INSTALLATION INSTRUCTIONS

Switchable Parking Sensor
9002-3003

Please read thoroughly before starting installation and check that kit contents are complete.

Items Included in the Kit:

4 Ultrasonic Sensors
Electronic Control Module (ECU)
LED Display with Sounder
¾" Hole Saw
4° and 8° sensor angle adaptors
4 sensor wiring harnesses
ECU Wiring Harnesses
Zip Ties
2 T-taps
These Instructions

Tools & Supplies Needed:

Plastic Trim Removal Tool
Various Socket Drives
Center Punch
Power Drill
Measuring Tape
Soldering Iron & Solder (Recommended)
Tape or Heat Shrink Electrical Tubing

The Brandmotion Switchable Parking Sensor is designed to be a convenience aid to assist in parking your vehicle near other vehicles and obstacles. It is not a safety system. Normal visual vigilance while parking is still recommended.

Safety Precautions:

- Work in well ventilated area that is clear of obstructions.
- Secure vehicle with tire chucks in both front and rear of tires.
- Turn vehicle accessories OFF and ensure ignition key is in OFF position.
- Wear safety goggles and snug fitting clothes.
- Use tools only for their intended purpose and which are in good repair.
- Only perform this task if confidence, skill, and physical ability permit.

NOTE: We strive to provide accurate and up-to-date installation instructions.

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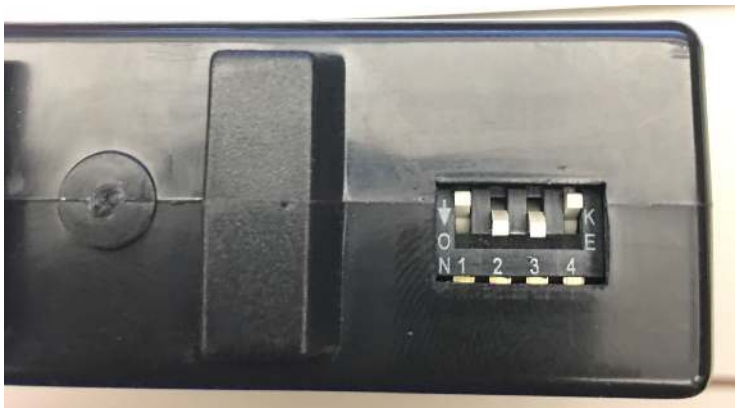
SET DIP SWITCHES BEFORE STARTING INSTALLATION

Please note: Dip switch adjustment and sensitivity adjustment may be covered by a Q/C sticker or rectangular silver sticker. Please remove sticker to access adjustments. Removing these stickers will not void your warranty.

For Rear Parking System:

1	Down	On
2	Up	Off
3	Up	Off
4	Up	Off

For Front Parking System:



1	Up	Off
2	Down	Off
3	Down	Off
4	Up	Off

NOTE: If you have a rear mounted spare tire, set dip switch 4 in the DOWN position

1. **Sensor installation**
   a. **Remove bumper fascia from vehicle. Use manufacturer recommended procedure** **NOTE: Before you drill any holes into the fascia you must check to see if the sensor locations will have any interference with the sensor installation (such as metal beam, braces, bracketry).** You may have to move the sensor slightly left or right to avoid the interference. If it is just interference from foam material, you may have to carve out space for the sensor. Ensure that there is enough clearance around the sensor to allow for movement**.**

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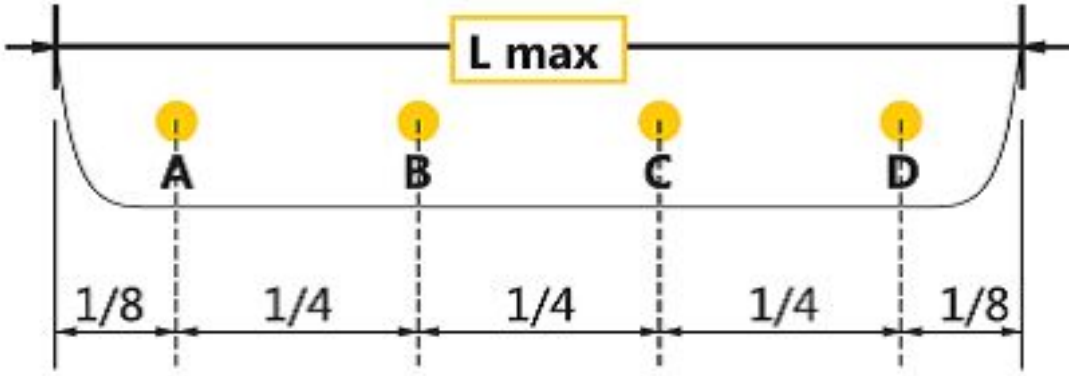
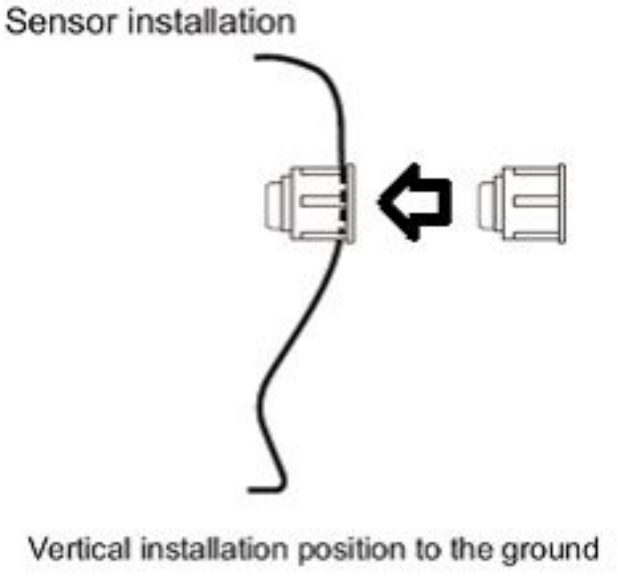
b. **Locate where to drill holes for sensors**

i. Space 4 sensor positions equidistant apart horizontally apart from both sides of bumper. The two outside sensors must be angled towards the sides of the vehicle in order to detect obstacles on the outside. If installing on front of vehicle, angle them 30º-45º. If installing on the rear, angle them 20º-30º.



ii. The sensors must be positioned on an area of the bumper that has a flat vertical surface. The front surface of the sensor should point roughly 9º above parallel with the ground to avoid the ground triggering the sensor. You can use included adaptors to achieve an adequate upward angle. If changing adaptors is needed, make sure the rubber O-ring is installed on the sensor after the change is made.



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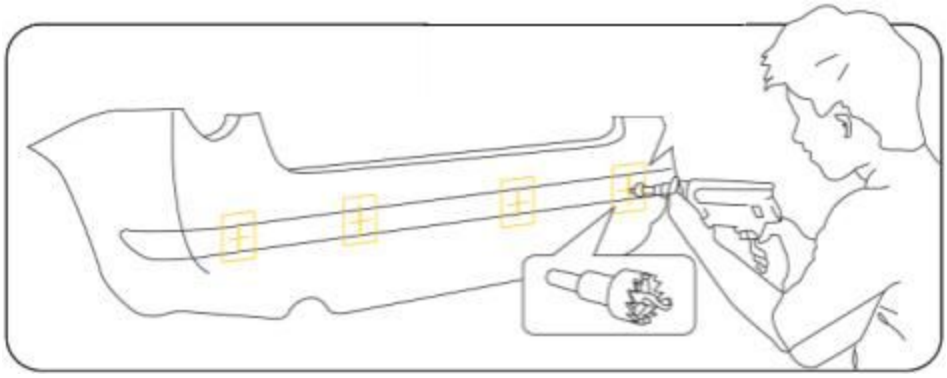
iii. **Back of sensor should be marked "UP".**

c. **Prepare the bumper (fascia) for the hole drilling. A ¾" hole bit is supplied. Mark sensor locations from step 1b. After drilling holes clean any excess material.**



d. **Insert sensors into the drilled holes. They should press firmly into place. If not, lightly sand and clean to open the hole Label the ECU connector end of the harnesses before running them to the cab. This will simplify the ECU connection process later on.**
    i. **Label them A through D, A on the drivers side and D on the passenger side. This is the same for both front and rear applications**
e. **Reinstall the bumper (fascia) onto the vehicle. Route the sensor wires to the drivers side, under the dash. If coming from the front, it is recommended that a factory grommet is used. If a new hole is needed, be sure to use a rubber grommet and seal the hole once wiring is run through. Be careful in routing the sensor wiring so they do not get pinched and to prevent them from chaffing.**

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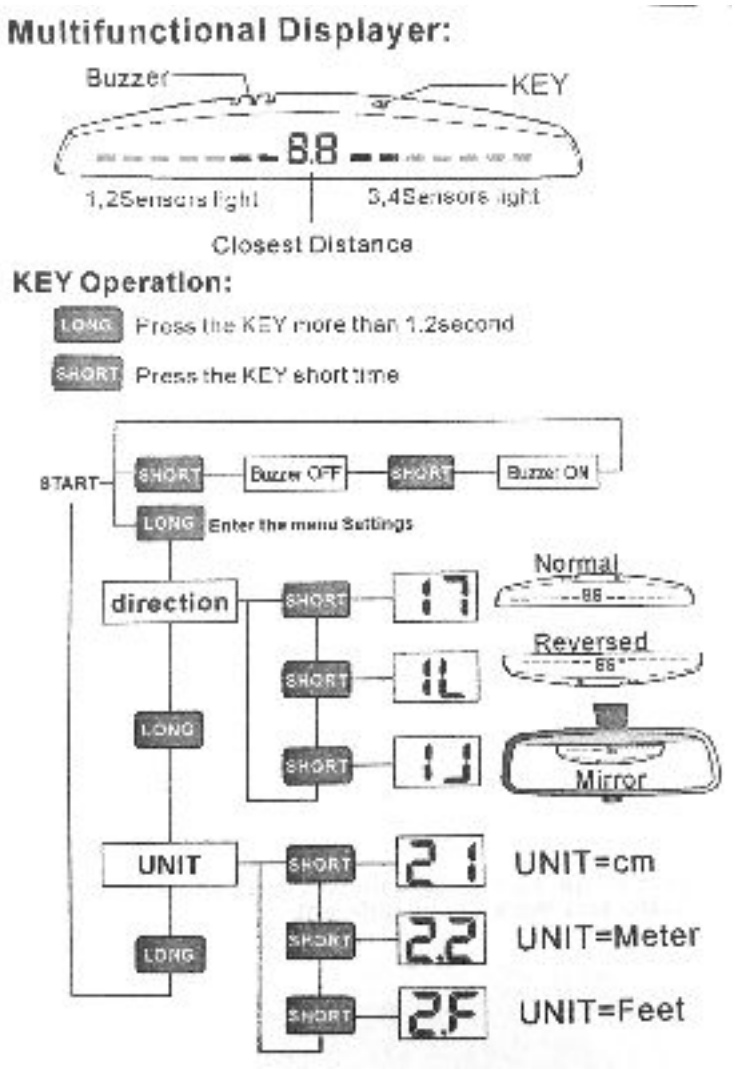
2. Multifunctional Display

a. **Find a location that suites desired application and mount with supplied double-sided tape then run harness to the drivers side, under the dash. Refer graphic below for placement and setup**



3. ECU Sensor/Display Connections

a. **Without Mounting the ECU, connect the Display and Power harnesses in the labeled positions.**
b. **Using the labels placed on the Sensors in step 1e, connect the sensor harness in their labeled position.**

4. ECU Wire Connections (Solder connections recommended)

a. **For front sensor installation:**

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i. **Red connected to 12v accessory**
ii. **White connected to Brake**
iii. **Black connected to Ground**

b. **For rear sensor installation:**
i. **Red connected to Reverse**
ii. **White is not used**
iii. **Black connected to Ground**

5. Mounting ECU

a. **Using supplied velcro, mount the ECU somewhere in the drivers side footwell. Be sure to choose a location that is both out of the drivers way and easily accessible. You may need to use the sensitivity adjustment after testing.**

General Comments:

1. **Drive slowly backwards to test. Measure detections to obstacles or vehicles with a tape measure. Note the actual measuring range is very deceiving to the driver. In general, you are further away than you think!**

2. **Use a large size test obstacle, such as a large diameter pole. (Greater than 6 inches in diameter), or a wall (perpendicular).**

3. **Certain objects will be harder to detect, depending on its size, angular shape (geometry), and material.**

4. **Sensitivity can be adjusted with the dial located on the side of the ECU, next to the dip switches. (dial may be covered by a small sticker out of the box)**

5. **If many false alarms are heard then it may be due to:**
   a. **Sensors are pointed downwards at the ground. They should be at zero degrees or pointed slightly upwards a couple degrees.**
   b. **Certain road surfaces, gravel, large bumps in road.**
   c. **Driveways slanted up or down, curbs, bushes.**
   d. **Sensors covered with snow, ice, dirt, mud, paint, grease, heavy rain.**
   e. **Metal bumpers may require an isolator ring for each sensor.**
   f. **Loose sensor.**
   g. **Interference from other noise source, RPA system, ultrasonic range devices.**

Sensor painting guidelines

The following guidelines are issued to assist commercial and private customers in the painting process for ultrasonic sensors.

I. Critical sensor areas (ref Fig. 1)
   a. Aluminum membrane, vibrating surface
      i. Sensitive to paint thickness, uniform coating
      ii. Must be isolated from bezel body, bumper/fascia
      iii. Should be free of contamination
      iv. Corrosive coating
      v. Primed to accept paint
   b. Acoustical isolation gap, may be air, silicone or rubber
      i. Isolates membrane from bezel
      ii. Should be kept clear
   c. Plastic Bezel
      i. Primed

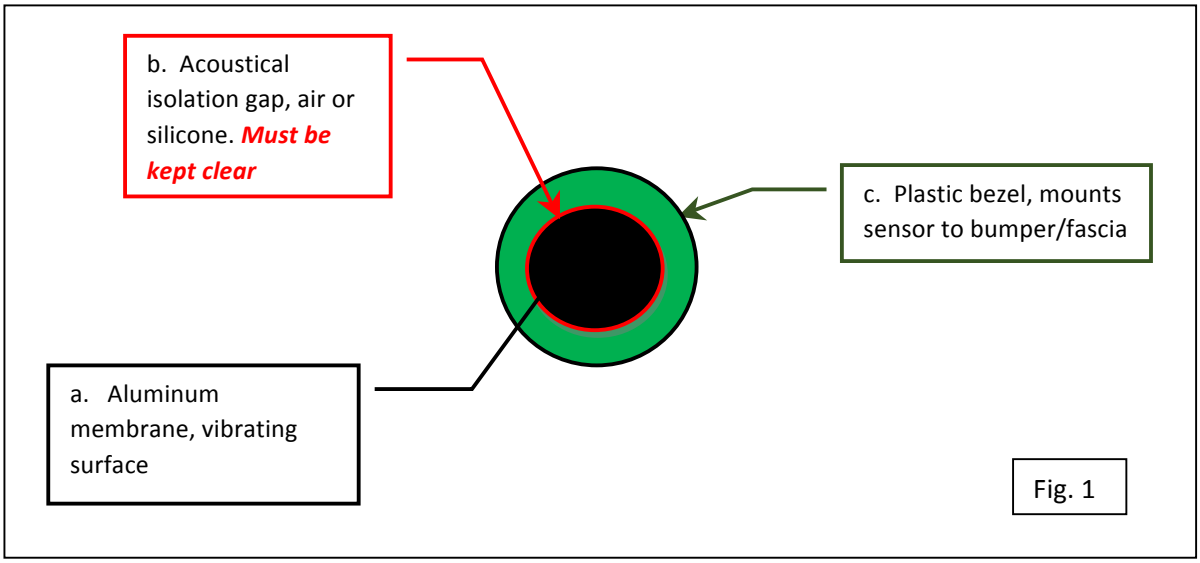


Fig. 1

II. Paint selection
   a. Sensors should be primed as received
      i. Aluminum membrane has anti-corrosive coating
      ii. Plastic surfaces primed
   b. Paint compatible for plastic and aluminum?
      i. Color match
      ii. Adhesion

c. Is clear coat required?
d. Check manufacturers specs, paint should be automotive grade
e.

III. Prepare sensor for painting
   a. Clean surfaces to be painted (alcohol) & dry
   b. Mount sensors & bezels in a rack or suitable fixture
   c. Paint and sensor should be acclimated to surrounding temperature for 1 hour prior
      i. Room temperature (70 – 90 degrees F)
      ii. Dry environment
      iii. No air movement other than for fume removal

IV. Paint process
   a. Consistent spray pattern
   b. Uniform distance, & strokes
   c. 2 coats max

V. Sensor inspection after painting
      i. Uniform coating
      ii. Color match
      iii. Smooth shiny surface, no signs of dust or blemishes
      iv. No drips or orange peel effect
      v. No paint bridge across acoustical gap

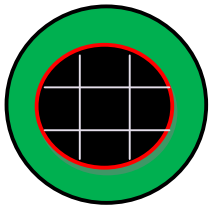
VI. Final system operational test after paint
   a. Install sensors into a test jig or vehicle
   b. System should detect target out to maximum range

Addendum: Validation of Paint Process

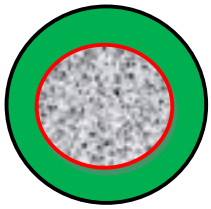
The following tests are recommended to validate the paint process

I. Film Thickness
   a. Maximum coating thickness 125 micro meters
   b. No more than 2 coats

II. Paint adhesion
   a. Cross hatch score test
      i. Score sensor surface with razor knife
      ii. Apply masking tape to surface & pull away from sensor
      iii. Should not pull remaining paint off surface



   b. Orange peeling, should be smooth across entire surface



III. Resistance to:
    a. Soap & Water
    b. Wax or polish
    c. Gasoline, oil, glycol, windshield washer fluids
IV. Mar Resistance
    a. No permanent damage with slight rubbing on surface
V. Stone chip resistance
VI. Environmental
    a. Thermal Shock (hot and cold extremes)
    b. UV resistance
        i. Color does not fade over time