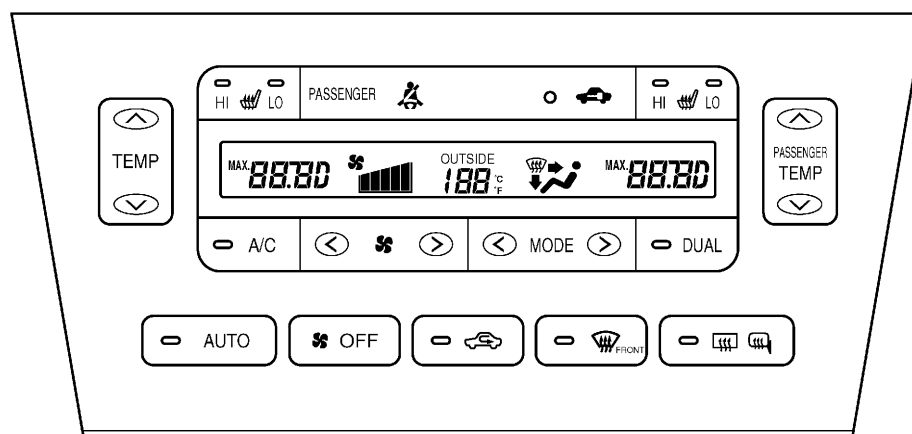


■ CONSTRUCTION AND OPERATION

1. Air Conditioning Control Panel

- The air conditioning control panel uses push button controls and an LCD (Liquid Crystal Display) to display the set temperature, air outlet mode, and blower speed, to ensure excellent visibility.
- This air conditioning control panel is integrated with the air conditioning ECU.
- Along with the adoption of the left/right independent temperature control, the temperature control switches for the driver and the front passenger have been located closer to the respective seats to enhance their ease of use.



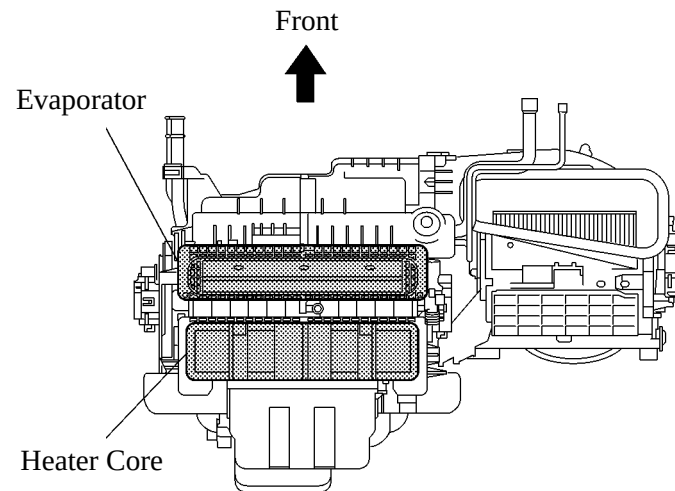
with Seat Heater Model

211BE22

2. Air Conditioning Unit

General

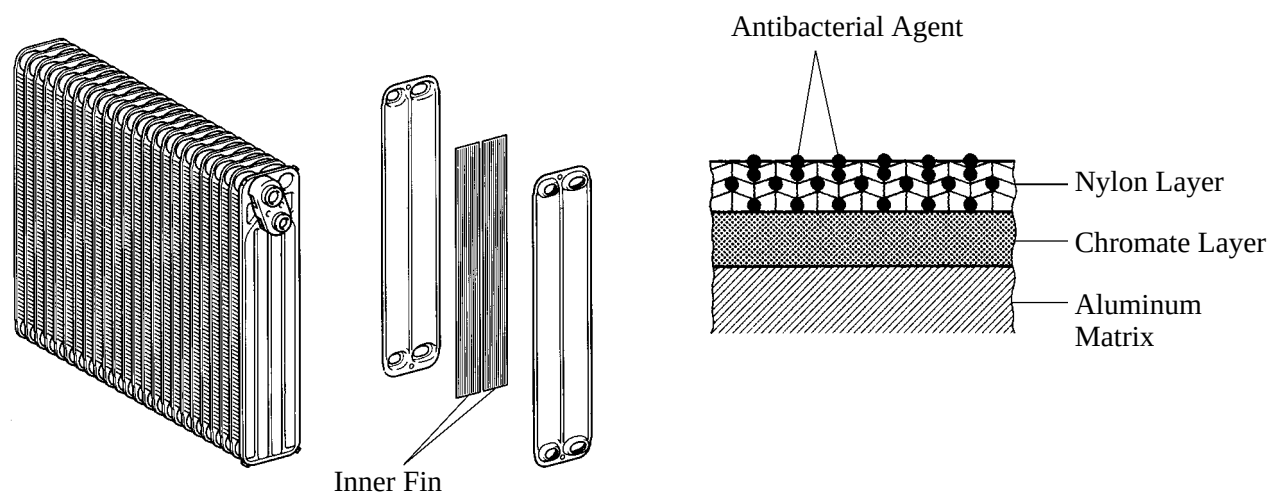
A semi-center location air conditioning unit, in which the evaporator and heater core are placed in the vehicle's longitudinal direction. As a result, the air conditioning unit has been made compact and light weight.



208BE16

Evaporator

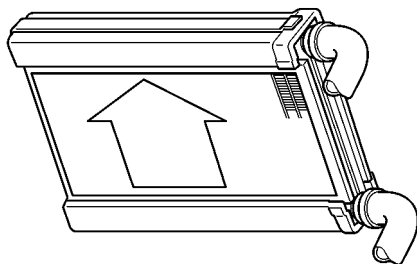
- By placing the tanks at the top and the bottom of the evaporator unit and by adopting an inner fin construction, the following effects have been realized:
 - a) The heat exchanging efficiency has been improved.
 - b) The temperature distribution has been made more uniform.
 - c) The evaporator has been made thinner.
- The evaporator body has been coated with a type of resin that contains an antibacterial agent in order to minimize the source of foul odor and the propagation of bacteria.



163BE17

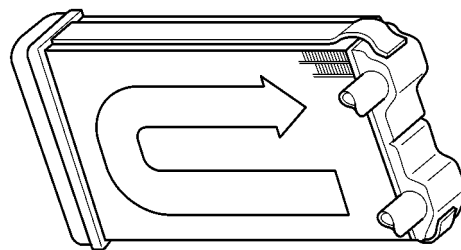
Heater Core

A compact, lightweight, and highly efficient straight flow (full-path flow) aluminum heater core has been adopted.



'02 ES300

152BE21

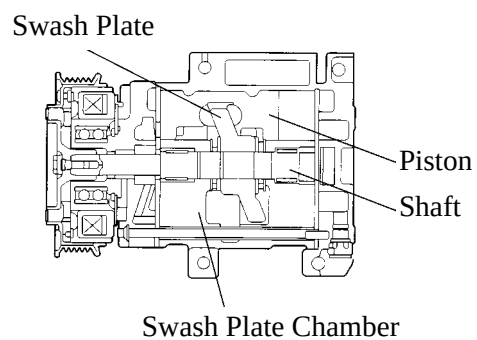


'01 ES300

152BE22

3. Compressor

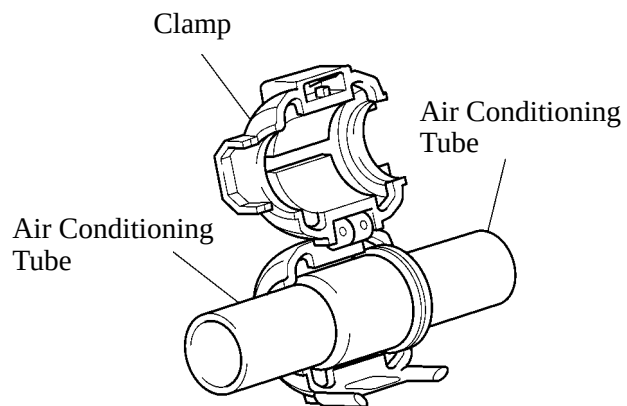
A compact, lightweight, and low-noise swash plate type compressor has been adopted on the '02 ES300.



163BE18

4. Quick Joint

The joint of the air conditioning tube, which passes through the dash panel, has been changed from the nut-and-union type that is used on the previous model to the clamp type quick joint. As a result, the ease of operation and service has been improved.



160CM04

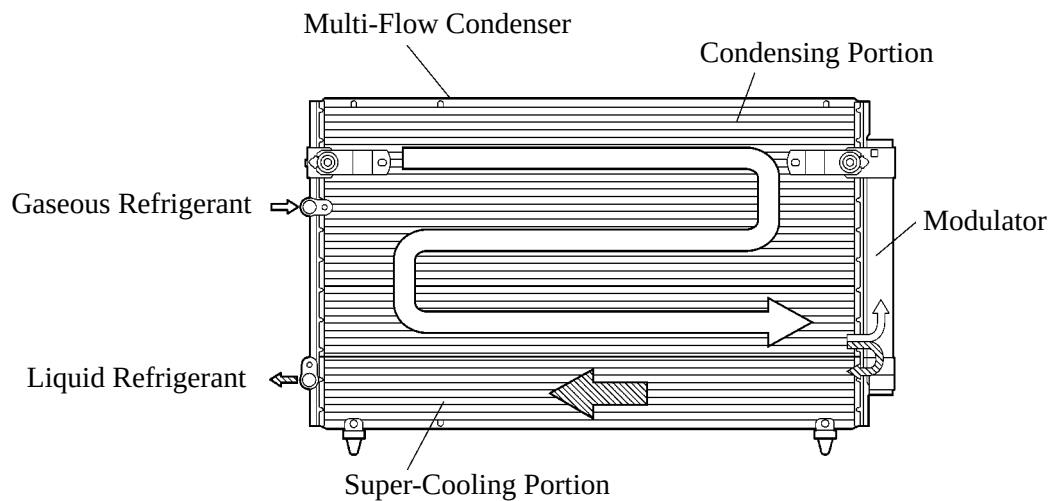
5. Condenser

General

The '02 ES300 has adopted sub-cool condenser in which a multi-flow condenser (consisting of two cooling portions: a condensing portion and a super-cooling portion) and a gas-liquid separator (modulator) have been integrated. This condenser has adopted the sub-cool cycle for its cooling cycle system to improve the heat exchanging efficiency.

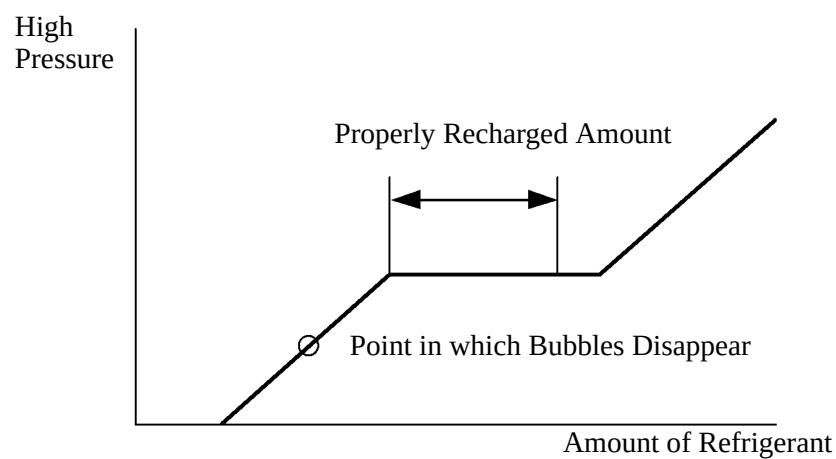
Sub-Cool Cycle

In the sub-cool cycle of the sub-cool condenser that has been adopted, after the refrigerant passes through the condensing portion of the condenser. Both the liquid refrigerant and the gaseous refrigerant that could not be liquefied are cooled again in the super-cooling portion. Thus, the refrigerant is sent the evaporator in an almost completely liquefied state.



198BE32

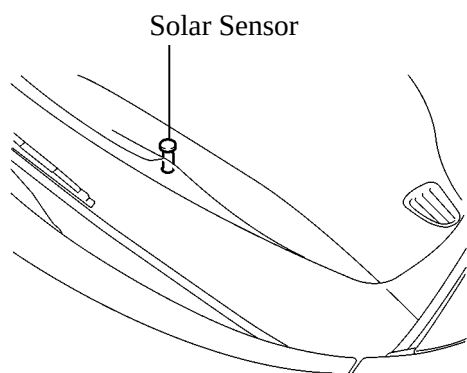
NOTE: The point at which the air bubbles disappear in the refrigerant of the sub-cool cycle is lower than the proper amount of refrigerant with which the system must be filled. Therefore, if the system is recharged with refrigerant based on the point at which the air bubbles disappear, the amount of refrigerant would be insufficient. As a result, the cooling performance of the system will be affected. For the proper method of verifying the amount of the refrigerant and to recharge the system with refrigerant, see the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).



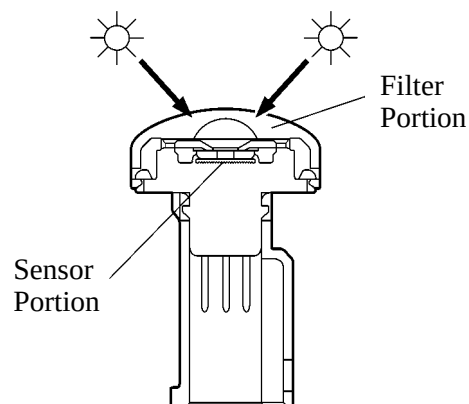
152BE40

6. Solar Sensor

- Detects (in the form of changes in the current that flows through the built-in photo diode) the changes in the amount of sunlight at the driver and front passenger sides (2 directions) and outputs them to the air conditioning ECU.
- This sensor is integrated with the automatic light control sensor that is used in the automatic light control system.
- This sensor is located in the driver side above the instrument panel.



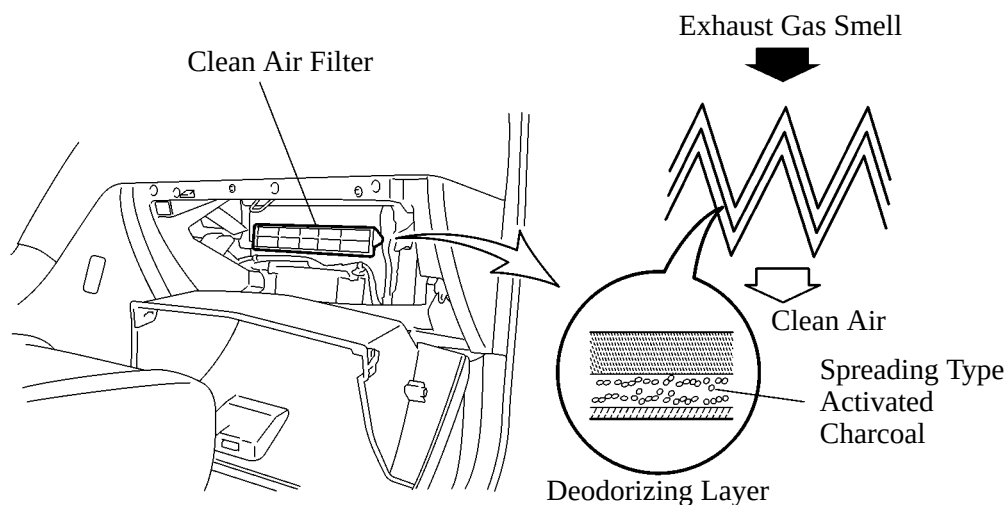
211BE24



199BE65

7. Clean Air Filter

A deodorizing function that eliminates the exhaust gas smell that enters the cabin from the outside has been added to the conventional clean air filter. This clean air filter uses spreading type activated charcoal in the deodorizing layer to eliminate the exhaust gas (include acetaldehyde) smell.



211BE25

Service Tip

- Do not wash the clean air filter with water or use an air blower to clean it because the clean air filter contains spreading type activated charcoal.
- The clean air filter on U.S.A. model should be changed at 7,500 miles. On Canada model, it should be changed at 16,000km. However, it varies with the use conditions (or environment).

7. Air Conditioning ECU

General

The air conditioning ECU has following control.

Control	Outline	'02 ES300	'01 ES300
Outlet Air Temp. Control	In response to the temperature control switch setting, the required outlet air temperature, evaporator temperature sensor, and engine coolant temperature sensor compensations are used by the air mix control damper control to calculate a tentative damper opening angle, through an arithmetic circuit in the air mix damper, to arrive at a target damper opening angle.	○	○
	The temperature setting for the driver and front passenger is controlled independently in order to provide a separate air temperature for the right and left outside. Thus, air conditioning that accommodates the occupants' preferences has been realized.	○	—
Blower Control	This function controls the operation of the blower motor in accordance with the signals from the engine coolant temperature sensor, evaporator temperature sensor, and the solar sensor. In addition, it protects the blower motor controller from the sudden drive current that occurs when the blower motor is activated.	○	○
Air Outlet Control	When the AUTO switch has been turned ON, automatic control causes the servomotor (for air mix control) to rotate to a desired position in accordance with the target damper opening, which is based on the calculation of the required outlet air temperature. Furthermore, under automatic control, the potentiometer in the servomotor (for air mix control) is used to detect the actual damper opening, as opposed to the calculated target damper opening, so that control can be effected to match the actual damper opening to the calculated target damper opening.	○	○
	In accordance with the engine coolant temperature, outside air temperature, amount of sunlight, required blower outlet temperature, and vehicle speed conditions, this control automatically switches the blower outlet to the FOOT/DEF mode to prevent the window from becoming fogged when the outside air temperature is low.	○	—
Air Inlet Control	Drives the servomotor (for air inlet) according to the operation of the air inlet control switch and fixes the dampers in the FRESH or RECIRC position.	○	○
	When selecting RECIRC mode with a manual operation, if the outside air temperature is low and the refrigerant pressure has malfunction, the air conditioning ECU automatically switched the air inlet mode to the FRESH mode. However, if the outside air temperature is much lower than the specified temperature, in spite of the malfunction of the refrigerant pressure, the air conditioning ECU automatically switches the air inlet mode to the FRESH mode.	○	—
	When selecting RECIRC mode with a manual operation, if the compressor turns OFF, the air conditioning ECU automatically switched the air inlet mode to the FRESH mode.	○	—

(Continued)

Control	Outline	'02 ES300	'01 ES300
Compressor Control	This control turns OFF the magnetic clutch of the compressor when the blower motor is turned OFF at the time the engine coolant temperature is below a predetermined value, an abnormal refrigerant pressure has been input, or the discharge temperature of the evaporator is below a predetermined value.	○	○
	When the DEF mode switch is turned on, the magnetic clutch relay is activated automatically to engage the compressor. Also, when the blower is turned off, and the front defroster switch is turned on, the blower will turn on in the automatic control condition.	○	○
Seat Heater Control*	The HI, LO, and OFF settings of the seat heater can be switched by pressing the seat heater switch (for driver or front passenger). Based on the signals from the temperature sensor that is built into the seat heater, the air conditioning ECU turns the built-in seat heater relay ON/OFF in order to regulate the temperature that suits the set mode. Turning OFF the ignition switch will turn off the set heater.	○	—
Rear Window Defogger Control	When switching the rear window defogger ON, the rear window defogger and outside rear view mirror heaters will operate. Then, after 15 minutes have passed, the switch will automatically turn OFF.	○	○
Outer Temperature Indication Control	Based on the signals from the ambient temperature sensor, this control calculates the outside temperature, which is then corrected in the air conditioning ECU, and shown in the air conditioning control panel.	○	○
Self-Diagnosis	Checks the sensor in accordance with operation of the air conditioning switches, then heater control panel display portion a DTC (Diagnosis Trouble Code) to indicate if there is a malfunction or not (sensor check function).	○	○
	Drives the actuators through a predetermined sequence in accordance with the operation of the air conditioning switches (actuator check function).	○	○

*: With Seat Heater Model

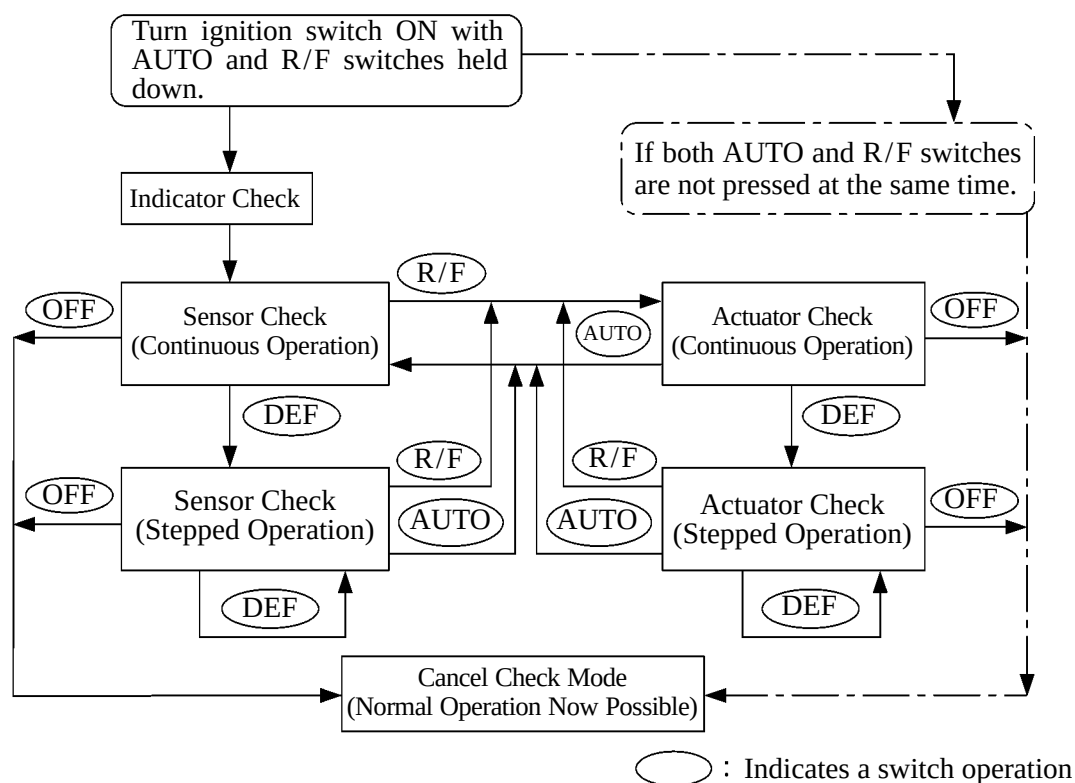
Self-Diagnosis

- The air conditioning ECU has a self-diagnosis function. It stores any operation failures in the air conditioning system memory in the form of a malfunction code. By operating switches on the air conditioning control switches, the stored malfunction code will be indicated. Since diagnostic results are stored directly by electric power from the battery, they are not cleared even when the ignition switch is turned off.

► Functions ◀

Function	Outline
Indicator Check	Checks indicator lights and temperature setting display.
Sensor Check	Checks the past and present malfunctions of the sensors, and clearing the past malfunction data.
Actuator Check	Checks against actuator check pattern if blower motor, servomotors and magnetic clutch are operating correctly according to signals from ECU.

- The check function can be started by the following procedure shown below.



187BE33

For details on the indicator check, sensor check, actuator check function, and clearing DTCs of this system, refer to the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).

AIR CONDITIONING

DESCRIPTION

1. General

The air conditioning system in the '02 ES300 has the following features:

- An automatic control air conditioning system comprising left/right independent temperature control has been adopted as standard equipment.
- A semi-center location air conditioning unit, in which the evaporator and heater core are placed in the vehicle's longitudinal direction, has been adopted.
- A compact, lightweight, and highly efficient straight flow (full-path flow) aluminum heater core has been adopted.
- A multi-tank, super-slim structure evaporator has been adopted.
- A compact, lightweight, and low-noise swash plate type compressor has been adopted.
- The heater exchange efficiency has been improved through the adoption of the sub-cool condenser.
- A deodorizing function that eliminates the exhaust gas smell that enters the cabin from the outside has been added to the conventional clean air filter.
- The air conditioning ECU is equipped with a self-diagnosis function. If there is a malfunction in the system, it stores the DTCs (Diagnostic Trouble Codes) in its memory and blinks the air conditioning switch indicator.

Performance ◀

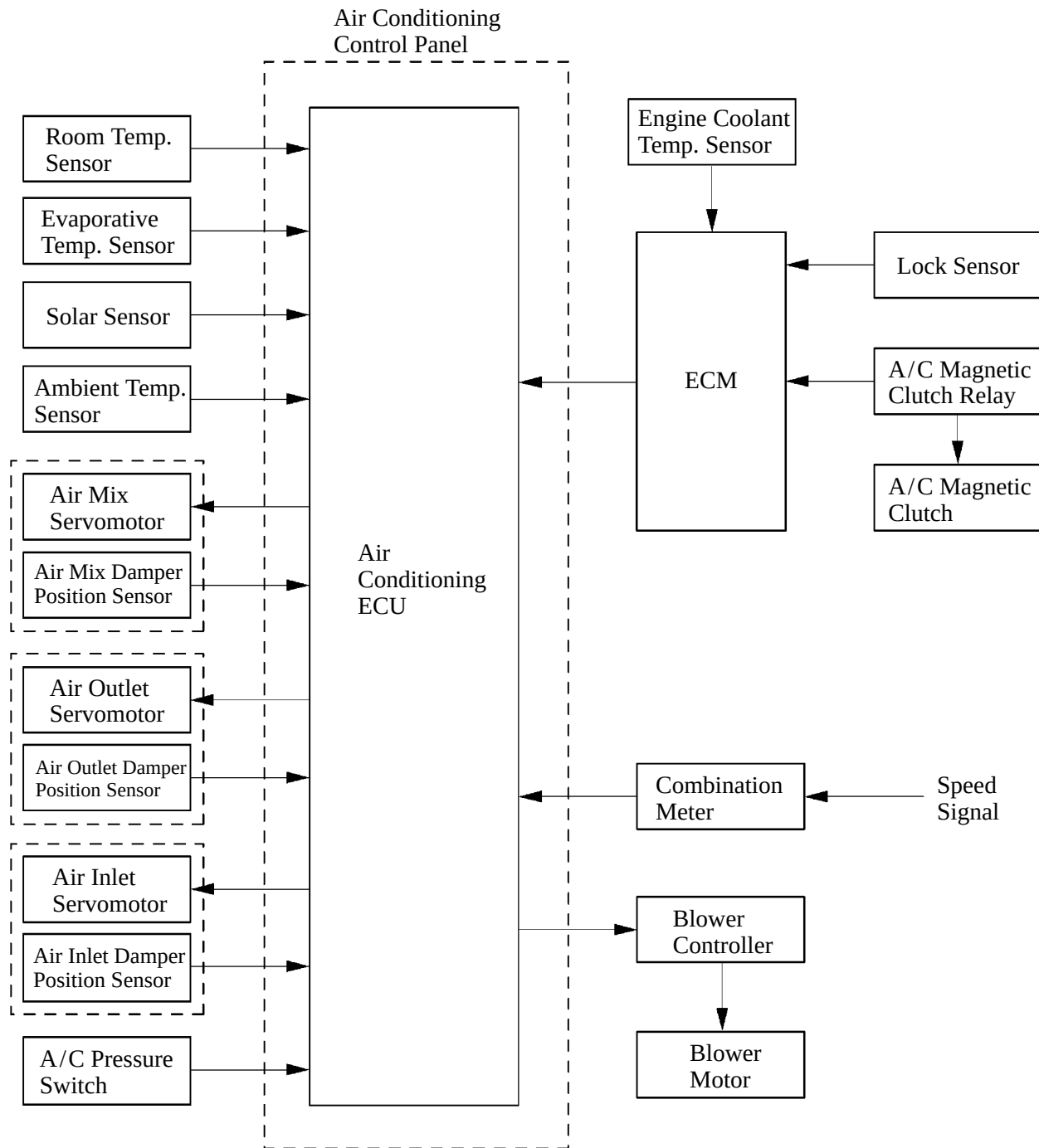
Model		'02 ES300	'01 ES300	
			with Clean Air Filter	without Clean Air Filter
Heater	Heat Output W (Kcal/h)	5750 (4950)	5220 (4490)	5580 (4800)
	Air Flow Volume m ³ /h	360	360	380
	Power Consumption W	210	220*	←
Air Conditioning	Cooling Capacity W (Kcal/h)	5500 (4730)	5230 (4500)	5350 (4600)
	Air Flow Volume m ³ /h	530	505	530
	Power Consumption W	260	260	←

*: With Side Vent Closed

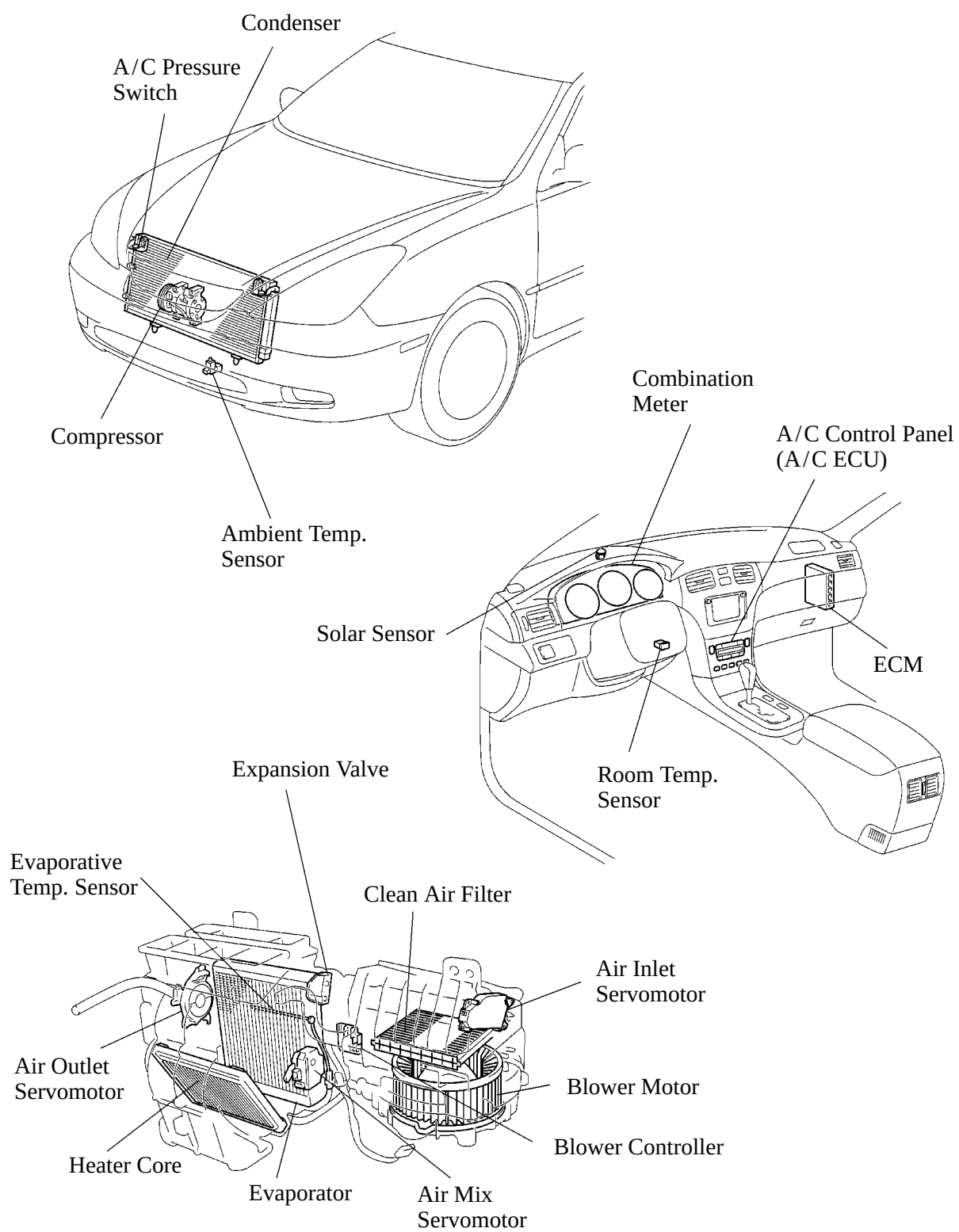
Specification ◀

Model		'02 ES300	'01 ES300
Ventilation and Heater Core	Heater Core	Type	Straight Flow (Full-path Flow)
		Size W x H x L mm (in.)	228.7 x 140 x 27 (9.0 x 5.5 x 1.1)
		Fin Pitch mm (in.)	1.8 (0.07)
	Blower	Motor Type	S80Fs-12.5T
		Fan Size Dia. x H mm (in.)	150 x 75 (5.9 x 3.0)
Air Conditioning	Condenser	Type	Multi-flow (Sub-cool)
		Size W x H x L mm (in.)	670 x 387.8 x 16 (26.4 x 15.3 x 0.6)
		Fin Pitch mm (in.)	3.6 (0.14)
	Evaporator	Type	Multi-tank, Super-slim Structure
		Size W x H x L mm (in.)	266.2 x 255 x 58 (10.5 x 10.0 x 2.3)
		Fin Pitch mm (in.)	3.5 (0.14)
	Compressor	Type	10S17

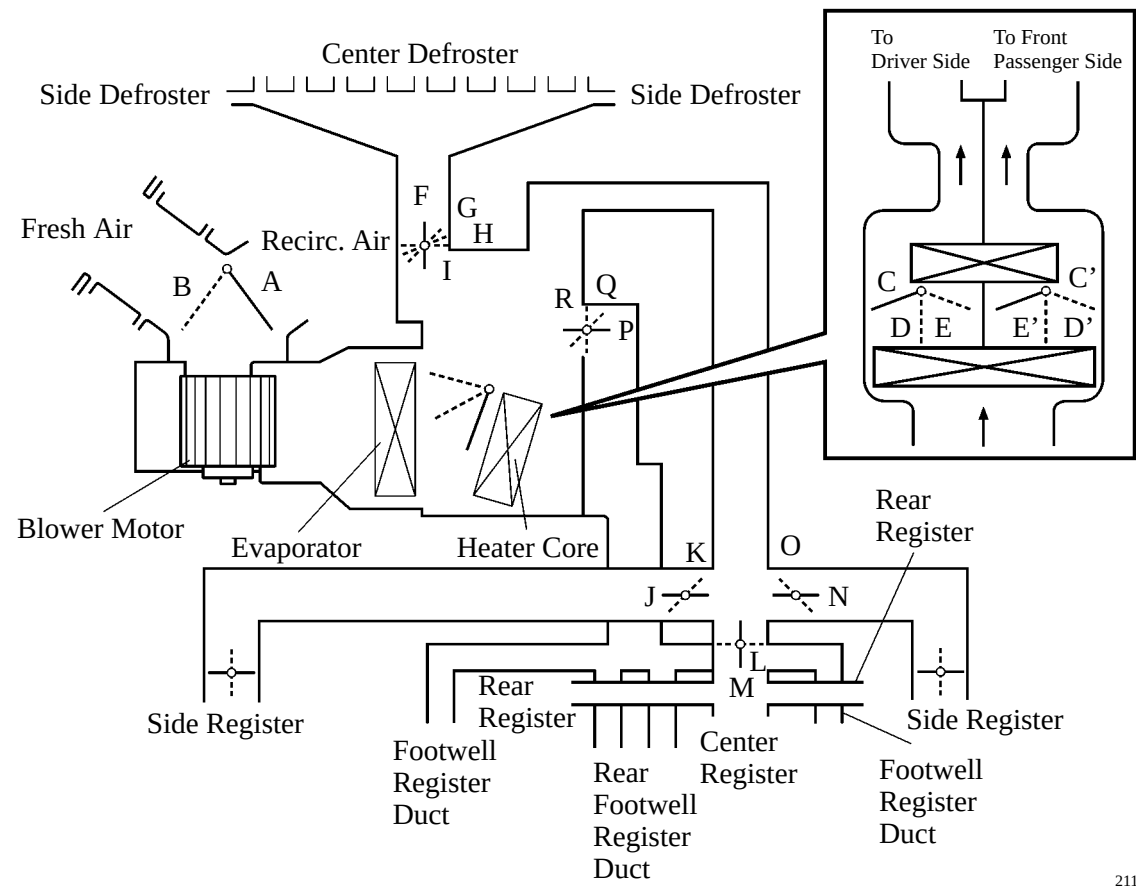
2. System Diagram



3. Layout of Main Component



4. Mode Position and Damper Operation

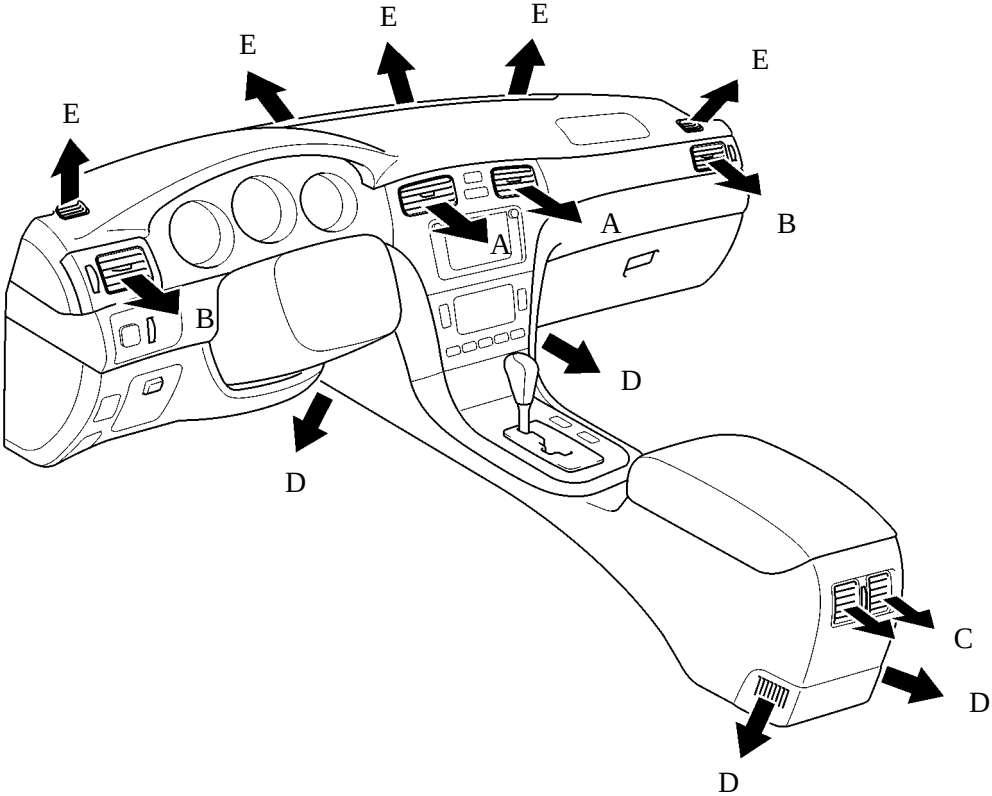


211BE20

► Function of Main Damper ◀

Control Damper	Control Position	Damper Position	Operation
Air Inlet Control Damper	FRESH 187BE23	A	Brings in fresh air.
	RECIRC 187BE41	B	Recirculates internal air.
Air Mix Control Damper (Left/Right Independent Control)	MAX COLD – MAX HOT TEMP. SETTING { 18°C (65°F) – 32°C (85°F) }	E ~ D ~ C E' ~ D' ~ C'	Varies the mixture ratio of the fresh air and the recirculation air in order to regulate the temperature continuously from HOT to COLD.
Mode Control Damper	DEF 187BE28	F, K, L, O, R	Defrosts the windshield through the center defroster, side defroster, and side register.
	FOOT/DEF 187BE27	G, K, L, O, Q	Defrosts the windshield through the center defroster, side defroster, and side register, while air is also blown out from the front and rear foot well register ducts.
	FOOT 187BE26	H, K, L, O, P	Air blows out of the front and rear foot well register ducts, and side register. In addition, air blows out slightly from the center defroster and side defroster.
	BI-LEVEL 187BE25	I, J, M, N, P	Air blows out of the center registers, side registers, and foot well register ducts.
	FACE 187BE24	I, J, M, N, R	Air blows out of the center registers, and side register.

5. Air Outlets and Air Volume Rations



211BE21

Air Outlet Mode			A	B	C	D	E
			Center Face	Side Face	Rear Face	Foot	Defroster
FACE		187BE24	○	○	○	—	—
BI-LEVEL		187BE25	○	○	○	○	—
FOOT		187BE26	—	○	—	○	○
FOOT/DEF		187BE27	—	○	—	○	○
DEF		187BE28	—	○	—	—	○

The size of the circle ○ indicates the proportion of airflow volume.

■ AUTOMATIC GLARE-RESISTANT EC MIRROR

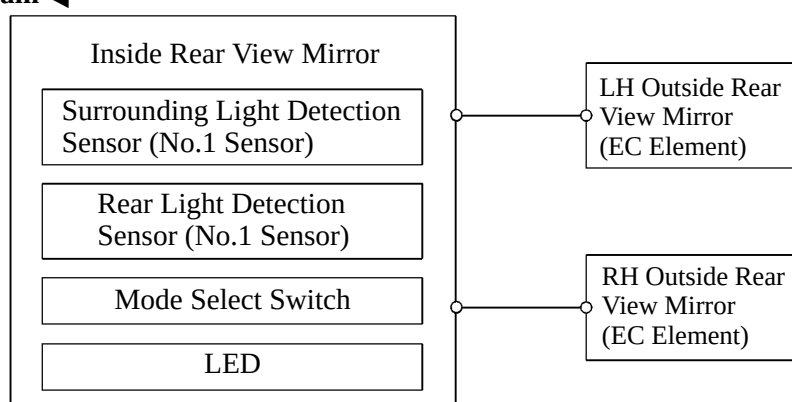
1. General

An automatic glare-resistant EC (electrochromic) mirror have been adopted for the inside rear view mirrors as standard equipment. This system uses 2 sensors that are attached onto the inside rear view mirror to detect the difference between the intensity of light entering the inside rear view mirror from the rear of the vehicle, and of the light surrounding the vehicle.

During nighttime driving, if a large difference in intensity exists between the surrounding light and the light entering the inside rear view mirror from the headlights of the vehicle driving behind, this system automatically reduce the reflection rate of the inside rear view mirror and thus dampens the glare on the mirror.

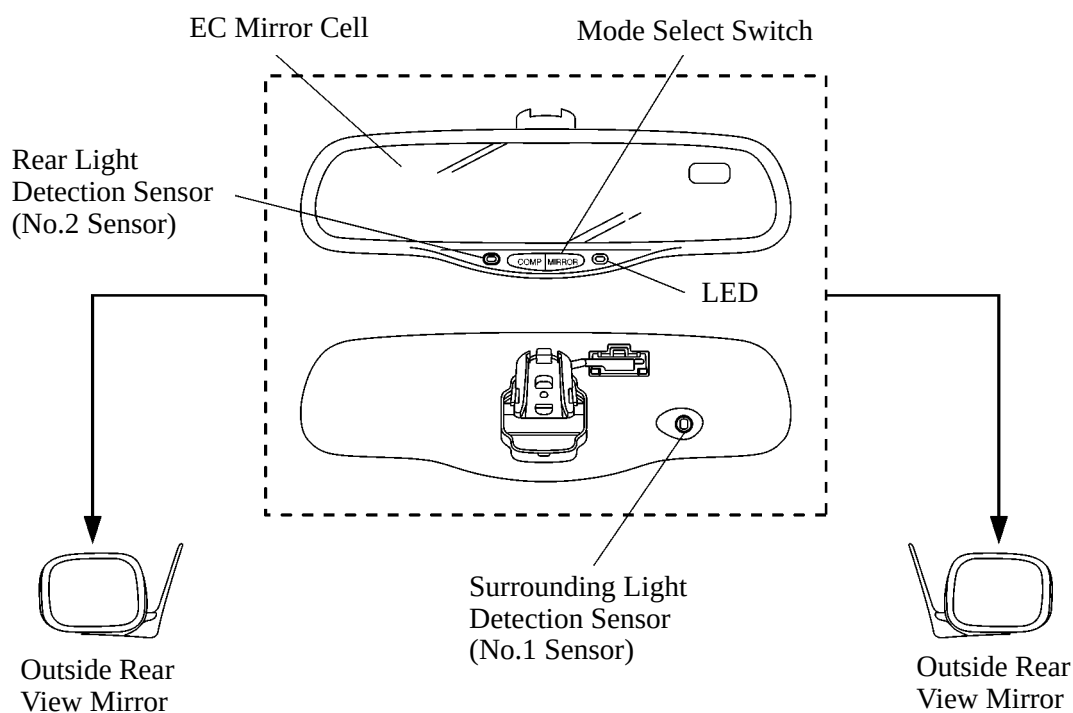
The reflection rate of the outside rear view mirrors varies in accordance with the change in the reflection rate of the inside rear view mirror.

► System Diagram ◀



211BE45

2. Function of Components



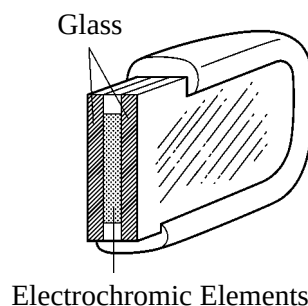
211BE46

Components		Function
Surrounding Light Detection Sensor(No.1 Sensor)		Detects the intensity of the light surrounding the vehicle.
Rear Light Detection Sensor (No.2 Sensor)		Detects the intensity of the light entering the inside rear view mirror from behind the vehicle.
LED		Turns on to inform the driver that the mirror control mode is operating in the AUTO mode.
Mode Select Switch		Selects the inside and outside rear view mirror control to AUTO or DAY mode.
(MIRROR)	AUTO Mode	Two sensors are used to steplessly adjust the reflection rate of the inside rear view mirror between 70 ~ 7%, and of the outside rear view mirror between 50 ~ 12%.
	DAY Mode	Fixes the reflection rate of the inside rear view mirror to 70% and of the outside rear view mirror to 50%.
EC Mirror Cell		Varies the reflection rate of the mirror through the function of EC elements.

3. Construction

EC Mirror Cell

An EC mirror cell consists of 2 layers of glass which sandwich the EC elements in the middle. The EC elements control coloring and discoloring characteristics through their electro-chemical oxidation reduce reaction. These characteristics are utilized to electronically vary the mirror's reflection rate.



189BE55

4. Operation

General

The EC mirror system provides 2 types of control modes, the AUTO and DAY modes, which can be selected using the mode select switch. In the AUTO mode, the system switches (Fig. 1) the inside rear view mirror's glare resistant and non-glare resistant functions in accordance with the difference in intensity between the surrounding and rear lights and automatically varies the reflection rate of the inside and outside rear view mirrors.

When the mode select switch is fixed to the DAY mode, the reflection rate of the inside and outside rear view mirrors are fixed to maximum reflection (DAY mode) regardless of the intensity of the surrounding or rear light. This system, when selected to the AUTO mode, is activated only when the ignition switch is ON.

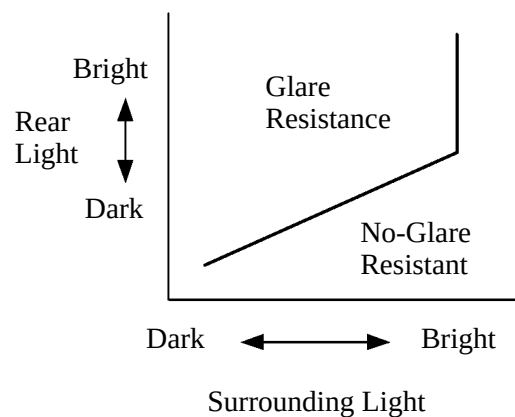


Fig. 1

189BE56

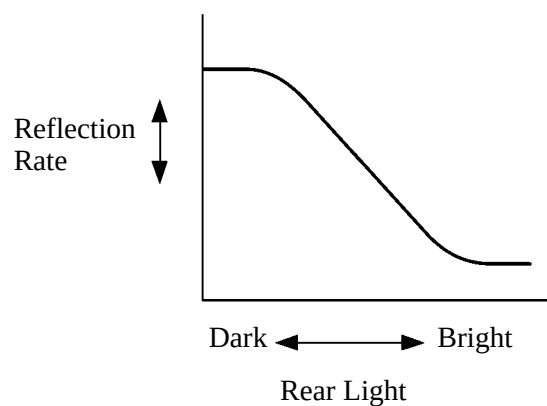
AUTO Mode

During daytime driving, the inside and outside rear view mirrors remain in the DAY mode.

The automatic glare-resistant circuit detects the surrounding light through its No. 1 sensor, the rear light through its No. 2 sensor, and determines whether it is day or night through the intensity of the surrounding light. At the same time, the intensity of the glare from the rear is determined through the difference in intensity between the surrounding and rear light.

When the automatic glare-resistant circuit determines that the rear light is too bright, the EC drive circuit applies voltage to the inside and outside rear view mirror cells to vary their reflection rate.

In accordance with the intensity of the rear light, the inside and outside rear view mirror's reflection rate varies steplessly (Fig. 2).

**Fig. 2**

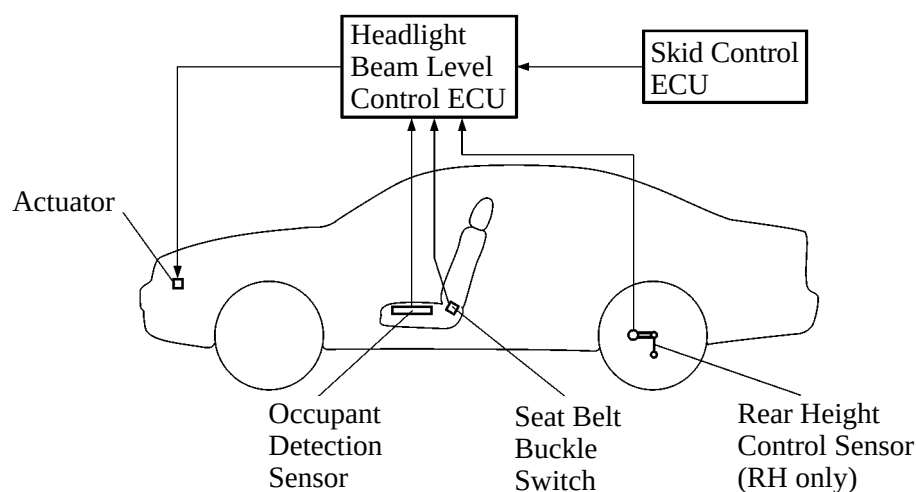
189BE57

■ AUTOMATIC HEADLIGHT BEAM LEVEL CONTROL SYSTEM

1. General

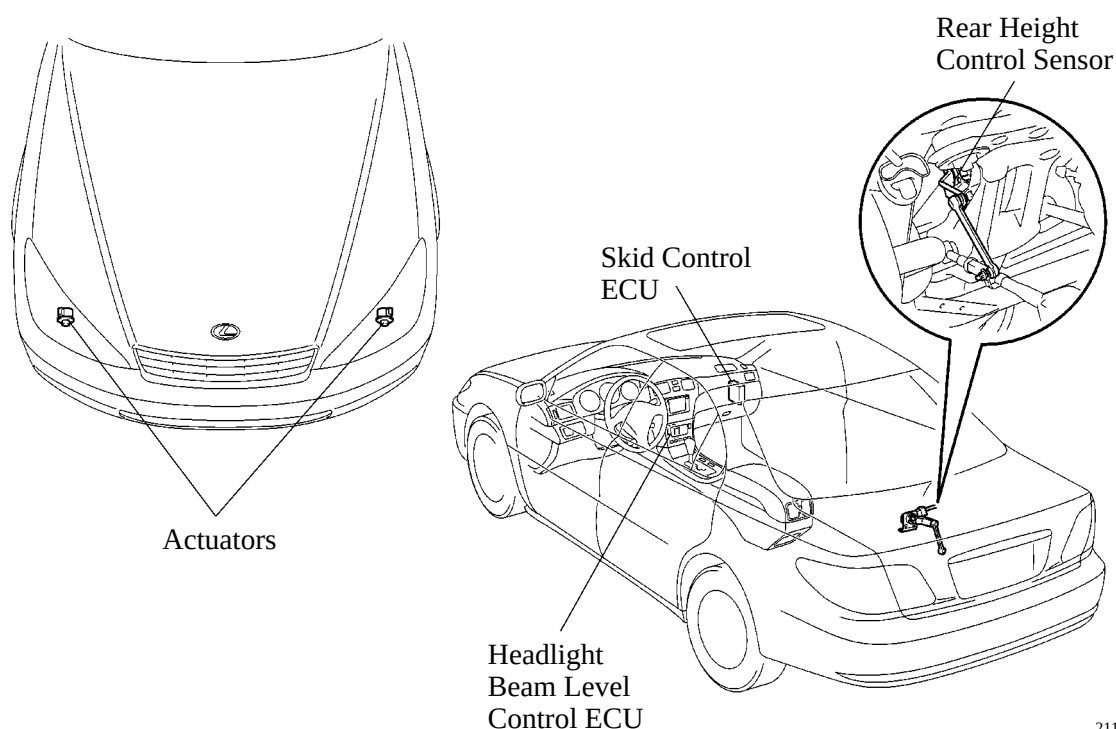
- The automatic headlight beam level control system regulates the orientation of the reflectors of the headlights in relation to the posture of the vehicle that has been detected by sensors. Thus, it is a system that maintains the headlight beams to a constant level while the vehicle is being driven.
- On the '01 ES300, the headlight beam level control ECU assessed the vehicle's posture through the signals from the rear height control sensor. On the '02 ES300, however, another piece of information has been added to the information that is used for assessing the vehicle's posture. The additional information determines whether or not the front passenger seat is occupied. This is accomplished by way of the ON/OFF signal of the occupant detection sensor, which is built into the front passenger seat, and the seat belt buckle switch. As a result, the precision of this system has been improved.

► System Diagram ◀



211BE53

2. Layout of Main Component



211BE54

3. Construction

Headlight Beam Level control ECU

Based on the signals that are transmitted by height control sensors, the occupant detection sensor and the skid control ECU, this ECU detects the amount of variance of the vehicle posture.

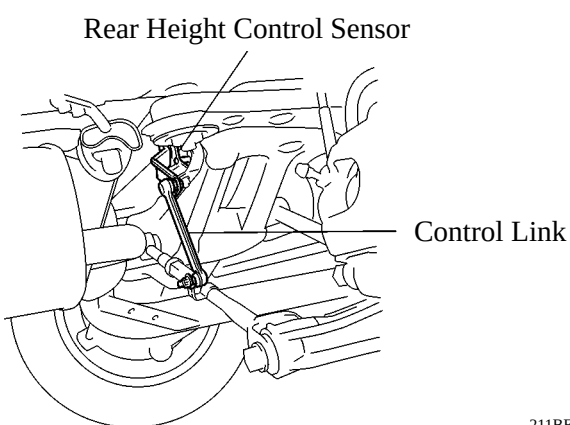
Based on the detected value, this ECU outputs control signal to the actuator.

The headlight beam level control ECU provides initial set control and fail-safe function.

Rear Height Control Sensor

The rear height control sensor detects the amount of variance of the vehicle height while the vehicle is being driven, and output this amount in the form of signal to the headlight beam level control ECU.

This sensor is located in the rear right suspension.



211BE55

Service Tip

The headlight beam level control ECU has the initial value of the rear height control sensor stored in its memory. Therefore, if a repair that alters the output value of the rear height control sensor has been performed (such as the removal and reinstallation of the rear height control sensor or the suspension), it is necessary to initialize the sensor and adjust the beams. For details, refer to the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).

Occupant Detection Sensor and Seat Belt Buckle Switch

The ON/OFF signals of the occupant detection sensor that is built into the front passenger seat and the seat belt buckle switch determine whether the front passenger seat is occupied. The signals are then transmitted to the headlight beam level control ECU. The occupant detection sensor is shared with the seat belt warning system.

Skid control ECU

The skid control ECU outputs the wheel speeds to the headlight beam level control ECU. The wheel speeds are calculated based on the signals which are received from the speed sensors which are part of the ABS.

Actuator

Based on the signals received from the headlight beam level control ECU, each actuator moves the reflector in the headlight to vary its beam. This actuator uses a step motor to precisely regulate the angle of the reflector.

4. Operation

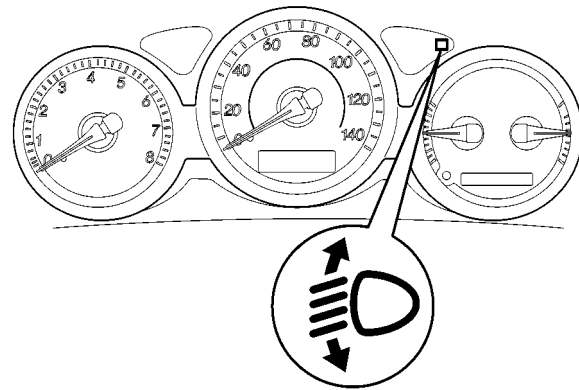
While the vehicle is being driven, the rear height control sensor detects the vehicle's posture that varies in accordance with the road conditions or driving conditions. The resultant signals are then output to the headlight beam level control ECU. Based on these signals from the sensor, the ECU assesses the vehicle's posture. If the front passenger seat is occupied, as determined by the ON/OFF signals from the occupant detection sensor that is built into the front passenger seat and the seat belt buckle switch, control is effected by making a correction to the vehicle posture information provided by the rear height control sensor.

In addition, the Skid Control ECU sends the vehicle speed signal to the headlight beam level control ECU, allowing the this ECU to determine the vehicle's driving conditions.

This ECU controls the actuator so as to cancel out the changes in the light beams that are caused by these changes in the vehicle's posture and speed.

5. Fail-Safe Function

The headlight beam level control ECU operates in the fail-safe mode if an abnormal condition such as those listed below has been detected, and illuminates the automatic headlight leveling system warning light in the combination meter.



211BE56

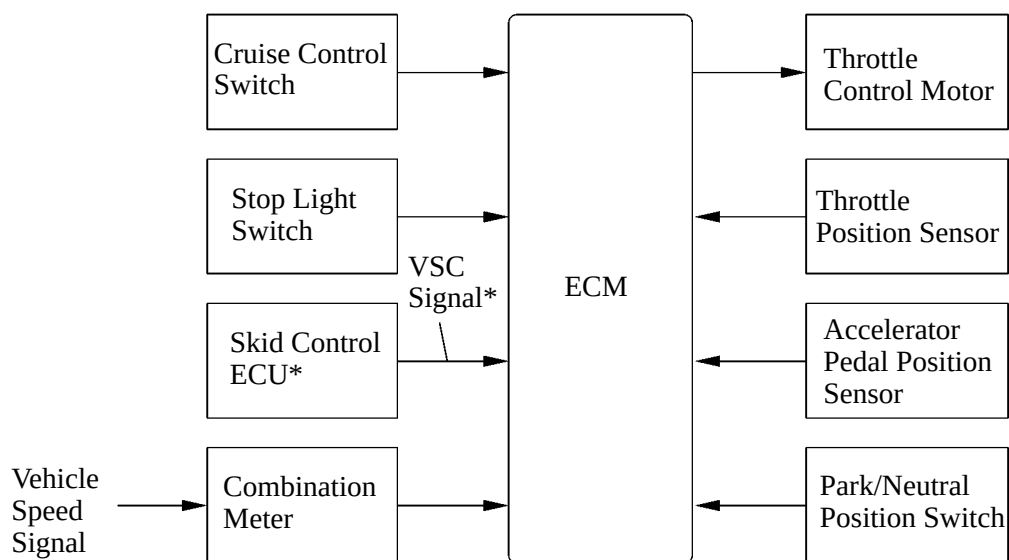
Item	Abnormality Detection Condition	Description of Control
Actuator	Open or Short	Holds the beam at the position of the actuator when the abnormality has been detected.
Rear Height Control Sensor	Signal Level Abnormality	Returns the beam to the actuator's initial set position if an abnormality has been detected higher than the initial set position.
		Holds the beam at the position of the actuator when an abnormality has been detected, if the abnormality has been detected lower than the initial set position.
Headlight Beam Level Control ECU	When an abnormal processing of the CPU has been detected.	Holds the beam at position of the actuator when the abnormality has been detected.

■ CRUISE CONTROL SYSTEM

1. General

- Once the system is set to a desired vehicle speed, the engine throttle position is adjusted automatically to maintain the vehicle speed at that speed without depressing the accelerator pedal. This system is standard equipment.
- The cruise control ECU is integrated with the ECM.
- With this system, the ECM directly controls the throttle valve to operate the vehicle at a fixed speed because it has adopted the ETCS-i (Electronic Throttle Control System-intelligent).

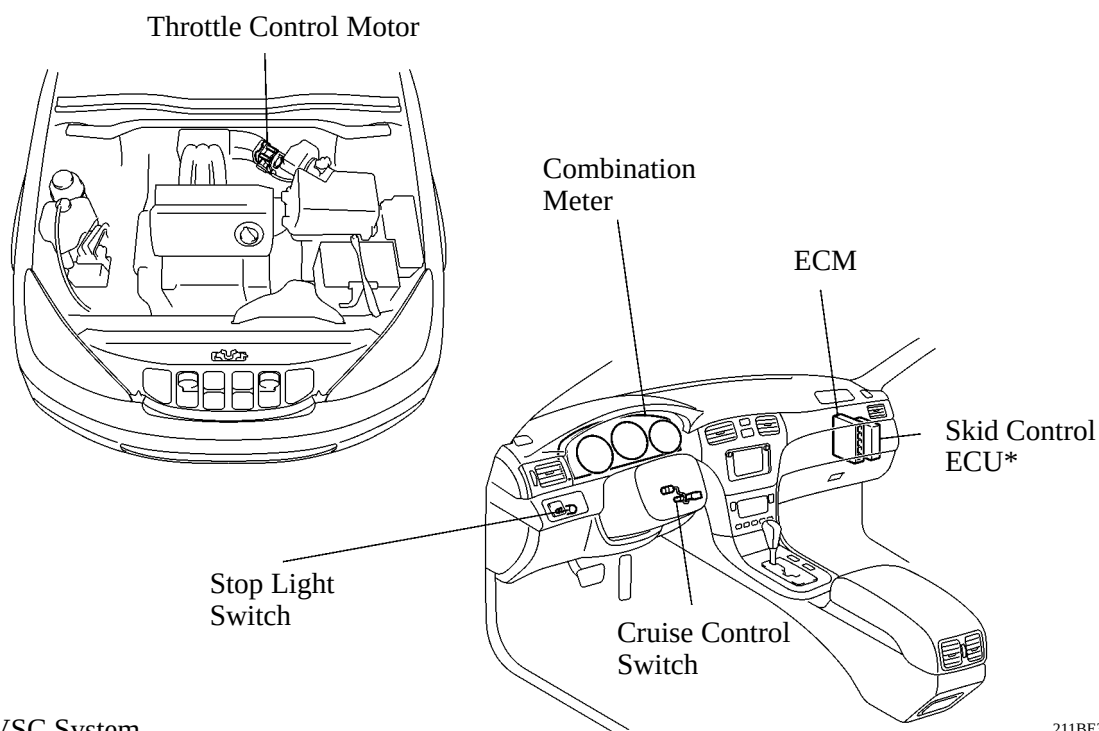
2. System Diagram



:* With VSC System

211BE37

3. Layout of Main Components



*: With VSC System

211BE38

4. Function

The cruise control has the following functions.

1	Constant Speed Control	6	Low Speed Limit Control	11	Tap-Down Control
2	Set	7	High Speed Limit Control	12	Tap-Up Control
3	Coast	8	Automatic Transmission Control	13	Diagnosis
4	Accel	9	Manual Cancel	14	Fail Safe
5	Resume	10	Auto Cancel	—	

5. Self-Diagnosis Function

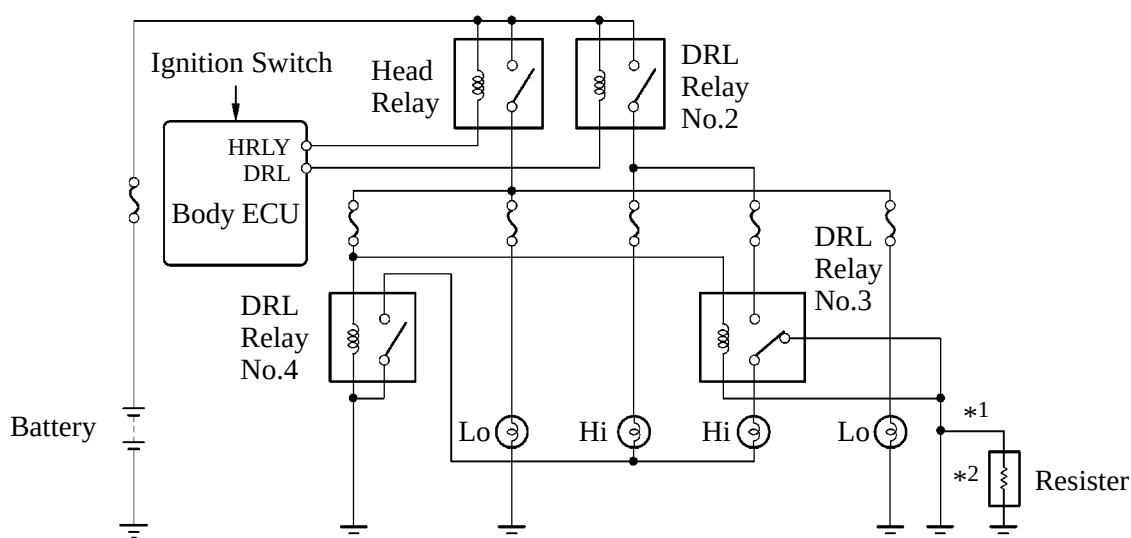
If the ECM detects a malfunction in the cruise control system, the ECU stores the malfunction data in memory, in addition to illuminating the cruise indicator light. Then, the DTCs (Diagnostic Trouble Codes) can be accessed by connecting a hand-held tester to the DLC3 terminal or the SST (09843-18040) to the Tc and CG terminals of the DLC3 and reading the blinking of the cruise indicator light. For further details, see the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).

■ DAYTIME RUNNING LIGHT SYSTEM

This system, which is directly connected to the high-beam headlights, is designed to automatically activate them the daytime in order to keep the vehicle highly visible to other vehicles.

This system is controlled by the Body ECU.

► Wiring Diagram ◀



*1: Only for U.S.A. Model

*2: Only for Canada Model

211BE57

■ AUTOMATIC LIGHT CONTROL SYSTEM

- When the light control switch at the AUTO position, the automatic light control sensor detects the ambient light and automatically turns the headlights and taillights ON or OFF accordingly.
- This system is controlled by the Body ECU.

■ LIGHT AUTO TURN-OFF SYSTEM

- When the headlights and taillights are illuminated through the operation of the light control switch or the activation of the automatic light control system, if the ignition switch is turned OFF and all the doors are closed, this system continues to illuminate the headlights and taillights for approximately 30 seconds, and then turns OFF the headlights.
However, with all the doors locked, when “LOCK” button on the wireless remote control is pushed, the headlights and taillights are turned OFF immediately.
- This system is controlled by the Body ECU.

■ ILLUMINATED ENTRY SYSTEM

- When a door is unlocked through a key operation or transmitter operation, or if a door is opened or closed, the illuminated entry system turns ON the interior light and the ignition key illumination.
- If the ignition switch is turned to the ACC or ON position or if all doors are locked during the 15 seconds in which these lights are ON, they will immediately turn OFF.
- This system is controlled by the Body ECU.

■ DOOR LOCK CONTROL SYSTEM

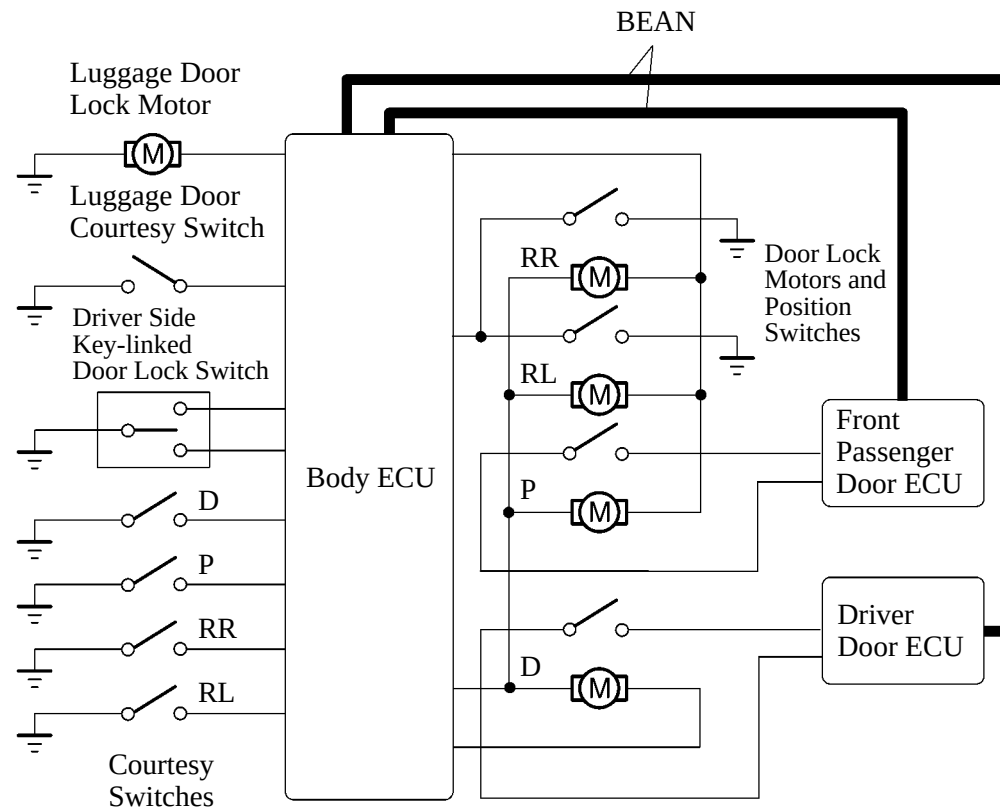
1. General

The door lock control system has the following functions:

Function	Outline
Key-linked lock and unlock function	This function, which is linked with the key cylinder, can lock or unlock all the doors when a lock or unlock operation is effected.
Key confine prevention function	When the key is inserted in the ignition key cylinder and if you perform the door lock operation, all the doors will be unlocked.
Manual unlock prohibition function	Performing the door lock operation with a transmitter or an ignition key will prohibit the unlock operation by the door lock control switch.
2-step unlock function	This function is provided to unlock the driver's door by turning the key cylinder first and to unlock passenger's door by turning it the second time.
Shift-linked automatic door lock	When the conditions listed below are met consecutively, this function causes all the doors to be automatically locked. ● The ignition switch is turned from the "OFF" or "ACC" position to the "ON" position. ● All doors are closed. ● The shift lever is moved out of P position. ● Either one of the doors is unlocked.
Speed-sensitive automatic door lock*	When the conditions listed below are met consecutively, this function causes all the doors to be automatically locked. ● Vehicle speed is higher than approximately 20 km/h (13 mph). ● All doors are closed. ● The shift lever position is out of P and N position. ● Either one of the doors is unlocked
Shift-linked automatic door unlock*	When the ignition switch is in the "ON" position, by shifting the shift lever to P position from the position other than P position, all the doors will be automatically unlocked.
Ignition switch-linked automatic door unlock*	When the driver's door is closed, by turning the ignition switch from ON to OFF position and opening the driver's door within 10 seconds all the doors will be automatically unlocked.
Collision door lock release	If the SRS airbag system has been deployed, and the body ECU has detected the signal that is output by the airbag sensor assembly, the body ECU unlocks all the doors.

*: Initial Setting = OFF

► System Diagram ◀



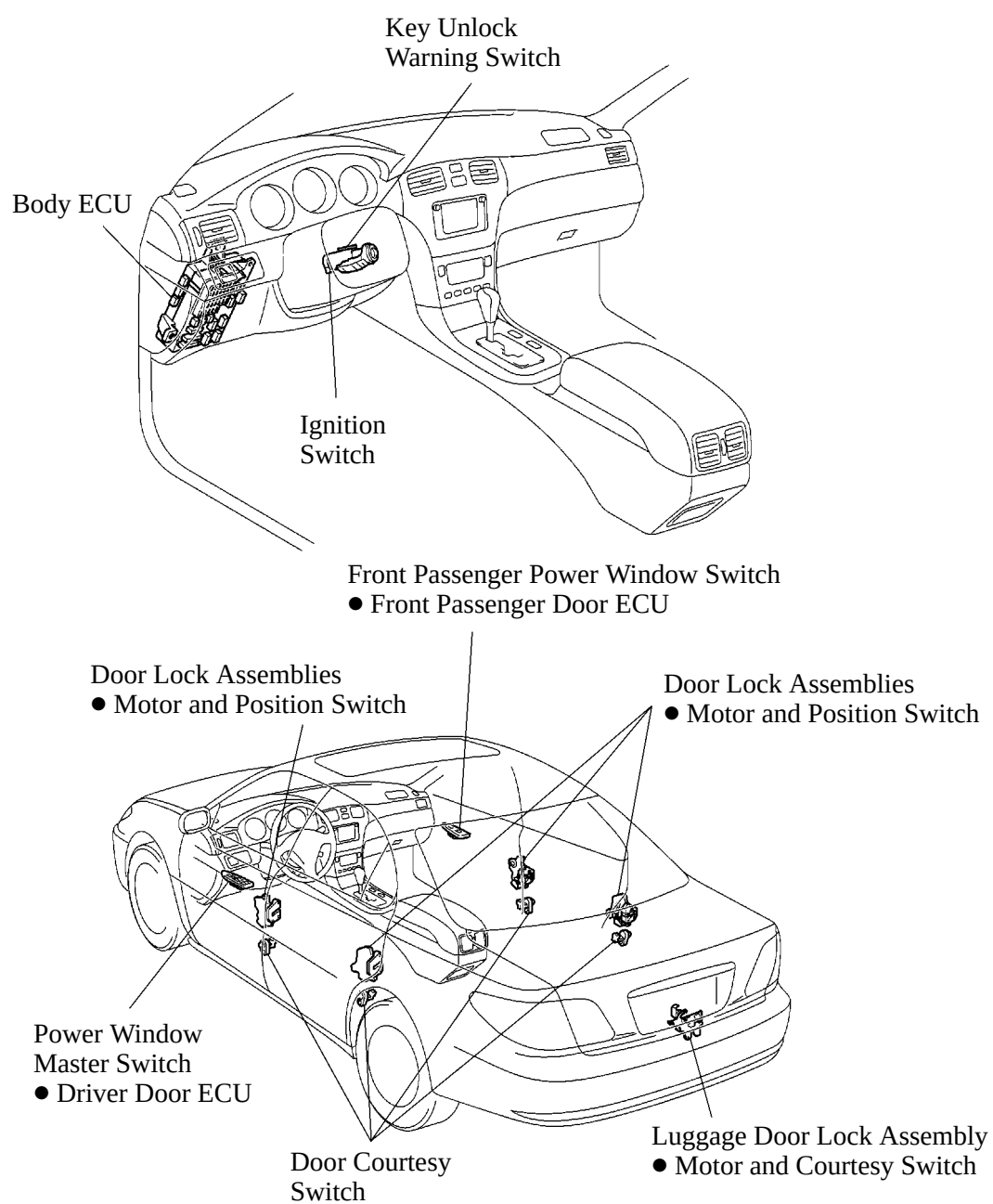
211BE29

2. Customize

Without using a hand-held tester, the setting of the automatic door lock/unlock functions can be changed with the following methods.

Function	Changing Methods
Shift-linked automatic door lock	1) Under the condition with all the doors closed, the ignition switch is turned to "ON" position. 2) Within 10 seconds after operating the above "1)", keep pressing the front side (lock side) of the driver's door lock switch for 5 seconds. 3) Releasing the switch gives signal to complete the setting, therefore, the door lock will lock/unlock one time each.
Speed-sensitive automatic door lock*	1) Under the condition with all the doors closed, the ignition switch is turned to "ON" position. 2) Move the shift lever from P to N position. 3) Within 10 seconds after operating the above "1)", keep pressing the front side (lock side) of the driver's door lock switch for 5 seconds. 4) Releasing the switch gives signal to complete the setting, therefore, the door lock will lock/unlock one time each.
Shift-linked automatic door unlock*	1) Under the condition with all the doors closed, the ignition switch is turned to "ON" position. 2) Set the shift lever in P position. 3) Within 10 seconds after operating the above "1)", keep pressing the rear side (unlock side) of the driver's door lock switch for 5 seconds. 4) Releasing the switch gives signal to complete the setting, therefore, the door lock will lock/unlock one time each.
Ignition switch-linked automatic door unlock*	1) Under the condition with all the doors closed, the ignition switch is turned to "ON" position. 2) Move the shift lever from P to N position. 3) Within 10 seconds after operating the above "1)", keep pressing the rear side (unlock side) of the driver's door lock switch for 5 seconds. 4) Releasing the switch gives signal to complete the setting, therefore, the door lock will lock/unlock one time each.

3. Layout of Main Component

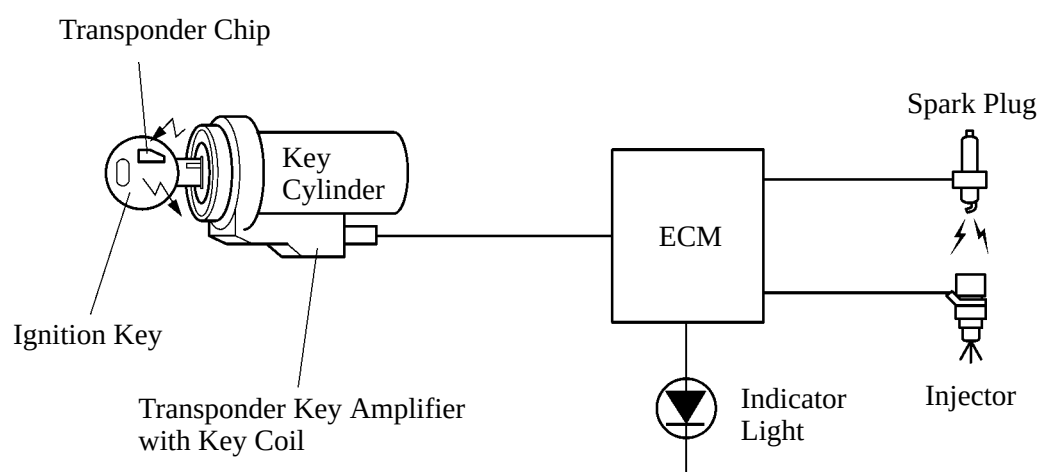


■ ENGINE IMMOBILISER SYSTEM

1. General

- This system has been provided on the all models as standard equipment.
- The engine immobiliser system is theft deterrent system which disables the engine from starting using the ignition key with an ID code that matched is the pre-registered code in the vehicle. This system consists of the transponder chip, coil, amplifier, and immobiliser ECU. The immobiliser ECU is enclosed in the ECM. This system adopts a transponder system which uses a transponder chip embedded in the grip of the ignition key. When the coil located around the ignition key cylinder receives the ID code signal transmitted by the transponder chip, the ECM determines whether or not the ID code matches the code stored.

► System Diagram ◀

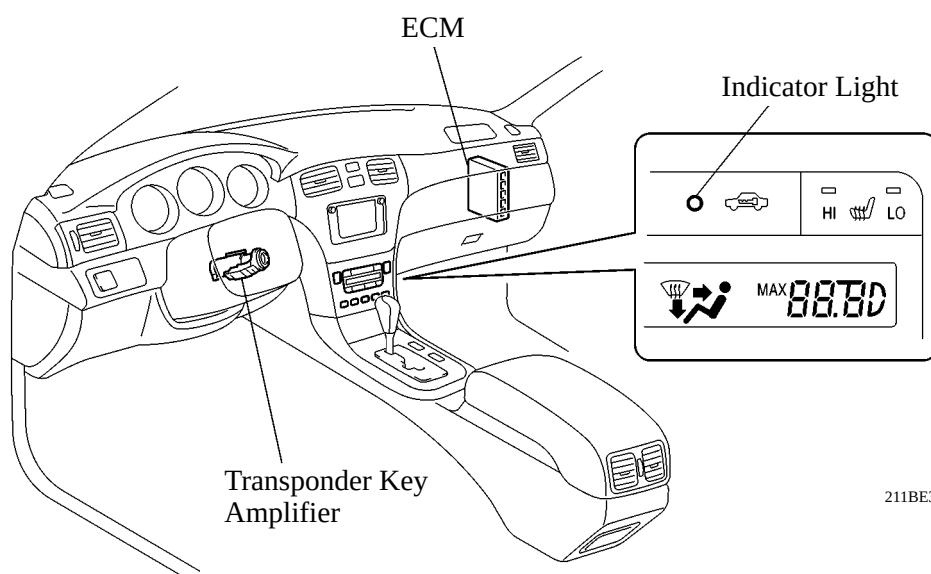


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Service Tip

In case of making new ignition key due to the loss of it, it is necessary to register ID code. Refer to see the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).

2. Layout of Main Component



211BE33

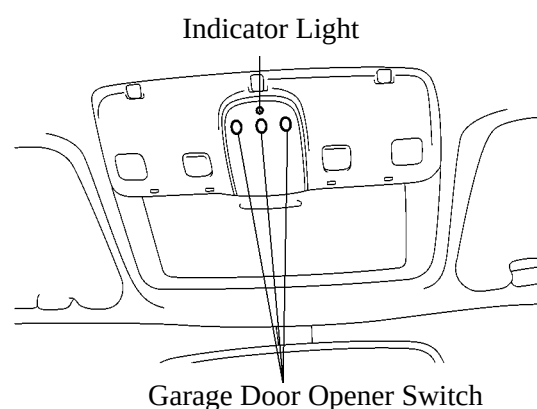
■ GARAGE DOOR OPENER

1. General

The garage door opener system has been adopted on the all model as standard equipment.

This system enables the garage door to be opened or closed from inside the vehicle by operating the switch that is provided in the overhead console. This system provides the features listed below.

- Up to three types of transmitter codes can be registered in the garage door opener.
- The garage door opener switch is provided in the overhead console where it is easily accessible.
- An indicator light is provided to enable the operator to verify the operation mode of the garage door opener.
- A rolling code function has been adopted, which changes the transmitter code each time the garage door opener switch is pressed.



211BE39

2. Function

The following table shows the garage door opener function and the indicator light operation in each of the modes.

Function	Outline	Indicator Light
Transmission Mode	While the switch is being pressed, the garage door opener transmits the code that was previously registered. Even if the button is pressed continuously, the transmission stops after 20 seconds.	Flash → On (Rolling Code) ON (Except Rolling Code)
Learning Mode	When the button is pressed continuously for 20 seconds, the mode transfers to the learning mode in which a transmitter code can be registered. In this mode, a new transmitter code can be registered or an existing code can be overwritten. If no codes are registered within 90 seconds after transferring to the learning mode, the mode transfers to the low power mode.	Slow flashing (during learning mode) Quick flashing (registration completed)
All Delete Mode	When the 2 outside buttons are pressed simultaneously for 20 seconds, all the transmitter codes that are registered in the button are cleared. By releasing the buttons within 10 seconds after clearing the codes, the mode transfers to the learning mode. By keeping the buttons pressed longer than 10 seconds after clearing the codes, all the buttons will be registered with a code for operation verification.	Quick flashing (code clearing completed)
Low Power Mode	If the button remains pressed longer than 100 seconds, such as in the case in which the pressed button does not release it self, the mode transfers to the low power mode to reduce power consumption.	OFF

3. Transmitter Code Registration Procedure

The garage door opener contains an EEPROM in which the maximum of 3 types of transmitter recognition codes can be registered. A transmitter code is registered into the EEPROM of the garage door opener according to the following steps.

- A: Press the button for registering transmitter codes continuously until the indicator light flashes slowly.
- B: While keeping the garage door opener's button pressed, place the transmitter for while you wish to register the code within about 25 mm (1 in.) of the garage door opener and press the transmitter's button.
- C: After the flashing of the indicator light changes from slow to quick flashing, the registration of the transmitter code has been completed. Then, release your fingers from the buttons of the garage door opener and the transmitter.
- D: To register the code of another transmitter, repeat the operation starting with step "A". To register a new code to the button that already has a code registered to it, select the button to which you wish to register the new code and start the operation starting with step "A".

CAUTION

The garage door or the gate could operate unintentionally while registering a transmitter code. Therefore, make sure that there are no people near the garage door or the gate before carrying out this operation.

- NOTE:**
- Before performing a transmitter code registration, stop the engine and pull the key from the ignition key cylinder.
 - The transmitter code of a garage door opener manufactured before 1982 cannot be registered in this system.

For details of procedures of transmitter code registration, refer to the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U) to register the codes correctly.

LIGHTING

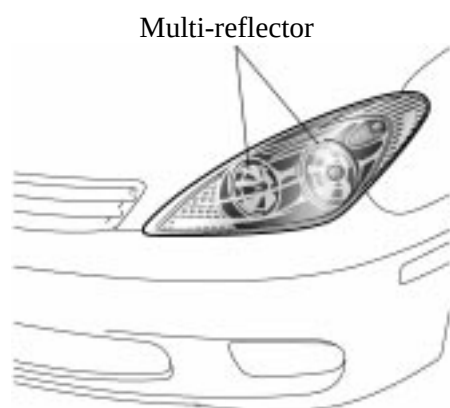
■ HEADLIGHT

1. General

- The multi-reflector headlights have been adopted as standard equipment.
- HID (High Intensity Discharge) headlights that produce light with a longer reach and wider distribution have been newly adopted as optional equipment for the low beams of all models in order to improve visibility.

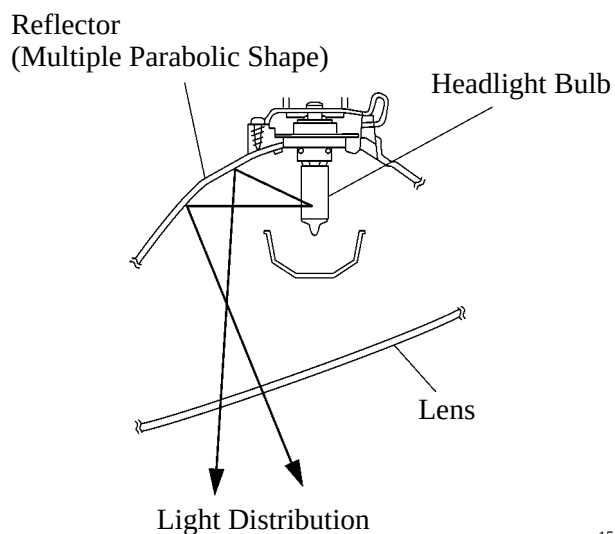
2. Multi-Reflector Type Headlight

With the multi-reflector type headlights and taillights, the light from the bulbs is dispersed and distributed through multiple parabolic shaped reflectors. As a result, the lens cut pattern is no longer provided in the center of the lens, thus realizing a clear look.



211BE52

► Light Distribution Imaginary Diagram ◀



151LBE67

3. HID (High Intensity Discharge) Headlight System

General

The HID headlight system that has been newly adopted on the '02 ES300 applies high voltage to the electrodes on the light bulb to discharge arcs, causing the metal atoms that are enclosed in the bulb to emit light.

Construction and Operation

The HID headlight system consists of metal halide bulbs and a light control ECU. The basic operation and construction are the same as in the '02 LS430.

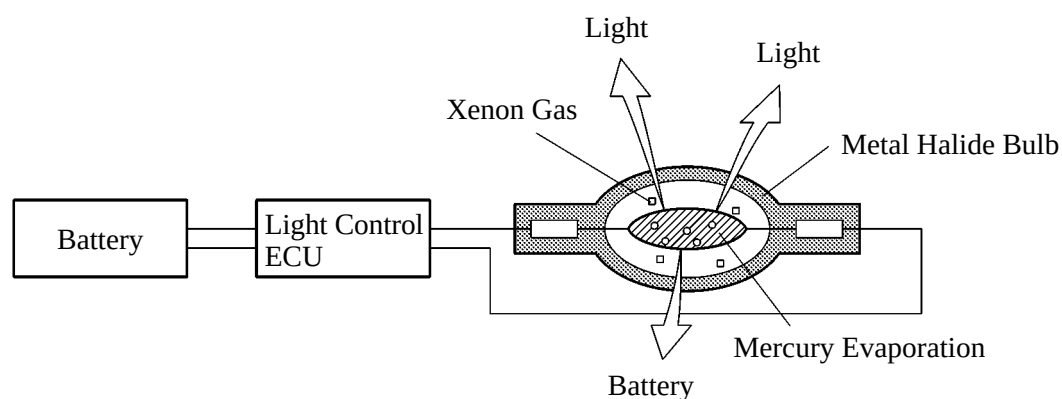
1) Metal Halide Bulb

a. Construction

The metal halide bulb contains xenon gas, mercury, and metal halide.

b. Operation

- When high voltage (approximately 20,000 volts) is applied to the electrodes of the metal halide bulb, the xenon gas in the bulb emits light.
- As the temperature in the bulb rises, the mercury evaporates and causes arcs to be discharged.
- As the temperature in the bulb rises even further, the metal halide in the mercury arc separates into metal atoms and iodine atoms.
- The separated metal atoms discharge light, which causes the bulb to emit light.



151LBE15

CAUTION

The replacement of an HID (High Intensity Discharge) must be performed only by a LEXUS dealer. Never touch the glass portion or the electrode portion of the bulb because high voltage that is generated at those areas is very dangerous.

2) Light Control ECU

a. General

The light control ECU is an electronic control unit which is necessary for illuminating the metal halide bulb. A light control ECU is located under each headlight unit. This ECU provides the functions Listed below.

- Generates the high voltage (approximately 20,000 volts) which is applied to the electrodes of the bulbs to enable the HID headlights to start to illuminate.
- Optimally controls the amperage and voltage in order to quickly provide an optimal amount of light immediately after the bulbs have been turned ON and to enable the bulbs to continue to illuminate in a stable manner.
- A fail-safe function is provided as a countermeasure against the high voltage that is generated in case that a problem occurs in the headlight system.

b. Fail-Safe Function

The light control ECU executes the fail-safe actions listed below in accordance with the item that has been detected.

Item	Outline
Detection of Abnormal Input Voltage	If the voltage that is input to the light control ECU deviates from the operating voltage (9-16 volts), the ECU stops illuminating the headlights, and resumes illuminating the headlights once the voltage reverts to the operating voltage range. However, if the input voltage decreases after the headlights have illuminated, the headlights will remain illuminated until the bulbs are extinguished.
Detection of Abnormal Output (Open Circuit or Short Circuit) or Flashing Bulb	If an abnormal condition (open or short circuit) occurs in the voltage that is output by the light control ECU, or if the bulb flashes, the ECU stops illuminating the headlights and will maintain this state until the power is reinstated (by tuning the headlight control switch from OFF to ON).
Detection of Bulb Open	If a bulb is not inserted in its socket, the ECU stops generating high voltage until the bulb is inserted correctly and the power is reinstated (by turning the headlight control switch from OFF to ON or turning the ignition switch from OFF to ON).

ACCESSORIES

■ LEXUS NAVIGATION SYSTEM

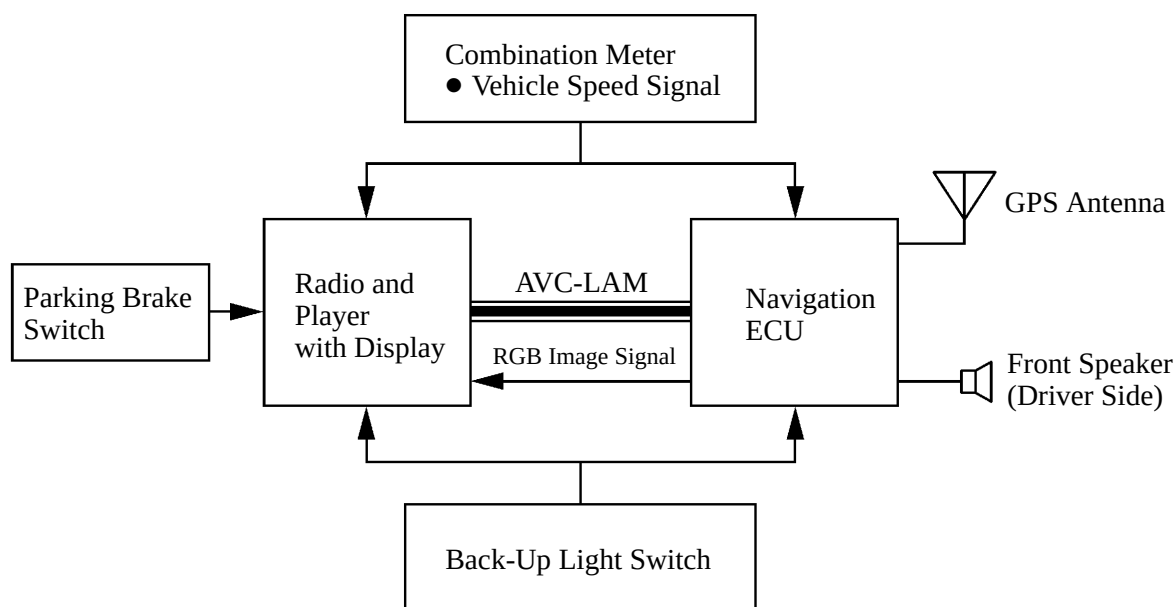
1. General

- The LEXUS navigation system with AV(Audio Visual) system has been adopted as optional equipment.
- Through the use of the GPS (Global Positioning System) and map data in a DVD (Digital Versatile Disc), this navigation system analyzes the position of the vehicle and indicates that position on the map that is displayed on the screen.
Additionally, it provided voice instructions to guide the driver through the route to reach the destination that has been selected.

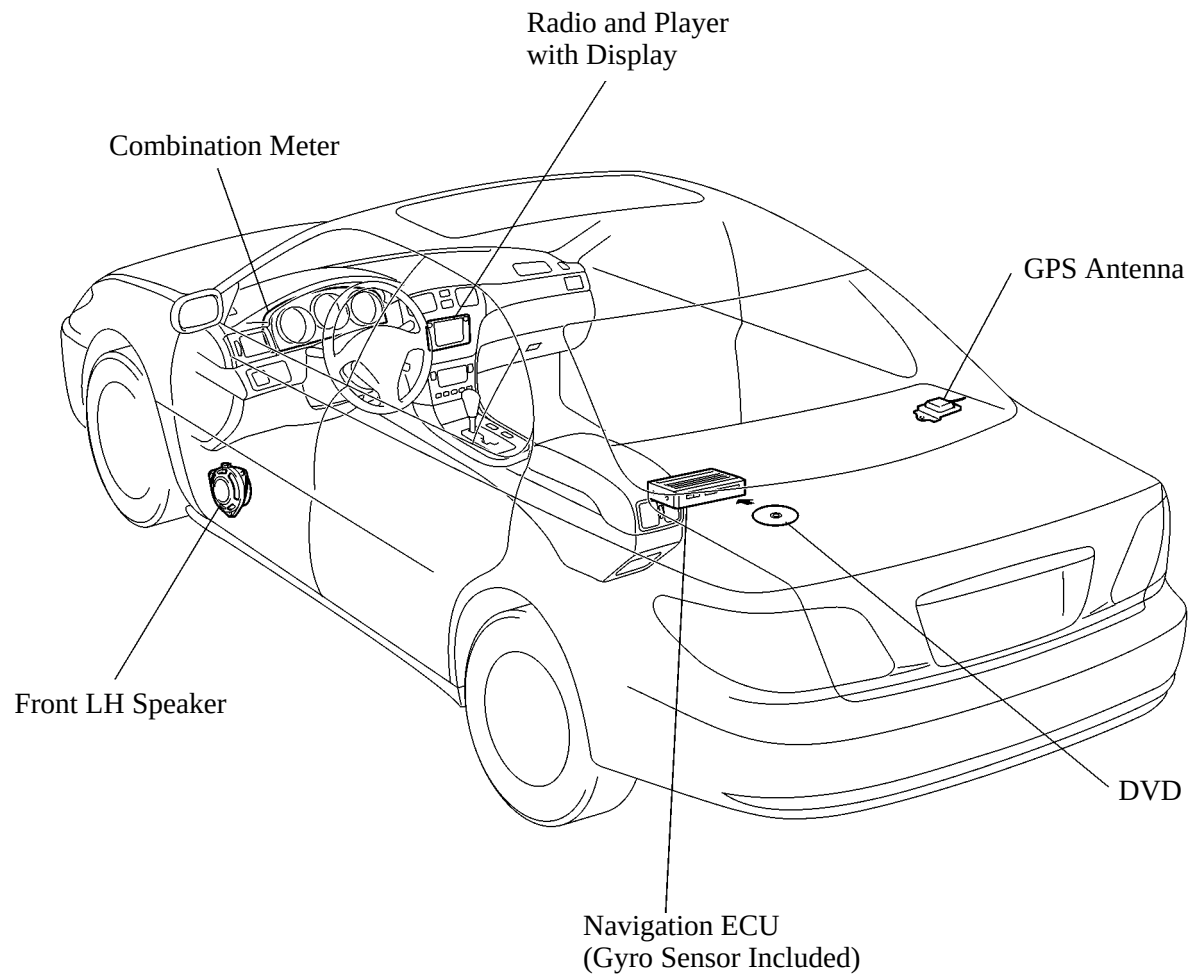
► Specifications ◀

Display	• 6.5-Inch Wide LCD (Liquid Crystal Display) • Pressure Sensitive Touch Panel • Dual Screen Display
Map Data Media	DVD (Digital Versatile Disc)
Navigation System	GPS (Global Positioning System)

2. System Diagram



3. Layout of Main Component



4. Construction and Operation

General

Listed below are the main functions of navigation display.

Function	Outline
Adjustment Screen Display	Image quality adjustment screen indication.
Navigation Screen Display	● Enlargement/reduction, rotation and movement of map. ● Indication of current position and direction of travel. ● Correction of current position. ● Setting change and indication of route. ● Voice guidance. There are many additional functions.
Diagnosis Screen Display	● Service Check Menu. ● Display Check. ● Navigation Check.

Navigation Screen Display

- Based on the map data on the DVD, signal from the GPS satellites, signals from the built-in gyro sensor, and signals from the vehicle's speed sensor, the vehicle's present position, direction of travel, and driven distance are calculated and displayed on the navigation display.
- The '02 ES300 has the GPS voice navigation system functions listed below:

Item		Function
Map Display	Linear Touch Scroll	Enables smooth scrolling by connecting the touch points on the screen.
	On-route Scroll	Scrolls the center of the cursor forward and reverse constantly along the route.
	Heading Up	Displays the map so that the direction of the route progression head up during route guidance.
	Map Color Change	Automatically changes the map display color by season.
	Front Wide	Displays a map in the direction of travel of the vehicle in an enlarged form. (Heading up only)
	Step-less Scale Display	Changes the scale of the map from the basic 13 steps to an even finer display.
	Direct Scale Change	Directly selects and displays the map scale.
	Multi-step Scale Display	Changes and displays the map scale in 13 stages.
	Split-view Display	Displays different modes on a screen that is split into two views.
	Points-of-Interest Display	Displays selected types of marks on the map.
	Taillight-interlocked Map Color Change	Changes the displayed color on the map screen when the taillights are turned ON.
	Road Number Sign Board Display	Displays the road number on the map.
Destination Search	Last Destination Memory	Stores 20 locations of coordinates, names and times that have been set as destinations in the past.
	Hybrid Points-of-interest Search	Narrows the search by names of the points-of-interest, category, and areas.
	Points-of-interest Pinpoint Display	Pinpoints and displays the position of the point-of-interest.
	House Number Search	Searches for a house number.
	Special Memory Point	Sets a pre-registered point as a destination point while driving.
	Nearest Point-of-interest Search List Display	Searches nearest points-of-interest and displays a list.

(Continued)

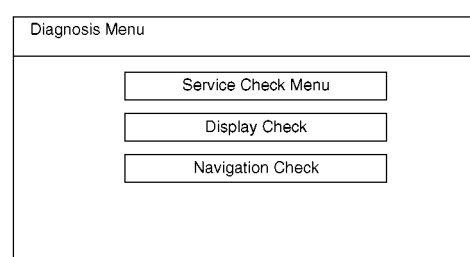
Item		Function
Destination Search	Intersection Search	By specifying two streets, the point at which they intersection is set as the destination point.
	Emergency Search	Performs a specific search for hospitals, police stations and dealers.
	Freeway Entrance/Exit Search	Searches for the destination by the name of the street that connects to a freeway entrance/exit.
Route Search	Multiple Destination Setting	Sets multiple destinations. It can also rearrange the sequence of the destinations.
	Route Search	Searches for multiple routes.
	Search Condition Designation	Searches for the recommended, shortest, and other routes.
	Regulated Road Consideration	Performs search while considering regulated roads.
	Avoidance Area	Avoids a designated area and searches a route.
Guidance	Destination Direction Arrow Display	Uses arrows along the road to display the direction of the destination during route guidance.
	Off-Route Arrow Display	Uses arrows along the road to display the direction of the destination during off-route.
	Rotary Guidance	Guidance that renders the entry and exit into a rotary as a single branching point.
	Right or Left Turn Guidance	Voice guidance to instruct the direction of travel to be taken.
	Freeway Direction of Travel Guidance	Voice guidance to instruct the direction of travel to take on the freeway.
	Distance Display Destination	Displays the distance from the present location to the destination.
	Freeway Branch Type Specimen Guidance	Type specimen for guidance to a freeway branch.
	Intersection Zoom-in Display	Zoom-in display when approaching an intersection.
	Turn List Display	Displays a turn list on the right side of the two-screen display when approaching an intersection.

Diagnosis Screen Display

The navigation display is equipped with a self-diagnosis system and can display the diagnosis menus shown on the right.

The diagnosis menu contains the following three items

- Service Check Menu
- Display Check
- Navigation Check



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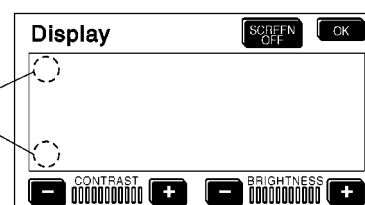
Service Tip

The diagnosis menu screen can be displayed according to the procedure given below.

- Vehicle speed should be 0 km/h (0 mph).
- Apply the parking brake.
- Turn the ignition switch to ACC or ON.
- Push the DISPLAY button.
- Activate the screen adjustment screen.
- Alternately touch the upper and lower bottom parts of the left end of the screen 3 times.

For details, refer to the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).

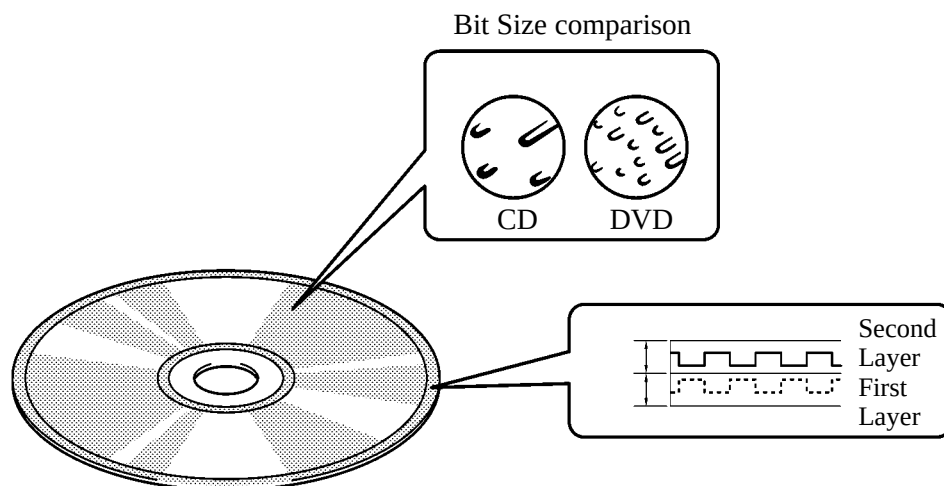
Concealed
Touch Switch



199BE404

DVD (Digital Versatile Disc)

The DVD, which uses a smaller laser beam diameter than the CD (Compact Disc), is able to record and play back a greater amount of data because it can handle pits, or signal grooves, at a higher density. The volume of data that a 12 cm (0.47 in.) diameter DVD can store is equivalent to approximately 7.5 times that of a CD-ROM, totaling 4.7 gigabytes. The navigation system has adopted a dual-layer DVD, which has two layers per side to store a large capacity of signal data, totaling 8.5 gigabytes.



187BE38

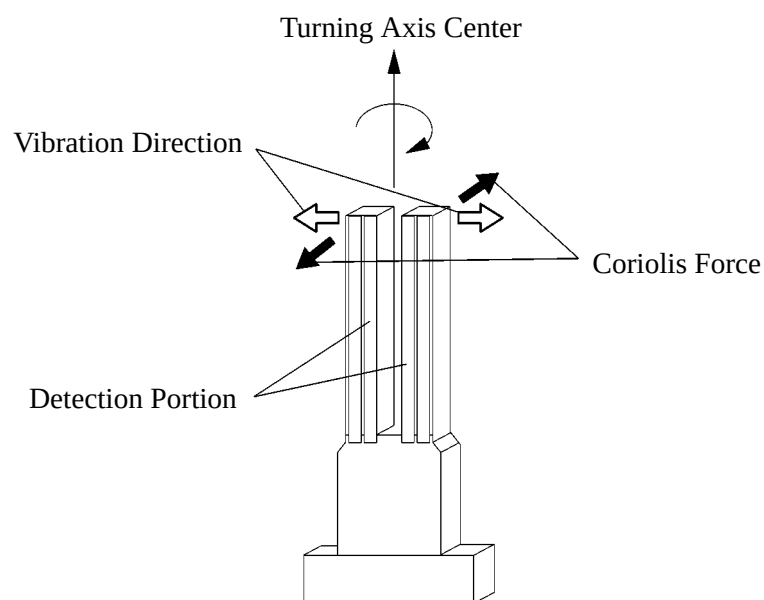
Gyro Sensor

The gyro sensor is designed to detect the yaw rate of vertical axis turn of the vehicle and installed in the Navigation ECU.

The gyro sensor has a piezoelectric ceramic piece inside. This piezoelectric ceramic piece deforms by charging voltage and generates voltage by deforming with force.

The piezoelectric ceramic piece inside the gyro sensor is vibrated by the driving circuit and when the vehicle turns (when the detection portion turns to the axis direction), coriolis force is added to the detection portion. With this force, the detection portion is twisted. The voltage generated by this twisting is signal-processed inside the gyro sensor and outputted.

Navigation ECU receives this signal and judges the yaw rate of the vehicle.



182BE49

Detection the Vehicle Position

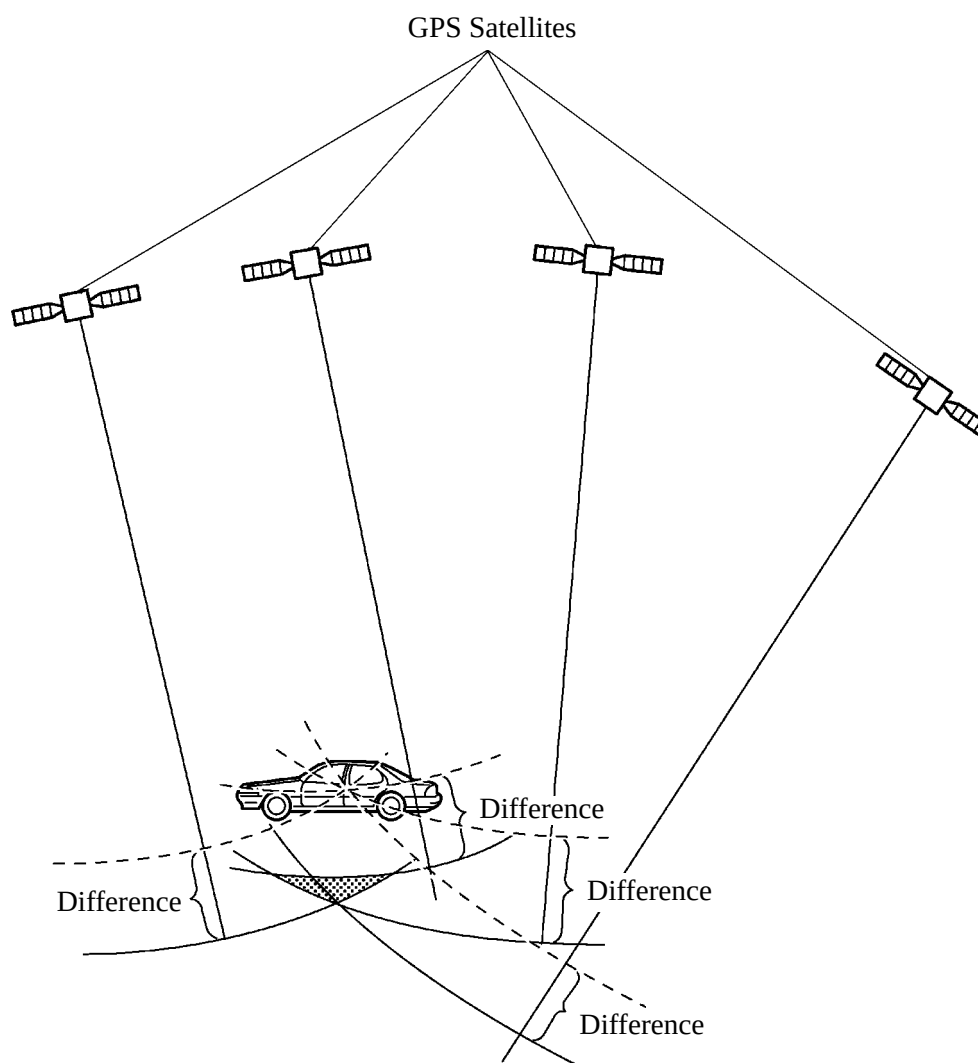
The navigation ECU calculates the position based on the principle of a 3-point measurement.

The GPS satellites are equipped with high-precision clocks. Thus, the satellites are able to transmit continuous orbit signals and radio wave transmission time signals.

The navigation ECU also contains a clock, which can understand the radio wave time signals that are received from the satellites.

As a result, the length of time that is taken by the radio waves to arrive from the satellites to the antenna can be determined. Thus, the lengths of time that elapse for the radio waves of the 4 satellites to reach the antenna are measured. Each of these lengths of time are multiplied by the luminous flux (the rate of transmission of luminous energy: approximately 300,000 km/second), the results of which are the distances from the satellites to the antenna. Because the positions of the GPS satellites are known by their signals, the receiving point (vehicle position) can be rendered as the point in which the 4 spheres (of which the centers are the respective satellites) converge.

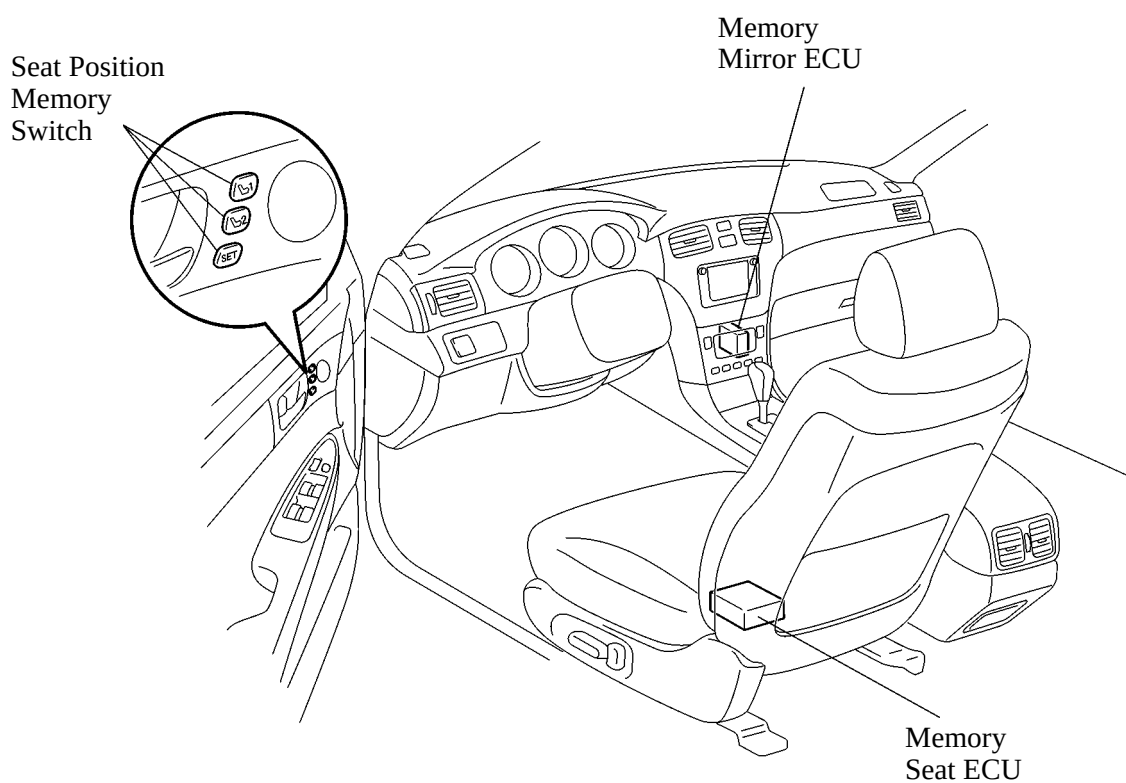
However, due to the differences that exist between the clocks of the satellite and the ECU, the 4 spheres do not converge at a single point. Therefore, the ECU uses another satellite to calculate the point at which the 4 spheres converge at a signal point and corrects its internal clock. As a result, the ECU determines the vehicle position and adjusts its internal clock to the clocks of the satellites.



■ MEMORY SYSTEM

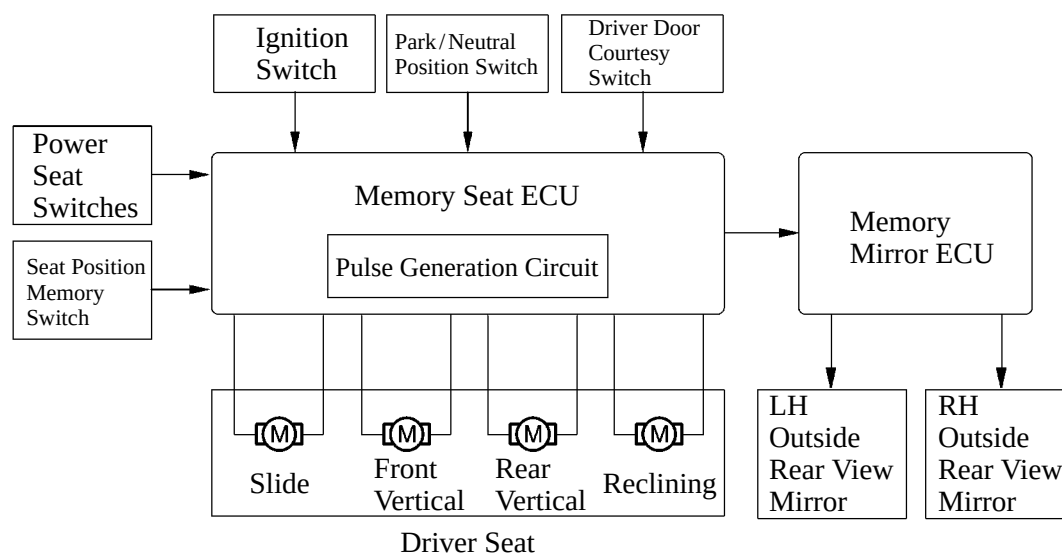
1. General

- On the '02 ES300, a memory system for the driver seat is provided as optional equipment.
- The memory seat ECU effects control by memorizing two seat positions and outside rear view mirror position.
- On the '01 ES300, the seat position was detected by the Hall IC that is installed on the power seat motor. However, the '02 ES300 has adopted a new mechanism to detect the seat position, in which the memory seat ECU converts the driving current pulsations generated by the rotation of the motor into pulse signals.



211BE42

► System Diagram ◀



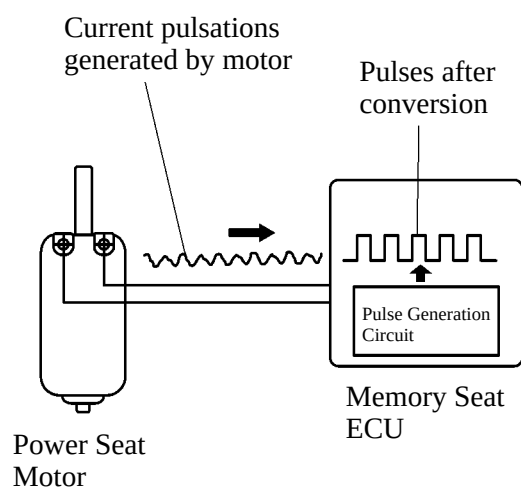
211BE43

2. Construction

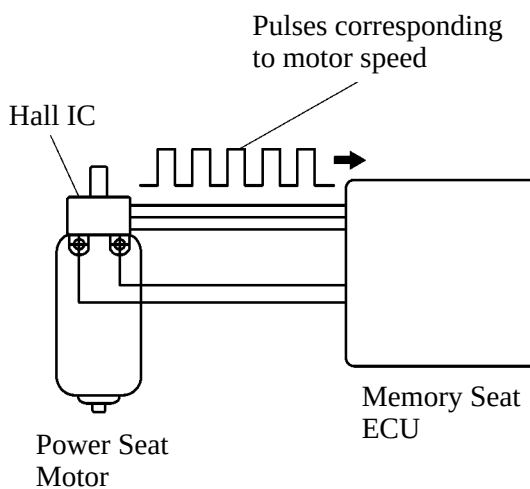
Seat Position Detection

On the '01 ES300, the Hall IC that is installed on the power seat motor generated the number of pulses that corresponded to the speed of the motor. These pulses were then picked up by the memory seat ECU in order to detect the seat position.

On the '02 ES300, however, a pulse generation circuit in the memory seat ECU converts the driving current pulsations that are generated by the rotation of the motor into pulse signals. These signals are then picked up in order to detect the seat position. As a result, the construction of the system has been simplified.



'02 ES300



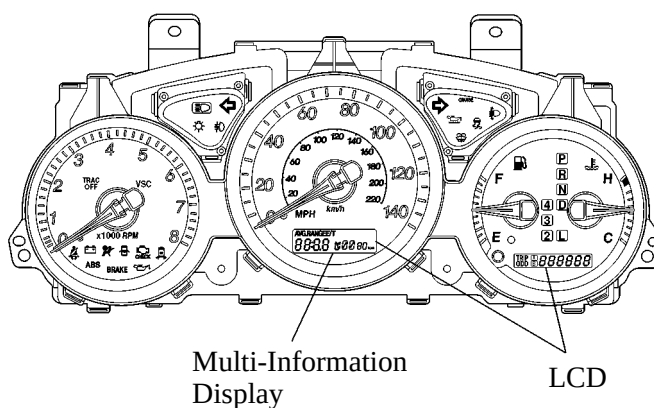
'01 ES300

METER

■ COMBINATION METER

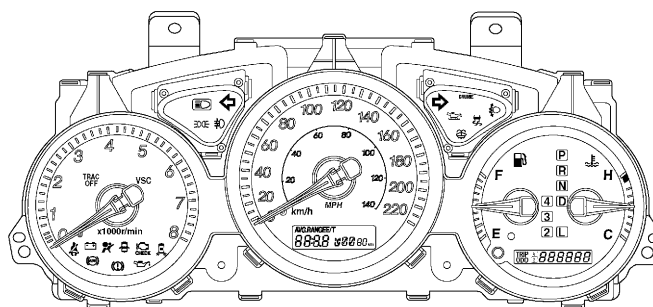
1. General

- An optitron display type combination meter has been adopted. The optitron display type meter realizes excellent visibility through the use of smoke acylic in the protective panel, and LEDs (Light Emitting Diodes) that is vary bright and has high contrast for illuminating the indicator and the dial.
- An odometer and trip meter that use an LCD (Liquid Crystal Display) have been adopted.
- The multi-information display has been provided below the speedometer. This multi-information display use an LCD.
- The combination meter has a built-in meter ECU and buzzer for Key remainder.
- This meter ECU receives the engine coolant temperature signal and the engine speed signal by establishing communication with the ECM via a serial data link.
Furthermore, the meter ECU receives various pieces of information that are necessary for its operation from the sensors and switches.
- This meter ECU flashes its warning lights even if an open circuit occurs in the wiring harnesses, which are connected to the ECUs for the purpose of flashing the ABS warning light, brake system warning light, and the SRS airbag warning light.



U.S.A. Model

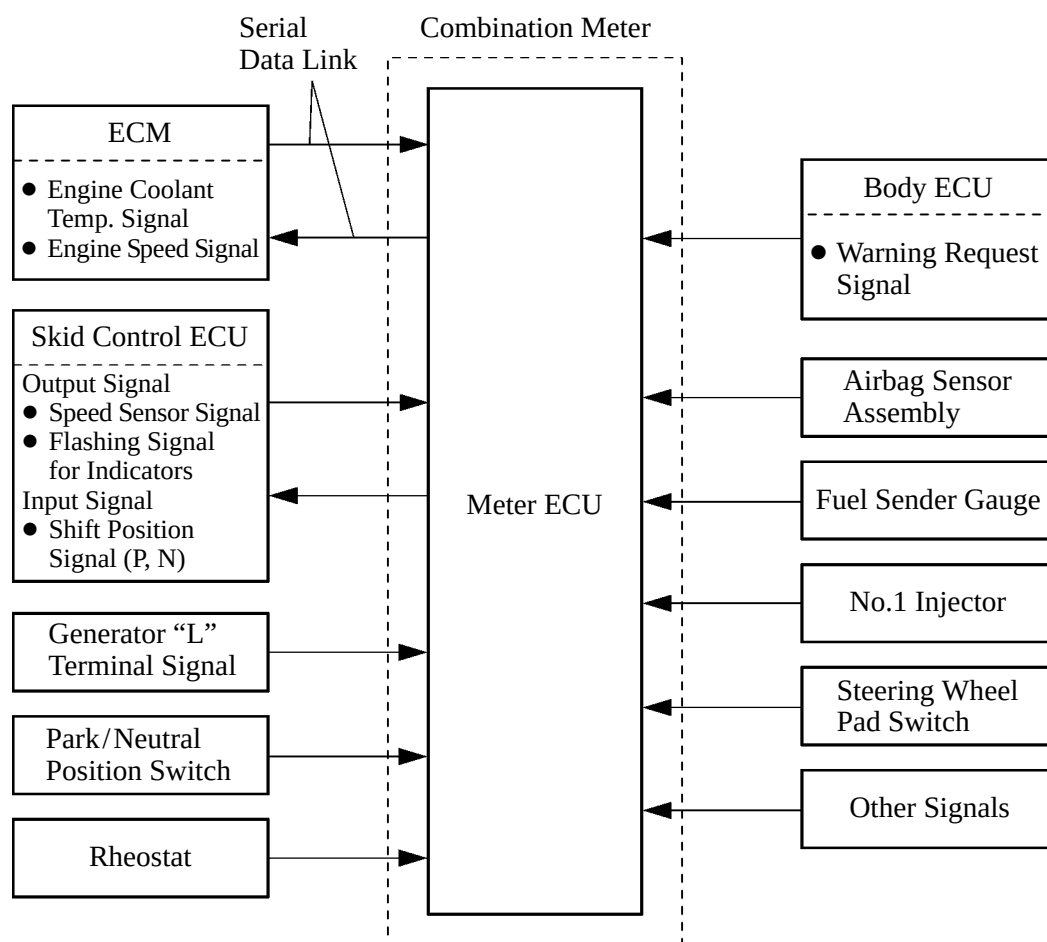
211BE03



Canada Model

211BE04

2. System Diagram

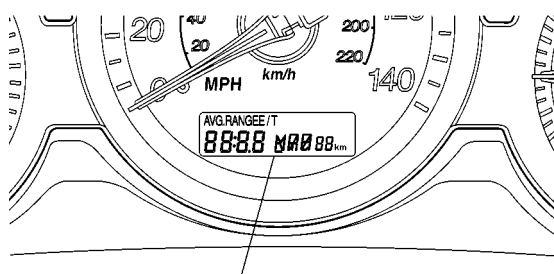


3. Multi-Information Display

General

- The following pieces of information appear on the multi-information display: instant fuel consumption, average fuel consumption, drivable distance, average vehicle speed and elapsed time.
- The display functions can be switched by operating the steering wheel pad switch.

Display Portion

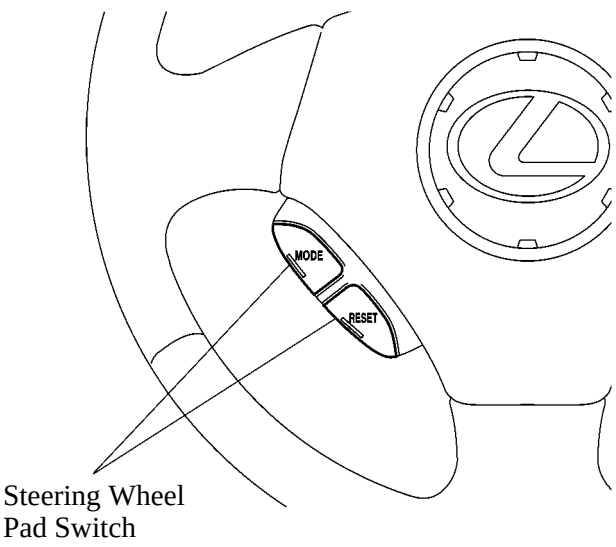


Display Portion

211BE06

Item	Display Contents		Outline
Average Vehicle Speed	U.S.A.	AVG. 32.8 MPH 211BE07	Displays the average vehicle speed, which is calculated by the ECU based on the length of time and the driven distance after connecting the battery terminal or pressing of RESET switch of the steering wheel pad switch.
	Canada	AVG. 52.5 km/h 211BE08	
Average Fuel Consumption	U.S.A.	AVG. 24.4 MPG 211BE09	The calculation of the average fuel consumption rate for this display is updated every 10 seconds by the ECU, based on the following pieces of information: the driven distance (from the time the battery terminals have been connected, or the RESET switch on the steering wheel pad switch has been pressed and the fuel consumption volume (fuel injection signal from No. 1 injector).
	Canada	AVG. 9.6 L / 100 km 211BE10	
Instant Fuel Consumption	U.S.A.	21.4 MPG 211BE66	In contrast to the calculations performed every 10 seconds for the average fuel consumption, the ECU calculates and displays the instant fuel consumption every 2 seconds.
	Canada	9.2 L / 100 km 211BE67	
Elapsed Time		12:45^{E/T} 211BE13	Displays the length of time that has elapsed from the time the ignition switch has been turned ON after the battery terminals have been connected, or the RESET switch on the steering pad switch has been pressed.
Drivable Distance	U.S.A.	RANGE 349 MI 211BE14	Displays the approximate drivable distance that has been calculated based on the following pieces of information: the remaining fuel information from the meter ECU, vehicle speed signal, No. 1 injector's fuel injection signal, and the fuel consumption that the ECU has learned.
	Canada	RANGE 536 km 211BE15	

Switch



211BE16

Switch	Function
MODE	Pressing MODE switch changes the contents of the multi-information display in the following sequence: → Instant Fuel Consumption ↓ Average Fuel Consumption ↓ Drivable Distance ↓ Average Vehicle Speed ↓ Elapsed Time
RESET	Pressing RESET switch resets the display contents of each mode.

BODY ELECTRICAL

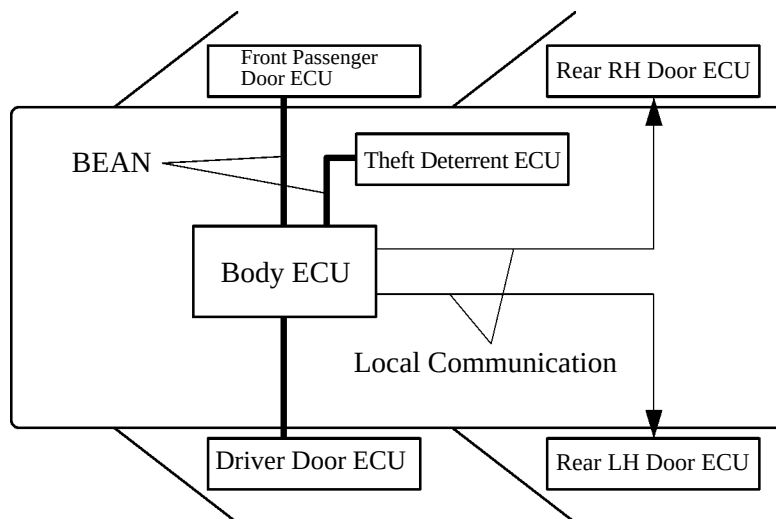
BODY ELECTRICAL SYSTEM CONTROL

■ MULTIPLEX COMMUNICATION SYSTEM

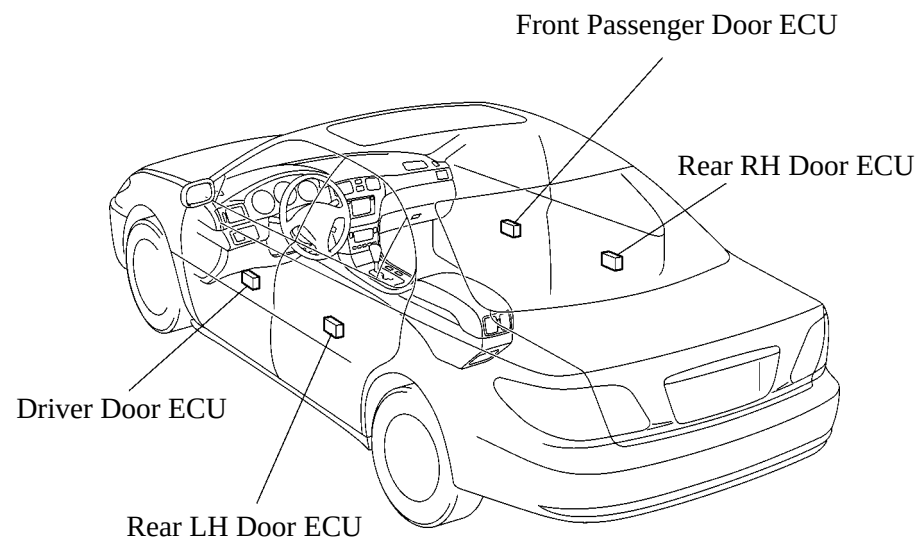
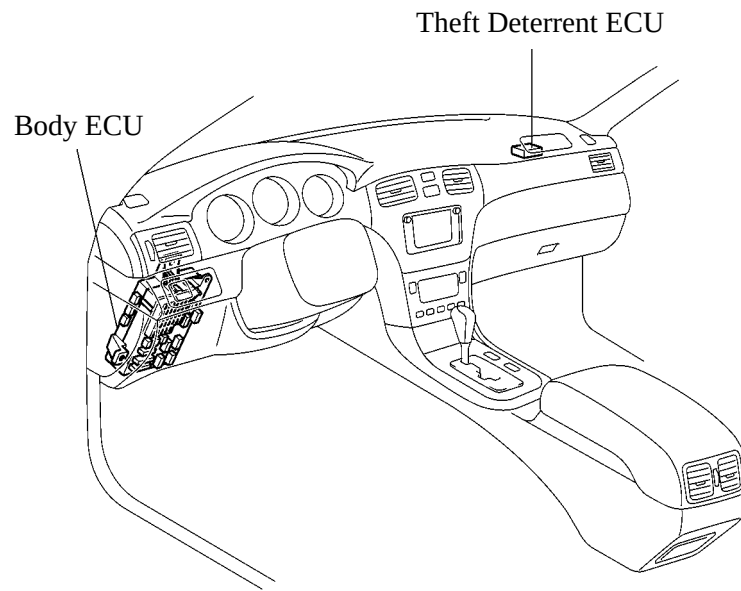
1. General

- A multiplex communication system has been adopted for body electrical system control and to achieve a slimmer wiring harnesses configuration.
- BEAN (Body Electronics Area Network) has been adopted between the body ECU, driver door ECU, front passenger door ECU, theft deterrent ECU.
- The local protocol unidirectional communication has been adopted between the body ECU, rear RH door ECU, rear LH door ECU.
- A customized body electronics system, which improves the malfunction diagnostic function, enables the functions to be changed according to customer needs, and reduce the types of parts, has been adopted.

► System Diagram ◀



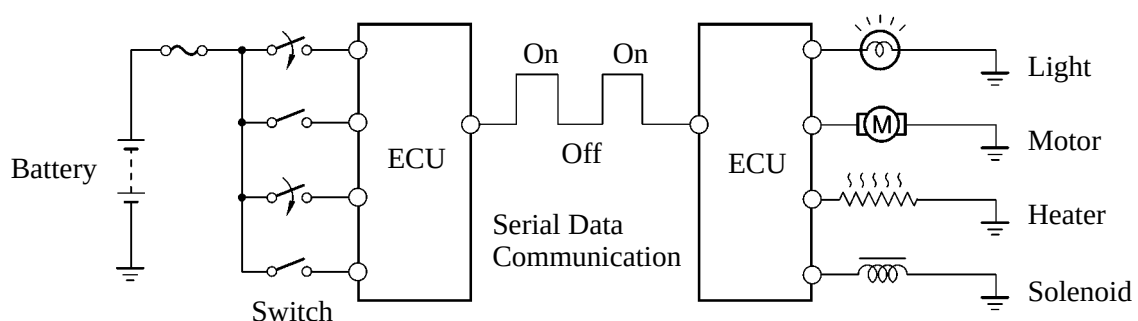
► Layout of Main Component ◀



2. System Outline

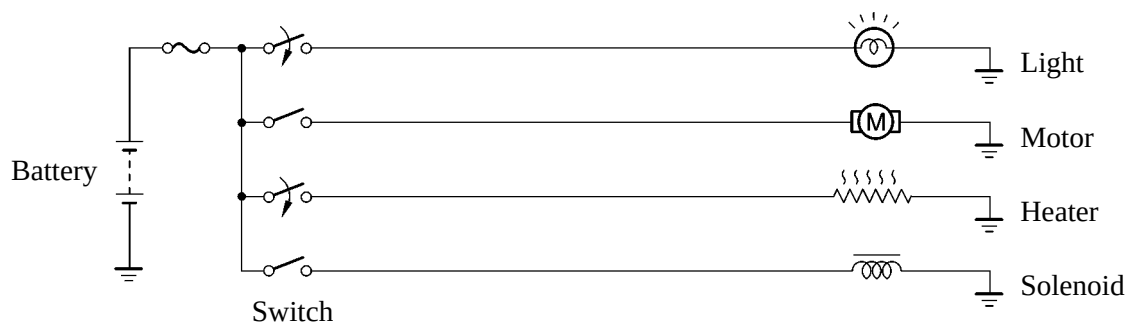
In the conventional system, electrical loads such as motors and lights were directly connected by wire harness to their switches which controlled their operation. However, in the multiplex communication system, the wire harness is replaced by serial data communication by the ECU, to provide functions similar to the conventional system, through a single serial communication bus. With this system, even when multiple tasks demand additional switches and electrical loads, communication among ECUs can be implemented through the serial communication bus only, resulting in the only reduction in wire harnesses.

► Conceptual Drawing of Multiplex Communication System ◀



208BE03

Multiplex Communication System



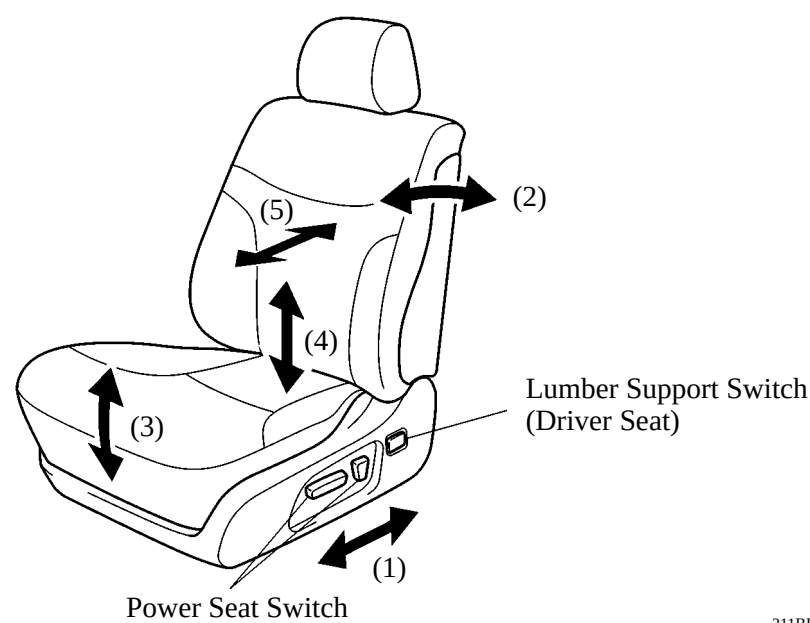
208BE51

Conventional System

■ POWER SEAT

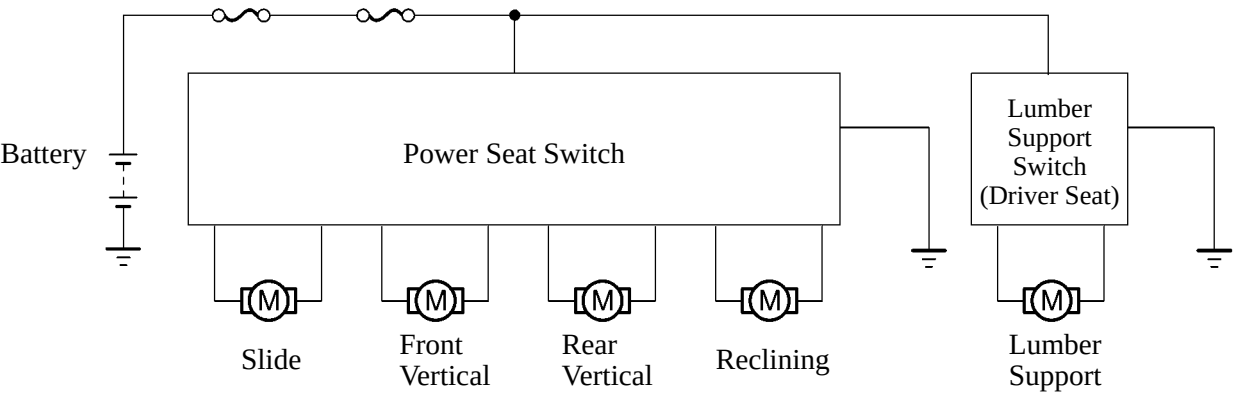
- The power seat has been adopted for driver and front passenger seats on all models as standard equipment.
- The following features are all for power functions.

Power Adjustment Function			Stroke
(1)	Fore-and-After Slide	mm (in.)	240 (9.45)
(2)	Reclining	degrees	48
(3)	Front Vertical	mm (in.)	22 (0.87)
(4)	Rear Vertical	mm (in.)	45 (1.77)
(5)	Lumber Support (Driver Seat)	mm (in.)	48 (1.89)



211BE40

► System Diagram ◀



211BE41

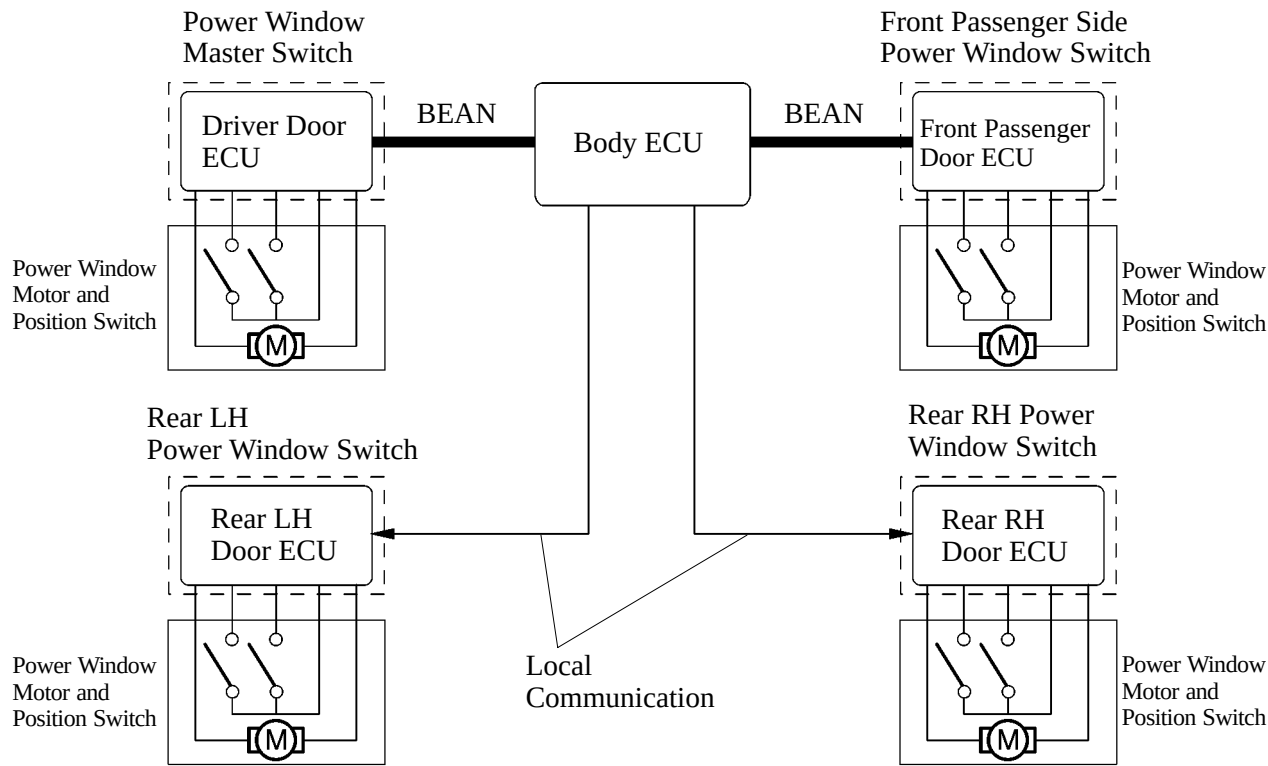
■ POWER WINDOW SYSTEM

1. General

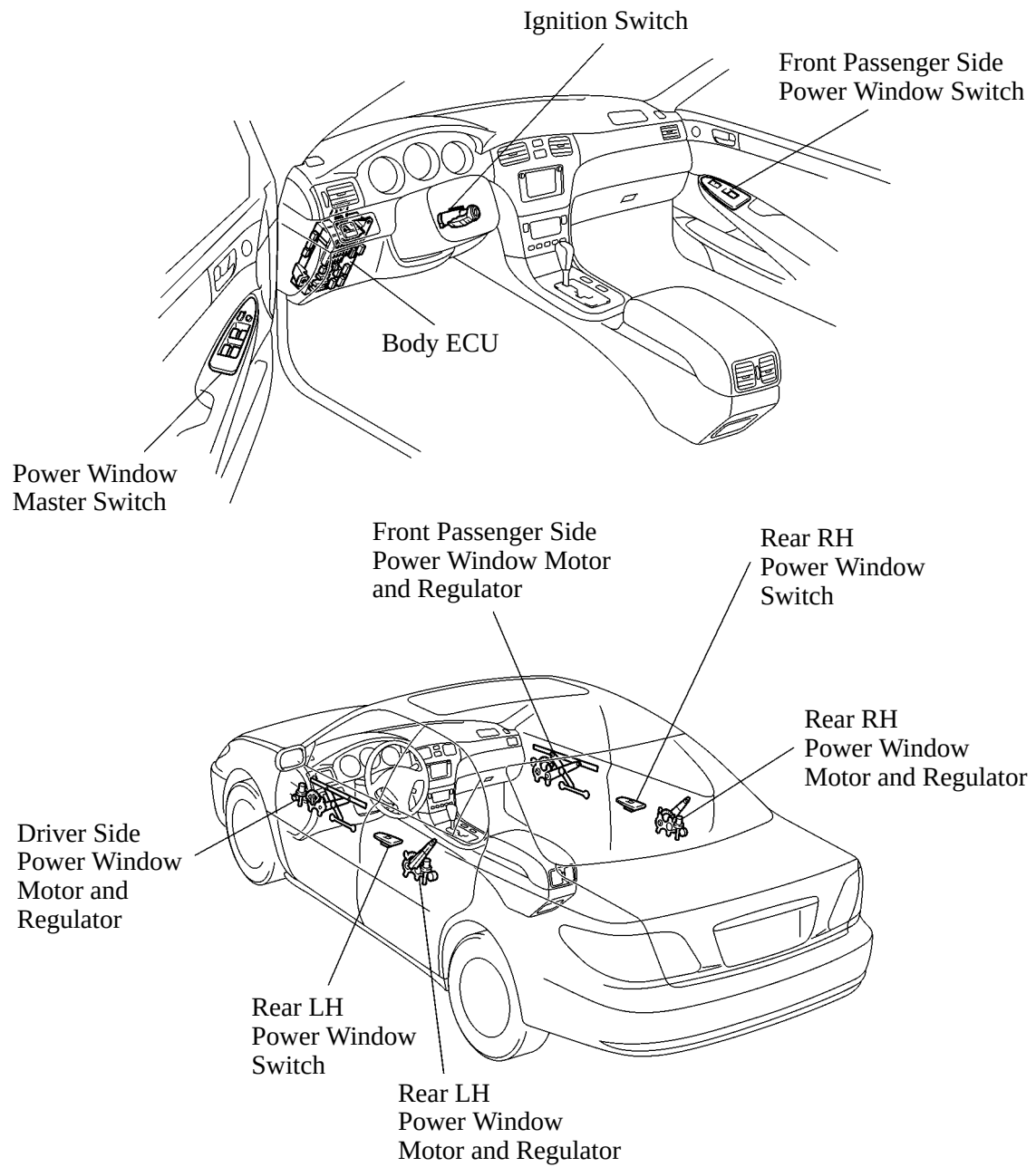
The power window system has the following functions:

Function	Outline
Manual up-and-down function	This function causes the window to open or close while the power window switch is being pulled halfway up or pushed halfway down. The window stops as soon as the switch is released.
All door one-touch auto up-and-down function	The all door one-touch auto up-and-down function enables the window of all door to be fully opened or closed at a touch of the power window switch.
Jam protection function	A jam protection function automatically stops the power window and moves it downward if a foreign object gets jammed in the window during one-touch auto-up operation.
Remote control function	The up-and-down operations of the front passenger door window and the rear door windows can be controlled by operating the power window master switch.
Key-off operation function	The driver's door key-off operation function makes it possible to operate the power window for approximately 43 seconds after the ignition switch is turned to the ACC or LOCK position, if the front doors are not opened.
Key-linked down function	A key-linked down function, which is linked to the driver door key cylinder operation, open the window of the all doors.
Transmitter-linked down function	When the body ECU receives an unlock signal from the transmitter continuously for longer than 2.5 seconds, the door ECUs control their power window motors in accordance with the signal to open the windows.

► System Diagram ◀

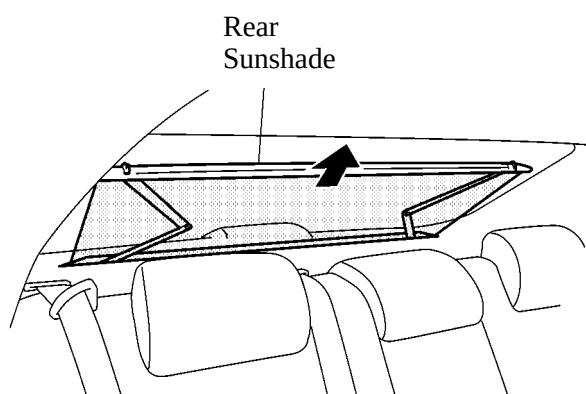


2. Layout of Main Component

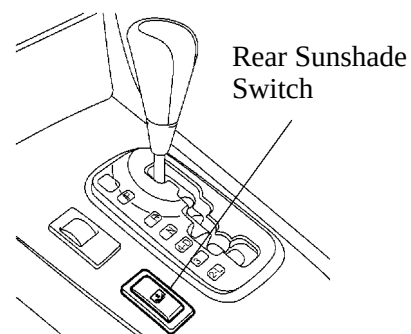


■ REAR SUNSHADE

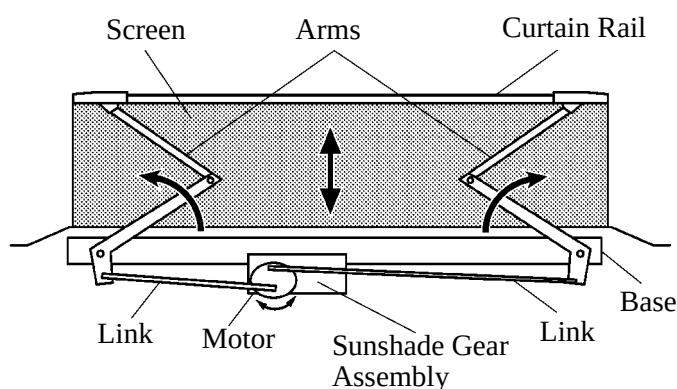
- An electrical type rear sunshade, which blocks the direct sunlight entering through the rear window in order to ensure the comfort of the rear seat passengers, has been adopted as an option.
This sunshade can easily be deployed or retracted by operating the rear sunshade switch located on the console upper panel. To prevent the rear view from being blocked by the deployed sunshade, this switch is provided with a reverse-linked auto-down function, which automatically lowers the screen when the shift lever is engaged in reverse.
- This system is controlled by the sunshade ECU, and receives the reverse position signal from the back-up light switch to control the reverse-linked auto-down function.



211BE48

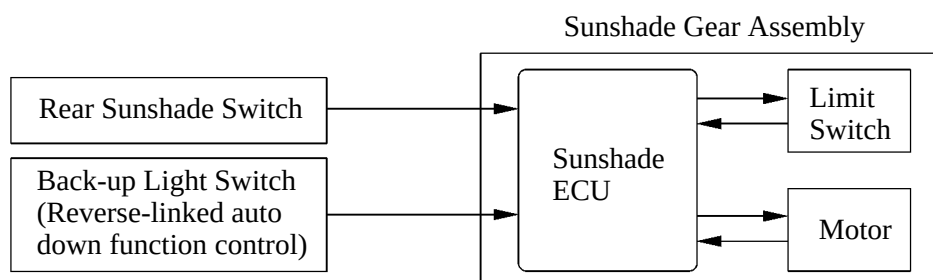


211BE49



177BE31

► System Diagram ◀

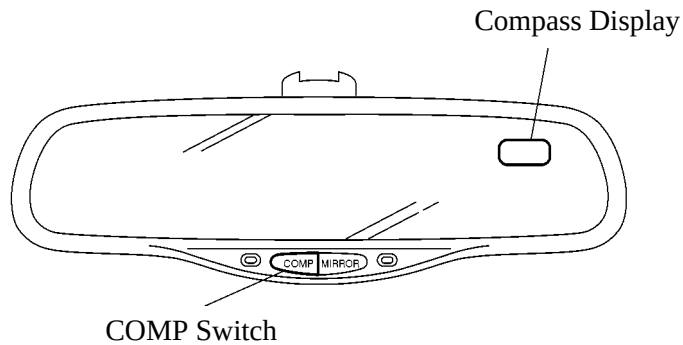


211BE51

INSIDE REAR VIEW MIRROR

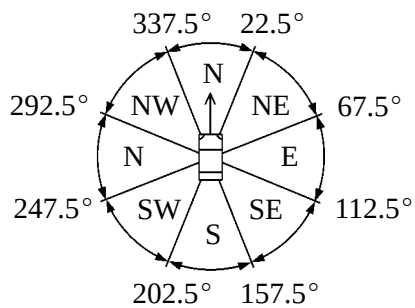
Compass Display

- Earth magnetism sensor has been built-in inside the mirror which has less influence on the magnetization of the vehicle. Thus, the accuracy has been improved.
- The compass indicates the North as 0° and the forward direction of the vehicle by 8 azimuths.
- By operating the “COMP” switch, whether or not to indicate the compass, establishment of the compass zone and calibration can be performed.



208BE47

► Compass Display ◀



186BE05

Display					
Calibration		C			
Azimuths		Display	Azimuths		Display
N	337.5° ~ 22.5°	N	S	157.5° ~ 202.5°	S
NE	22.5° ~ 67.5°	NE	SW	202.5° ~ 247.5°	SW
E	67.5° ~ 112.5°	E	W	247.5° ~ 292.5°	W
SE	112.5° ~ 157.5°	SE	NW	292.5° ~ 337.5°	NW

186BE06

Service Tip

As the compass system memorize the vehicle's marked magnetic field, it is necessary to do calibration for each vehicle. Once calibration has done, it is not necessary to do the calibration unless having a sudden magnetic field change. In case of occurrence of a sudden magnetic field change, “C” will be display in the compass display and it is necessary to do the calibration again.

For details, refer to 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).

■ OUTSIDE REAR VIEW MIRROR

- On the '02 ES300, “automatic glare-resistant EC (Electrochromic) mirror”, “electrical remote control type mirror”, “memory function”, and “rear window defogger-linked mirror heater” function have been used.
- The outside rear view mirror has following functions:

Function	Outline
Electrical Remote Control type Mirror	When the mirror control switch is operated, this function moves the mirror surface vertically or laterally to enable the driver to attain an optimal mirror angle. Setting the mirror master switch to the “R” position operates the right mirror, and to the “L” position operates the left mirror.
Rear Window Defogger-linked Mirror Heater	This function also automatically turns ON the mirror heater when the rear window defogger switch is turned ON. After 15 minutes have elapsed from the time this function has been activated, the rear window defogger turns OFF automatically, and the mirror heater also turns OFF.
Automatic Glare-resistant EC Mirror	This function prevents the glare of the headlights of the vehicle being driven behind that are reflected on the mirror from blinding the driver during nighttime driving. It works in unison with the inner mirror to reduce the amount of reflection. For details, refer to the Inside Rear View Mirror section.
Memory Function*	This function stores 2 mirror adjustment positions in the mirror memory ECU. Thus, the mirrors can be adjusted to the positions that are stored in the mirror memory ECU by pressing the memory switch. This function operates by linking with the driver seat position memorized in the memory seat ECU. For details, refer to the Memory System section.

*: Optional Equipment

■ MOON ROOF

- This system is optional equipment. The moon roof system has the following functions.

Function	Outline
One touch tilt up-and-down function	The “tilt one touch auto up-and-down” function enables the moon roof to be tilt up or down a touch of the tilt up switch or slide close switch.
One touch open-and-close function	The “one touch auto open-and-close” function enables the moon roof to be open or close a touch of the slide open switch or slide close switch.
Jam protection function	The “jam protection” function detects if a foreign object gets caught while the moon roof is closing (in the slide-close or tilt-down mode).

- On the '01 ES300, the moon roof position was detected by a limit switch. However, the '02 ES300 discontinued the limit switch and has adopted a new mechanism to detect the position by using a pulse sensor (Hall IC), in which the position is detected by counting the pulses output during the moon roof has traveled from specified initial position.

Service Tip

The moon roof ECU memorizes the initial position of the moon roof, therefore, the data will be lost when the battery terminal is removed, so that only manual operation is available. After connecting the battery terminal, move the moon roof once to the tilt-up full open state with a manual operation. With this, the moon roof ECU will memorize the initial position again.

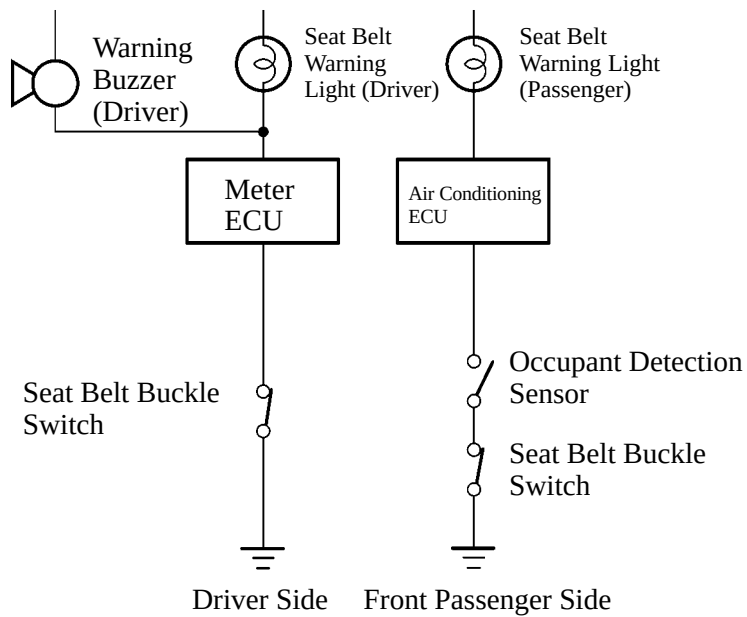
For details, refer to the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).

SEAT BELT WARNING SYSTEM

1. General

A seat belt warning system has been adopted. If the seat belt is not buckled, the warning light flashes and the buzzer sounds. When the ignition switch is turned ON, this system determines whether or not the seat belt is buckled by the ON or OFF condition of the switch that is provided in the seat belt buckle. The occupant detection sensor provided in the seat cushion of the front passenger seat determines whether or not an occupant is seated in the front passenger seat.

► System Diagram ◀

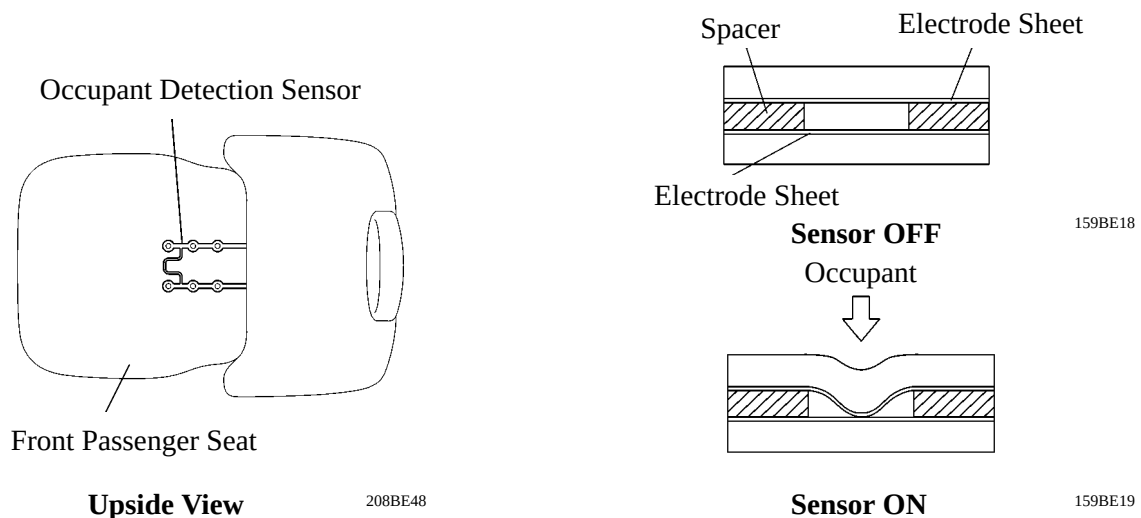


2. Occupant Detection Sensor

The occupant detection sensor, which is enclosed in the seat cushion of the front passenger seat, is used to detect whether or not the front passenger seat is occupied.

This sensor, which is shaped as illustrated below, consists of a construction in which two sheets of electrodes sandwich a spacer. When the occupant is seated, the electrode sheets come in contact with each other through the hole that is provided in the spacer portion, thus enabling the current to flow.

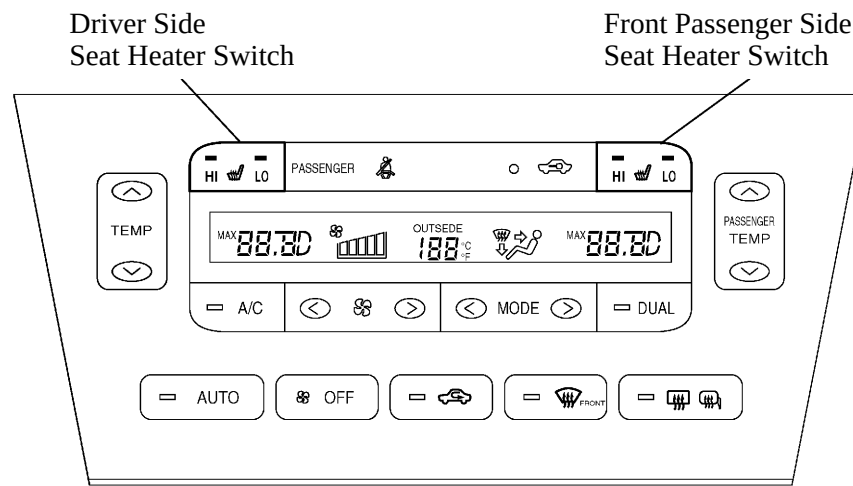
Thus, the sensor detects whether or not an occupant is seated in the front passenger seat.



SEAT HEATER

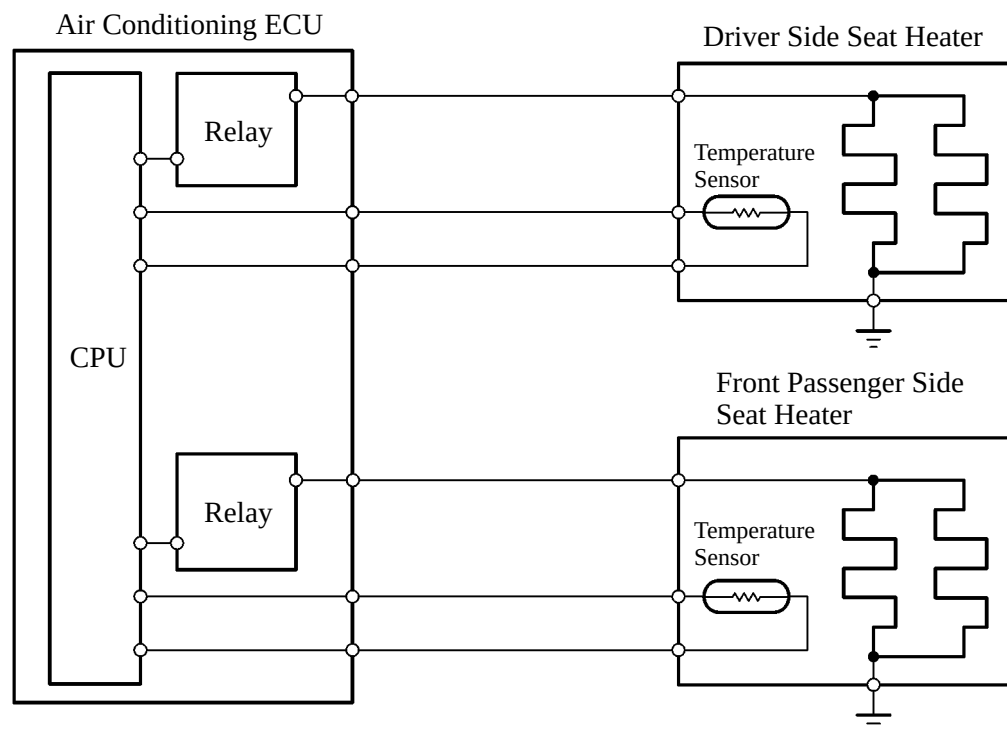
1. General

- The seat heater for front seats are provided as optional equipment.
- The HI, LO, and OFF settings of the seat heater can be switched by pressing the seat heater switch (for driver or front passenger). Based on the signals from the temperature sensor that is built into the seat heater, the air conditioning ECU turns the built-in seat heater relay ON/OFF in order to regulate the temperature that suits the set mode.
- A seat heater switch with a built-in indicator light for checking the heater operation (OFF, LO or HI) is provided.



211BE59

► System Diagram ◀

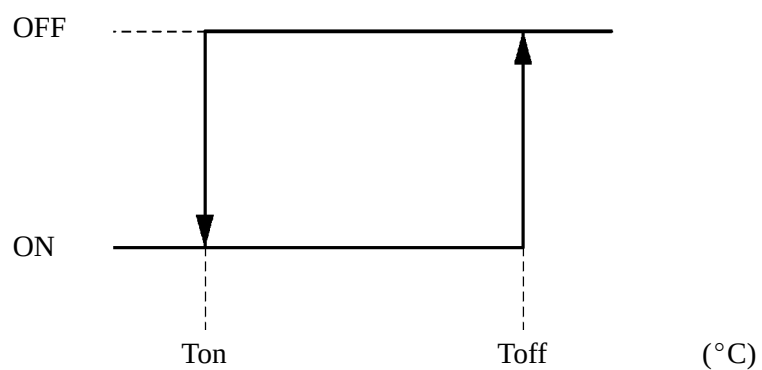


211BE60

2. Function

Based on the signals from the temperature sensor that is built into the seat heater, the air conditioning ECU turns the built-in seat heater relay ON/OFF in order to regulate the temperature to the standard temperature that is prescribed for each mode.

► Imaginary Temperature Control ◀



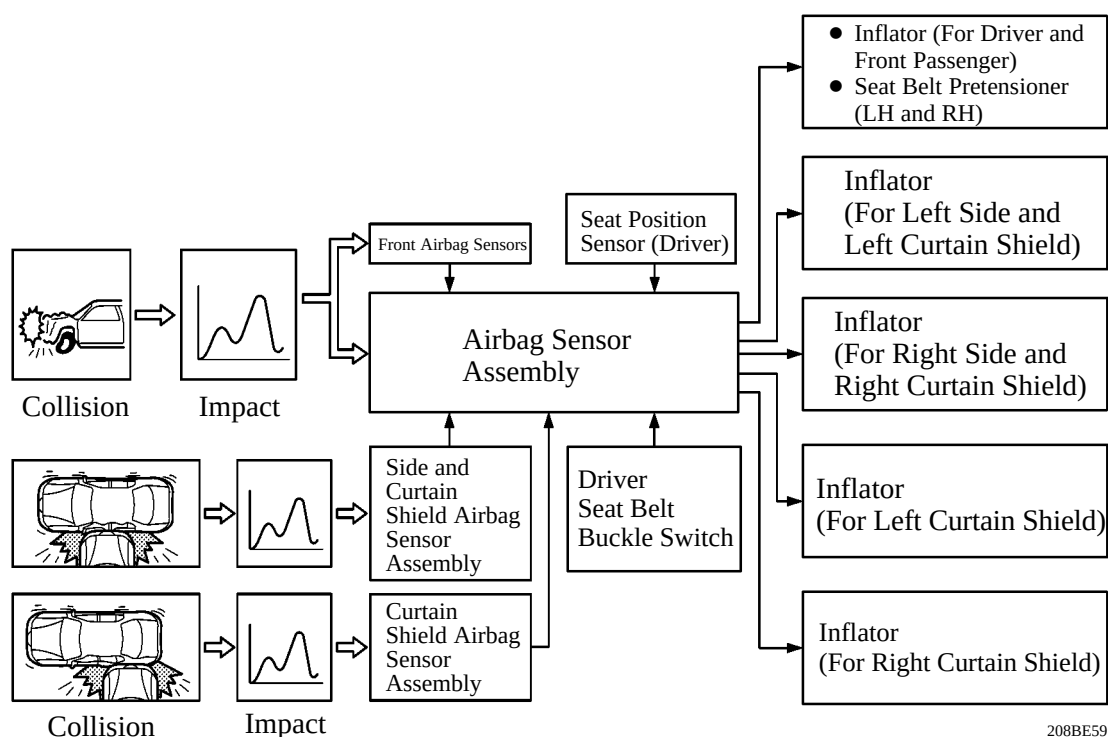
Ton, Toff = Lo Mode < Hi Mode

■ SRS AIRBAG SYSTEM

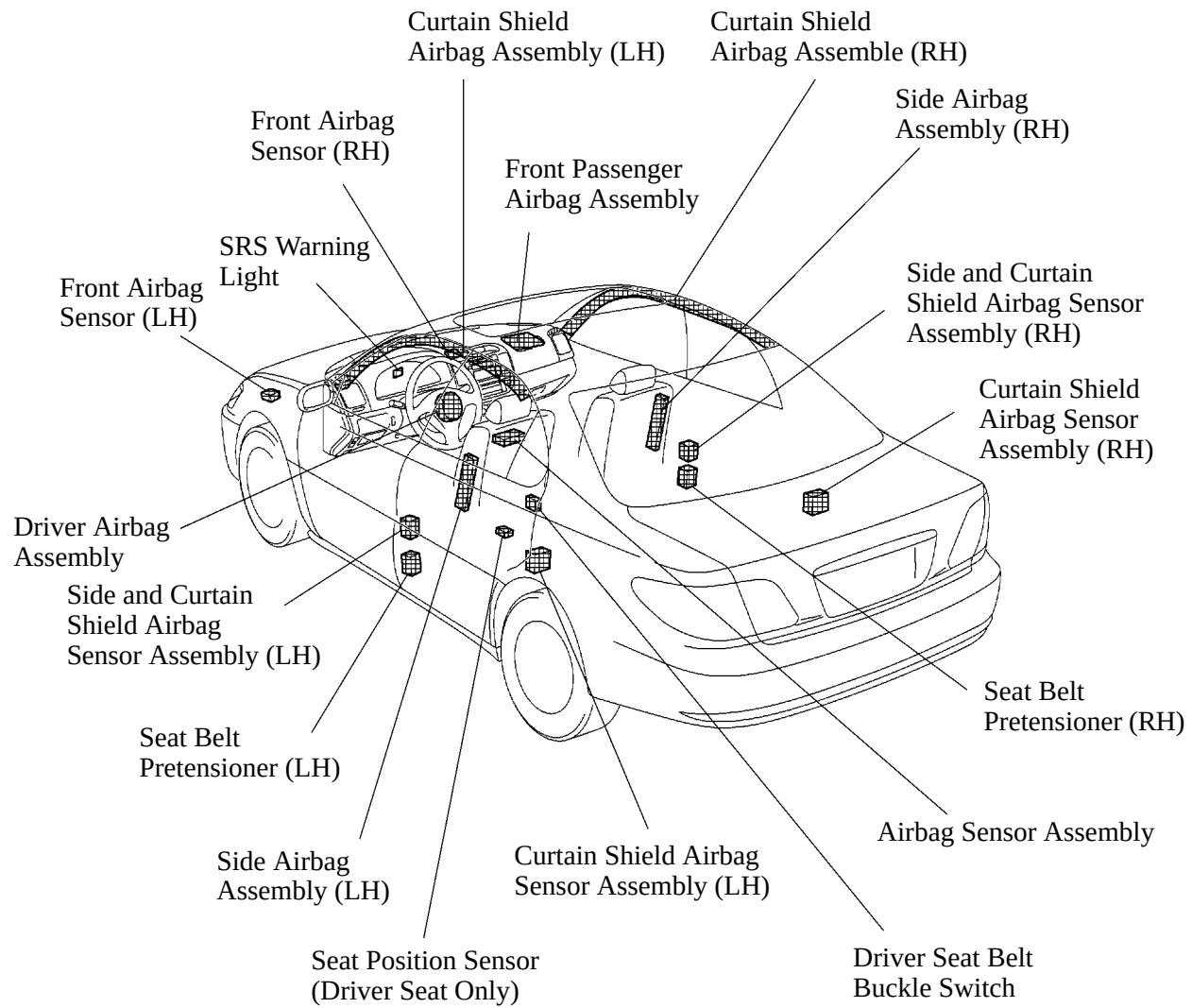
1. General

- The SRS (Supplemental Restraint System) airbag are provided for the driver and front passenger. The SRS airbags have been designed to help reducing the shocks to the heads and chests of the driver and front passenger in the event of a severe frontal impact collision as supplements to the seat belts.
This system is a 3-sensor type airbag system to detect the impact during a front collision using the airbag sensor assembly and front airbag sensors, and to make the airbag system and seat belt pretensioner operate as well.
- On the '02 ES300, the previous mechanical type front airbag sensor assembly (consisting of movable and stationary contact points) has been changed to an electrical (deceleration sensor) type front airbag sensor assembly.
- Dual-stage SRS airbags system, that controls the airbag inflating output optimum by judging the extent of impact, seat position and whether or not the seat belt is fasten, has been adopted for the driver and front passenger airbags.
- In accordance with the adoption of the dual-stage SRS airbags system, a seat position sensor has been established for the driver seat.
- On the '02 ES300, a curtain shield airbag system that helps reduce the impact applied to the front and rear seat occupants with a single curtain shield airbag has been adopted.
In conjunction with this system, a side and curtain shield airbag sensor assembly has been provided at the bottom of the center pillar and a curtain shield airbag sensor assembly at the bottom of the rear pillar.
- In this system, a front side collision is detected by the side and curtain shield airbag sensor assembly in order to simultaneously deploy the side and curtain shield airbags. A rear side collision is detected by the curtain shield airbag sensor assembly and the airbag sensor assembly in order to deploy only the curtain shield airbag.
- The function of the airbag sensor assembly to memorize the driver and front passenger's seat belt wearing condition while inflating the airbag is added.

► System Diagram ◀



2. Layout of Main Components



3. Dual-stage SRS Airbags System

General

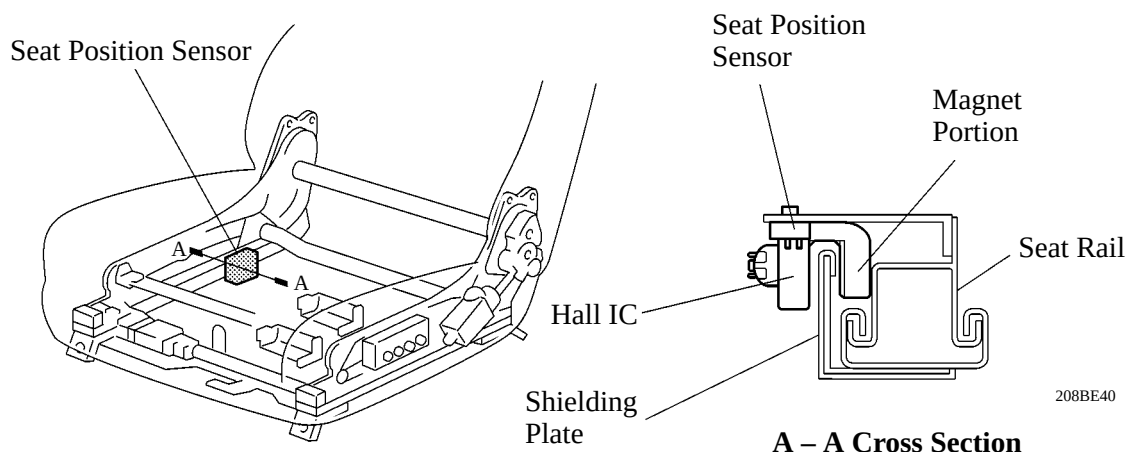
In this system, when the front airbag sensors and the airbag sensor assembly detect the front collision, the airbag sensor assembly judges the extent of impact, seat position and whether or not the seat belt is fasten, thus making the airbag inflating output optimum by delaying the inflating timing of the 2nd initiator and the 1st initiator.

Service Tip

In accordance with the structure change of the driver and front passenger inflators on '02 ES300, a SST (09082-00800) used for scrapping driver and front passenger airbag assemblies of the vehicle has been newly established.

Seat Position Sensor

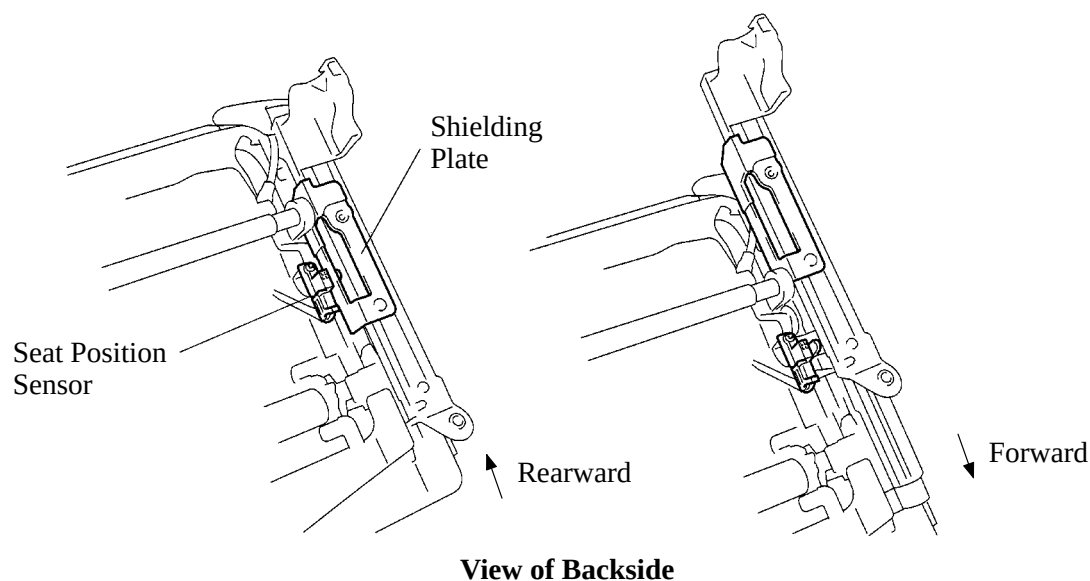
- The seat position sensor, which is attached to the seat rail of the driver seat, detects the sliding position of the seat. In addition, the shielding plate to make the seat position sensor judge the seat position is installed on this seat rail.
- The seat position sensor use a Hall IC for its sensor and has magnet portion on its opposite side.



- The seat position detection by the seat position sensor judges that the seat position is rearward if the shielding plate is between the sensor and the seat position is forward if the shielding plate is not between the sensor.

► Seat position is rearward ◄

► Seat position is forward ◄



4. Self-Diagnosis Function

- If the airbag sensor assembly detects a malfunction in the SRS airbag system, the airbag sensor assembly stores the malfunction data in memory, in addition to illuminating the SRS warning light. Then, the DTCs (Diagnostic Trouble Codes) can be accessed by connecting a hand-held tester to the DLC3 terminal or the SST (09843-18040) to the Tc and CG terminals of the DLC3 and reading the blinking of the SRS warning light. For further details, see the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).
- The following DTC is newly added.

DTC No.	Detection Item	DTC No.	Detection Item
B1180/17	Short in D squib (2nd step) circuit	B1149/37	Front airbag sensor (LH) malfunction
B1181/18	Open in D squib (2nd step) circuit	B1154/38	Curtain shield airbag sensor assembly (RH) malfunction
B1182/19	Short in D squib (2nd step) circuit (to ground)	B1155/39	Curtain shield airbag sensor assembly (LH) malfunction
B1183/22	Short in D squib (2nd step) circuit (to B+)	B1187/55	Short in P squib (2nd step) circuit (to ground)
B1153/25	Seat position sensor assembly malfunction	B1188/56	Short in P squib (2nd step) circuit (to B+)
B0126/27	Seat belt buckle switch (LH) malfunction	B1185/57	Short in P squib (2nd step) circuit
B0127/27	Seat belt buckle switch (LH) malfunction	B1186/58	Open in P squib (2nd step) circuit
B1148/36	Front airbag sensor (RH) malfunction	—	

■ SYSTEM OPERATION

1. General

The ECUs that pertain to the body electrical system perform the functions and system controls described in the following chart.

ECU	Function	
Body ECU	Interior Light	Illuminated entry system control
	Exterior Light	Light auto turn-off system control (with Delay control)
		Daytime running light system control
		Automatic light control system
	Warning Control	Key reminder warning
		Door ajar warning
	Door Lock Control	Door lock control switch manual operation
		Key-linked lock and unlock function
		Manual unlock prohibition function
		2-step unlock function
		Key confine prevention function
		Shift-linked automatic door lock and unlock
		Speed sensitive automatic door lock
		Ignition switch-linked automatic door unlock
		Collision door lock release
	Wireless Door Lock Remote Control System	Door lock and unlock operation
		Answer back operation
		Panic alarm operation
		Luggage door open operation
	Theft Deterrent System	Door lock operation
		Warning operation (Interior light, Hazard light, Headlight, Taillight, Vehicle Horn)
	Rear Power Window Control	Control signal conversion function (Converts control signal from power window master switch and outputs it to rear RH door ECU or rear LH door ECU.)
	Moon Roof Control	Key-linked open operation
		Transmitter-linked open operation
	Customize	Customized body electronics system control
	Diagnosis	Self diagnosis
Driver Door ECU	Power Window Control	Power window system control (Driver's door)
	Customize	Customized body electronics system control
Front Passenger Door ECU	Power Window Control	Power window system control (Front passenger's door)
	Customize	Customized body electronics system control

(Continued)

ECU	Function	
Rear RH Door ECU and Rear LH Door ECU	Power Window Control	Power window system control (Rear passenger's door)
Theft Deterrent ECU	Theft Deterrent System	Warning operation (Security Horn)
	Customize	Customized body electronics system control

2. Customized Body Electronics System

General

The customized body electronics system enables the control function settings of the ECUs to be changed through the use of a hand-held tester.

However, this system can only change the settings of the ECUs that are connected to the BEAN.

Operation

The specifications of the systems and functions that can be changed by operating a hand-held tester are listed below.

ECU	System	Content	Initial Setting	Selection
Body ECU	Wireless Door Lock Remote Control System	Answer back buzzer volume	50%	50/75/84/89/93% /Non-operation
		Answer back operation	ON	ON/OFF
		Wireless-linked power window open operation	ON	ON/OFF
		Door ajar warning operation	ON	ON/OFF
		Automatic lock operation	30 sec.	60/30 sec.
		Trunk lid open operation	0.8 sec. Pressed Continuously	Pressed Once /0.8 sec. Continuously /Pressed Twice /Non-operation
		All door's unlock operation (Button operation twice)	ON	ON/OFF
		Panic alarm operation	ON	ON/OFF
	Door Lock Control System	Speed sensitive automatic door lock operation	OFF	ON/OFF
		All door's unlock operation (Door key operation twice)	ON	ON/OFF
		Shift-linked automatic Door unlock operation	OFF	ON/OFF
		Shift-linked automatic Door lock operation	ON	ON/OFF
		Ignition switch-linked automatic door unlock	OFF	ON/OFF
	Reminder System	Key reminder warning function	ON	ON/OFF
	Illuminated Entry System	Light illumination time	15 sec.	7.5/15/30 sec.
		Front foot light illumination operation	ON	ON/OFF
		Front foot light dimmer control	ON	ON/OFF

(Continued)

ECU	System	Content	Initial Setting	Selection
Body ECU	Illuminated Entry System	Light control of the front interior light by turning the ACC off	OFF	ON/OFF
		Brightness of front foot light under dimmer control	3%	0 – 100%
	Automatic Light Control System	Delay time	Standard	Standard /Long
		Sensitive adjustment	0	–40/–20/0/20/40%
		Light off delay adjustment	30 sec.	0/30/60/90 sec.
	Daytime Running Light System	Daytime running light system control	ON	ON/OFF
Driver, Front Passenger Door ECU	Power Window System	Key-linked open operation	ON	ON/OFF
Theft Deterrent ECU	Theft Deterrent System	Passive mode	OFF	ON/OFF

THEFT DETERRENT SYSTEM

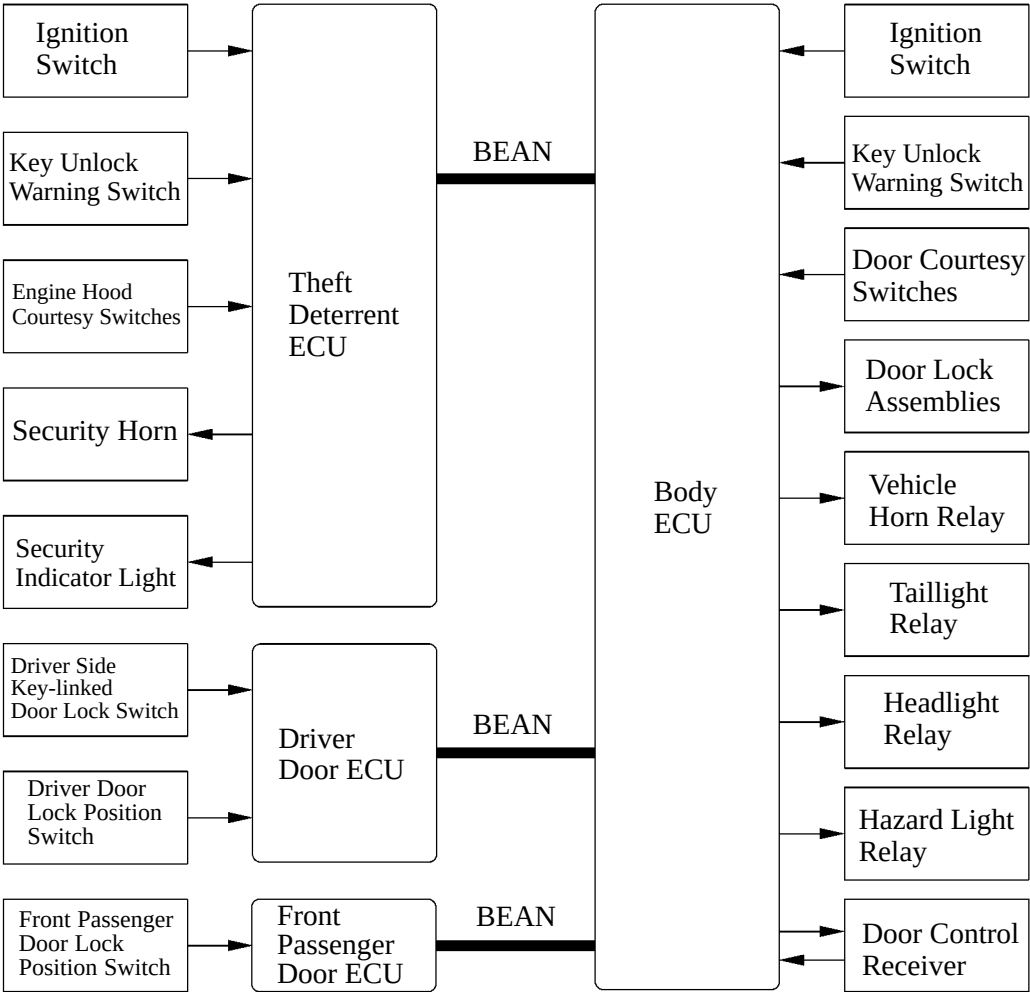
1. General

- This system has been provided on the all models as standard equipment.
- The theft deterrent system use the door lock control system and wireless door lock remote control system parts. The theft deterrent system will operate when somebody attempts to forcibly enter the vehicle, open the engine hood, or when the battery terminals are removed and reconnected.
- The control of this system is effected by the theft deterrent ECU, which maintains communication via the body ECU and BEAN (Body Electronics Area Network).
- The warning specifications of this system are listed below.

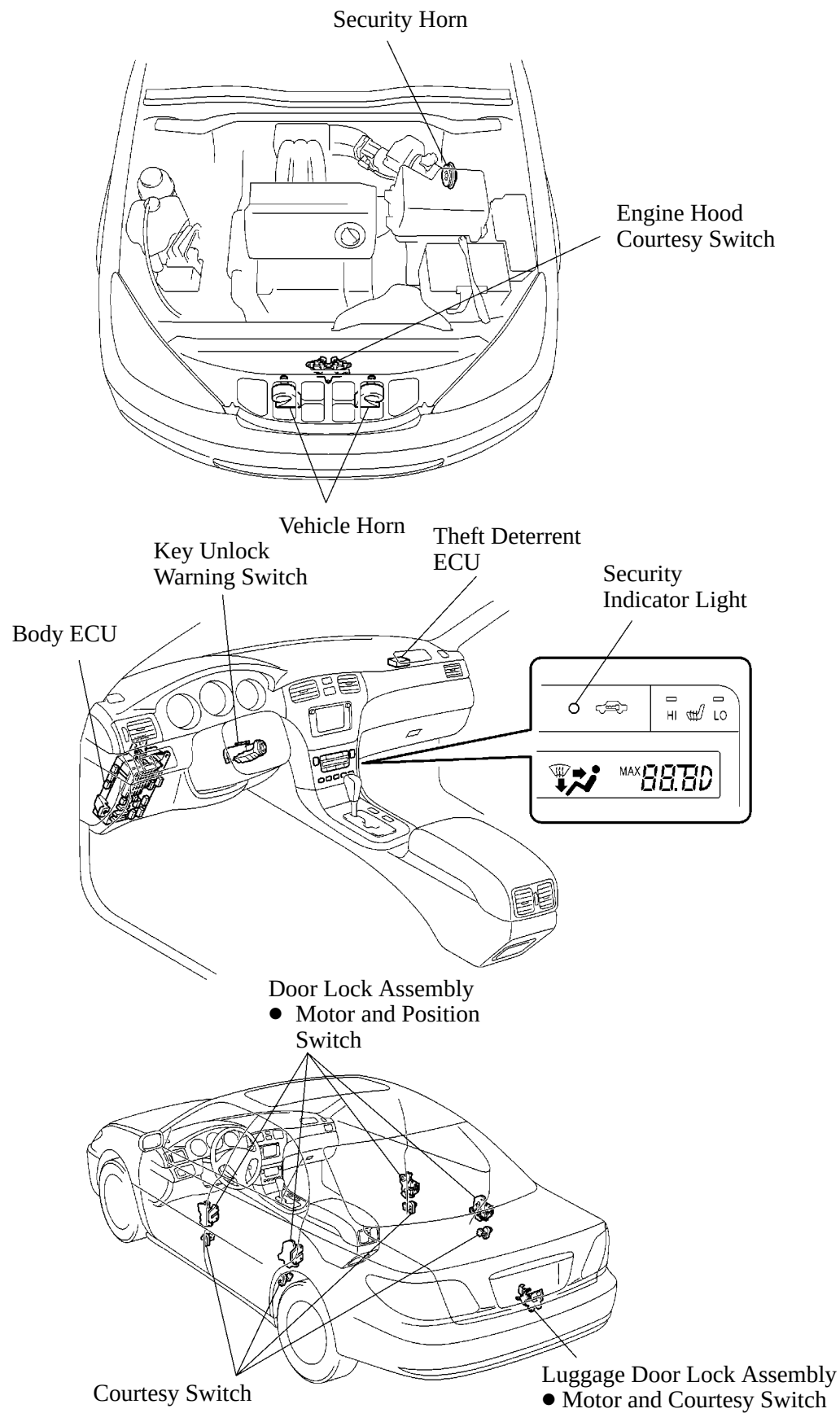
Warning Specifications ◀

Warning Method	Interior Light	Illuminates
	Hazard Light	Flashing
	Headlights and Taillights	Flashing
	Vehicle Horn	Sounds a warning at approx. 0.4 second cycles
	Security Horn	Sounds a warning at approx. 0.4 second cycles
	Door Lock Motor	Locking
Warning Time		60 sec.

System Diagram ◀



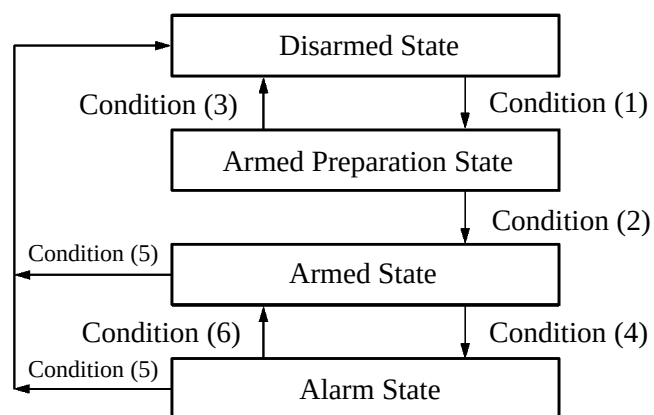
2. Layout of Main Component



3. System Operation

Basic Operation

This system activates as described in the diagram below when one of items place in the respective state.



187BE40

Condition	Item
Condition (1)	- There is no ignition key in the ignition key cylinder. - When the doors, engine food, and luggage door are all closed, the transmitter is used to lock all doors. - When the doors, engine food, and luggage door are all closed, the key is use to lock all doors.
Condition (2)	When the doors, engine hood, and luggage door are all closed and locked, and 30 seconds have elapsed.
Condition (3)	- When one of the doors, engine hood, or luggage door is changed from “close” to “open”. - When one of the doors, engine hood, or luggage door is changed from “lock” to “unlock”. - When the ignition key is inserted in the ignition key cylinder. - When a terminal is disconnected from the battery and reconnected.
Condition (4)	- Any door, engine hood, or luggage door is opened. - Any door is unlocked with something other than the ignition key or transmitter. - The engine hood is opened. - A terminal is disconnected from the battery and reconnected. - The wiring harness is directly connected as if the turn the ignition switch ON.
Condition (5)	- The transmitter is used to unlock the doors. - The key is inserted in the ignition key cylinder and the ignition switch is turned ON. - When the key is available, and the engine immobiliser is canceled by turning the ignition switch ON.

Forced Door Lock Operation

When the system starts the alarm state, and one of the doors is subsequently unlocked, the forced door lock operation forcefully outputs a door lock signal to prevent intrusion into the vehicle. This operation becomes activated when all the starting conditions listed below have been met, and stops when one of the stopping conditions occurs.

Condition	Item
Starting Condition	The theft deterrent system is in the alarm state.
	There is no key inserted in the ignition key cylinder.
	If one of the doors is unlocked.
Stopping Condition	All doors are locked.
	The warning ends.
	The key is inserted in the ignition key cylinder.

Alarm Memory Operation

When the driver returns to the vehicle and cancels the theft deterrent system, this function illuminates the taillights for 2 seconds to inform the driver that the theft deterrent system had been tripped and was in the alarm state.

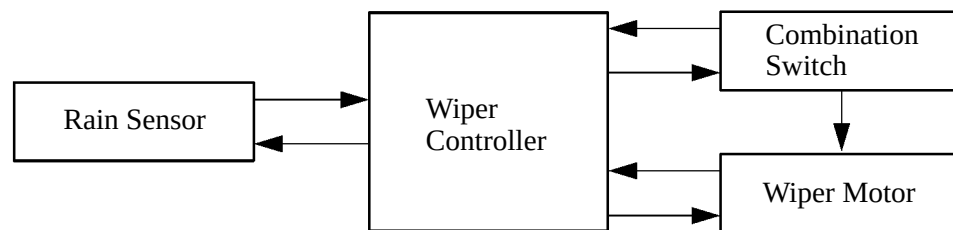
WIPER SYSTEM

■ RAINDROP SENSING FUNCTION

1. General

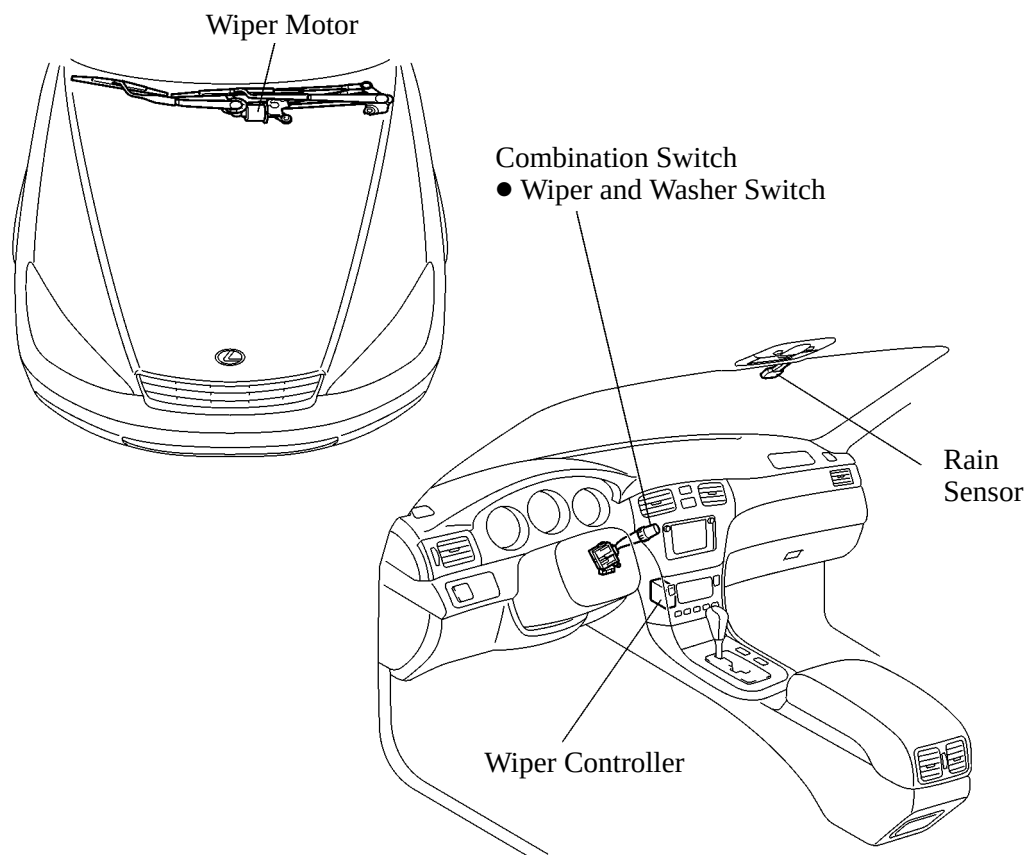
When the wiper switch is in the AUTO position, this function uses a rain sensor that is mounted on the front windshield glass to detect the amount of raindrops, and controls an optimal wiping timing accordingly.

► System Diagram ◀



209BE03

2. Layout of Main Component



211BE17

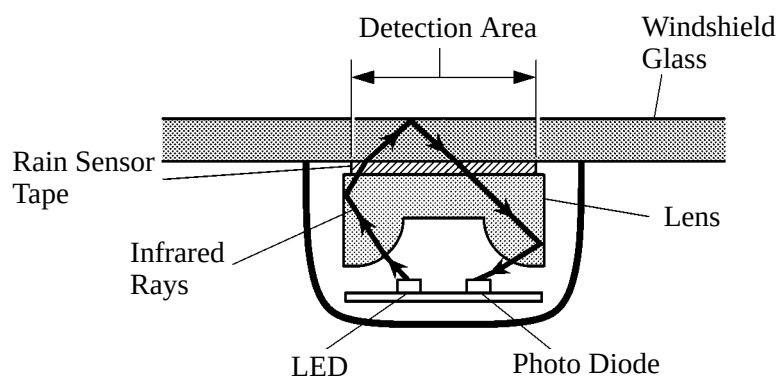
3. Construction and Operation

Rain Sensor

The rain sensor consists mainly of an LED (Light Emitting Diode) that emits infrared rays, and a photo diode that receives those rays. The detection method is based on the infrared rays that are reflected by the front windshield glass.

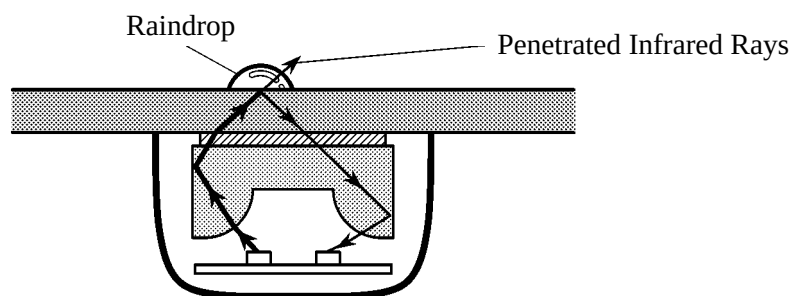
For example, if no raindrops are present in the detection area, the infrared rays emitted by the LED are all reflected from the windshield glass and are received by the photo diode. If raindrops are present in the detection area, a portion of the emitted infrared rays penetrates with the change of index of reflection outward of the windshield glass via the raindrops, thus reducing the amount of infrared rays that are received by the photo diode. The amount of this reduction is then used to detect the amount of raindrops.

Thus, this function controls the INT, LO, and HI operations in order to operate the wipers at an optimal wiping timing.



209BE05

If no raindrops are present



209BE06

If raindrops are present

Service Tip

If the rain sensor tape has been peeled during a windshield glass replacement, make sure to affix a new rain sensor tape. Failure to do so will lead to a system malfunction.

■ WIRELESS DOOR LOCK REMOTE CONTROL SYSTEM

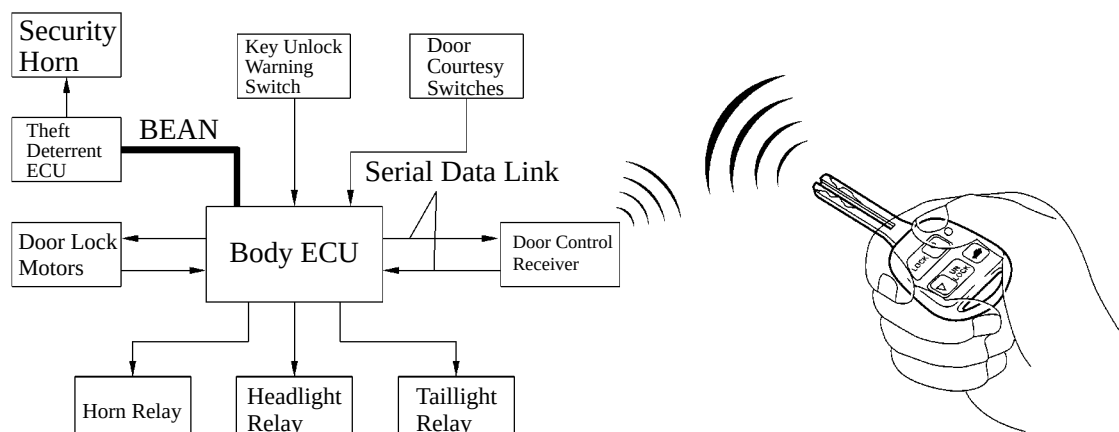
1. General

The wireless door lock remote control system has been adopted as standard equipment.

This system is a convenient system for locking and unlocking all the doors, at a distance. This system in the '02 ES300 has the following features:

- In this system, the wireless door control receiver performs the code identification process and the body ECU effects the door lock control. Serial data link is provided for communication between the wireless door control receiver and the body ECU.
- Key-integrated, three-button type transmitter has been adopted.
- A rolling code system, in which the signal configuration changes each time when a signal is transmitted by the transmitter, has been adopted.

► System Diagram ◀

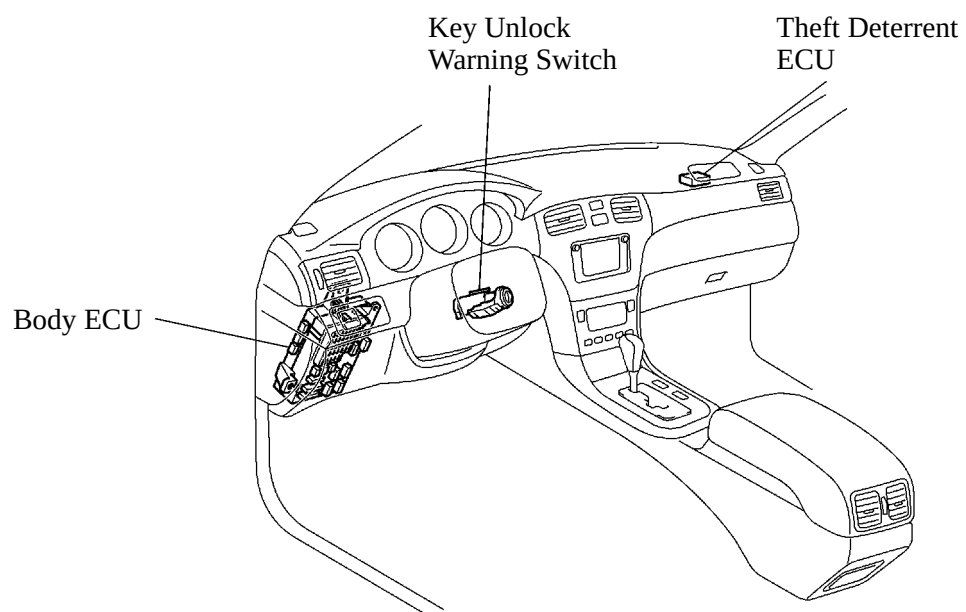


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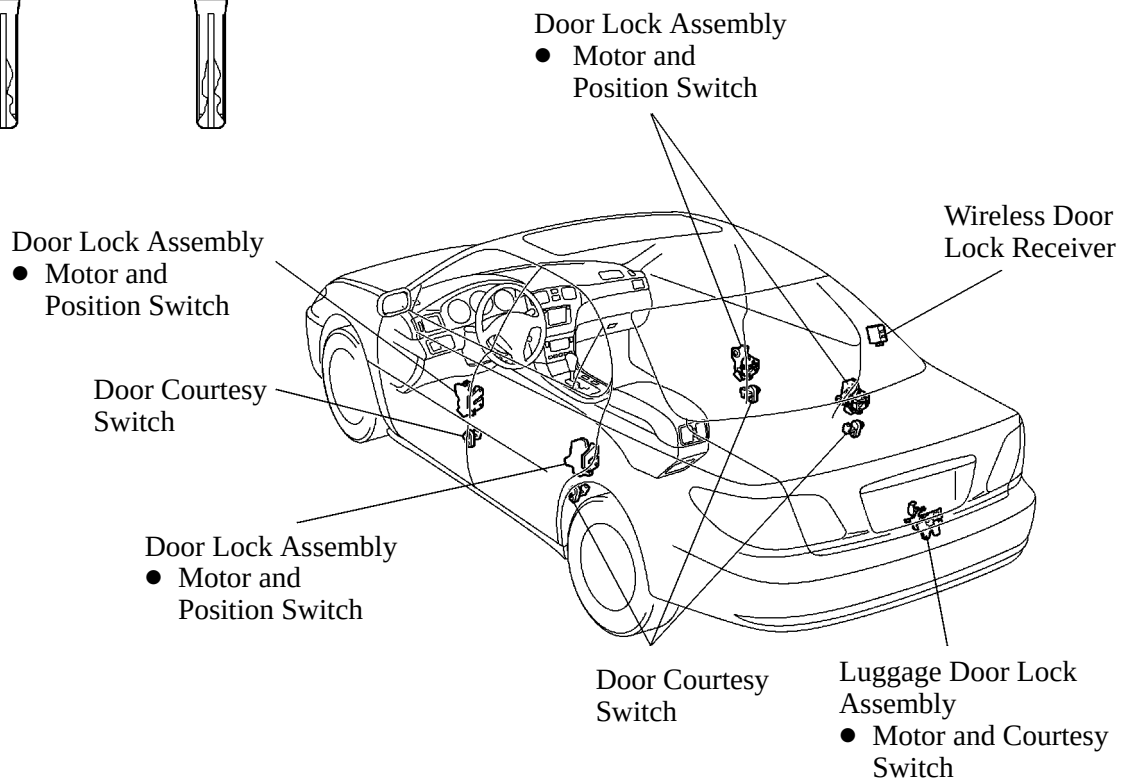
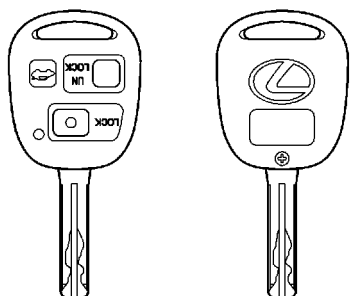
Service Tip

In case of making new ignition key due to the loss of it, it is necessary to register recognition code. Refer to see the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U).

2. Layout of Component



Transmitter



3. Function

General

The wireless door lock remote control system in the '02 ES300 has the following functions.

Function	Outline
All Doors Lock Operation	Pressing the door lock switch of the transmitter locks all doors.
All Doors Unlock (2-step Unlock) Operation	Pressing the door unlock switch twice within 3 seconds opens all doors after opening the driver's door.
Luggage Door Open Operation	Keeping the luggage door opener switch of the transmitter pressed longer than about 1 second opens the luggage door.
Power Window Open Operation	● Keeping the "door unlock" switch of the transmitter pressed longer than 2.5 seconds opens all the doors and the moon roof. ● With this function, the buzzer sounds when control is started.
Answer Back Operation	When the transmitter is used for locking or unlocking the doors, for opening the luggage door, or a power window is operated, this function momentarily sounds the buzzer to inform the user that the operation has been completed.
	When the transmitter is used for locking the doors, this function flashes the hazard lights to inform the user that the operation has been completed.
Panic Alarm Operation	Keeping the PANIC switch of the transmitter pressed longer than about 2 ~ 3 seconds activates the alarm of the theft deterrent system (to sound the horn, flash the headlights, taillights, and hazard lights).
Automatic Lock Function	If none of the doors are opened within 30 seconds after they are unlocked by the wireless door lock remote control, all the doors are locked again automatically.
Repeat Function	If a door is not locked in response to the locking operation of the transmitter, the body ECU will output a lock signal after the 1 second.
Illuminated Entry Function	When all the doors are locked, pressing the door unlock switch causes the interior lights to illuminate simultaneously with the unlock operation.
Security Function	Sends an operation signal as a rolling code.
Door Ajar warning Function	If any door is open or ajar, pressing the "door lock" switch of the transmitter will cause the wireless door lock buzzer to sound for about 10 seconds.
Transmitter Recognition Code Registration Function	Enables the registering (writing and storing) of 4 types of transmitter recognition codes in the EEPROM that is contained in the body ECU.
Self-Diagnosis	If there is a malfunction in the system, the body ECU stores the DTCs (Diagnostic Trouble Codes) in its memory.

Transmitter Recognition Code Registration Function

The table below shows the 4 special coded ID registration function modes through which up to 4 different codes can be registered. The codes are electronically registered (written to and stored) in the EEPROM. For details of the recognition code registration procedure, refer to the 2002 LEXUS ES300 Repair Manual (Pub. No. RM911U) to register the codes correctly.

Mode	Function
Rewrite Mode	Erases all previously registered codes and registers only the newly received codes. This mode is used whenever a transmitter or the Body ECU is replaced.
Add Mode	Adds a newly received code while preserving any previously registered codes. This mode is used when adding a new transmitter. If the number of codes exceeds 4, the oldest registered code is erased first.
Confirm Mode	Confirms how many codes are currently registered. When adding a new code, this mode is used to check how many codes already exist.
Prohibit Mode	To delete all the registered codes and to prohibit the wireless door lock function. This mode is used when the transmitter is lost.