

GENERAL DESCRIPTION

The adoption of new accessories and functions has enhanced a lineup of equipment.

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. Headlamps with built-in twilight lamp and position lamp illuminate slightly when the tail lamps illuminate during twilight <Vehicle for Hong Kong and Singapore (except CS3A)>.
2. Installation of front turn signal lamp with outstanding visibility using an aluminum metal evaporated reflector
3. Installation of rear combination lamps with large tail and stop lamp emitter blending with the body design
4. Installation of high mount stop lamps
5. Installation of large high contrast meter <Some models for Hong Kong>
6. Front fog lamps with outstanding visibility provided as an option for some models (Vehicle for China as a standard feature)
7. Installation of rear fog lamps with outstanding visibility for vehicle for China
8. Equipped with an immobilizer system <vehicles for G.C.C.>

Improvements in service quality

1. Installation of diagnostic connectors (two) for MUT-II inspection
2. Addition of ignition timing inspection function to the MUT-II
3. Adoption of Smart Wiring System (SWS) to reduce weight and complexity of harnesses

Improvements in commercial value

1. Installation of Smart Wiring System (SWS) with new functions such as headlamp auto-cut and lamp turn-off reminder, ETACS-ECU, and front-ECU

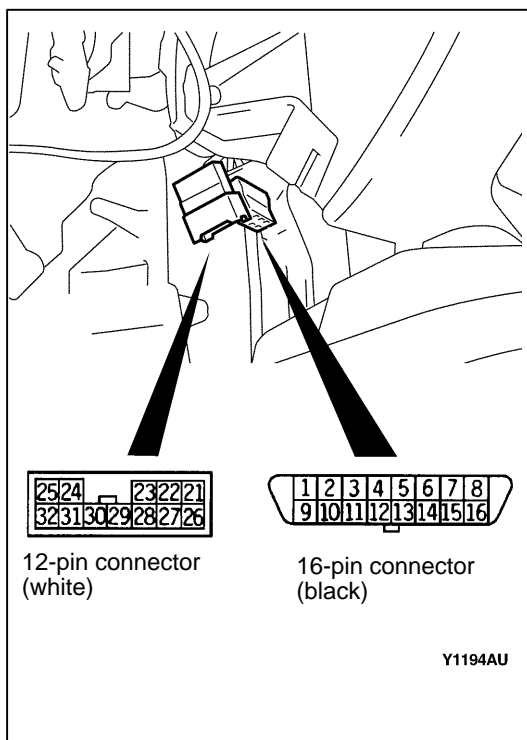
NOTE

[Refer Also](#) for general information and features of the heater and air conditioner.

DIAGNOSTIC SYSTEM

Service quality has been improved by fitting diagnostic connectors for MUT-II inspection near the left knee area of the driver's seat on the instrument panel.

Diagnostic Function	GDI, MPI	ABS	A/T, CVT	Immo- bilizer	SRS airbag	SWS		
						ETACS	Column switch	Front ECU
Diagnosis code output	●	●	●	—	●	●	●	●
Diagnosis code output by voltmeter	—	—	—	—	—	●	●	●
Output of service data	●	●	●	—	●	—	—	—
Actuator test	●	●	●	—	—	—	—	—
Diagnostic output by warning lamp and indica- tor lamp	—	● (ABS warning lamp)	● (N range indica- tor lamp)	—	—	—	—	—
Diagnosis record storage	●	●	●	●	●	—	—	—
Erasure of diagnosis code by MUT-II	●	●	●	●	●	—	—	—
Pulse check by MUT-II	—	—	—	—	—	●	●	●
Pulse check by sounding buzzer	—	—	—	—	—	●	●	●



DIAGNOSTIC CONNECTOR

Diagnostic connector (Black)	
1	Diagnosis control
2, 3	—
4	Grounding
5	Grounding
6	—
7	MPI, GDI, ABS, A/T, CVT, Immobilizer and SRS airbag
8	—
9	ETACS
10	—
11	Auto air conditioner
12	—
13	—
14	—
15	—

Diagnostic connector (Black)	
16	Battery
Diagnostic connector (white)	
21 – 25	–
26	MPI, GDI
27 – 32	–

BATTERY

Light and compact batteries have been adopted.

Item	34B19L	55D23L or 55D23
Voltage V	12	Ditto
Capacity (5-hour rate Ah)	29	50
Electrolytic fluid specific gravity (fully charged state at 20°C)	1.280	Ditto

IMMOBILIZER SYSTEM <Vehicles for G.C.C>

The immobilizer system consists of the ignition key, the key ring antenna, the immobilizer-ECU, and the engine-ECU<M/T>, engine-A/T-ECU<A/T> or engine-CVT-ECU<CVT>.

The ignition key has a built-in transponder as the oscillator. The key ring antenna is installed on the steering lock key cylinder. Only the registered ignition key permits the engine to start, therefore, the engine can never be started by means of a forged key or by connecting the ignition wiring directly. The system is significantly safe and reliable against theft. In addition, the driver has only to

turn the ignition switch to the “ON” position to activate the immobilizer system. If the ignition key is lost or another ignition key is added, all the keys must be registered again by using the scan tool MB991502 (MUT-II) for security reasons.

CONSTRUCTION DIAGRAM

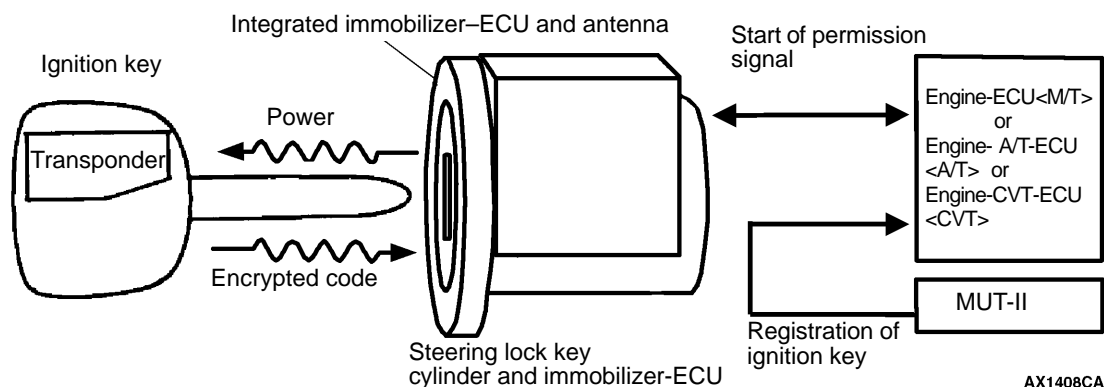
The system prevents the engine from being started deviously to protect the vehicle from theft. The operation is as follows.

1. When the ignition switch is turned “ON” position, the engine-ECU<M/T>, engine-A/T-ECU<A/T> or engine-CVT-ECU<CVT> sends a requirement for the encrypted code to the immobilizer-ECU (at this time, the engine is remobilized).
2. When the immobilizer-ECU receives the requirement from the engine-ECU<M/T>, engine-A/T-ECU<A/T> or engine-CVT-ECU<CVT> transponder inside the ignition key via the antenna. The energized transponder sends the encrypted code back to the immobilizer-ECU via the antenna.
3. The immobilizer-ECU judges the encrypted code with its code logic in itself. If they are identical, the immobilizer-ECU sends the encrypted code to the engine-ECU<M/T>, engine-A/T-ECU<A/T> or engine-CVT-ECU<CVT>.
4. If the engine-ECU<M/T>, engine-A/T-ECU<A/T> or engine-CVT-ECU<CVT> can not receive the encrypted code, the engine will be immobilized.

DISPOSITION WHEN REPLACING IMMOBILIZER SYSTEM RELATED PARTS

To replace immobilizer related parts, observe the table below. When the ignition key is re-registered with the MUT-II, the originally registered ignition key registration information will be lost.

	Engine-ECU <M/T> Engine-A/T-ECU <A/T> Engine-CVT-ECU <A/T>	Immobilizer-ECU	Ignition key
When replacing engine-ECU <M/T>, engine-A/T-ECU<A/T>, engine-CVT-ECU<CVT>	–	Replacement required	Replacement and re-registration are required.
When rewriting engine-ECU	–	Replacement not required	Replacement not required, re-registration not required
When replacing immobilizer-ECU	Replacement not required	–	Replacement not required, registration are required
When adding ignition key newly	Replacement not required	Replacement not required	Register an additional ignition key and re-register all other ignition keys.
When ignition key is lost	Replacement not required	Replacement not required	Re-register all other ignition keys except the lost one.



LIGHTING

EXTERIOR LAMPS

- The special-shaped two bulb type <models other than those for Hong Kong and Singapore (except for CS3A)> and special-shaped four bulb type <for Hong Kong and Singapore (except for CS3A)> are adopted for the headlamps. The headlamps incorporate a large integrated lamp consisting of the front turn signal lamp and position lamp. The special-shaped four bulb type headlamp also incorporates a twilight lamp which illuminates the headlamps softly when the tail lamp is illuminated during evening twilight to improve visibility.
- The front turn signal lamp adopts an aluminum metal evaporated reflector to improve visibility.
- The tail/stop lamp has been given a design which emphasizes consistency with the car body with a shallow side float cut (semi-cylindrical).
- The rear turn signal lamp and backup lamp have been designed to emphasize depth by combining the vertical and side cuts.
- Integrating the rear reflector with the tail/stop lamp has improved visibility and safety with a large emitter.
- The non-light emitter of the rear combination lamp has improved appearance with the use of flannel cut (concentric cut) inner lens.
- The front fog lamp has improved visibility with the use of hard coats without lens cut.
- Fog lamps with outstanding visibility have been installed. <For China>
- A high mount stop lamp has been installed to the rear shelf or rear spoiler.
- The lighting system is provided with headlamp auto-cut and auto-lamp functions <vehicles for Hong Kong and Singapore (except for CS3A)>.([Refer Also.](#))

EQUIPMENT – Lighting

SPECIFICATIONS

Item			Specifications
Headlamp assembly W	2-lamp type <Vehicles other than those for Hong Kong and Singapore (except for CS3A)>	High beam/low beam (Halogen bulb)	60 /55 (H4)
		Position lamp	5
		Front turn signal lamp	21
	4-lamp type <Vehicle for Hong Kong and Singapore (except for CS3A)>	High beam (Halogen bulb)	60 (HB3)
		Low beam (Halogen bulb)	55 (H1)
		Twilight lamp	5
		Position lamp	5
		Front turn signal lamp	21
Fog lamp W		Front	55
		Rear	21
Side turn signal lamp W			5
Rear combination lamp W		Tail/stop	5/21
		Turn signal	21
		Backup	16 (W16W) or 18 (921)
High mount stop lamp		Mounted on rear shelf W	21
		Incorporated in rear spoiler	LED type
Licence plate lamp W × number			5 × 2

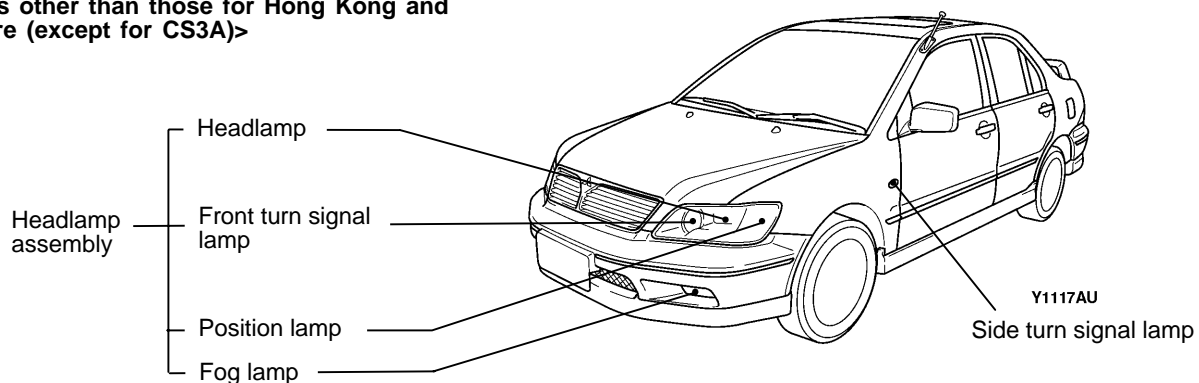
NOTE The brackets () show the bulb type.

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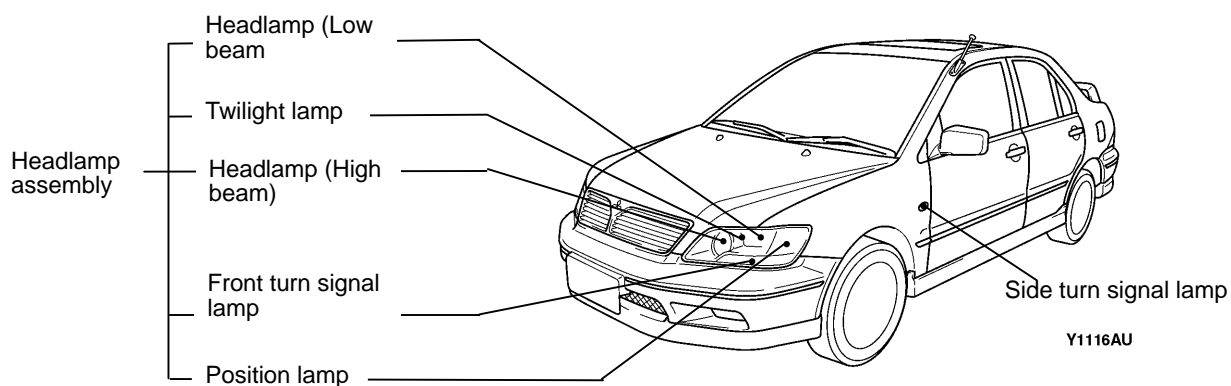
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CONSTRUCTION DIAGRAM

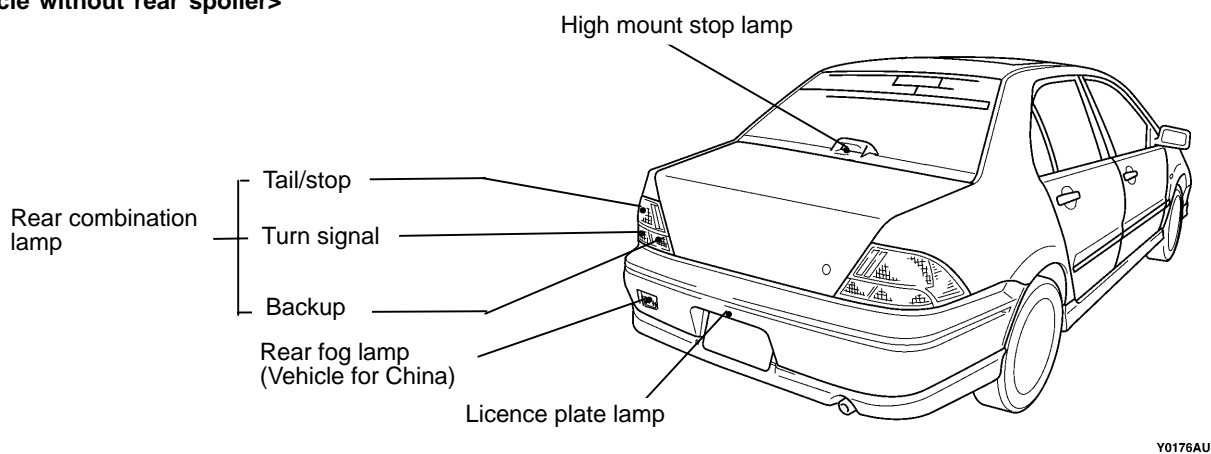
<Vehicles other than those for Hong Kong and Singapore (except for CS3A)>



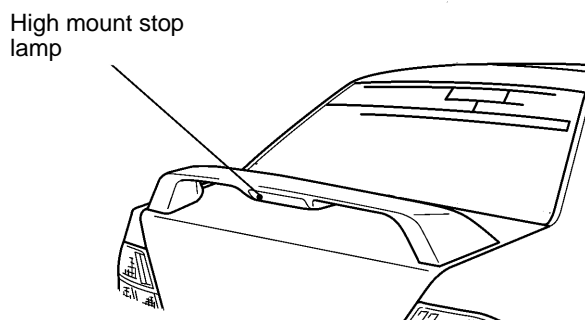
<Vehicle for Hong Kong and Singapore (except for CS3A)>



<Vehicle without rear spoiler>



<Vehicle with rear spoiler>



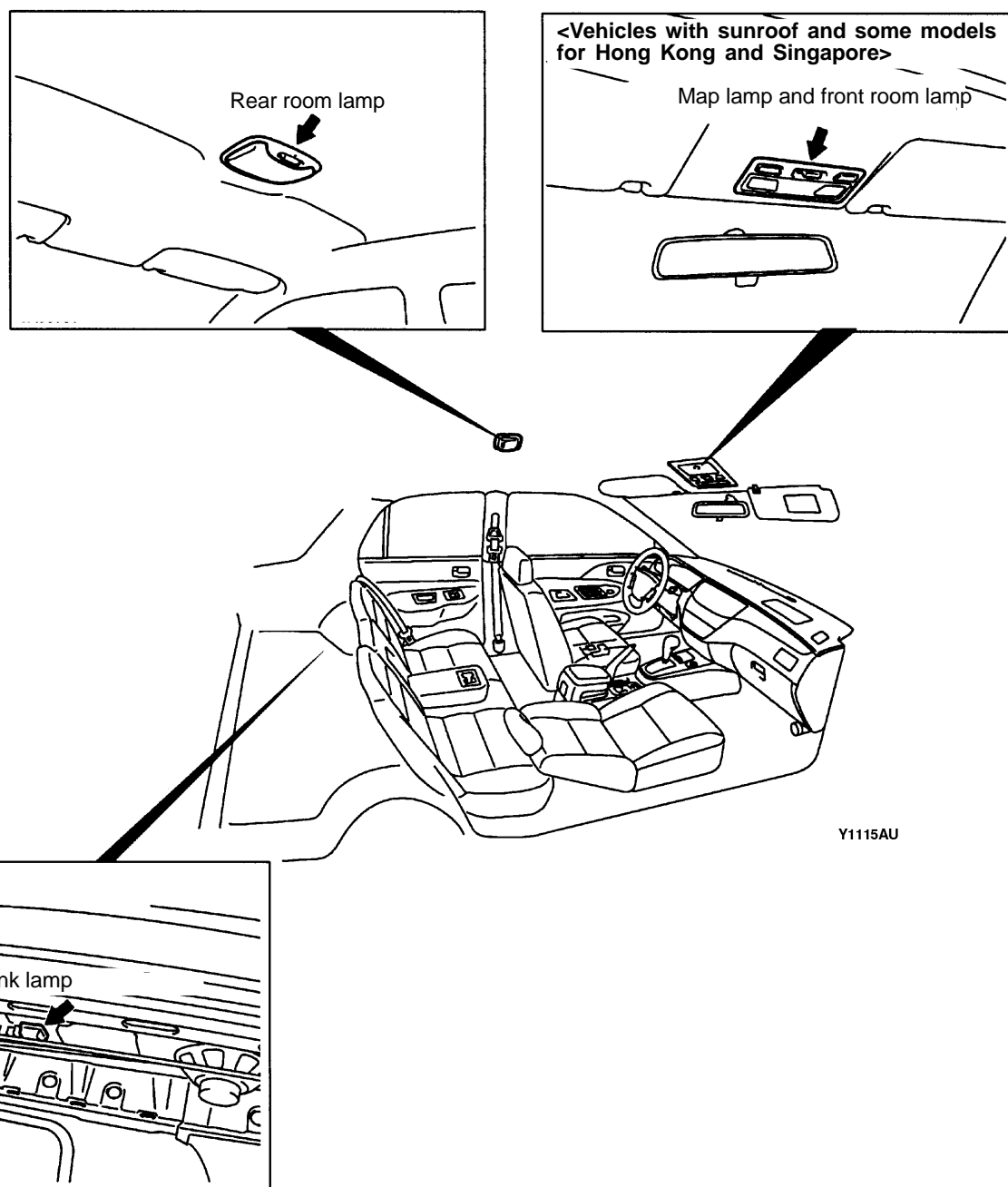
INTERIOR LAMPS

- A map lamp serving also as front room lamp which can be used at both the driver's seat and passenger seat (some models for Hong Kong and Singapore have sunglass pockets) is provided.<Vehicles with sunroof and some models for Hong Kong and Singapore>
- A rear room lamp to light the backseat and trunk lamp to light the trunk are provided.

SPECIFICATIONS

Item		Specifications
Map lamp and front room lamp	Map lamp W × quantity	7.5 × 2
	Front room lamp W	7.5
Rear room lamp W		8
Trunk lamp W		5

CONSTRUCTION DIAGRAM



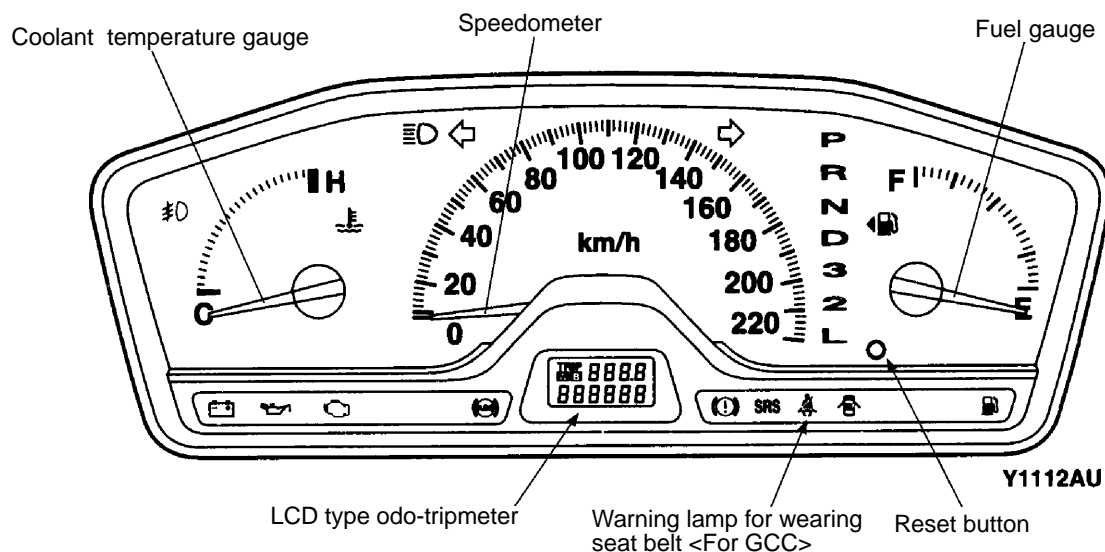
COMBINATION METER

The combination meter is an easy-to-read pointer type meter. A vehicle without a tachometer has a speedometer at the centre, a coolant temperature gauge on the left, and a fuel gauge on the right. A vehicle with a tachometer has a speedometer at the centre, tachometer on the left, and fuel gauge and coolant temperature gauge on the right. Both type of vehicles are designed to facilitate reading of meter information by the driver.

- The speedometer is an electronic type speedometer which operates by the pulse signal generated by the speed sensor.
- 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. (Standard meter)
- A GDI ECO indicator lamp which indicates the low fuel running state of the GDI engine is provided. ([Refer to Control System.](#))
- A warning lamp to alert the driver to wear the seat belt has been installed. <For Hong Kong, Singapore and GCC>
- The fuel gauge is provided with a triangular mark indicating the location of the fuel filler door to show clearly that the fuel filler door is on the left side of the car.
- A high contrast meter design which shows a pointer and dial display on a black panel when the ignition switch is turned to the ON position is provided to improve visibility and add a touch of luxury. <Some models for Hong Kong>
- A large and clear LCD type odo-tripmeter is provided. The display of the odometer and tripmeter can be switched by a reset button. The tripmeter adopts a twin-trip (trip A, trip B) function which can be switched by a reset button.<High contrast meter>
- The combination meter brightness can be changed both in the daytime and at night using the rheostat in the combination meter.
- The high contrast meter is provided with a tail lamp indicator lamp which illuminates when the tail lamp illuminates to indicate the tail lamp state clearly.
- A CVT shift position display has been added below the CVT indicator to show gears 1 to 6 by digital display to indicate the shift position clearly.

CONSTRUCTION DIAGRAM

<Standard meter without tachometer>

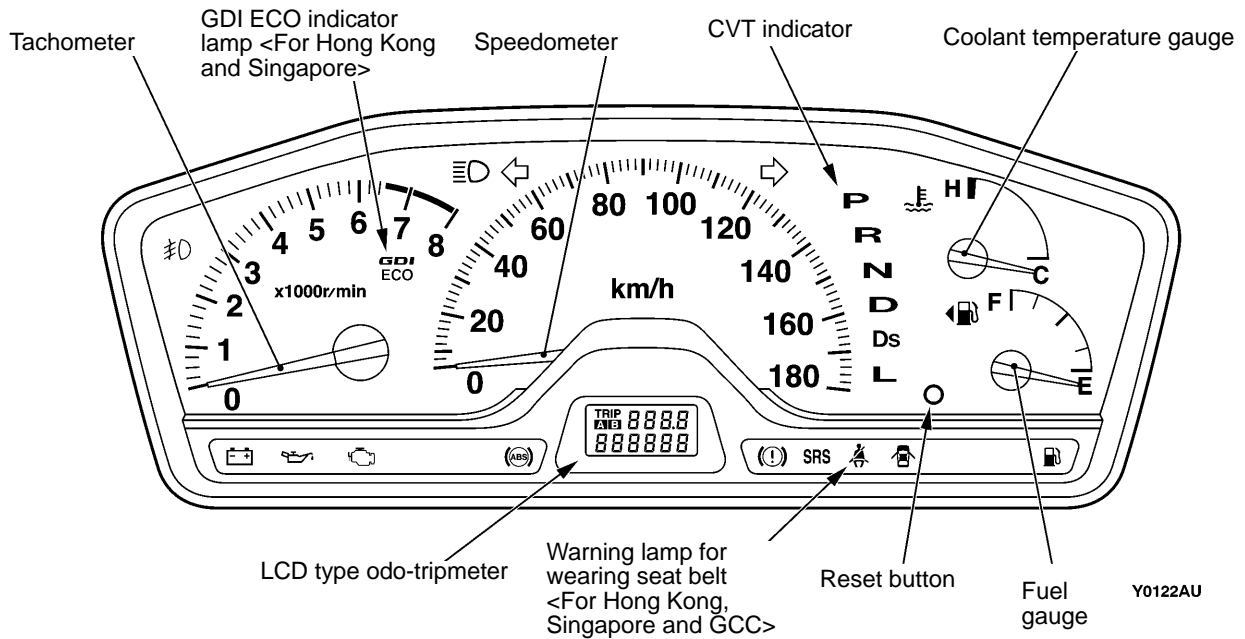


EQUIPMENT – Combination Meter

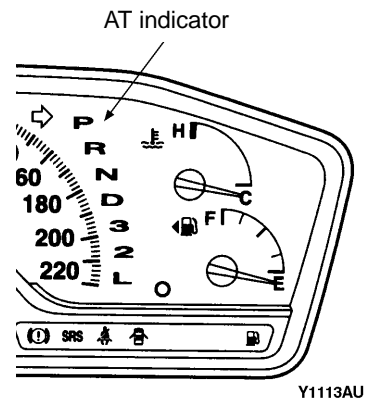
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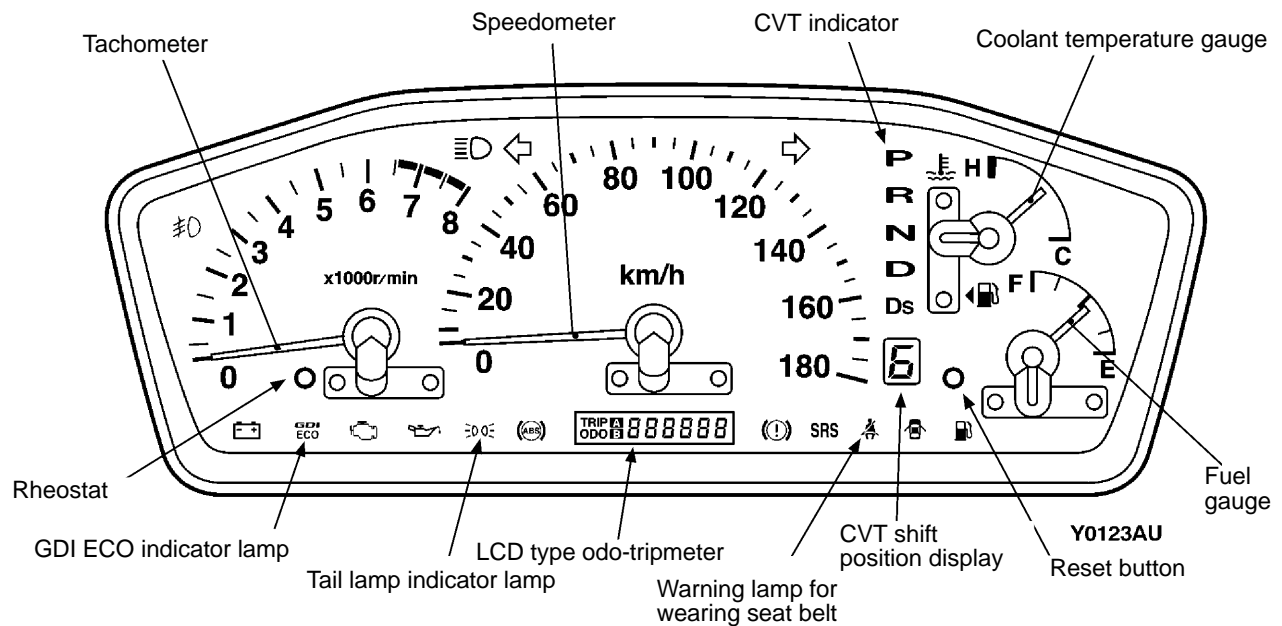
<Standard meter with tachometer>



<Vehicle with 4A/T>



<High contrast meter> (For Hong Kong and Singapore)



RADIO, TAPE PLAYER, SPEAKER, ANTENNA

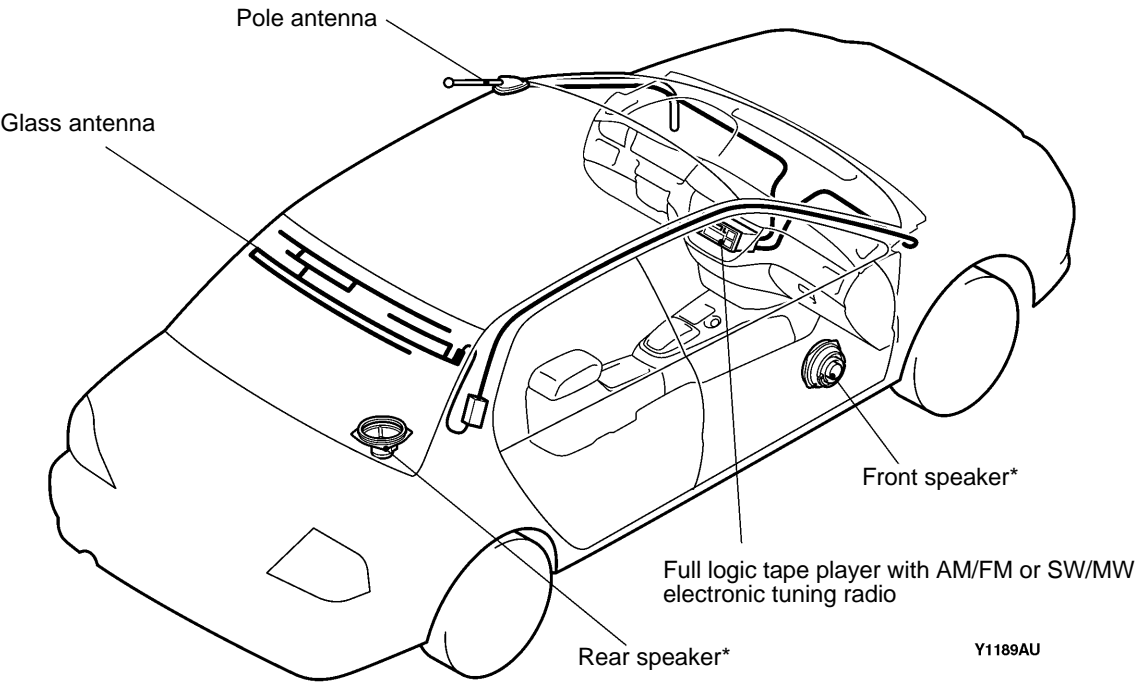
1. Three types of 1DIN size integrated audio units are provided for the radio and tape player.

Item	Type 1	Type 2	Type 3
AM/FM electronic tuning radio	Equipped	Ditto	-
SW/MW electronic tuning radio	-	-	Equipped
Full logic tape player	Equipped	Equipped	Equipped
CD player	-	Equipped in some models	-
CD auto-changer (6-disk pack player)	Equipped(Optional)	Ditto	Ditto
Power amplifier with radio	11W × 2	15W × 4	15W × 2

2. Depending on the model, 4 speakers (front door: 16 cm, rear shelf: 13 cm) or 2 speakers (rear shelf :13 cm) are provided. The 13 cm-dia. speaker is a dual cone full range speaker while the 16 cm-dia. speaker is a single cone full range speaker.
3. The following 2 types of antennas are available depending on the model.
- Pole antenna
 - Rear glass antenna

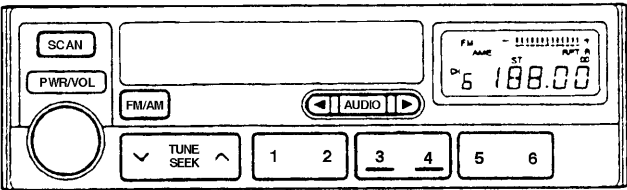
EQUIPMENT – Radio, Tape Player, Speaker, Antenna

CONSTRUCTION DIAGRAM



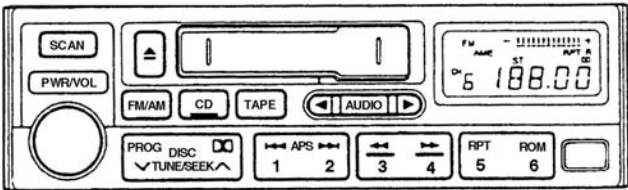
NOTE
The * indicates equipped on the left and right sides.

Type 1



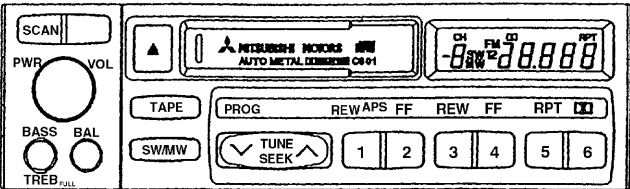
Y1188AU

Type 2



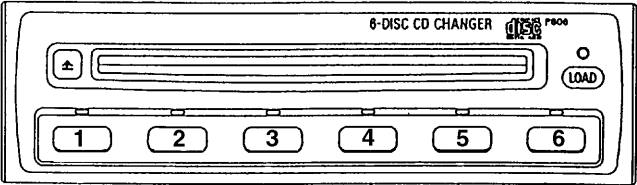
H11A253

Type 3



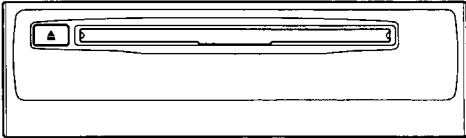
Y1192AU

CD changer



X0370CA

CD player



W1104AL

SMART WIRING SYSTEM (SWS)

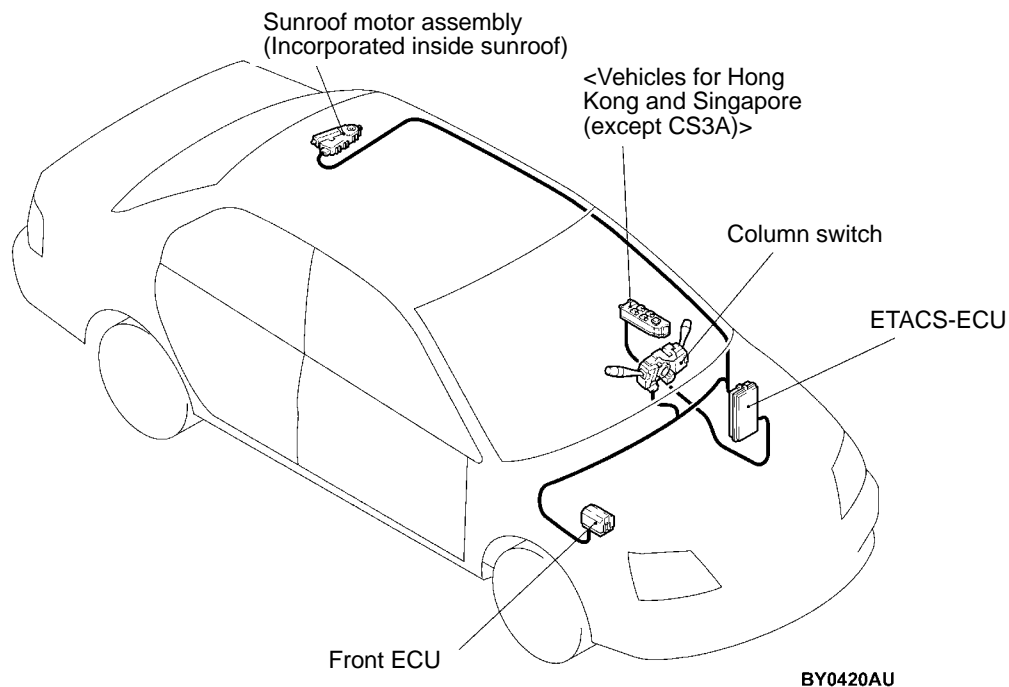
SWS is a minimal line system which transmits numerous signals using one wiring to control against increased weight and complication of harnesses which result from the increase in electronic accessories. Basically the same as the new SPACE RUNNER.

To transmit numerous signals, the ETACS-ECU*, column switch, front ECU, power window main switch (power window switch of the driver's seat side) <Vehicles for Hong Kong and Singapore (except CS3A)>, sunroof motor assembly (incorporated in the sunroof ECU) and multi-centre display incorporate multi-distribution circuits to carry out communication between control units.

NOTE

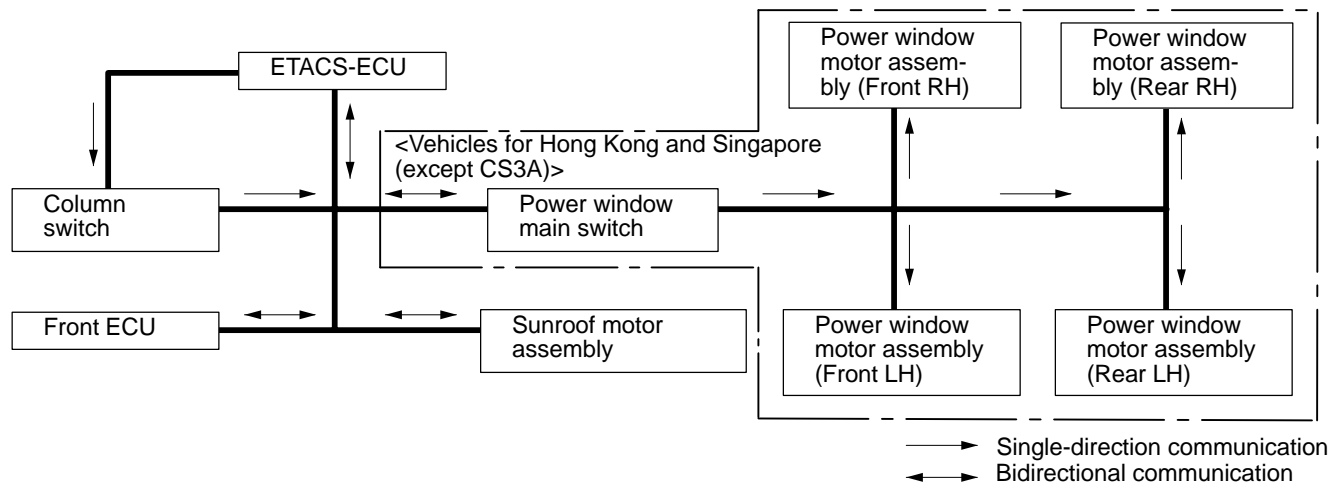
*: ETACS (Electronic Time and Alarm Control System)

CONSTRUCTION DIAGRAM



COMMUNICATION METHOD

The exclusive signal lines for transmitting the multi-distribution data are connected as follows between the ETACS-ECU, column switch (incorporated inside the column ECU), front ECU, sunroof motor assembly (incorporated inside the sunroof ECU), power window main switch (incorporated inside the power window ECU), and power window motor assemblies (incorporated inside the power window motor ECU) <Vehicles for Hong Kong and Singapore (except CS3A)> for internal communication.



MULTI-DISTRIBUTION INPUT/OUTPUT BY CIRCUIT

Multi-distribution is employed by the following circuits. The relation of the input switches, sensors, ECUs connected by multi-distribution lines, and outputs are also shown below.

Circuit and Input Switch and Sensor	ECUs and Switches Connected by Multi-Distribution	Output Side
1. Buzzer <ul style="list-style-type: none"> Lamp still ON reminder warning function <div> <ul style="list-style-type: none"> Ignition switch (IG1) Driver's seat door switch Key reminder switch </div>	<div> ETACS-ECU Column switch (Lighting switch) </div>	Buzzer (built-in ETACS-ECU)
2. Power window <Vehicles for Hong Kong and Singapore (except CS3A)> <ul style="list-style-type: none"> Power window timer function <div> <ul style="list-style-type: none"> Ignition switch (IG1) Driver's seat door switch </div>	<div> ETACS-ECU Power window main switch Power window motors </div>	Power window relay

EQUIPMENT – Smart Wiring System (SWS)

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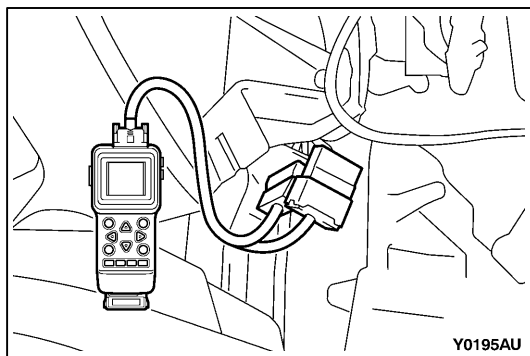
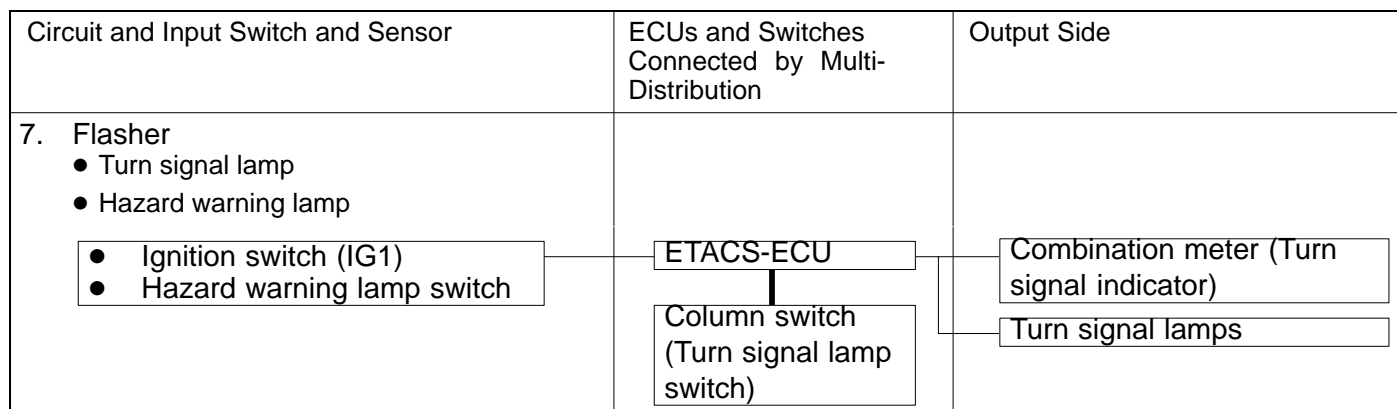
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Circuit and Input Switch and Sensor	ECUs and Switches Connected by Multi-Distribution	Output Side
<p>3. Keyless entry <Vehicles for Hong Kong and Singapore (except CS3A)></p> <ul style="list-style-type: none"> Multi-mode keyless entry function <p>Keyless entry transmitter</p>	<p>ETACS-ECU</p> <p>Power window main switch</p> <p>Power window motors</p> <p>Sunroof motor</p>	<p>Power window relay</p> <p>Power folding outside mirror</p> <p>Turn signal lamps</p> <p>Room lamp</p>
<p>4. Sunroof</p> <ul style="list-style-type: none"> Sunroof timer function <p>Ignition switch (IG1)</p> <p>Driver's seat door switch</p> <p>Ignition switch (1G2)</p>	<p>ETACS-ECU</p> <p>Sunroof motor</p>	
<p>5. Windshield wiper washer</p> <ul style="list-style-type: none"> Windshield mist wiper Vehicle speed-dependent variable windshield intermittent wiper Windshield low speed wiper Windshield high speed wiper Windshield washer <p>Speed signal (Engine-CVT-ECU)</p> <p>Column switch (Windshield intermittent wiper volume)</p> <p>Ignition switch (ACC)</p>	<p>ETACS-ECU</p> <p>Column switch (Windshield wiper washer switch)</p> <p>Front ECU</p>	<p>Windshield wiper motor</p> <p>Windshield washer motor</p>
<p>6. Lighting</p> <ul style="list-style-type: none"> Headlamp, tail lamp Headlamp auto-cut function Auto-lamp function <Vehicles for Hong Kong and Singapore (except CS3A)> <p>Ignition switch (IG1)</p> <p>Driver's seat door switch</p> <p>Vehicle speed signal (Engine-CVT-ECU)</p> <p>Photo sensor (Auto-light)</p> <p>Ignition switch (IG29)</p>	<p>ETACS-ECU</p> <p>Column switch (Lighting switch)</p> <p>Front ECU</p>	<p>Combination meter (High beam indicator)</p> <p>Illumination lamps</p> <p>Headlamp</p> <p>Taillamps</p>

EQUIPMENT – Smart Wiring System (SWS)

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DIAGNOSTIC FUNCTION

DIAGNOSIS CODE SET

The ETACS-ECU sends diagnosis codes if the communication line is faulty when the MUT-II is connected.

NOTE Refer to the Workshop Manual for details of the diagnostic items.

SWS INPUT SIGNAL CHECK BY MUT-II

When the MUT-II is connected to the diagnostic connector, and switches input for the SWS are operated, the buzzer in the MUT-II sounds, indicating whether the operations of the switches are satisfactory or not.

INPUT SIGNALS THAT CAN BE CHECKED

Input signal	Conditions for sounding buzzer
Ignition switch (ACC)	When the switch is turned from the LOCK (OFF) position to ACC
Ignition switch (IG1)	When the switch is turned from ACC to the ON position
Key reminder switch	When the ignition key inserted in the ignition key cylinder is removed.
Inhibitor switch (Reverse)	When the selector lever is moved to the R position
Electronic remote control mirror switch (Fold/unfold switch) <Vehicles for Hong Kong and Singapore (except CS3A)>	When the switch is turned from the OFF to the ON position
Hazard lamp switch	
Fog lamp switch	
Driver's seat door switch	When the driver's seat door is opened from the closed state
Various door switches	When one of the closed doors is opened
Driver's seat door lock actuator	When the key cylinder or door lock knob of the driver seat is turned from LOCK to UNLOCK position, or from UNLOCK to LOCK position
Speed signal	When the speed changes from less than 10 km/h to more than 10 km/h
Photo sensor (auto-lamp <Vehicles for Hong Kong and Singapore (except CS3A)>)	When the brightness of the sensor changes from bright to dark

EQUIPMENT – Smart Wiring System (SWS)

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Input signal		Conditions for sounding buzzer
Column switch	Auto lamp switch <Vehicles for Hong Kong and Singapore (except CS3A)>	When the lighting switch is turned from one position to the auto-lamp position
	Tail lamp switch	When the lighting switch is turned from one position to the tail lamp position
	Headlamp switch	When the lighting switch is turned from one position to the headlamp position
	Dimmer switch	When the switch is turned from the OFF to the ON position
	Passing switch	
	Turn signal lamp LH switch	
	Turn signal lamp RH switch	
	Windshield mist wiper switch	
	Windshield intermittent wiper switch	
	Windshield low speed wiper switch	
	Windshield high speed wiper switch	
	Windshield intermittent wiper volume	When turned from FAST to SLOW(Output once near the centre)
	Windshield washer switch	When the switch is turned from the OFF to the ON position
<Vehicles for Hong Kong and Singapore (except CS3A)>	Switches	When the switch is turned from the OFF to the ON position
<Vehicles for Hong Kong and Singapore (except CS3A)>	Switches	When the switch is turned from the OFF to the ON position
Sunroof	Switches	When the switch is turned from the OFF to the ON position
Multi-purpose fuse No.17 load <Vehicles for Hong Kong and Singapore (except CS3A)>		When the multi-purpose fuse No. 17 is used as the power supply load

FUNCTIONS AND CONTROL OF SWS ECUS

The following functions are controlled by the SWS ECUs:

No.	Functions	Control ECU
1	Ignition switch inserted reminder warning function* ¹	ETACS-ECU
2	Lamp still ON reminder warning function	ETACS-ECU, column switch
3	R (reverse) position warning function* ²	ETACS-ECU
4	Speed alarm function* ³	ETACS-ECU
5	Multi-centre display buzzer function	ETACS-ECU, multi-centre display
6	Central door lock control function	ETACS-ECU
7	Key inserted reminder function* ²	ETACS-ECU
8	Keyless entry hazard answerback function* ²	ETACS-ECU
9	Power window timer function* ²	ETACS-ECU, power window main switch
10	Sunroof timer function	ETACS-ECU, sunroof motor
11	Windshield wiper washer control function	ETACS-ECU, front ECU, column switch
12	Power folding outside mirror control function	ETACS-ECU

EQUIPMENT – Smart Wiring System (SWS)

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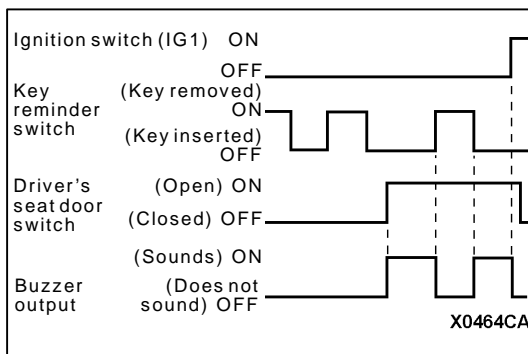
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No.	Functions	Control ECU
13	Ignition key cylinder illumination lamp control function	ETACS-ECU
14	Headlamp auto-cut function	ETACS-ECU, front ECU, column switch
15	Auto-lamp function* ²	ETACS-ECU, front ECU, column switch
16	Flasher timer function	ETACS-ECU, column switch
17	Dimmer type room lamp control function	ETACS-ECU
18	Interior lamp auto-cut function* ²	ETACS-ECU
19	Adjustment function* ²	ETACS-ECU, column switch

*1 For Hong Kong, Singapore (except CS3A) and GCC only

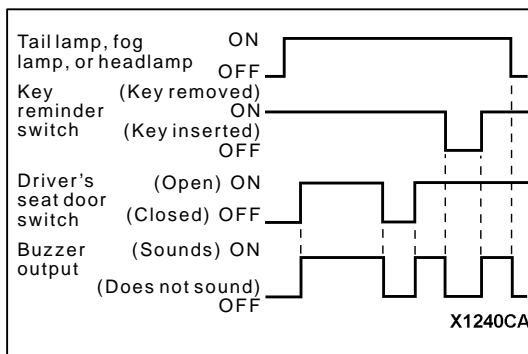
*2 For Hong Kong and Singapore (except CS3A) only

*3 For GCC only



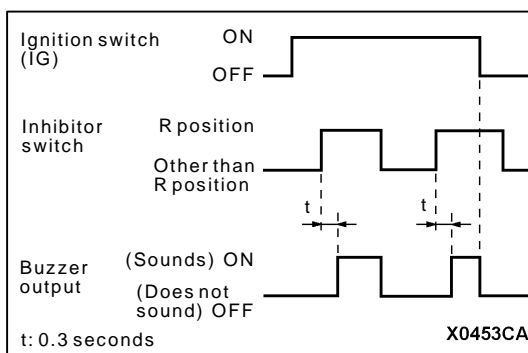
IGNITION KEY INSERTED REMINDER WARNING FUNCTION <FOR HONG KONG, SINGAPORE (EXCEPT CS3A) AND GCC>

When the driver's seat door is opened with the ignition key inserted in the ignition key cylinder (ignition switch is in the OFF position), the buzzer sounds intermittently (horning sound) to indicate that the ignition key has not been removed.



LAMP ON WARNING FUNCTION

When the tail lamp, fog lamp, or headlamp is ON, if the ignition key is removed and the driver's door is opened, a buzzer will sound continuously to warn that the lamp is illuminated. However, if the tail lamp or headlamp has been turned off by the headlamp auto-cut function, the buzzer will not sound.

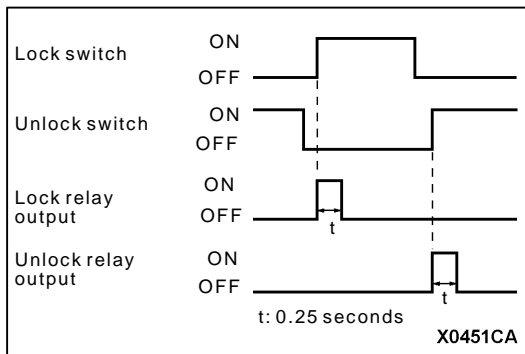


R (REVERSE) POSITION WARNING FUNCTION <FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>

When the selector lever (inhibitor switch) is moved to the R position with the ignition switch is turned to the ON position, the buzzer will sound intermittently 0.3 seconds later (beep sound) to warn that the selector lever is at the R position.

SPEED ALARM FUNCTION<FOR GCC ONLY>

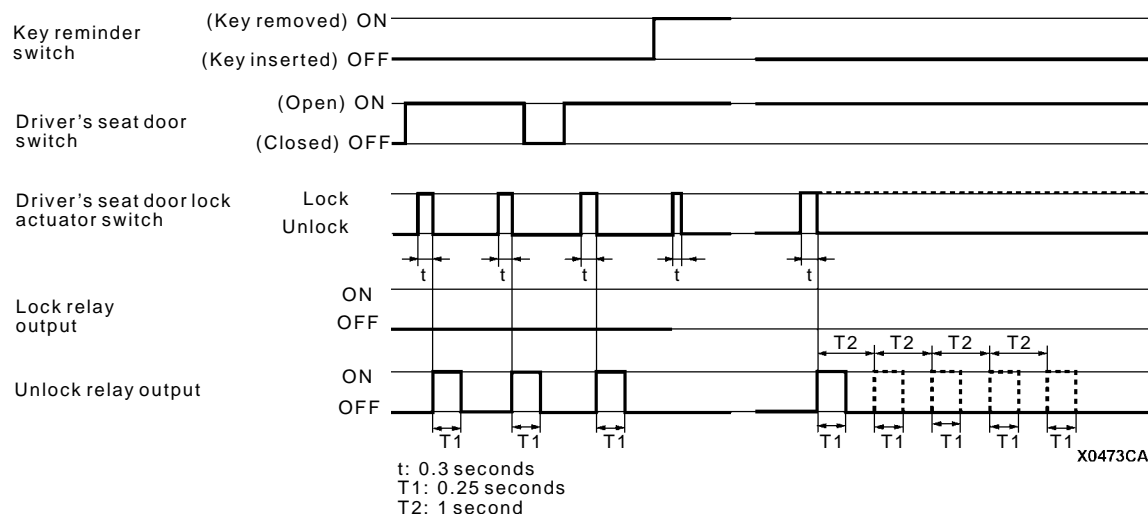
When the ignition switch is ON and the speed is more than 120 km/h, the buzzer will sound (doorbell buzzer) to warn the driver of overspeeding.

**CENTRAL DOOR LOCK CONTROL FUNCTION**

When the driver's seat door is locked (after the unlock switch in the driver's seat door lock actuator is turned OFF, the lock switch is turned ON), the ETACS-ECU activates the lock relay output for 0.25 seconds and locks all doors. Next, when the driver's seat door is unlocked (after the lock switch in the driver's seat unlock actuator is turned OFF, the unlock switch is turned ON), the ETACS-ECU activates the unlock relay output for 0.25 seconds and unlocks all doors.

KEY INSERTED REMINDER FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>

When the driver's seat door is opened with the ignition key inserted in the ignition key cylinder, and the driver's seat door is locked (after the unlock switch in the driver's seat door unlock actuator is turned OFF, the lock switch is turned ON), after about 0.3 seconds, the ETACS-ECU activates the unlock relay output for 0.25 seconds to prohibit unlocking operations and prevent the ignition key from being locked in. If locking operations could not be inhibited, power conduction for retry is carried out (the unlock relay output is turned ON for about 0.25 seconds every second for up to 5 times).

**NOTE**

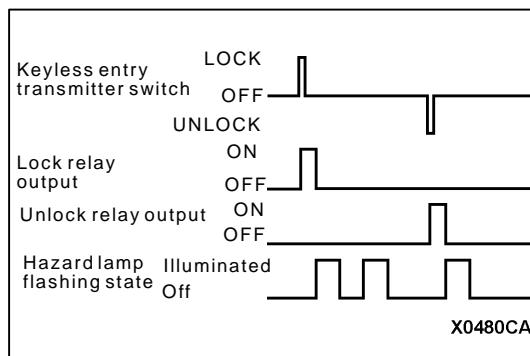
The dotted line indicates the power conduction state for retry when locking operations could not be inhibited.

MULTI-MODE KEYLESS ENTRY FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>

Keyless entry transmitter operations can be used to lock and unlock all doors, and operate the power windows, sunroof, and outside mirrors. [Refer to Multi-Mode Keyless Entry System](#) for details on operations.

NOTE

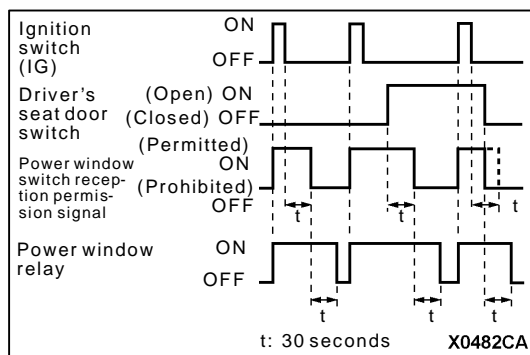
The adjustment function can be used to adjust whether to perform power window and sunroof operations. ([Refer Also](#).)

**KEYLESS ENTRY HAZARD ANSWERBACK FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>**

A hazard answerback function which facilitates checking of lock and unlock operations even during daytime is provided. When the lock signal is input from the keyless entry transmitter to the ETACS-ECU, the hazard lamp flashes twice. When the unlock signal is input, it flashes once.

NOTE

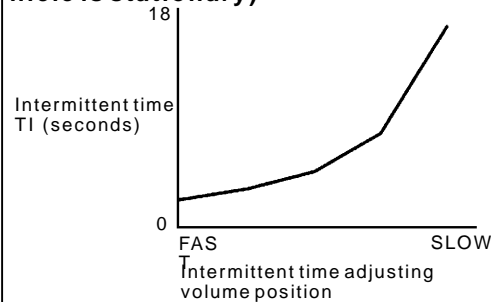
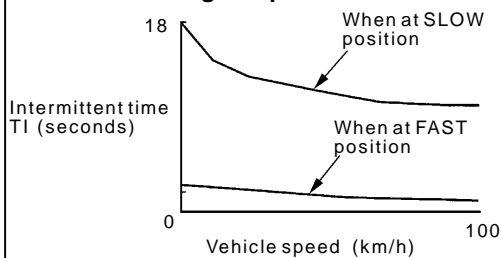
This function can be disabled by the adjustment function ([Refer Also](#)).

**POWER WINDOW TIMER FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>**

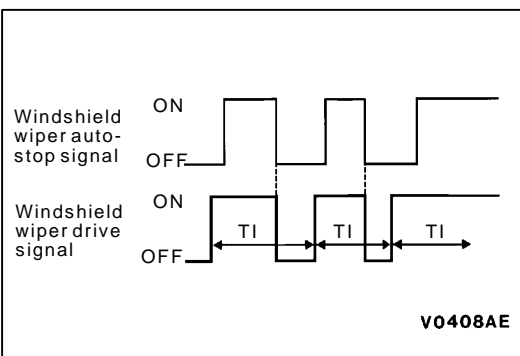
When the ignition switch is turned to the ON position, the power window relay and power window switch reception permission signals (SWS signal sent from the ETACS) are turned ON. After the ignition switch is turned OFF, the system continues to turn ON the power window switch reception permission signal for about 30 seconds and to enable the opening and closing of the door window by the power window switch. The power window relay goes OFF about 30 seconds after the reception permission signal goes OFF. When the driver's seat door is opened while the timer is in operation, the reception permission signal will be turned ON for about 30 seconds from this point. However, if the driver's seat door is closed, the reception permission signal will be turned OFF. The power window relay goes OFF about 30 seconds after the reception permission signal goes OFF.

SUNROOF TIMER FUNCTION

Sunroof operations are possible with the sunroof switch about 30 seconds after the ignition switch is turned OFF. [Refer to Sunroof](#) for details on the operations.

Change in intermittent time by intermittent time adjusting volume (when vehicle is stationary)**Change in intermittent time according to speed**

AX0508CA



V0408AE

WINDSHIELD WIPER WASHER CONTROL FUNCTION

- Intermittent control (Vehicle speed-dependent variable type)

(1) The ETACS-ECU calculates the intermittent time according to the vehicle speed calculated from the windshield wiper intermittent time adjusting volume vehicle speed signal (engine CVT-ECU), and sends it to the front ECU as SWS data.

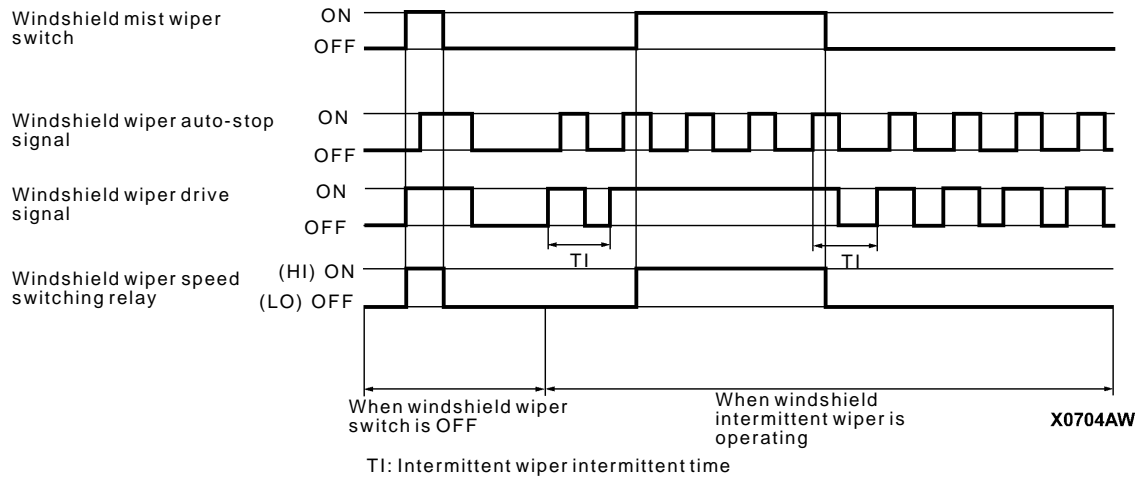
NOTE

The vehicle speed-dependent function can be disabled using the adjustment function only for vehicles for Hong Kong and Singapore (except for CS3A).([Refer Also](#))

- The front ECU determines the intermittent time TI from the input SWS data signal, and turns ON the windshield wiper drive signal. When the wiper is at the STOP position, the windshield wiper auto-stop signal goes OFF to turn OFF the windshield wiper drive signal. After the intermittent time TI seconds from when the windshield wiper drive signal turned ON, the windshield wiper drive signal is turned ON again and the above operation is repeated.

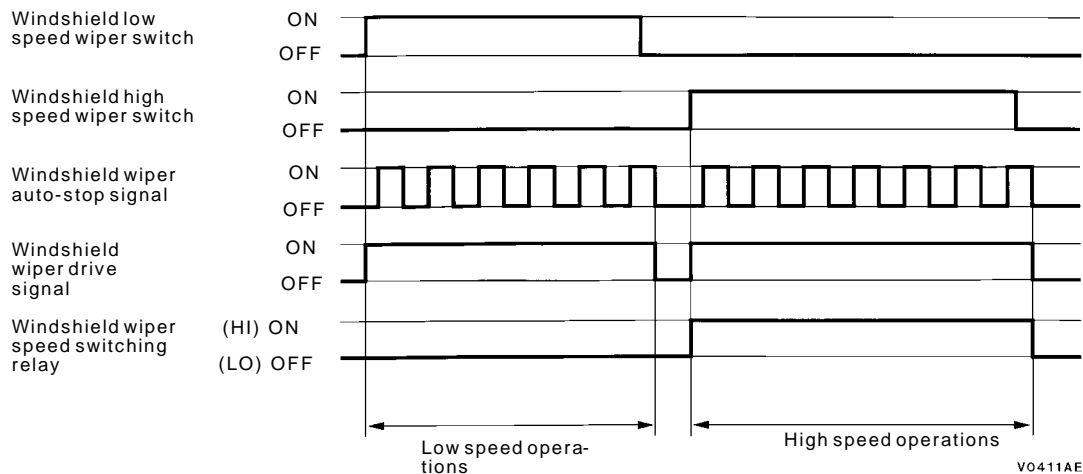
2. Mist wiper control

When the ignition switch is at the ACC or ON position, if the windshield mist wiper switch of the column switch is turned ON, the front ECU turns ON the windshield wiper drive signal. At the same time, the wiper speed switching relay is turned ON (HI), and while the windshield mist wiper switch is ON, the windshield wiper will operate at high speed. At the point the windshield mist switch is turned ON, if the windshield wiper has been operating intermittently, the same operations as the above will be performed while the windshield mist wiper switch is ON. After the windshield mist wiper switch goes OFF, the intermittent operations will be set again TI seconds after the windshield wiper auto-stop signal is turned ON last.



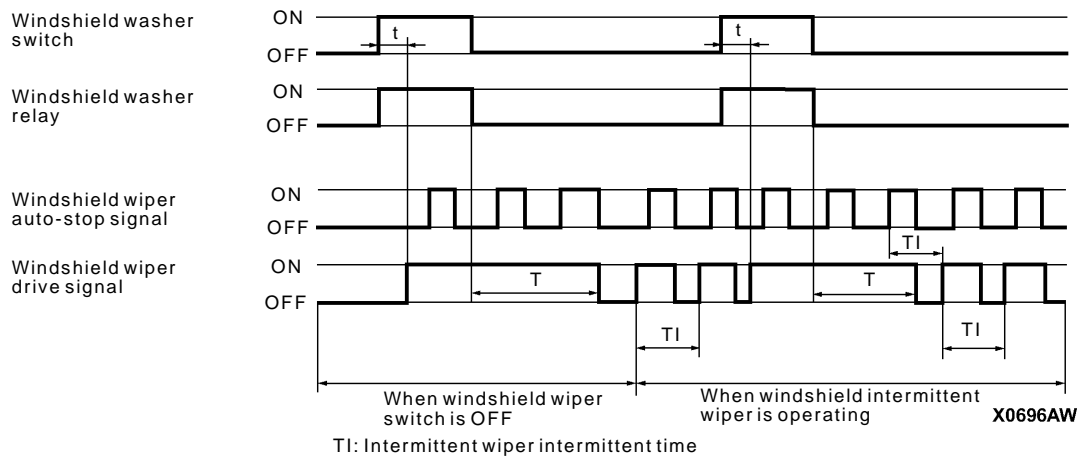
3. Low Speed Wiper, High Speed Wiper Control

When the ignition switch is at the ACC or ON position, if the windshield low speed wiper switch of the column switch is turned ON, the front ECU turns ON the windshield wiper drive signal, turns OFF (LO) the windshield wiper speed relay, and operates the windshield wiper at low speed. Next, when the windshield high speed wiper switch is turned ON, the windshield wiper drive signal is turned ON, the windshield wiper speed switching relay is turned ON (HI), and the windshield wiper is operated at high speed.



4 Washer control

When the ignition switch is at the ACC or ON position, if the windshield washer switch of the column switch is turned ON, the front ECU turns ON the windshield washer relay. The windshield wiper drive signal is turned ON in 0.3 seconds until 3 seconds after the windshield washer switch goes OFF (The wiper drive signal output time varies according to the conditions. Refer to the following table for details) to operate the windshield wiper continuously. When the windshield washer switch is turned ON, if the windshield wiper is operating intermittently, intermittent operations will be continued after continuous operations.



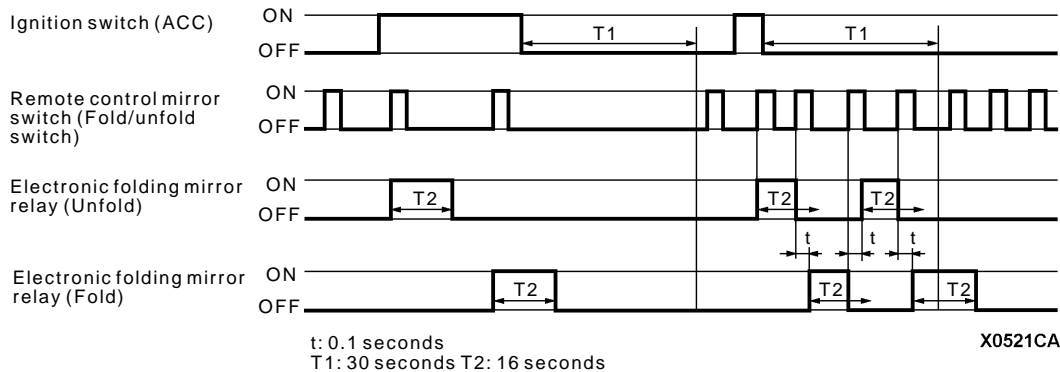
	When wiper switch is OFF				When wiper switch is INT				When wiper switch is LO or HI
t	0.3 seconds or less	0.3 - 0.5 seconds	0.5 - 0.7 seconds	0.7 seconds	Less than 0.2 seconds	0.3 - 0.5 seconds	0.5 - 0.7 seconds	0.7 seconds	-
T	0 second	1 second	2 seconds	3 seconds	0 second	1 second	2 seconds	3 seconds	3 seconds

POWER FOLDING OUTSIDE MIRROR CONTROL FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>**(1) Power folding outside mirror timer function**

When the fold/unfold switch of the power remote control mirror switch is turned ON with the ignition switch at the ACC or ON position, the power folding mirror relay (fold or unfold) is turned ON for 16 seconds to perform folding or unfold operation. After the ignition switch is turned to the OFF position, the operable state continues for about 30 seconds. If the power fold/unfold switch of the remote control mirror switch is turned ON while the folding or unfold relay is driving, the operation relay on the opposite side is turned ON after 0.1 second delay.

NOTE

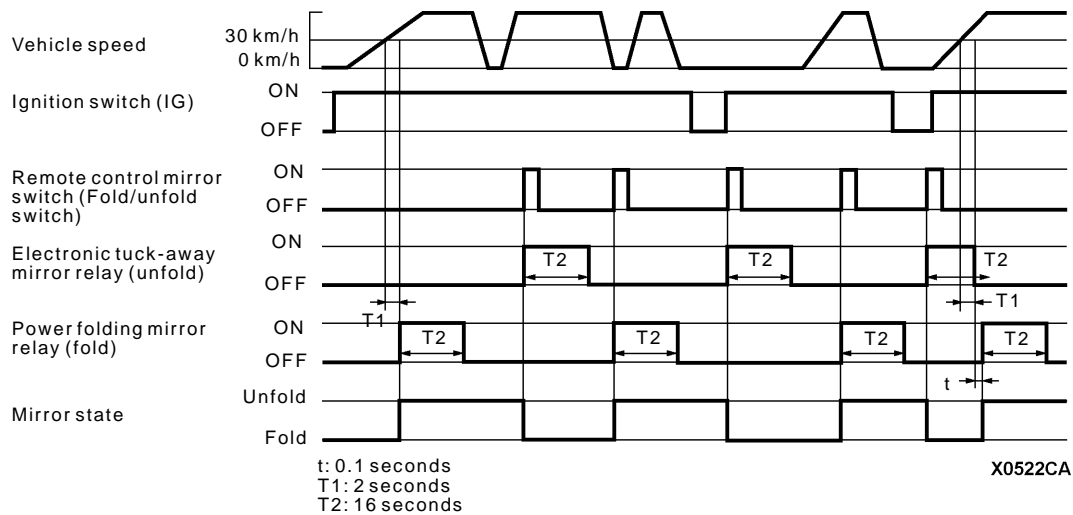
As the relay which turned ON previously is memorized and used to determine whether the outside mirror is at the fold or unfold position, if folding is done manually, the fold/unfold switch may not be operable the next time it is pressed.

**2. Automatic unfold function**

When the ignition switch is ON, and the speed exceeds 30 km/h (continues for more than 2 seconds), if the mirror is in the fold state, the ETACS-ECU turns ON the folding mirror relay (unfold) for 16 seconds to place the outside mirror at the unfold position. However, after the ignition switch is turned from the OFF to ON position, if the fold/unfold switch of the remote control mirror switch is operated, automatic unfold will not be performed. Even during mirror folding operations, if the speed exceeds 30 km/h (continues for more than 2 seconds), like (1), the folding mirror relay (unfold) is turned ON after 0.1 seconds delay.

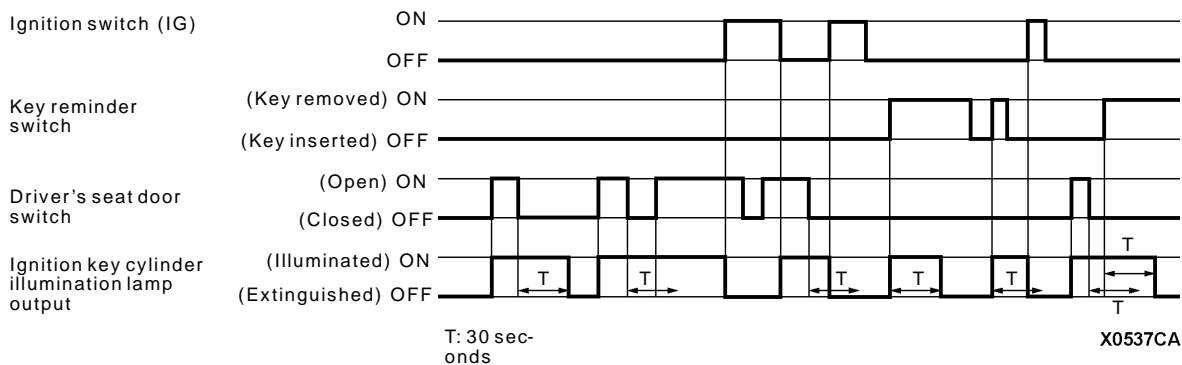
NOTE

- (1) As the relay which turned ON previously is memorized and used to determine whether the outside mirror is at the fold or unfold position, automatic unfold will not be performed when folding is done manually.
- (2) This function can be disabled by the adjustment function. [\(Refer Also.\)](#)



IGNITION KEY CYLINDER ILLUMINATION LAMP CONTROL FUNCTION

The ignition key cylinder illumination lamp lights up when the driver's seat door is open with the ignition switch at the OFF position and for 30 seconds after the door is closed. It will also illuminate for 30 seconds after the ignition key is removed. In both cases, the lamp will go off when the ignition key is turned to the ON position.



HEADLAMP AUTO-CUT FUNCTION

Even if the lighting switch (tail lamp switch or headlamp switch) is ON, the head lamp (including the tail lamps) will automatically go off in the following conditions to prevent the battery from discharging as a result of forgetting to turn off lights.

<Other than for Hong Kong>

When the ignition key is turned from ON to OFF with the lighting switch turned ON, and this state continues for 3 minutes, the lamp will automatically be turned off. If the driver's seat door is opened during these 3 minutes, the lamp will go off 1 second later. (During the one second until it goes off, the light still ON reminder warning buzzer will sound. However, if the driver's seat door is opened with the ignition key inserted, the key inserted reminder warning buzzer will function first.)

<For Hong Kong>

- When the ignition key is turned from ON to OFF with the lighting switch turned ON, and this state continues for 3 minutes, the lamp will automatically be turned off. If the driver's seat door is opened during these 3 minutes, the lamp will go off 1 second later. (During the one second until it goes off, the light still ON reminder warning buzzer will sound. However, if the driver's seat door is opened with the ignition key inserted, the key inserted reminder warning buzzer will function first.)
- When the headlamp switch is turned ON with the ignition switch and lighting switch OFF, the lamp will automatically go off 3 minutes later. If the driver's seat door is opened and then closed during these 3 minutes, the lamp will automatically go off 30 seconds later.

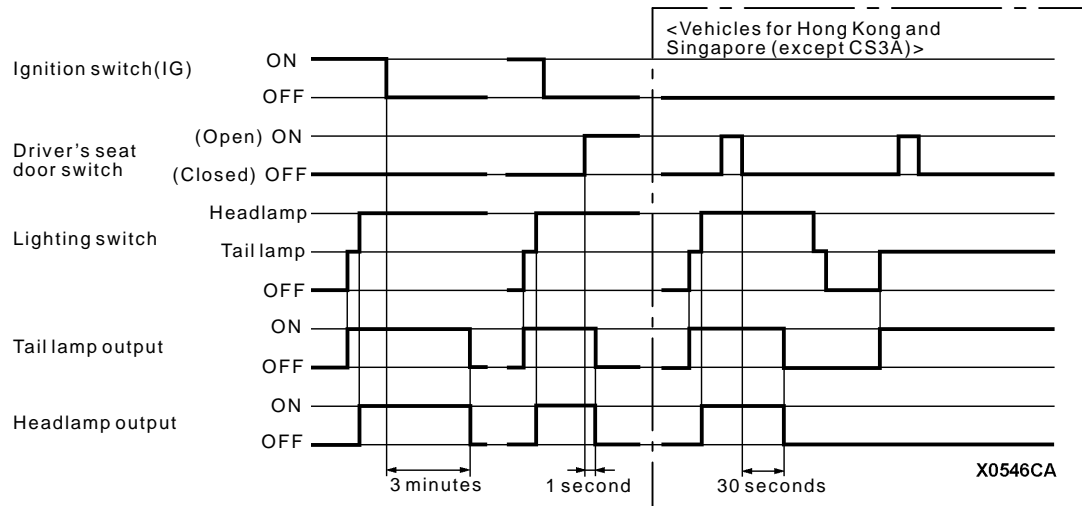
- (3) When the tail lamp switch is turned ON with the ignition switch and lighting switch OFF, the lamp will not go off automatically.

NOTE

The adjustment function can be used to set so that it goes off automatically 30 seconds later.(Refer Also.) If the lighting switch is turned ON after it was turned OFF after this function operated or if the ignition switch turns ON, the headlamp will light up again. It will also automatically go off in the (2) condition after lighting.

NOTE

This function can be disabled by the adjustment function(Refer Also.)



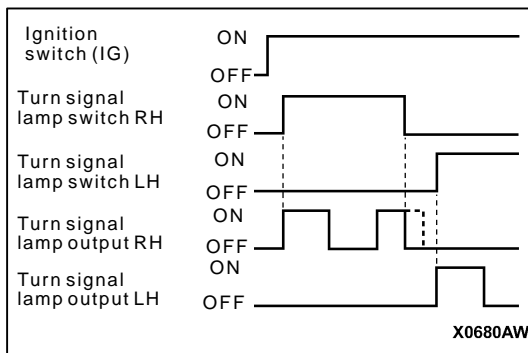
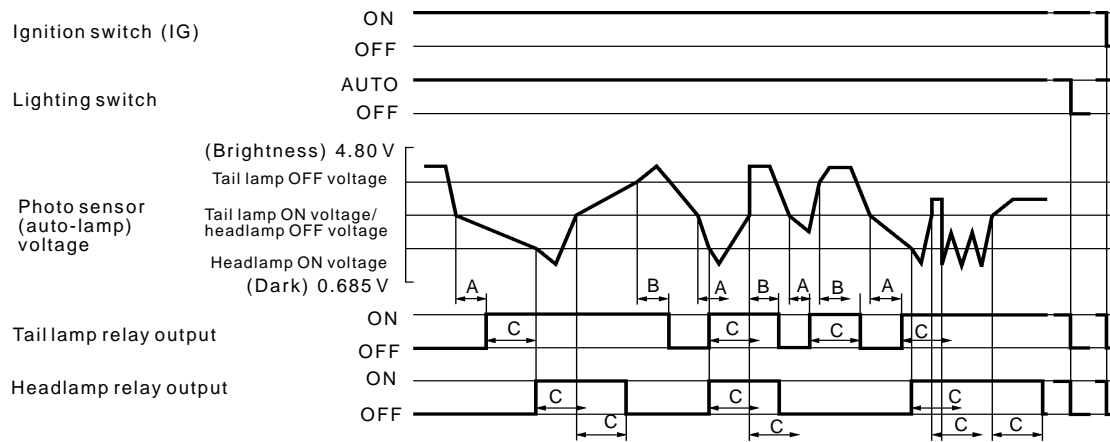
AUTO-LAMP FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>

When the lighting switch is turned to the AUTO position with the ignition switch ON, the tail lamp relay and head lamp relay lighting output are controlled according to the voltage (voltage value output according to the surrounding brightness) of the photo sensor (auto-lamp) to control the lighting on and off of the tail lamps or headlamps automatically.

- When below the tail lamp ON voltage, the tail lamp relay is turned ON after running 50 m or after 3 seconds.
- When below the headlamp ON voltage, the tail lamp relay and headlamp relay are turned ON immediately.
- When above the headlamp OFF voltage, the headlamp relay is turned OFF when the headlamp OFF voltage is exceeded.
- When above the tail lamp OFF voltage, the tail lamp relay and headlamp relay are turned OFF after running 30 m or after 3 seconds.
- When the relay turns ON once, it will maintain the ON state for 3 seconds.

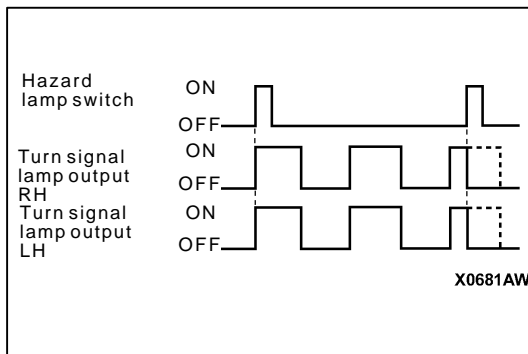
NOTE

- (1) The sensitivity of the photo sensor (auto-lamp) can be adjusted by the adjustment function.(Refer Also.)
- (2) If the ignition switch is turned ON before the engine is started, the lighting of the headlamp will be prohibited for 2 seconds to reduce electric load during cranking.(If cranking is within 2 seconds, the headlamp will illuminate after cranking completes.)
- (3) To prevent instantaneous lighting of the headlamp when the auto-light switch is conducted and the tail lamp switch is turned ON, the headlamp will illuminate for 0.5 seconds after turning to the auto-light switch position.



FLASHER TIMER FUNCTION

- (1) The turn signal lamp output (flashing signal) is turned ON when the turn signal lamp ignition switch is ON and the turn signal lamp switch is ON (LH or RH). If the front turn signal lamp or rear turn signal lamp bulb has burned out, the flashing speed increases to indicate that the bulb has burned out.



- (2) Detects the signal where the hazard lamp hazard lamp switch input changes from OFF to ON, and reverse the flashing state according to this signal. (Flashes when the hazard lamp is not flashing and turns off when flashing.)

NOTE

The hazard lamp switch is a push-return switch.

DIMMER TYPE ROOM LAMP CONTROL FUNCTION

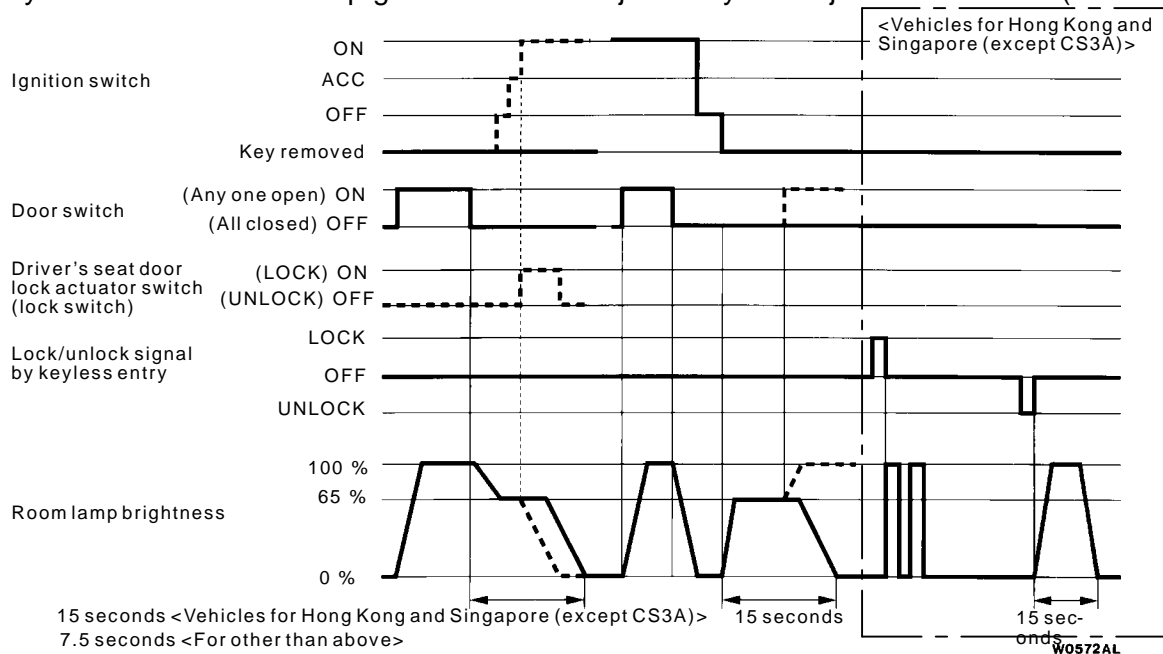
When the room lamp switch is at the door position, the ETACS-ECU controls the lighting of the room lamp as follows.

- (1) When a door is opened to get on or get off the vehicle (when the ignition switch is OFF), the lamp lights up (100%), when closed, the lamp dims (65%), and goes off 15 <Vehicles for Hong Kong and Singapore (except CS3A)> or 7.5 <For other than Hong Kong> seconds later. However if the ignition switch is turned ON while the timer illuminates or if door is locked, the lamp will go off at that point.
- (2) When a door is opened with the ignition switch ON, the lamp illuminates (100%), and goes off when closed.
- (3) When the ignition key is removed with all doors closed <Vehicles for Hong Kong and Singapore (except CS3A)>
When the ignition key is removed with all doors closed, the lamp illuminates (65%) and goes off after 15 seconds. When the ignition key is inserted again while the lamp illuminates or when door is locked, the lamp goes off.

- (4) Keyless entry room lamp answerback <Vehicles for Hong Kong and Singapore (except CS3A)>
To check keyless entry operations more easily, the room lamp is flashed twice when door is locked. When door is unlocked, the lamp illuminates for 15 seconds (100%) and then goes off.

NOTE

The delay time until the room lamp goes off can be adjusted by the adjustment function. [\(Refer Also.\)](#)



NOTE

The dotted lines indicate that lighting mode when the ignition switch is turned ON, door is locked, or any door is opened during the timer illumination time.

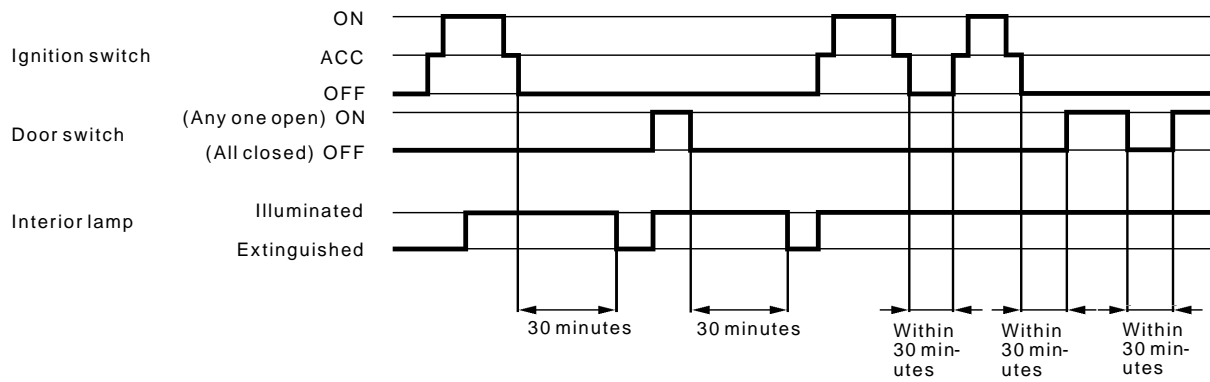
INTERIOR LAMP AUTO-CUT FUNCTION <VEHICLES FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>

Illuminated interior lamps such as the room lamp, etc. (all lamps using the room lamp fuse as the power supply) will automatically go off in the following conditions to prevent the battery from discharging as a result of forgetting to turn off the lights or incomplete closing of the door.

- When the ignition switch is turned off and more than 30 minutes pass by with the interior lamp illuminated, the lamp will go off automatically.
- When the ignition switch is turned off, and one of the door switches remains open for 30 minutes continuously, the lamp will go off automatically.

NOTE

This function can be disabled by the adjustment function. [\(Refer Also.\)](#)



ADJUSTMENT FUNCTION<VEHICLES FOR HONG KONG AND SINGAPORE (EXCEPT CS3A)>

According to the adjustment mode entry conditions of the input switch, the following functions can be adjusted. The data on adjustment will be memorized even if the battery is removed.

- Keyless entry system hazard answerback function
- Power window and sunroof operation of multi mode keyless entry
- Speed sensitivity wiper function
- Automatic unfold function of electric folding door mirror
- Headlamp auto-cut function
- Sensor sensitivity of auto-lamp function (Lighting brightness)
- Delayed light-off time of the room lamp
- Interior lamp auto-cut function
- Initialization of all functions (Returns to initial settings)

(1) Conditions for entering the adjustment mode

1) Set each switch to the following state.

- Hazard lamp switch: OFF
- Diagnosis control:ON (Connect the MUT-II or ground pin 1 of the diagnosis connector.)
- Key reminder switch: OFF (Insert the ignition key)
- Ignition switch: LOCK (OFF) position
- Driver's seat door switch: OFF (driver's seat door closed)

2) When the windshield washer switch is ON for more than 10 seconds, the buzzer in the ETACS-ECU sounds once, and the adjustment mode will be set.

(2) Conditions for exiting the adjustment mode

The adjustment mode will be exited when the following conditions are satisfied.

- Diagnosis control:OFF (Disconnect the MUT-II or the ground of Pin 1 of the diagnosis connector.)
- Key reminder switch:ON (Remove the ignition key)
- Ignition switch: Turning to any position other than LOCK (OFF) position
- Driver's seat door switch: ON (driver's seat door opened)
- When 3 minutes pass without adjustments performed
- When the other warning buzzer output is generated

(3) Adjustments of various functions

EQUIPMENT – Smart Wiring System (SWS)

Main
Index

Group
TOC

Functions	Adjustment procedure
Keyless entry system hazard answerback function	<p>When the lock switch of the transmitter is turned ON twice continuously within 2 seconds, the hazard answerback function during the lock state will be switched between available or unavailable.</p> <ul style="list-style-type: none"> ● Function available: Buzzer sounds once.(Initial state) ● Function not available: Buzzer sounds twice. <p>When the unlock switch of the transmitter is turned ON twice continuously within 2 seconds, the hazard answerback function during the unlock state will be switched between available or unavailable.</p> <ul style="list-style-type: none"> ● Function available: Buzzer sounds once.(Initial state) ● Function not available: Buzzer sounds twice.
Multi-mode keyless entry power window and sunroof operations, and power window timer function	<p>When one of the power window main switch turns ON twice within 2 seconds (however there must be an interval of more than 0.3seconds), the power window and sunroof operation by the multi-mode keyless entry will be switched in the following order.(Returns to a after f, and repeats from a in order. For vehicles without the keyless entry function, b and e are switched alternately.)</p> <ol style="list-style-type: none"> Close and open operations, power window timer function available (Power window only during open operations): Buzzer sounds once. No operations, power window timer function available: Buzzer sounds twice.(Initial state of vehicles without keyless entry function) Only closed operations, power window timer function available: Buzzer sounds three times.(Initial state of vehicles with keyless entry function) Closed and open operations, power window timer function not available (Only power window for open operations): Buzzer sounds three times. No operations, power window timer function not available: Buzzer sounds four times. Closed operations only, power window timer function not available: Buzzer sounds five times.
Vehicle speed-dependent wiper function	<p>When the windshield wiper mist switch is turned ON for more than 2 seconds, the vehicle speed-dependent wiper function is switched between available or unavailable.</p> <ul style="list-style-type: none"> ● Function available: Buzzer sounds once.(Initial state) ● Function not available: Buzzer sounds twice.
Electronic tuck-way door mirror automatic recovery function	<p>When the fold/unfold switch of the electronic remote control mirror switch is turned ON for more than 2 seconds, the automatic recovery function of the door mirror is switched between available and unavailable.</p> <ul style="list-style-type: none"> ● Function available: Buzzer sounds once.(Initial state) ● Function not available: Buzzer sounds twice.
Headlamp auto-cut function	<p>When the passing switch is turned ON for more than 2 seconds with the auto-lamp switch ON and the turn signal lamp switch turned to RH, the headlamp auto-cut function switches in the following order.(Returns to a after c, and repeats from a in order.)</p> <ol style="list-style-type: none"> Function available: (when the tail lamp illuminates with the ignition switch turned to the LOCK (OFF) position, it is automatically turned off): Buzzer sounds once. Function not available: Buzzer sounds twice. Function available: (when the tail lamp is inspected with the ignition switch turned to the LOCK (OFF) position, it is automatically turned off): Buzzer sounds three times.(Initial state)
Sensor sensitivity of auto-lamp function (Lighting brightness)	<p>When the passing switch is turned ON for more than 2 seconds with the auto-lamp switch turned to ON and the turn signal lamp switch turned to LH, the sensor sensitivity (lighting brightness) switches in the following order.(Returns to a after d, and repeats from a in order.)</p> <ol style="list-style-type: none"> Illuminates at high brightness: Buzzer sounds once. Illuminates at standard brightness: Buzzer sounds twice.(Initial state) Illuminates at low brightness: Buzzer sounds three times. Illuminates at very low brightness: Buzzer sounds four times.

EQUIPMENT – Smart Wiring System (SWS)

Functions	Adjustment procedure
Delayed light-off time of the room lamp	<p>When the turn signal lamp switch is set in the order of LH"RH"LH"RH"LH within 3 seconds from the LH position, the delayed light-off time switches(Returns to a after e, and repeats from a in order.)</p> <ul style="list-style-type: none">a. 30 seconds: Buzzer sounds once.b. 10 seconds: Buzzer sounds twice.c. 0 seconds (No delay time): Buzzer sounds three times.d. 15 seconds: Buzzer sounds four times.(Initial state)e. 7.5 seconds: Buzzer sounds five times.
Interior lamp auto-cut function	<p>When the hazard lamp switch is turned ON for more than 2 seconds, the interior lamp cut-off function switches in the following order.(a and b switches alternately)</p> <ul style="list-style-type: none">a. Function available:Buzzer sounds once.(Initial state)b. Function not available:Buzzer sounds twice.
Initialization of all functions	<p>When the windshield washer switch is ON for more than 20 seconds continuously, the buzzer sounds twice, and all functions will be initialized.(Settings are returned to their Initial states.) The adjustment mode entry buzzer sounds after 10 seconds, however to initialize all functions, the ON state will continue for 20 seconds. When the windshield washer switch is ON for more than 20 seconds continuously without the adjustment mode set, the adjustment mode will be set after 10 seconds without the initialization of all functions.</p>

[Main Index](#)[Group TOC](#)

HEATER AND AIR CONDITIONER

The heater and air conditioner system incorporating the heater and cleaning unit has reduced ventilation resistance to increase air volume and reduce noise. Two types of air conditioner system have been adopted; manual air conditioner (except for Hong Kong) and fully automatic air conditioner (Hong Kong and Singapore).

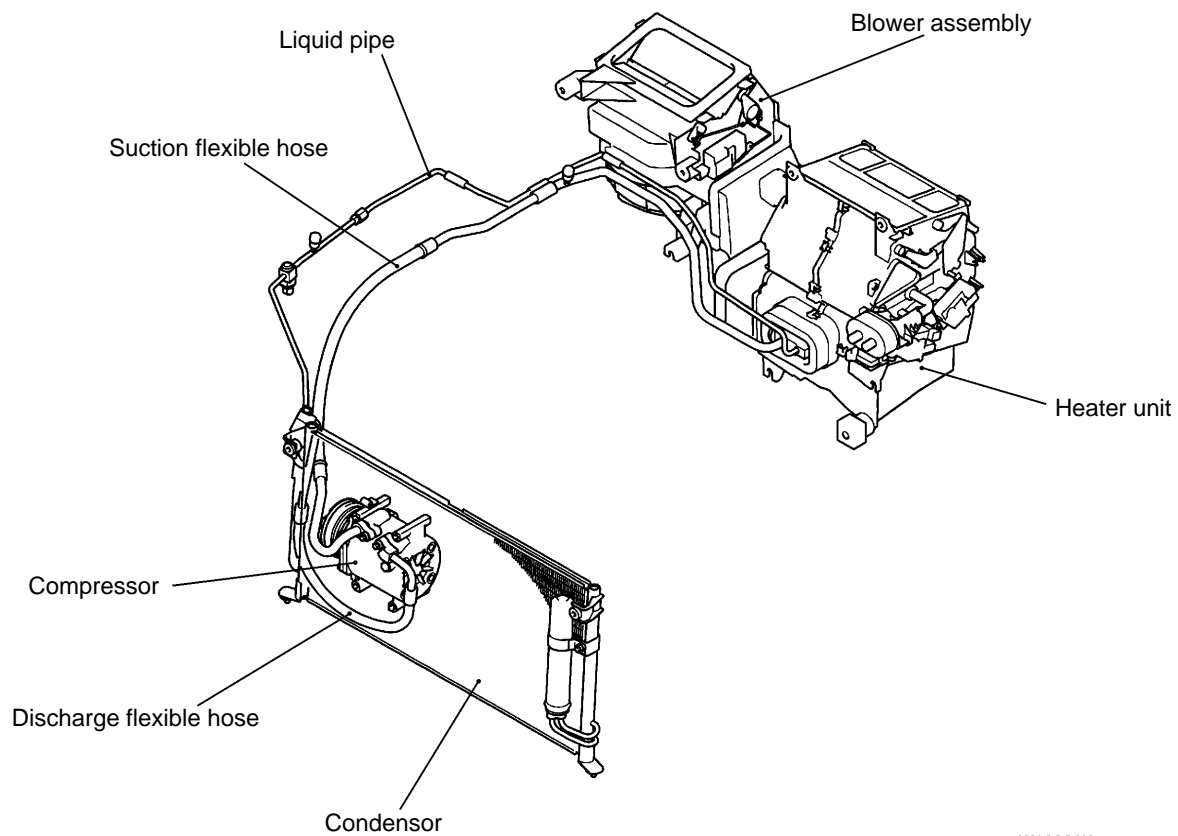
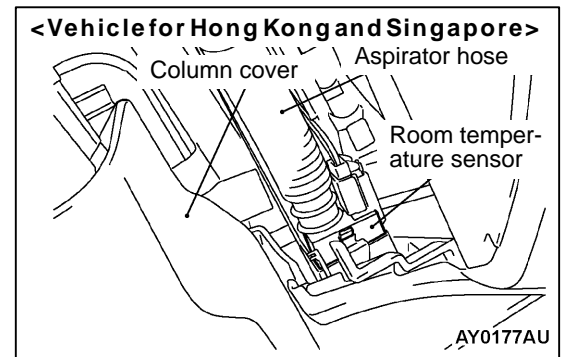
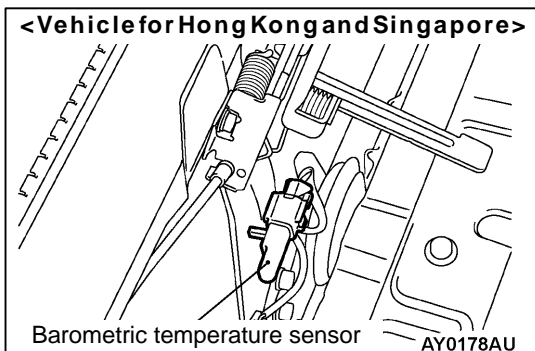
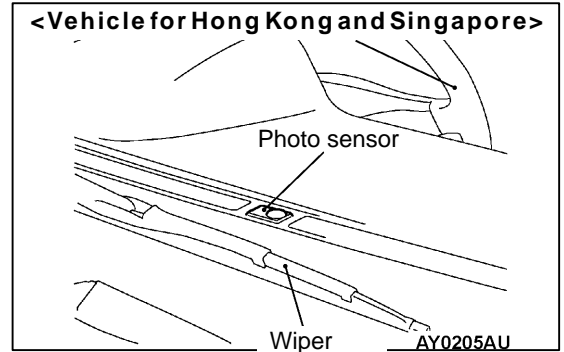
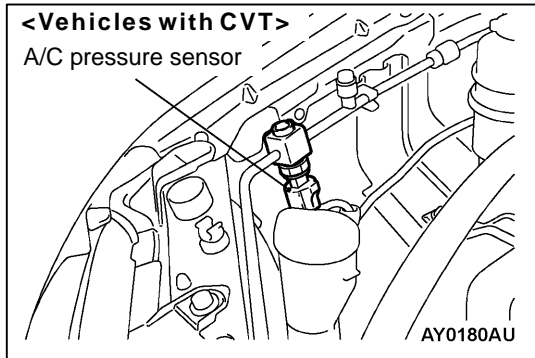
FEATURES

Improvements in comfort	<ol style="list-style-type: none"> 1. Installation of two-ray blow full air mix heater 2. Adoption of low noise, large air volume heater and air conditioner system
Improvements in operation performance	<ol style="list-style-type: none"> 1. Installation of dial type control with excellent operation performance on the heater and air conditioner control panel 2. Incorporation of rear defogger switch with timer into the control panel 3. Increase in panel display size
Reliable visual field (improvement in safety)	<ol style="list-style-type: none"> 1. Achievement of ventilation system to defog windows by increasing the outside air intake duct area on the front deck and adopting a large air outlet 2. Windshield defogging speed improvement derived from increase in air volume and wind speed by adopting a blower type defroster and high performance heater
Improvements in fuel economy	<ol style="list-style-type: none"> 1. Optimization of idle rotation speed according to air conditioner load 2. Installation of sub-cooling type condenser 3. Installation of blower pulse controller <Vehicle for Hong Kong and Singapore>
Global environment protection	Adoption of a new refrigerant system
Improvements in service quality	<ol style="list-style-type: none"> 1. Improvement in service performance and reliability by adopting an O-ring dropout prevention structure for the refrigerant lines. 2. Achievement of accurate adjustment of the drive belt tension by using the MUT-II and special tools (tension meter cartridge set) 3. Reduction of gas leakage and improvement in service performance by incorporating condenser and receiver 4. Enhancement of the MUT-II compatible diagnostic function

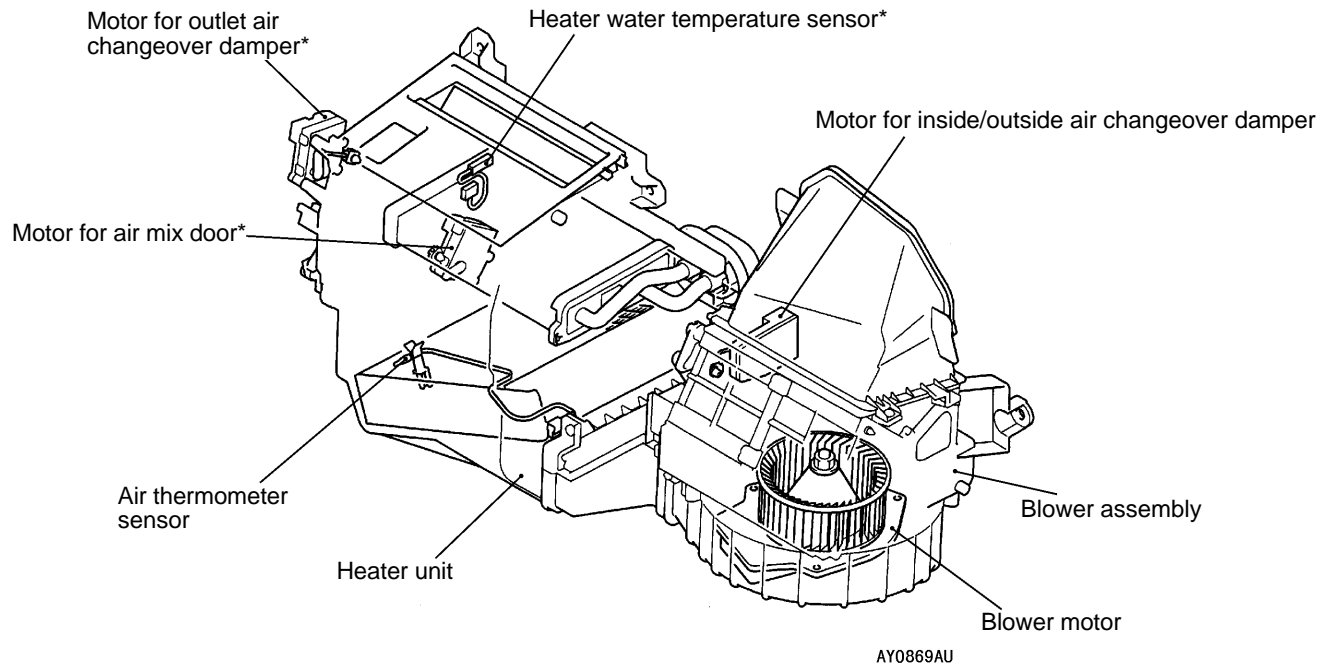
SPECIFICATIONS

Item		Specifications
Heater unit type		Two-ray blow full air mix method
Heater control method		Dial type
Air conditioner switch type		Push button type
Compressor type		MSC90C
Refrigerant	Type	R134a (HFC-134a)
	Filled air volume g	550 + 20

CONSTRUCTION DIAGRAM



AY1092AU



NOTE

*: Indicates a vehicle with fully automatic air conditioner <Vehicle for Hong Kong and Singapore>

HEATER AND AIR CONDITIONER SYSTEM

CONSTRUCTION AND DESCRIPTION

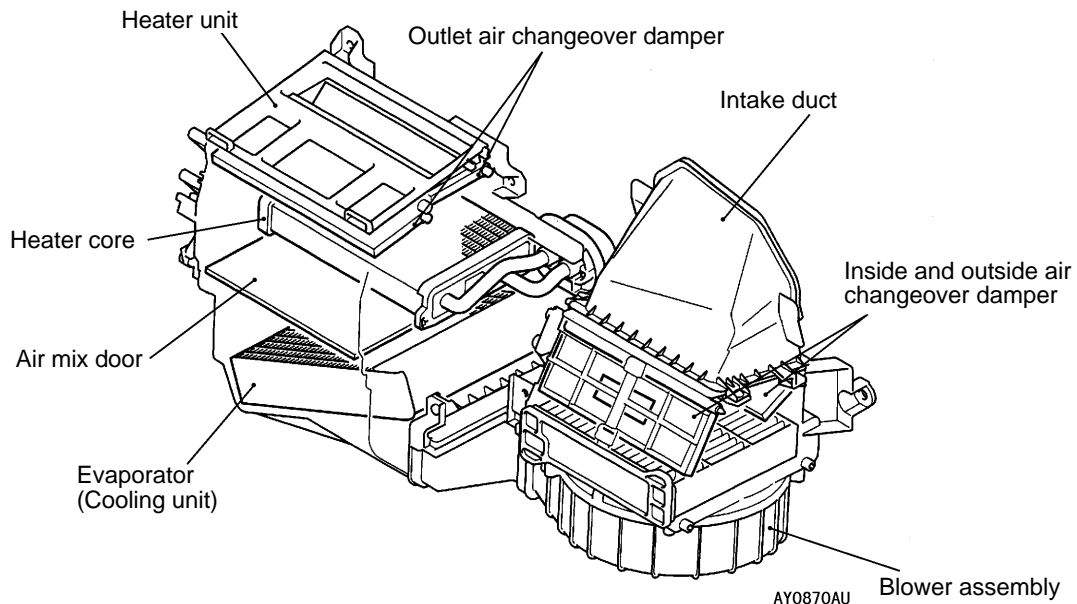
BLOWER ASSEMBLY AND HEATER UNIT

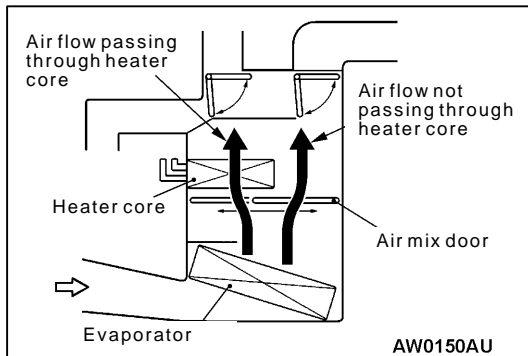
The following blower assembly and heater unit has been adopted to increase air volume, reduce noise, improve air-conditioning performance, as well as improve the car interior air environment.

Installation of two-ray blow full air mix heater

Incorporation of heater and cleaning unit

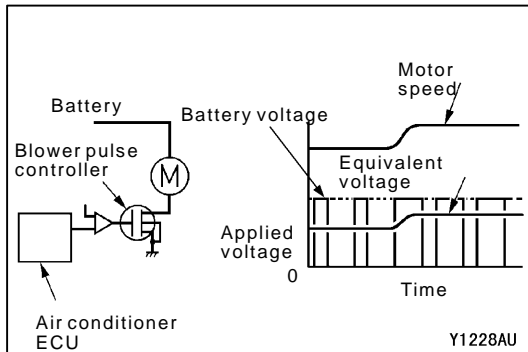
Increase in the outside air intake duct area size of the blower assembly and optimization of the shape





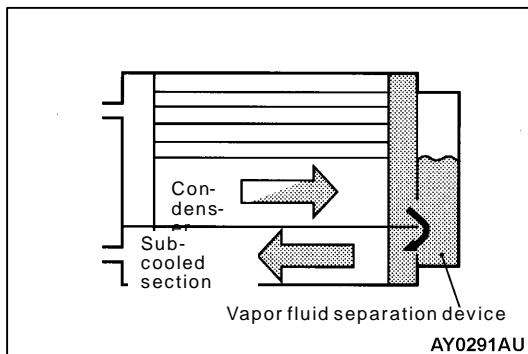
Two-Ray Blow Full Air Mix Heater

In the heater unit, there are two rays of air; one which passes through the heater core, and air which does not pass through the core. One air mix door is used for temperature control. The two-ray blow full mix heater with low ventilation resistance has increased air volume and has reduced noise.



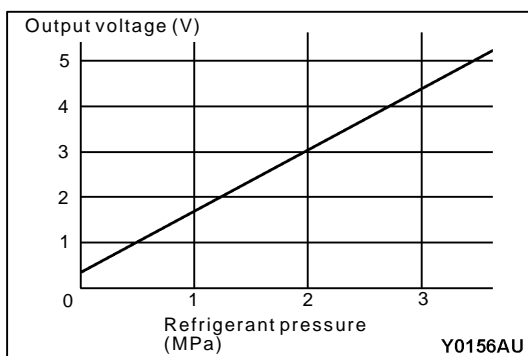
Blower Motor Control <Vehicle for Hong Kong and Singapore>

The non-stepped control method based on PWM (pulse width modulation) for the blower motor speed control has been adopted to control excessive rotation of the blower motor and to reduce fuel consumption and noise. The blower pulse controller changes the motor switching time using the pulse signal from the A/C-ECU and changes the motor supplied voltage equally to control the motor speed by the non-step method.



CONDENSER

The heat exchange efficiency has been improved with the adoption of a sub-cooling type condenser added with a sub-cooled section. The reduction of line unions by incorporating the condenser and receiver has reduced a possibility of gas leakage and has increased service performance.



A/C PRESSURE SENSOR <VEHICLE WITH CVT>

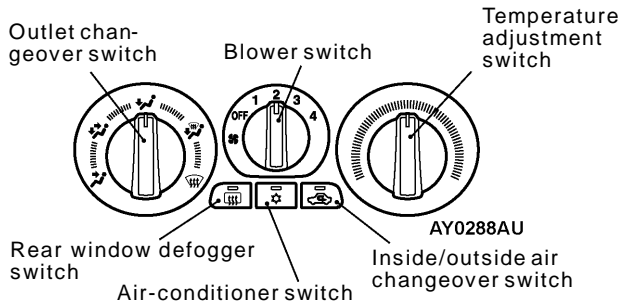
The adoption of an A/C pressure sensor which can continuously detect changes in the refrigerant pressure optimizes engine control according to the air conditioner load and improves fuel efficiency.

HEATER AND AIR CONDITIONER CONTROL

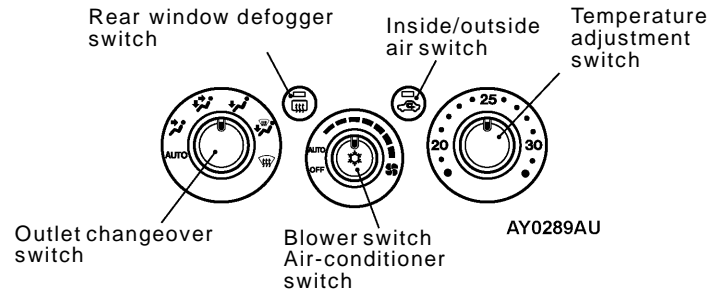
Adoption of the following heater and air conditioner control has improved operation performance and visual observation.

- Installation of dial type switch
- Incorporation of rear window defogger switch with timer
- Improved appearance by incorporating the center panel

<Other vehicle than for Hong Kong>



<Vehicle for Hong Kong>



VENTILATION SYSTEM

DESCRIPTION OF STRUCTURE AND OPERATION

The adoption of the following mechanism has increased air volume for ventilation and has achieved a ventilation system for defogging windows.

- Increasing the outside air intake duct area
- Increasing the size of air outlet on the back of the rear bumper
- Installation of blower type defroster

