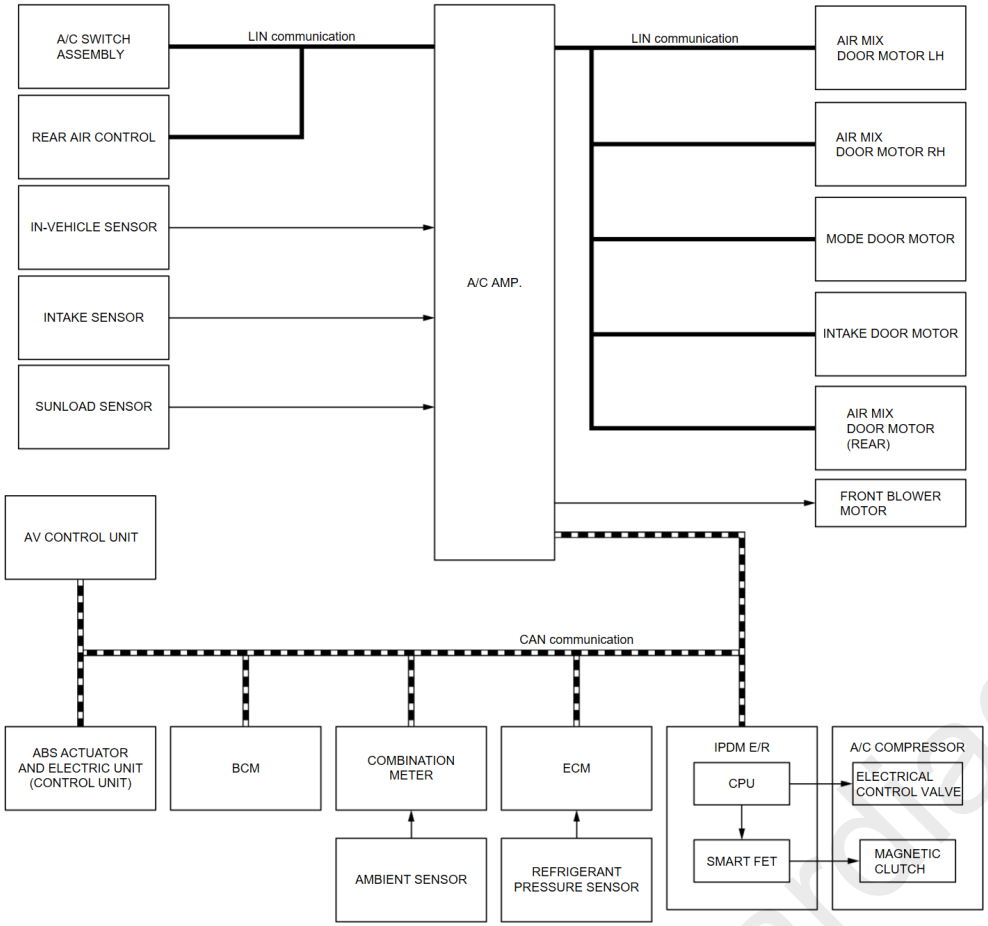
[Previous] [Next]

System Description

SYSTEM DIAGRAM



Component	Function
ABS actuator and electric unit (control unit)	ABS actuator and electric unit (control unit) transmits vehicle speed signal to A/C amp. via CAN communication line.
AV control unit	AV control unit transmits blower reduction request signal to A/C amp. via CAN communication line.
A/C amp.	A/C Amp.
BCM	BCM transmits remote engine start status signal to A/C amp. via CAN communication line.

Component	Function
Combination meter	Combination meter transmits ambient temperature signal to A/C amp. via CAN communication line.
ECM	• ECM, when receiving A/C ON signal and blower fan ON signal from A/C amp., transmits A/C compressor request signal to IPDM E/R via CAN communication line according to status of the engine and refrigerant pressure. • ECM transmits engine coolant temperature signal and refrigerant pressure sensor signal to A/C amp. via CAN communication line. • ECM controls the cooling fan based on the cooling fan request signal received from the A/C amp.
IPDM E/R	• Smart FET is integrated in IPDM E/R. • IPDM E/R operates smart FET when receiving A/C compressor request signal from ECM via CAN communication line. • IPDM E/R controls ECV when receiving ECV control signal from A/C amp. via CAN communication line.
A/C switch assembly	A/C Switch Assembly
Rear air control*	Rear Air Control
Ambient sensor	Ambient Sensor
Intake sensor	Intake Sensor
In-vehicle sensor	In-vehicle Sensor
Refrigerant pressure sensor	Refrigerant Pressure Sensor
Sunload sensor	Sunload Sensor

Component	Function
Air mix door motor LH	Air Mix Door Motor LH
Air mix door motor RH	Air Mix Door Motor RH
Air mix door motor (Rear)*	Air Mix Door Motor (Rear)
Front blower motor	Front Blower Motor
Intake door motor	Intake Door Motor
Mode door motor	Mode Door Motor
A/C compressor	A/C Compressor

*: With rear air control

INPUT/OUTPUT SIGNAL

Control unit	Signal status
ABS actuator and electric unit (control unit)	Transmits the vehicle speed signal to A/C amp. via CAN communication.
AV control unit	Transmits the blower reduction request signal to A/C amp. via CAN communication.
BCM	Transmits the remote engine start status signal to A/C amp. via CAN communication.
Combination meter	Transmits the ambient temperature signal to A/C amp. via CAN communication.

ECM	• Transmits the following signal to A/C amp. via CAN communication.
	  • Engine coolant temperature signal
	  • Refrigerant pressure sensor signal
	• Transmits the A/C compressor request signal to IPDM E/R via CAN communication.

Control unit	Signal status

	• Receives mainly the following signal from A/C amp. via CAN communication.
	  • A/C ON signal
	  • Blower fan ON signal
	  • Cooling fan request signal

IPDM E/R	Receives mainly the ECV control signal from A/C amp. via CAN communication.
A/C switch assembly	• Transmits the A/C control signal to A/C amp. via LIN communication. • Receives mainly the A/C display signal from A/C amp. via LIN communication.
Rear air control*	• Transmits the rear A/C control signal to A/C amp. via LIN communication. • Receives mainly the rear A/C display signal from A/C amp. via LIN communication.
Air mix door motor LH	• Transmits the door position feedback signal to A/C amp. via LIN communication. • Receives mainly the door motor request signal to A/C amp. via LIN communication.
Air mix door motor RH	
Air mix door motor (Rear)*	
Intake door motor	
Mode door motor	

*: With rear air control

DESCRIPTION

- Automatic air conditioning system is controlled by each function of A/C amp., ECM and IPDM E/R.
- Each operation of air conditioning system can be controlled by the A/C switch assembly.

CONTROL BY A/C amp.

- Temperature Control
- Air Outlet Control
- Air Inlet Control
- Door Control
- Air Flow Control
- A/C Compressor Control
- Cooling Fan Operation Request Control
- Remote Engine Start Control

CORRECTION FOR INPUT VALUE

- Ambient temperature correction
  - A/C amp. inputs the temperature detected by ambient temperature signal received from combination meter via CAN communication as the ambient temperature.
  - A/C amp. performs the correction of the temperature detected by ambient sensor for air conditioning control.
  - A/C amp. selects and uses the initial value of ambient temperature data depending on the engine coolant temperature when turning the ignition switch from OFF to ON. The detection temperature of the ambient sensor is used when engine coolant temperature is low [less than approximately 56°C (133°F)]. The memory data (before the ignition switch is OFF) when the engine is warmed up [approximately 56°C (133°F) or more].
  - The correction of the ambient temperature is not performed when the detection temperature of the ambient temperature is less than approximately −20°C (–4°F).
- In-vehicle temperature correction
  - A/C amp. inputs the temperature detected by in-vehicle sensor as the in-vehicle temperature.
  - A/C amp. performs the correction of the temperature detected by in-vehicle sensor for air conditioning control.
  - A/C amp. performs the correction so that the recognition passenger room temperature changes depending on the difference between the detected passenger room temperature and the recognition passenger room temperature. If the difference is large, the changing is

early. The changing becomes slow as the difference becomes small.

- Intake temperature correction
  - A/C amp. inputs the temperature detected by intake sensor as the intake temperature (evaporator temperature).
  - A/C amp. performs the correction of the temperature detected by intake sensor for air conditioning control.
  - A/C amp. performs the correction so that the recognition intake temperature changes depending on the difference between the detected intake temperature and the recognition intake temperature. If the difference is large, the changing is early. The changing becomes slow as the difference becomes small.
- Sunload amount correction
  - A/C amp. inputs the sunload amount detected by sunload sensor.
  - A/C amp. performs the correction of the sunload amount detected by sunload sensor for air conditioning control.
  - When the sunload amount suddenly changes, for example when entering a tunnel, perform the correction so that the recognition sunload amount of the A/C amp. changes slowly.
- Set temperature correction
  - A/C amp. performs the correction to the target temperature set by the A/C switch assembly so as to match the temperature felt by the passengers depending on the ambient temperature detected by ambient sensor and controls it so that the in-vehicle temperature is always the most suitable.

CONTROL BY ECM

A/C Compressor Control

CONTROL BY IPDM E/R

A/C Compressor Control