

Think safety think Steelmate



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201821531324.8

STEELMATE®
Automotive

SBS-1

79GHz Microwave Radar Blind Spot Detection System



Manual

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79GHz Microwave Radar Blind Spot Detection System

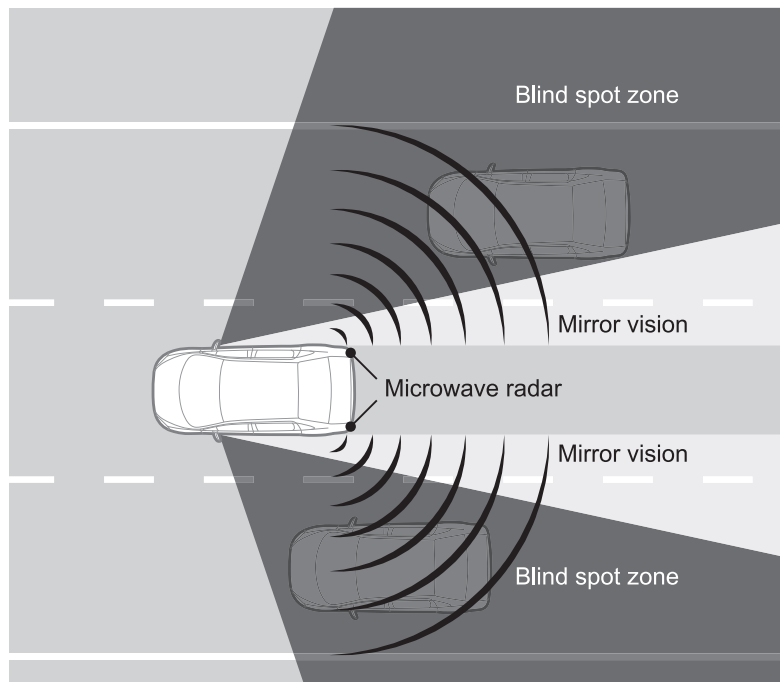
Manual

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Operating principle

This system is using 79GHz microwave radar to warn drivers of approaching vehicles in blind spot zone. This system is most effective when driver is being passed by other vehicles or making a lane change. It can provide visual warning when vehicles are in the vehicle's rear blind spot zones, and provide audible & visual warning if the vehicles's turn signal is on.



Disclaimer

1. This system is designed for warning drivers of approaching adjacent lanes vehicles in blind spot zone, but can not completely replace driver's judgment. Driver should follow the local rules and coupled with good driving habits. Steelmate does not guarantee or assume liability for any accident.
2. Before using this system please read the manual carefully and you should pay attention to page 9~17.
3. This system should be installed by a professional technician.
4. Please perform product calibration and functional test before first use.
5. The system does not work once the moving object relative speed is over 40 km/h, or the obstacle is relative static.
6. Incorrect installation angle or height may occur false detection.
7. Do not add any decoration like anti-rub anticollision on rear bumper.

Specifications

ECU

Operating voltage:	DC 9~30V (Compatibility with 12 & 24 volt system)
Operating current:	<300mA (include sensor and display)
Operating temperature:	-40°C~+85°C / -40°F~+185°F
Storage temperature:	-40°C~+85°C / -40°F~+185°F

Sensor

Operating frequency:	77~81GHz
Operating temperature:	-40°C~+85°C / -40°F~+185°F
Storage temperature:	-40°C~+85°C / -40°F~+185°F
IP rate:	IP67
Maximum detection range:	≤5m / ≤16.4ft
Detection accuracy:	±5cm / ±0.16ft
Installation height:	55±10cm / 1.8±0.33ft
Relative speed range:	>5 km/h and <40 km/h >3.1 mile/h and <24.9 mile/h

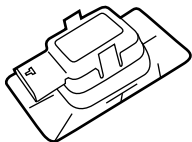
Display

Buzzer sound frequency:	1.0KHz±0.1KHz
Operating temperature:	-20°C~+70°C / -4°F~+158°F
Storage temperature:	-40°C~+85°C / -40°F~+185°F
SPL:	80dB±10dB

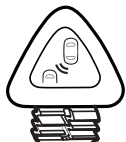
Includes



ECU x 1



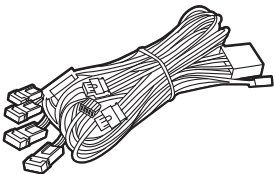
Sensor x 2



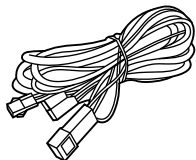
Left display



Right display



Main harness x 1



Display cable x 1



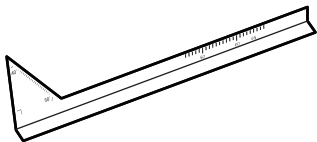
Alcohol pat x 2



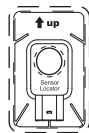
Magnet x 2



Manual x 1



Sensor location
calibration tool X1

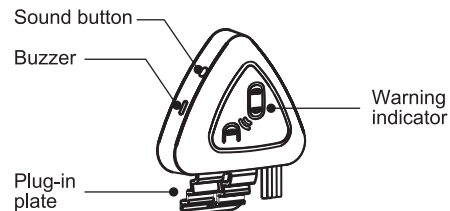


Sensor locator card X1

Tear out from the packaging

Notes:
The above graphics are for reference only. .

Brief look on the display



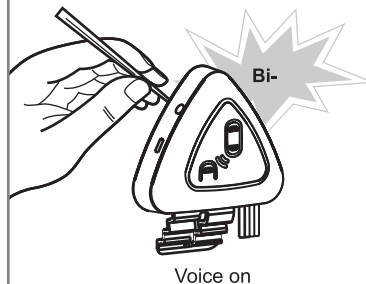
Brightness setting

There are two brightness modes for day and night.

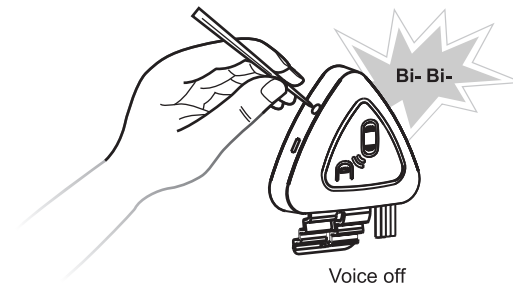
- Day mode: high-brightness when you enter the system (Default setting).
- Night mode: Low-brightness when you turn on the clearance lamp or headlights.

Voice setting

The voice can be turned ON/OFF by pressing the sound button. The display will "Bi" once when voice on and "Bi- Bi-" twice when voice off.



Voice on



Voice off

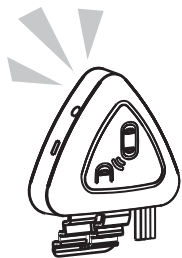
Self-testing function

When power is on, system will test both left & right sensors automatically.

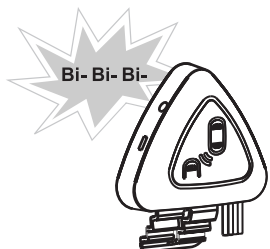
Normal: If two sensors are working properly, both left & right display will flash once.

Issue 1: If one sensor is damaged or defective, the same direction of display will "Bi" for 3 times and always ON, and the other display will flash.

Issue 2: If two sensors are damaged, both left & right display will "Bi" for 3 times and always ON for warning.



Sensor is working properly



Damaged or defective sensor

If there is a sensor is damaged or defective while driving, system will warning the driver immediately.

Issue 1: If one sensor is damaged or defective, the same direction of display will always ON.

Issue 2: If two sensors are damaged, both left & right display will always ON.

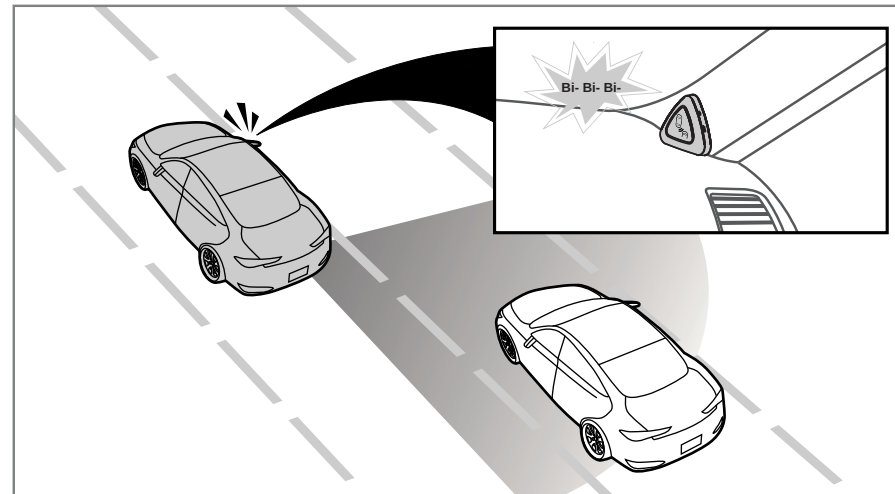
Note: Once a sensor is damaged or defective after self-testing, the other sensor does not enter the working status as well.

How does the system work

When driver is being passed by other vehicles or making a lane change,

If the turn signals is on, the corresponding direction of display will "Bi" and flash for warning while approaching vehicle is closing and enter the detection area.

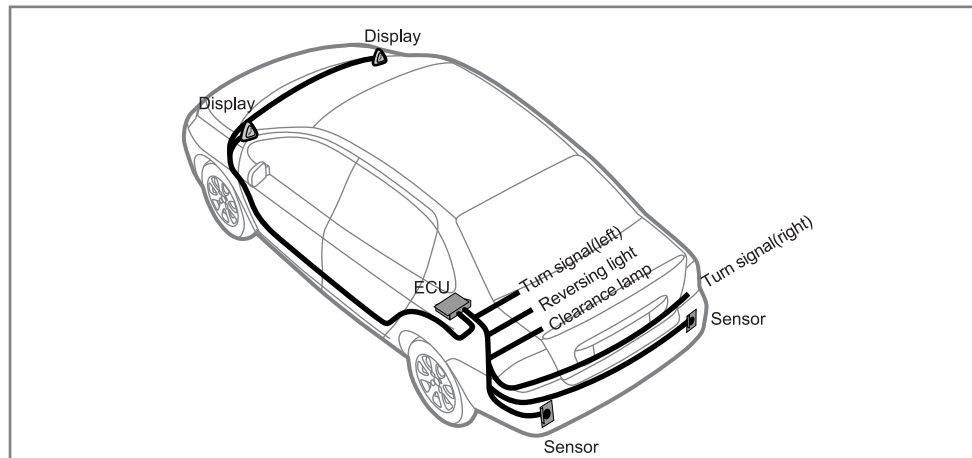
If the turn signals is off, the corresponding direction of display will always ON only for warning while approaching vehicle is closing and enter the detection area.



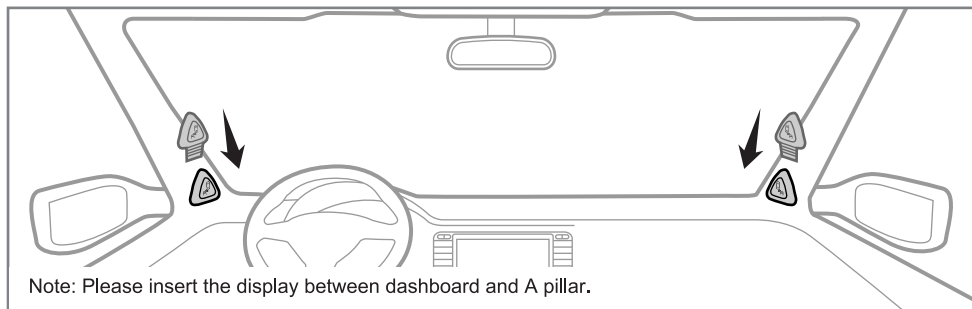
Note:

1. The distance between sensors and moving object is less than 5 meters.
2. The relative speed between vehicle and moving object is $< 40\text{km/h}$.
3. When the hazard warning lights are turned on, both right & left display will always ON only for warning when approaching vehicle is closing and enter the detection area.
4. When vehicle is reversing, the system will be invalid temporarily.

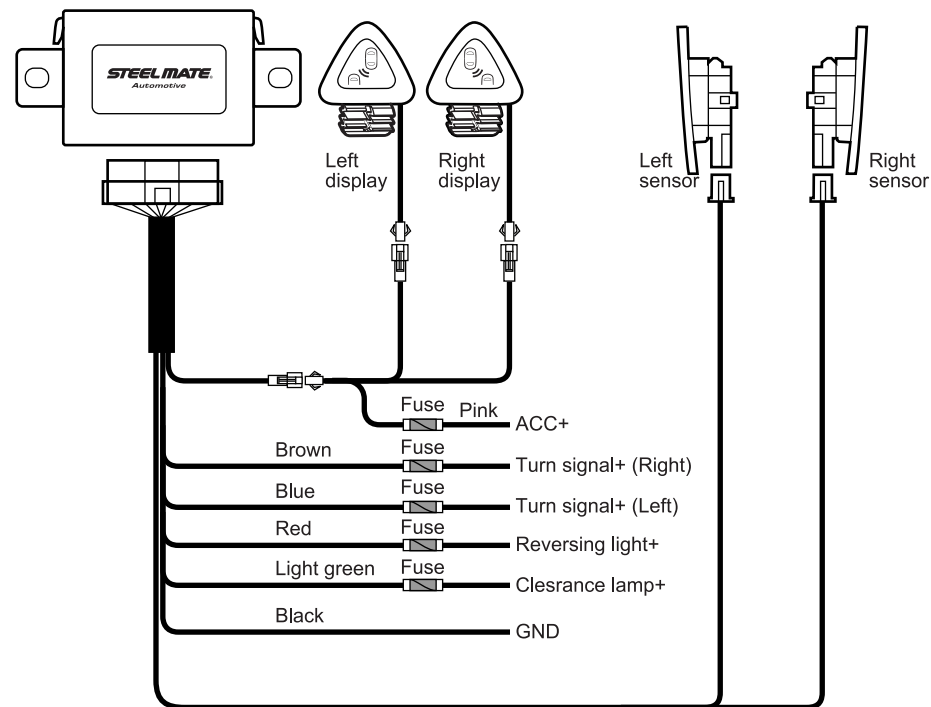
Installation diagram



Display installation

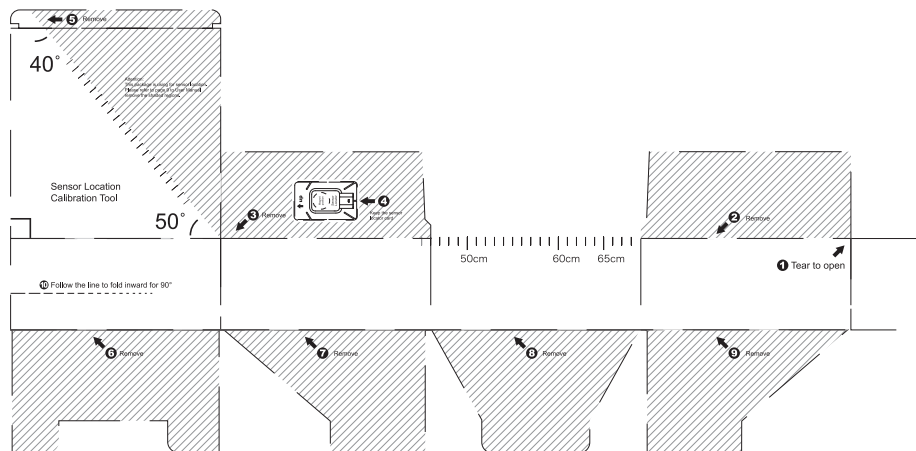


Wiring diagram

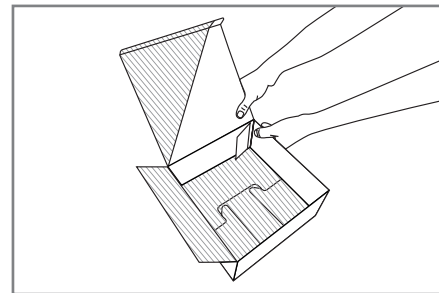


Sensor installation

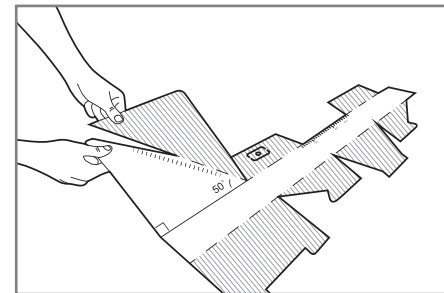
1 Make the sensor location calibration tool



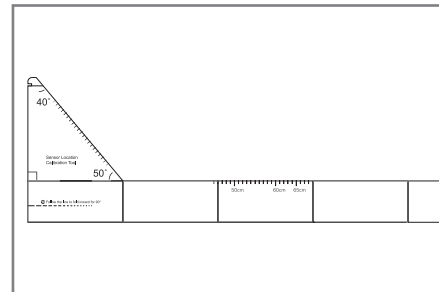
Expanded view



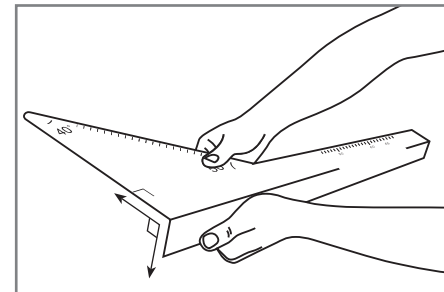
1. Tear along ① to open the white box



2. Remove shaded regions were number ②③⑤⑥⑦⑧⑨

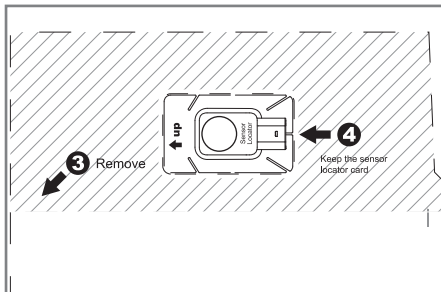


3. After remove the shaded regions, keep the sensor location calibration tool as above

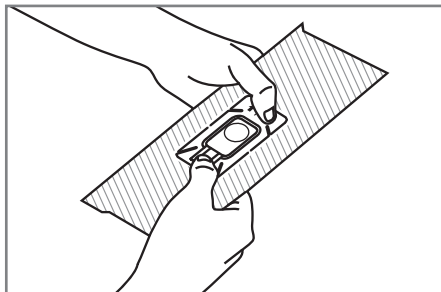


4. Follow number ⑩ to fold inward the calibration tool

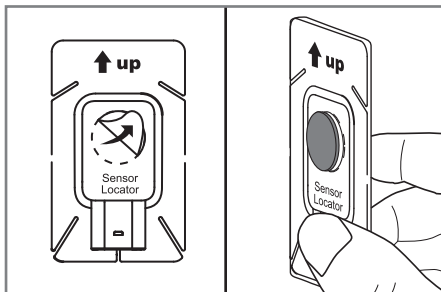
2 Make sensor locator card



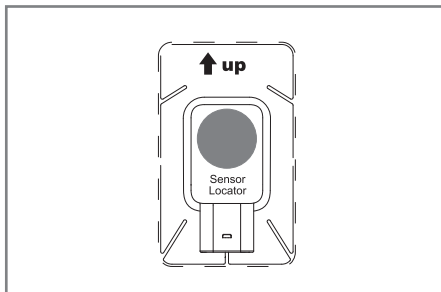
1. Find out the number ③ shaded region



2. Follow the dotted line hollow out the sensor locator card

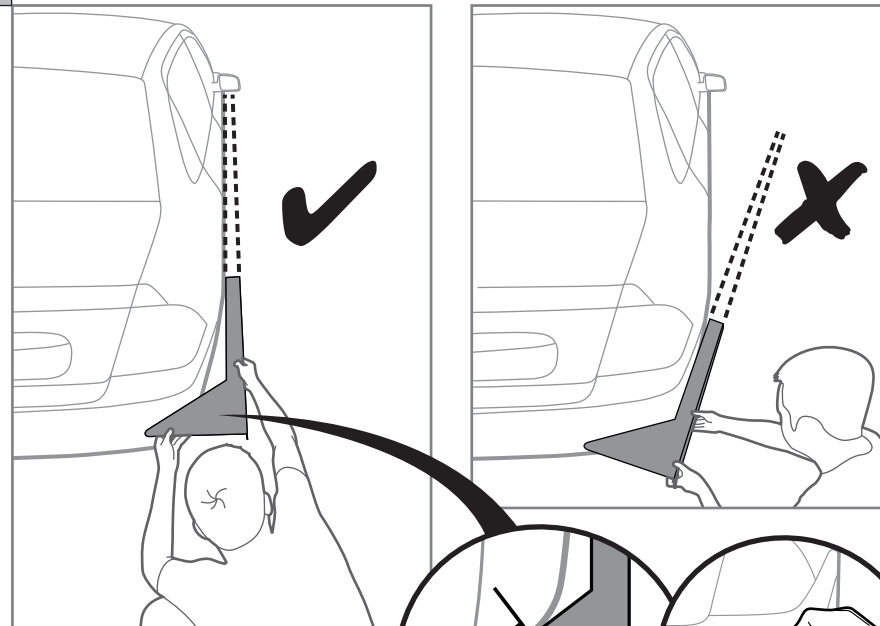


3. Peel off the tape and stick one magnet on it correctly

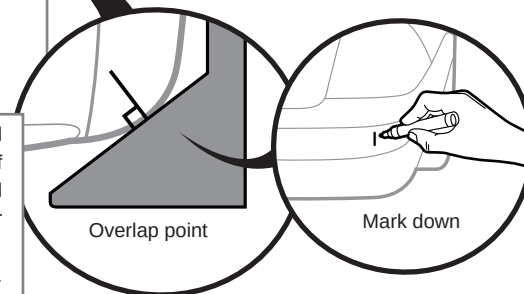


4. Using the sensor locator card to complete step 8 as page 15

3 Find out the sensor installation

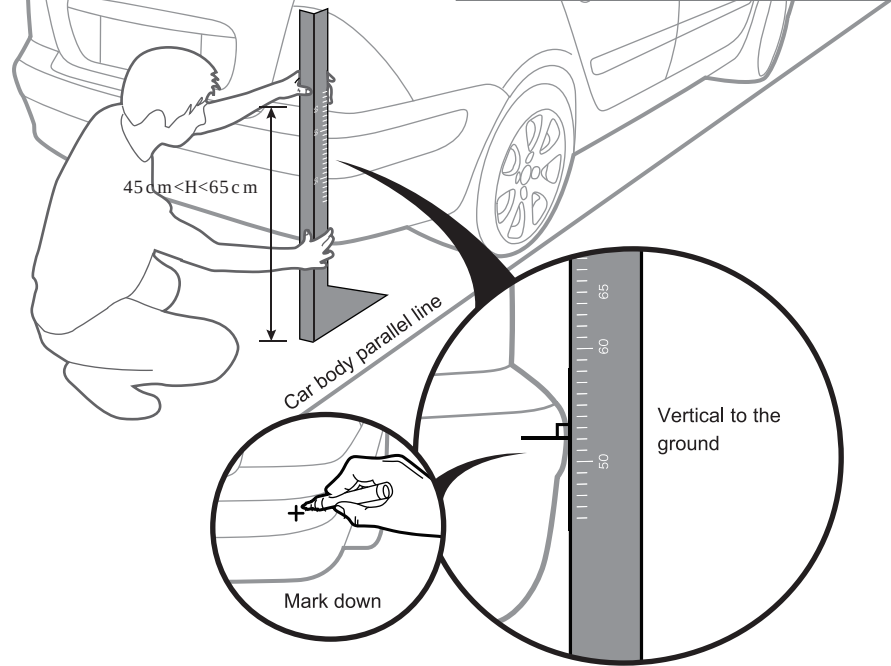


- Make sure the sensor location calibration tool parallel to car body, then the hypotenuse of right angled triangle and rear bumper will overlap. The overlap point is the sensor installation angle.
- Using a mark pen to make marks on bumper.

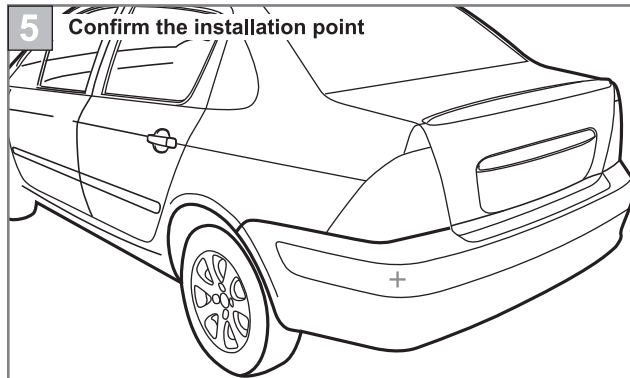


4 Find out the sensor installation height

- Place the sensor location calibration tool as below and mark down the installation height which it's suitable for your rear bumper.
- The recommended installation height is $45\text{cm} < H < 65\text{cm}$ ($1.5\text{m} < H < 2.1\text{ft}$)

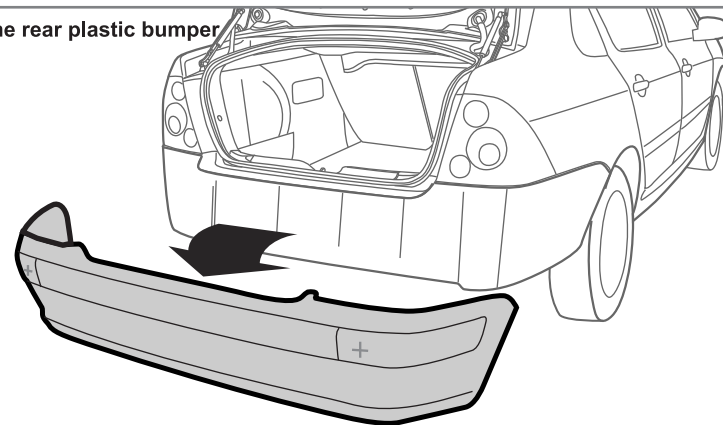


5 Confirm the installation point

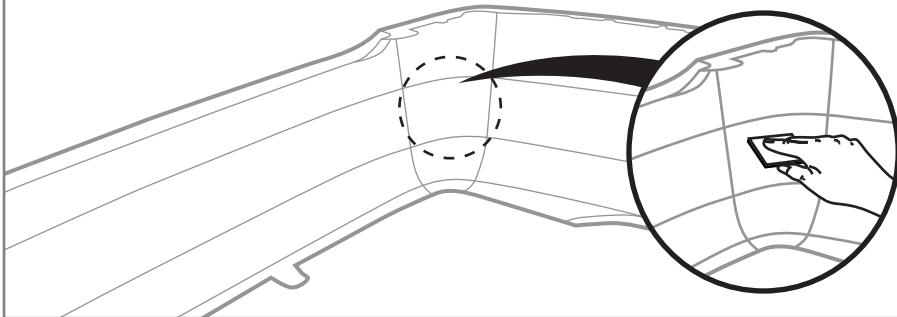


Make sure the installation point at the flat area, and this area should be as perpendicular to the ground as possible.

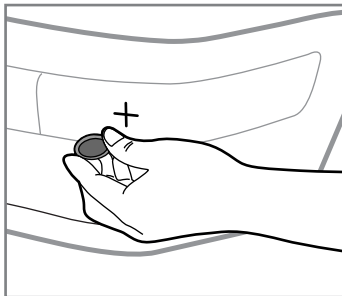
6 Remove the rear plastic bumper



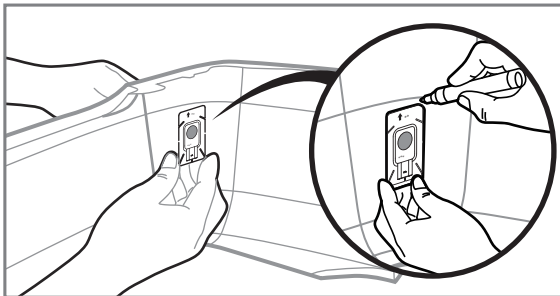
7 Clean the sensor installation area at the bumper



8 Using two magnets to mark down the position

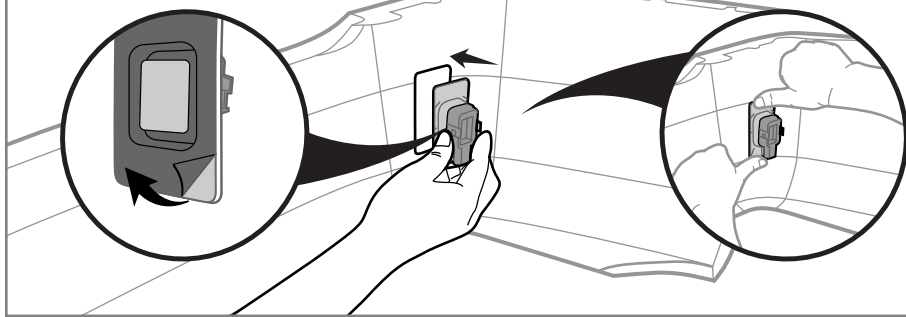


Place one magnet on the sensor installation point, and other magnet be attached at behind the bumper.

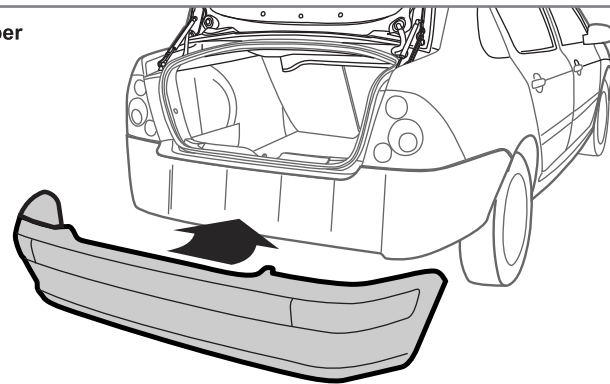


Using the sensor locator card (keeping it upright) mark down the installation position accurately.

9 Stick the sensor on inner bumper



10 Replace the bumper



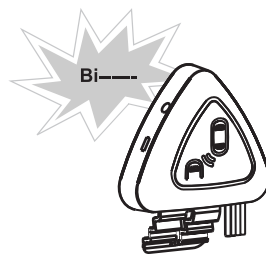
11 Install the ECU and wiring

Install the ECU and complete the wiring as page 8.



Product calibration

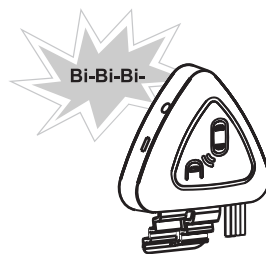
Holding the sound button of left or right display before ACC ON, then ACC ON, the display will "Bi" for 3 seconds and the warning indicator will always ON to complete the product calibration.



Note:

1. Please perform the product calibration after installation.
2. Please restart the vehicle after perform the product calibration. Then, please drive the vehicle and make a functional test, finally this system enter the working mode.
3. Please make sure there is not any obstacle within 2 meters at the rear of the bumper after installation.

Functional test



Functional test is performed by turning on the left or right turn signal light, the corresponding direction of display will "Bi" and flash for warning while moving object is closing and enter the detection area. (The detecting relative velocity has to be over 5 km/h and less than 40 km/h)

Troubleshooting

1. Display without any sound

- ACC did not in ON position
- Fuse damaged
- ECU damaged
- Display damaged
- Turn signal cable is improperly inserted
- Display cable is improperly inserted
- ECU cable is improperly inserted
- The moving object relative speed is lower 5km/h or fast than 40 km/h
- The hazard warning lights are turned on

2. Display light not turn on

- ACC did not in ON position
- Fuse damaged
- ECU damaged
- Display damaged
- Display cable is improperly inserted
- ECU cable is improperly inserted
- The moving object relative speed is lower 5km/h or fast than 40 km/h

3. light always on while there is not moving object.

- ECU damaged
- Sensor damaged
- Sensor cable is improperly inserted

4. Detection area is abnormal

- There is any metal object in front of the sensor
- Installation did not follow the manual
- Stormy weather or heavy snow etc.
- The moving object relative speed is lower 5km/h or fast than 40 km/h

5. Wrong alert

- There is any metal object in front of the sensor

6. Display / ECU damaged

- Please go to the auto repair shop for inspection first.
- If still a problem, please buy a new display / ECU from retailer or Steelmate online shop.

CE warning statement

Remark: This product can be used across EU member states We, STEELMATE CO., LTD. (Steelmate Industrial Park, Heping Street, DongFu Road, DongFeng Town, ZhongShan City, GuangDong, P.R. China) declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

FCC warning statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio / TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF exposure warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This product may not be collocated or operated in conjunction with any other antenna or transmitter