GROUP 52B

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

CONTENTS

GENERAL INFORMATION

M2521000100897

- The driver's and front passenger's air bags and seat belts with pre-tensioner have been standard equipped on all vehicles. And the side air bags on both driver's and front passenger's sides have been standard equipped on INTENSE and TURBO for added safety. (Option for INVITE)
- An inflator that does not contain sodium azide has been adopted for all types of the air bag modules.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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.

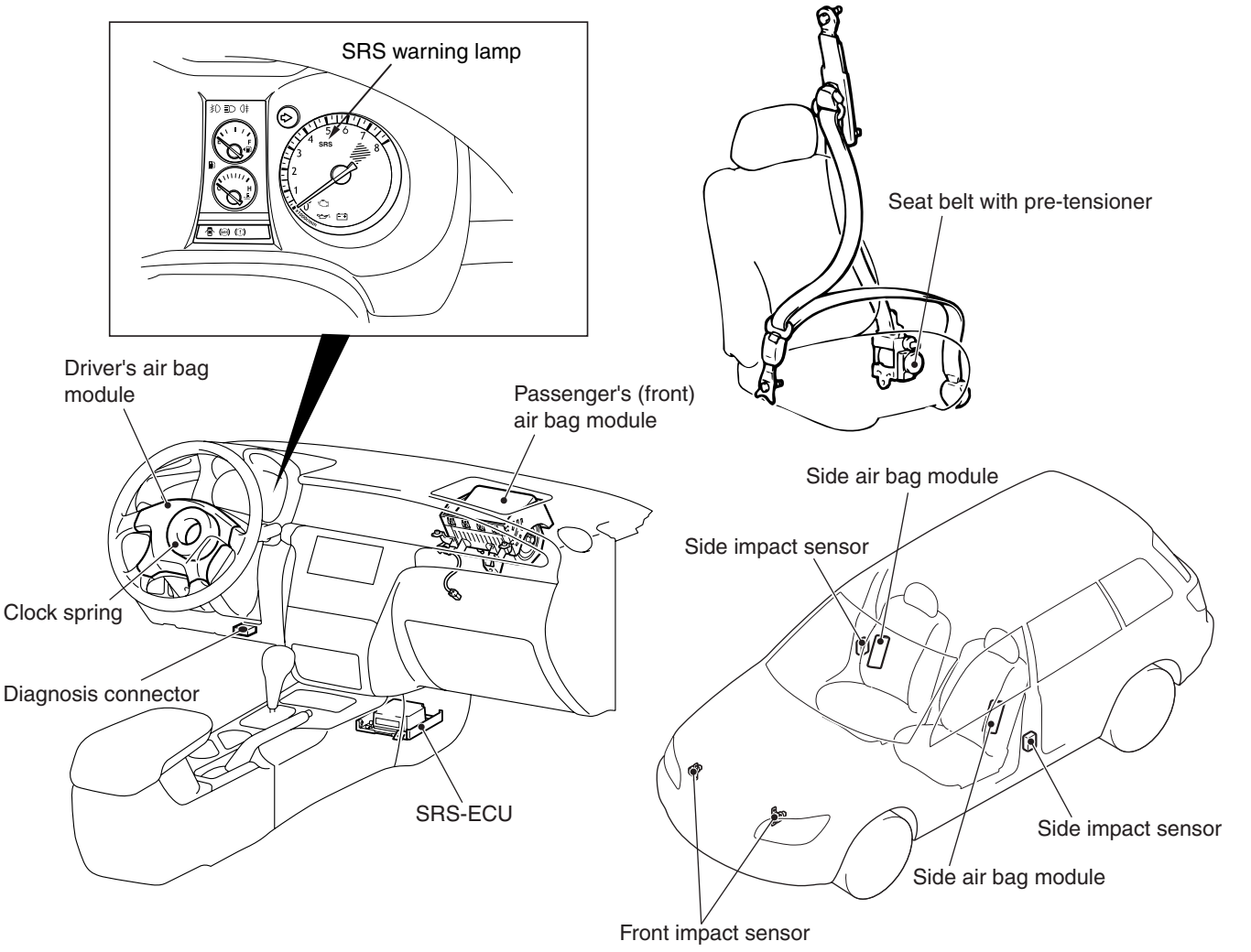
SRS SIDE AIR BAG

Side air bag 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

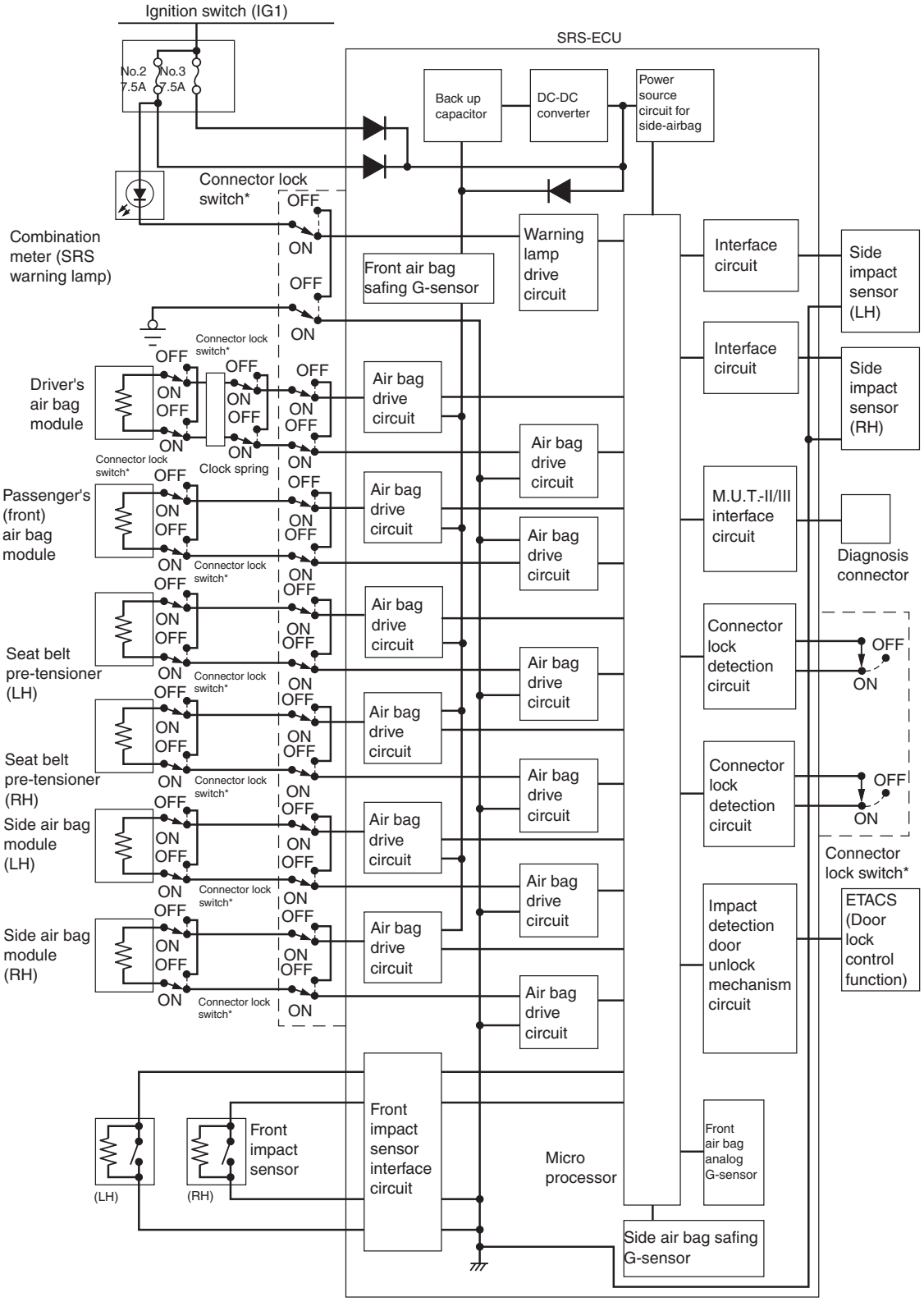
The seat belts with pre-tensioner work simultaneously with the SRS. The pre-tensioner takes up seat belt slack immediately when a collision takes place, restraining the front passengers sooner than the SRS. This prevents the passengers from moving forward.

CONSTRUCTION DIAGRAM



AC301343AC

SRS SYSTEM CIRCUIT DIAGRAM



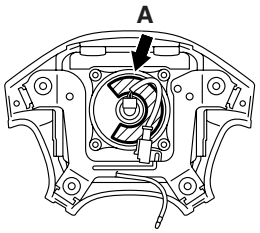
Note
*: Connector connected: ON
Connector disconnected: OFF

AC309181AB

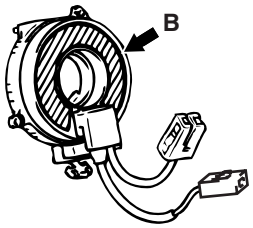
CAUTION LABELS

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

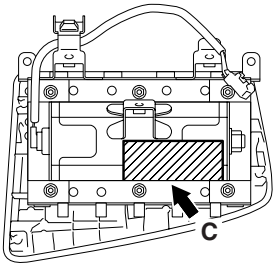
Driver's air bag module



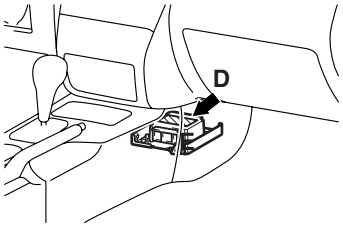
Clock spring



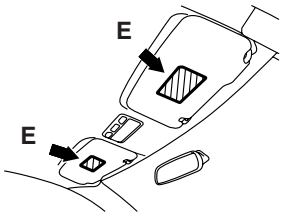
Passenger's (front) air bag module



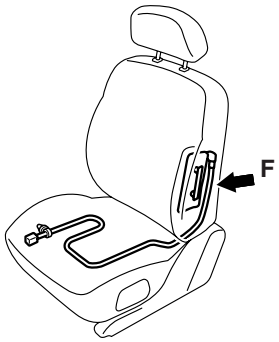
SRS-ECU



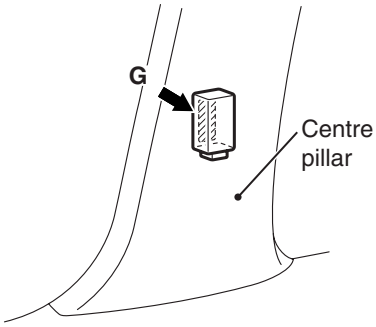
Sun visor



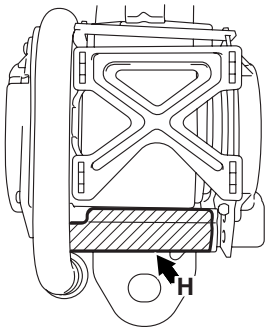
Side air bag module (driver's and front passenger's seat)



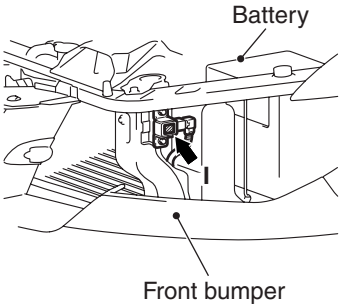
Side impact sensors (left and right)



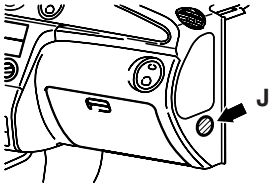
Seat belt with pre-tensioner (driver's and passenger's seat)



Front impact sensors (left and right)



Instrument panel



AC605855AC

Label contents	
A	DANGER CONTENTS ARE EXTREMELY FLAMMABLE. DO NOT PROBE WITH ELECTRICAL DEVICES OR OTHERWISE TAMPER WITH IN ANY WAY.
B	CAUTION: SRS CLOCKSPRING PLEASE DO NOT TURN EXCEPT WHEN REQUIRED. THIS IS NOT A REPAIRABLE PART. IF DEFECTIVE, PLEASE REPLACE ENTIRE UNIT ACCORDING TO THE SERVICE MANUAL INSTRUCTIONS. ALIGNMENT OF MODULES IS NECESSARY WHEN THEY ARE ADJUSTED AND / OR INSTALLED FOR THE ALIGNMENT PROCEDURES, FOLLOW THE SERVICE MANUAL INSTRUCTIONS.
C, F	WARNING FLAMMABLE/EXPLOSIVE SRS AIR BAG MODULE TO AVOID SERIOUS INJURY: • 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	CAUTION: DO NOT DISASSEMBLE OR DROP. IF DEFECT REFER TO SERVICE MANUAL.
E	WARNING TO AVOID DEATH OR SERIOUS INJURY • DO NOT INSTALL REAR-FACING CHILD RESTRAINTS IN THE FRONT PASSENGER SEAT POSITION. • CHILDREN ARE SAFER IN THE REAR SEAT. • SEE THE OWNER'S MANUAL FOR FURTHER INFORMATION AND EXPLANATIONS.
H	DANGER SEAT BELT PRETENSIONER CAUTION THIS ASSEMBLY CONTAINS AN EXPLOSIVE INITIATOR FLAMMABLE MATERIAL TO PREVENT PERSONAL INJURY • DO NOT IMPACT, DISMANTLE OR INSTALL IT INTO ANOTHER VEHICLE. • SERVICE OR DISPOSE OF IT AS DIRECTED IN THE REPAIR MANUAL.
I	CAUTION: DO NOT DISASSEMBLE OR DROP.
J  AC300151	

SYSTEM OPERATION

DRIVER'S AIR BAG MODULE, CLOCK SPRING AND PASSENGER'S AIR BAG MODULE

M2521002000090

The driver's air bag module, clock spring and front passengers air bag module structure are the same as those for 2001 PAJERO.

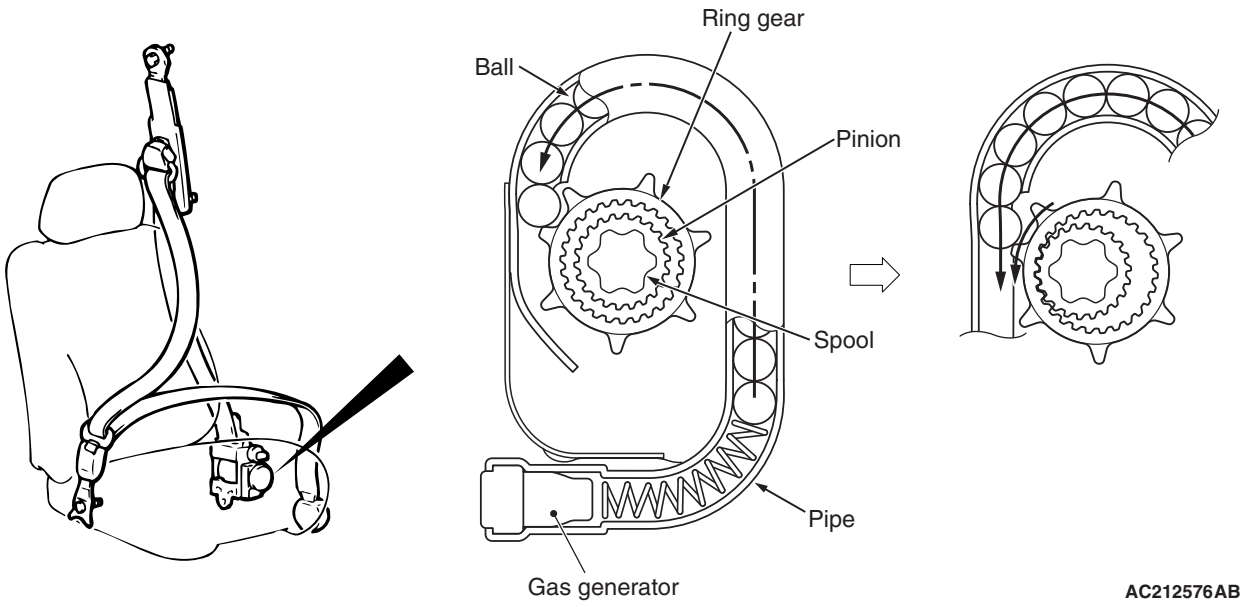
SIDE AIR BAG MODULE

M2521004000041

The side air bag module structure is the same as that for 2001 PAJERO.

SEAT BELT WITH PRE-TENSIONER

M2521008000087



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 thresh-hold. 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.

FRONT IMPACT SENSOR

M2521005000077

The front impact sensor structure is the same as that for 2001 PAJERO.

SIDE IMPACT SENSOR

M2521006000047

The side impact sensor structure is the same as that for 2001 PAJERO.

SRS-ECU

M2521007000181

The SRS-ECU incorporates an analog G-sensor and safing G-sensor for frontal collisions.
In frontal collisions, the driver's and front passenger's air bags deploy only when both the analog 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	Front impact sensor LH system	Short circuit in the sensor
1B		Open circuit in the sensor
1C		Short circuit in the power supply
1D		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	Analog G-sensor malfunction	
15	Safing G-sensor short-circuited (for frontal collision)	
16	Safing G-sensor open-circuited (for frontal collision)	
17	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	

CODE NO.	MAJOR CONTENTS OF DIAGNOSTICS
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
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) and A/D converter system
46*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 ignition drive circuit) system detected short
57	Driver’s seat belt pre-tensioner (squib ignition drive circuit) system detected open
58	Passenger’s seat belt pre-tensioner (squib ignition drive circuit) system detected short
59	Passenger’s seat belt pre-tensioner (squib ignition drive circuit) system detected open
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 air bag squib (RH) short-circuited
72*3*5	Side air bag squib (RH) open-circuited
73*5	Side air bag squib (RH) drive circuit shorted

CODE NO.	MAJOR CONTENTS OF DIAGNOSTICS
74*5	Side air bag squib (RH) drive circuit open
75*5	Side air bag squib (RH) drive circuit (power supply side) shorted
76*5	Side air bag squib (RH) drive circuit (earth side) shorted
79*5	Side impact sensor (LH) communication error
81*3	Side air bag squib (LH) shot-circuited
82*3*5	Side air bag squib (LH) open-circuited
83*5	Side air bag squib (LH) drive circuit shorted
84*5	Side air bag squib (LH) drive circuit open
85*5	Side air bag squib (LH) drive circuit (power supply side) shorted
86*5	Side air bag squib (LH) drive circuit (earth side) shorted
89*5	Side impact sensor (RH) communication error
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 air bag*

**5: Vehicles with side air bag*

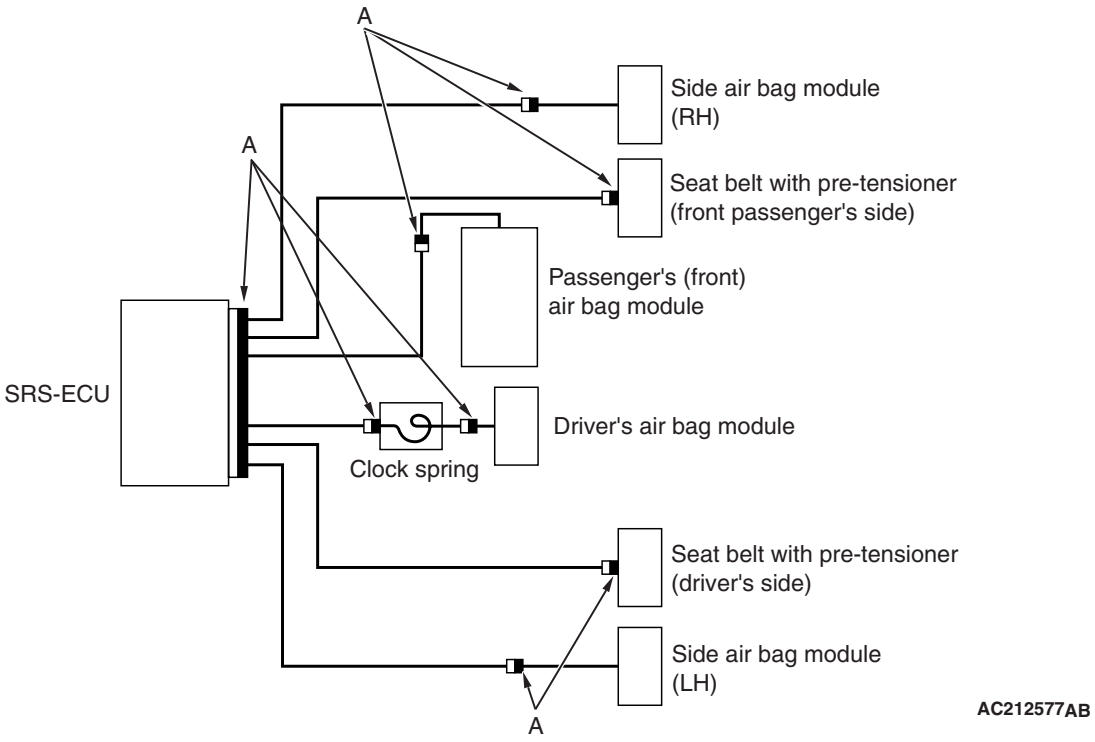
SERVICE DATA OUTPUT

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 days
93	How long a problem has lasted (How long takes from the occurrence of the problem until the first air bag squid 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)	

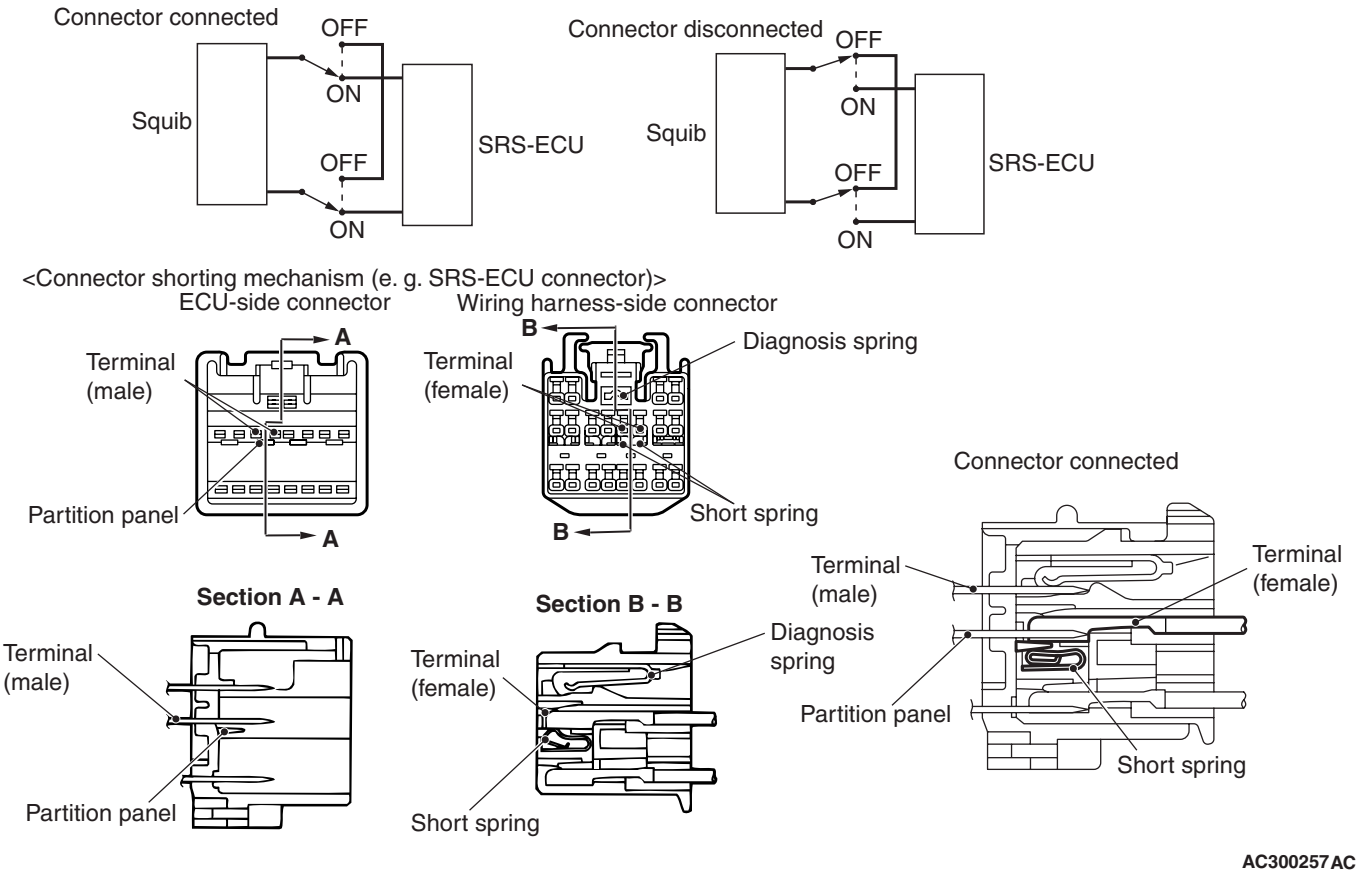
SRS AIR BAG SPECIAL CONNECTOR

M2521009000068



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

SQUIB CIRCUIT CONNECTOR LOCK SWITCH



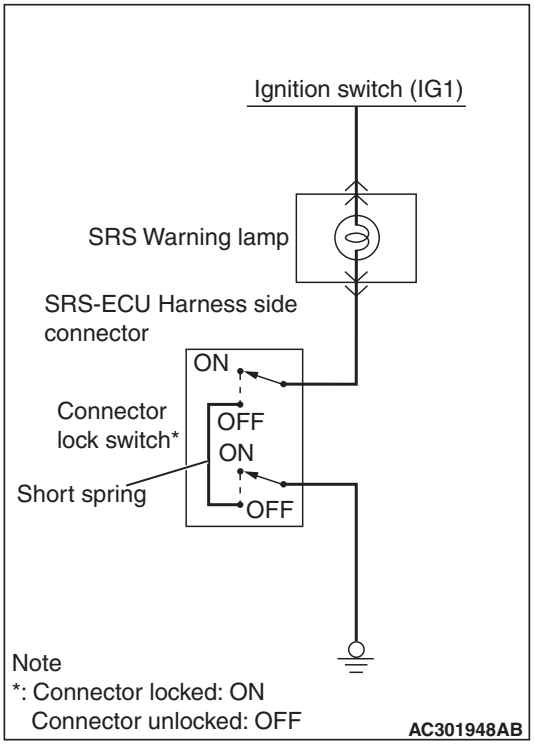
AC300257AC

⚠ CAUTION

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

- The diagnosis spring is assembled on the SRS-ECU wiring harness-side connector. When the ECU-side connector is connected to the SRS-ECU wiring harness-side connector, the diagnosis spring is disengaged from the terminal to short the circuit between the ECU-side connector terminals. The connector engagement is detected electrically by flowing the monitor current to this circuit.
- 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.

WARNING LAMP CIRCUIT CONNECTOR LOCK SWITCH



The switch is a mechanism that shorts the power supply terminal to the earth terminal automatically in the warning lamp circuit when the connector is disconnected. Its structure is similar to the squib circuit connector shorting mechanism.