

FRONT BODY CONTROL MODULE (FBCM)

id094000002500

Outline

- Located at the front of the vehicle, the front body control module (FBCM) performs numerous system controls for functions at the front of the vehicle.

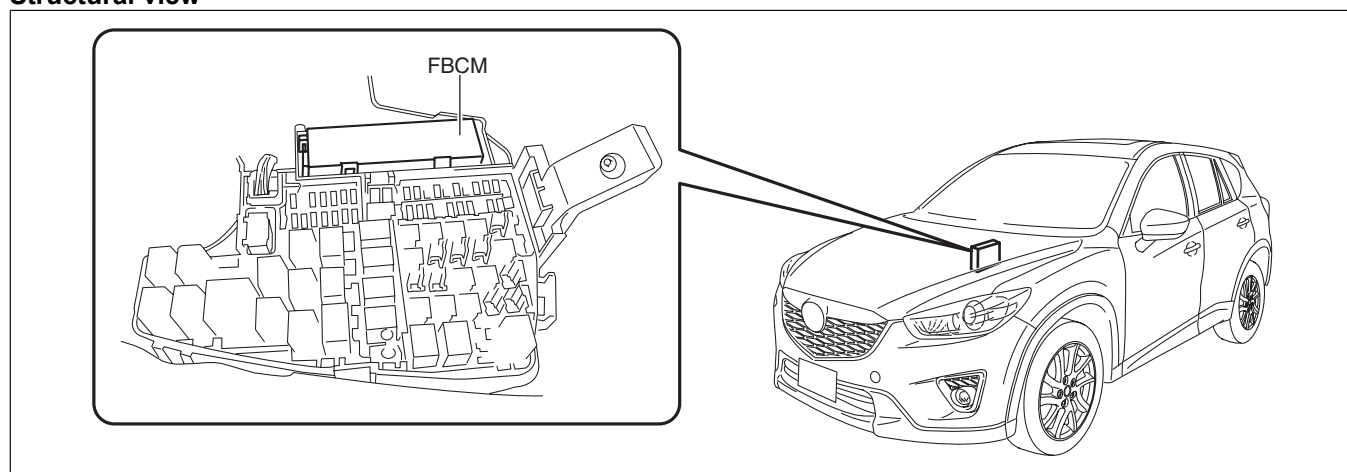
Function

- The front body control module (FBCM) controls the system based on the input/output signals.
- The functions which are controlled are as follows:

Control table

Control	Content	Reference
Front combination light control	Each light illuminates or flashes in conjunction with the operation of the light switch, turn switch and hazard warning switch.	(See FRONT COMBINATION LIGHT.)
Horn control	Sound is harmonized between high and low pitch.	(See HORN.)
Rear defroster system control	Warms the rear window glass and the outer mirror glass using heat filaments to defog the glass surface.	(See REAR WINDOW DEFROSTER/OUTER MIRROR HEATER.)
Headlight cleaner control	The headlight cleaner system removes dirt from the headlights by spraying washer fluid from the headlight cleaner nozzles installed to the front bumper.	(See HEADLIGHT CLEANER SYSTEM.)
Front fog light control	By shining light in a wider area in front of the vehicle than the light from the headlights, visibility during poor weather conditions, such as rain and fog, has been improved. In addition, the visibility of the vehicle from on-coming vehicles, pedestrians, has been improved.	(See FRONT FOG LIGHT.)
Front wiper system control	Equipped with continuous (low/high), auto-stop, one-touch wiper, intermittent wiper, and synchronized washer and wiper operation.	(See WINDSHIELD WIPER SYSTEM.)
CAN (Controller Area Network)	Sends and receives signals between CAN system-related modules using CAN system.	(See CONTROLLER AREA NETWORK (CAN) SYSTEM.)
ON-BOARD DIAGNOSTIC SYSTEM	The front body control module (FBCM) is equipped with an on-board diagnosis function which records DTCs in the event of a malfunction.	(See ON-BOARD DIAGNOSTIC SYSTEM [FRONT BODY CONTROL MODULE (FBCM)].)

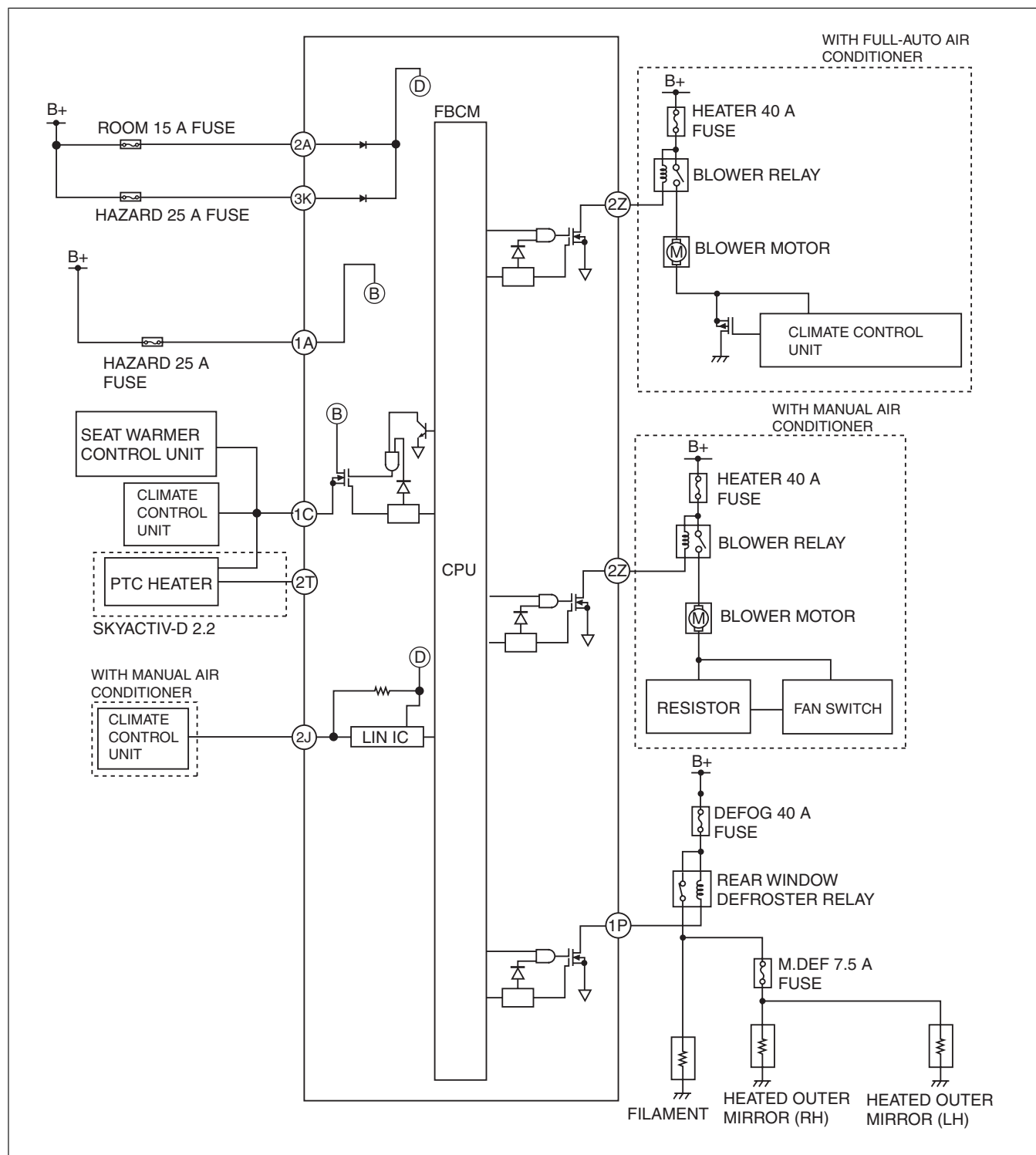
Structural view



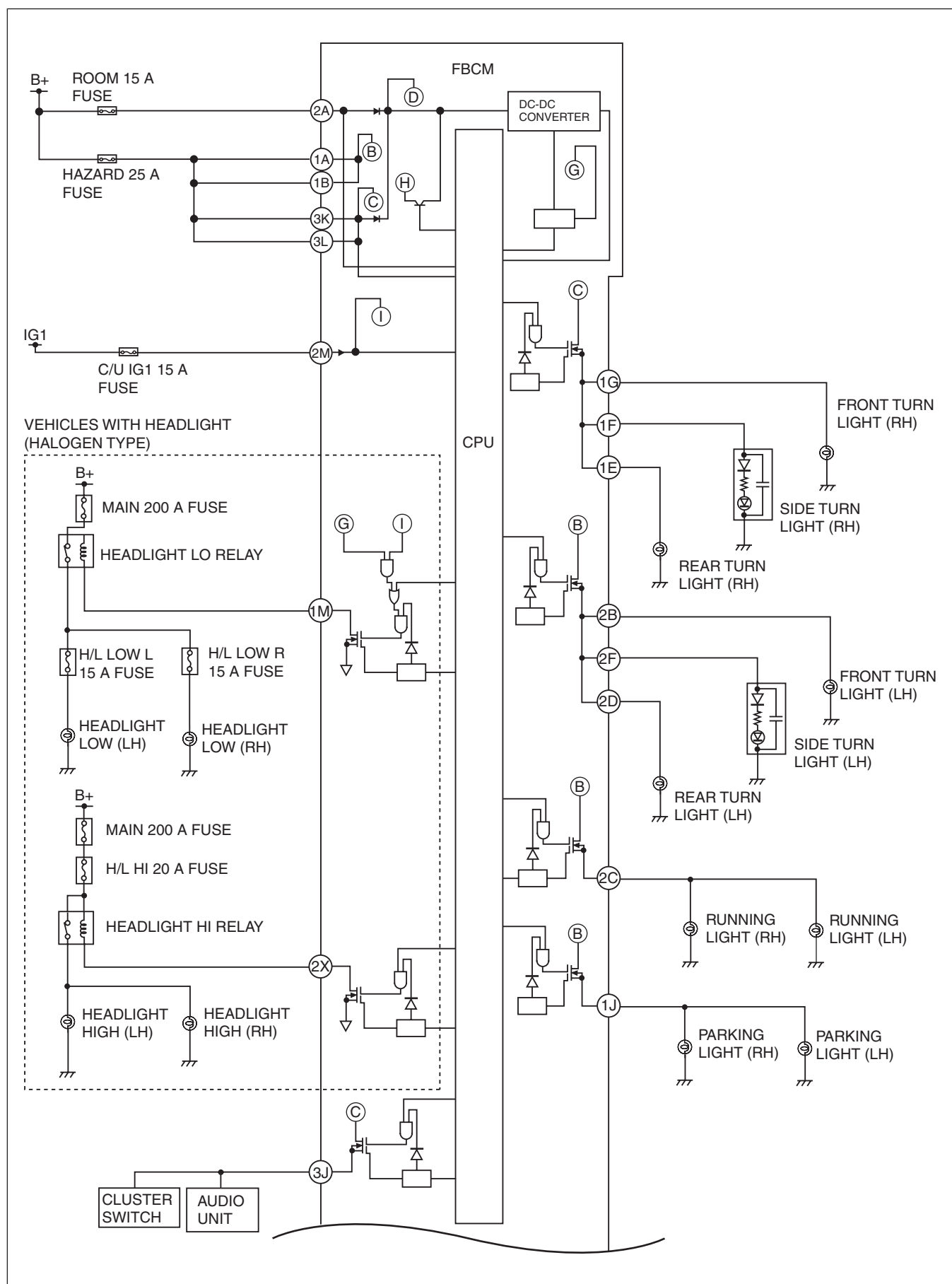
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System wiring diagram

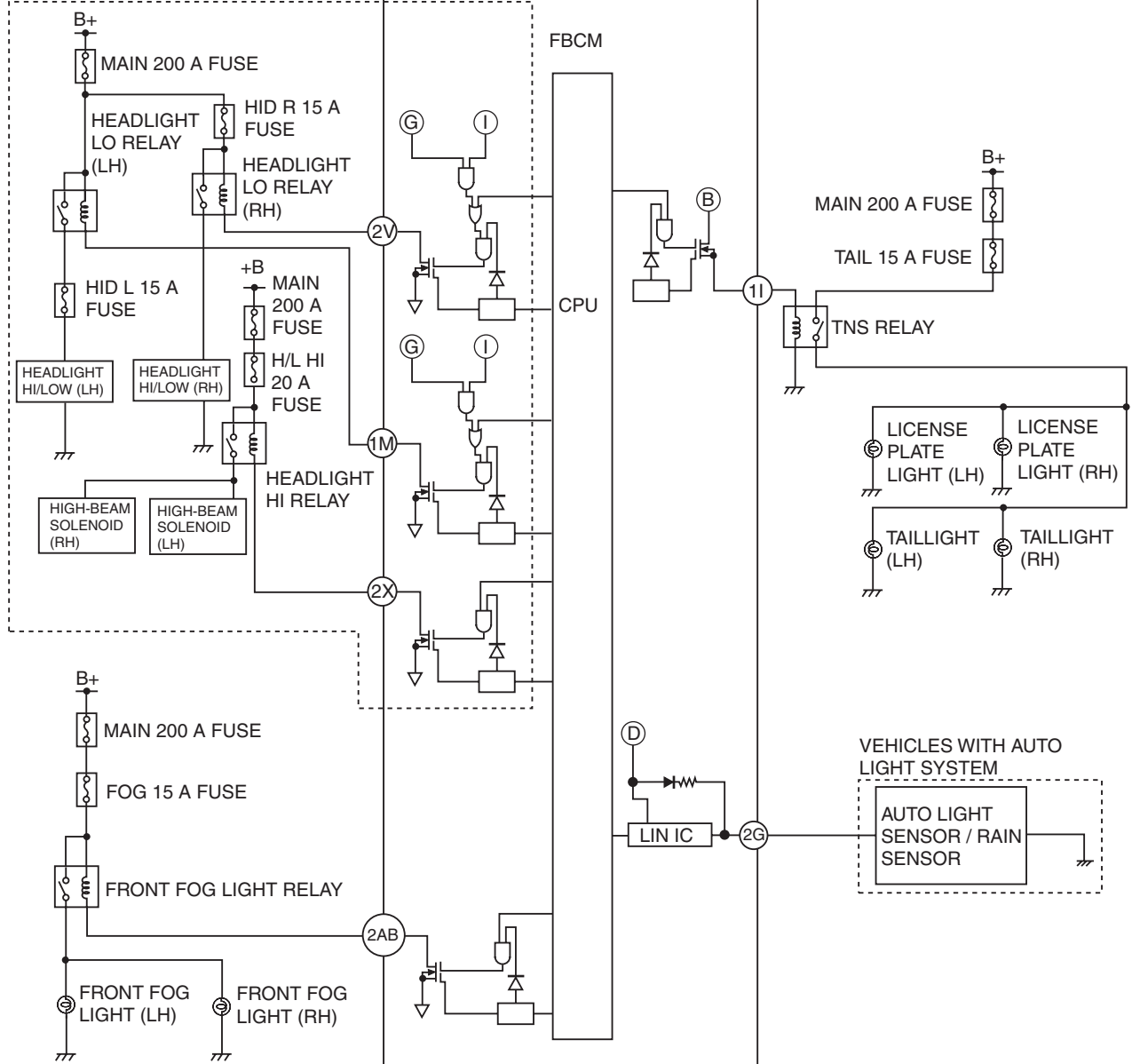
Rear defroster, blower motor



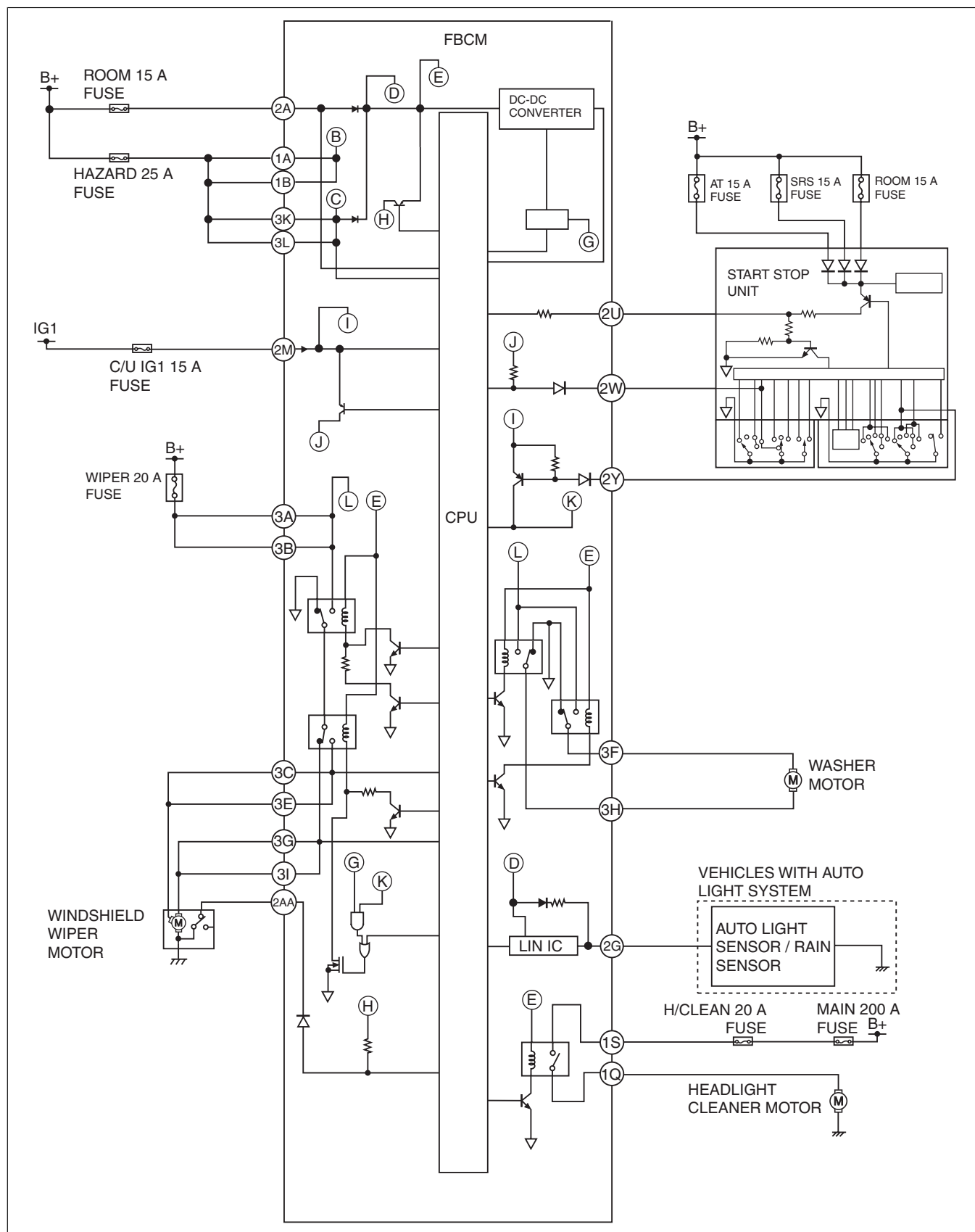
Headlights, turn lights, front fog lights



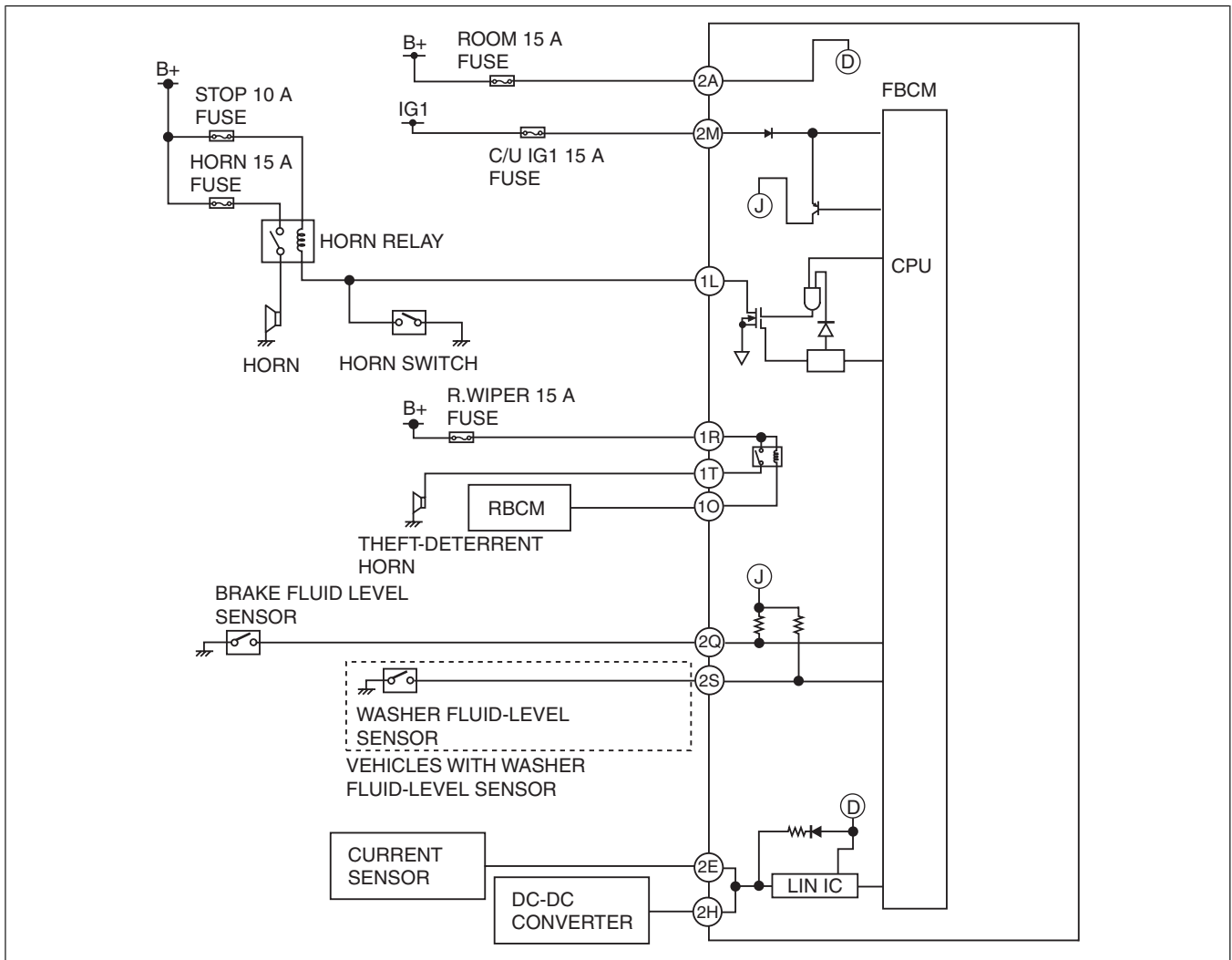
VEHICLES WITH HEADLIGHT (DISCHARGE TYPE)



Windshield wipers, front/rear washers

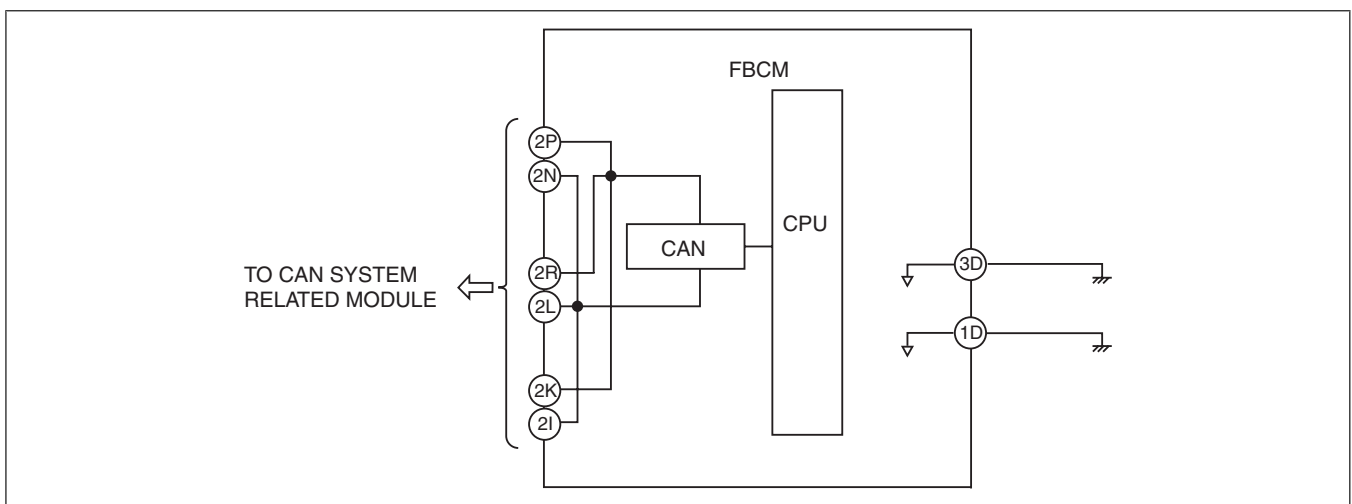


Theft-deterrent system, horn, sensors



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CAN system



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Fail-safe

Exterior lighting system

- If the CAN signal cannot be received normally, the front body control module (FBCM) performs the following controls:
 - Light is illuminated: Continues to illuminate until the ignition is switched OFF (LOCK).
 - Light is turned off: Turns on/off according to the light switch operation. If the light switch is off, the TNS is forced on. When the ignition is switched OFF (LOCK), the light turns off.

Auto light system

- If there is a communication error in the rain sensor while the light is illuminated, the front body control module (FBCM) continues to illuminate the light until the ignition is switched OFF (LOCK) or the light switch is operated to the position other than AUTO.

Running light system

- Function not equipped.

Emergency stop signal system (ESS)

- If the CAN signal cannot be received normally, the front body control module (FBCM) controls the ESS based on the signal last received. If the CAN signal cannot be received normally for 5 s or more, the front body control module (FBCM) stops the turn light system control.

Turn light system

- If the CAN signal cannot be received normally, the front body control module (FBCM) controls the turn light system based on the signal last received. If the CAN signal cannot be received normally for 5 s or more, the front body control module (FBCM) stops the turn light system control.

Rear defroster system control

- Function not equipped.

Horn control

- Function not equipped.

Windshield wiper and washer system

- If the front body control module (FBCM) detects a malfunction in the internal CPU, it controls as follows:
 - When the wiper and washer switch is in the LO or HI position: LO operation control is performed.
 - When the wiper and washer switch is in the OFF position: Windshield wiper operation is stopped.
- If the front body control module (FBCM) cannot receive a windshield wiper switch position signal because of a malfunction in the start stop unit or a CAN communication error between the start stop unit, or if it detects an error in the windshield wiper switch position signal, it continues the control before detecting the malfunction. However, if the driver operates the wiper and washer switch, it controls as follows:
 - When the front body control module (FBCM) detects LO/HI ON using the LO/HI detection function: The windshield wipers are operated at low speed.
 - When the front body control module (FBCM) detects LO/HI OFF using the LO/HI detection function: The windshield wipers are stopped at the park position.
- If the windshield wiper switch position which is monitored by the LO/HI detection function of the front body control module (FBCM) does not match the one which is sent from the start stop unit as a CAN signal, the windshield wipers are controlled according to the CAN signal for a certain period of time. After a certain period of time has elapsed, they are controlled as follows:
 - When the front body control module (FBCM) detects LO/HI ON using the LO/HI detection function: The windshield wipers are operated at low speed.
 - When the front body control module (FBCM) detects LO/HI OFF using the LO/HI detection function: The windshield wipers are stopped at the park position.
- If the front body control module (FBCM) detects a malfunction in the auto stop switch circuit while the windshield wipers are operating, it allows the windshield wipers to operate for a certain period of time and then stops the operation. However, if the driver operates the wiper and washer switch, or if the ignition is switched OFF (LOCK) and switched ON (engine off or on) again, it operates the windshield wipers again.
- If the front body control module (FBCM) cannot receive an INT volume signal because of a CAN communication error between the start stop unit or a malfunction in the start stop unit, it continues the operation at a certain intermittent timing.
- If the front body control module (FBCM) detects an error in the INT volume signal from the start stop unit, it continues the operation according to the INT volume signal before detecting the malfunction.
- If the front body control module (FBCM) cannot receive a windshield washer operation request signal because of a CAN communication error between the start stop unit or a malfunction in the start stop unit, it controls as follows:
 - When the windshield washer is operated: The washer operation is continued for a certain period of time and then stopped.
 - When the windshield washer is not operated: The washer is not operated.
- If the windshield washer is continuously operated for a long period (**approx. 1 min. or more**), the operation is stopped temporarily to prevent the windshield washer relay from overheating.

Auto wiper system

- If the front body control module (FBCM) cannot receive a CAN signal (vehicle speed signal) from the PCM normally, it continues the control using the vehicle speed signal before detecting the malfunction.
- If there is a malfunction in the rain sensor or a communication error between the rain sensor and front body control module (FBCM), and if the front body control module (FBCM) detects a signal error ten times in a series, the operation before the malfunction was detected is continued.
- If the rain sensor detects rainfall and then detects no change in the detected amount after the wipers have been operated approx. two times, the windshield is determined to be dirty and windshield wiper operation is stopped.
 - If the windshield is dirty, set the wiper and washer switch to LO or HI position to operate the windshield wiper. Or, remove the dirt from the windshield, then operate the auto wiper.
- If the temperature sensor in the rain sensor detects **approx. -10 °C {14 °F}** or less when the ignition is switched ON (engine off or on), the windshield wipers do not operate even though it may be snowing.

Rear wiper and washer system

- If the front body control module (FBCM) cannot receive a rear wiper switch position signal because of a malfunction in the start stop unit or a CAN communication error between the start stop unit, it controls as follows:
 - When the rear wiper is operated: The rear wiper operation is continued for a certain period of time and then stopped.
 - When the rear wiper is not operated: The rear wiper is not operated.
- If the front body control module (FBCM) detects an error in the signal from the start stop unit, it controls the rear wiper and washer according to the signal before detecting the malfunction.
- If the front body control module (FBCM) cannot receive a rear washer operation request signal from the start stop unit because of a malfunction in the start stop unit or a CAN communication error between the start stop unit, it controls as follows:
 - When the rear washer is operated: The rear washer operation is continued for a certain period of time and then stopped.
 - When the rear washer is not operated: The rear washer is not operated.
- If the rear washer is continuously operated for a long period (**approx. 1 min. or more**), the operation is stopped temporarily to prevent the rear washer relay from overheating.