



Fleet Safety Technologies • Collision Avoidance Systems

Owner's Manual

Installation & Operating Guide

MODEL SP70

Heavy Duty Reversing Sensor System
for Commercial Vehicles
One Wire with Hi-Lo Install Switch

Version 2

Version 2
Revision Date:
11/05/2019

INSTALLATION INSTRUCTIONS & OPERATING MANUAL

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Your VRS Sonar Parking Aid system utilizes the latest technology and quality components to provide you and your business with years of reliable service. A great amount of care went into building your Sonar Parking Aid system. Please take the time to read the manual carefully before installing, as we want you to be as proud of your installation, as we are of the product. Thank You, for your purchase and safe motoring, from all of us at VRS Fleet Products.

SYSTEM OVERVIEW

FUNCTIONAL SPECIFICATIONS:

The sensors operate both as transmitters and as receivers, which send an ultra high frequency sound wave (sonar) that is reflected off an object and received. The distance from the obstacle is evaluated through the transit time of the signals and is indicated by a sequence of pulse tones, the closer the obstacle, the faster the sequence of pulse tones as well as the Voice Distance Indicator (VDI) that verbally indicates the distance to an obstacle to the driver.

WARNING: This reversing aid system is designed to supplement other safety practices by enhancing driver awareness of difficult to see areas. Failure to operate the system in the in the manner specified in this manual could result in personal injury property damage or possibly death. Always inspect behind and below your vehicle prior to backing up to eliminate the possibility of property damage and/or bodily injury. Always use caution when backing up. The responsibility for safe vehicle operation will always remain with the driver.

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DETECTION ZONES:

When the vehicle is put into reverse, the system will sound one quick “BEEP” to alert the driver the system has been activated. The system will alert the driver to the presence of an obstacle when it is within one of the nine (9) detections zones. The following describes each zone:

Zone	Distance from Bumper	Audible Tone	Voice Alert
1	12 to 9 Feet	1 beep per second	Twelve (12 Feet
2	9 to 6 Feet	1 Beep per second	Nine (9) Feet
3	6 to 5 Feet	2 Beep per second	Six (6) Feet
4	5 to 4 Feet	2 Beep per second	Five (5) Feet
5	4 to 3 Feet	2 Beep per second	Four (4) Feet
6	3 to 2 Feet	3 Beep per second	Three (3) Feet
7	2 Feet to 18 in	3 Beep per second	Two (2) Feet
8	18 in to 12 in	4 Beeps per second	Eighteen (18) Inches
9	12 Inches	4 Beeps per second	Twelve (12) Inches
10	less than 12 inches	Continuous Beep	“CRASH”

NOTE: All measurements are approximate. Due to an objects’s composition, position, shape, size or angle, the reflected signal may be affected.

When a target moves entirely out of the detection area, the system will stop alarming. This reversing aid system will alert the driver to moving or stationary objects. The system is deactivated when an object movers out of the detection area.

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Object in Blind Area: When an object moves across the path or away from the path of the sonar sensors, it will announce “Object in Blind Area” repeatedly. This is a built in safety function that means the sensors have picked up a moving object or perhaps a person in possible range. Drivers should take the vehicle out of reverse, place it in park and visually check out the area. Taking the transmission out of reverse disengages the system. This will clear the “Object in Blind Area” voice warning & reset the system.

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Important Notice!

1. Do not reverse at HIGH speed. Reversing at high speed does not allow time for the sensors to transmit and receive sonar signals and then calculate distances between your vehicle and impact objects. Safe reversing that allows the system to work effectively should occur at speeds under 8 miles per hour.
2. Execute regular checks on your sensors for any dirt or snow; always keep your sensors clean.
3. In case of water drops on the surface of the sensor (e.g., washing, raining ...etc.) the sensitivity may be decreased by about 20% until water evaporates.
4. Keep all the cables and sensors away from the vicinity of high temperature objects such as engine or exhaust pipes which could cause system failure.
5. The system engages when the vehicle is placed in reverse. A confirmation Beep” sounds each time the vehicle is placed in reverse. This informs you that the system is activated.
6. The system will start detecting larger objects at 12 feet. Objects like another vehicle or a fence. The most effective detecting area is 5 feet. The system will count down 12ft, 9ft, 8ft, 5ft, 3ft, 2ft, 18 inches and 12 inches. Under 12 inches it will announce “CRASH”. This system is accurate to within +/- 2 inches.
7. All four sensors have the full 12-foot maximum detection range.
8. When backing at an angle, the system will sometimes announce 2 different distances. A low object, like a curb, could cause this. This will also happen when two sensors pick up the same object on an angle. Always go by the shorter announced distance.
9. System components are complex, opening by user may damage its completeness. VRS Fleet Products LLC shall NOT take any responsibility for equipment that has been tampered with by the end user.

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WHEN OBSTACLES MAY NOT BE DETECTED:

Due to the obstacle's position, angle or size, the reflected signal may not reach the receiving sensor. Complex reflections may also occur in a complex environment causing inaccurate detection. See examples.

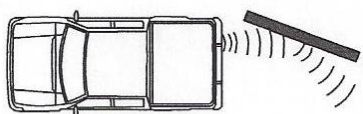
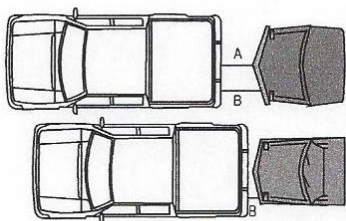


Low lying obstacle

The system will detect areas B and C but not area A



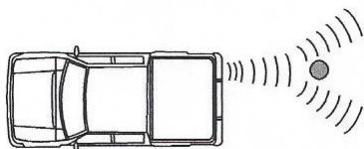
Complex environment: B will be detected but A cannot be detected. Distance A will be detected first, then distance B, as the car reverses. However, as the car nears, A will fall into the sensor's blind zone. In such cases, the system will misjudge B as the closest distance.



When the car approaches a glass wall (or any other smooth surface) almost paralleled to the body of the car, the wall may not be detected as most of the signal is reflected away.



When the car approaches a smooth slope, the slope may not be detected.



The system may not detect a small, round, smooth pole.

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PARTS IDENTIFICATION:



1. Speaker – 1
2. Processor – 1
3. Hardware Package – 1
4. Heavy Duty Sensors – 4

Before Beginning Installation, familiarize yourself with the installation instructions and system components. To ensure your safety:

- A. make sure the vehicle is in “PARK”.
- B. Apply the emergency brake.
- C. Place wheel blocks behind the rear wheels.
- D. If you lift the vehicle, be sure to use jack stands and follow the vehicle manufacturer’s instructions.

Caution: It is advisable to disconnect the negative battery cable for 3 minutes before beginning installation to avoid unintended air bag deployment. Note and record any anti-theft radio codes prior to disconnecting.

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INSTALLATION OF SENSORS:

WARNING! THE MOUNTING POSITION OF THE SENSORS IS VERY CRITICAL. IMPROPER INSTALLATION DIRECTLY AFFECTS THE PERFORMANCE OF THE SYSTEM. PLEASE READ AND FOLLOW THE INSTALLATION PROCEDURES CAREFULLY.

FINDING THE BEST POSITIONS FOR THE SENSORS AND DRILLING THE HOLES:

The sensors should be placed on the bumper at a height of between 16 and 30 inches from the ground to be most effective. You have some leeway with regards to height to place them on the bumper or in the back of the truck, it must be noted that the sensors operate best when the flat part of the sensor is perpendicular to the ground. Meaning that you MUST install the sensors on a vertical surface or the sensors will not point straight out. Try to find the best part of the bumper or truck that will allow this. If you are installing 3 sensors on the bottom and 1 on the top right corner for low overhangs, put both end sensors 10-12 inches in from the side and locate the center sensor evenly spaced between the two end sensors.

If placing all 4 on the bottom, put the two end sensors 10-12 inches in from the end of the bumper or truck and space the center sensors approximately 36 inches from the end of the bumper on each side. The two center sensors should be approximately 24 inches apart from each other.

DRILLING THE HOLES:

Once you have determined the sensor positions mark the drilling points with the stick-on markers provided being sure the end marked downward is positioned correctly. Use a center punch to start the hole prior to drilling. This will keep the drill bit from drifting. Use a 7/8" inch drill bit.

You will also need to drill the holes for the stainless-steel mounting screws which are included in the kit. Disconnect the sensor head from the cable by holding the sensor head and unscrew the plastic coupling on the back side. **“Do not turn the sensor head itself”**. Using a small flathead screw driver, remove the plastic cover from the sensor to reveal the holes for the screws. Place the sensor in the hole to mark the placement of the holes for the mounting screws. Be sure the word PORON is at the bottom in a horizontal position. Mark the two holes on the bumper and drill a starter hole for the screw.

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SETTING THE SENSORS INTO THE BUMPER:

Once you have completed the drilling, reattach the sensor head to the cable being sure to set the sensor into the rubber seat provided. Align the holes in the sensor with the holes in the rubber seat. Pull the entire sensor cable through the hole and then place the sensor on the bumper with the word PORON on the bottom of the sensor. The neck of the sensor head should be in the middle of the drilled hole and not touching any metal part of the bumper. Once attached to the bumper pop the plastic cover back on the sensor head. Make sure when the cap is snapped in that the rubber flange around the gray sensor is not compressed.

Labels are included to mark the ends of the sensor cables. Starting from left go to the right, label the sensors 1 through 4. This is to be able to identify the cables when they are plugged into the processor as it is critical they are plugged into the correct ports on the processor. Holding the processor with the ports facing you, the left port should have the sensor on the left side of the bumper.

IMPORTANT NOTE:

THE SENSORS MUST BE POSITIONED TO POINT STRAIGHT OUT DIRECTLY BEHIND THE VEHICLE. IF THEY ARE INADVERTENTLY POINTED TO SOME DEGREE IN A DOWNWARD POSITION FACING THE GROUND, YOU WILL EXPERIENCE FALSE READINGS.

SYSTEM WIRING:

Check to see where the reverse lamp is at the rear of the vehicle and locate the wiring to the bulb. You may need to remove the reverse lamp assembly to get access to the wiring. Make a note of the connecting color of the positive wire. It is usually green or black with a red or purple stripe. (This color coding varies with makes and models. If you are unsure, contact your local OEM dealer and they can advise). Connect into the reversing lamp's positive wire with the processors "RED" wire. Ground the processors "BLACK" wire to the body or chassis or into the reversing lamp's ground wire. **Processor needs to be connected to reverse power only.**

MOUNTING OF THE PROCESSOR:

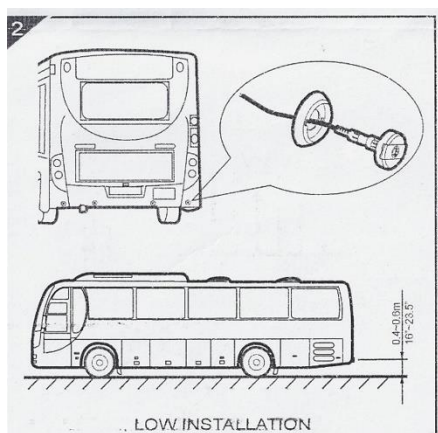
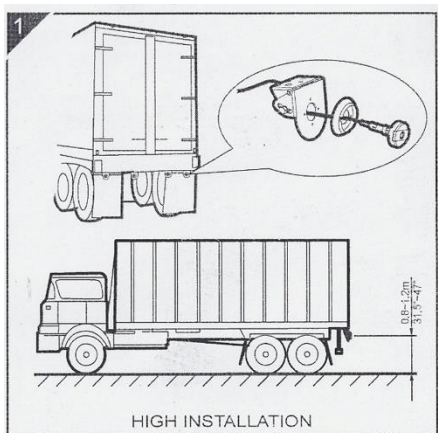
The processor can be mounted inside or outside of the truck. Processor is completely weather proof. Bolts & screws are provided to secure the processor to the truck. Keep enough room in front of the processor ports to install the sensors. Check the position of the sensors to confirm all sensor cables will reach the processor.

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HI-LO INSTALLATION:

Sensors can be installed in a High or Low configuration. A low install would be a distance from the ground of 20 to 30 inches. A high install would be greater than 30 inches. If placing one sensor at the top of the truck, do not consider this sensor when determining High or Low.



On the processor, there is a white wire. This is the Hi-Lo switch. For a High sensor installation, connect this wire to ground. For a low installation, do not connect. Secure the wire so it is out of the way.

WIRING SENSORS TO THE PROCESSOR:

You have already mounted the sensors and labeled the wires. Now run the wires to the processor. Ensure that your wires are in a loom and are protected... **DO NOT** wrap the sensor wires “around” any existing wiring loom or harness. Connect the 4 sensor ends to the processor paying close attention to the labels you previously applied. The ports are also labeled accordingly on the processor. You should hear a “double click” when the sensor is properly snapped into the port. **Be sure to connect the sensor ends from left to right in the same position they are placed on the bumper.**

MOUNTING OF THE SPEAKER:

The speaker can be placed anywhere in the interior of the cab, ideally within 2 to 3 feet of the driver. Connect the black wire to Ground. Connect the red wire to the 50-foot red wire. Then loom (loom not provided) the speaker wire to the back and connect to the yellow wire on the processor.

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BLIND AREA ALERTING:

As with all sensing systems there are blind areas in the sensing patterns due to the cone or triangular nature in the way the sonar pulse is emitted. Whenever an object moves from a covered area and into one of these blind areas a special warning alert message and a very loud tone “**OBJECT IN BLIND AREA**” will be transmitted twice or until the operator takes the vehicle out of reverse.

OPERATION AND TESTING:

1. Back your vehicle at least 15ft away from a wall or flat surface.
2. Shift the vehicle into reverse gear. The system will emit a tone indicating it has been activated. Slowly begin moving in reverse.
3. As the vehicle reaches the effective distance of 12ft or less the system will begin emitting a warning sound.
4. As you continue backing, the system will count down from 12 ft. down to 12 inches.

TROUBLE SHOOTING:

- **No Power** - Check power input wire and ground wire. Make sure power wire is connected to a reverse trigger. Ground to a proper ground source. Red Light on the processor should be on when vehicle is in reverse.
- **Sensor(s) not responding or giving erratic distance** - unplug all sensors and replace one at a time to determine if there is a defective sensor. A loose or improperly connected ground can give cause the same response. Check to make sure the plastic screw cap on the sensor is seated properly and not compressing the rubber flange.
- **False Reading** – Be sure the sensors are all pointed straight back and not Tilted to the ground or off to the side. Make sure the notch in the sensor bezel is in the 6 o'clock position. (PORON is horizontal).
- **No Sound** – Make sure the speaker is plugged into the processor. If you are using an extension, check the connection between the speaker and the extension. It is probably a good idea to use electrical tape on the connection to be sure vibration doesn't pull the connection apart.

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LIMITATION OF LIABILITY:

VRS Fleet Products LLC (Hereinafter called “VRS”) will not be liable for any claims, actions, suits, proceedings, costs, expenses, damages or liabilities arising out of the use of this product. The sole undertaking of VRS is limited to providing the product and services outlined herein in accordance with the terms of this agreement. The provision of products sold and services provided to the customer shall not be interpreted, construed or regarded either expressly or implied, as being for the benefit of or creating any obligation toward any third party or legal entity outside of VRS and the customer. VRS’s liability for damages hereunder, regardless of the form or action, shall not exceed the fees or other charges paid to VRS by the customer or customer’s dealer. VRS shall not, in any event, be liable for special, indirect, incidental or consequential damages including but not limited to: lost income, lost revenue or lost profit, whether such damages were foreseeable or not at the time of the purchase and whether such damages arise out of a breach of warranty, a breach of agreement, negligence, strict liability or any other theory of liability.

WARRANTY:

This product is guaranteed to be free from manufacturing defects in material and workmanship under normal use for a period of one (1) year. This warranty applies to the original retail purchaser only. If a defect covered by this warranty occurs during this one-year period, VRS will repair or replace the defective system or component part, free of charge upon proof of original purchase excluding any labor costs associated with installing or reinstalling the product. This warranty does not apply to defects caused by negligence, accident, unreasonable use, modification, abuse or tampering, or any other causes not related to defective materials or workmanship. The liability of VRS is limited solely to the repair or replacement of this product. All liability for consequential damages, breach of any express or implied warranties including merchantability or fitness for purpose, is expressly disclaimed. This warranty gives you specific rights. You may have other rights that vary from state to state.

IMPORTANT SAFETY NOTICE:

Vehicle Reversing Systems sold by VRS Fleet Products LLC are intended strictly as a driver assistance device. It is not intended as a safety device or for any other purpose. Due to the nature of the technology, some obstacles may not be detected or may be identified inaccurately due to physical reflection properties of the obstacle. This product is not a substitute for driver responsibility or common sense when operating a vehicle. Please follow all local and federal laws as well as your company’s safety policies while backing up your vehicle. VRS does not guarantee or assume liability for collisions or damages occurring while using this product while backing up your vehicle