

AUDIO AMPLIFIER [WITH CENTER DISPLAY]

id0920zz011200

Purpose

- The audio signal (analog voltage waveform) output from the unit equipped on the vehicle is converted into a digital pulse. The converted digital pulse signal is amplified, converted to an analog signal again, and sent to the speakers.

Function

Road noise correction system (AudioPilot®)

- The volume of the music constituent obscured by noise is corrected by the audio amplifier based on the cabin noise measured by the AudioPilot® microphone and the vehicle speed signal sent from the instrument cluster.

Current control function at engine restart by i-stop (With i-stop system)

- When the audio amplifier receives a voltage increase request signal from the PCM, output current to the speakers is controlled at 10 A or less to assure input voltage to the DC-DC converter when the engine is re-started by the i-stop control.

Active engine sound function (With i-stop system, without i-ELOOP)

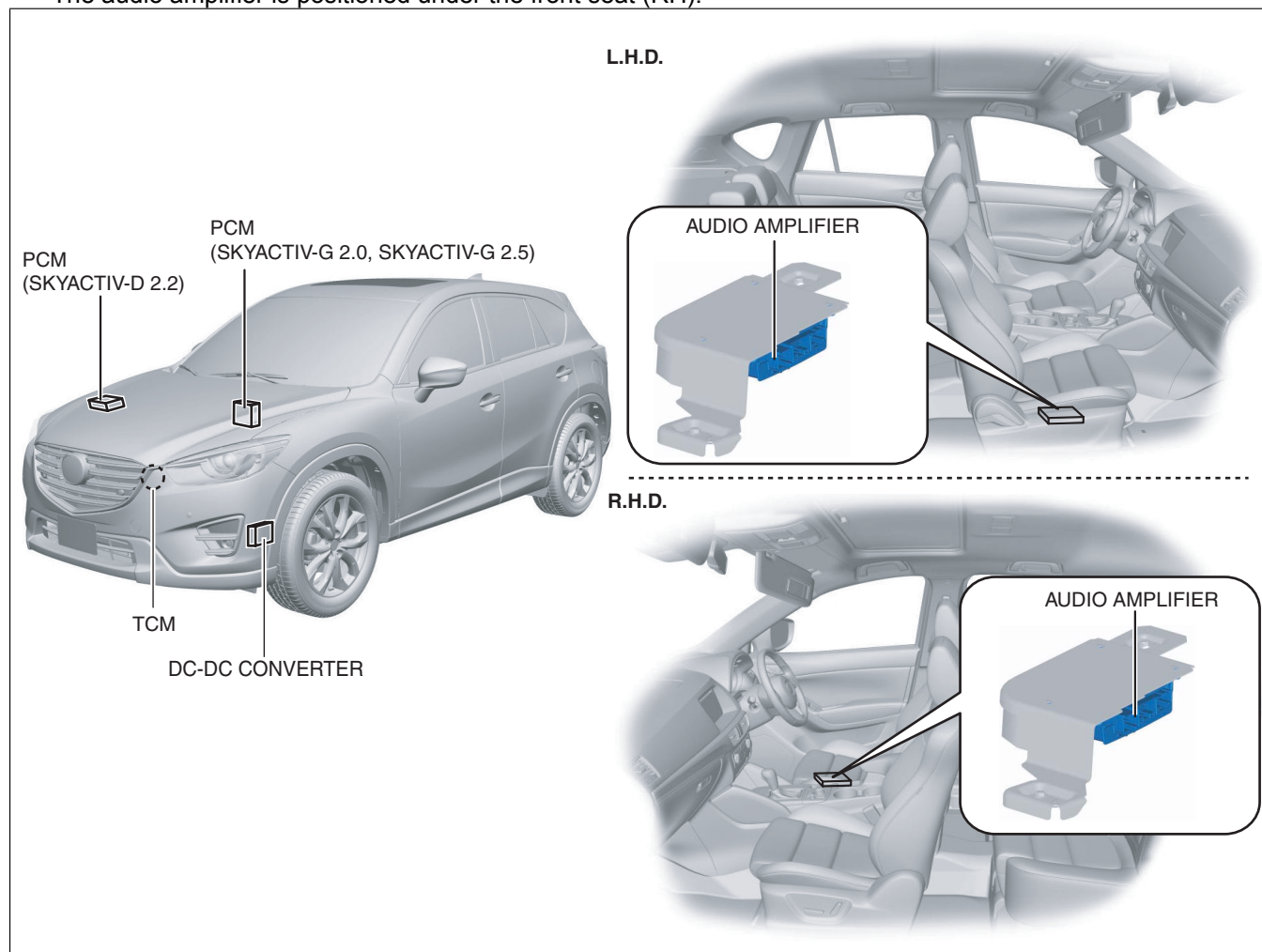
- The active engine sound function supplements the engine sound. A sound for supplementing the engine sound is output from the speakers equipped on the vehicle providing the driver an acceleration feel and a sense of speed.

On-board diagnostic function

- The audio amplifier has an on-board diagnostic function to facilitate system diagnosis. DTCs are stored in the event of a malfunction occurring. For details, refer to the [ON-BOARD DIAGNOSTIC]. (See ON-BOARD DIAGNOSTIC [AUDIO AMPLIFIER (WITH CENTER DISPLAY)].)

Construction

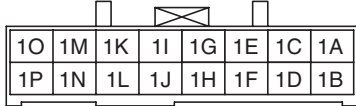
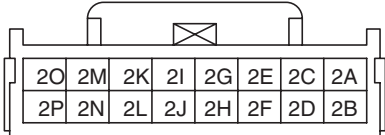
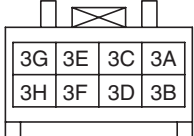
- The audio amplifier is positioned under the front seat (RH).



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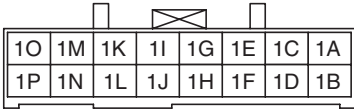
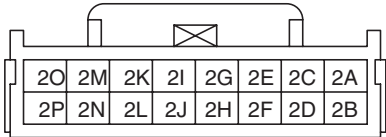
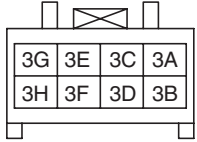
Terminal Layout and Signal

L.H.D.

Terminal	Signal
	1A —
	1B —
	1C —
	1D —
	1E —
	1F —
	1G AudioPilot® (+)
	1H AudioPilot® (-)
	1I Rear door speaker input RH (+)
	1J Rear door speaker input RH (-)
	1K Rear door speaker input LH (+)
	1L Rear door speaker input LH (-)
	1M Front door speaker input RH (+)
	1N Front door speaker input RH (-)
	1O Front door speaker input LH (+)
	1P Front door speaker input LH (-)
	2A Rear door speaker output RH (+)
	2B Rear door speaker output RH (-)
	2C Tweeter LH (-)
	2D ACC
	2E Tweeter LH (+)
	2F Audio amplifier control
	2G Front center speaker output (+)
	2H Pulse width modulation (PWM) control
	2I Front center speaker output (-)
	2J —*1
	2K Tweeter RH (-)
	2L HS-CAN_H
	2M Tweeter RH (+)
	2N HS-CAN_L
	2O Rear speaker (+)
	2P Rear speaker (-)
	3A B+
	3B Ground
	3C Front door speaker output LH (+)
	3D Front door speaker output LH (-)
	3E Front door speaker output RH (+)
	3F Front door speaker output RH (-)
	3G Rear door speaker output LH (-)
	3H Rear door speaker output LH (+)

*1 : Not used

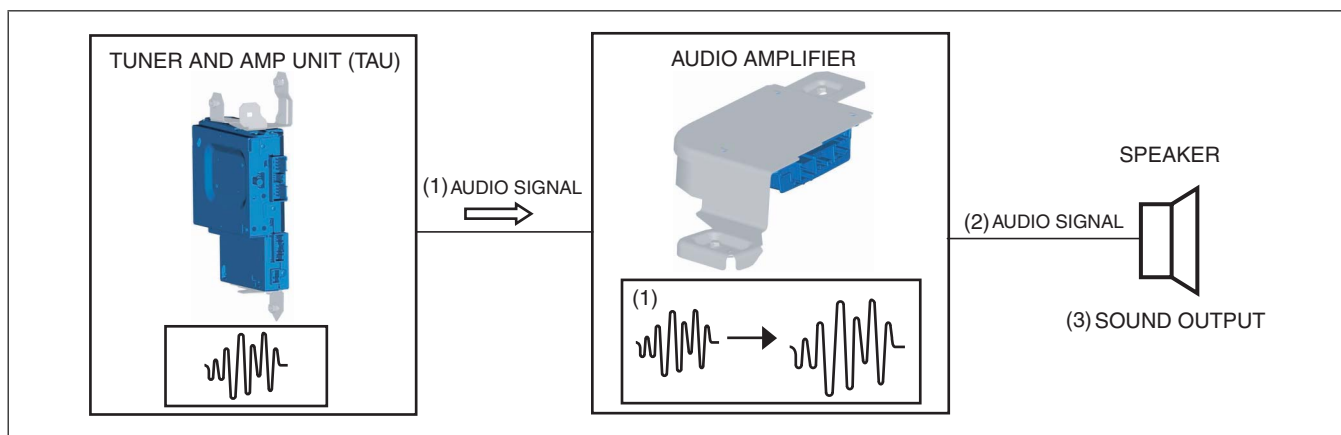
R.H.D.

Terminal	Signal
	1A —
	1B —
	1C —
	1D —
	1E —
	1F —
	1G AudioPilot® (+)
	1H AudioPilot® (-)
	1I Rear door speaker input LH (+)
	1J Rear door speaker input LH (-)
	1K Rear door speaker input RH (+)
	1L Rear door speaker input RH (-)
	1M Front door speaker input LH (+)
	1N Front door speaker input LH (-)
	1O Front door speaker input RH (+)
	1P Front door speaker input RH (-)
	2A Rear door speaker output LH (+)
	2B Rear door speaker output LH (-)
	2C Tweeter RH (-)
	2D ACC
	2E Tweeter RH (+)
	2F Audio amplifier control
	2G Front center speaker output (+)
	2H Pulse width modulation (PWM) control
	2I Front center speaker output (-)
	2J —*2
	2K Tweeter LH (-)
	2L HS-CAN_H
	2M Tweeter LH (+)
	2N HS-CAN_L
	2O Rear speaker (+)
	2P Rear speaker (-)
	3A B+
	3B Ground
	3C Front door speaker output RH (+)
	3D Front door speaker output RH (-)
	3E Front door speaker output LH (+)
	3F Front door speaker output LH (-)
	3G Rear door speaker output RH (-)
	3H Rear door speaker output RH (+)

*2 : Not used

Operation

1. The audio amplifier amplifies the audio signal sent (1) from the tuner and amp unit (TAU) and sends (2) it to the speakers.
2. The speakers produce (3) audio based on the audio signal sent from the TAU.



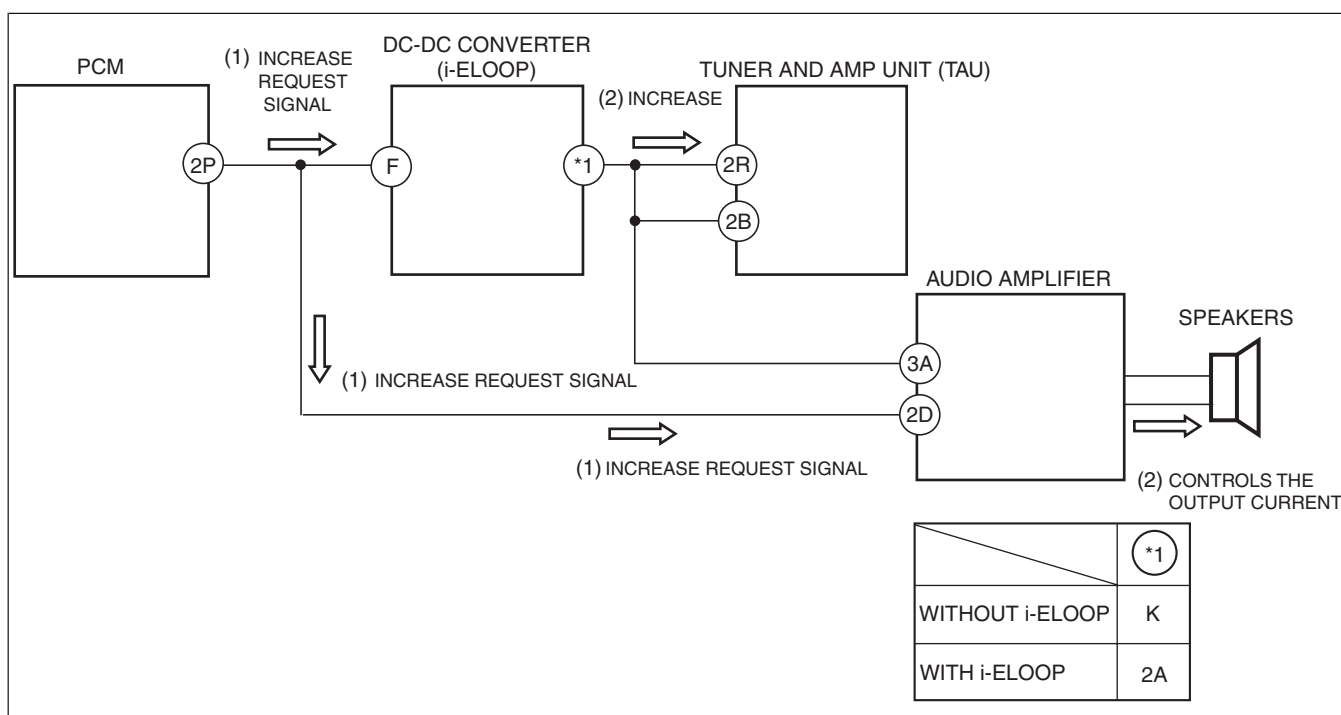
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Engine restart by i-stop (With i-stop system)

1. The PCM sends a boost request signal to the DC-DC converter and audio amplifier when the engine is restarted by the i-stop control.
2. When the DC-DC converter receives a boost request signal from the PCM, the power supply voltage is increased to the TAU.
3. When the audio amplifier receives a boost request signal, output current to the speaker is controlled to 10 A or less.

Note

- If the audio amplifier performs current control when the audio volume is 50 or more, the audio volume may decrease for approx. 0.3 s.



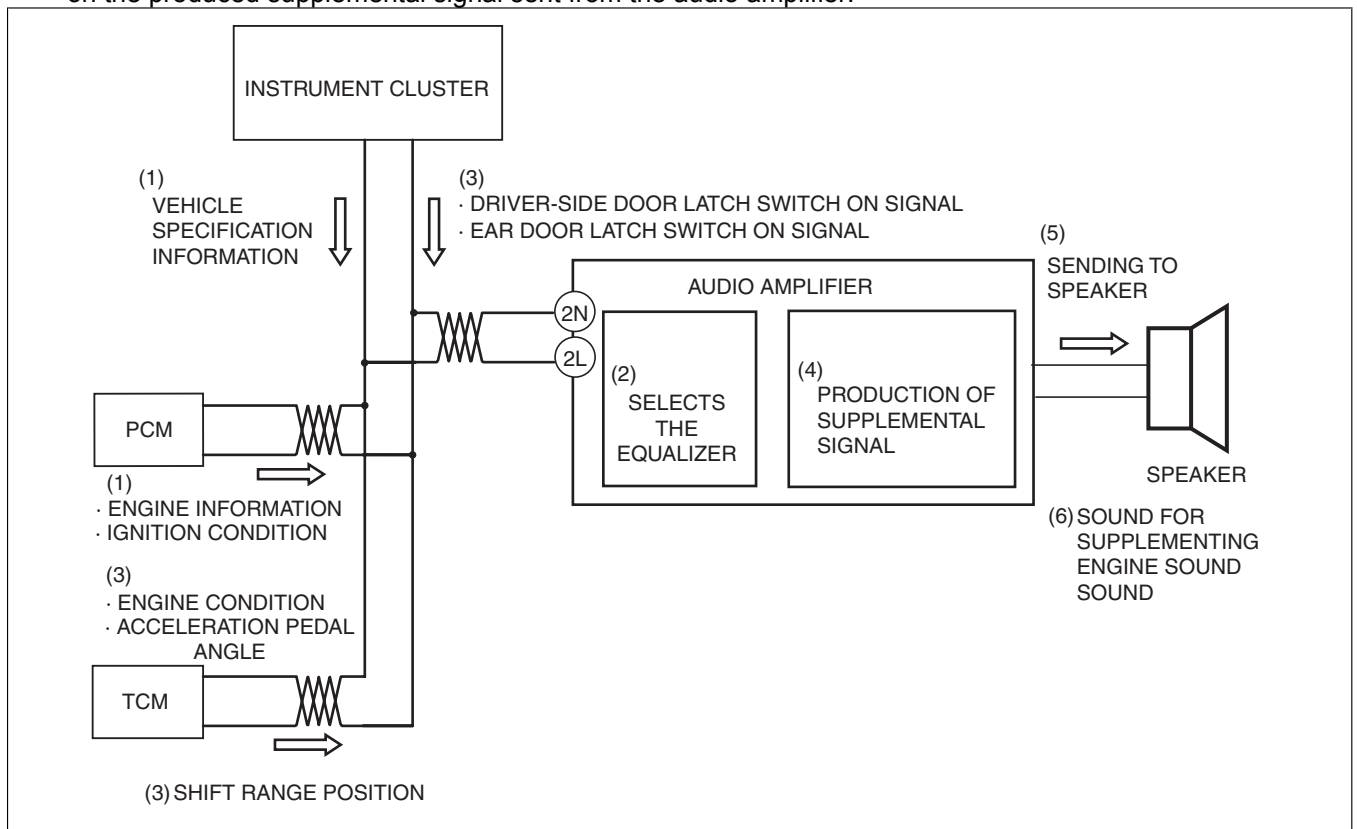
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Active engine sound function (With i-stop system, without i-ELOOP)

Note

- When all of the following conditions are met, the active engine sound function operates.
 - Active engine sound function is ON (disconnecting M-MDS)
 - All doors, liftgate, and trunk lid are closed
 - Configuration is completed
 - CAN information received normally

1. When the ignition is switched ON (engine off or on), the PCM sends the engine information and the ignition condition, and the instrument cluster sends vehicle specification information to the audio amplifier via a CAN signal.
2. When the engine information and the specification information for the ignition condition and vehicle are received, the audio amplifier selects the equalizer built into the audio amplifier and sets the frequency output from the speaker.
3. The PCM sends the engine condition signal and acceleration pedal angle, the TCM sends the shift range position, and the instrument cluster sends a driver-side door latch switch on signal and rear door latch switch on signal to the audio amplifier via a CAN signal.
4. The audio amplifier analyzes the engine load conditions, calculates the range of insufficient engine sound, and produces a supplemental signal based on the signal received from the PCM, TCM and instrument cluster.
5. The audio amplifier sends the produced supplemental signal to the front door speaker and the front side speaker.
6. The front door speaker and the front side speaker output a sound for supplementing the engine sound based on the produced supplemental signal sent from the audio amplifier.



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Fail-safe

- Not applicable