GROUP 54A

CHASSIS ELECTRICAL

CONTENTS

GENERAL DESCRIPTION

M2540000100432

FEATURES

IMPROVEMENTS IN DESIGN

- Inner-lens-type headlights and rear combination lights
- High-mounted stoplight integrated into the rear spoiler
- Motorcycle-type combination meter

IMPROVEMENTS IN VISIBILITY AND SAFETY

- Large dual-lamp headlights with a lightweight resin lenses
- LEDs for the tail and stoplights in the rear combination lights
- LEDs for the warning lights and night illumination lights in the combination meter
- LEDs for high-mounted stoplight

IMPROVEMENTS IN RELIABILITY

Secure data transmission by connecting the combination meter and ECUs with CAN

IMPROVEMENTS IN SERVICE QUALITY

- Attachment of a data link connector for inspection with MUT-III scan tool
- Inset connector for the combination meter
- Diagnosis and service data in the combination meter, enabling communication with MUT-III scan tool
- Simplified Wiring System (SWS) to reduce weight and complexity of harnesses

IMPROVEMENTS IN MARKETABILITY

- Immobilizer system
- Panic alarm system
- Rockford Fosgate high performance audio system (premium audio system) as an option
- Multi center display for viewing a variety of vehicle data
- Accessory sockets

DIAGNOSTIC SYSTEM

M2540001000342

For improved serviceability, a data link connector for inspection with MUT-III is built into the instrument panel near the position of the driver's right foot.

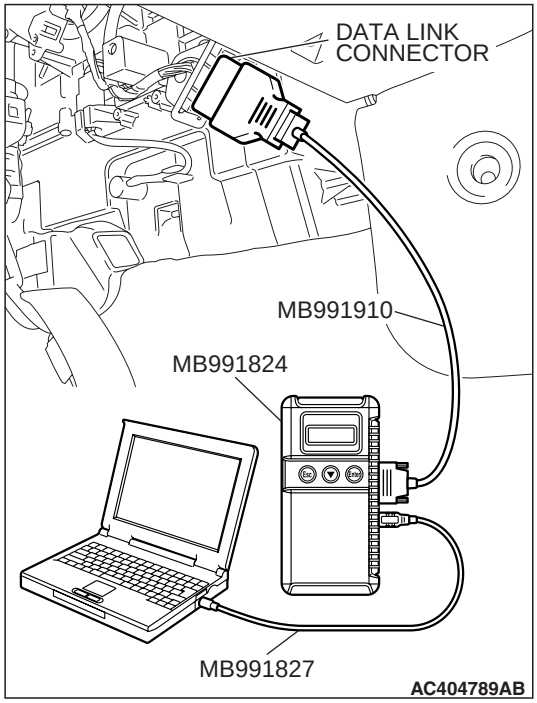
DIAGNOSIS FUNCTION	MFI	ABS	A/C	ETACS	COMBINATION METER	SRS
DTC code sent	×	×	×	×	×	×
Service data sent	×	×	×	–	×	×
Actuator test	×	×	×	–	×	×
Diagnosis record stored	×	×	×	×	×	×
Erase DTCs using scan tool	×	×	×	×	×	×
Pulse check using scan tool	–	–	–	×	–	–

DIAGNOSIS FUNCTION	MFI	ABS	A/C	ETACS	COMBINATION METER	SRS
Status display for each DTC code*	–	×	×	×	×	–
Estimated vehicle speed sent	–	–	–	x (via CAN)	x (via CAN)	–
ECU version number displayed	–	x	x	–	–	–

NOTE:

- **: If a diagnosis code is sent for this function, the display informs users whether a mechanical problem currently exists ("current problem"), or whether it previously existed ("past problem") but normal operation has been restored.*
- *x: indicates that the diagnosis function is set.*
  –: indicates that the diagnosis function is not set.

DATA LINK CONNECTOR



DATA LINK CONNECTOR (BLACK)	
1	Diagnosis control
2	–
3	SWS communication line
4	Ground
5	Ground
6	CAN communication line (CAN_H)
7	PCM
8	–
9	ETACS
10	–
11	ECU optimization control
12	–
13	–
14	CAN communication line (CAN_L)
15	–
16	Battery power supply

BATTERY

M2540002000345

ITEM	BCI GROUP SIZE 86	BCI GROUP SIZE 24
Voltage V	12	12
Capacity (5-hour rate Ah)	50	56
Electrolytic fluid specific gravity [fully charged state at 20°C (68°F)]	1.280	1.280
Reserve capacity min	90	115
Cold cranking current A [at −18°C (0°F)]	525	550

IMMOBILIZER SYSTEM

M2540003000315

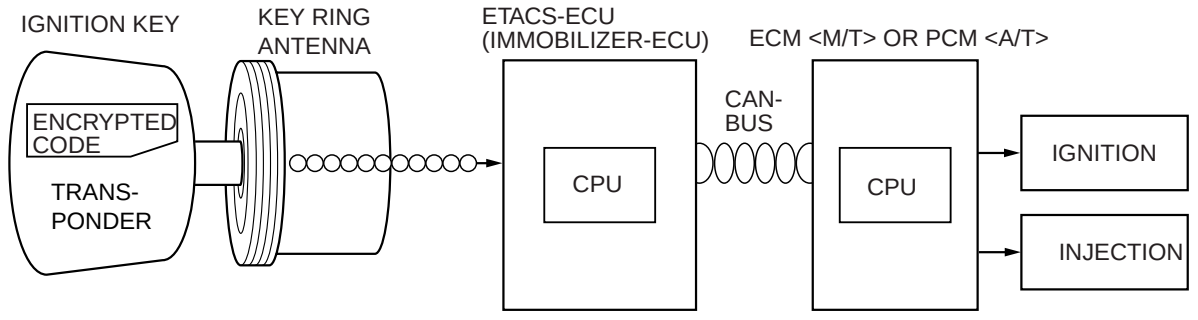
The engine immobilizer system prevents the engine from starting and immobilizes the vehicle if a key other than the key registered for that vehicle is used in an attempt to start the engine after forced entry. The engine immobilizer system consists of the ignition key, the key ring antenna, the ETACS-ECU (immobilizer-ECU), and the engine control module (ECM) <M/T> or powertrain control module (PCM) <A/T>. It has these functions:

The system is designed to be maintenance-free because the power source for the transponder is supplied by the ETACS-ECU (immobilizer-ECU) via the key ring antenna. Two ignition keys are provided, and up to eight keys can be registered to one vehicle (one receiver) as needed. There are 4 billion combinations for the encrypted code. 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.

DIAGNOSIS CODE TABLE

CODE NUMBER	TROUBLE CONTENT
B1702	Reception error of transponder data
B1703	Transponder data inconsistent
B1731	Reception error of CAN data
B1761	VIN not recorded

CONSTRUCTION DIAGRAM



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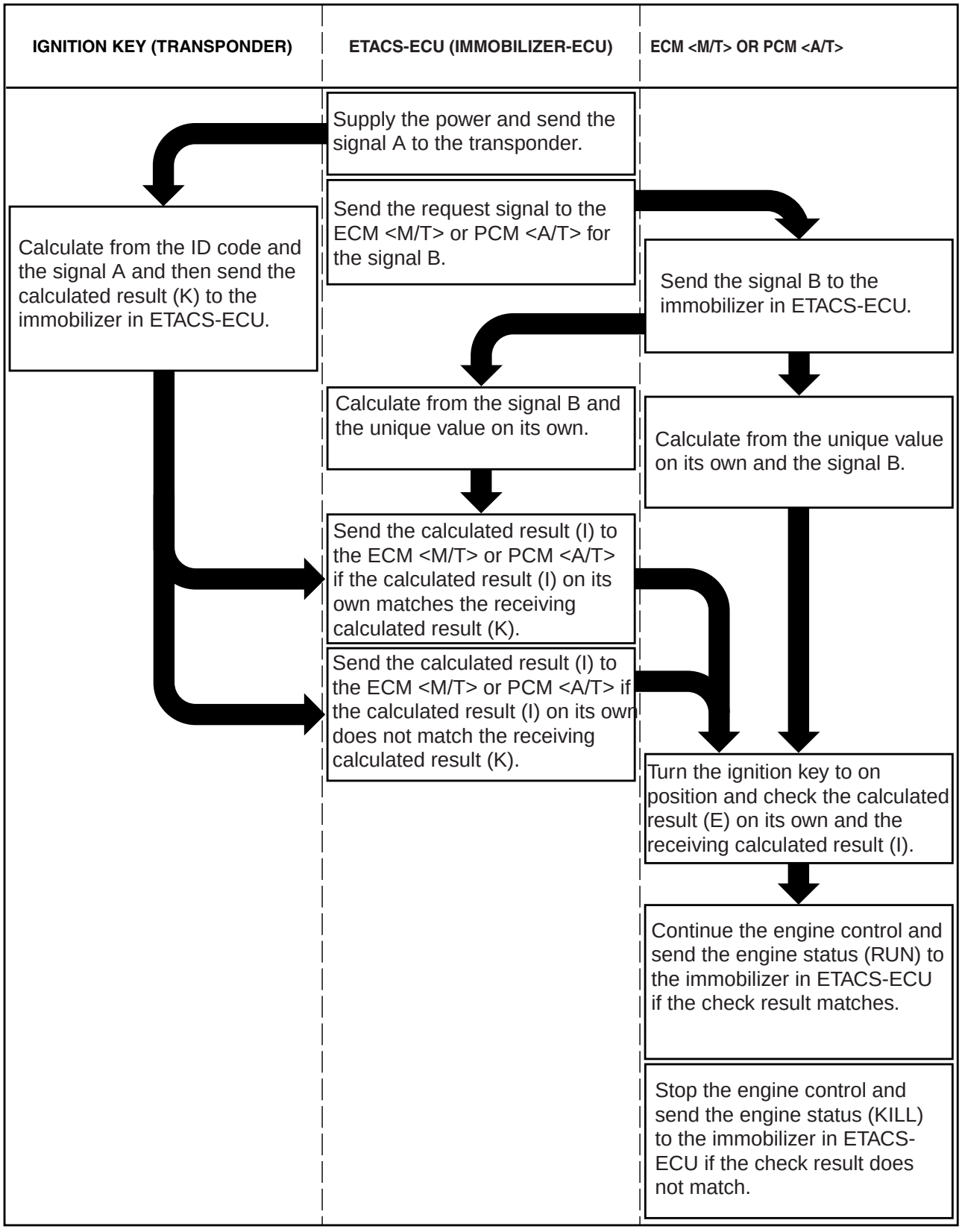
OPERATION

With the ignition switch ON, the immobilizer system operates as follows.



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LIGHTING

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EXTERIOR LIGHTS

HEADLIGHT ASSEMBLY

- The dual-lamp headlights with built-in front turn-signal light, front parking light, front side-marker light, and front side reflex reflector lens have been installed.
- Blue inner lenses are used at the front of the headlight bulbs.
- Blue coating bulbs are used for the front side-marker lights, front turn-signal lights, and front parking lights.
- Double filament bulbs, multi-reflectors, and uncut outer lenses are used. Also, the shapes of the multi-reflectors have been optimized to provide a wide distribution of light, thereby improving visibility.

FRONT FOG LIGHT

- The front fog lights have non-faceted lenses and multi-reflectors.
- Bright bezels are installed to the circumferences of the front fog lights.

REAR COMBINATION LIGHT

- The rear combination lights have a turn signal light, a tail/stoplight, a backup light, a rear side reflex reflector, and a rear side-maker light.
- Clear inner lenses are used at the front of the back-up light bulbs.
- LED-type tail and stoplights improve lighting response.
- Blue coating bulbs are used for the rear turn-signal lights.
- Clear smoke outer lenses and aluminum-finished and silver-evaporated inner bezels.
- Striped lenses with aluminum-finished multi-reflectors increase brightness and visibility.

HIGH-MOUNTED STOPLIGHT

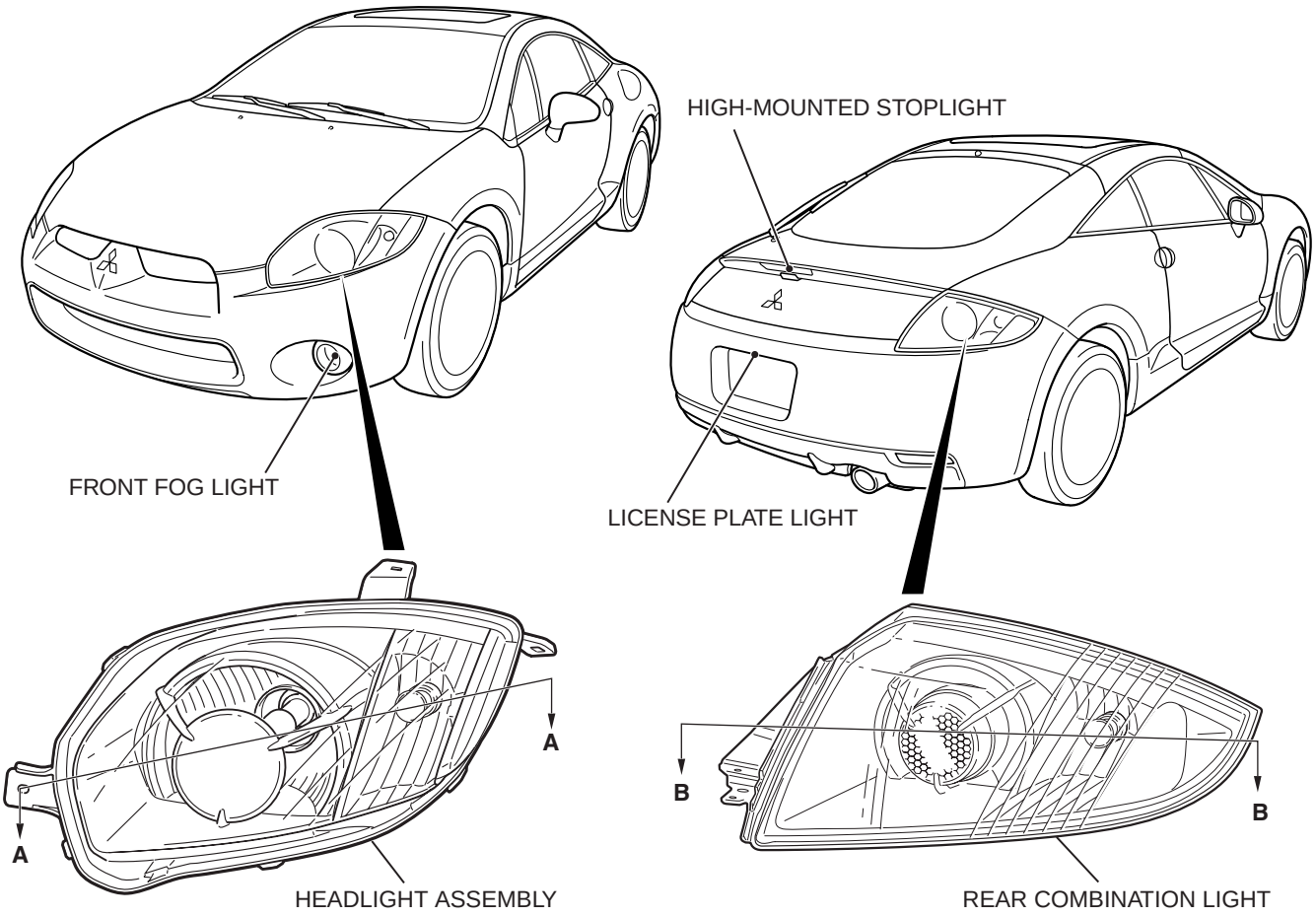
- High-mounted stoplight integrated into the rear spoiler.
- LED-type high-mounted stoplight.
- In the same way as the rear combination lights, clear smoke outer lenses and aluminum-finished and silver-evaporated inner bezel are used.

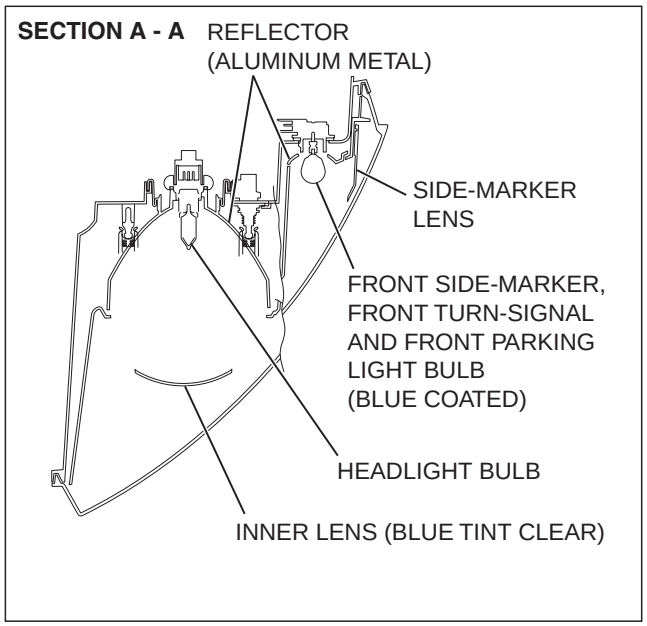
SPECIFICATIONS

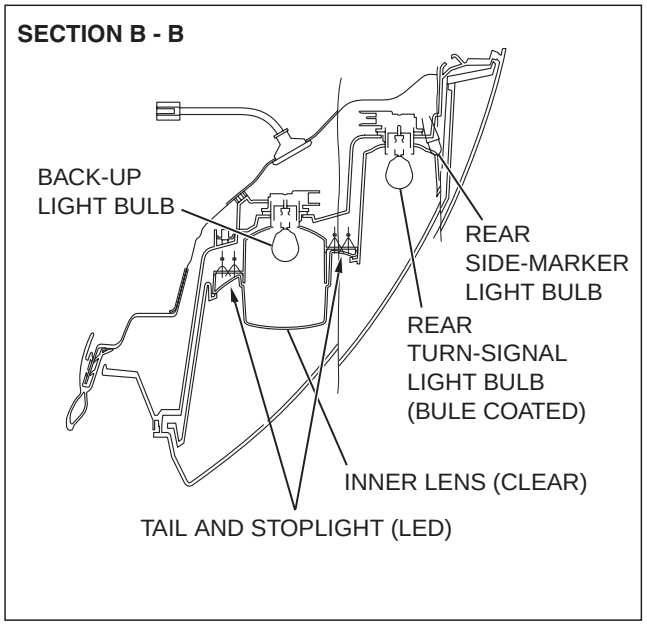
ITEM		SPECIFICATION
Headlight assembly	High-beam/low- beam W/W (Halogen bulb)	60 /55 (H13)*
	Front side-marker light, front turn-signal and parking light cp/cp	30/2
Front fog light W		55
Rear combination light	Back-up light cp	32
	Tail and stoplight	LED type
	Rear side-marker light cp	3
	Rear turn-signal light cp	30
High-mounted stoplight		LED type
License plate light cp		3

*NOTE: *( ) indicates the bulb type.*

CONSTRUCTION DIAGRAM







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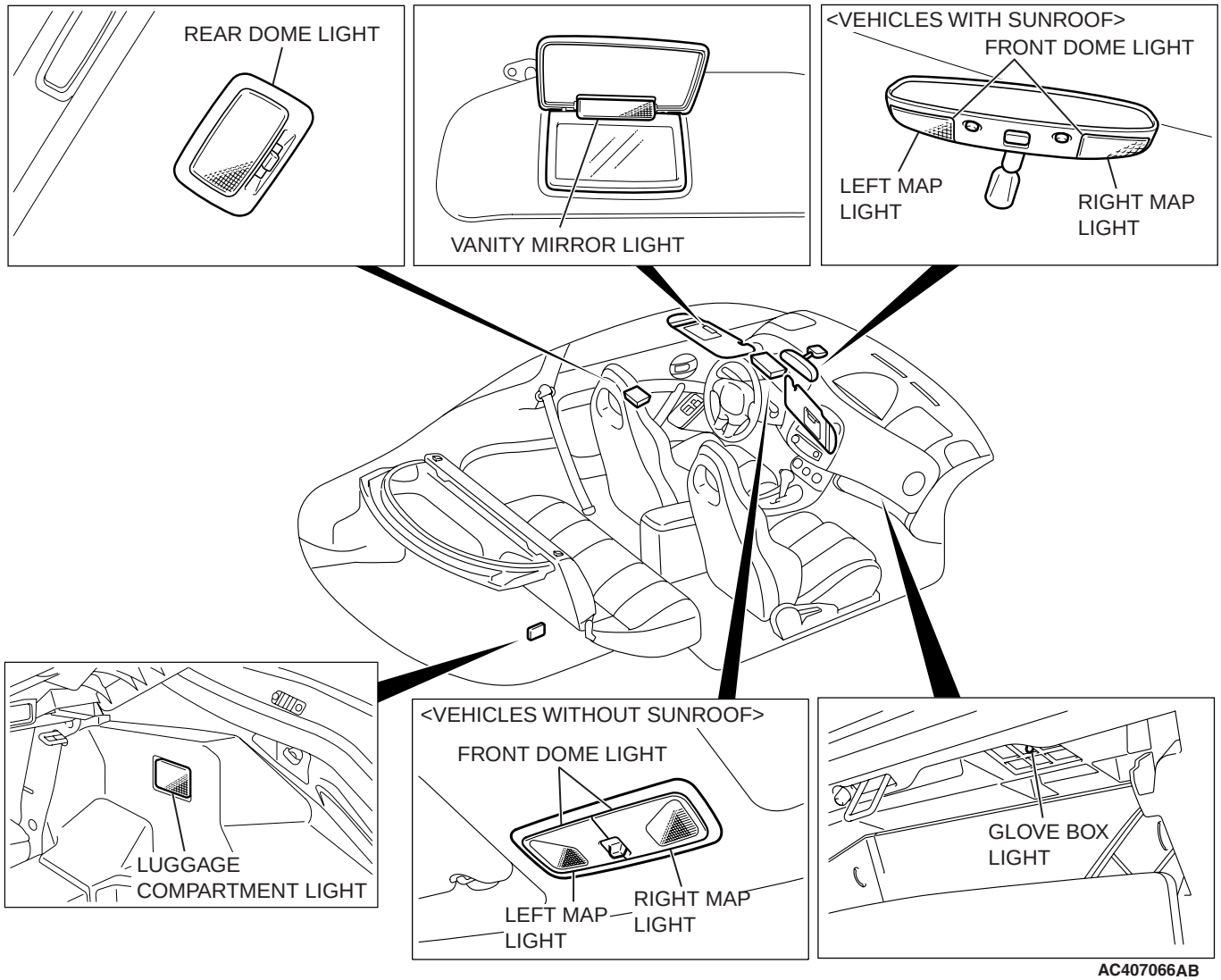
INTERIOR LAMPS

- The inside rear view mirror with the built-in front dome lights. <Vehicles with sunroof>
- Front dome lights above the front seats. <Vehicles without sunroof>
- Rear dome light above the rear seat.
- Luggage compartment light above the luggage compartment.
- Vanity mirror lights on the vanity mirrors.
- Glove box light in the glove box.

SPECIFICATIONS

ITEM		SPECIFICATION
Front dome light W × quantity <Vehicles without sunroof>		5 × 2
Inside rear view mirror assembly	Front dome light W × quantity <Vehicles with sunroof>	5 × 2
Rear dome light W		8
Luggage compartment light W		5
Vanity mirror light W		1.4 × 2
Glove box light W		1.4

CONSTRUCTION DIAGRAM



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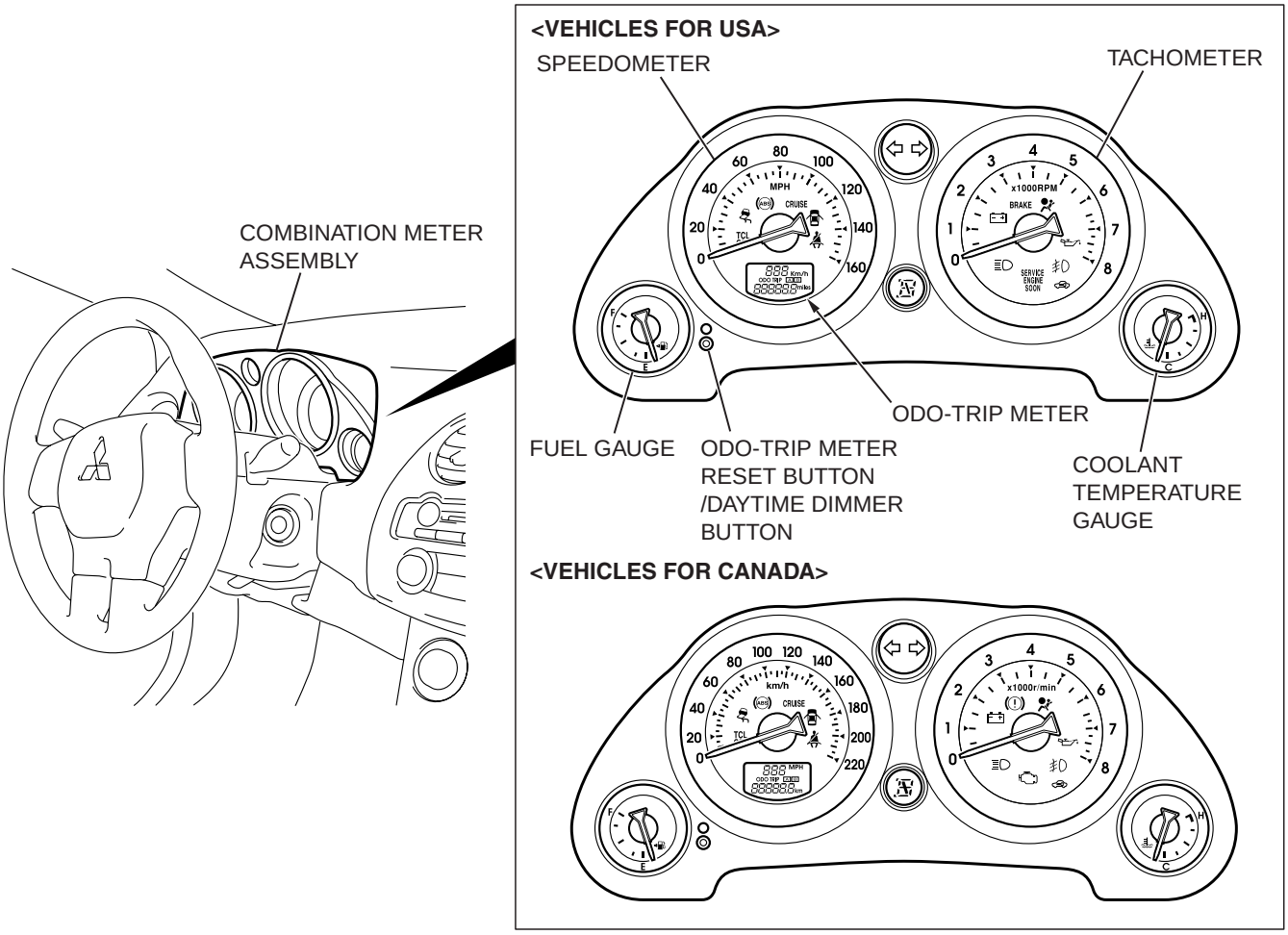
COMBINATION METER

M2540005000548

The combination meter features large, clearly visible analog indicators. Designed to be easy to distinguish by a driver, the gauges are arranged with the speedometer at the center-left, tachometer at the center-right, fuel gauge at lower-left, and coolant temperature gauge.:

- The combination meter assembly has a sporty and unique image.
- Blue LEDs illuminate the speedometer, tachometer, fuel gauge, and coolant temperature gauge in ice blue.
- LEDs for the warning lights and night illumination provide brighter night illumination, a longer life of the warning light source, and reduced warning indicator space.
- A plated ring is installed to the speedometer and tachometer.
- The meter panel of each gauge is formed in a cone shape to create a deep effect on the meter panel. In addition, the meter panel is silver-coated to improve the appearance.
- The daytime dimming button function is integrated into the reset button.
- The sub-speed indicator is incorporated into the LCD of the odo/trip meter.
- CAN communication provides reliable transmission of all gauge data and indicator light input signals, such as vehicle speed, engine RPM, and coolant temperature. For further details on CAN, refer to GROUP 54C, CAN P.54C-9. The signals that the combination meter uses are described in the CAN communications input signals table in section P.54A-11.
- The indicators for the speedometer, fuel gauge, and other gauges are driven by a stepping motor. For further details, refer to the section on the stepping motor P.54A-11.
- The electronic speedometer receives vehicle speed signals sent by the engine control module <M/T> or powertrain control module <A/T> via the CAN.
- Combination meter features a diagnostic trouble code function for improved serviceability.

CONSTRUCTION DIAGRAM



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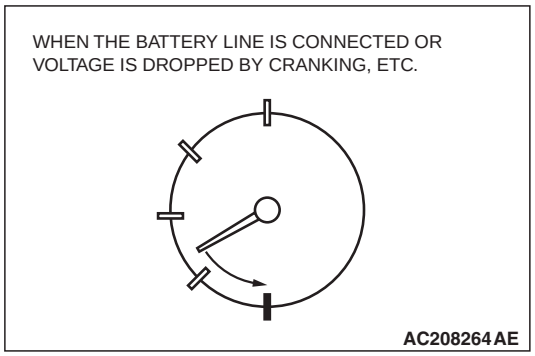
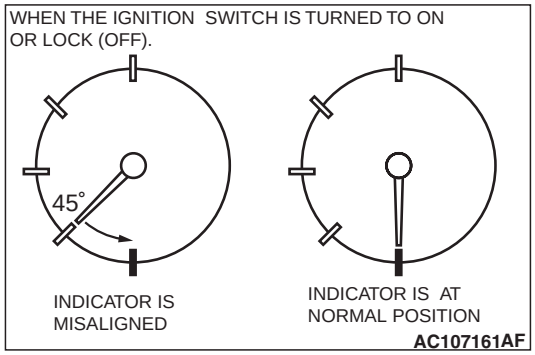




STEPPING MOTOR

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 provides 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° in response to 360° driving controls. However, a stepping motor is designed so that the indicator revolves only 45°, even in response to a drive control of 360°. The 45° drive control must be repeated to make the indicator rotate 360°. Thus, at a position 45° away from the indicator display position, there will be an identical control.

As a result, in the case of a great impact, 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 cut and reconnected. Then, 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 45° 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	ECM <M/T> or PMC <A/T>
Vehicle speed signal	
Vehicle stop signal	
Malfunction indicator light request signal	
Auto-cruise control indicator light signal	
Engine coolant temperature signal	
Selector lever position indicator signal <A/T>	
ABS warning light request signal	ABS/TCL-ECU <vehicles with TCL>
TCL indicator request signal	
TCL OFF indicator request signal	
ABS warning light request signal	ABS-ECU <vehicles without TCL>
TCL indicator request signal	
TCL OFF indicator request signal	
SRS warning light 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	
Seat belt warning light request signal	

DTC TABLE

DTC NO.	DIAGNOSTIC ITEM
B1200	Defective odometer
B1201	Defective fuel gauge
U1073	Bus off
U1100	ECM <M/T> or PCM <A/T> time-out (related to engine)
U1101	ECM <M/T> or PCM <A/T> time-out (related to transaxle)
U1102	ABS-ECU time-out
U1109	ETACS-ECU time-out
U1112	SRS-ECU time-out
U1114*	TPMS-ECU time-out
U1120	Failure information on ECM <M/T> or PCM <A/T> (related to engine)
U1206	Flag invalid
U1434*	Failure information on TPMS-ECU

*NOTE: *: Diagnosis code No.U1114 and U1434 does not mean that there is a problem.*

RADIO, CD PLAYER, SPEAKER AND ANTENNA

M2540006000477

RADIO AND CD PLAYER

The audio operation panel matches the interior design with an ice blue illumination for the switch panel. The audio operation status is displayed on the multi-center display. There are 2 types of audio system as follows.

<STANDARD AUDIO SYSTEM>

- 1-disk CD player for MP3/CD-R/CD-RW
- AM/FM electronic tuning radio
- MAX output: 140W

<PREMIUM AUDIO SYSTEM>

- Rockford Fosgate, a youth-oriented audio brand.
- CD player (with 6-disk CD changer incorporated) for MP3/CD-R/CD-RW with sound quality adjustment functions by digital signal processor (DSP)
- AM/FM electronic tuning radio
- MAX output: 650W
- Steering wheel with remote control radio switches

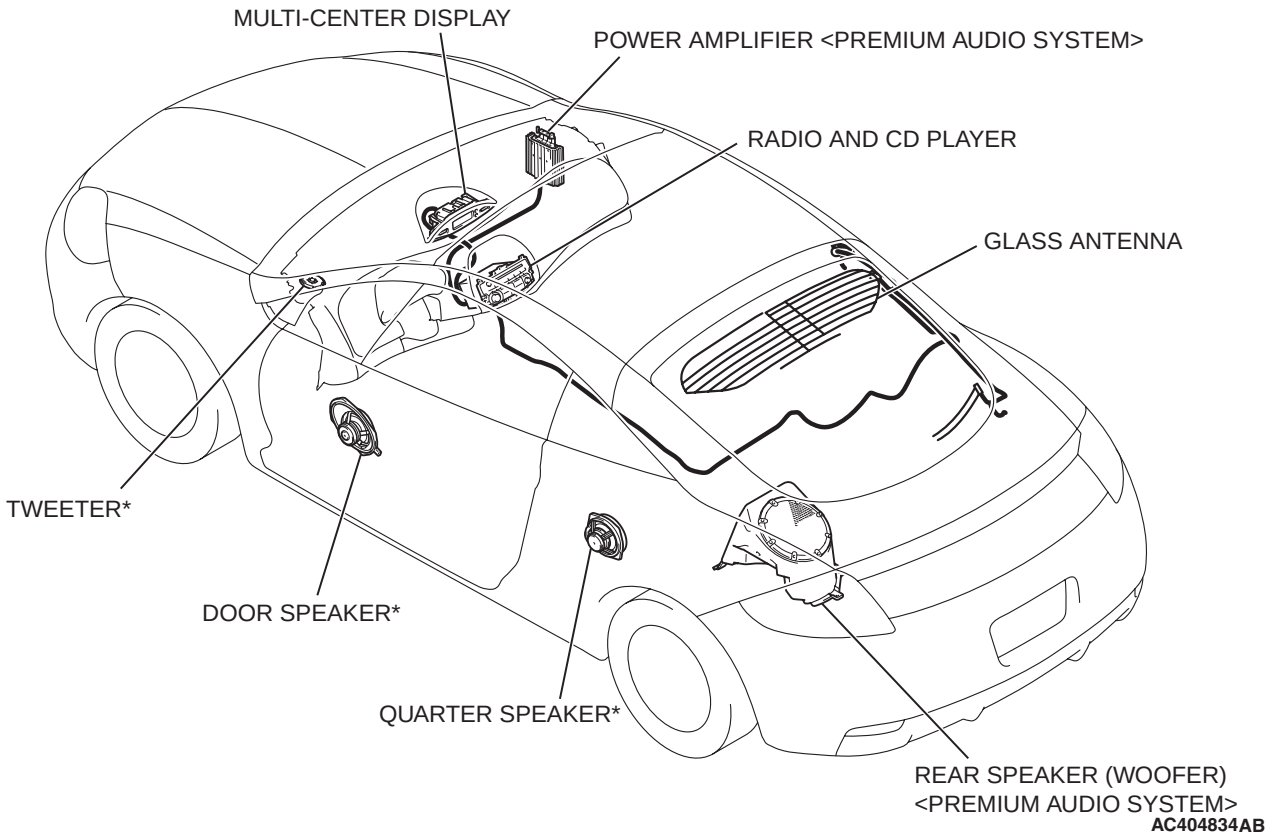
SPEAKER

LOCATION	SIX SPEAKERS <STANDARD AUDIO SYSTEM>	NINE SPEAKERS (SEVEN LOCATION) <PREMIUM AUDIO SYSTEM>
Instrument panel	Equipped (3.5 cm soft dome – tweeter)	Equipped (3.5 cm balanced dome – tweeter)
Door	Equipped (full range – 6×9 inch)	Equipped (full range –16 cm). Mid to high range oriented.
Quarter trim	Equipped (full range – 16 cm)	Equipped (2 way coaxial – 16 cm)
Luggage room	–	Equipped (25 cm –sub woofer). Low range oriented.

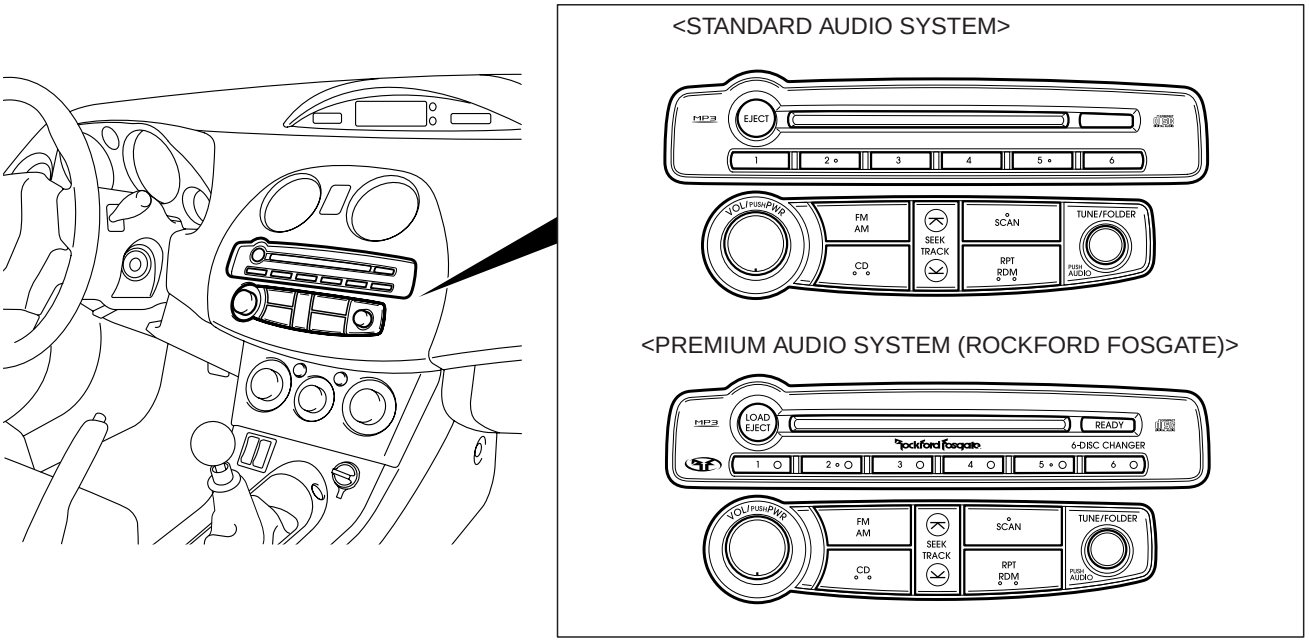
ANTENNA

Glass antenna is used.

CONSTRUCTION DIAGRAM



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



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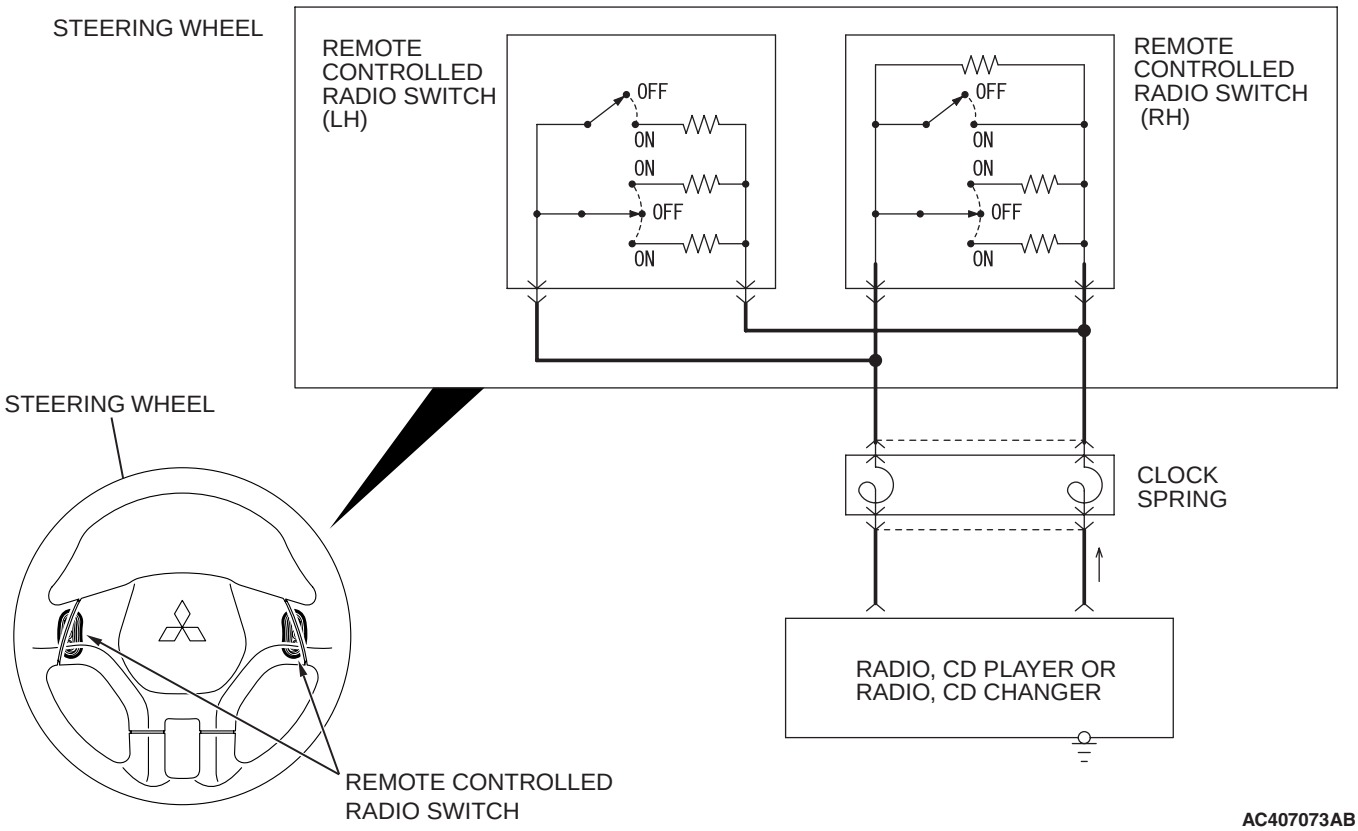
REMOTE CONTROL RADIO SWITCH

SYSTEM CIRCUIT DIAGRAM



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MULTI-CENTER DISPLAY

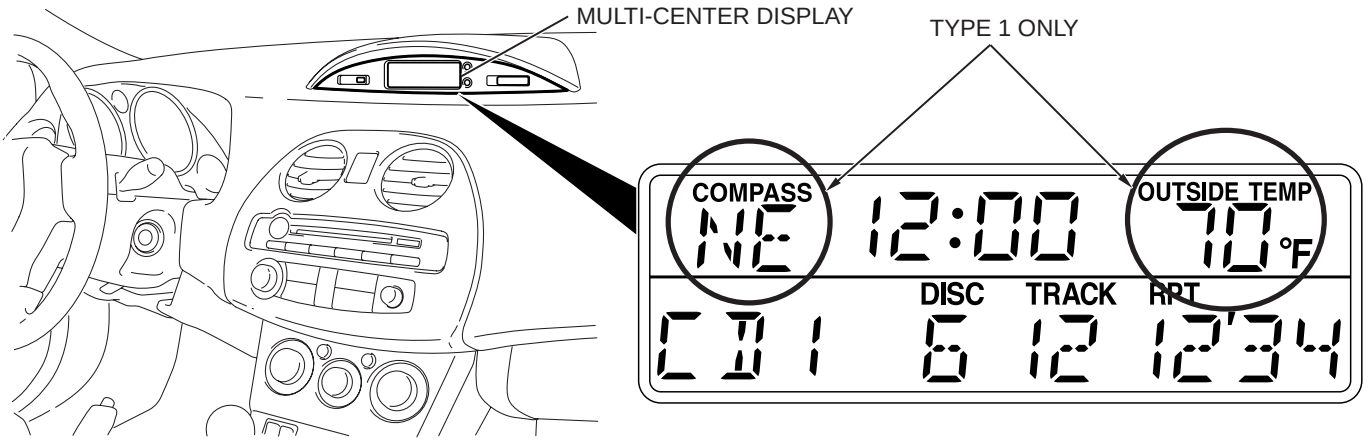
M2540000700100

The multi-center display shows a variety of vehicle data. The following information can be shown on the multi-center display:

- Clock display <type 1, type 2>
- Environmental data display (compass, outside temperature) <type 1>
- Entertainment system data display (Audio volume, bass, midrange, treble, fader, balance, CD data, CD changer data, and more) <type 1, type 2>

NOTE: The clock is displayed in all of the screens.

CONSTRUCTION DIAGRAM



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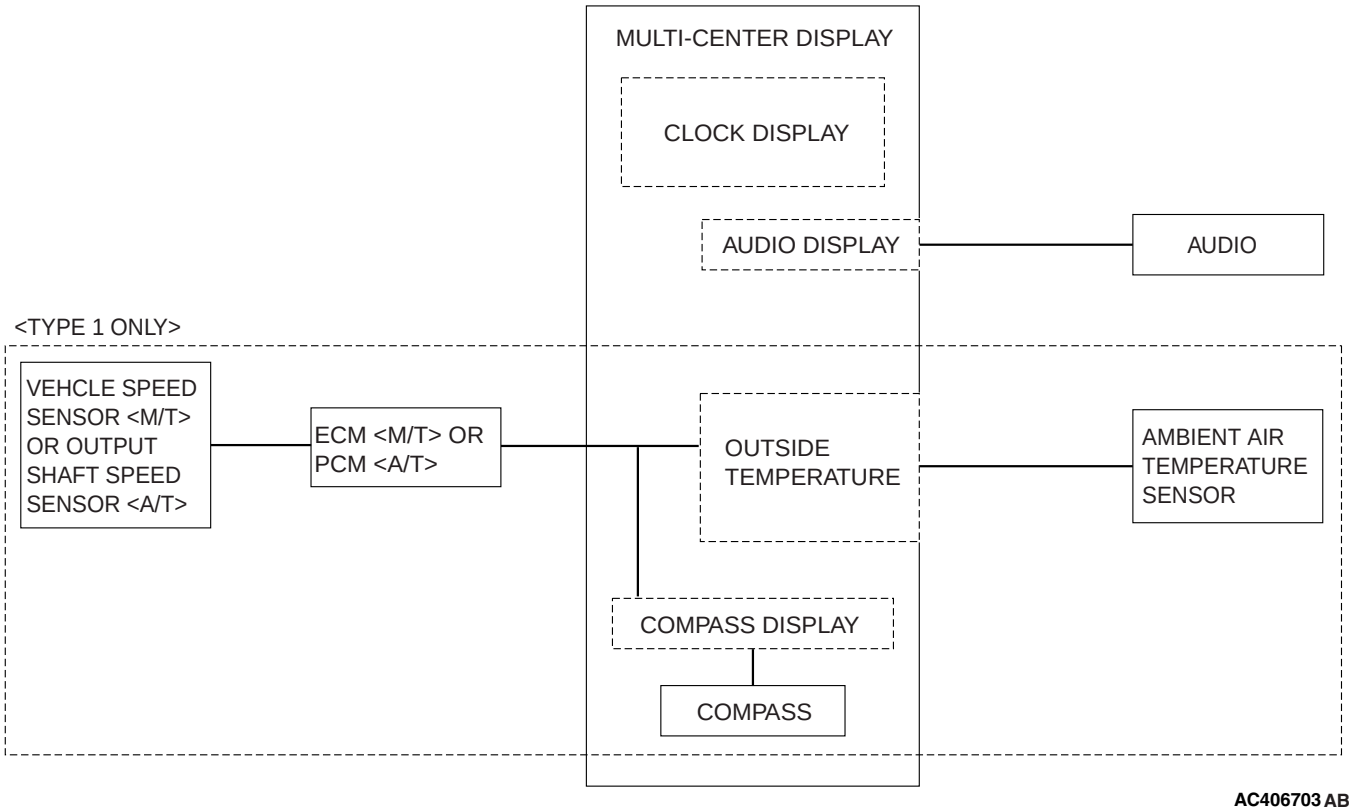
SYSTEM BLOCK DIAGRAM



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ACCESSORY SOCKET

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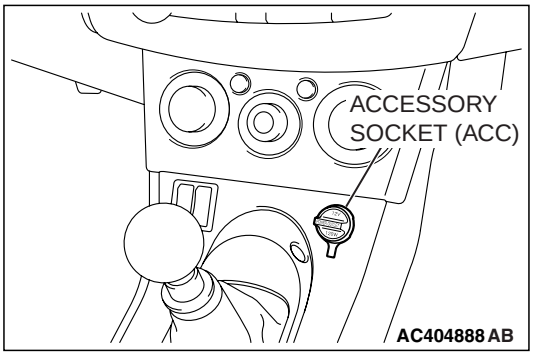
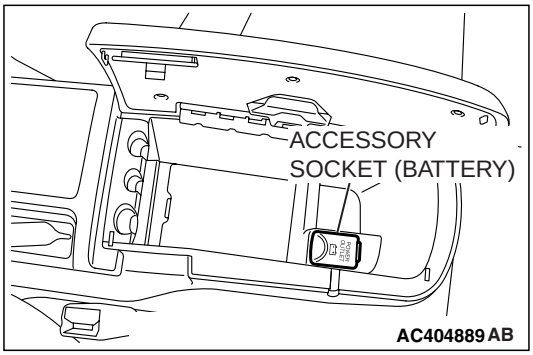




An accessory socket is in the front of the floor console and inside the console box. Since power is always supplied to the accessory sockets in the console box, it is convenient for charging a cellular telephone and such devices. If a cigarette lighter plug offered by the dealer has been used, the accessory socket in the front of the floor console could be utilized for the cigarette lighter.

PANIC ALARM SYSTEM

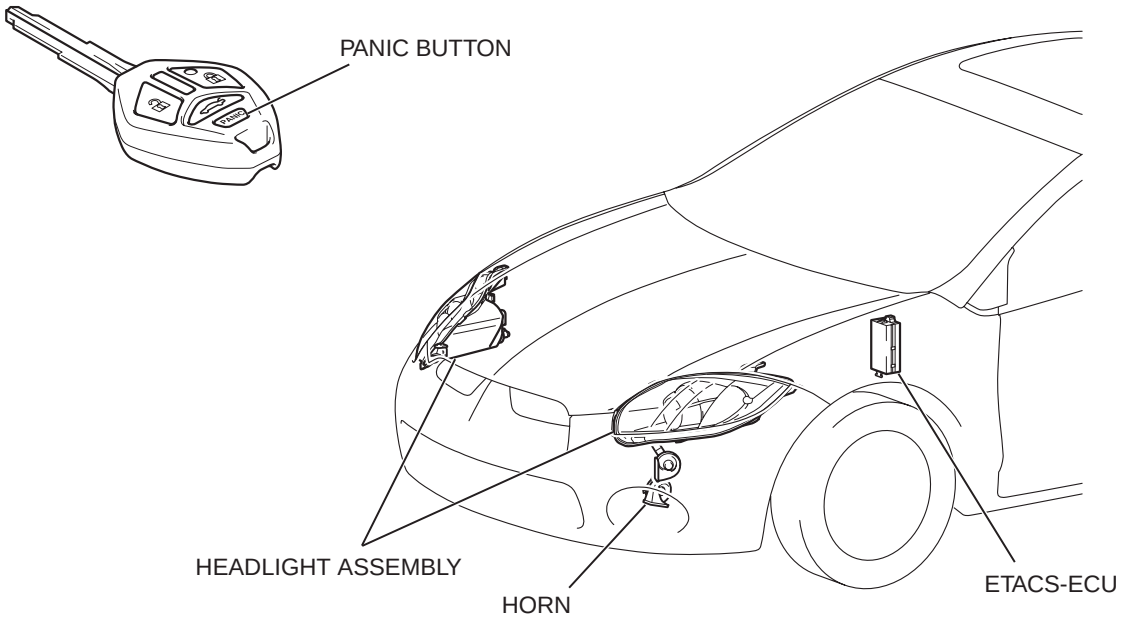
M2540001400027

When the panic alarm button is pressed, the headlights flash and the horn sounds.

Panic alarm system operation table

OPERATION OF TRANSMITTER		OPERATION OF PANIC ALARM SYSTEM
Panic button	Press once (press and hold for 1 second).	Starts the panic alarm (headlights flash and horn honks for three minutes)
Lock button, Unlock button, Trunk button, Panic button	Press again	Stops the panic alarm in progress

CONSTRUCTION DIAGRAM



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