

## GROUP 42

# BODY

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## GENERAL DESCRIPTION

M2420000100109

The main body (monocoque body) is highly rigid and has excellent noise and vibration reduction characteristics. It also contributes reduced vehicle weight.

### FEATURES

#### Weight reduction and high rigidity

1. Use of high-tensile steel panels and steel plate with uneven thickness.
2. Hood panel and front fender panel are changed from steel to aluminum construction.

#### Reduction of vibration, noise, and aerodynamic noise

Effective layout of acoustic and sound proofing materials.

#### Improvements in safety

1. Break-proof resin door trim materials in case of impact are used to protect passengers from the side impact to the vehicle.
2. Power window switch with one-touch power windows mechanism and power window lock switch are adopted.
3. Inside lock cables are used on the front doors to improve safety in case of impact.
4. A trunk lid latch, which prevents a person from being confined in the luggage compartment in an accident, is used.

5. Impact safety body RISE (Realized Impact Safety Evolution) is adopted for the main body (monocoque body).
6. Side door beams are utilized to improve safety in case of side impact.

#### Improvements in operation quality

1. The keyless entry system in the radio frequency type.
2. The central door lock system to lock/unlock all doors has been installed.
3. High rigidity in the suspension mounting areas.

#### Improvements in commercial value and appearance

1. A sunroof is as an optional.
2. UV-reducing glass is used for the front door window glass.
3. The rear window glass with sun shade has been adopted.

#### Improvements in convenience

1. Hinge protrusion to the loading space has been improved by reducing the size of the trunk lid hinge.
2. Adoption of larger front door pockets.

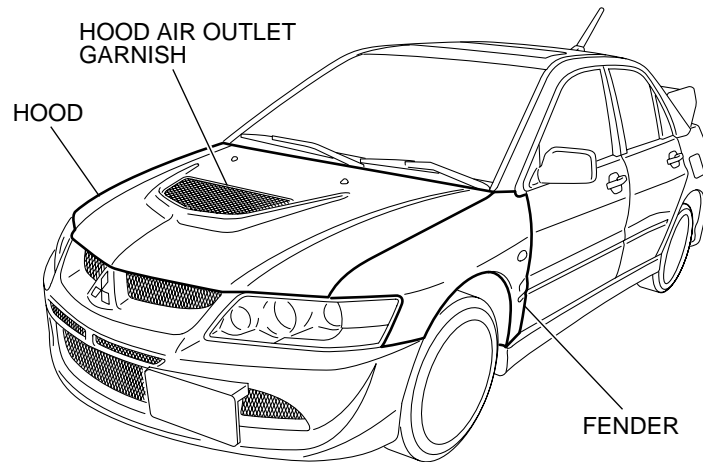
## HOOD AND FENDER

### HOOD AND FENDER

M2420001400039

Aluminum hood and fender are used to reduce the weight of the body. A hood air outlet garnish is used to prevent overheating of the engine compartment.

### CONSTRUCTION DIAGRAM



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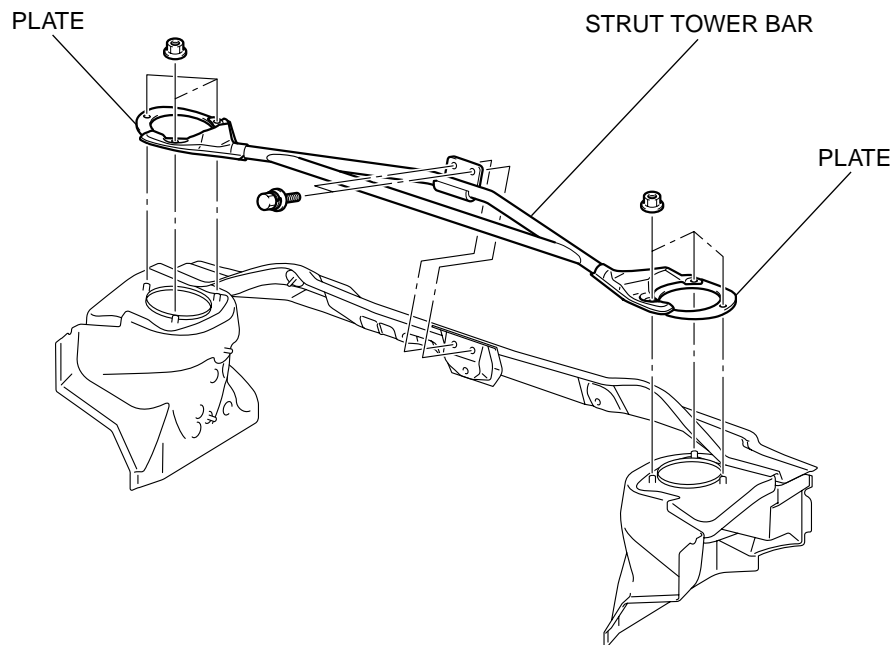
## STRUT TOWER BAR

### GENERAL INFORMATION

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A strut tower bar is added to the strut attachment point to improve body rigidity and steering feel.

### CONSTRUCTION DIAGRAM

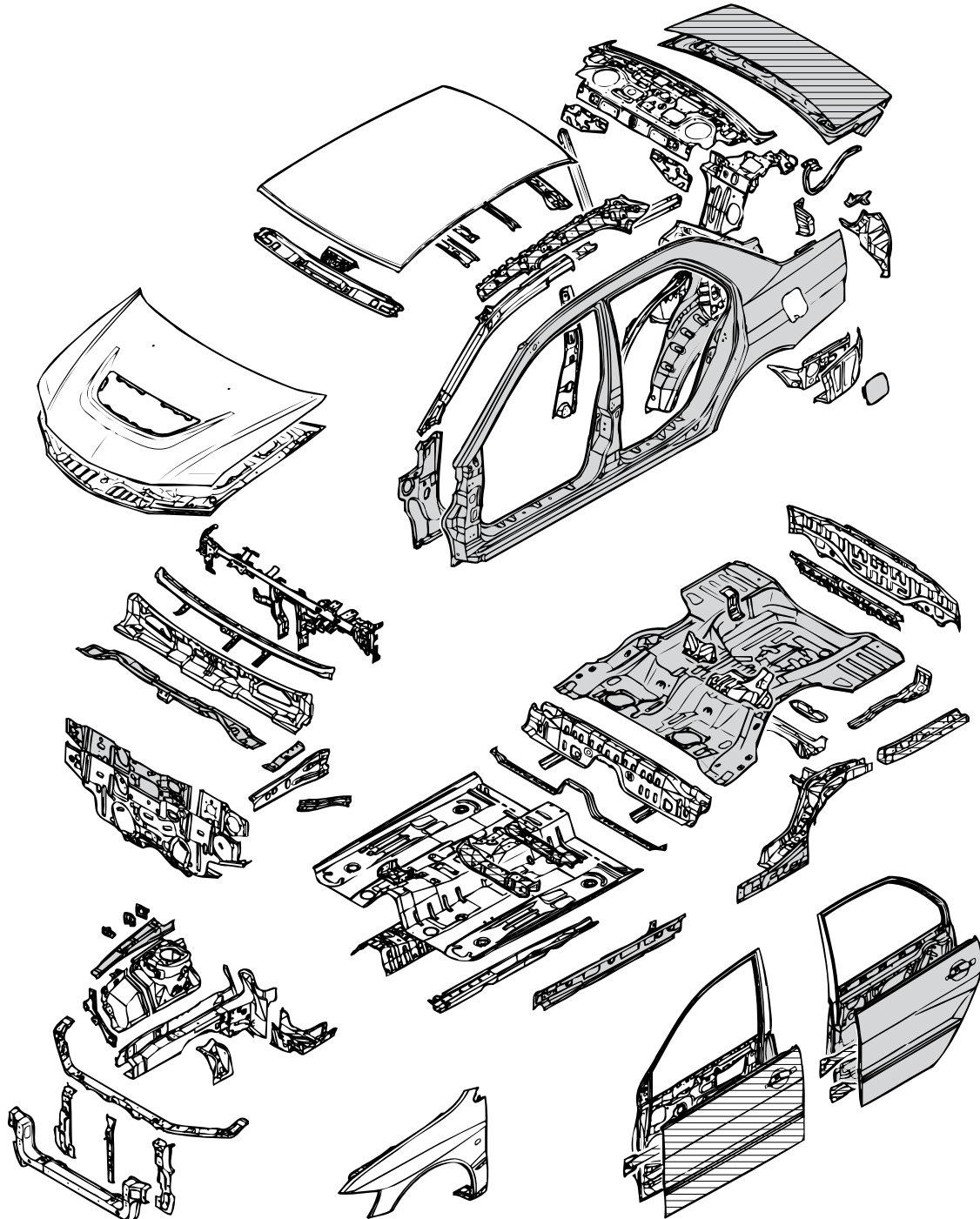


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## MAIN BODY

## BODY PANELING

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■ : Anti-corrosion steel panels

▨ : High-tensile steel panels

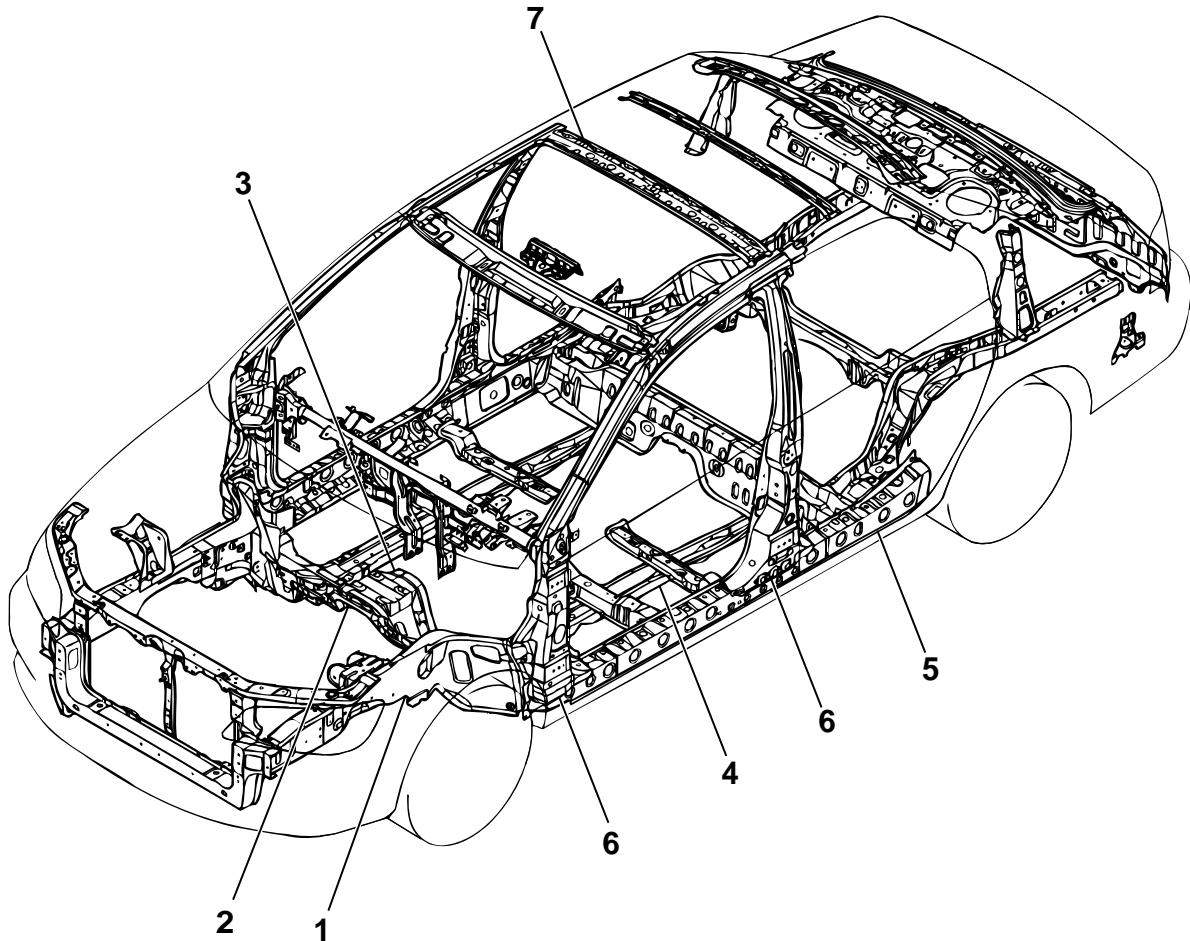
The body has been given enhanced impact safety performance. It has been made lighter by adopting aluminum alloy panels for the hood panel and front fender. A lighter weight main body and better anti-corrosive properties are achieved by the use of highly tensile steel plate and anti-corrosion steel plate.

AB201073

BODY SHELL

Impact safety body

M2420003000093



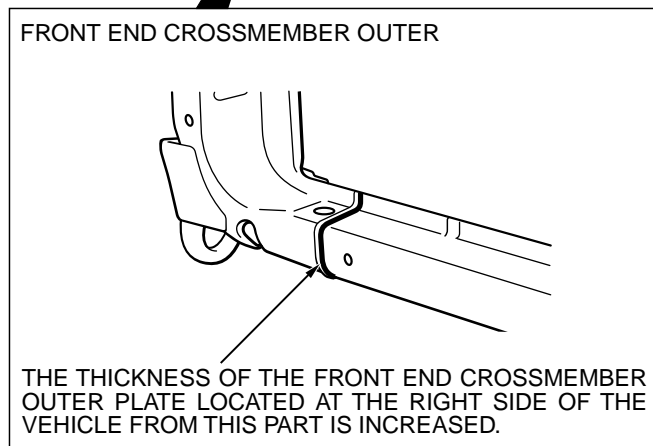
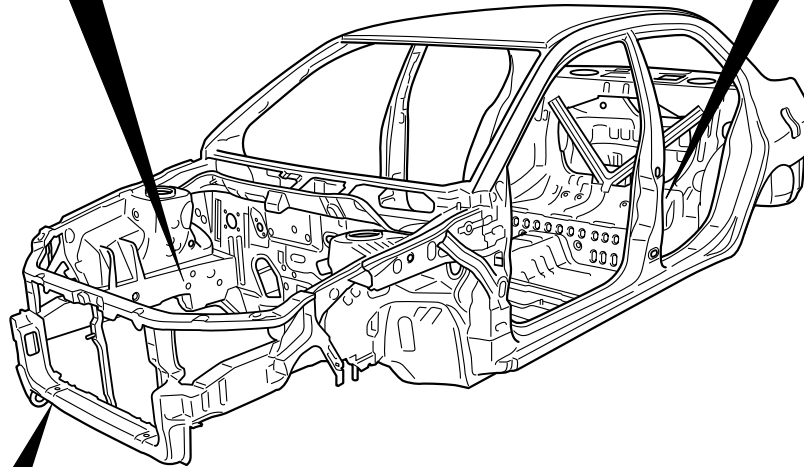
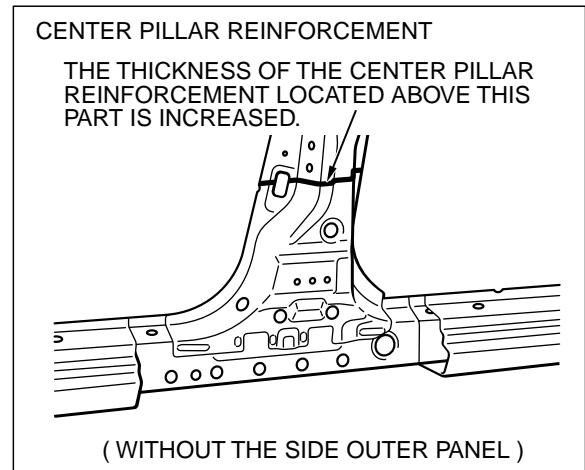
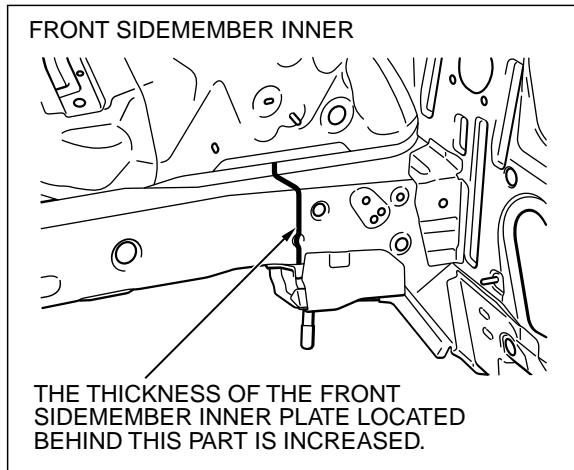
AB201008AB

The following structure ensures survival space during impact and facility to rescue passengers.

1. Application of enlarged and linear cross section of front side member
2. Addition of dash panel cross member
3. Application of thicker dash panel lower

4. Enlarged cross section of front floor side member
5. Enlarged cross section of side sill outer reinforcement
6. Thicker front pillar reinforcement and center pillar reinforcement
7. Enlarged cross section of roof bow

## Steel plate with uneven thickness



AB201040AB

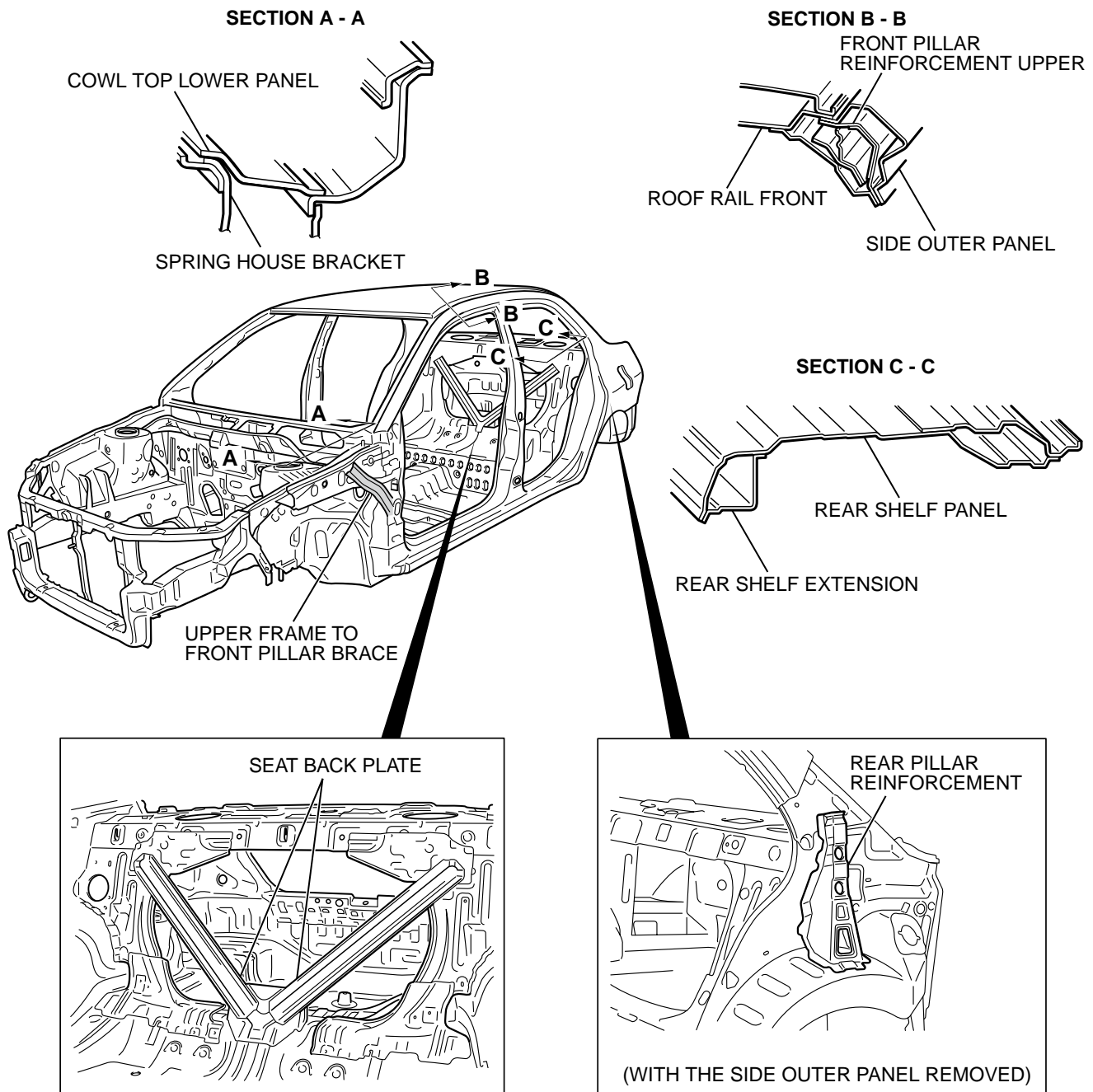
The following part is made of an unequal thickness steel plate\*. Safety upon impact and lightness is improved with the integrated varying thickness structure.

- The thickness of the front end crossmember outer plate located at the right side of the vehicle is increased.

- The thickness of the front side member inner plate located at the rear is increased.
- The thickness of the center pillar reinforcement applied at the upper is increased.

*NOTE: \*: Steel plates with different thickness welded together to make one steel plate*

Operational stability



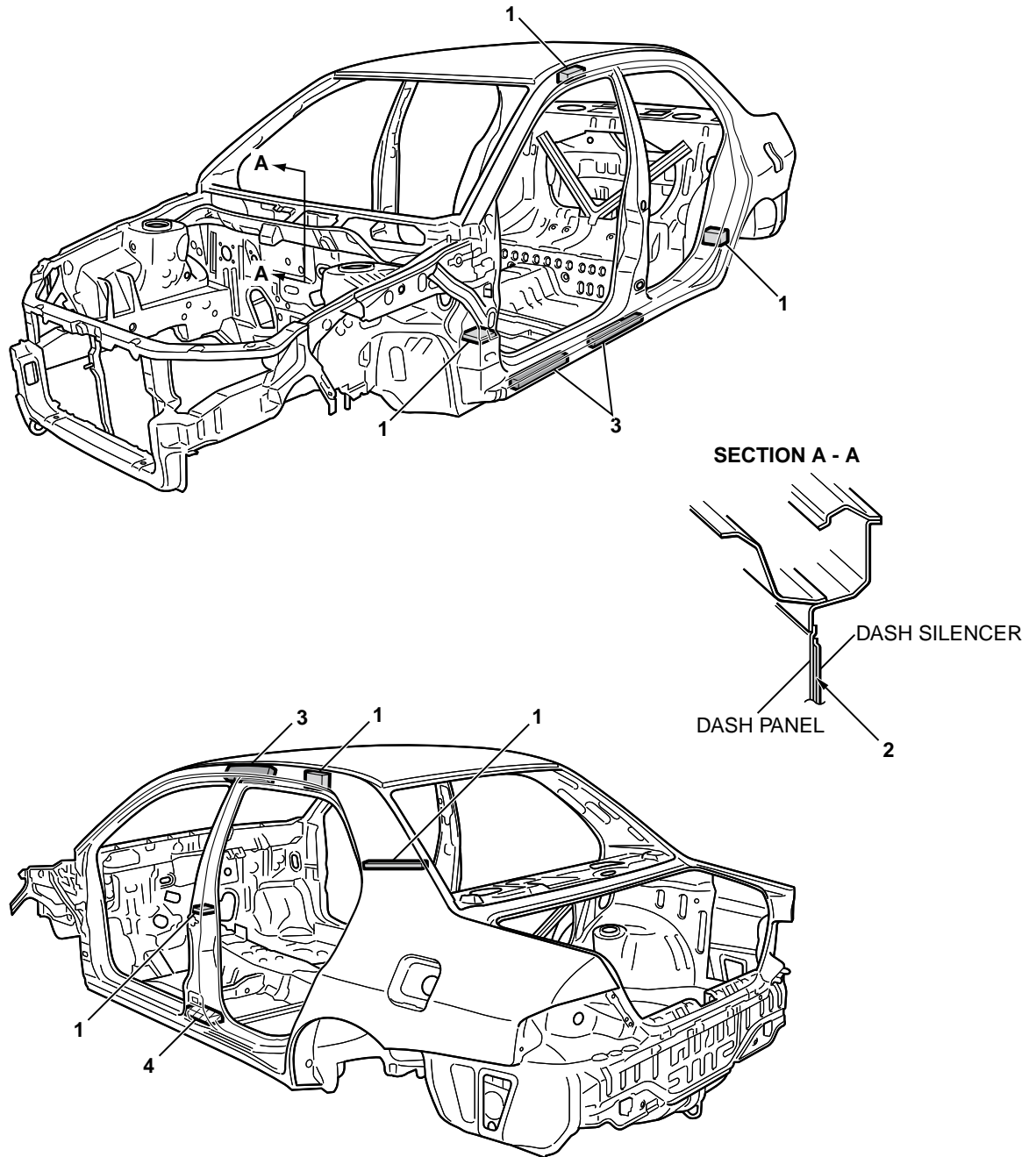
AB201049

The adoption of the following structure to increase rigidity of the suspension mounting parts has improved driving stability and has reduced road noise.

1. By directly joining the spring house bracket with increased thickness to the cowl top lower panel, and adding an upper frame to the front pillar brace, the rigidity of the top, bottom, left, and right sides of the front suspension is improved.
2. The roof rail front, front pillar reinforcement upper, and side outer panel have been joined with each other to increase torsional rigidity.
3. A closed surface structure is achieved by adding a rear shelf extension to the front of the rear shelf. The top of the rear shelf and rear wheel house have been additionally joined with a rear pillar reinforcement and the rear shelf and rear floor with a seat back plate to improve twisting rigidity.
4. Additional welded positions at the door opening improves torsional rigidity.

## QUIETNESS

M2420004000085



AB201074AB

The following items improve quietness.

1. Sound absorption foam materials have been filled into the front pillar, the roof side rail, the center pillar, the rear pillar, and the inside the wheel house arch to prevent noise penetration.
2. Steel plate restricted anti-vibration materials (silencer sandwiched inside the panel) are used to suppress operating sounds and engine vibration.
3. Filling high rigid foam materials into the side sill and the roof side rail to suppress panel vibration reduces road noise.
4. Urethane foam has been inserted into the center pillar to prevent noise penetration.



**BODY COLOR CHARTS**

M2420005000129

OUTER PANEL- COLOR					INNER PANEL- COLOR	
COLOR	COLOR CODE	COLOR NUMBER	COLOR NAME	COMPOSITION OF FILM	COLOR NUMBER	COLOR NAME
SILVER	A31	CMA10031	Cool Silver	Metallic	AC10595	GRAY
BRIGHT BLUE	T10	CMT10010	French Blue	Solid	CMB17004	BRIGHT BLUE
BLACK	X42	AC11342	Amethyst Black	Interferenced Pearl	AC10903	BLACK
WHITE	W83	AC10983	Scotia White	Solid	AC10863	WHITE
RED	P85	AC11185	Palma Red	Solid	AC10795	RED
YELLOW	Y01	CMY10001	Dandelion Yellow	Solid	AC10911	YELLOW

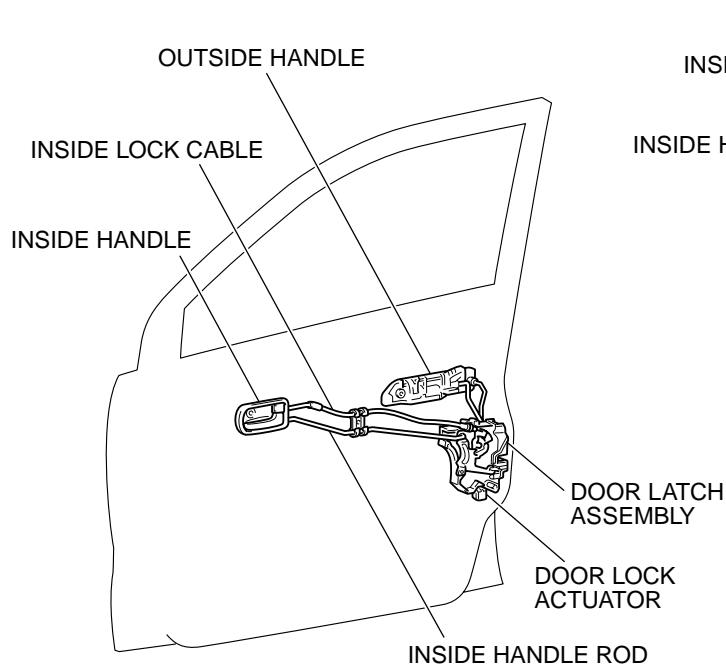
*NOTE: Inner Panel-Color refers to the coat color of the engine, cabin and floor.*

## DOOR

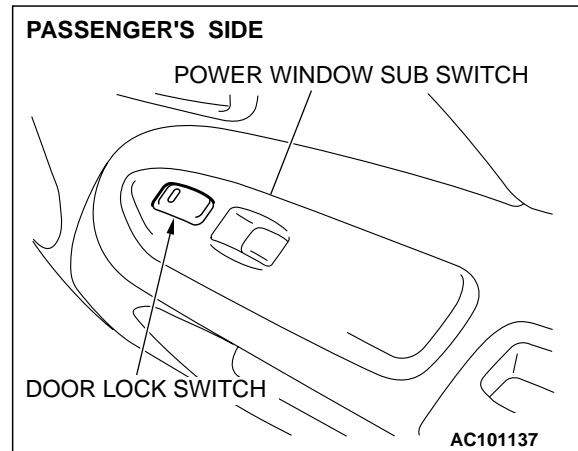
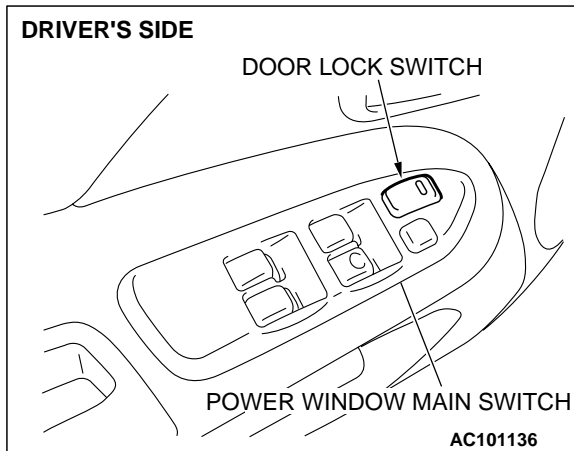
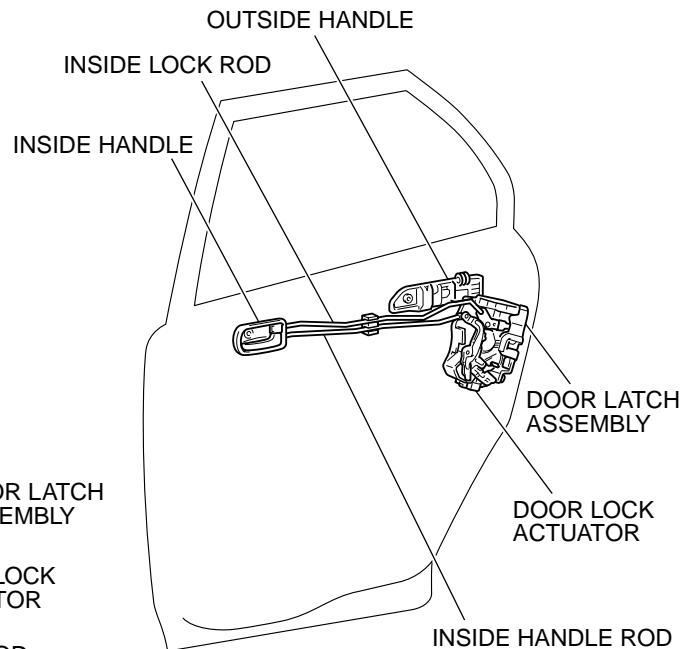
DOOR LOCK  
CONSTRUCTION DIAGRAM

M2420009000091

&lt;FRONT&gt;



&lt;REAR&gt;



AC211879 AB

- A central door lock to lock/unlock all doors with a key cylinder at the driver's door is utilized.
- As an added safety measure, the front doors incorporate an inside lock cable to prevent the door from locking during an impact.
- The door lock prevention function by ETACS control when the ignition key is left has been adopted. (Refer to GROUP 54B, SIMPLIFIED WIRING SYSTEM P.54B-6.)

**CENTRAL DOOR LOCKING SYSTEM**

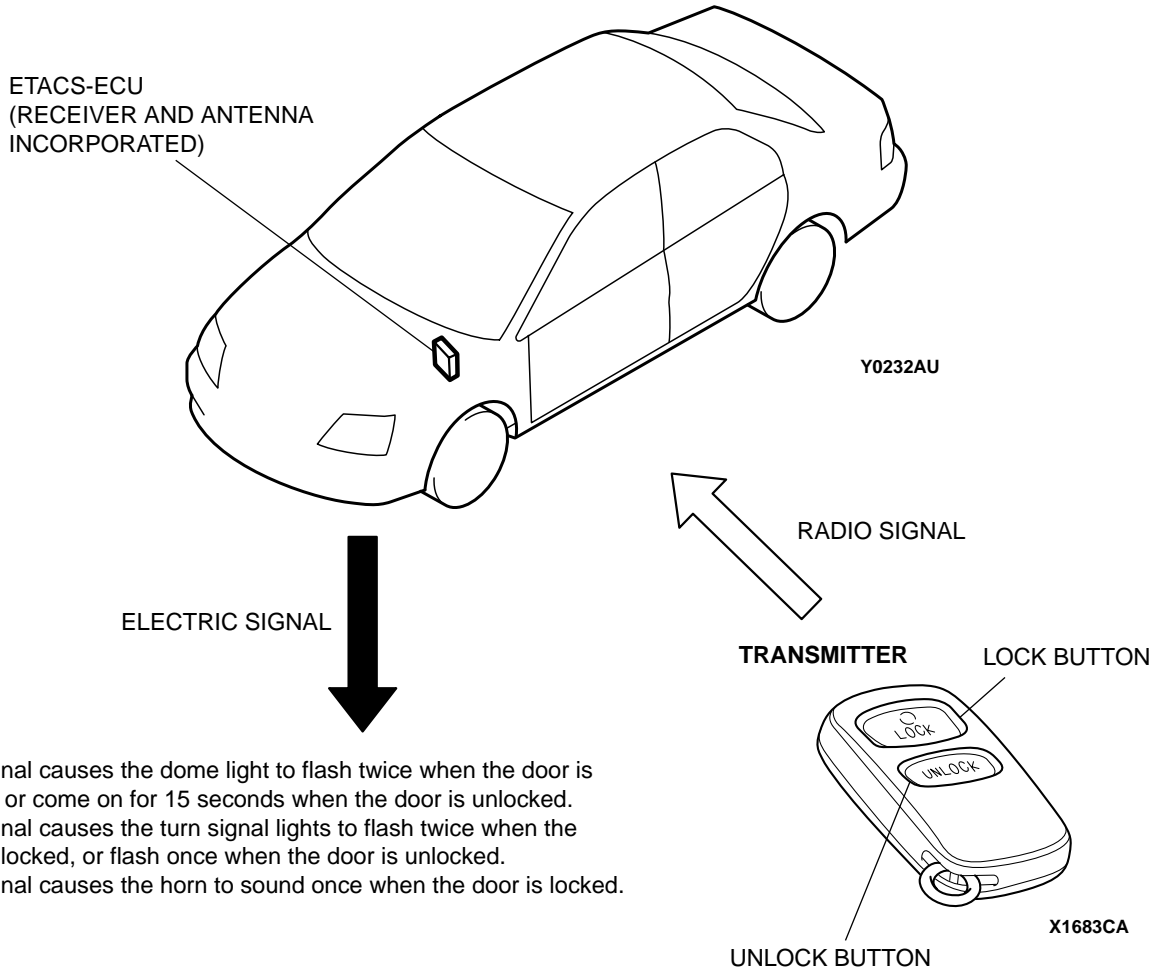
**Door lock operation table**

OPERATION	OPERATION		DRIVER'S SIDE DOOR	PASSENGER'S SIDE DOOR	REAR DOOR
Key cylinder	Driver's side door	Lock	Lock	Lock	Lock
		Unlock	Unlock	Unlock*	Unlock*
Inside lock knob		Lock	Lock	Lock	Lock
		Unlock	Unlock	–	–
Door lock switch		Lock	Lock	Lock	Lock
		Unlock	Unlock	Unlock	Unlock
Key cylinder	Passenger's side door	Lock	Lock	Lock	Lock
		Unlock	Unlock	Unlock	Unlock
Inside lock knob		Lock	–	Lock	–
		Unlock	–	Unlock	–
Door lock switch		Lock	Lock	Lock	Lock
		Unlock	Unlock	Unlock	Unlock
Inside lock knob	Rear door	Lock	–	–	Lock
		Unlock	–	–	Unlock

*NOTE: \*: The key must be turned twice to unlock the door.*

**KEYLESS ENTRY SYSTEM  
CONSTRUCTION DIAGRAM**

M2420010000095



- The signal causes the dome light to flash twice when the door is locked, or come on for 15 seconds when the door is unlocked.
- The signal causes the turn signal lights to flash twice when the door is locked, or flash once when the door is unlocked.
- The signal causes the horn to sound once when the door is locked.

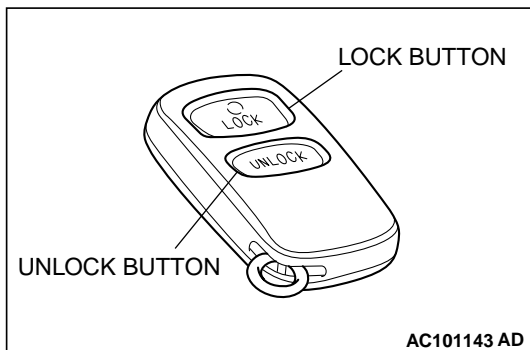
AC101142AB

A keyless entry system allows the doors to be locked or unlocked remotely from any point within approximately 12 meters (39.4 feet) of the center of vehicle. The remote-controlled keyless entry system is features of as follows:

- The antenna and receiver are incorporated in the ETACS-ECU.
- The ID code can be registered by using the scan tool MB991502.

**TRANSMITTER**

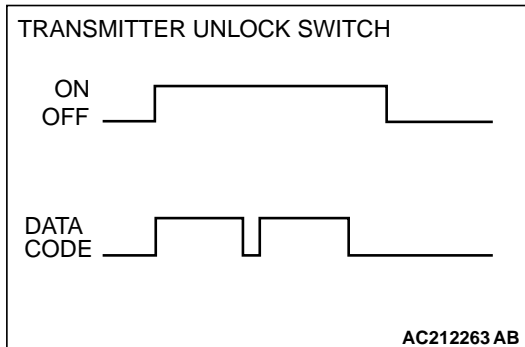
The transmitter is a key ring type. There are two buttons on the transmitter; the lock button and the unlock button. When either is pressed, the transmitter emits a radio signal representing a specific ID code.



OPERATION OF TRANSMITTER		OPERATION OF KEYLESS ENTRY SYSTEM
Lock button	Press once	Lock all doors
Unlock button	Press once	Unlock the driver's door
	Press once more	Unlocks all doors

### CIPHER CODE

The left figure shows a code which is sent from the RKE transmitter. When the button is pressed once, two data codes will be sent. The cipher code has one million kinds by combining 0 and 1. In addition, the cipher code also includes a rolling code which varies per transmission. This rolling code prevents unauthorized duplication.



### ETACS-ECU (RECEIVER)

- The ETACS-ECU incorporates a receiver with an antenna. The receiver compares the code sent from transmitter with the code retained in the receiver through the antenna.
- The ETACS-ECU sends a signal only when those two codes correspond and the rolling code is judged to be correct.
- All of those output signals are processed internally in the ETACS-ECU.
- A maximum of four cipher code (4 transmitters) can be registered by connecting the data link connector to the scan tool MB991502.

### FUNCTION FOR CONFIRMING ETACS-ECU (RECEIVER) OUTPUT AND OPERATION

When the ETACS-ECU (receiver) sends a signal to the door lock actuators, the turn-signal lights and dome light illuminate and horn sounds (when locking), indicating that the keyless entry system is activated.

ITEMS	OPERATION	
	DOORS LOCKED	DOORS UNLOCKED
ETACS-ECU (receiver)	Sends lock signal	Sends unlock signal
Dome light	Flashes twice	Illuminates for 15 seconds
Turn-signal lights (RH and LH)	Flashes twice	Flashes once
Horn	Sounds once	—

### TIMER LOCK FUNCTION

- The ETACS-ECU (receiver) sends a door lock signal automatically unless any door is opened within 30 seconds after the doors have been unlocked by the keyless entry system while all doors are closed.
- This function prevents unlocking the doors unintentionally.

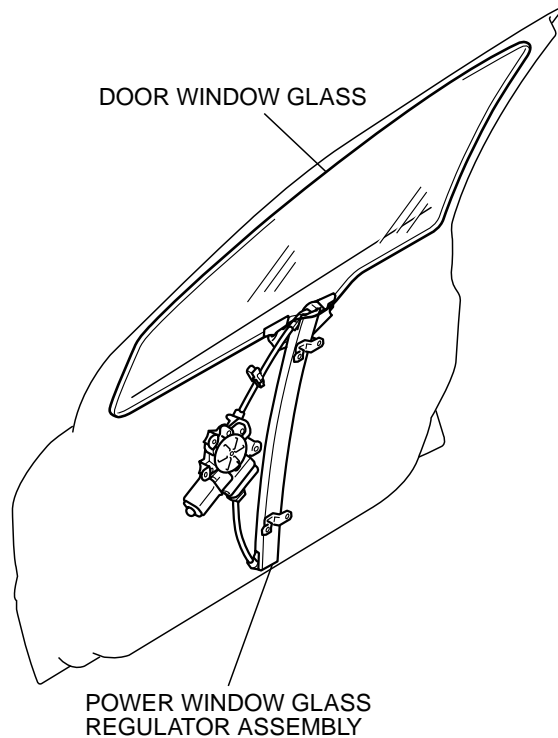
### OPERATION CONDITIONS

The keyless entry system is prohibited from operating when the key is inserted in the ignition switch.

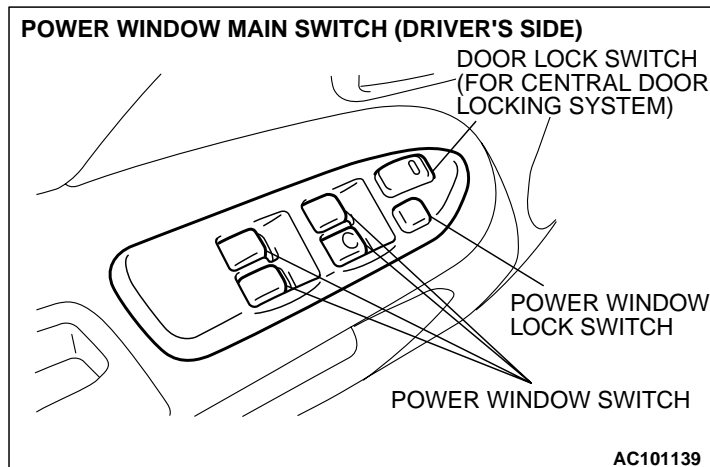
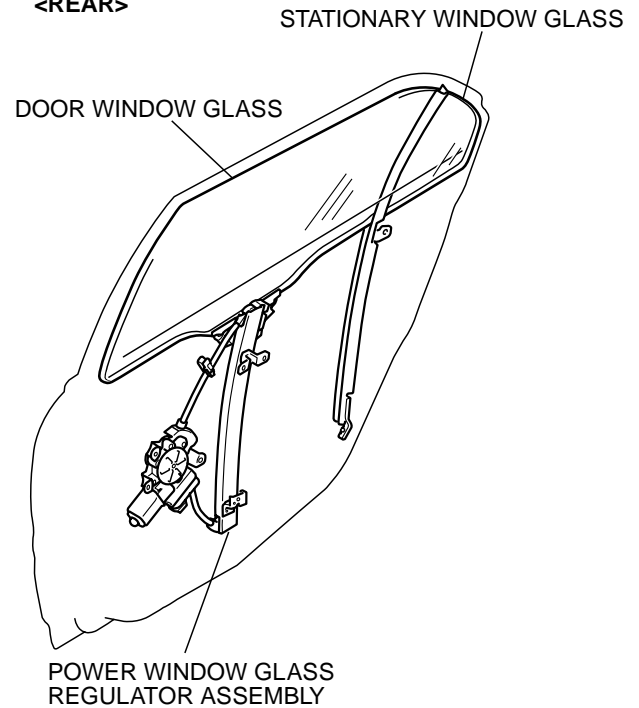
## WINDOW GLASS REGULATOR CONSTRUCTION DIAGRAM

M2420011000098

&lt;FRONT&gt;



&lt;REAR&gt;



AC210231 AB

- The window regulator is a compact and light-weight wire winding type.
- The power window system incorporates a one-touch-down window opening mechanism which allows driver's window to open completely by fully pressing the main switch without need for keeping it pressed.

The driver's power window control also has a lock switch which, when in the ON state, prevents the switches of all other doors from being operated.

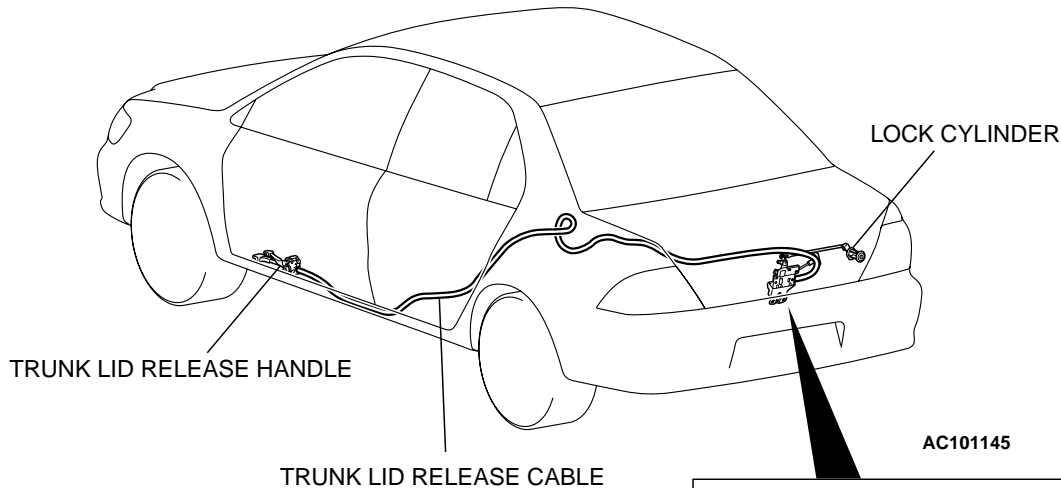
- For the control of the power window timer of the ETACS-ECU. (Refer to GROUP 54B, SIMPLIFIED WIRING SYSTEM P.54B-6.)
- The power window system stays operative for approximately 30 seconds after the ignition switch is turned OFF. (Refer to GROUP 54B, SIMPLIFIED WIRING SYSTEM P.54B-6.)

LID

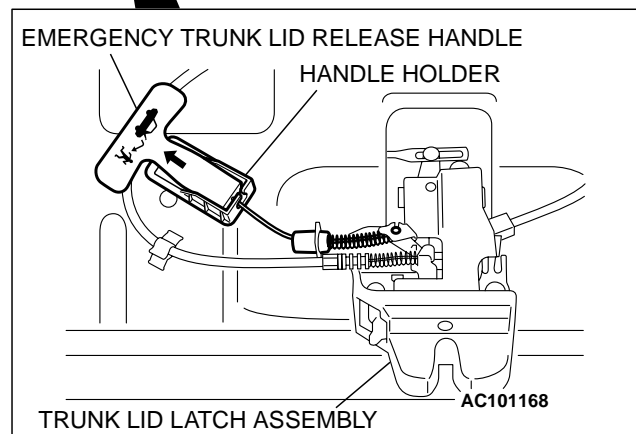
TRUNK LID

TRUNK LID LATCH

M2420013000050



AC101145



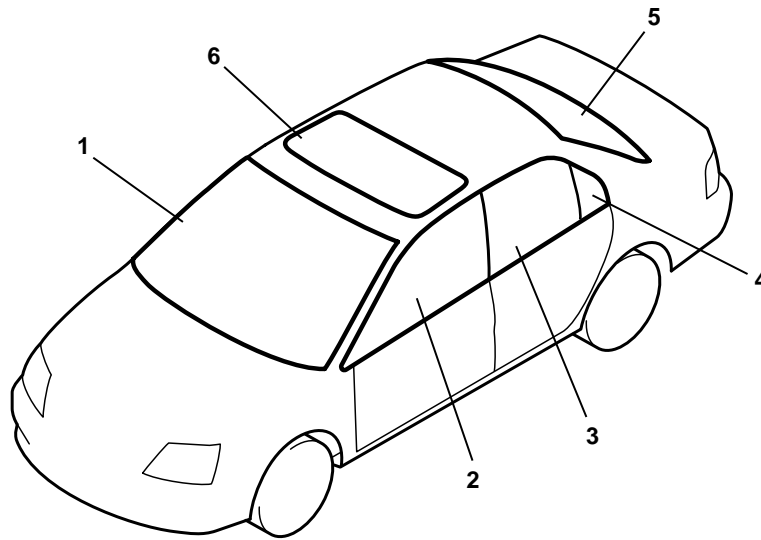
AC101169AB

- A trunk lid latch, which prevents a person from being confined in the luggage compartment in an accident, is used. You can open the trunk lid by pulling an emergency trunk lid release handle to the arrow direction when you are confined in the luggage compartment in an accident.

- The emergency trunk lid release handle glows by absorbing light, so you can operate the handle even in a dark luggage compartment.  
*NOTE: The glow time depends on the degree of the light absorption, but the handle will glow four hours in maximum when a beam of sun light has remained on its surface for 30 seconds or more. The glow performance depends on environmental conditions.*

**WINDOW GLASS**

M2420015000090



AC005392AB

NO.	NAME	TYPE	THICKNESS {mm (in)}	COLORING	VISIBLE LIGHT PERMEATION RATE (%)
1	Windshield	Laminated glass	4.3 (0.2)	Green	80
2	Front door window glass	Tempered glass	3.1 (0.1)	Green	74
3	Rear door window glass		3.1 (0.1)	Green	82
4	Rear stationary window glass		3.1 (0.1)	Green	82
5	Rear window glass		3.1 (0.1)	Green	82
6	Roof lid glass		4.0 (0.2)	Dark gray	18

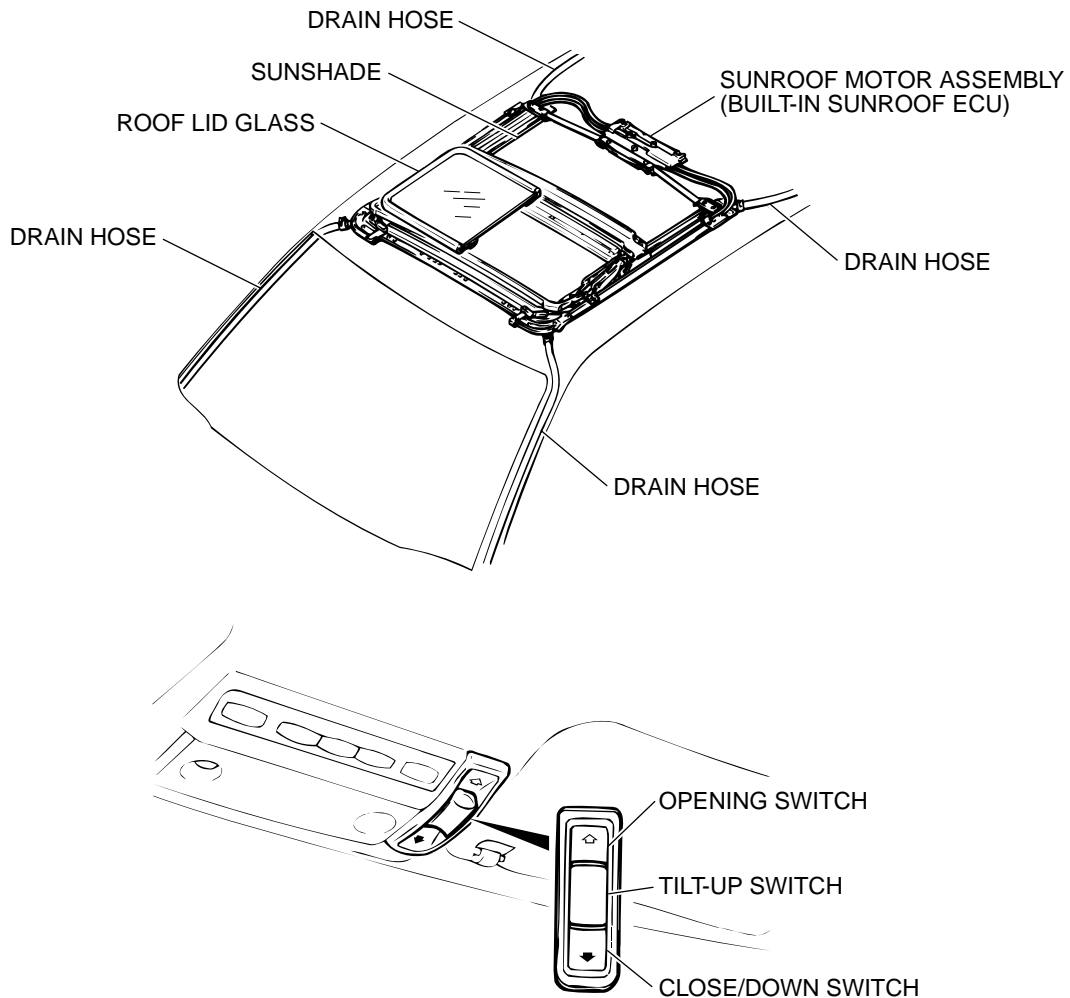
*NOTE: The figure at the visible light permeation rate is a reference value. There could be marginal errors.*



# SUNROOF

M2420016000082

## Construction diagram



AC210365AB

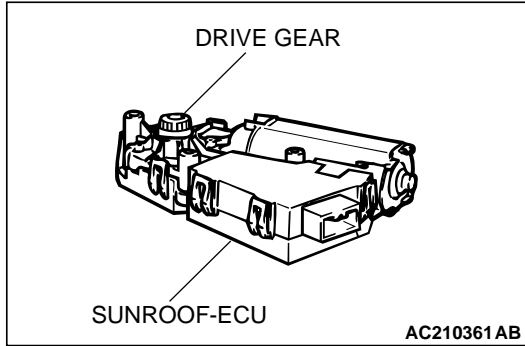
The power sliding glass sunroof with the tilt-up function to provide sufficient ventilation by tilting up (30mm) as well as sufficient sunlight and a sense of emancipation by opening the sunshade even if the roof lid glass is fully closed is installed on some models as an option. This sunroof has the following features:

- All functions, including sliding open/close, tilting up/down, and stop can be done by operating a single switch. Also, all functions can be done by one touch operation.
- Jamming prevention mechanism in which the roof lid glass moves in the opposite direction and stops during sliding close or tilt down movement when the outside force is applied is featured.
- Due to the elimination of manual operation in the event of a malfunction, a new function of moving the roof approximately 30 mm increments to the fully closed position is adopted. This occurs whenever the close/down switch is pressed after jamming prevention mechanism is disabled, when a reverse movement repeated for 5 times or more is triggered by deformation, or when jamming prevention mechanism is activated by error.
- After the ignition switch is turned to the OFF position, the sunroof can be operated for 30 seconds. (If the driver's seat door is open during that particular time, the sunroof can be operated for another 30 seconds. However, as soon as the door is closed, the key off operation function is disabled.)

- Fully closing operation as a transmitter adjustment function can be done with the lock switch. (Refer to GROUP 54B, SIMPLIFIED WIRING SYSTEM - SWSP.54B-6.)

**DESCRIPTION OF STRUCTURE AND OPERATION**

**MOTOR**



The motor is installed at the front of the housing. It consists of the motor body, drive gear and sunroof-ECU.

**SUNROOF-ECU**

The sunroof-ECU has a built-in microprocessor which controls motor operation in accordance with signals from the sunroof switches and from the ETACS.

**SYSTEM DIAGRAM**

