

# MICROWAVE RADAR BLIND SPOT DETECTION SYSTEM

User's Manual

**BOYO<sup>®</sup>**  
VISION

VTBSD2

Version : V2.0



## Catalog










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### Foreword

Thanks for using our BSD system. The System is designed for universal cars, please read this product manual carefully for installing and uninstalling the product.

#### I. Components

NO.	ITEM	QTY	PICTURE
1	Main harness	1PCS	
2	Sensor	2PCS	
3	LED indicator	2PCS	
4	Buzzer	1PCS	
5	GPS Antenna	1PCS	
6	GPS Module	1PCS	
7	Instruction manual	1PCS	
8	Cable tie	A dozen	
9	3M tape	2PCS	

Tools for angle calibration: tape, ruler, angle calibration cloth, marker pen, magnet.

Tools for installing and uninstalling: plastic pry, alcohol, cleaning cloth, insulated tape, multi-meter, screwdriver.



## II. System Specification

NO.	Item	Specification
1	System Configuration	2pcs Radar Sensors 2pcs LED Indicator lights 1pcs Buzzer
2	Alert Range	0.3m~15m
3	System Alert Accuracy	Car : $\geq 95\%$ Motorcycle : $\geq 95\%$ Pedestrian : $\geq 95\%$
4	HMI(Human Machine Interface )	Level 1:LED Stay lit Level 2:LED Blink+ Beep Sound
5	IP Rating	IP6K7K
6	Power Consumption	$\leq 200\text{mA}$ @12VDC
7	Operation voltage	12V
8	Operation Temperature	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
9	Storage Temperature	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$



### III. Install Caution

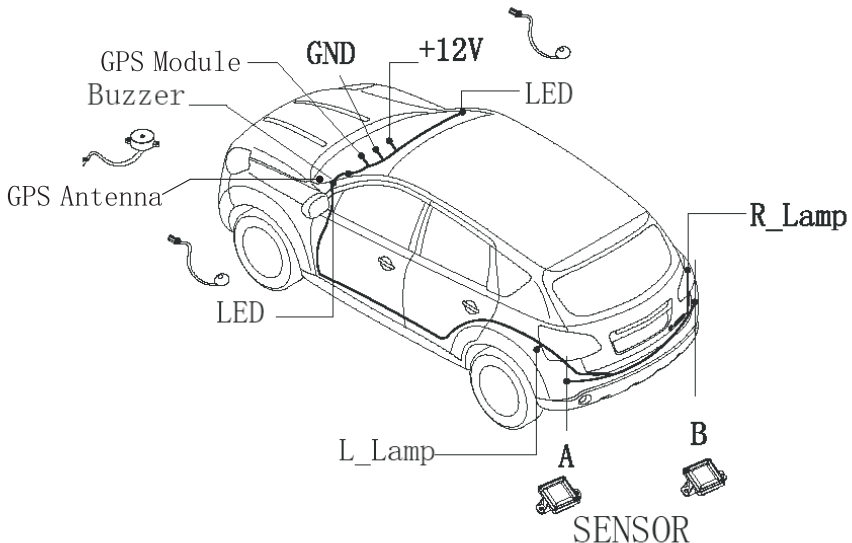
1. Please release negative power before operation.
2. Do not pull the harness when removing the connector, insert the connector to the buckle until a sound.
3. Harness should be fixed with car harness by cable tie.

The installation and disassembly should follow the vehicle maintenance manual and relative operating instruction. Avoid breaking any components of the car, replace the corresponding parts immediately should there is any broken component.

### IV. Requirements for Radar Sensor Setting

1. Radar sensor can only penetrate plastic object (bumper shell).
2. Radar sensor should not be interfered by metal objects.
3. Do not install the radar sensor against fluorescent lamps.

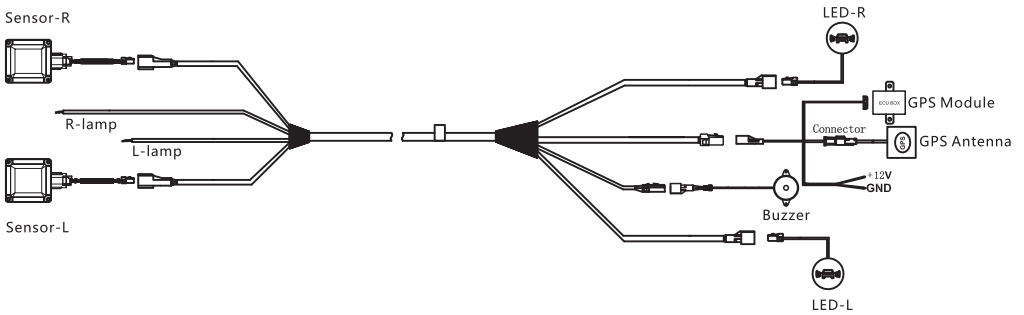
### V. Installation Diagram





## VI. Wires Connection Diagram

BSD+GPS Diagram effect



1. GPS cable have 2 pcs of +12V. one connect to car ACC, another one connect to BSD main harness +12v.
2. GPS cable have two GND. one connect to car GND, another one connect to BSD main harness GND.
3. GPS cable have SPEED wire, connect to BSD main harness SPEED.
4. LED L connect to Left LED indicator.
5. LED R connect to Right LED indicator.
6. Buzzer connect to buzzer.
7. BSD L connect to Left sensor of BSD
8. BSD R connect to Right sensor of BSD
9. L Lamp connect to Left rear lamp(left turn light).
10. R Lamp connect to Right rear lamp(right turn light).
11. Sensor and LED no distinguish between left and right, only with installation location.

## VII. Installation Gist

### 1. Sensor settings

Step1. Sensors of the BSD system should be pasted to both inner corners of rear bumper shell with an angle of  $18^{\circ}$  to  $22^{\circ}$ , at height of 35-90cm.(Fig.1-Fig.3).

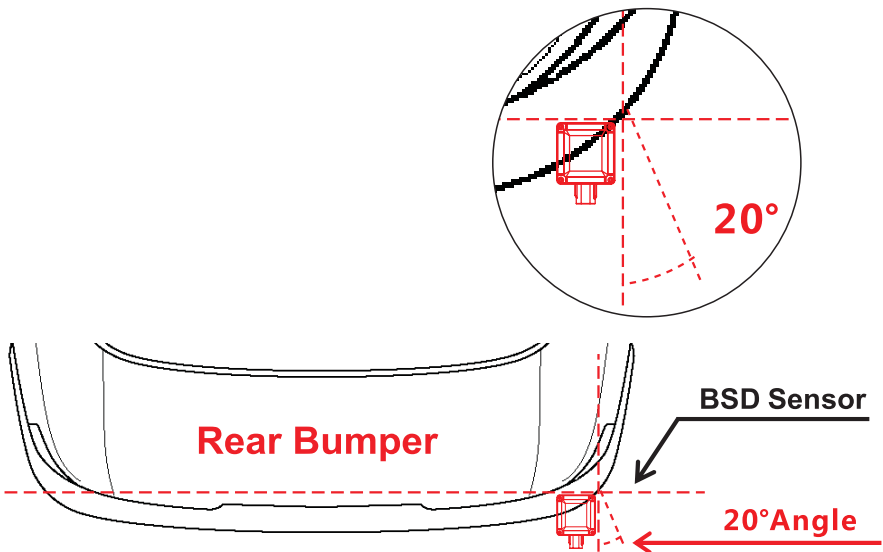


Fig.1 ~ Fig.3

Step2. Place a straight tape between front wheel and rear wheel, then place a  $20^{\circ}$  angle calibration cloth under the rear bumper, the cloth edge should be paralleled with the tape (Fig.4).

Step3. Place a ruler (about80cm) vertically, one side of the ruler should be leaned on the rear bumper, the other side of the ruler should be paralleled with the calibrating lines on calibration cloth (Fig.5-Fig.6).

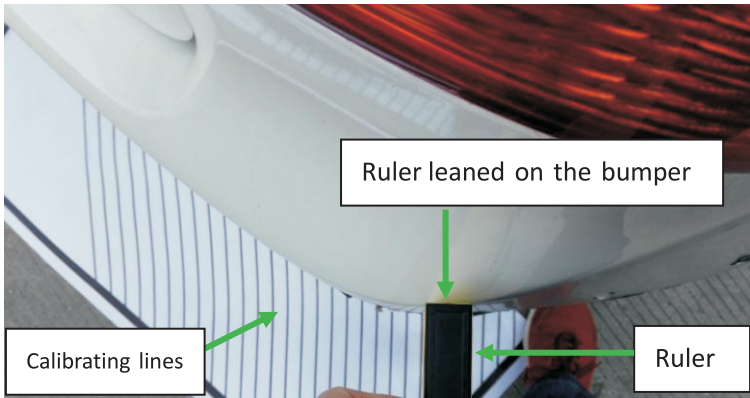


Fig.4-Fig.6

Step4. Mark down the position ruler against the bumper with a marker (Fig.7-Fig.9).

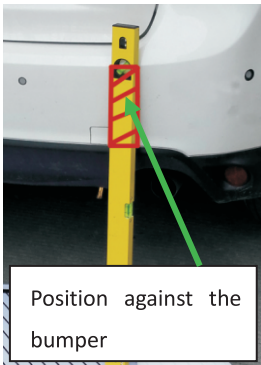


Fig.7

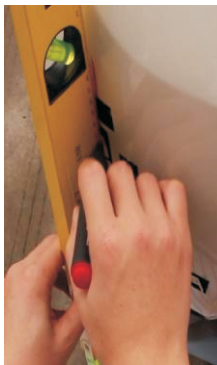


Fig. 8



Fig. 9



Step5. Mark down the position with same method for the other side of bumper (Fig.10).



Fig. 10

Step6. Take off the plastic rear bumper (be aware of scratching on the bumper)(Fig.11-Fig.12).



Fig. 11



Fig. 12

Step7. Clean the installation location of sensor with alcohol (Fig.13-Fig.14).



Fig. 13



Fig. 14

Step8. Prepare 2 pieces of magnetic metal; place one on the line marker outside the bumper and the other one on the corresponding spot inside of it. Mark the location with the marker. (Fig.15-Fig.17)



Fig.15



Fig. 16



Fig. 17

Step9. Clean the plastic surface of the sensor with alcohol and then place a 3M adherent tape on the sensor (Fig.18-Fig.19).

Step10. Stick the sensor to the location of Fig.17 (Step.8). Place the terminal wires of the sensors upward vertically. (Fig.22)

Step11. Install the sensor on the other side with same method

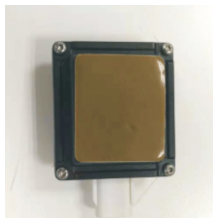


Fig.18



Fig.19



Fig.20

Step12. The wiring scheme of sensor please refer to Fig.21, allow some adjustments due to different cars.

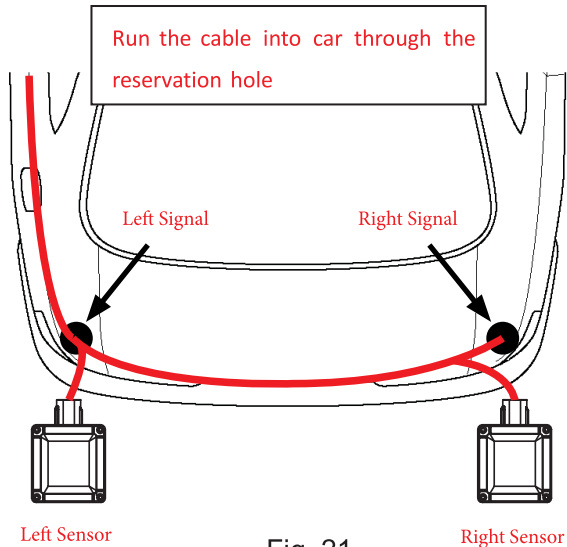


Fig. 21

## 2. Installation of left/right signal lights harness

Step13. Take out the reversing lamp, turn on the right signal light, the right-turn signal light is on, find out the 12v power cable with multi-meter, connect the R\_LAMP in harness cable with the 12v power cable, and connect the L-LAMP in harness cable with the left side power cable. (Fig.22-Fig.24)



Fig. 22



Fig. 23



Fig. 24



### 3. Installation of LED lights

Step14. LED Light is installed at left/right side of A pillar (Fig. 25-Fig. 26)  
26) Install the GPS module as shown in the picture26-1.



Fig.25

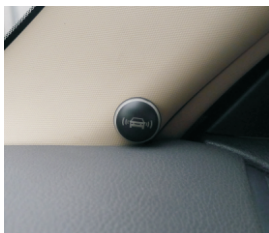


Fig.26



Fig.26-1

### 4. Installation of Buzzer

Step15. The buzzer should be pasted and hidden inside the panel. (Fig. 27)



Fig. 27

Step16. Run the wires based on the installation diagram.



## VIII. Parts Recovery

### Step1. Confirmation of installation condition

1. The wiring and installation shall be checked prior to power connection.
2. Be cautious whether there is excessive pressure, stretch or getting stuck with the wires.

### Step2. Power supply recovery

1. Connect the negative terminal of battery (-) to make sure it functions well.
2. In case of abnormality, check the wiring arrangement.
3. Step3. Restore the cars parts step by step and check every single part to avoid abnormal sound.

## IX. Operation Instruction

1. When the ACC is on, the LED lights on left and right A pillar will be on for 2 seconds, which means the system is powered on. The system will immediately initiate to the environmental adaption detection, after 5-8 seconds system will start to work.(Fig.28-Fig.29)



Fig. 28



Fig. 29

2. When the system is on, the system would start detecting objects in the blind area behind the vehicle (Fig. 30).
  - A. Blind detection on right side :
    1. Right LED indicator will turn on and stay lit when there is object approaching on the right blind area (3m X 15m).
    2. If the right signal light is turned on at this time, the right LED indicator will keep blinking and the buzzer will be on with sound beeping.
  - B. Blind detection on left side :
    1. Left LED indicator will turn on and stay lit when there is object approaching on the left blind area (3m X 15m).
    2. If the left signal light is turned on at this time, the left LED indicator will keep blinking and the buzzer will be on with sound beeping.
  - C. The LED and buzzer would not react if there is no object approaching on both sides.

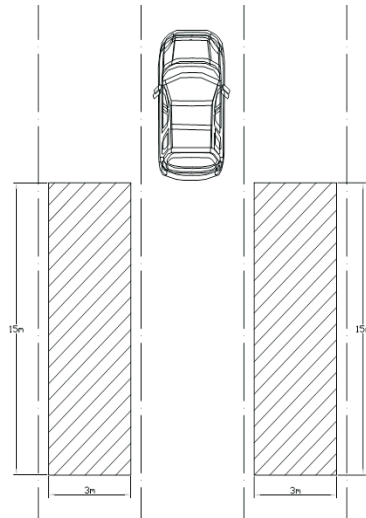


Fig. 30



#### X. Usual malfunction elimination

NO.	Malfunction	Reason	Solution
1	LED light doesn't work	Wrong connection or missed connection on harness	Check the harness and make sure connection is correct
		LED light is broken	Replace LED light
2	Contrary alarm on right/left LED lights	Contrary connection of BSD_L and BSD_R on the BSD main harness	Exchange the connection of BSD_L and BSD_R
3	Buzzer doesn't work	Wrong connection or missed connection on harness	Check the harness and make sure connection is correct
		Buzzer is broken	Replace buzzer