squib activating circuit short-circuited
74*5	Side-airbag squib (RH) squib activating circuit open-circuited
75*5	Side-airbag squib (RH) drive circuit (power supply side) shorted
76*5	Side-airbag squib (RH) drive circuit (earth side) shorted
79*5	Side impact sensor (LH) communication error
81*3*5	Side-airbag squib (LH) short-circuited
82*3*5	Side-airbag squib (LH) open-circuited
83*5	Side-airbag squib (LH) activating circuit short-circuited
84*5	Side-airbag squib (LH) activating circuit open-circuited
85*5	Side-airbag squib (LH) drive circuit (power supply side) shorted
86*5	Side-airbag squib (LH) drive circuit (earth side) shorted
89*5	Side impact sensor (RH) communication error

CODE NO.	MAJOR CONTENTS OF DIAGNOSTICS
91*2*5	Side impact sensor (LH) voltage error
92*5	G-sensor of side impact sensor (LH) failure
93*5	Side impact sensor (LH) communication impossible
94*2*5	Side impact sensor (RH) voltage error
95*5	G-sensor of side impact sensor (RH) failure
96*5	Side impact sensor (RH) communication impossible

NOTE:

*1: Electrically Erasable Programmable ROM

*2: This diagnosis code memory will be automatically cleared from the memory and the SRS warning lamp will be switched off when the system returns to normal condition.

*3: The diagnosis codes will remain in memory and the SRS warning lamp will be switched off if the system returns to normal condition.

*4: Vehicles without side-airbag

*5: Vehicles with side-airbag

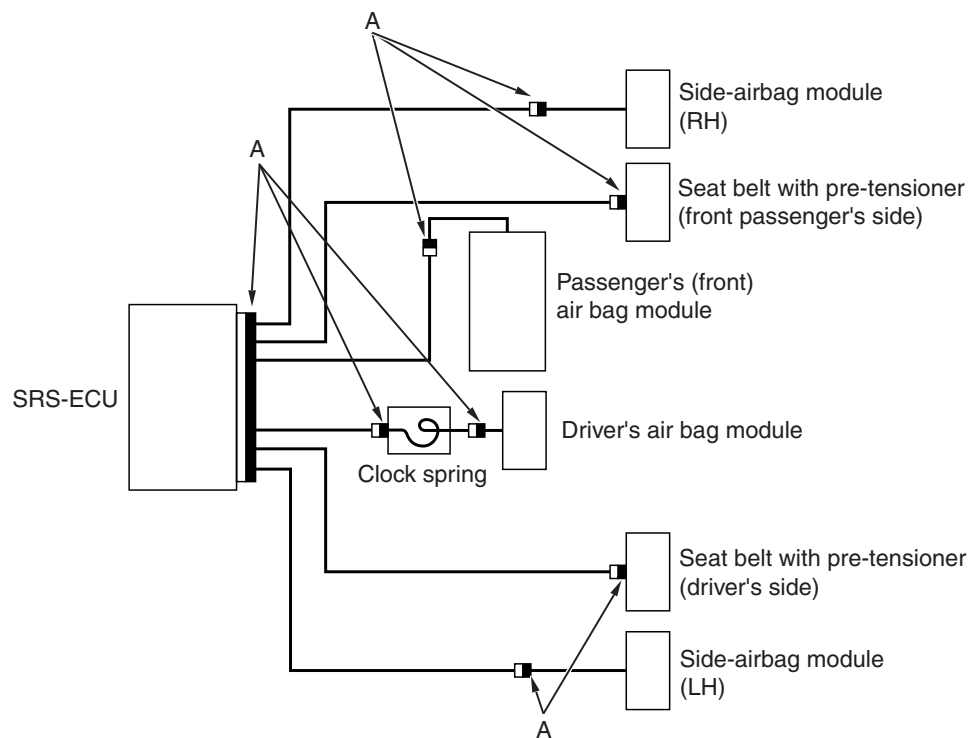
SERVICE DATA OUTPUT

When the SRS-ECU detects a problem, it stores a diagnosis code and the duration that the problem has lasted in the non-volatile memory. In addition, how often a diagnosis code and duration are cleared by the M.U.T.-II/III are stored in the non-volatile memory as a reference for service work. This data can be read by the M.U.T.-II/III.

No.	Service Data Item	Applicability
92	Number indicating how often the memory is cleared	Maximum time to be stored: 250 times
93	How long a problem has lasted (How long takes from the occurrence of the problem until the first air bag squib Igniting signal)	Maximum time to be stored: 9,999 minutes (approximately 7days)
94	How long a problem has lasted (How long from the first air bag squib igniting signal until now)	

SRS AIR BAG SPECIAL CONNECTOR

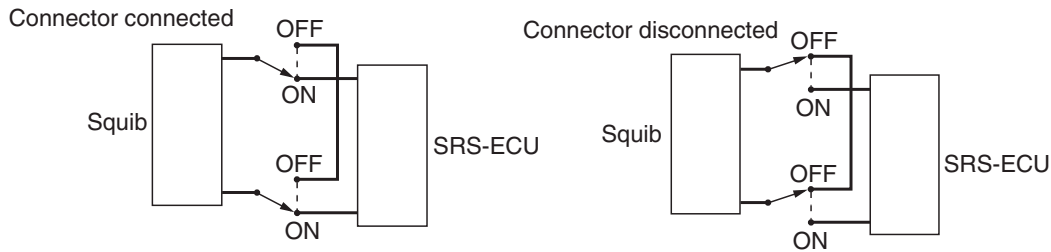
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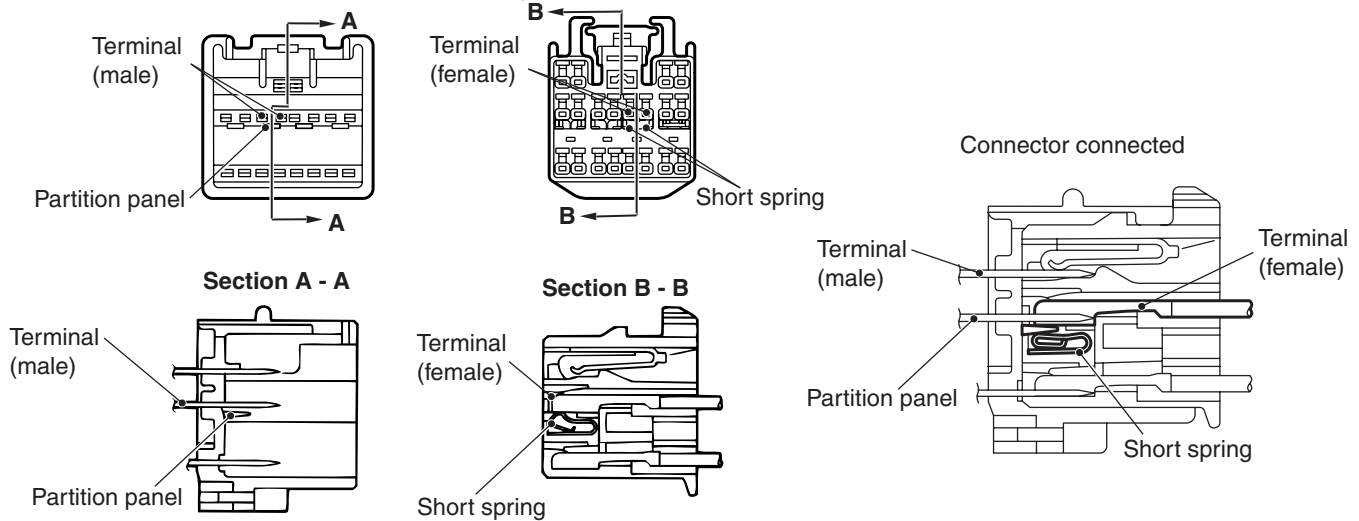
AC212577AC

To enhance the system reliability, a connector lock switch is integrated in the SRS-ECU connector, the air bag module connectors, the clock spring connector, the seat belt pre-tensioner connectors (black connector "A" shown in the illustration above).

SQUIB CIRCUIT CONNECTOR LOCK SWITCH



<Connector shorting mechanism (E. G. SRS-ECU connector)>
ECU-side connector Wiring harness-side connector



AC300257AB

CAUTION

When the connector is disconnected, it is normal for short-circuiting to occur between the connector terminals.

This mechanism automatically short-circuits the power supply side terminal and earth side terminal of the air bag when the connector is disconnected. A short spring is incorporated in the connector to short-circuit the power supply side terminal and earth side terminal of the air bag (no potential difference between the two terminals) and prevent flow of current by static electricity to the squib.

NOTES