

---

## GROUP 54A

# CHASSIS ELECTRICAL

### CONTENTS

GENERAL INFORMATION .....	54A-2	COMBINATION METER .....	54A-9
DIAGNOSIS SYSTEM .....	54A-2	SPEED ALARM SYSTEM <VEHICLES FOR GCC> .....	54A-11
BATTERY .....	54A-3	RADIO, TAPE PLAYER, SPEAKER, ANTENNA .....	54A-12
IMMOBILIZER SYSTEM <SOUTH AFRICA, ARGENTINA, GCC, AUSTRALIA AND NZ> .....	54A-3	ACCESSORY SOCKET .....	54A-14
LIGHTING .....	54A-4		

## GENERAL INFORMATION

M2540000100539

## FEATURES

## ENHANCED RELIABILITY

1. Adoption of waterproof connector in the engine compartment.
2. Installation of fuse box and relay box.

## ENHANCED VISIBILITY AND SAFETY

ENHANCED EASE-OF-USE AND  
CONVENIENCE

1. Equipped with four-bulb type headlamp.
2. A high-mount stop lamp is assembled on the tail-gate spoiler.
3. The combination meters feature a round speedometer and tachometer with large needle movement angle.

## IMPROVEMENTS IN SERVICE QUALITY

1. Installation of diagnostic connectors (two) for M.U.T.-II/III inspection.
2. Addition of ignition timing inspection function to the M.U.T.-II/III.

3. Adoption of Simplified Wiring System (SWS) to reduce weight and complexity of harnesses.

IMPROVEMENTS IN COMMERCIAL  
VALUE

1. Installation of an engine immobilizer system.  
<Vehicles for South Africa, Argentina, GCC, Australia and New Zealand>
2. Addition of map lamp and front room lamp.
3. Adoption of an electronically tuned AM/FM radio with tape player. <Vehicles for GCC: standard, Vehicles for General Export <Except for South Africa>: option> or electronically turned AM/FM radio with CD player. <Vehicles for Australia and New Zealand>
4. Adoption of CD auto changer. <Standard: Vehicles for Australia and New Zealand (XLS and VR-X model), Option: Vehicles for General Export <Except for South Africa>, GCC (GLS model), Australia and New Zealand (LS model)>
5. Addition of accessory socket.

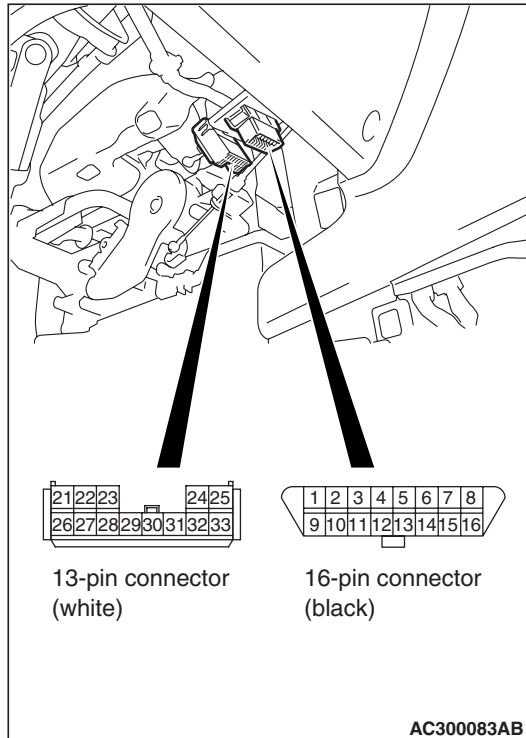
## DIAGNOSTIC SYSTEM

M2540001000289

Service quality has been improved by fitting diagnosis connectors for the M.U.T.-II/III inspection near the left <L.H. drive vehicles> and right <R.H. drive vehicles> knee area of the driver's seat on the instrument panel.

Diagnostic function	MPI	ABS	A/T	Immobilizer	SRS	ETACS
Diagnosis code set	×	×	×	×	×	×
Diagnosis code output by voltmeter	—	—	—	—	—	×
Output of service data	×	×	×	—	×	—
Actuator test	×	×	×	—	—	—
Diagnostic output by warning lamp and indicator lamp	—	×	—	—	—	—
		(ABS warning lamp)				
Diagnosis record storage	×	×	×	×	×	—
Erase of diagnosis code by the M.U.T.-II/III	×	×	×	×	×	—
Pulse check by M.U.T.-II/III	—	—	—	—	—	×

## DIAGNOSIS CONNECTORS



Diagnosis connector (Black)	
1	Diagnosis control
2,3	—
4	Earth

Diagnosis connector (Black)	
5	Earth
6	—
7	MPI, ABS, A/T, Immobilizer, SRS
8	—
9	ETACS-ECU
10	—
11	—
12	—
13	—
14	Simulated vehicle speed signal
15	—
16	Battery
Diagnosis connector (White)	
21 –23	—
24	MPI
25 –30	—
31	SWS communication line
32	—
33	—

## BATTERY

M2540002000408

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 &lt;VEHICLES FOR SOUTH AFRICA, ARGENTINA, GCC, AUSTRALIA AND NEW ZEALAND&gt;

M2540003000371

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, the immobilizer ECU, and the

engine-A/T-ECU. It works in the following way and has these functions:

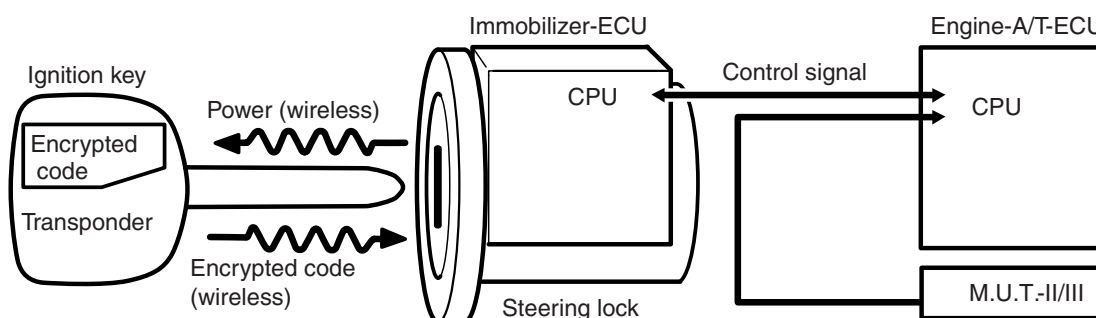
1. After the ignition is switched on, the engine-A/T-ECU sends a control signal and transponder read to the immobilizer ECU.

- When the immobilizer ECU receives the control signal from the engine-A/T-ECU, the immobilizer ECU supplies a current and sends random number data to the transponder in the ignition key.
- The transponder uses the random number data to derive an encrypted code, which is sent to the immobilizer ECU.
- The immobilizer ECU compares the encrypted code that was sent with pre-registered encrypted codes, and if it matches, a control signal approving ignition is sent to the engine-A/T-ECU. If the encrypted code does not match (in the case of counterfeit ignition keys, for example), the immobilizer ECU sends a control signal denying ignition to the engine-A/T-ECU, preventing the engine from starting.

- The system is designed to be maintenance-free because the power source for the transponder is supplied by the immobilizer ECU. Two ignition keys are provided, and up to eight keys can be registered to one vehicle (one receiver) as needed. There are 4 billion possible combinations for the registered encrypted codes, and in addition, one part of the code is changed each time the key is switched on, which improves security by preventing theft using a copied encrypted code.

**NOTE:** If the immobilizer ECU is replaced or if the ignition key is lost or additional keys are requested, the M.U.T.-II/III must be used to reset all transponder encrypted codes. During the resetting process, all transponders must be re-registered because the registered encrypted codes will be erased.

## CONSTRUCTION DIAGRAM



AC309519AC

## DIAGNOSIS CODE TABLE

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

## LIGHTING

M2540004000653

### EXTERIOR LAMPS

- The four-bulb headlamps have been used. These headlamps contain the front turn-signal lamps and the position lamps, and create a more aggressive and refined look.
- A headlamp levelling function is adopted. <Standard for Argentina, Option for GCC>

**NOTE:** For structure and operation of the headlamp levelling function, refer to .

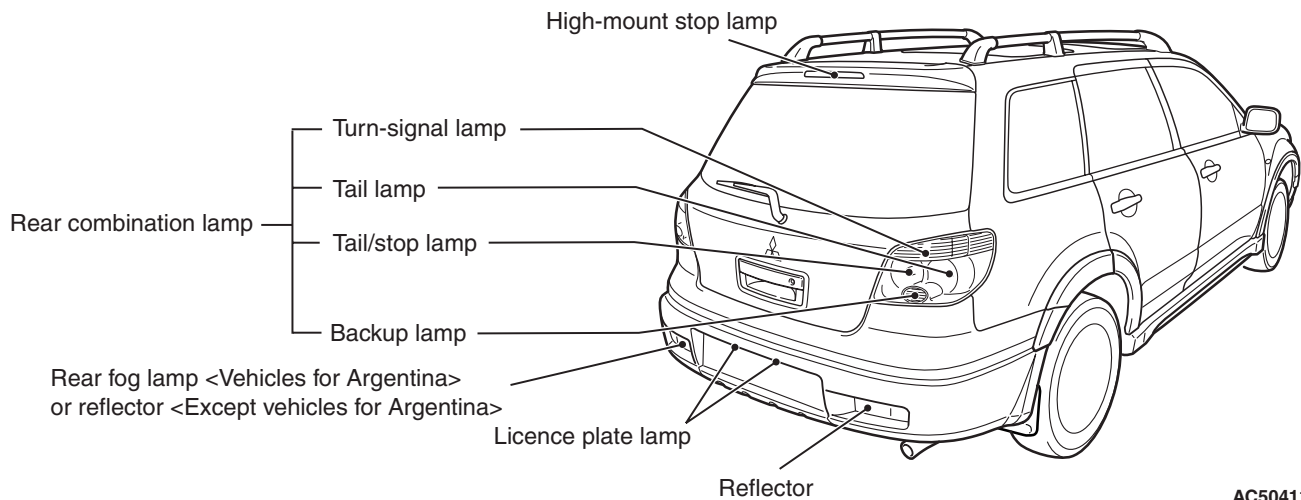
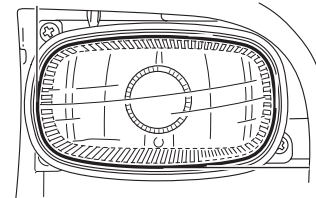
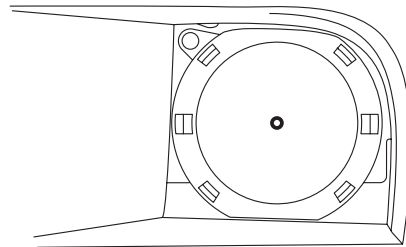
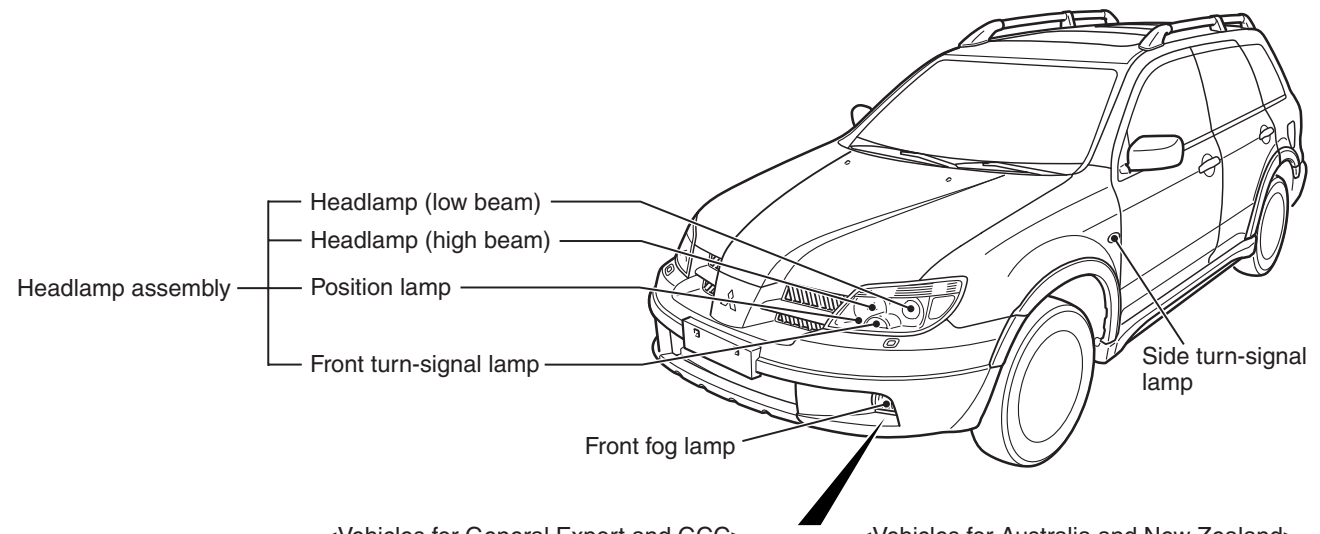
- The appearances has been improved by featuring a no-cut lens for front fog lamp.
- The rear combination lamps create a clean-cut, stereoscopic and excellent-quality look.
- The rear fog lamps are adopted. <Vehicles for Argentina>
- A high-mount stop lamp has been installed to the rear spoiler.

**SPECIFICATION**

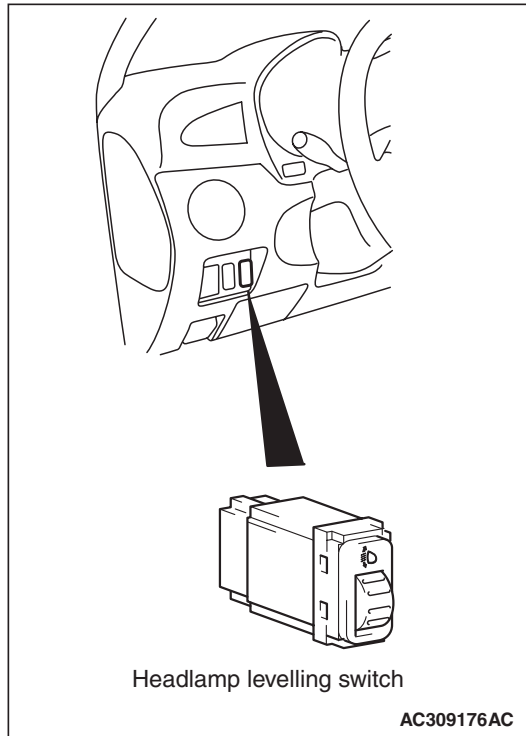
Item		Specification
Headlamp assembly	Low beam W (Halogen bulb)	55 (H1)
	High beam W (Halogen bulb)	60 (HB3)
	Front turn-signal lamp W	21
	Position lamp W	5
Front fog lamp W	Vehicles for General Export and GCC	55 (H11)
	Vehicles for Australia and New Zealand	51 (HB4)
Side turn-signal lamp W		5
Rear combination lamp	Tail/stop lamp W/W	5/21
	Tail lamp W	5
	Rear turn-signal lamp W	21
	Backup lamp W	16
Rear fog lamp W	Vehicles for Argentina	21
High-mount stop lamp	Incorporated in tailgate spoiler	LED type
Licence plate lamp W × Number		5 × 2

*NOTE: The brackets ( ) show the bulb type.*

## CONSTRUCTION DIAGRAM



## HEADLAMP LEVELLING SYSTEM



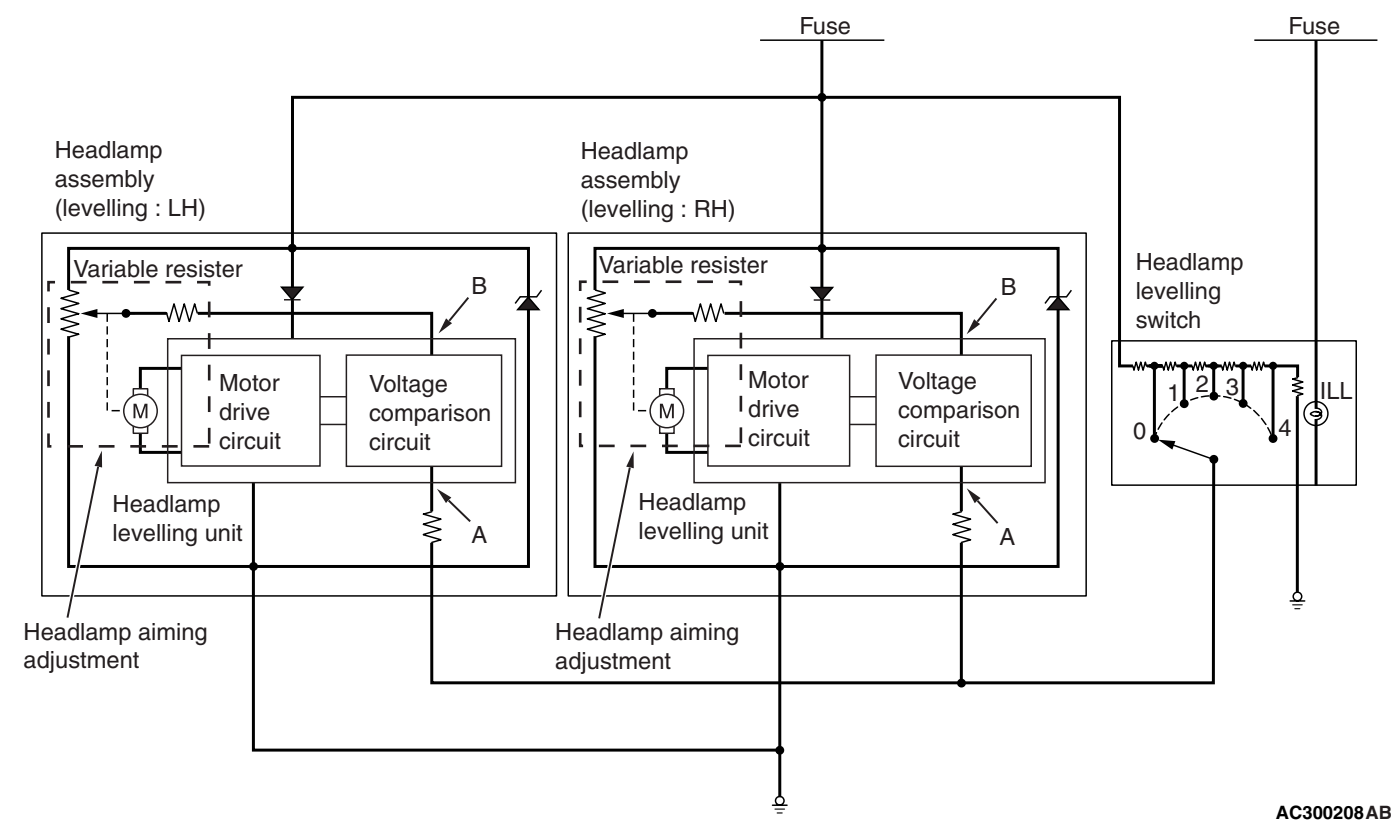
The beam direction of the headlamps changes according to the number of passengers and the amount of load. The headlamp levelling function is a system that allows the driver to change the direction of headlamp beam so that the drivers of oncoming cars are not dazzled by the headlamps. The headlamp levelling 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	<p>Driver only or driver and one passenger AC301941AB</p>	<p>Driver and four passenger AC301942AB</p>	<p>Driver and four passenger, and loads AC301943AB</p>	<p>Driver and heavy loads AC301944AB</p>	When a more load than those to the left is on the vehicle

## OPERATION

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 deflectors for the adjustment of the headlamp beam direction.



INTERIOR LAMPS

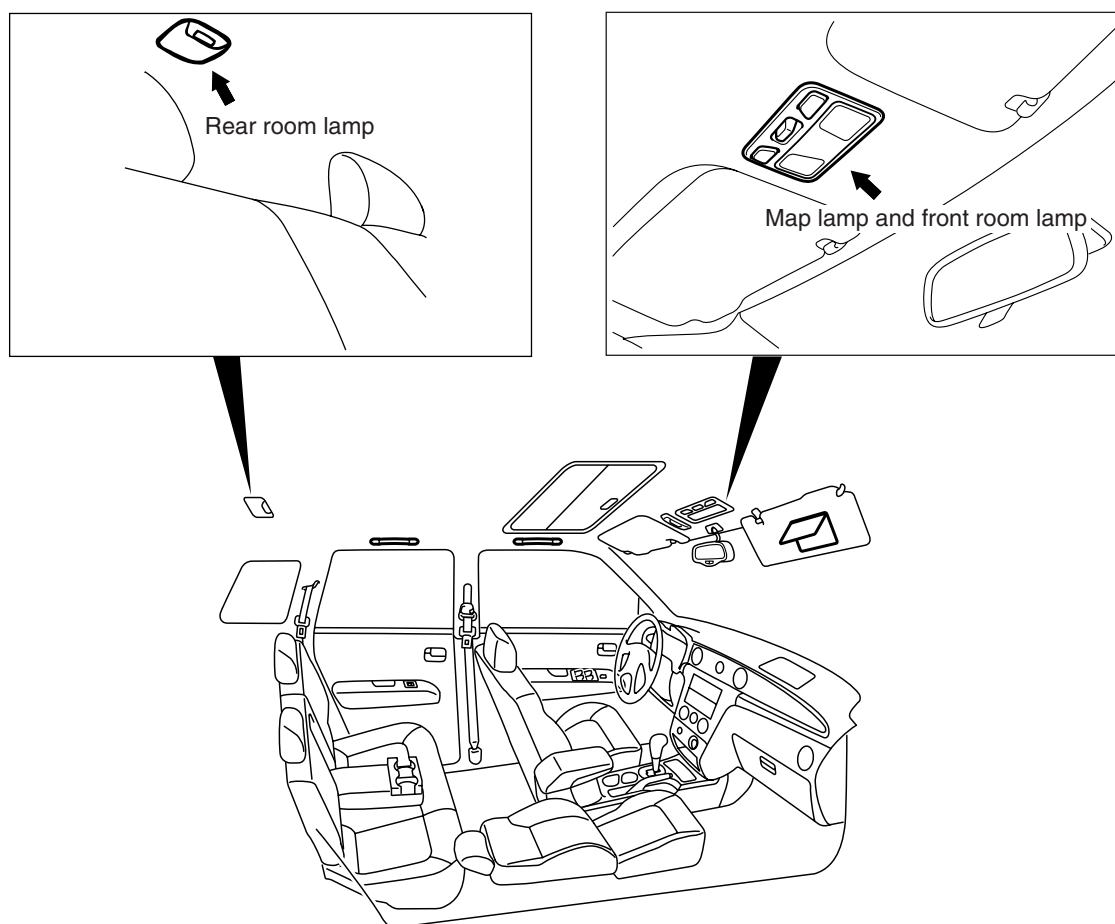
- A map lamp serving also as front room lamp which can be used at both the driver's seat and passenger seat is provided.
- A rear room lamp to lamp the backseat and luggage room lamp to lamp the luggage room are provided.

SPECIFICATIONS

Item		Specification
Map lamp and front room lamp	Map lamp W × quantity	7.5 × 2
	Front room lamp W	7.5
Rear room lamp W		8



## CONSTRUCTION DIAGRAM



AC201039AC

## COMBINATION METER

The combination meter was designed to enhance the driver's view of the meters and feature an easy-viewing large needle-meter design. At the top centre is the fuel gauge and below it is the water thermometer. To the left is the speedometer and to the right is the tachometer.

- The speedometer is an electronic type speedometer which operates by the pulse signal generated by the engine-A/T-ECU.

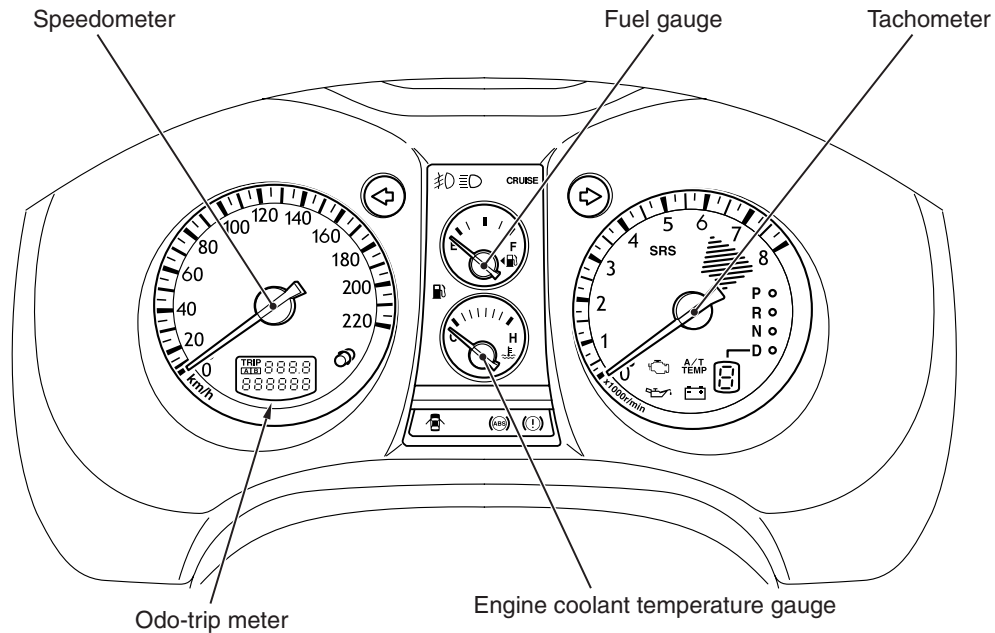
- The A/T indicator is located at the bottom right and features a LCD\* sports mode digital (shift position) display.
- A large and clear LCD\* type odo-trip meter is provided. The odometer continuously displays values while the trip meter adopts a twin-trip (trip A, trip B) function which is switched by a reset button.

**NOTE:** LCD\*: Liquid crystal display

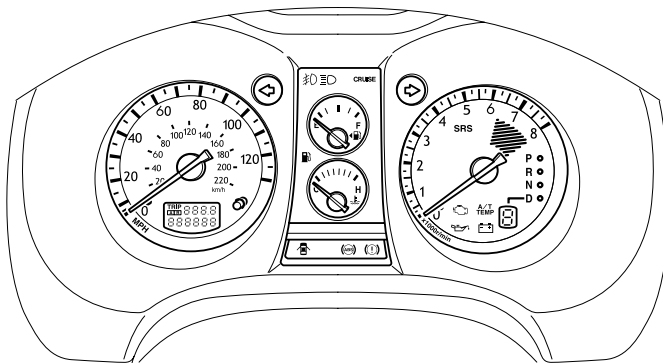
M2540005000656

## CONSTRUCTION DIAGRAM

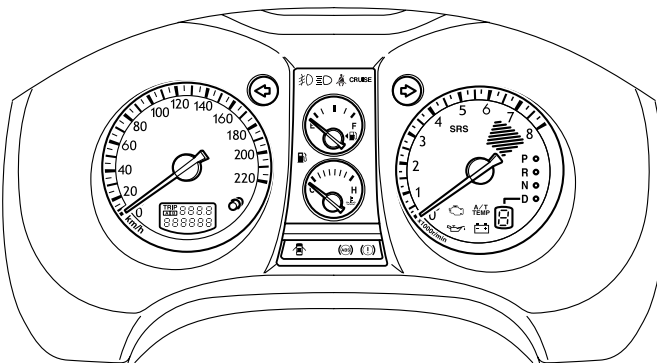
Vehicles for General Export &lt;Except for Argentina&gt;



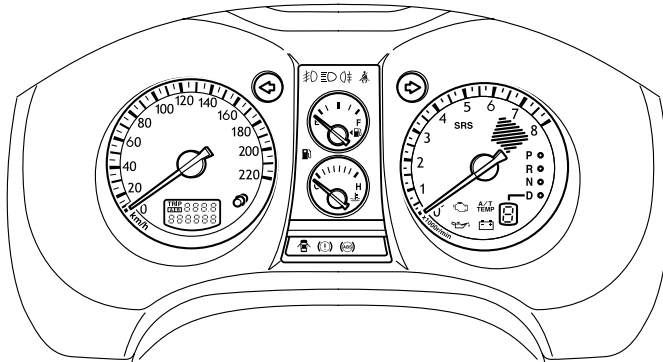
AC504177AB

Option for General Export  
<Except for Brazil, South Africa, Argentina and Chile>

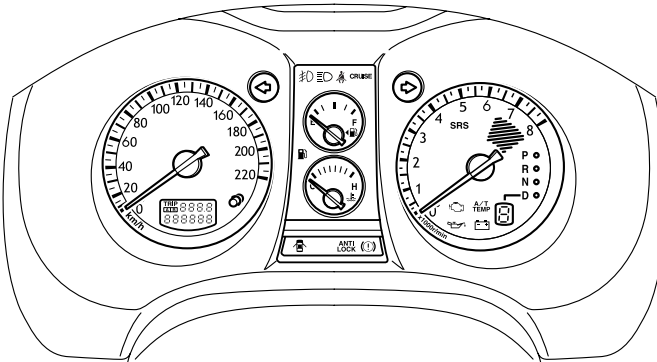
Vehicles for GCC



Vehicles for Argentina



Vehicles for Australia and New Zealand



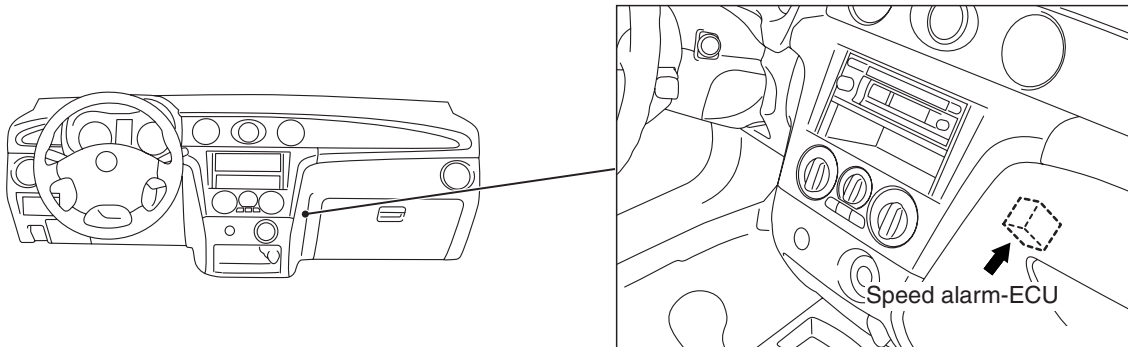
AC504176AB

# SPEED ALARM SYSTEM <VEHICLES FOR GCC>

M2540001500024

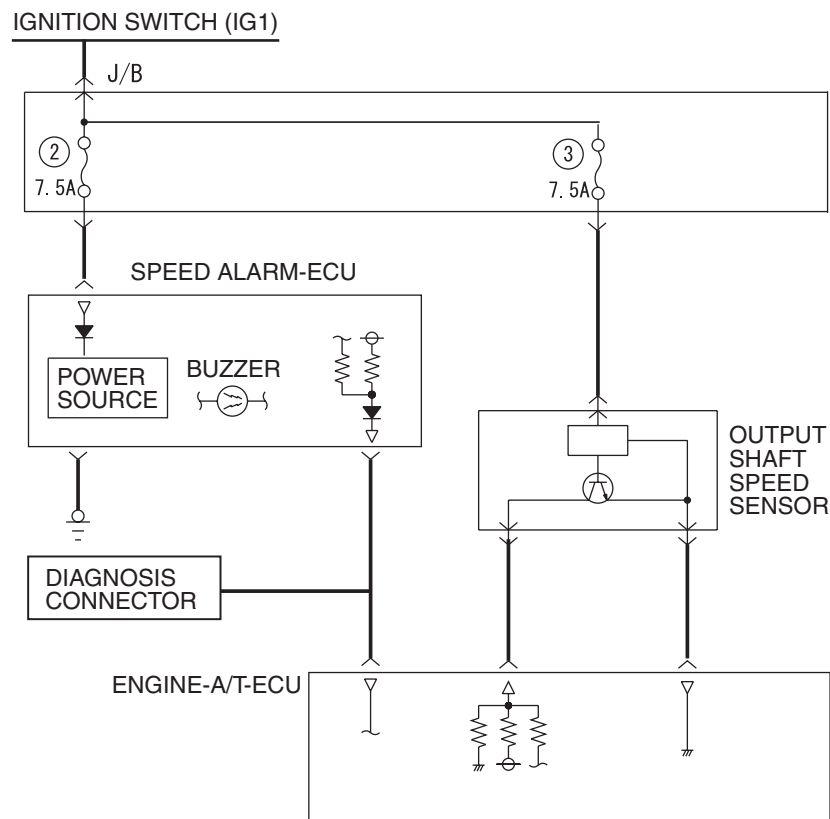
The speed alarm-ECU sounds the speed alarm buzzer when the vehicle speed reaches  $120 \pm 5$  km/h. The ECU monitors vehicle speed signal from the engine-A/T-ECU to sound the buzzer.

## CONSTRUCTION DIAGRAM



AC309598AB

## SYSTEM BLOCK DIAGRAM



AC309601

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

M2540006000574

**RADIO AND CD PLAYER**

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

Item	Type 1 <Vehicles for GCC: standard, Vehicles for General Export (except for South Africa): option>	Type 2 <Vehicles for Australia and New Zealand>
AM/FM electronic tuning radio	Equipped	Equipped
Tape player	Equipped	–
CD player	–	Equipped
Power amplifier with radio	25W × 4	25W × 4

**SPEAKER**

Location	Four speakers <Vehicles for General Export, GCC, Australia and New Zealand (LS model)>	Six speakers <Vehicles for Australia and New Zealand (XLS and VR-X model): standard, Vehicles for General Export, GCC, Australia and New Zealand (LS model): option>
Front door	–	Equipped (tweeter –3.5 cm)
	Equipped (dual cone full range –16 cm)	Equipped (full range –16 cm)
Rear door	Equipped (dual cone full range –16 cm)	Equipped (full range –16 cm)

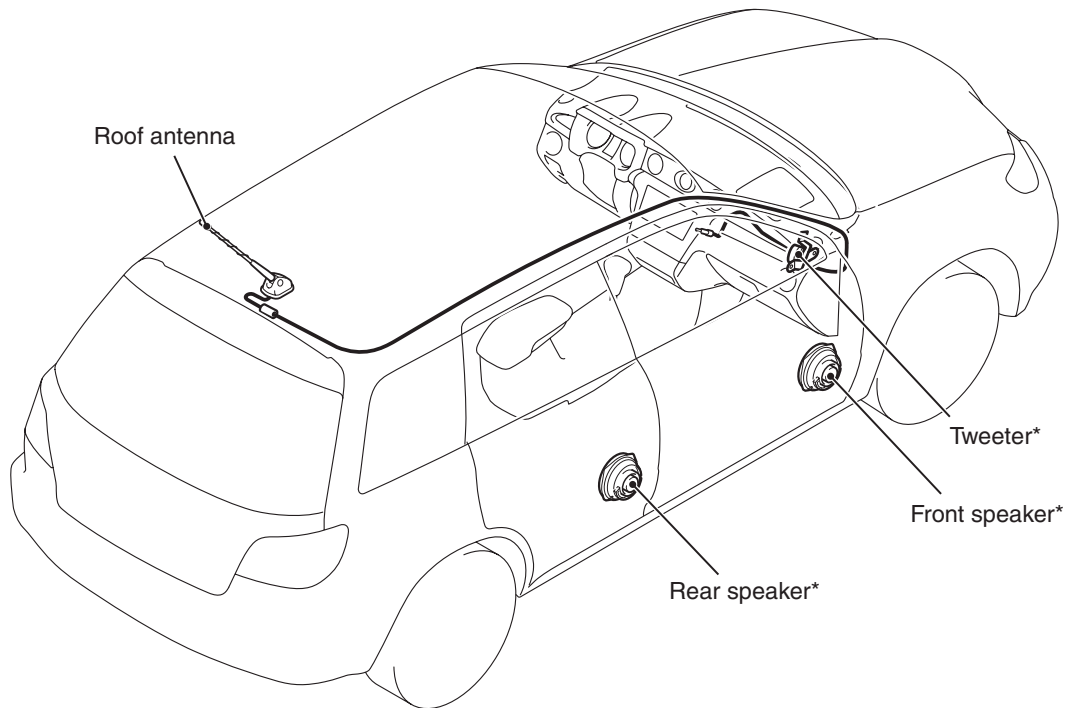
**ANTENNA**

The roof antenna are used.

**CD AUTO CHANGER**

The model comes standard with a 6 disc CD auto changer of the 1 DIN size. <Standard: Vehicles for Australia and New Zealand (XLS and VR-X model), Option: Vehicles for General Export <Except for South Africa>, GCC (GLS model) and Australia and New Zealand (LS model)>

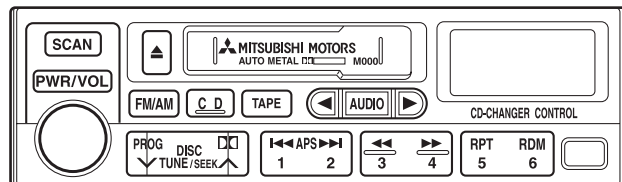
CONSTRUCTION DIAGRAM



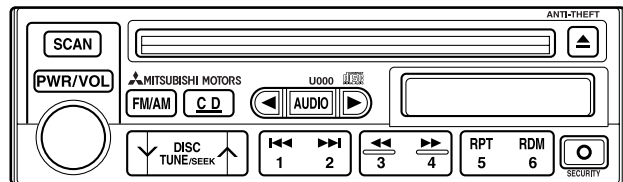
AC301111AB

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

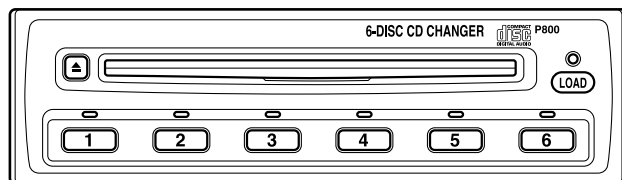
<TYPE 1>



<TYPE 2>



<CD auto changer>



AC401681AB

## ACCESSORY SOCKET

M2540008000161

Power sockets for electrical accessories are located on the lower quarter trim and gear shift lever panel. When using one accessory socket alone, the maximum load is up to 120 W.

