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## GROUP 54A

# CHASSIS ELECTRICAL

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## GENERAL INFORMATION

M2540000100506

### FEATURES

#### IMPROVEMENT OF VISUAL OBSERVATION AND SAFETY, AND ENHANCEMENT OF USER-FRIENDLINESS AND VERSATILITY

- The engine immobilizer system with the improved security system has been applied. <Vehicles for GCC, Hong Kong, Singapore, Australia and New Zealand>
- The large four headlamps with the lightweight resin lenses have been adopted.
- The LED type tail/stop lamps have been adopted for less power consumption and illumination speed improvement.
- The high-mounted stop lamp is installed on the tailgate for all models.
- Reliable information transmission can be achieved by connecting the combination meters, and each ECU via CAN communication.

- The combination meters are provided integrated with a perfect round-shaped speedometer where the needles operate at the wider angle.
- A corner sensor that helps the driver when parking in a garage or narrow spaces has been adopted.

#### IMPROVEMENTS IN SERVICE QUALITY

- Diagnosis connector for inspection with M.U.T.-III is provided.
- Integration of diagnosis and service data in the combination meter, enabling communication with M.U.T.-III.

#### BETTER PRODUCT PACKAGE

- The turn-signal lamps integrated in door mirrors have been adopted.
- The smart wiring system (SWS) has been adopted for the lamp control including the headlamp auto turn-off and fog lamp unattended-operation reminder.
- The radio and CD player and radio and cassette player are optionally established.

## DIAGNOSIS SYSTEM

M25400001000386

The diagnosis connector for M.U.T.-III inspection is installed near the driver's right leg under the instrument panel <L.H. drive vehicles> or near the driver's left leg <R.H. drive vehicles> in order to improve service quality.

Diagnostic function	MPI	A/T	ABS	SRS air bag
Diagnosis code set	×	×	×	×
Output of service data	×	×	×	×
Actuator test	×	×	×	×
Diagnosis code reading by warning lamp and indicator lamp	—	—	—	—
Diagnosis code storage (EEPROM)	×	×	×	×
Erase of diagnosis code by the M.U.T.-III	×	×	×	×
Freeze frame data	×	—	—	—

Diagnostic function	MPI	A/T	ABS	SRS air bag
Status indication by diagnosis code*	—	—	×	—
Estimated vehicle speed sent	—	—	—	—
ECU information display	—	—	×	—

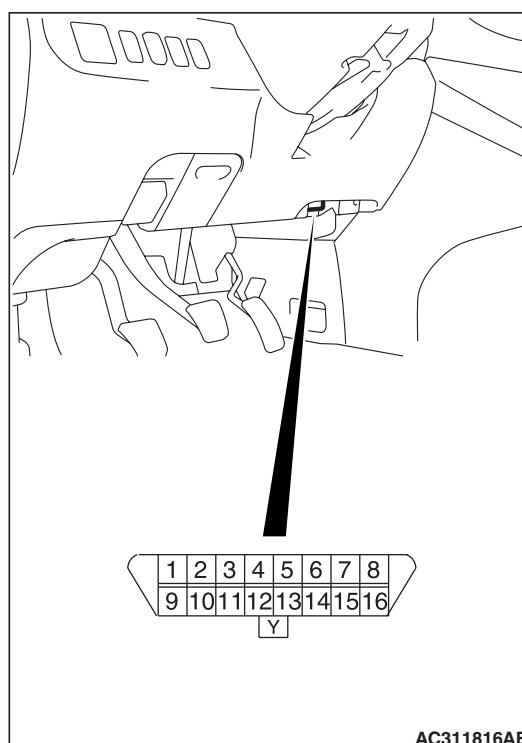
  

Diagnostic function	Immobilizer	Combination meter	ETACS	A/C
Diagnosis code set	×	×	×	×
Service data sent	×	×	—	×
Actuator test	—	×	—	×
Diagnosis code reading by warning lamp and indicator lamp	—	—	—	—
Diagnosis record stored	×	×	×	×
Diagnosis deletion using M.U.T.-III	×	×	×	×
Freeze frame data	—	—	—	—
Status indication by diagnosis code*	—	×	—	×
Estimated vehicle speed sent	—	x (via CAN)	x (via CAN)	—
ECU information display	—	×	—	×

**NOTE:**

- \* If a diagnosis code is sent for this function, the display informs users whether a mechanical problem currently exists or whether it existed before but normal operation has been restored. The message for the former state identifies it as a current trouble and the message for the latter identifies it as a past trouble.
- x: indicates that the diagnosis function is set.
- : indicates that the diagnosis function is not set.

**Diagnosis connector**



Diagnosis connector (black)	
1	Diagnosis control
2	–
3	SWS communication line
4	Earth
5	Earth
6	CAN communication line (CAN_H)
7	MPI, A/T
8	–

Diagnosis connector (black)	
9	Pulse check
10	–
11	ECU optimisation control
12	–
13	–
14	CAN communication line (CAN_L)
15	–
16	Battery power supply

## BATTERY

M2540002000248

Item	75D23L
Voltage V	12
Capacity (5-hour rate) Ah	52
Electrolytic fluid specific gravity (fully charged state at 20° C)	1.280

## IMMOBILIZER SYSTEM <Vehicles for Hong Kong, Singapore, GCC, Australia and New Zealand>

M2540003000359

The engine immobilizer system prevents the engine from starting and immobilizes the vehicle if a key other than the key registered for that vehicle is used in an attempt to start the engine after forced entry. The engine immobilizer system consists of the ignition key, key ring antenna, immobilizer-ECU <Vehicles for Hong Kong and Singapore> or immobilizer-ECU with an antenna <Vehicles for GCC, Australia and New Zealand> and the engine-ECU <M/T> or engine-A/T-ECU <A/T>. It works in the following way and has these functions.

1. With the ignition key turned ON, the transponder (a small transmitter) integrated in the ignition key transmits its own encrypted code to the key ring antenna via radio wave <Vehicles for Hong Kong and Singapore> or the ring antenna via radio wave <Vehicles for GCC, Australia and New Zealand>.
2. According to the sent encrypted code, the immobilizer-ECU controls the engine-ECU <M/T> or engine-A/T-ECU <A/T> only when the sent encrypted code agrees with the pre-registered one.
3. The system is designed to be maintenance-free because the power source for the transponder is supplied by the immobilizer-ECU. Three ignition keys are provided, and up to eight keys can be registered to one vehicle as needed. More than one trillion of encrypted code combinations can be registered, and parts of them are irregularly changed whenever the ignition key is turned ON. This feature prevents code copying, resulting in higher security of the system.

**DIAGNOSIS CODE TABLE****Vehicles for Hong Kong and Singapore**

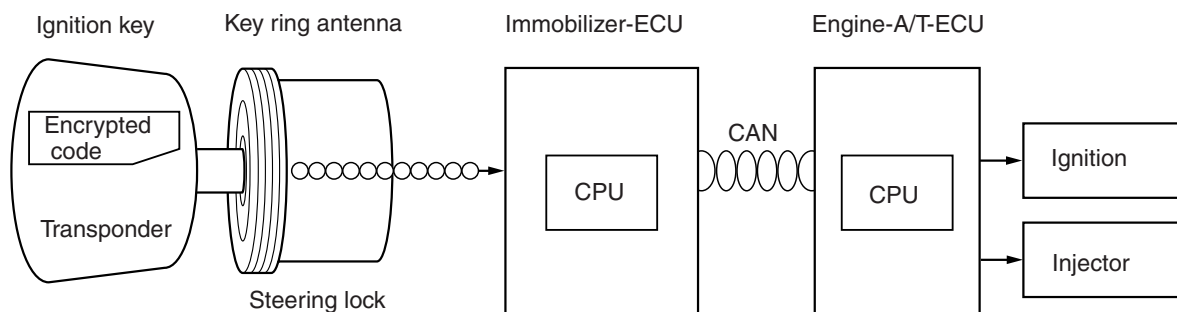
Diagnosis code No.	Diagnosis item
B1702	Reception error of encrypted code
B1703	Encrypted code inconsistent
B1722	Antenna failure
B1731	Communication error with the engine-A/T-ECU
B1761	VIN not recorded
B1766	Transponder registered for other vehicle
U1073	Bus off

**Vehicles for GCC, Australia and New Zealand**

Diagnosis code No.	Diagnosis item
11	Transponder communication system or radio interference of encrypted code
12	Encrypted codes are not the same or are not registered

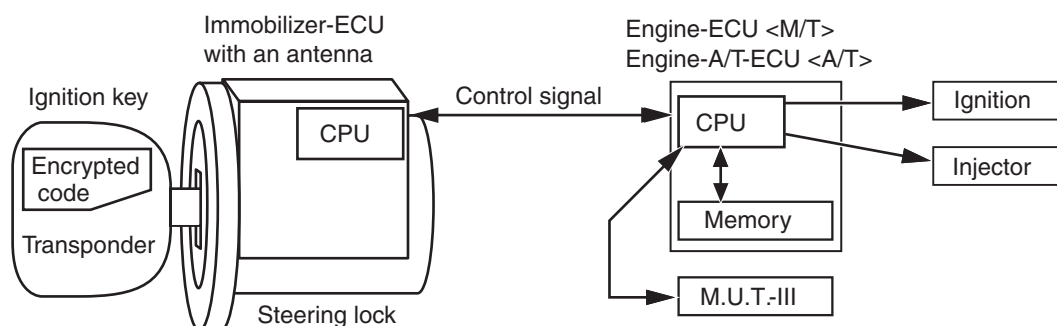
## CONSTRUCTION DIAGRAM

## Vehicles for Hong Kong and Singapore



AC406526AE

## Vehicles for GCC, Australia and New Zealand



AC503619AB

## MAIN COMPONENTS

## Vehicles for Hong Kong and Singapore

Component name	Outline of function
Transponder	Is power-supplied by the key ring antenna. When the transponder receives random number data, it processes it and the encrypted code. Then it transmits the process result to the ETACS-ECU.
Key ring antenna (included an amplifier)	The ETACS-ECU supplies power via an antenna on a steering lock by transmission of electromagnetic waves to a transponder built into a key, using magnetic coupling
Immobilizer-ECU	<ul style="list-style-type: none"> <li>Supplies electrical power to the transponder integrated in the ignition key, and transmits random number data.</li> <li>Verifies the encrypted code which is sent from the transponder. If the code is correct, it sends an engine mobilization signal to the engine-ECU &lt;M/T&gt;.</li> </ul>
Engine-A/T-ECU	Starts the engine, and then continues the engine running if an engine mobilization signal is confirmed. If an engine immobilization signal is confirmed, the ECU cancels the engine control and stops the engine.

**Vehicles for GCC, Australia and New Zealand**

Component name	Outline of function
Transponder	Is power-supplied by the immobilizer-ECU. When the transponder receives random number data, it processes it and the encrypted code. Then it transmits the process result to the immobilizer-ECU.
Immobilizer-ECU with an antenna	<ul style="list-style-type: none"> <li>Supplies electrical power to the transponder integrated in the ignition key, and transmits random number data.</li> <li>Verifies the encrypted code which is sent from the transponder. If the code is correct, it sends an engine mobilization signal to the Engine-ECU &lt;M/T&gt; or engine-A/T-ECU &lt;A/T&gt; to start the engine.</li> </ul>
Engine-ECU <M/T>, Engine-A/T-ECU <A/T>	Starts the engine, and then continues the engine running if an engine mobilization signal is confirmed. If an engine immobilization signal is confirmed, the ECU cancels the engine control and stops the engine.

**Encrypted code registration criteria table <Vehicles for Hong Kong and Singapore>****⚠ CAUTION**

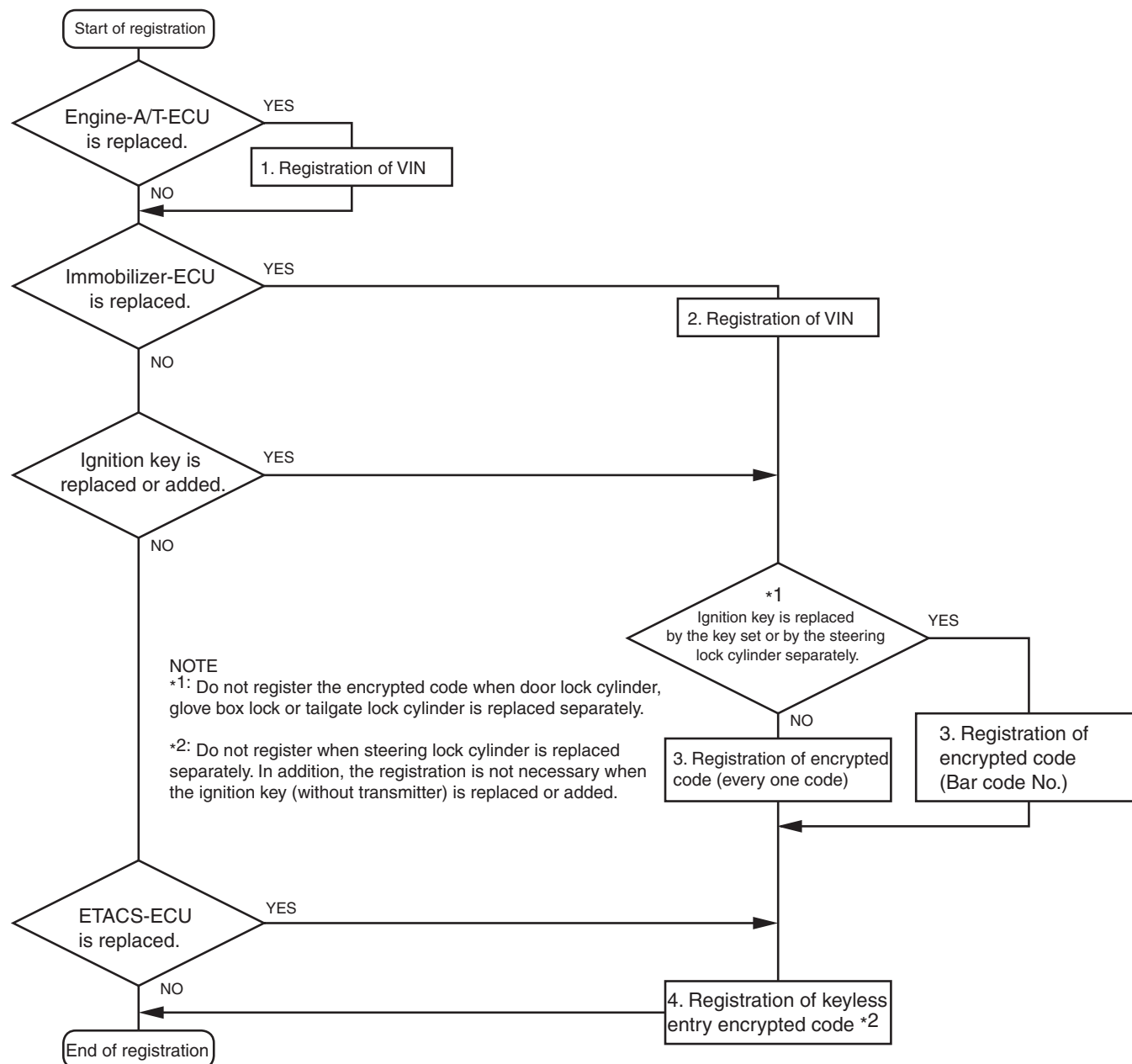
**Do not replace the engine-A/T-ECU, immobilizer-ECU and the ETACS-ECU simultaneously. Always replace the ECU by ones when the multiple ECU is replaced, and then replace the next ECU after registering the necessary IDs.**

The ignition key contains a transponder (small transmitter), which retains an unique encrypted code. Under any of the conditions described in the table below, the VIN and encrypted code should be registered in the immobilizer-ECU or engine-A/T-ECU again. In addition, the keyless entry encrypted code should be registered in the ignition key (with transmitter) and ETACS-ECU.

*NOTE: The immobilizer-ECU can retain maximum eight different ignition key in the memory.*

Item	Operation contents and procedure
When the engine-A/T-ECU is replaced	Write the VIN
When the engine-A/T-ECU is rewritten (other than immobilizer system-related item)	Operation is not needed
When the immobilizer-ECU is replaced	<ol style="list-style-type: none"> <li>Write the VIN</li> <li>Register all ignition key encrypted code again</li> </ol>
When the ETACS-ECU is replaced	Register all ignition key encrypted code again
When the key ring antenna is replaced	Operation is not needed
When the ignition key is added separately.	<ol style="list-style-type: none"> <li>Register all ignition key encrypted code again</li> <li>Register all ignition key encrypted code again (with transmitter only)</li> </ol>
When the ignition key is lost separately.	<ol style="list-style-type: none"> <li>Register all ignition key encrypted code other than the lost ignition key again</li> <li>Register all ignition key encrypted code other than the lost ignition key again</li> </ol>
When the ignition key is replaced by the set or the steering lock cylinder is replaced by the piece.	<ol style="list-style-type: none"> <li>Register all ignition key encrypted code again &lt;bar code No. input&gt;</li> <li>Register all ignition key encrypted code again (set supply only)</li> </ol>
When the door lock cylinder, glove box lock and tailgate lock cylinder are replaced	Register the replaced ignition key encrypted code

## Registration flow chart



AC503627AB

### Encrypted code registration criteria table <Vehicles for GCC, Australia and New Zealand>

The ignition key contains a transponder (small transmitter), which retains an unique encrypted code. Under any of the conditions below, the encrypted code should be registered in the immobilizer-ECU again. The immobilizer-ECU can retain maximum eight different encrypted codes. This means that maximum eight ignition keys can be registered.

Component to be replaced	Engine-ECU <M/T> or engine-A/T-ECU <A/T>	Immobilizer-ECU	Ignition key
When Engine-ECU <M/T> or Engine-A/T-ECU <A/T> is replaced	–	Should be replaced	Should be replaced
			All ignition keys should be registered



When Engine-ECU <M/T> or Engine-A/T-ECU <A/T> is overwritten*	–	Should not be replaced	Should not be replaced
			Should not be registered again
When immobilizer-ECU is replace	Should not be replaced	–	Should not be replaced
			All ignition keys should be registered again
When ignition key is added	Should not be replaced	Should not be replaced	<ul style="list-style-type: none"> <li>• Additional ignition key should be registered</li> <li>• All ignition keys should be registered again</li> </ul>
When ignition key is lost	Should not be replaced	Should not be replaced	All the ignition keys other than the lost one should be registered again

NOTE: \*: When the engine-ECU <M/T> or engine-A/T-ECU <A/T> other than immobilizer system is rewritten, it is not necessary to register the ignition key again.

## LIGHTING

M2540004000589

### EXTERIOR LAMPS

- The headlamp assembly employs the large four-lamp integrated with the front turn signal lamp and position lamp.
- The newly adopted discharge headlamp for low beam provides a much better view than ordinary halogen lamps. <Vehicles for Hong Kong and Singapore>
- The high intensity bulb is adopted for the high beam of the headlamp in order to improve visibility.
- The front fog lamp is equipped.
- The turn-signal lamp integrated in the door mirror is the LED-type designed to emphasize a clear taste in order to improve product package. At the same time, it improves visibility of the outer edge of vehicle in order to provide higher safety.
- The rear combination lamps are a large vertical-type integrated with the tail/stop lamp, turn-signal lamp, back-up lamp and reflex reflector.
- The LED type tail/stop lamps have been adopted for less power consumption and higher safety with illumination speed improvement.
- The LED-type high-mounted stop lamp is provided as standard equipment to improve safety.
- The headlamp automatic-shutdown function is adopted for the lighting system. (Refer to GROUP 54B, ECU functions and controls in the SWS [P.54B-13](#)).

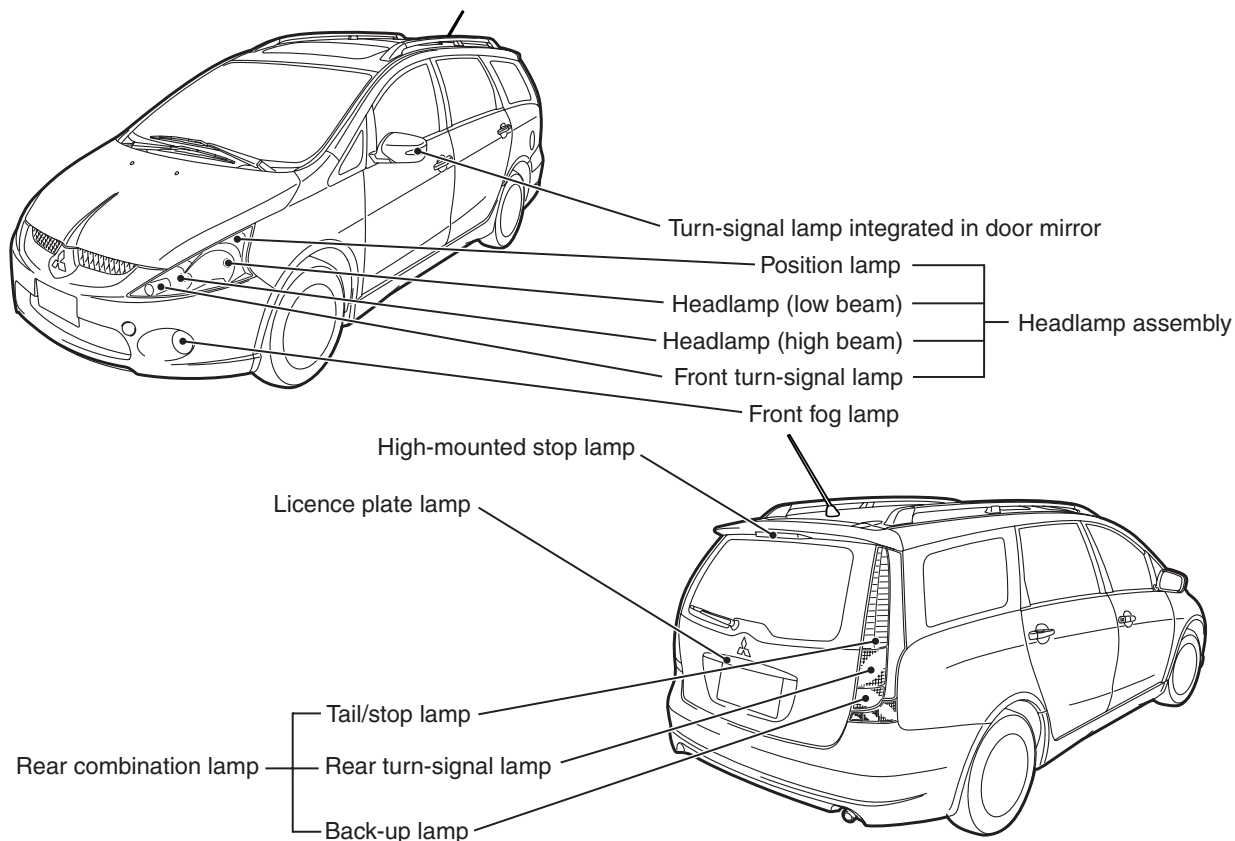
### Specifications

Item			Specifications
Headlamp assembly	Headlamp	Low-beam W (halogen headlamp)	55 (H1)
		Low-beam W (discharge headlamp)	35 (D2R)
		High-beam W	65 (H9)
	Position lamp W		5
	Front turn-signal lamp W		21
Front fog lamp W			51 (HB4)
Turn-signal lamp integrated in door mirror	Side turn-signal lamp		LED type

Item		Specifications
Rear combination lamp	Tail/stop	LED type
	Turn-signal W	21
	Back-up W	21
High-mounted stop lamp		LED type
Licence plate lamp W		5

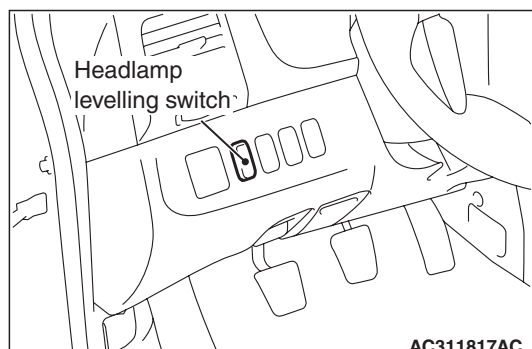
NOTE: The brackets ( ) show the bulb type.

## CONSTRUCTION DIAGRAM



AC313161AB

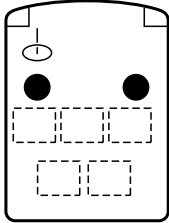
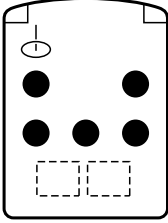
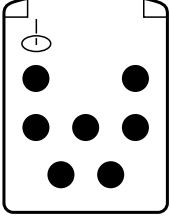
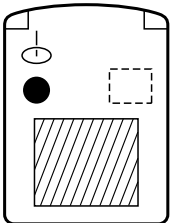
## Headlamp manual levelling system <Vehicles for GCC, Hong Kong and Singapore (Vehicles with halogen headlamp)>

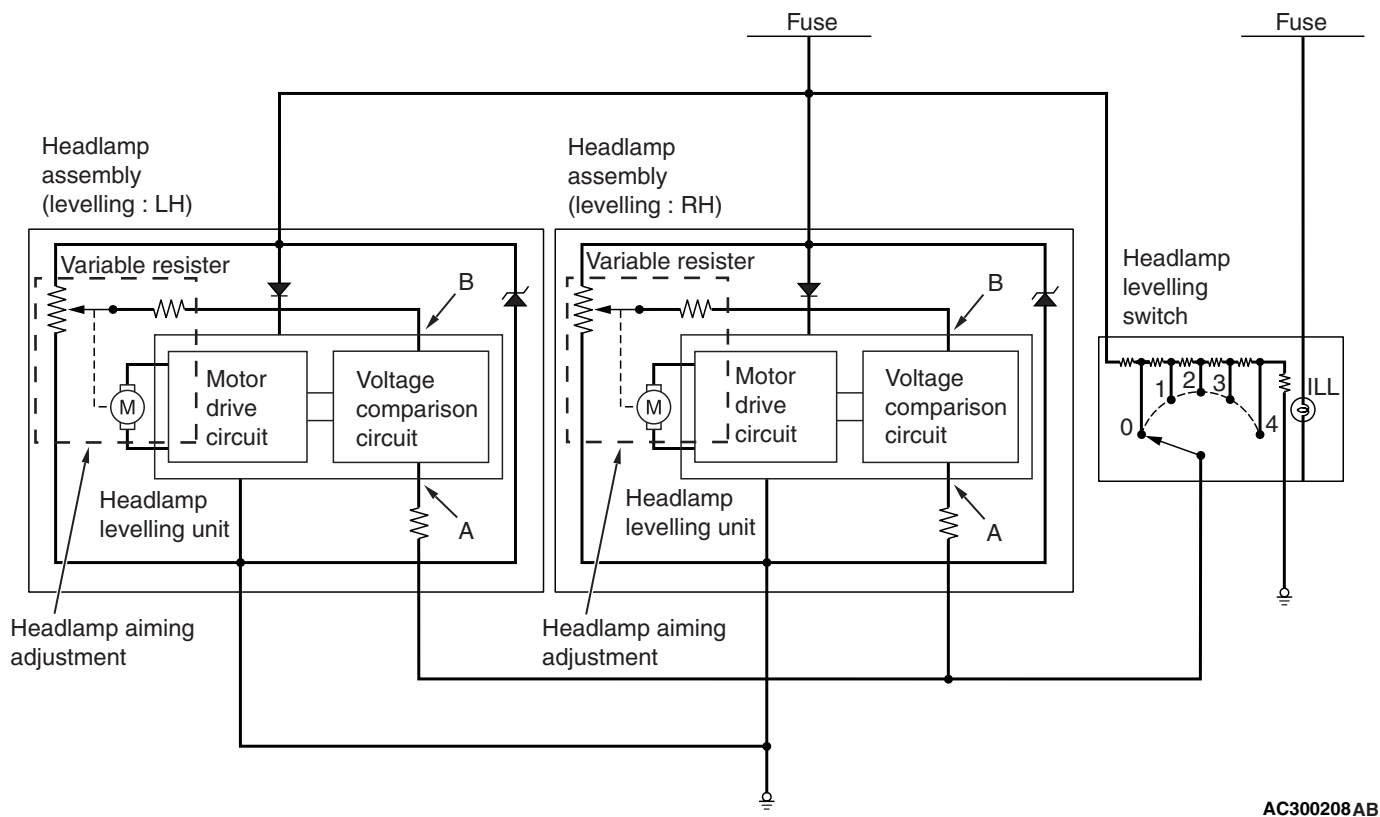


AC311817AC

The beam direction of the headlamps changes according to the number of passengers and the amount of load. The headlamp levelling function is a system that allows the driver to change the direction of headlamp beam so that the drivers of oncoming cars are not dazzled by the headlamps. The headlamp levelling switch allows changing the direction in five steps: 0 to 4.

**Relationship between the switch positions and the number of passengers/loads**

Switch position	0	1	2	3	4
Passenger and load	 1 or 2 passengers AC312000AB	 4 or 5 passengers AC312001AB	 6 or 7 passengers AC312002 AB	 Driver and heavy loads AC312003AB	When a more load than those to the left is on the vehicle

**OPERATION**

AC300208AB

1. The headlamp levelling switch increases the resistance as it is turned from 0 to 4. Turning the headlamp levelling switch changes the voltage at point A. When the headlamp levelling switch is turned from 0 to 4, the voltage at point A decreases. Upon detection of this voltage change, the headlamp levelling unit turns the motor to lower the beam direction. At this time, the resistance of the variable resistor in the headlamp assembly changes, and the voltage at point B decreases gradually. When the voltages at points A and B become equal, the headlamp levelling unit stops the motor.
2. Turning the headlamp levelling switch from 4 to 0 increases the voltage at point A, and then the headlamp levelling unit turns the motor in the direction opposite to that mentioned in Item 1, increasing the voltage at point B. When the voltages at points A and B become equal, the headlamp levelling unit stops the motor.
3. The headlamp levelling unit detects voltage changes caused by headlamp levelling switch operation, and turns the motor to change the directions of the headlamp reflectors for the adjustment of the headlamp beam direction.

## Headlamp automatic levelling system

### <Vehicles for Hong Kong and Singapore (Vehicles with discharge headlamp)>

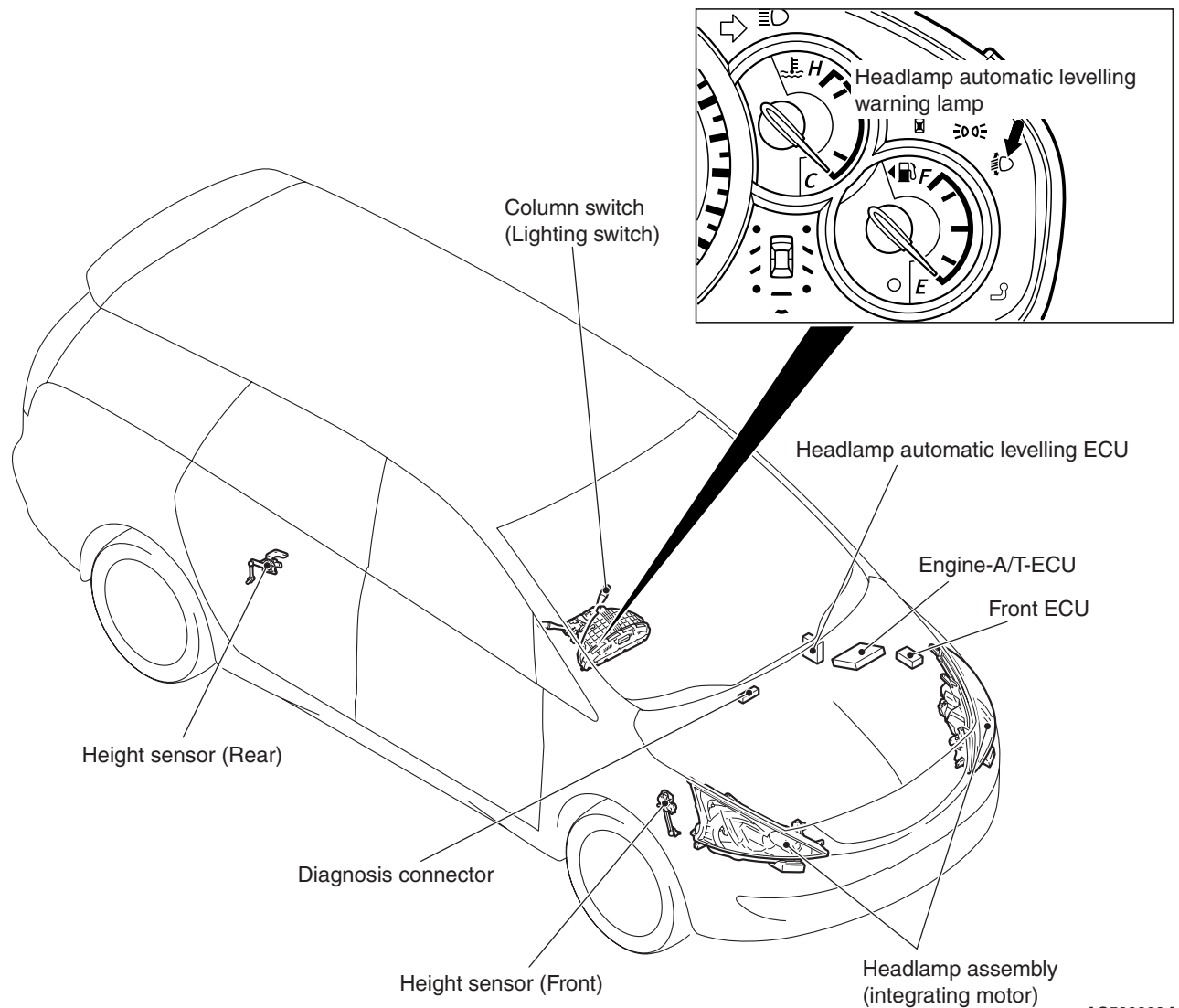
The beam direction of the headlamps (vertical angle) changes according to the number of passengers and the amount of load. The headlamp automatic levelling system is a system that automatically controls the beam direction of headlamps so that the drivers of oncoming cars are not dazzled by the headlamps if the beam direction of the headlamp upwards when parking or travelling at a constant speed.

### Function

The beam direction of headlamps is automatically controlled according to driving conditions as described in the table below.

Vehicle condition	Control content
When parking	The headlamp automatic levelling ECU calculates the vehicle pitch angle from the height sensor values according to the change in load resulting from getting on/off or loading/unloading to control the beam direction.
When driving at a constant speed	When a vehicle starts on curb, the travelling vehicle posture changes from the posture during parking, so that the beam direction changes. To control the improper beam direction caused by such vehicle posture change, the headlamp automatic levelling ECU calculates the vehicle pitch angle based on the average of height sensor values obtained for 12 seconds after the vehicle speed becomes constant. This beam direction control while driving at a constant speed is performed only once between a vehicle stop and the next stop. If driving is started at a constant speed on the gravel or rough road, to prevent unnecessary control resulting from detection of road uneven surface, the beam direction control is launched after the driving speed becomes constant on pavement.

## CONSTRUCTION DIAGRAM



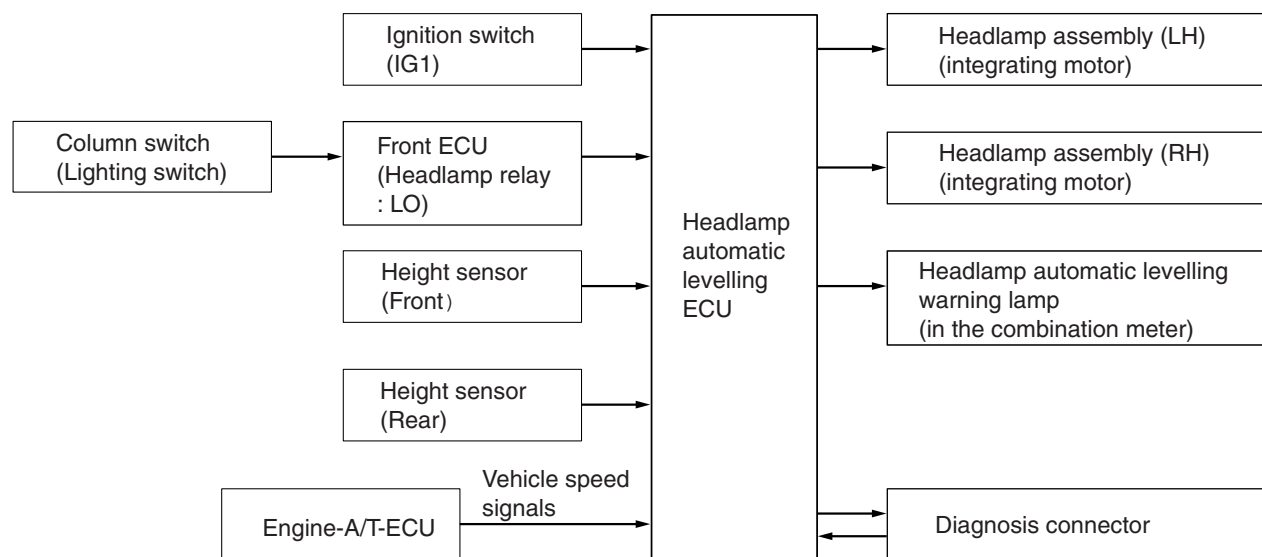
AC500983AB

## System component and function

Parts Name	Functional Description
Column switch (lighting switch)	When the lighting switch is set to the headlamp position, the headlamp relay (LO) inside the front-ECU turns ON to transmit the signal to the headlamp automatic levelling ECU.
Front-ECU	
Height sensor (Front)	Detects the elongation/contraction of the front suspension and transmits the signal to the headlamp automatic levelling ECU.
Height sensor (Rear)	Detects the elongation/contraction of the rear suspension and transmits the signal to the headlamp automatic levelling ECU.
Engine-A/T-ECU	Transmits vehicle speed signals to the headlamp automatic levelling ECU.
Headlamp assembly (integrating motor)	Drives the headlamp reflector by receiving signals from the headlamp automatic levelling ECU.

Headlamp automatic levelling warning lamp	Located in the combination meter. Lights up for warning when an abnormality occurs in the headlamp automatic levelling system.
Headlamp automatic levelling ECU	Controls the motor integrated in the headlamp assembly based on the signals from switches and sensors to control the beam direction according to the vehicle posture.
Diagnosis connector	Outputs diagnosis codes.

### System block diagram



AC500168AB

### FAIL-SAFE FUNCTION

Trouble spot	Trouble condition	Headlamp automatic levelling warning lamp	Countermeasures for trouble
Height sensor	Open or short circuit	ON	Control stop
Vehicle speed signal	Open or short circuit	-	Continues control when parking
Motor (integrated in headlamp assembly)	Open circuit	-	Control stop
	Short	ON	Control stop
Headlamp automatic levelling ECU	Open or short circuit	-	Control stop
	ECU is out of control.	-	Program reset by ECU self-diagnosis
Headlamp signal	Open or short circuit	-	Control stop

**Diagnosis code table**

Diagnosis code No.	Diagnostic item
21	Malfunction of the height sensor (Rear)
22	Height sensor abnormality (front)
23	Height sensor power supply short to earth
24	Pitch angle abnormality
31	Malfunction of the levelling unit

**INTERIOR LAMP**

- The lens-push type room lamp is adopted so that an excellent operation ability can be achieved allowing operation from driver and passenger seats.
- The rear personal lamps are installed in upper area of the rear door opening (both sides) for the second seat, and in upper area of the quarter window (both sides) for the third seat. Also, they are lens-push type with an excellent operation ability.
- The main interior lamp switch integrated in the room lamp enables turning ON/OFF all of room and rear personal lamps in order to improve operation ability.

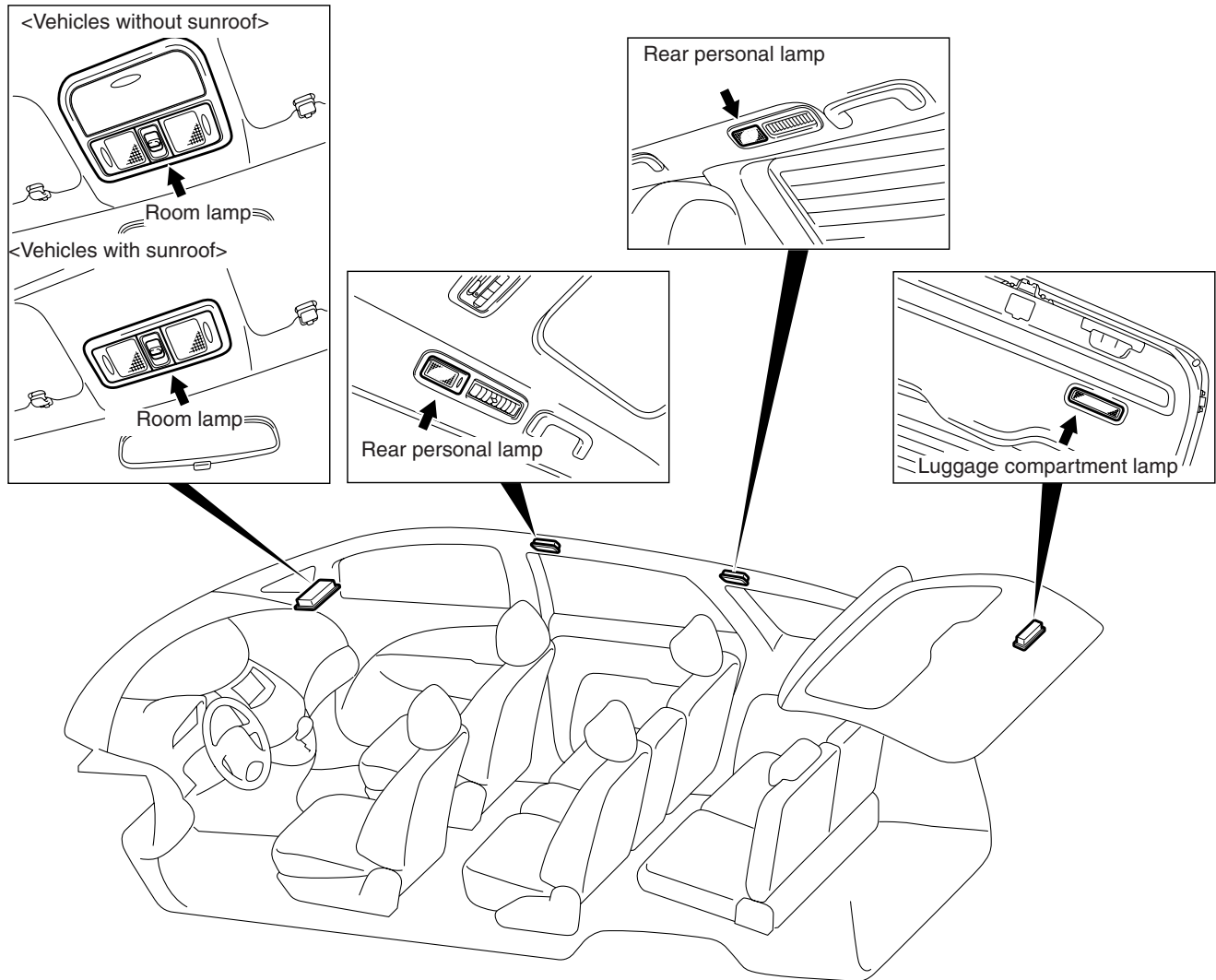
*NOTE: When the interior lamp switch (for front seat) is in the ON position, the front seat lamp illuminates even if the main interior lamp switch is in the OFF position.*

- The luggage compartment lamp is installed in the tailgate.
- Door lamps have been added to the front and rear doors.
- A glove box lamp has been added to the glove box.
- The interior lamp automatic-shutoff function is installed to prevent needless battery consumption caused by unattended operation of interior lamps (including door ajar indicator lamp and ignition key cylinder illumination lamp). <vehicles with keyless entry system> (Refer to GROUP 54B, ECU functions and controls in the SWS [P.54B-13](#)).

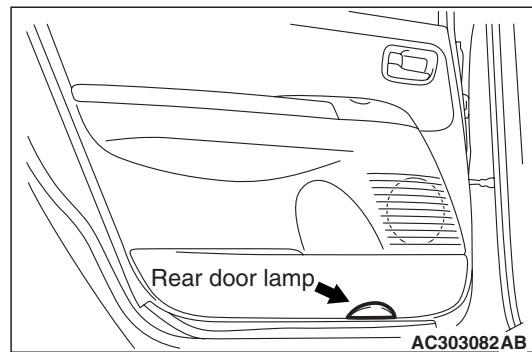
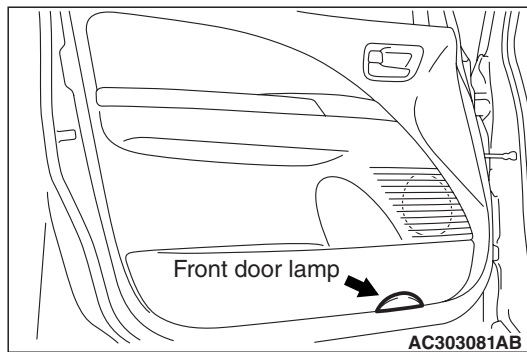
**Specifications**

Item	Specifications
Room lamp W × quantity	8 × 2
Rear personal lamp W	8
Luggage compartment lamp W × quantity	5 × 2
Door lamp W	8
Glove box lamp W	1.4

## CONSTRUCTION DIAGRAM



AC311882AB





## COMBINATION METER

M2540005000623

The combination meter features large, clearly visible analogue indicators. Designed to be easy-to-distinguish by drivers, the gauges are arranged with the speedometer in the middle, the coolant temperature gauge at upper right, the fuel gauge at lower right and the tachometer at left. The combination meter offers the following advantages.

- The high contrast meter using LED as a lighting source is standard equipped.
- The formed meter panel made of acrylic with a plated ring creates cubic appearance effect.
- With the ignition switch turned ON, the needles of speedometer and others, the ring area, and the panel surface illuminates staggeredly in 3 steps to create a luxury atmosphere.
- The rheostat integrated in the combination meter controls brightness of illumination in 4 steps for both daytime (non-dimming) and nighttime (dimming) modes.
- The nighttime dimming for the combination meter is controlled based on signals from the solar sensor so that the dimming is not performed in brighter circumstances such as a rainy daytime condition. <Vehicles for Hong Kong and Singapore>
- CAN communication is used for more reliable transmission of all gauge data and indicator lamp input signals, such as vehicle speed, engine RPM, and coolant temperature.

**NOTE:** For further details on CAN, refer to GROUP 54C, CAN [P.54C-2](#).

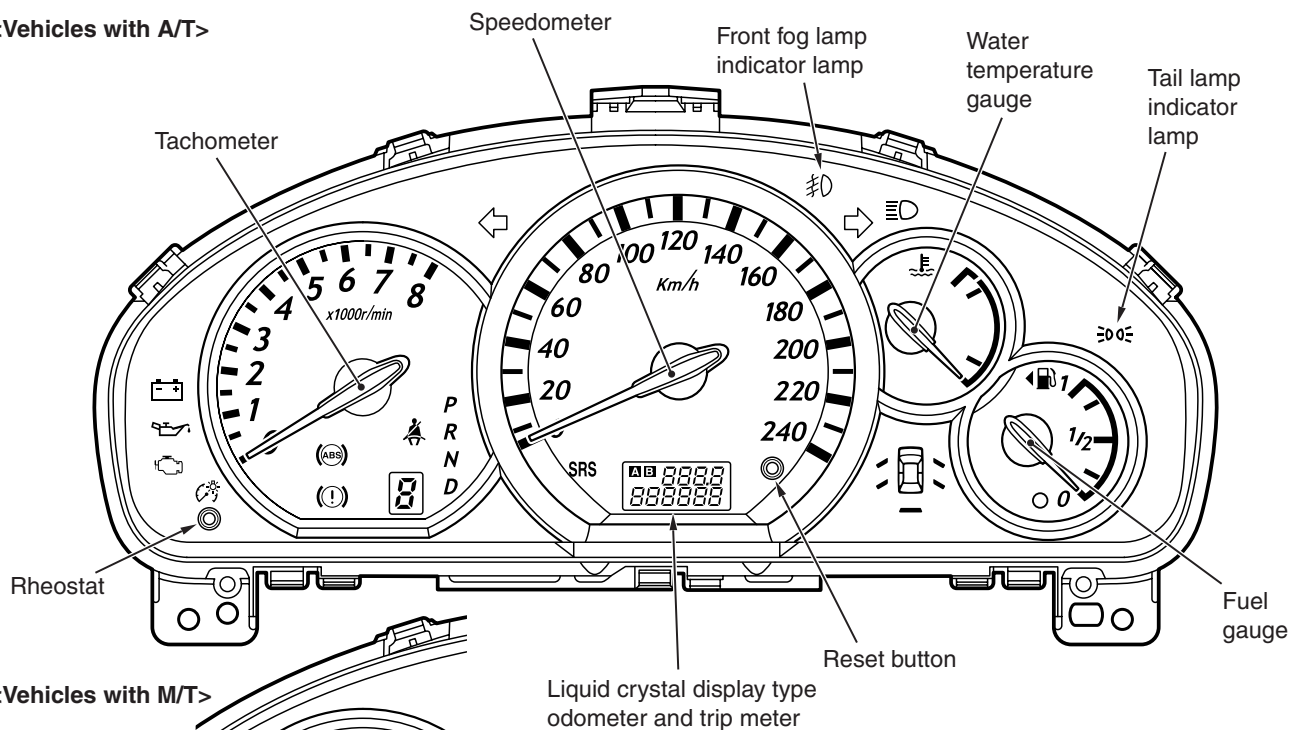
**NOTE:** The signals that the combination meter uses are described in the CAN communications input signals table .

- Several diagnosis functions such as the diagnosis code memory and actuator tests are prepared in order to improve serviceability.
- For a brighter display at night and for a longer useful life, all indicator lamps, warning lamps, and illumination bulbs use LEDs.
- The indicators for the speedometer, fuel gauge, and other gauges are driven by a stepping motor.
- The electric speedometer is adopted so that it is operated by vehicle speed signals sent from engine-ECU <M/T> or engine-A/T-ECU <A/T> via CAN communication.
- A large and clear LCD type odo-tripmeter is provided. The odometer continuously displays values while the tripmeter adopts a twin-trip (trip A, trip B) function which is switched by a reset button. Even with the ignition switch turned OFF, the odo-tripmeter is displayed by operating the reset button.
- Comes with a tail indicator lamp to let the driver know that the tail lamp is on.
- Comes with a front fog indicator lamp to let the driver know that the front fog lamps are on.
- Comes with a seat belt warning lamp to encourage the driver to fasten the seat belt.
- The shift position indicator digitally shows gear positions from 1st to 4th on the left of A/T indicator lamp for easy confirmation of gear positions. <A/T>

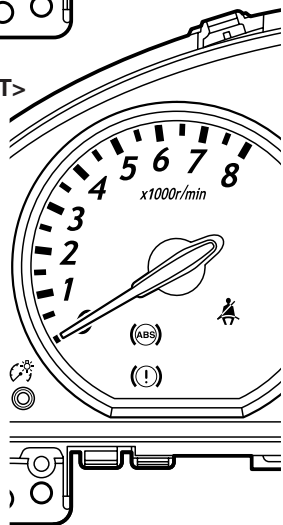
## CONSTRUCTION DIAGRAM

<Vehicles for General Export (Except for  
Hong Kong and Singapore), GCC>

<Vehicles with A/T>

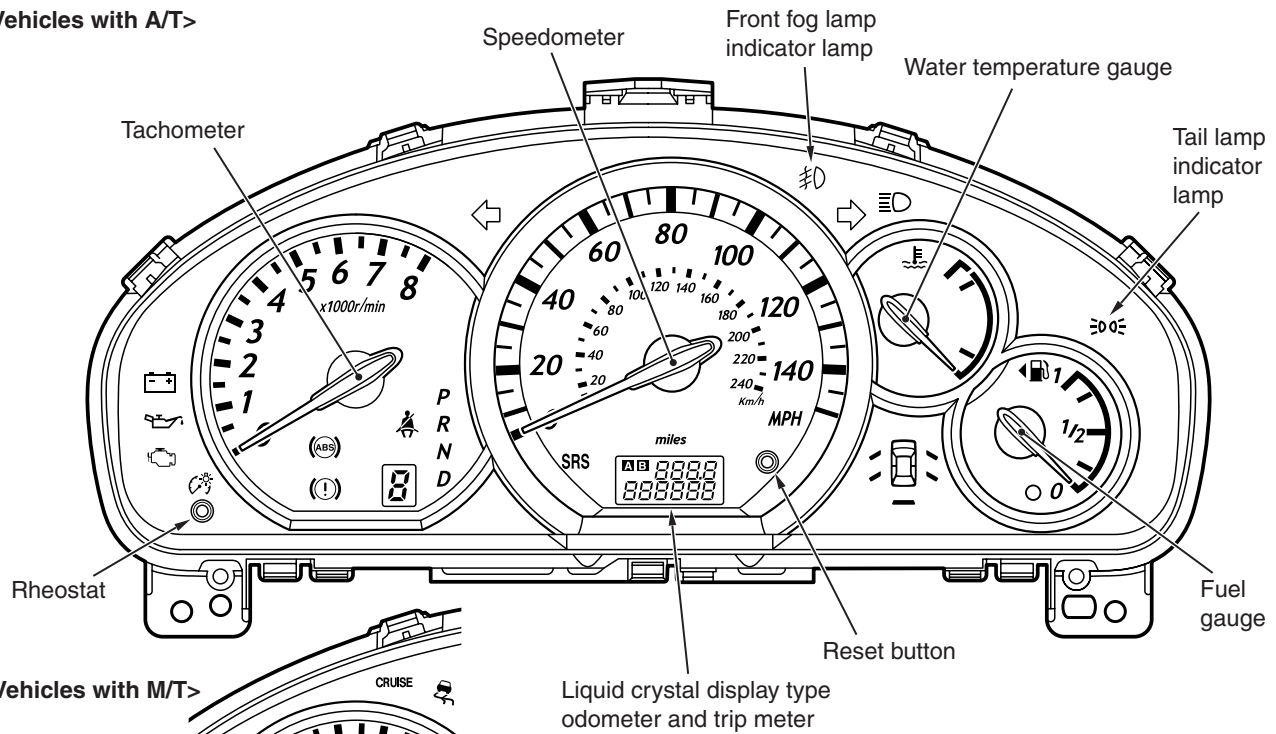


<Vehicles with M/T>

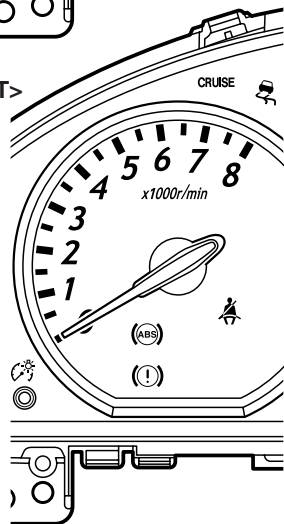


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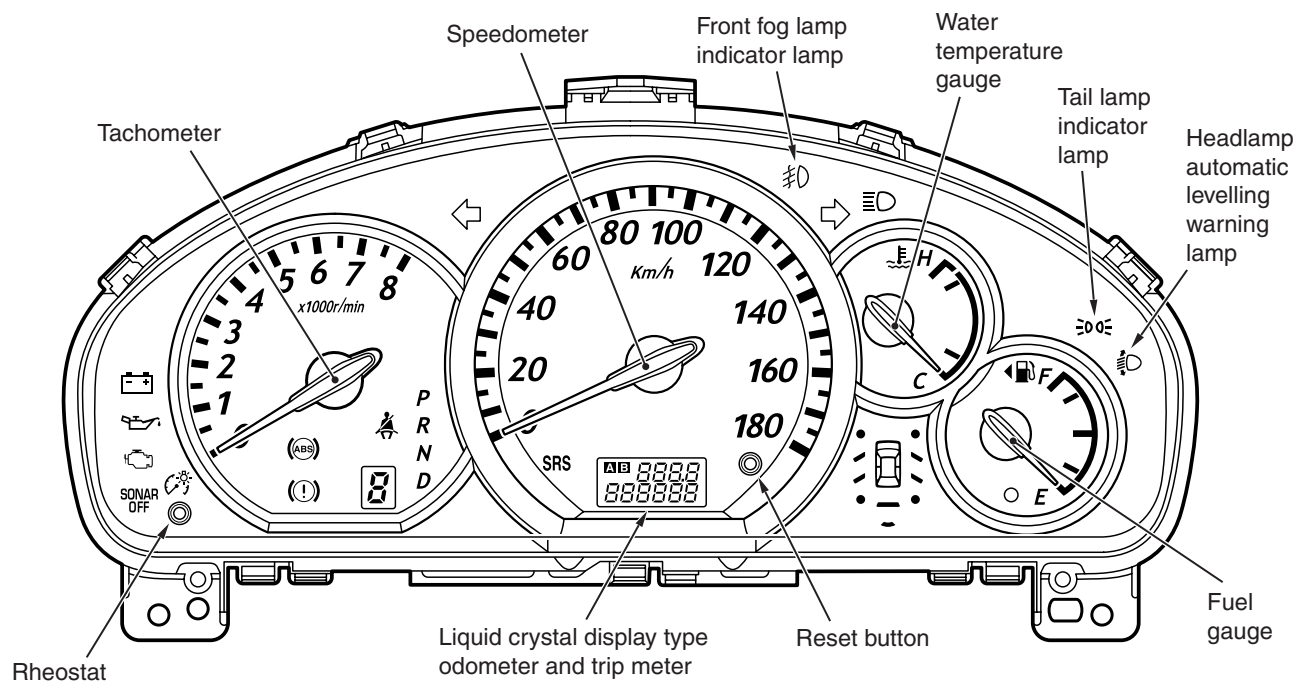
<Vehicles with A/T>



<Vehicles with M/T>

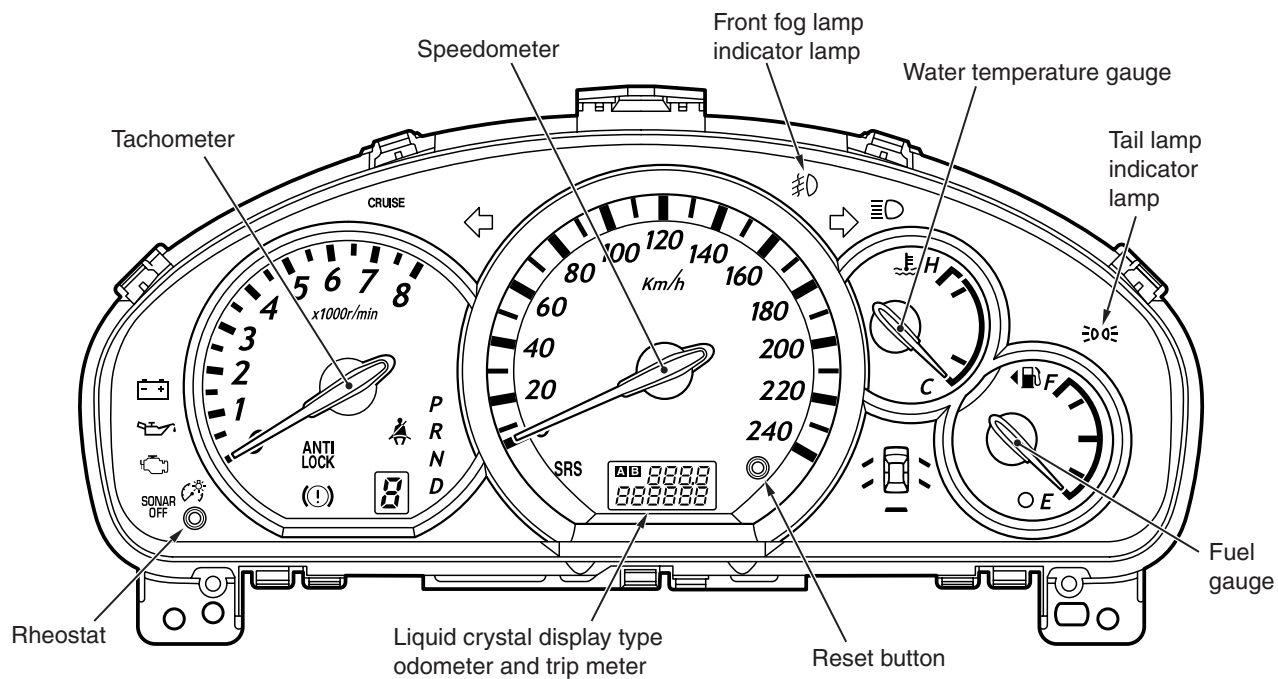


## &lt;Vehicles for Hong Kong and Singapore&gt;



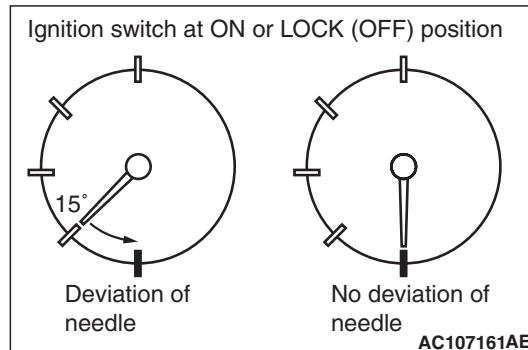
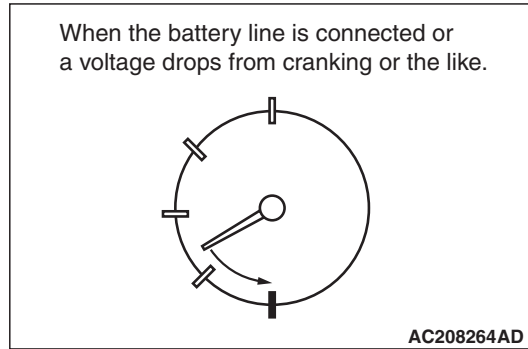
AC503455AB

## &lt;Vehicles for Australia and New Zealand&gt;



AC503456AB

## STEPPING MOTOR



These gauges use a stepping motor as the drive mechanism for the indicators (called the "movement"). Compared with conventional movements, the torque for driving the indicators is much greater for superior indicator accuracy and more stable

response. The indicator position displayed is determined as the microcontroller circuit in the gauge controls the stepping motor. In conventional gauges, the indicator revolves  $360^\circ$  in response to  $360^\circ$  driving controls. However, a stepping motor is designed so that the indicator revolves only  $15^\circ$ , even in response to a drive control of  $360^\circ$ . The  $15^\circ$  drive control must be repeated to make the indicator rotate  $360^\circ$ . Thus, at a position  $15^\circ$  away from the indicator display position, there will be an identical control. As a result, in the case of a great impact such as from an accident when the indicator becomes misaligned, if the ignition is switched on to start driving while the indicator is misaligned, the indicator will function while misaligned. Thus, to return the indicator to the normal position in case this happens, when the ignition is switched on, the indicator positions are reset to their respective positions after the battery line is connected after it is cut. After the battery line is cut and reconnected, the indicators simply return to the zero position. The same operation is performed after voltage is restored if gauge functions are lost because of a voltage drop from cranking or the like. Furthermore, the indicator only returns  $15^\circ$  after the ignition is switched on or the lock is turned off. The indicator is not moved if it is not misaligned.

## CAN COMMUNICATION INPUT SIGNALS TABLE

Signal	Transmitter ECU
Engine speed signal	Engine-ECU <M/T> or engine-A/T-ECU <A/T>
Vehicle speed signal	
Vehicle stop signal	
Malfunction indicator lamp request signal	
Auto-cruise control indicator lamp signal	
Engine coolant temperature signal	
Selector position signal <A/T>	
ABS warning light request signal	ABS-ECU
Indicator request signal	
SRS warning lamp illumination request signal	SRS-ECU

Signal	Transmitter ECU
Communication standby signal	ETACS-ECU
Ignition switch (ACC) signal	
Ignition switch (IG1) signal	
High-beam indicator request signal	
Turn-signal indicator request signal	
Front fog light indicator request signal	
Illumination signal	
Door "open" signals	
Interior light shut-off signal	

**DIAGNOSIS CODE TABLE**

Code No.	Diagnostic item
B1200	Malfunction odometer
B1201	Trouble of fuel information
U1073	Bus Off
U1100	Engine-ECU <M/T> or engine-A/T-ECU <A/T> time-out (related to engine)
U1101*	Engine-A/T-ECU <A/T> time-out (related to transmission)
U1102	ABS-ECU time-out
U1109	ETACS-ECU time-out
U1112	SRS-ECU time-out
U1120	Failure information on engine-ECU <M/T> or engine-A/T-ECU <A/T> (related to engine)
U1206	Flag invalid

NOTE: \*: For M/T-vehicles, diagnosis code No. U1101 does not mean that there is a problem.

**DATA LIST REFERENCE TABLE**

Item No.	Check items	Check conditions	Normal conditions
80	Speedometer	Perform a test run of the vehicle.	Speedometer displayed value and M.U.T.-III displayed value agree with each other.*
81	Speedometer (target value)	Perform a test run of the vehicle.	Speedometer displayed value and M.U.T.-III displayed value agree with each other.*
82	Vehicle speed sensor malfunction flag	Ignition switch: ON	Without
83	Vehicle speed sensor definite flag	Ignition switch: ON	Set
84	Vehicle stopped flag	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Vehicle speed 0 km/h</li> </ul>	Set
87	Tachometer	Start the engine.	Tachometer displayed value and M.U.T.-III displayed value agree with each other.

Item No.	Check items	Check conditions	Normal conditions
89	Fuel gauge	Ignition switch: ON	Fuel gauge unit resistance value and M.U.T.-III displayed value agree with each other.
8A	Fuel gauge (target value)	Ignition switch: ON	Fuel gauge and M.U.T.-III displayed values agree with each other.
8C	Water thermometer	Ignition switch: ON	Water thermometer and M.U.T.-III displayed values agree with each other.
8E	Water thermometer definite flag	Ignition switch: ON	Set
90	Odometer	Ignition switch: ON	Odometer displayed value and M.U.T.-III displayed value agree with each other.
91	Rheostat	Ignition switch: ON	The brightness of the combination meter illumination changes.
92	Tripmeter A	Ignition switch: ON	Tripmeter A displayed value and M.U.T.-III displayed value agree with each other.
93	Tripmeter B	Ignition switch: ON	Tripmeter B displayed value and M.U.T.-III displayed value agree with each other.
A1	SRS warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>After warning lamp pre-check</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>During warning lamp pre-check</li> </ul>	ON
A2	ABS warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>After warning lamp pre-check</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>During warning lamp pre-check</li> </ul>	ON
A3	Hydraulic pressure warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>After starting the engine</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Before starting the engine</li> </ul>	ON
A4	Charging warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>After starting the engine</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Before starting the engine</li> </ul>	ON
A5	Engine warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>After warning lamp pre-check</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>During warning lamp pre-check</li> </ul>	ON
A6	Fuel reserve warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Much fuel</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Poor fuel</li> </ul>	ON

Item No.	Check items	Check conditions	Normal conditions
A7	Brake warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Parking brake: At release</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Parking brake operates</li> <li>During warning lamp pre-check</li> </ul>	ON
A8	Seat belt warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Driver's seatbelt: fastened</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Driver's seatbelt: Not fastened</li> </ul>	ON
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Front passenger: Set</li> <li>Driver's seatbelt: Not fastened</li> </ul>	ON
B1	Turn-signal indicator (RH)	Turn signal lamp: OFF or only left side lamp illuminates	OFF
		Turn signal lamp: Right side lamp illuminates	ON
B2	Turn-signal indicator (LH)	Turn signal lamp: OFF or only right side lamp illuminates	OFF
		Turn signal lamp: Left side lamp illuminates	ON
B3	Front fog lamp indicator	Front fog lamp: OFF	OFF
		Front fog lamp: ON	ON
B4	High-beam indicator	Headlamps: OFF or low beam illuminates	OFF
		Headlamps: High beam illuminates	ON
B5	Door indicator (front, LH)	Left side front door closed	OFF
		Left side front door open	ON
B6	Door indicator (front, RH)	Right side front door closed	OFF
		Right side front door open	ON
B7	Door indicator (rear, LH)	Left side rear door closed	OFF
		Left side rear door open	ON
B8	Door indicator (rear, RH)	Right side rear door closed	OFF
		Right side rear door open	ON
B9	Door indicator (tailgate)	Tailgate closed	OFF
		Tailgate open	ON
BA	Position lamp indicator	Position lamp: OFF	OFF
		Position lamp: ON	ON
C1	A/T indicator: P	Shift position: Other than P position	OFF
		Shift position: P position	ON
C2	A/T indicator: R	Shift position: Other than R position	OFF
		Shift position: R position	ON
C3	A/T indicator: N	Shift position: Other than N position	OFF
		Shift position: N position	ON



Item No.	Check items	Check conditions	Normal conditions
C4	A/T indicator: D	Shift position: Other than D position	OFF
		Shift position: D position	ON
C8	A/T indicator: 4	Shift position: Other than 4 position	OFF
		Shift position: 4 position	ON
C9	A/T indicator: 3	Shift position: Other than 3 position	OFF
		Shift position: 3 position	ON
CA	A/T indicator: 2	Shift position: Other than 2 position	OFF
		Shift position: 2 position	ON
CB	A/T indicator: 1	Shift position: Other than 1 position	OFF
		Shift position: 1 position	ON
D1	Cruise	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Cruise main switch: OFF</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Cruise main switch: ON</li> </ul>	ON
D7	Oil level warning lamp	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>After starting the engine</li> </ul>	OFF
		<ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Before starting the engine</li> </ul>	ON

*NOTE: \* indicates that the slowest vehicle speed is 5 km/h.*

## ACTUATOR TEST TABLE

Item No.	Check items	Test content	Check conditions	Normal conditions
80	Speedometer	Set the speedometer to 0 km/h	Turn the ignition switch to the ON position.	Speedometer shows 0 km/h
81		Set the speedometer to 40 km/h		Speedometer shows 40 km/h
82		Set the speedometer to 100 km/h		Speedometer shows 100 km/h
84	Tachometer	Set the tachometer to 0 r/min	Turn the ignition switch to the ON position.	Tachometer shows 0 r/min
85		Set the tachometer to 2,000 r/min		Tachometer shows 2,000 r/min
86		Set the tachometer to 5,000 r/min		Tachometer shows 5,000 r/min
88	Water thermometer	Set the water thermometer to 0 °C	Turn the ignition switch to the ON position.	Water thermometer shows 0 °C
89		Set the water thermometer to 85 °C		Water thermometer shows 85 °C
8A		Set the water thermometer to 126 °C		Water thermometer shows 126 °C

Item No.	Check items	Test content	Check conditions	Normal conditions
90	Fuel gauge (target value)	Set the fuel gauge to 0 %	Turn the ignition switch to the ON position.	Fuel gauge shows 0 %
91		Set the fuel gauge to 50 %		Fuel gauge shows 50 %
92		Set the fuel gauge to 100 %		Fuel gauge shows 100 %
A0	Combination meter illumination	Set the combination meter illumination to 0 %	Turn the ignition switch to the ON position.	Combination meter illumination is 0 %
A1		Set the combination meter illumination to 50 %		Combination meter illumination is 50 %
A2		Set the combination meter illumination to 100 %		Combination meter illumination is 100 %
A3	Indicator lamp and warning lamp	Illuminate the indicator lamp and the warning lamp.	Turn the ignition switch to the ON position.	Turn, door, fog, high beam, parking brake, check engine, charge, oil pressure, SRS, ABS and seatbelt indicator lamps, and fuel and cruise warning lamps illuminate.
A4		Extinguish the indicator lamps and the warning lamps.		Turn, door, fog, high beam, parking brake, check engine, charge, oil pressure, SRS, ABS and seatbelt indicator lamps, and fuel and cruise warning lamps go out.
A5		Illuminate the indicator lamp and the warning lamp.		The position indicator lamp illuminates.
A6		Extinguish the indicator lamps and the warning lamps.		The position indicator lamp goes out.
A7		Illuminate the indicator lamp and the warning lamp.		The oil level warning lamp illuminates.
		Extinguish the indicator lamps and the warning lamps.		The oil level warning lamp goes out.
A9	A/T indicator lamp and display	Illuminate the A/T indicator lamp or display the A/T indicator.	Turn the ignition switch to the ON position.	<ul style="list-style-type: none"><li>A/T indicator lamp (P, R, N, D) illuminates.</li><li>A/T indicator displays gear position (1,2,3 or 4) on LED.</li></ul>
AA		Illuminate the A/T indicator lamp or display no A/T indicator.		<ul style="list-style-type: none"><li>A/T indicator lamp (P, R, N, D) goes out.</li><li>A/T indicator does not display gear position (1,2,3 or 4) on LED.</li></ul>

## CORNER SENSOR <Vehicles for Hong Kong, Singapore, Australia and New Zealand>

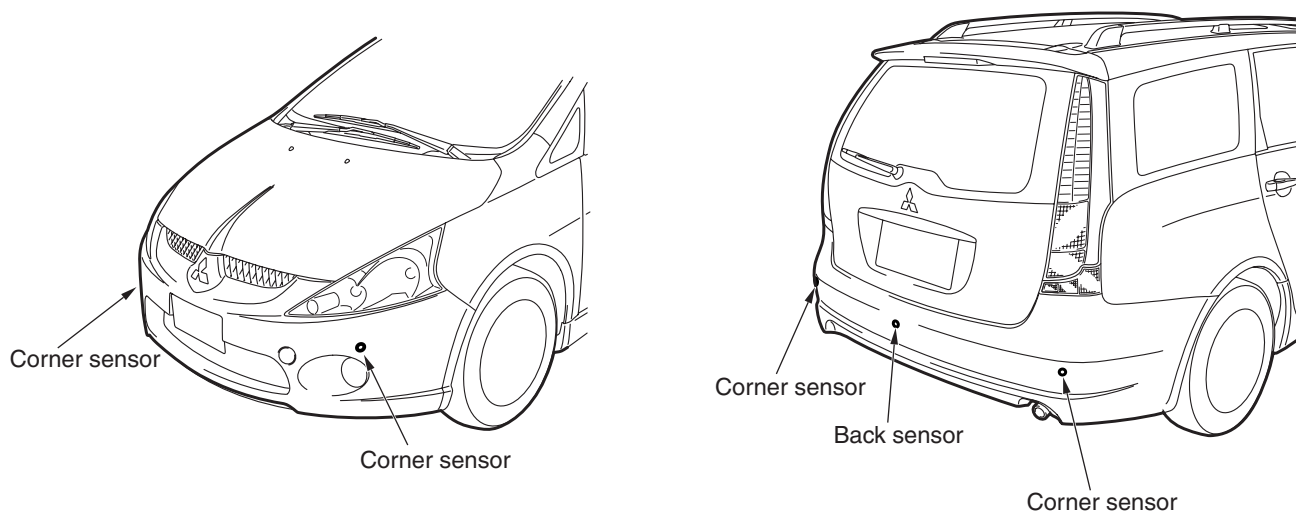
M2540000200150

The corner sensors (on each corner of the front bumper <vehicles for Hong Kong and Singapore> and the rear bumper) and the back sensor (on the centre of the rear bumper) are equipped with ultrasonic sensors to detect the obstacles at the corners and to rearward of the vehicle. They inform the driver of the position of the obstacles and remaining distance between the vehicle and obstacles, using the buzzer and warning indicator on the combination meter. The corner sensor system improves safety and drivability during garage or parallel parking maneuver.

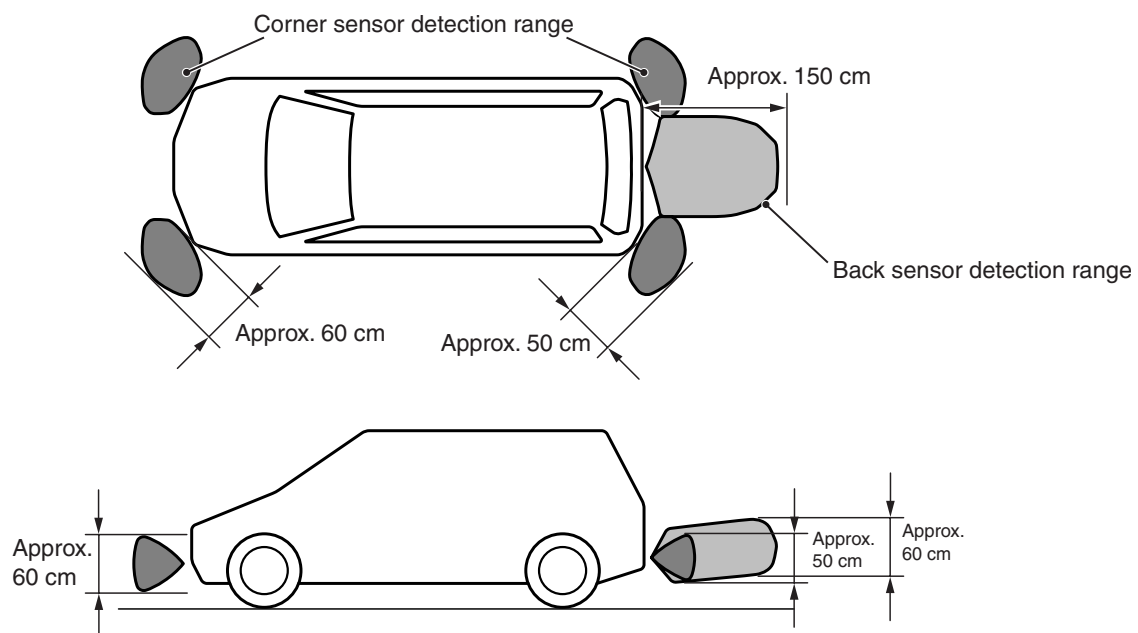
- Automatically active system by select reverse position.
- Depending on whether the vehicle is equipped with a towing bar, you can change the corner sensor between the standard mode and the towing bar mode. The towing bar mode changes the system to exclude in the area in which the towing is mounted from the detection areas. <vehicles for Australia and New Zealand>

*NOTE: The detection range of the sensor varies with temperature and humidity. Obstacles below the bumpers or curbstone not taller than the sensor position may be hard to be detected.*

## &lt;Vehicles for Hong Kong and Singapore&gt;

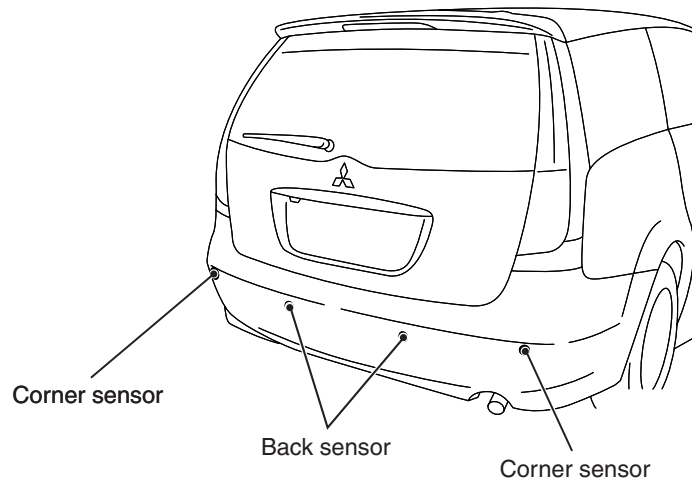


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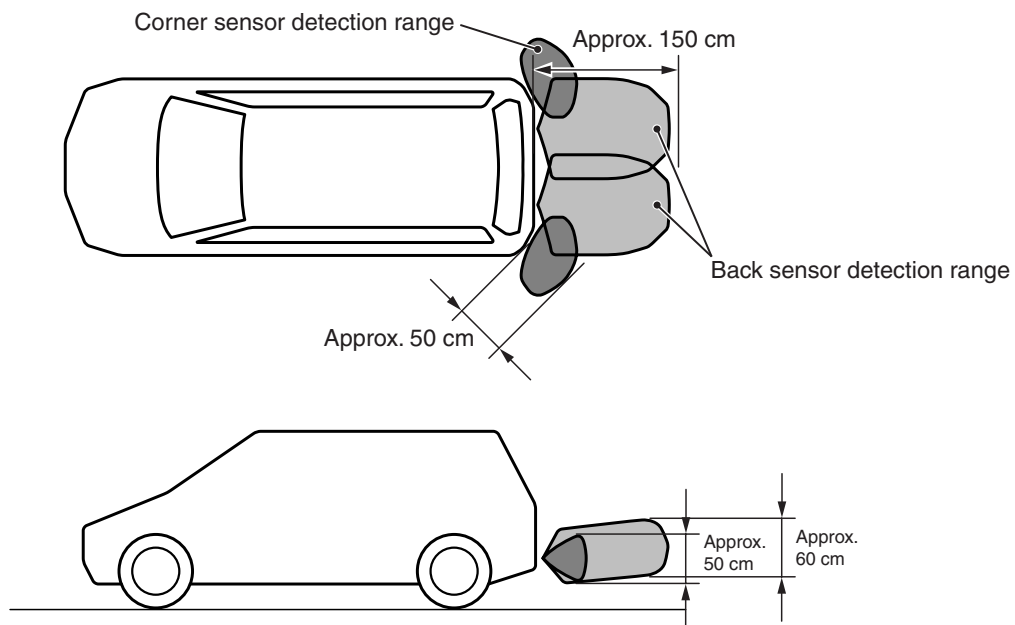


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## &lt;Vehicles for Australia and New Zealand&gt;

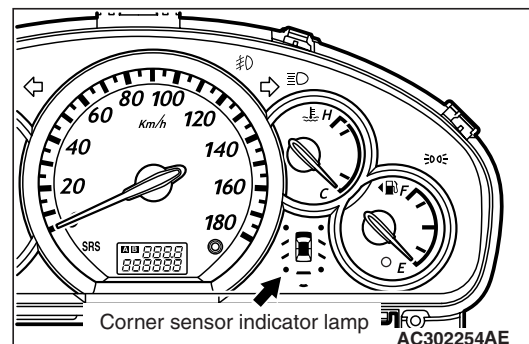


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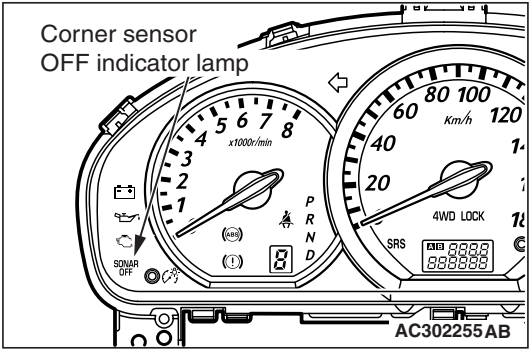
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## OPERATION

CORNER SENSOR INDICATOR LAMP  
BULB CHECK <VEHICLES FOR HONG  
KONG AND SINGAPORE>

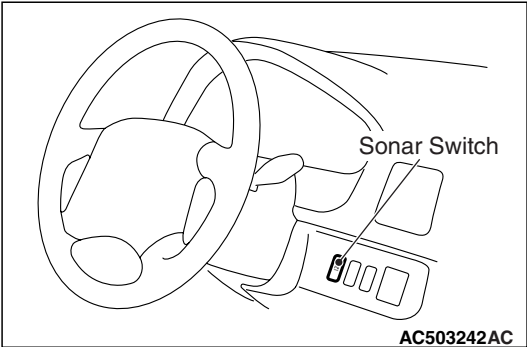
When the ignition switch is turned to the ON position, the corner sensor system is activated and performs bulb check by illuminating the corner sensor indicator lamp for a certain period.

ACTIVATION/DEACTIVATION OF  
CORNER SENSOR SYSTEM



By operating the corner switch, the system can be turned on (corner sensor OFF indicator lamp: OFF) and off (corner sensor OFF indicator lamp: ON).

THE TOWING BAR MODE SELECT  
<VEHICLES FOR AUSTRALIA AND NEW  
ZEALAND>



Shift the gear to the "R" (reverse) position and press and hold the sonar switch for 3 seconds. The standard mode can, therefore, be switched to the towing bar mode.

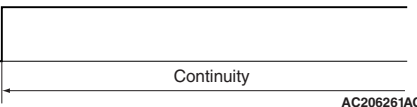
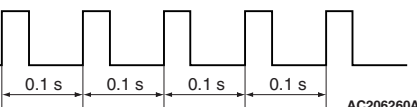
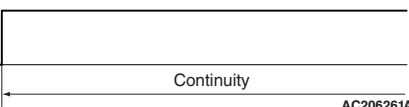
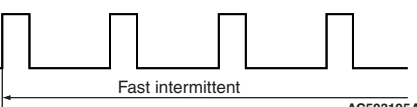
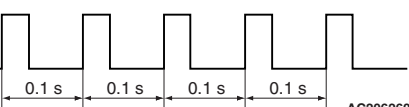
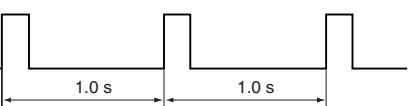
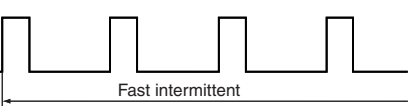
PATTERNS AND DURATION OF  
WARNING BUZZER <VEHICLES FOR  
HONG KONG AND SINGAPORE>

- 1. Buzzer function is integrated into the corner sensor-ECU. When the corner sensor is activated, the low-tone beep is sounded for the corner sensor, and the high-tone beep for the back sensor so that the driver easily recognizes which sensor is activated. The beep tone of the front and rear corner sensors is identical.
- 2. The buzzer duration varies with the remaining distance between vehicle and obstacles.

Distance between vehicle and obstacles		Buzzer duration	
Corner sensor	Back sensor		
Approx. 40 - 60 cm (front)	Approx. 100 - 150 cm	Buzzer: ON	<p>AC206259 AB</p>
Approx. 40 - 50 cm (rear)		Buzzer: OFF	
Approx. 20 - 40 cm	Approx. 50 - 100 cm	Buzzer: ON	<p>AC206260 AB</p>
		Buzzer: OFF	
Approx. 0 - 20 cm	Approx. 0 - 50 cm	Buzzer: ON	<p>Continuity</p> <p>AC206261 AB</p>
		Buzzer: OFF	

## **PATTERNS AND DURATION OF WARNING BUZZER <VEHICLES FOR AUSTRALIA AND NEW ZEALAND>**

The buzzer duration varies with the remaining distance between vehicle and obstacles.

<b>Distance between vehicle and obstacles</b>	<b>Buzzer duration</b>	
	<b>The standard mode</b>	<b>The towing bar mode</b>
Less than approx. 40 cm	Buzzer: ON Buzzer: OFF  Continuity AC206261AC	Buzzer: OFF
Approx. 40 - 60 cm	Buzzer: ON Buzzer: OFF  0.1 s 0.1 s 0.1 s 0.1 s AC206260AC	Buzzer: ON Buzzer: OFF  Continuity AC206261AC
Approx. 60 - 140 cm	Buzzer: ON Buzzer: OFF  Fast intermittent AC503195AB	Buzzer: ON Buzzer: OFF  0.1 s 0.1 s 0.1 s 0.1 s AC206260AC
Approx. 140 cm or more	Buzzer: ON Buzzer: OFF  1.0 s 1.0 s AC206259AC	Buzzer: ON Buzzer: OFF  Fast intermittent AC503195AB

## **RADIO, TAPE PLAYER, CD PLAYER, SPEAKER, ANTENNA**

M2540006000541

### **RADIO AND TAPE PLAYER OR RADIO AND CD PLAYER**

Two types of 1DIN size integrated audio units are provided for the radio and tape player or radio and CD player.

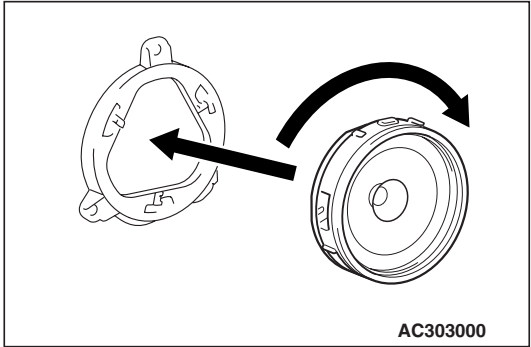
<b>Item</b>	<b>Type 1* &lt;For General Export (except for Hong Kong and Singapore) and GCC&gt;</b>	<b>Type 2* &lt;For General Export (except for Hong Kong and Singapore), Australia and New Zealand&gt;</b>	<b>Type 3 &lt;For Australia and New Zealand&gt;</b>
AM/FM electronic tuning radio	Equipped	Equipped	Equipped
Tape player	Equipped	—	—
CD player	—	Equipped	Equipped
Power amplifier with radio	25W × 4	25W × 4	25W × 4
Anti -theft system	—	—	Equipped

**NOTE:** The \* mark indicates optional item.

SPEAKER

Location	Four speakers <For General Export (except for Hong Kong and Singapore), GCC, Australia and New Zealand>	Six speakers <For Hong Kong, Singapore, General Export* (except for Hong Kong and Singapore), Australia and New Zealand*>
Front door	–	Equipped (tweeter – 3.5 cm)
	Equipped (dual cone full range – 16 cm)	Equipped (dual cone full range – 16 cm)
Rear door	Equipped (dual cone full range – 16 cm)	Equipped (dual cone full range – 16 cm)

NOTE: The \* mark indicates optional item.



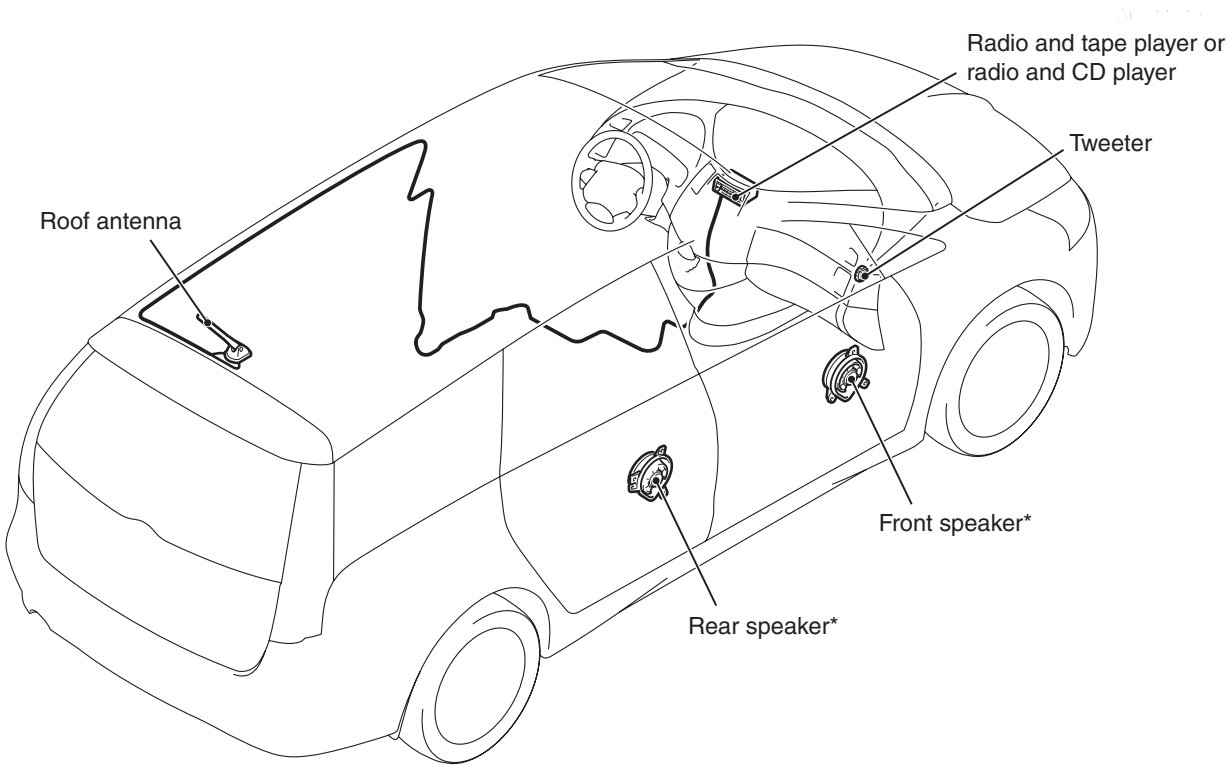
The 16-cm speaker (with 3 tabs, fixed by rotating) which can be installed by one-touch improves serviceability.

ANTENNA

Two types of antenna have been adopted.

- Glass antenna <For Hong Kong and Singapore>
- Roof antenna <For General Export (except for Hong Kong and Singapore), GCC, Australia and New Zealand>

CONSTRUCTION DIAGRAM  
<L.H. DRIVE VEHICLES>

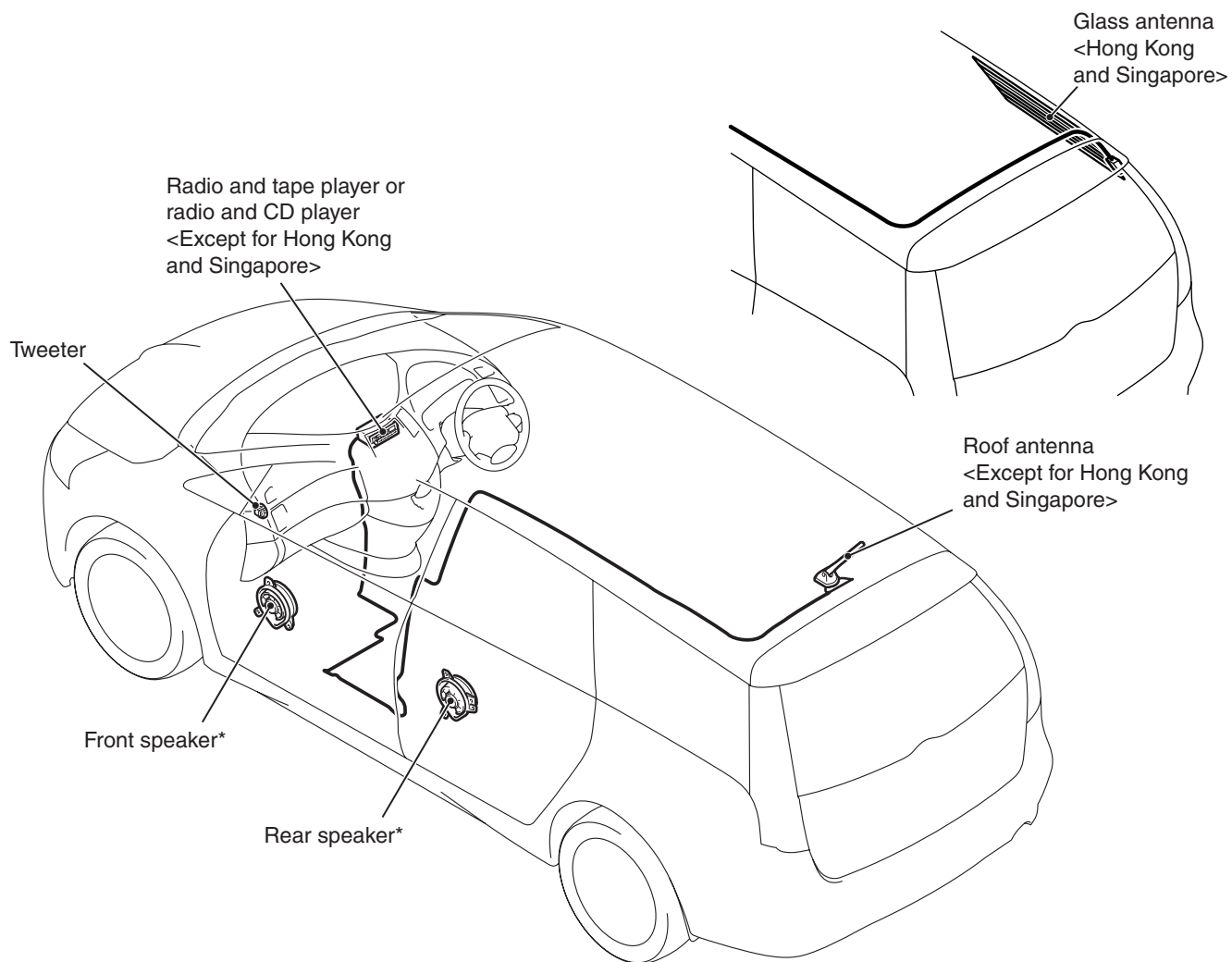


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NOTE: The \* indicates equipped on the left and right sides.



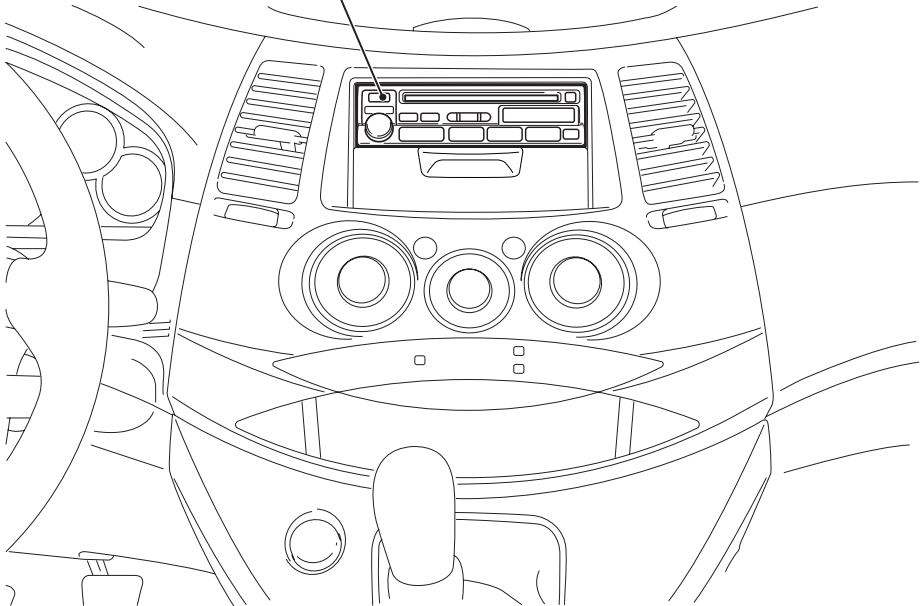
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AC503403AB

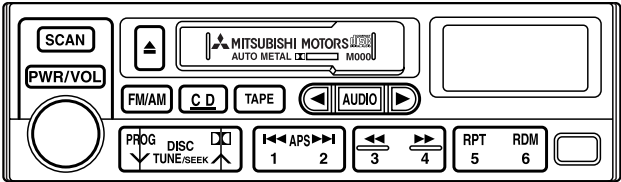
*NOTE: The \* indicates equipped on the left and right sides.*

Radio and tape player or radio and CD player

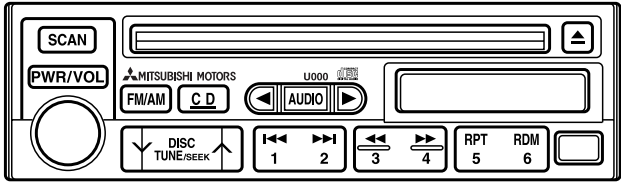


AC313205 AB

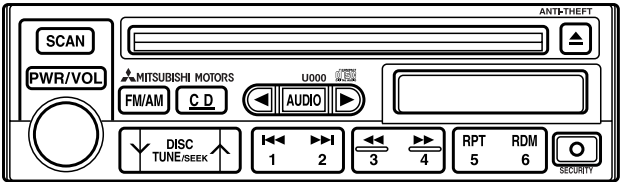
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<TYPE 2>



<TYPE 3>



AC503390 AB