

■ SYSTEM CONTROL

1. General

- The controls are basically the same as on the GS430/300, except for the addition of the controls listed below.
  - a) Retractable hardtop open A/C control
  - b) Automatic recirculation control
- This system has the following controls:

Control	Outline
Required Outlet Air Temp. Calculation	Calculates the required outlet air temperatures for the driver side and front passenger side based primarily on the inputs of the temperature control switches signals (driver and front passenger sides), room temperature signal, ambient temperature signal and solar sensor signal.
Retractable Hardtop Open A/C Control	Actuates the foot servomotor when the retractable hardtop is open in order to blow air out of the lap-jet.
	Automatically corrects the blower airflow volume in accordance with the vehicle speed when the retractable hardtop is open.
	Varies the solar correction volume in accordance with the ambient temperature when the retractable hardtop is open.
	Automatically cancels the room temperature signals and effects automatic air conditioner control when the retractable hardtop is open.
Outlet Air Temp. Control	Determines the outlet air temperature by adding an evaporator temperature signal correction to the required outlet air temperature, and actuates the air mix servomotor.
Blower Control	Controls the airflow volume in multiple steps in accordance with the amount of sunlight.
	Stops the blower fan until the water temperature increases to a prescribed temperature when the air outlet is in the FOOT or BI-LEVEL mode and the engine coolant temperature is low.
	Stops the blower fan for approximately 4 seconds, turns the compressor ON to cool the air conditioner unit, then raises the blower fan speed in steps to attain the target airflow volume, when the air outlet is in the FACE or BI-LEVEL mode and the evaporator temperature is high (30°C minimum).
	Increases the blower’s minimum flow volume if a strong sunlight is indicated by the solar sensor signal, and decreases the blower’s minimum flow volume if a weak sunlight is indicated, when the air outlet is in the FACE or BI-LEVEL mode.
Air Outlet Control	Actuates the mode servomotor in accordance with the mode ratio that is calculated from the required outlet air temperature and automatically switches the air outlet modes (FACE, BI-LEVEL, or FOOT).
Air Inlet Control	Actuates the air inlet servomotor in accordance with the driver side required outlet air temperature to automatically switch between the RECIRC and FRESH air inlet modes.

: Controls added since the GS430/300

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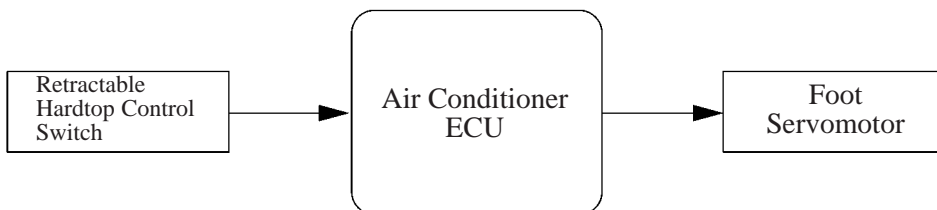
Control	Outline
Compressor Control	Determines that the compressor has locked if the slippage rate of the drive belt exceeds 80% for 3 seconds or more while the magnetic clutch is ON, turns OFF the magnetic clutch, and blinks the indicator light of the air conditioning control switch. (This control is not effected when the engine speed is below 450 rpm.)
	Detects the refrigerant pressure in accordance with the signals from the air conditioner pressure switch, and turns OFF the magnetic clutch if there is a malfunction.
	Turns the magnetic clutch OFF and prevents the evaporator from frosting when the evaporator temperature is below $-4^{\circ}\text{C}$ ( $25^{\circ}\text{F}$ ).
	Turns the magnetic clutch ON/OFF in accordance with the ambient temperature, when the air inlet is in the FRESH mode.
	Automatically turns ON the magnetic clutch when the user sets the air outlet to the DEF mode.
OuterTemperature Indication Control	Based on the signals from the ambient temperature sensor, this control calculates the outside temperature, which is then corrected in the air conditioner ECU, and shown in the air conditioner control panel.
Rear Window Defogger Control	Switches the rear defogger and outside rear view mirror heaters on for 15 min. when the rear defogger switch is switched ON. Switches them off if the switch is pressed while they are operating.
Automatic Recirculation Control	The air conditioner ECU automatically controls the air inlets based on the signals from the smog ventilation sensor.
Self-diagnosis (Panel Diagnosis)	Checks the sensors in accordance with operation of the air conditioner switches, then the LCD on the air conditioner control panel display 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 conditioner switches (actuator check function).

**2. Retractable Hardtop Open Air Conditioner Control**

**Lap-Jet Selector Control**

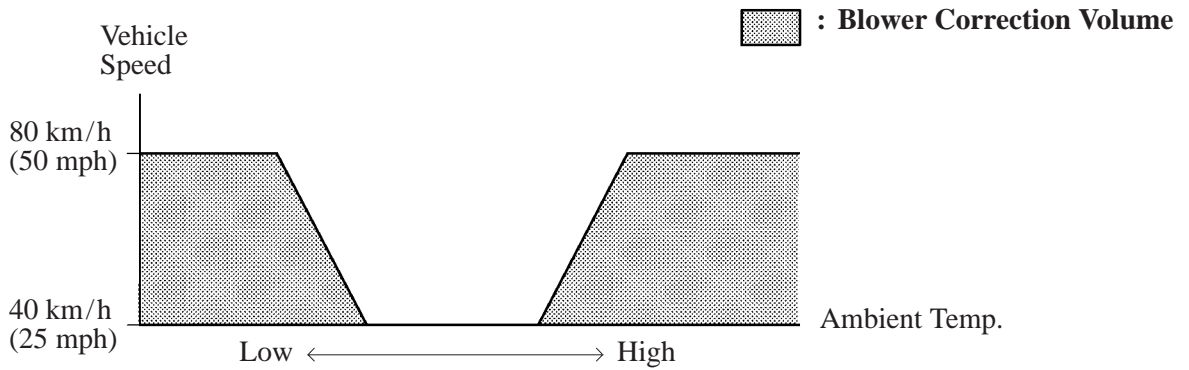
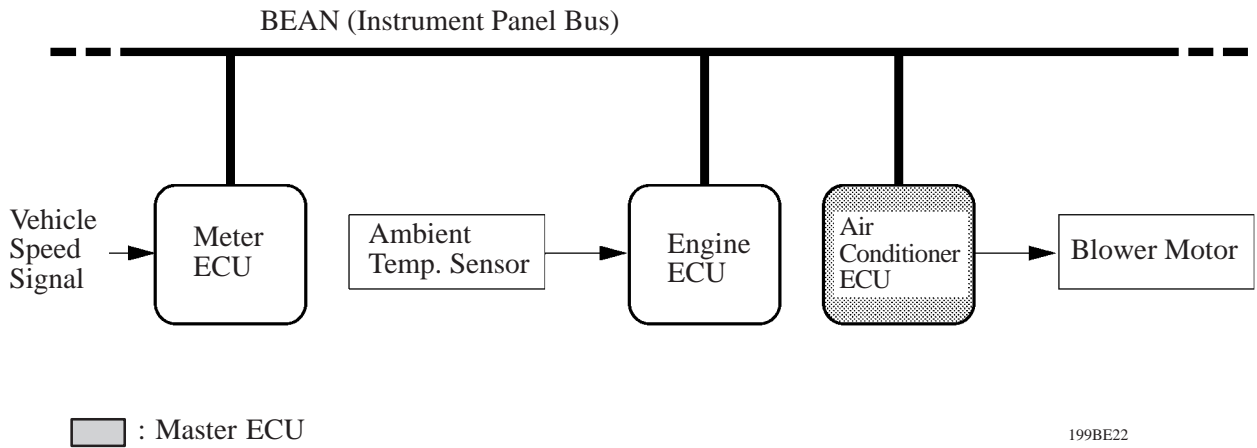
When the retractable hardtop is open and the air outlet is in the FOOT’ BI-LEVEL or FOOT/DEF mode, the air conditioner ECU actuates the foot servomotor and divides the airflow that is normally discharged through the foot outlet to blow out also through the lap-jet. This has improved the comfort level of the lower half of the occupants’ body when the ambient temperature is low.

**► System Diagram ◀**



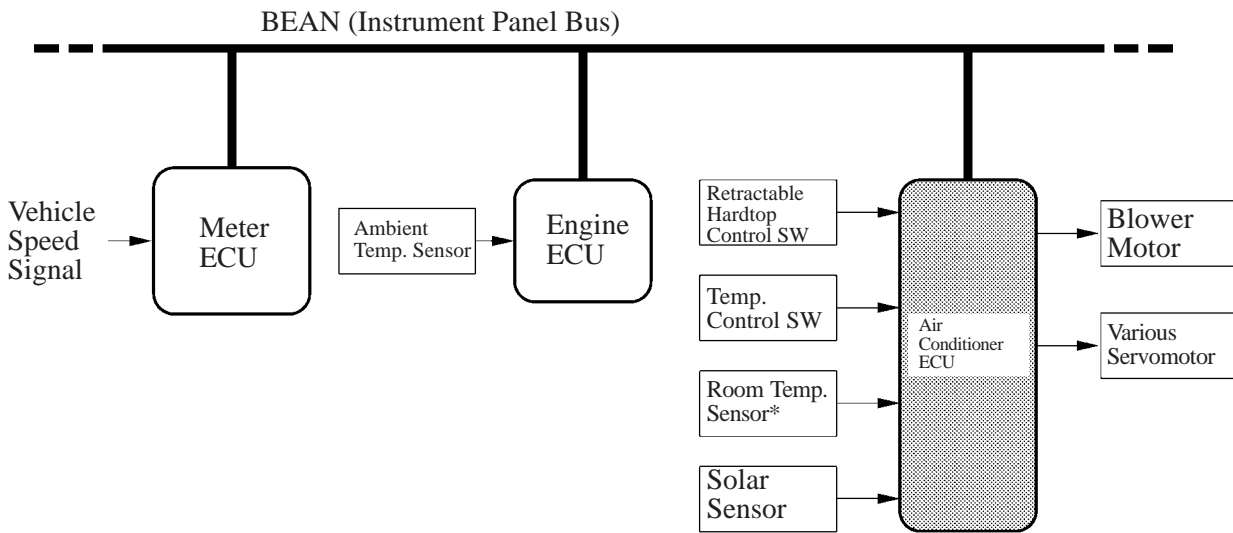
**Blower Level Correction Control**

When the ambient temperature is low or high and the retractable hardtop is open, this control automatically corrects the blower level in accordance with the vehicle speed, in addition to effecting normal blower control. Control is effected within the range of 40 to 80 km/h (25 to 50 mph). This reduces the level of discomfort caused by the air that blows in from the rear of the vehicle during high-speed driving.



### Solar Correction Control

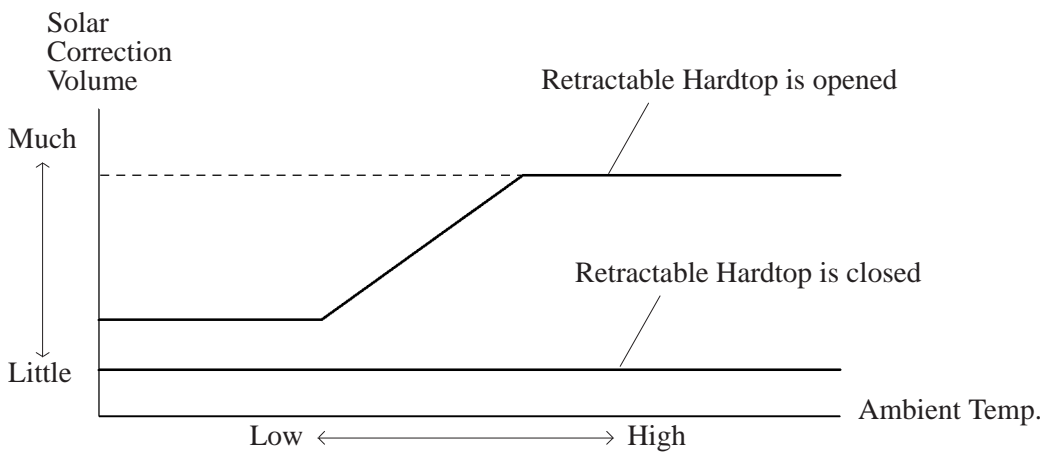
- Due to the sunlight, it feels warmer when the retractable hardtop is open than when it is closed. Therefore, in addition to the normal solar correction, the amount of solar correction is changed in accordance with the ambient temperature when the retractable hardtop is open.
- The room temperature is affected by the vehicle speed when the retractable hardtop is open. Therefore, the room temperature signal is canceled and the automatic air conditioner control is effected only through the use of the ambient temperature signal, solar signal, and temperature control switches signals (driver and front passenger sides).



\*: This signal is canceled when the retractable hardtop open.

■ : Master ECU

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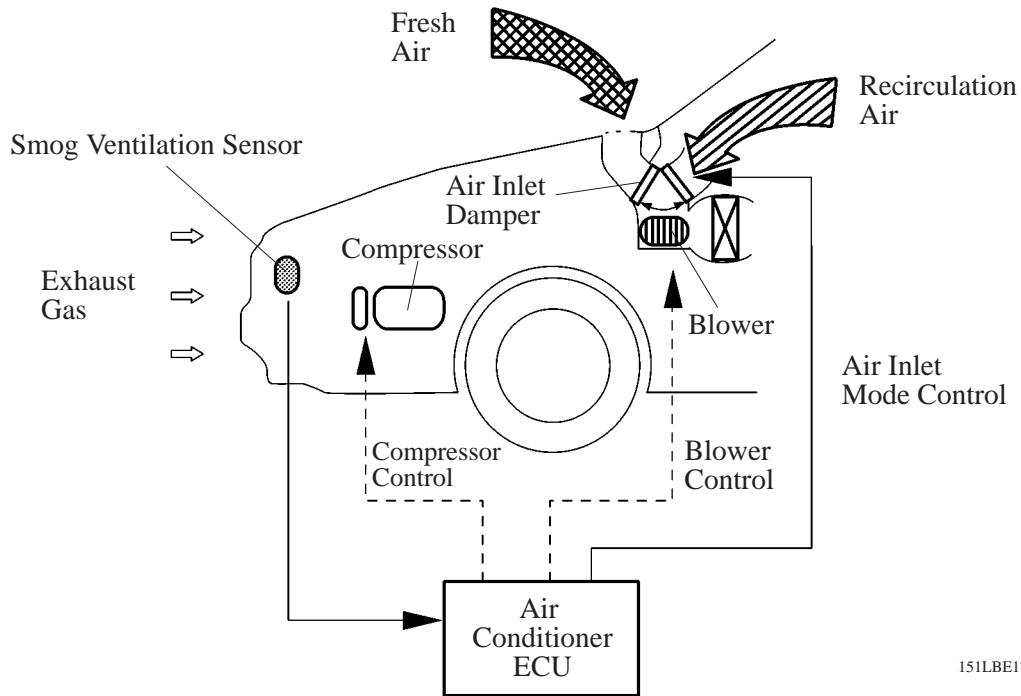
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### 3. Automatic Recirculation Control

#### General

The automatic recirculation system is a system which uses a smog ventilation sensor which detects harmful elements such as CO, HC, which are present in the air outside of the vehicle, and automatically switches the air inlet modes in accordance with the level of concentration of those elements.

#### ► System Diagram ◀



#### Operation

##### 6) Normal Operation

When the air inlet mode is selected in the automatic mode, the air conditioner ECU automatically switches the air inlet to the recirculation mode or to the fresh air mode by making a comprehensive analysis for preventing the intrusion of the harmful elements (CO, HC) that are present in the exhaust gases that are contained in the air outside of the vehicle, thus ensuring the maximum cooling performance in the summer and preventing the fogging of the windows in the winter. Also, when the automatic mode is selected, the air conditioner ECU automatically turns ON the compressor.

However, to allow for the smog ventilation sensor to warm up, the automatic switching of the air inlet modes through the detection of the elements is not carried out for 30 seconds immediately after the engine is started.

##### 7) Automatic Internal Air Cool Down Operation

When the air inlet mode is in the automatic mode and the vehicle's internal air temperature is high, such as in summer, the air conditioner ECU switches the air inlet mode to the recirculation mode in order to reduce the internal air temperature.

##### 8) Automatic External Air Fogging Prevention Operation

When the air inlet mode is in the automatic mode and the blower or the compressor is turned OFF through the manual operation of the switch or through automatic control, the air conditioner ECU switches the air inlet mode to the fresh air mode.

When the outside air temperature is low, the air conditioner ECU automatically switches the air inlet mode to the fresh air mode in order to ensure the defogging performance of the window.

- NOTE:**
- The smog ventilation sensor cannot detect elements such as the smoke from a bonfire or factory exhaust, foul or animal odors, and dirt or dust particles. Therefore, the air inlet modes are not switched in accordance with those elements.
  - Depending on the direction of the wind, the smog ventilation sensor might not be able to detect the exhaust gas elements, and could emit an odor.

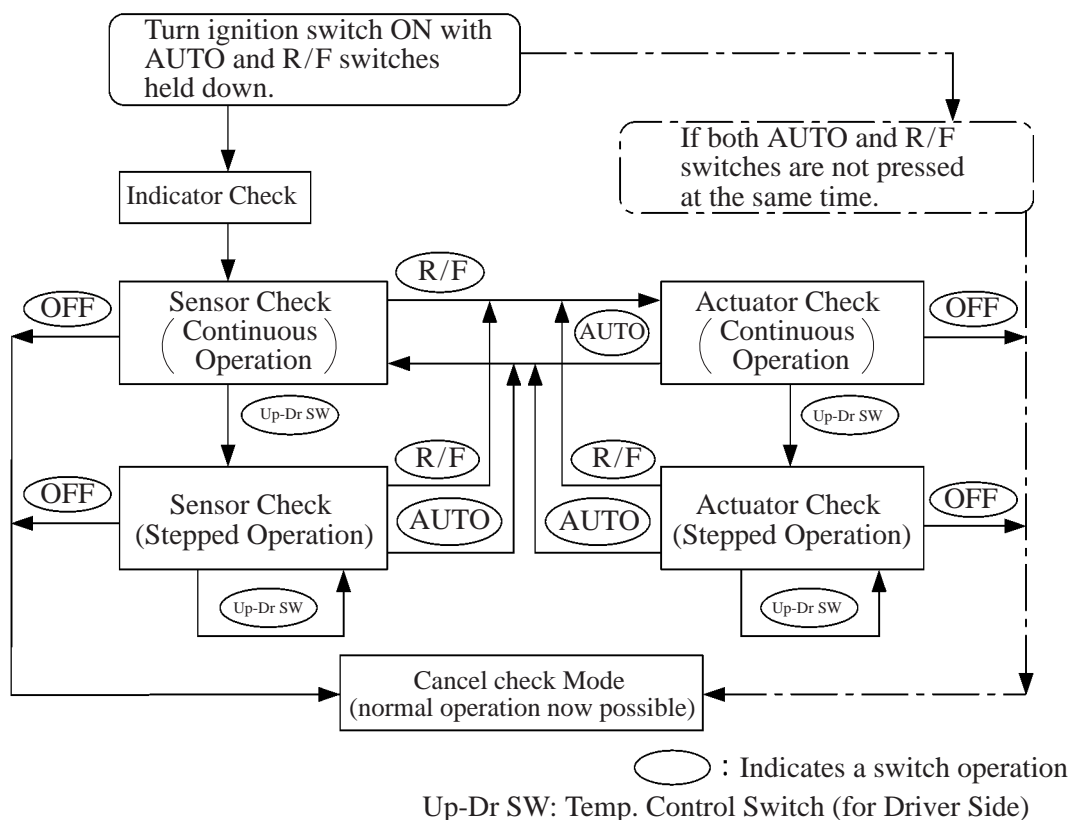
### 4. Self-Diagnosis

- The air conditioner ECU has a self-diagnosis function. It stores any operation failures in the air conditioner system memory in the form of a malfunction code. By operating switches on the air conditioner 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, servo motors and magnetic clutch are operating correctly according to signals from ECU.

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



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For details on the indicator check, sensor check, actuator check function, and clearing of this system, refer to LEXUS SC430 Repair Manual (Pub. No. RM858E).

- The DTCs (Diagnostic Trouble Codes) can be read by connecting a hand-held tester to the DLC3 (Data Link Connector 3). For details, refer to the LEXUS SC430 Repair Manual (Pub. No. RM858E).
- Active tests can be performed and the data list can be monitored by connecting a hand-held tester to the DLC3 and establishing communication with the air conditioner ECU.