

PARKING AID SYSTEM

8790-04

GENERAL

1. SPECIFICATIONS

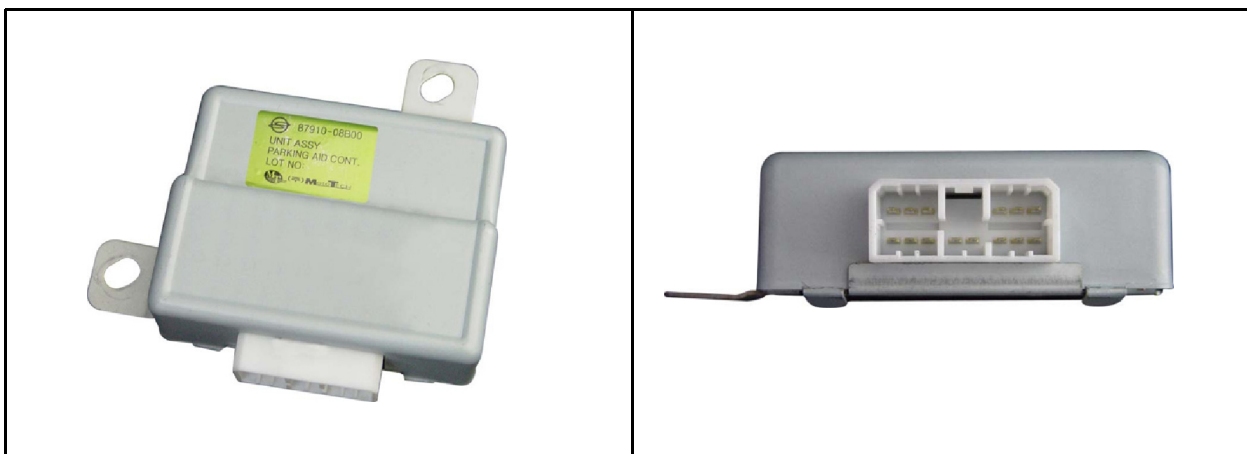
The parking aid system emits the supersonic wave signals from the sensors on the rear bumper with a specific interval and detects the reflected signals from obstacles while the gear selector lever is in "R" position. The alarm interval increases as the obstacle approaches. This supplementary system is to secure the safety distance for parking.

Descriptions		Value	Descriptions		Value
Rated voltage		DC 12 V	Operating temperature		-30°C ~ +80°C
Operating voltage		DC 9 V ~ 16 V	Storage temperature		-40°C ~ +85°C
Maximum permissible current	Unit	Below 100 mA	Relative humidity		95% RH max
	Sensor	Below 20 mA (each)	Weight	Unit	160g ± 10g max
Sensor insulating resistance		Over 5 MΩ			Sensor

► Parking Aid Unit

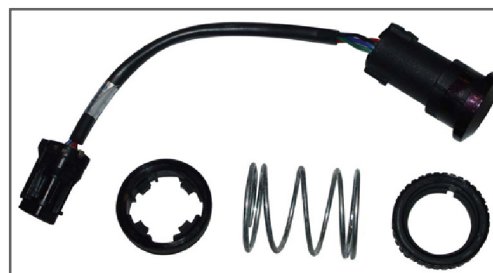
Detecting type: Super sonic wave

Detecting distance: 25 cm ~ 120 cm (distance between sensor and obstacle)



► Parking Aid Sensor

- Type: Piezo ceramic element
Calculates the distance between the sensor and the object by caculating the return time of the emitted the ultrasonic wave.
- Frequency: 40 KHz ± 1 KHz
- Detecting range: 25 cm ~ 120 cm (based on the direct distance from the sensor)
- Tolerance: ± 5 cm



Modification basis	
Application basis	
Affected VIN	

2. CAUTIONS ON PARKING AID SYSTEM

CAUTION

- Note that the display does not show everything in the rear area. Always check nobody, especially animals and children, is behind the vehicle when parking or reversing.
- If you can not properly check the vehicle behind, get out of the vehicle and then visually check it.

1. The parking aid system is just a supplemental device to help your parking operation.
2. Always keep the safety precautions.
3. Do not press or shock the sensors by hitting or high-pressure water gun while washing, or the sensors will be damaged.
4. If the system is in normal operating condition, a short beep sounds when the gear selector lever is moved into "R" position with the ignition key "ON".

► The parking aid system will not work or improperly work under following cases

1. Certain obstacles that sensors can not detect
 - Wires, ropes, chains.
 - Cotton, sponge, clothes, snow that absorb ultrasonic waves.
 - Obstacles lower than the bumper (ex. drain ditch or mud puddle)
2. Not defective but improperly working
 - When the sensing portion is frozen (operates normally after thawed)
 - When the sensing portion is covered by rain, water drops, snow or mud (operates normally after cleaned)
 - When receiving other ultrasonic signals (metal sound or air braking noises from heavy commercial vehicles)
 - When a high-power radio is turned on
3. Narrowed sensing area
 - When the sensing portion is partially covered by snow or mud (operates normally after cleaned)
 - Surrounding temperature of sensor is too high (approx. over 80 °C) or too low (approx. below -30 °C)
4. Not defective but may occur improper working
 - When driving on the rough roads, gravel road, hill and grass
 - When the bumper height is changed due to the heavy load
 - When the sensing portion is frozen
 - When the sensing portion is covered by rain, water drops, snow or mud
 - When receiving other ultrasonic signals (metal sound or air braking noises from heavy commercial vehicles)
 - When a high-power radio is turned on
 - When some accessories are attached in detecting ranges

Modification basis	
Application basis	
Affected VIN	

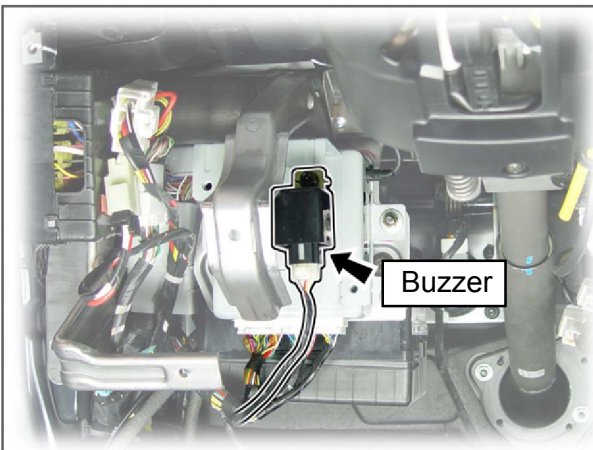
OVERVIEW AND OPERATION PROCESS

1. OVERVIEW

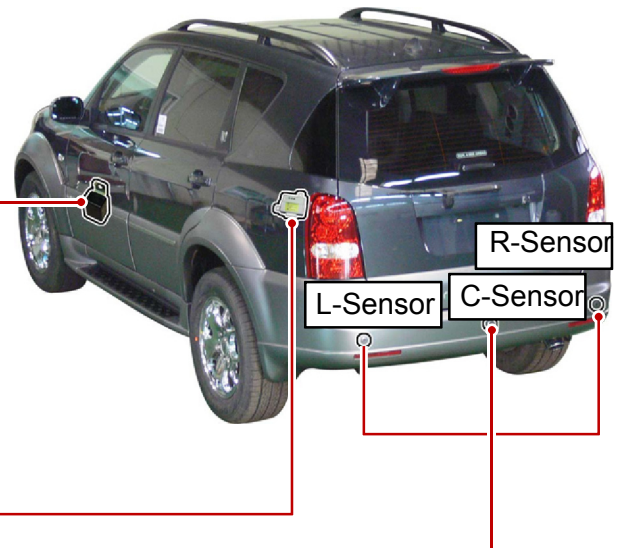
The parking aid device is integrated in the rear bumper and it uses three Piezoelectric elements to measure vertical and horizontal distance to obstacles.

When placing the gear selector lever to "R" position, the designated unit (PAS unit in the rear right quarter panel) activates the parking aid sensors to measure the distance to obstacles.

If a sensor is malfunctioning, the buzzer in PAS unit sounds to warn the driver.



- The locations of buzzer and folding unit may vary according to the model.



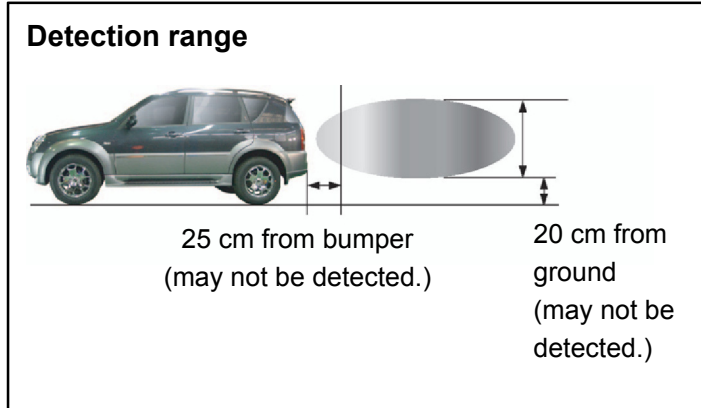
Modification basis	
Application basis	
Affected VIN	

2. ALARM INTERVAL AND TROUBLESHOOTING OF SENSOR

1) Alarm Interval

Alarm interval and display changes according to the distance as below:
While reversing, if obstacles are within stage

- 1, the warning beep sounds with long intervals. If within stage
- 2, the warning beep sounds with short intervals and if within stage
- 3, the warning beep sounds continuously.

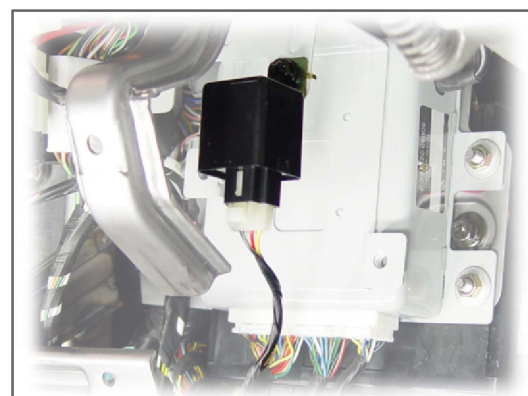


Stage	L, R Sensor	C Sensor	Interval (msec)	Remark
1	90 ~ 100 cm	90 ~ 120 cm		"Beep ----", "Beep ----"
2	60 ~ 90 cm			"Beep -", "Beep -", "Beep -"
3	25 ~ 60 cm			"Beep ----"
Tolerance	± 5 cm		±10%	

2) Troubleshooting of Sensor

When the shift lever is in the "R" position with the ignition switch on, the sensor is diagnosed once (under normal condition, the buzzer sounds once). If found any failure due to open circuit to sensor or communication error, buzzer sounds as below:

However, if more than one sensor are malfunctioning, warning buzzer sounds for 3 seconds.



Modification basis	
Application basis	
Affected VIN	

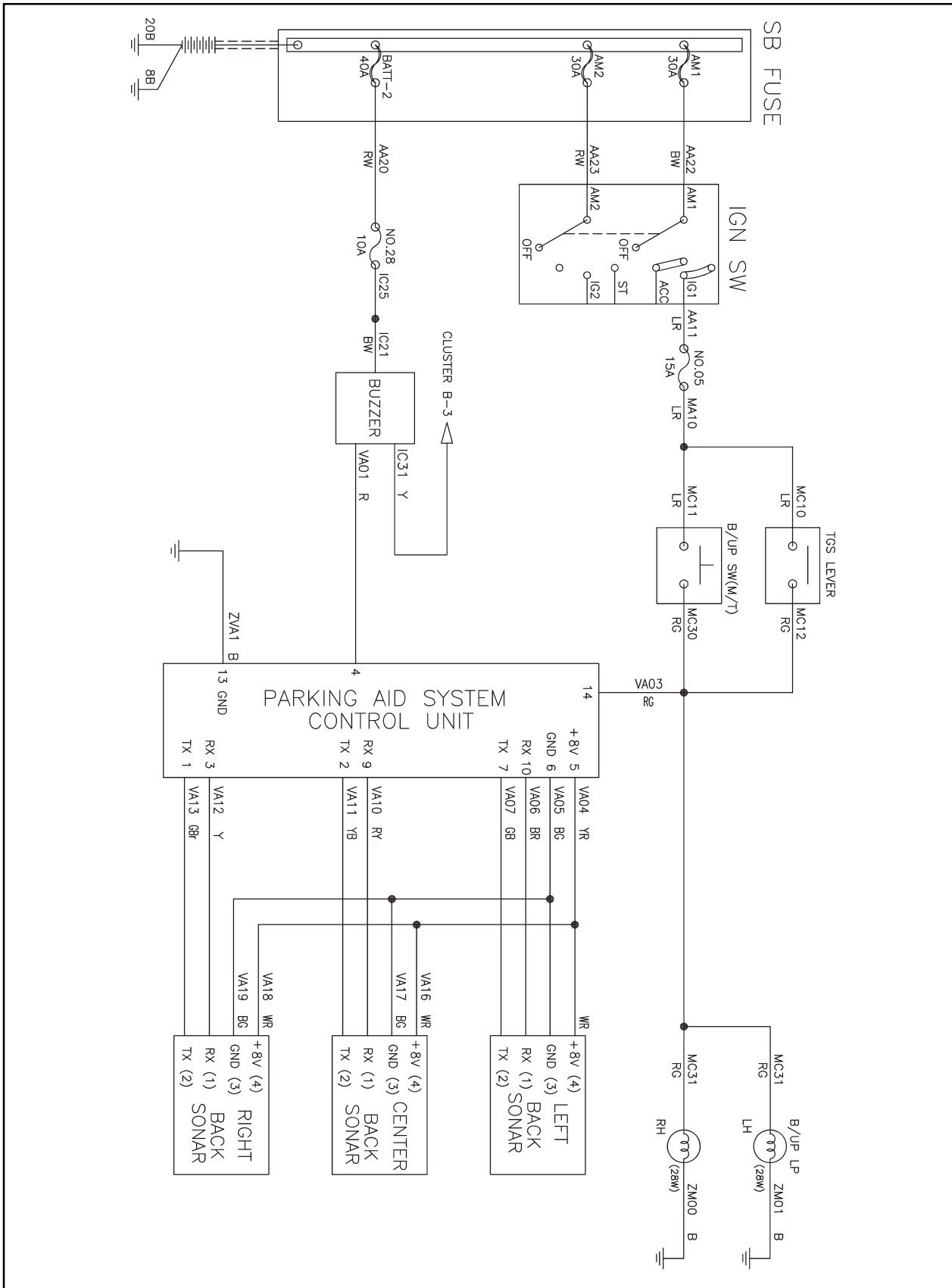
* When sensor fails self-diagnosis

Malfunction mode	Interval (msec)	Remark
Left sensor error		"beep----beep"
Center sensor error		"beep, beep---- beep, beep"
Right sensor error		"beep, beep, beep---- beep, beep, beep"
Multiple sensor error		The buzzer sounds for 3 seconds if there is any defect in more than one sensor.

FUSE & RELAYS
 RKSTICS
 IMMOBILIZER
 CLUSTER
 SPWM
 SEAT WARMER
 SWITCH
 WIPER & WASHER
 RAIN SENSOR
 LAMP
 MULTI JACK
 PARKING AID
 AV SYSTEM

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3. CIRCUIT DIAGRAM



Modification basis	
Application basis	
Affected VIN	