Installation Manual

3-Sensor System

Waste Connections
Connect with the Future

Global Sensor Systems Inc.

November 2025
Version 14.8
GS3000

www.GlobalSensorSystems.com

Read this document carefully before installation. Improper installation will void the manufactures warranty.

- Observe all necessary regulations and instructions.
- Adhere to all instructions, information and safety information to prevent injury to persons and property damage.
- Global Sensor Systems Inc. will only guarantee the safety, reliability and performance of their products and systems if all the information in this publication is adhered to.
- Observe all accident regulations of the respective company as well as regional and national regulations.
- Only trained and qualified technicians should carry out work on the vehicle.

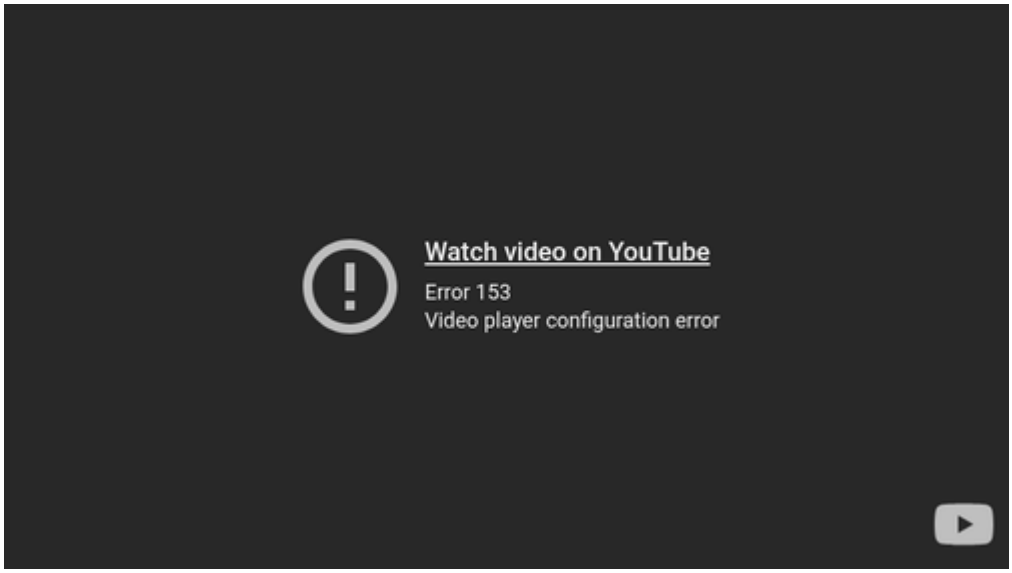
Table of Contents

About

Global Sensor Systems has spent +45 years preventing backing accidents and we're excited that you have chosen us to be part of your fleet safety initiatives.

We are passionate about helping businesses keep their fleets safe and accident-free. Our technology is designed to alert drivers to potential hazards and apply the brakes automatically when needed, helping to prevent accidents before they occur. We prioritize exceptional customer service, as our success hinges on customer satisfaction.

We are excited to be partnering with Waste Connections to help fulfill your mission of ensuring the safety of our employees, your customers and the public in all of your operations. Protection from accident or injury is paramount in all you do!



Visit our website at www.globalsensorsystems.com

Global Sensor Systems Inc. is not responsible for a defect in the system as a result of misuse, improper installation, damage or mis-handling of the hardware and/or electronic components. Global Sensor Systems Inc. is not responsible for consequential damages of any kind.

Included in Your Kit

Component List

Global Sensor Systems Inc.

GS01	Control Box	
GS08	Brake Valve Bracket	
GS12-2	Shoulder Bolts	
GS13	Pressure Protection Valve	
GS-16	Mounting Boxes	
GS19	Junction Box	
GS20	Control Box Mounting Hardware	
GS21	Brake Valve Mounting Hardware	
GS75	75' Wiring Harness	
GS-100	3 Sensors	
GS-16B	Center Sensor Bracket	

Installation Instructions

Caution ⚠

- The battery of the vehicle should be disconnected until the system is fully installed.
- The green “system on” light should **NEVER BE ON** when the vehicle is moving forward. If this happens the vehicle should **NOT** be operated until the system has been serviced.

75-Foot Harness Installation

The 75-foot harness is routed starting from the junction box and runs towards the cab of the vehicle.

Route through the frame of the vehicle and fasten securely.

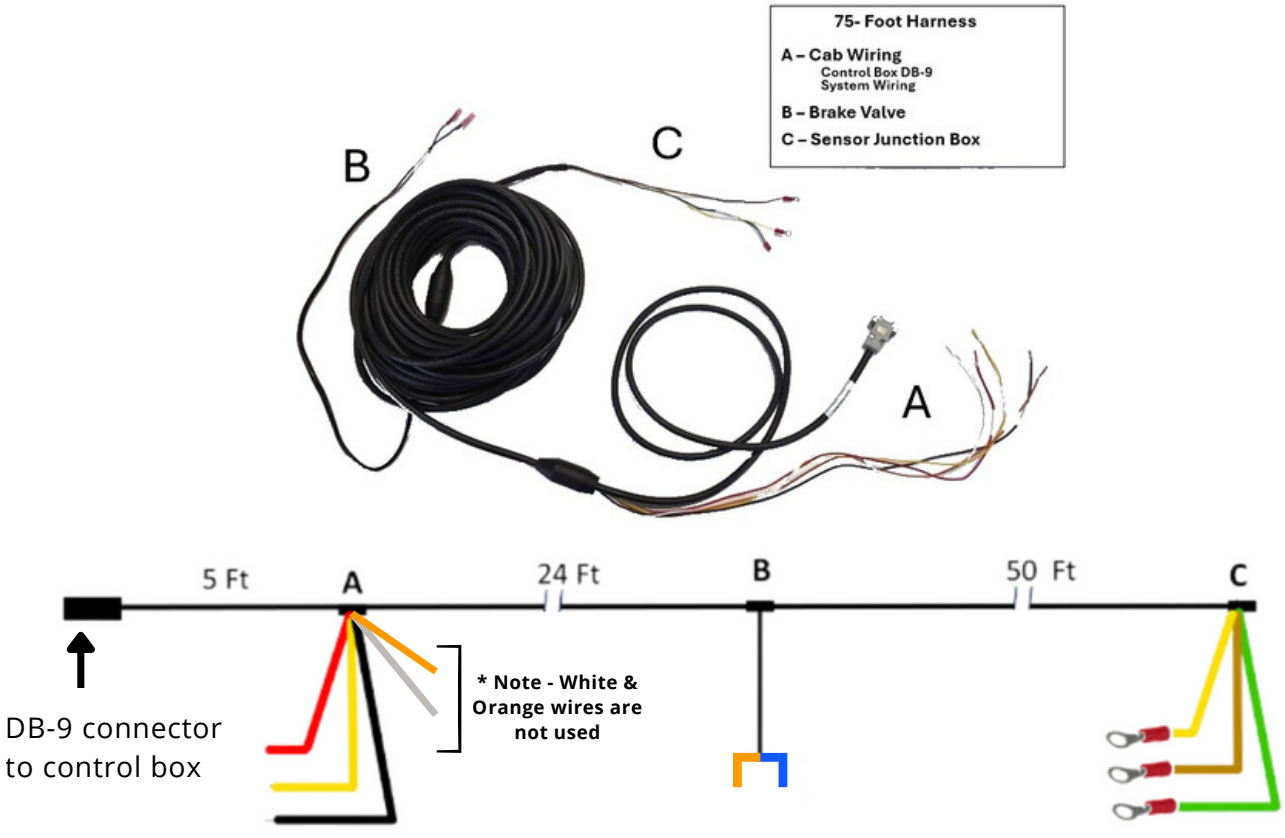
Secure the yellow, brown and green wires with the ring terminals to the junction box along with the colour-matched sensor wires.

In the middle of the harness, there will be a blue and orange wire that splits off to the brake valve. (Refer to pages 7-9 for brake valve instructions.)

The remaining end of the harness is routed to the fuse panel area in the cab where you will connect the harness to the control box.

Caution: When pulling the harness into the cab of the truck, ensure it does not catch on sharp metal edges. Final location of the harness should be free of obstructions and verified that it cannot contact any moving surfaces.

Live wires in harness. Do not run wires near pinch points or sharp edges. Whenever possible, run wires alongside existing harnesses on the truck. Secure the harness with zip ties every 2–3 feet along the chassis, adjusting spacing as needed for proper fit and protection.



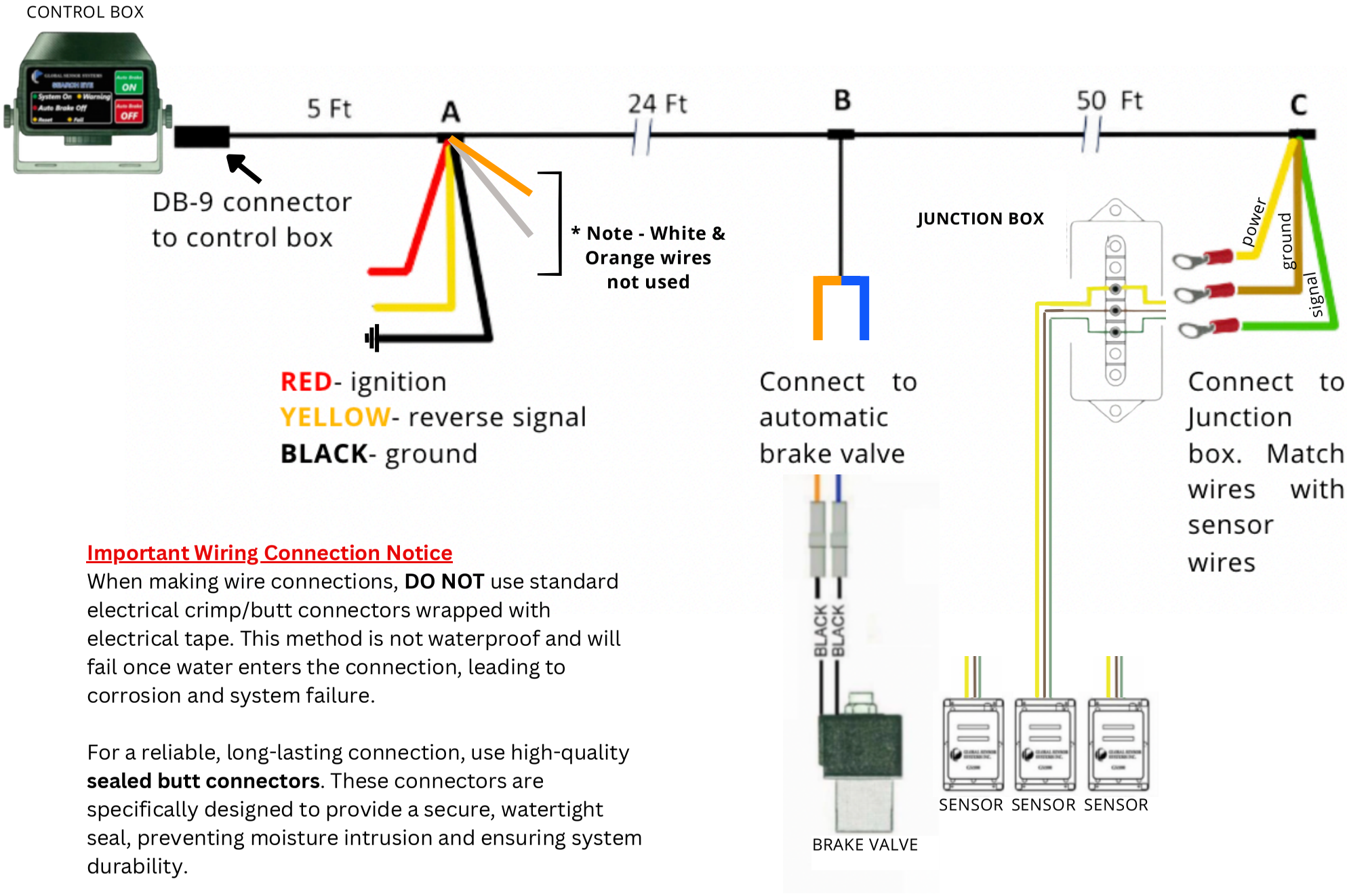
RED- ignition
YELLOW- reverse signal
BLACK- ground

Connect to automatic brake valve

Connect to Junction box. Match wires with sensor wires

Wire Diagram

A: IN CAB TERMINAL CONNECTION
B: VALVE ASSEMBLY CONNECTION
C: SENSOR CONNECTION



Important Wiring Connection Notice

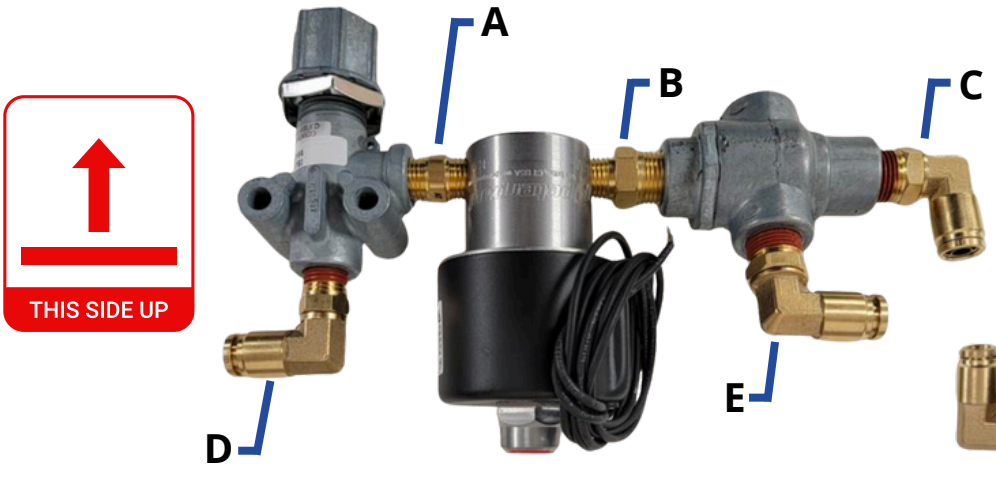
When making wire connections, **DO NOT** use standard electrical crimp/butt connectors wrapped with electrical tape. This method is not waterproof and will fail once water enters the connection, leading to corrosion and system failure.

For a reliable, long-lasting connection, use high-quality **sealed butt connectors**. These connectors are specifically designed to provide a secure, watertight seal, preventing moisture intrusion and ensuring system durability.

Brake Valve Installment

Important: The connection from the supplied brake valve must be **BEFORE THE RELAY VALVE** to ensure the correct operation of the full-service brakes on both axles.

Caution: All air lines must be leakproof. Use only D.O.T. approved materials and methods.



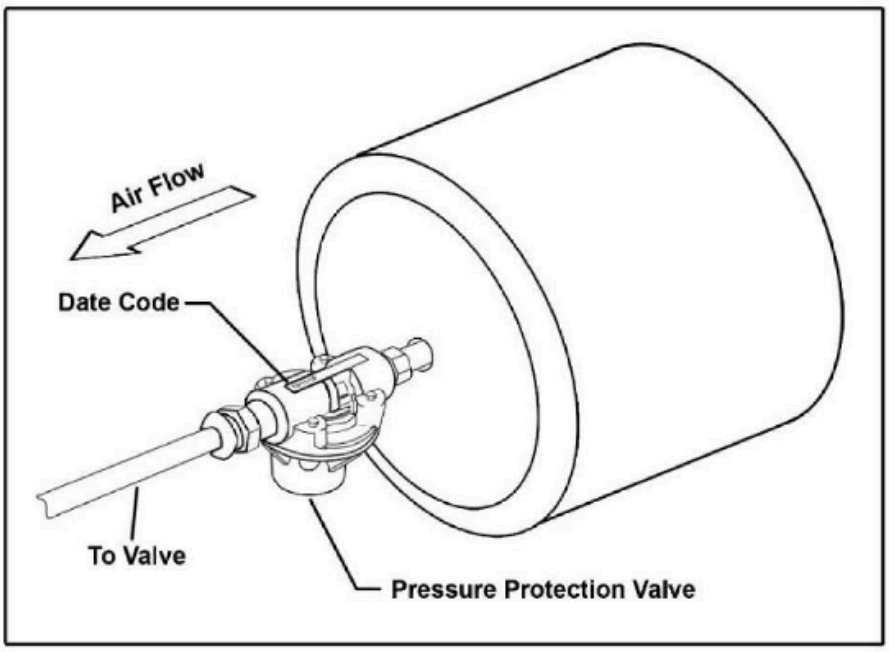
GSS Part #	Description	Picture
GSA-NIP-14	Brass Hex Pipe Nipple - 1/4"	A
GSA-SWV-14	90° SWV Male Elb. 3/8"Tx1/4"MPT	D, F
GSA-SWV-38	90° SWV Male Elb. 3/8"Tx3/8"MPT	C, E
GSA-RDCR-14	Reducer 3/8" x 1/4"	B, G

Note: The electric brake valve is vertical with the vent position down and the shuttle valve is horizontal.

Install the brake valve and shuttle valve as shown in the diagram on page 9. Ensure clean hands and work area while installing the fittings on the valves. Use thread sealant and only in the middle of the threads on all pipe fittings to eliminate the chance of internal contamination of the valves.

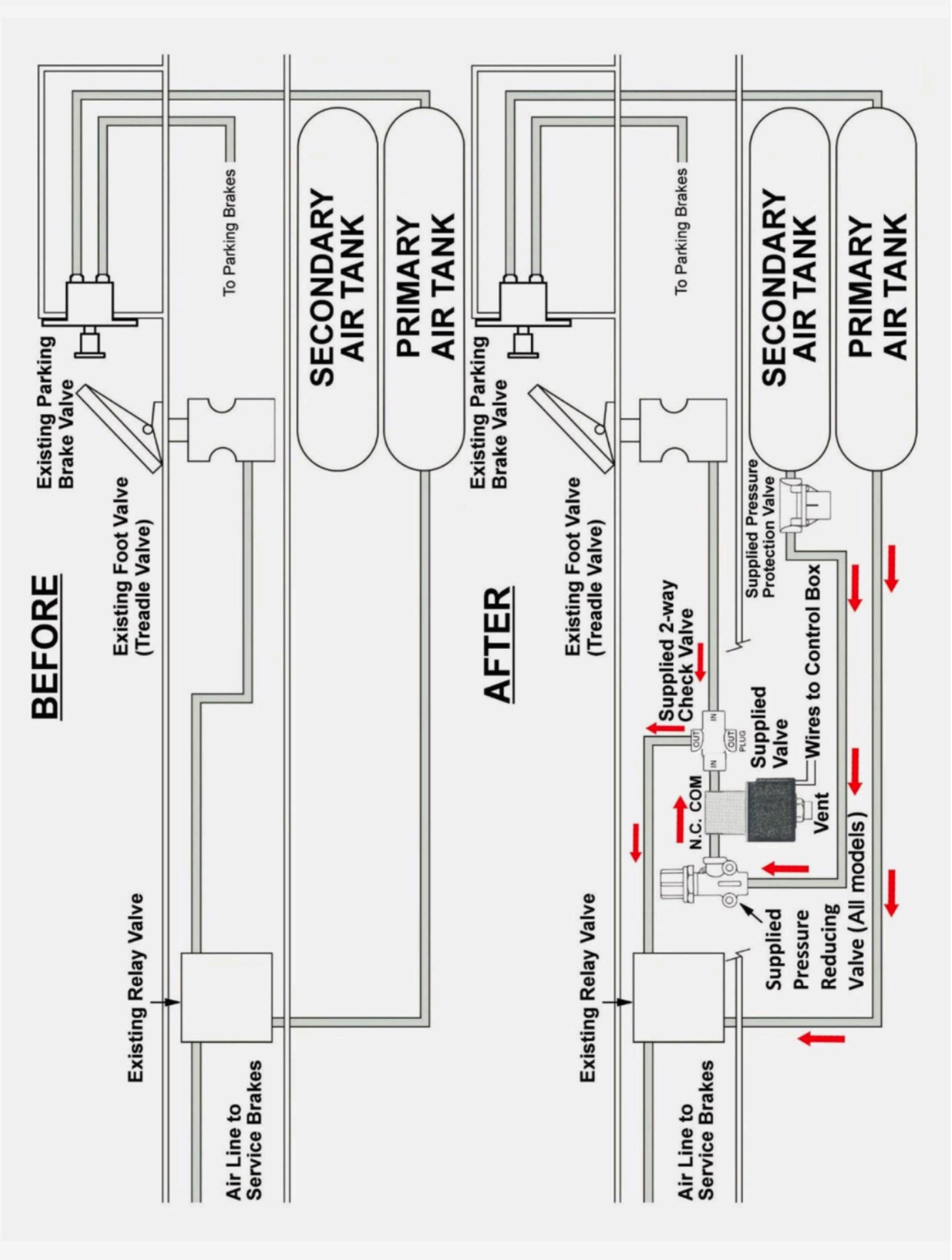
1. Attach the shuttle valve directly to the brake valve using a threaded union. The inlet and outlet ports of the shuttle valve are identified, with the extra unused outlet port plugged in. Horizontal is identified by a decal. Using the supplied mounting bracket, **mount the assembly to the vehicle chassis, ensuring the shuttle valve is in a horizontal position and the solenoid brake valve is in a vertical position, with the vent pointing downward.** Connect the two black wires from the valve to the blue and orange wires on the harness.
   Note: black wires from valve are interchangeable (ground/power).
2. Attach the inlet of the pressure protection valve directly to the secondary air tank using a threaded union, with the arrow on the valve pointing in the direction of airflow and positioned as shown with the top of the valve up. **Attach the outlet to the N.C. port on the brake valve using the appropriate size brake hose.**
3. Pressure reduction valve, the installation of this valve is **mandatory** to prevent harsh braking. Connect the pressure reduction valve to the line coming from the air tank and the N.C. inlet port of the brake valve using a union. Using plastic zip ties ensures that all brake lines are well supported.

Note: On some vehicles, the secondary tank and wet tanks are the same physical tank with an internal baffle installed separating the two. Make certain you are attached to the correct side of the tank.



Note: Most common brake lines are 1/2 or 3/8 inches.

Brake Valve Diagram

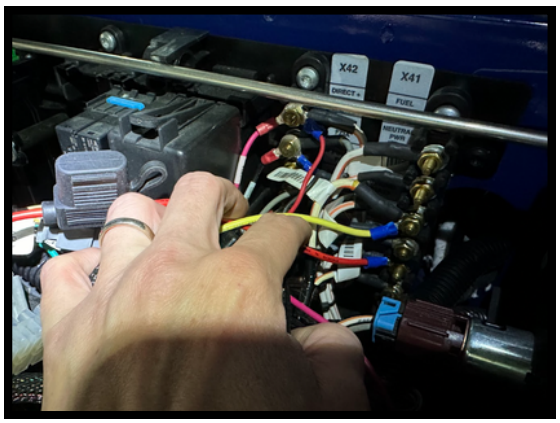


Control Box Installation

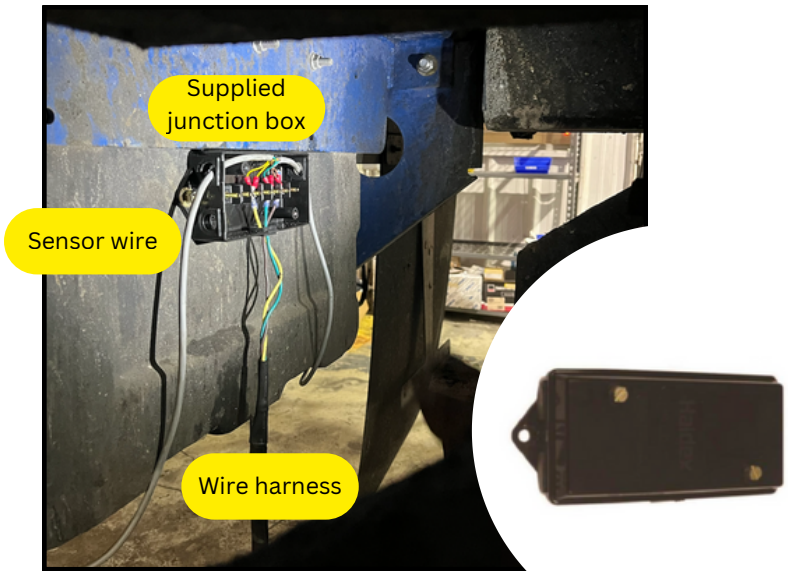
1. Mount the control box on the dash or where it is visible and easily accessible to the driver.

2. Connect the rear of the control box to the DB-9 connector of the harness and route the harness into the fuse panel area where the 75-foot harness was routed to.

3. Referring to the diagram on page 6, from the 75' harness connect the RED wire to the ignition, the YELLOW wire to the reverse signal, and the BLACK wire to ground.



Junction Box Installation



1. Secure the junction box within 3 feet of the sensor mounting boxes to allow the sensor wires to reach.

2. A recommended spot is behind the rear bumper bar. (Refer to the diagram on page 6)

Preventing Water Ingress at Junction Box Gasket

When routing wires through the supplied gasket plug, do not use a plug with a pre-cut wire pass-through hole without proper sealing.

If the gasket already has an opening, installers must:

- Seal the gap between the wire and gasket with a suitable silicone sealant.

If the gasket has no opening but a complete rubber gromet:

- Cut a small “X” in the supplied gasket to create a tight fit around the wires, then apply silicone around the wire entry point.

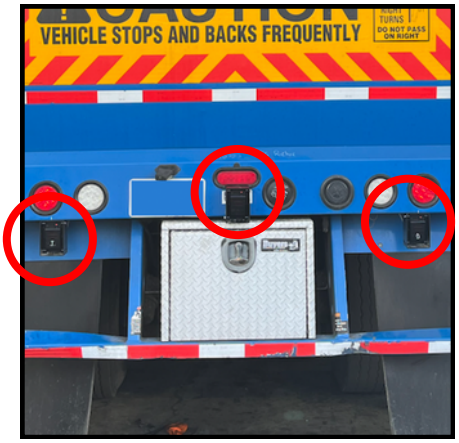
Note: Junction boxes installed in locations exposed to direct water spray or power washing are more susceptible to water ingress. To reduce this risk, always ensure proper sealing. Position the wire entry point in a direction that minimizes the chance of water entry. Use appropriate sealing methods, such as silicone sealant around the cable entry, to maintain a watertight connection.

If water ingress is found after installation:
Dry out the junction box and apply silicone around the wire entry point immediately to prevent further moisture intrusion.

IMPORTANT: To protect the junction box from water damage, silicone is required around the openings.

Sensor Mounting Box Installation

Picture #1



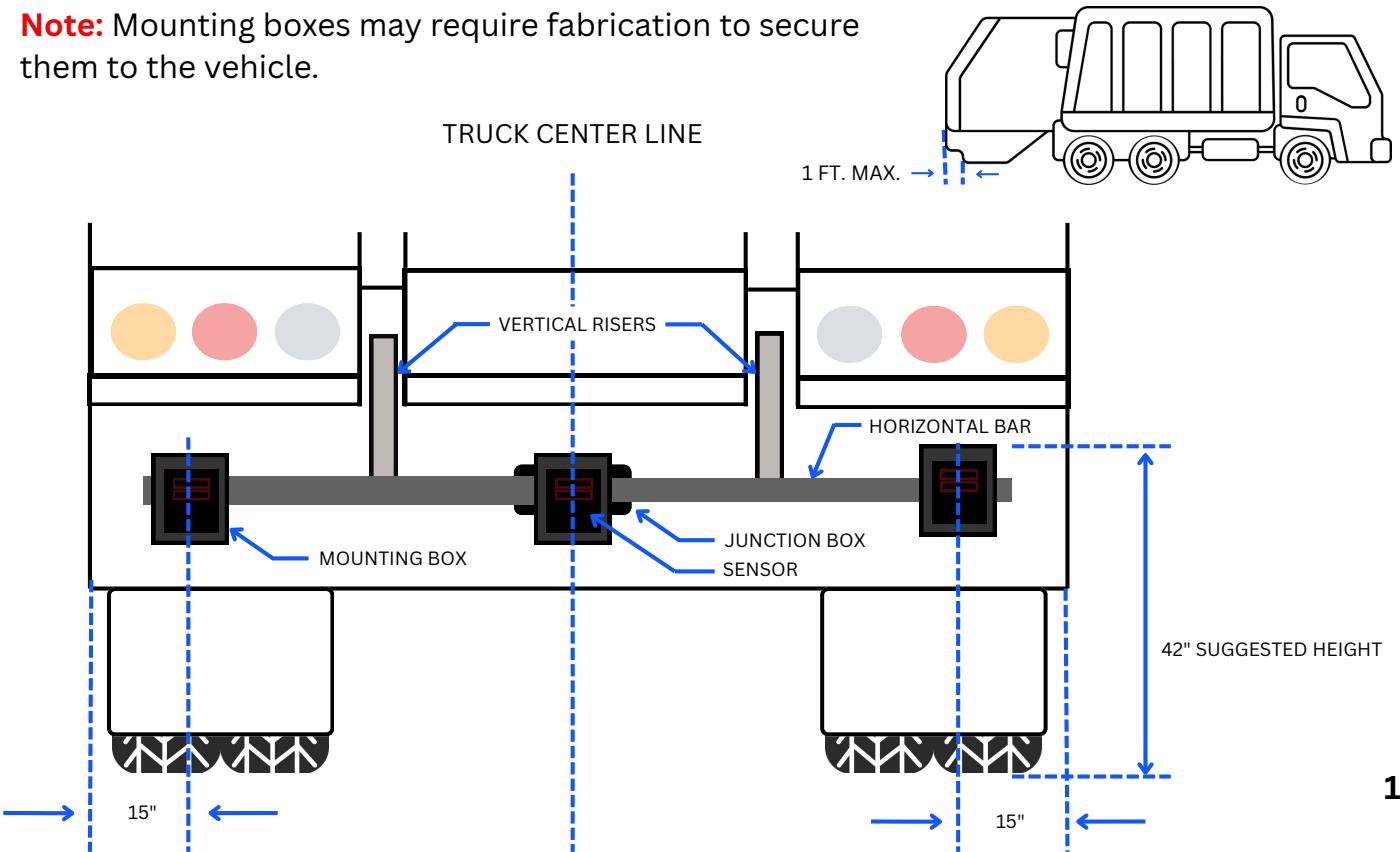
1. Locate a flat surface that does not impede the sensor's view but will also protect it.

2. For optimal sensor coverage, affix two of the mounting boxes about 7-10 inches from the outer edges of the vehicle and about 42 inches (may vary depending on truck) from the ground. Affix the remaining two mounting boxes 22 inches from the mounting boxes on the edge. (Refer to the diagram below)

3. For the center sensor, use the GS16-B bracket to ensure the sensor is positioned forward so the sensor does not see the toolkit. (See picture #1)

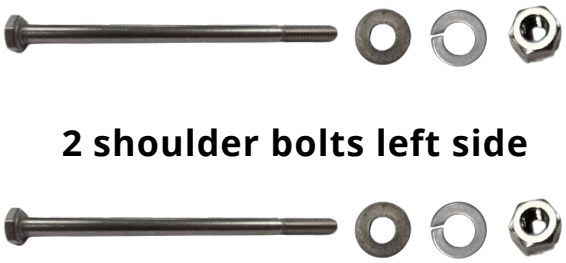
4. Bolt or weld.

Note: Mounting boxes may require fabrication to secure them to the vehicle.



Sensor Installation

2 supplied shoulder bolts for each sensor. To be mounted on either the left <u>OR</u> the right side of the mounting box.



2 shoulder bolts left side

<u>OR</u>

2 shoulder bolts right side

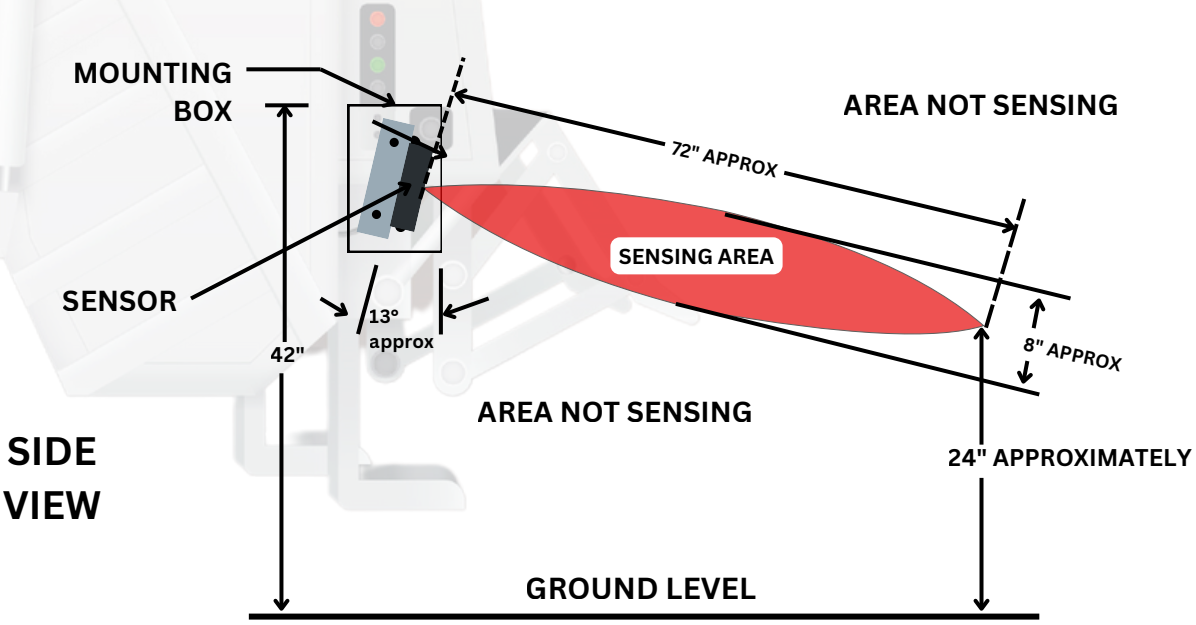
1. Use provided sensor mounting hardware to secure the sensors to the mounting box.
2. Keep loose until the aligning procedure is completed. (Page 15)
3. Run sensor wires to the junction box. (Page 6) All of the sensors are connected together in the junction box.

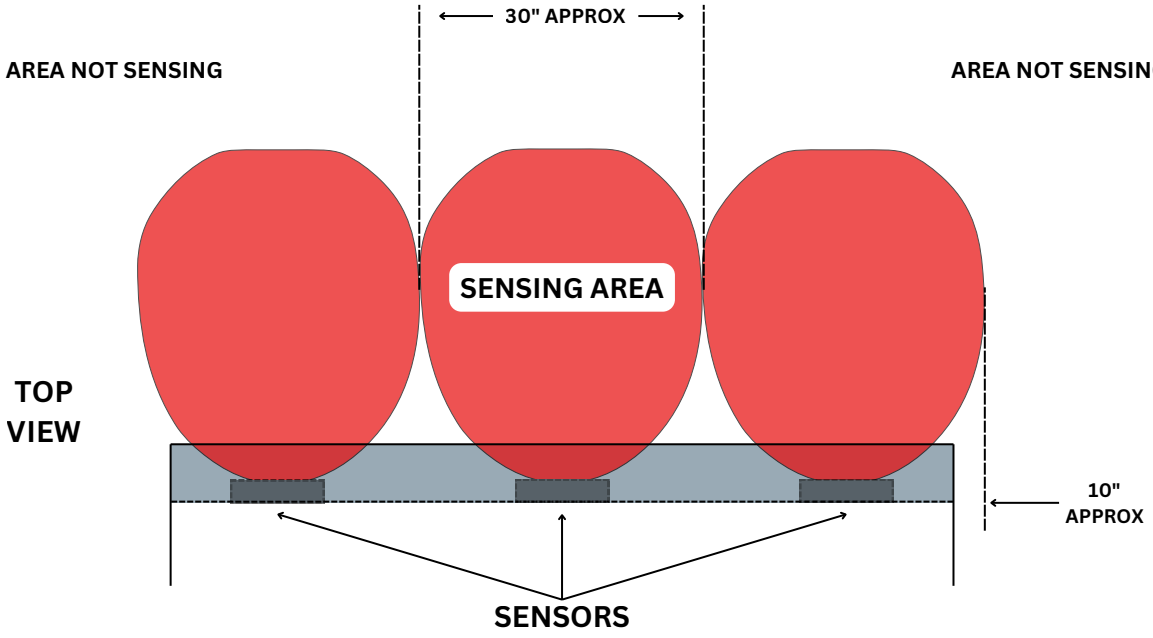
Sensor Mounting Positions

See the diagram below for the best sensor mounting positions. Universal to accommodate various types of vehicles.

Sensors are angled so that coverage is obtained to within 25 inches off the ground. Choose the mounting box hole that aligns closest to 25 inches. Correct angle is achieved by following installation instructions.

By using the Global Sensor Systems alignment tool (GSA150-sold separately) angle the sensors like the picture below. See page 15 on how to use the sensor alingnment tool.





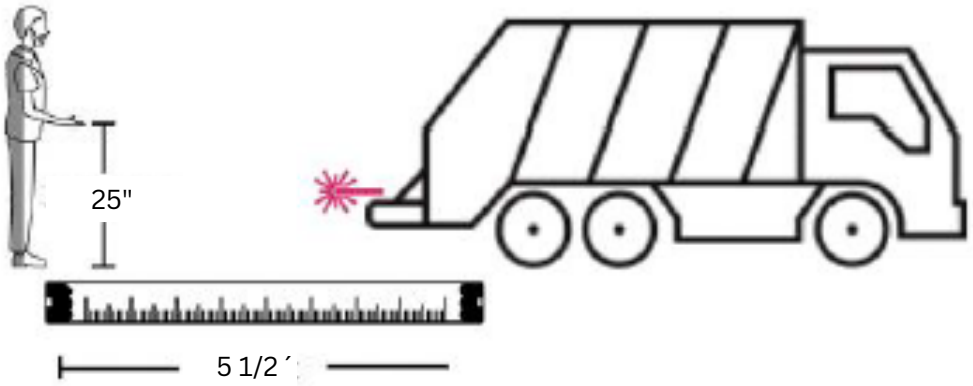
Sensor Alignment Tool - How to adjust the sensor

What you will need:

- Global's sensor alignment tool
- Measuring tape
- Ratchet wrench for 7/16 socket
- 2 people

Instructions

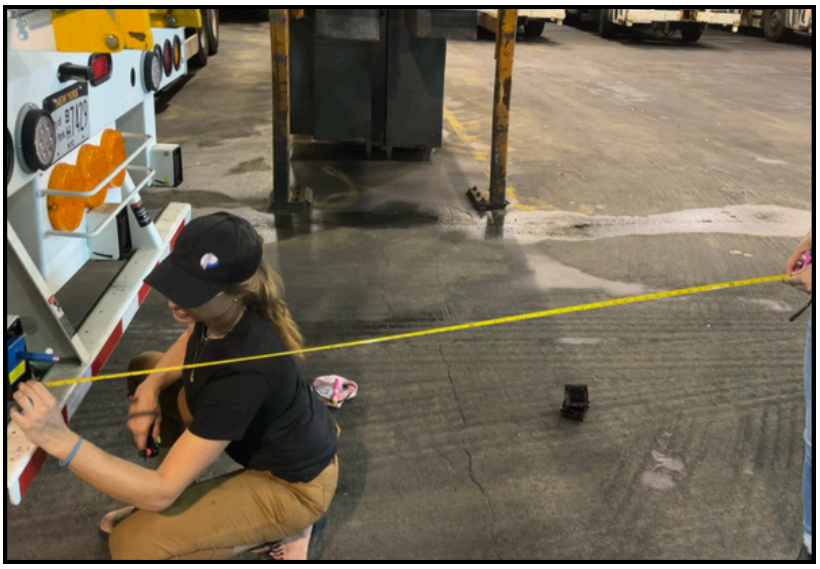
Measure 5 1/2 feet out from the sensor, once there, measure 25 inches high.



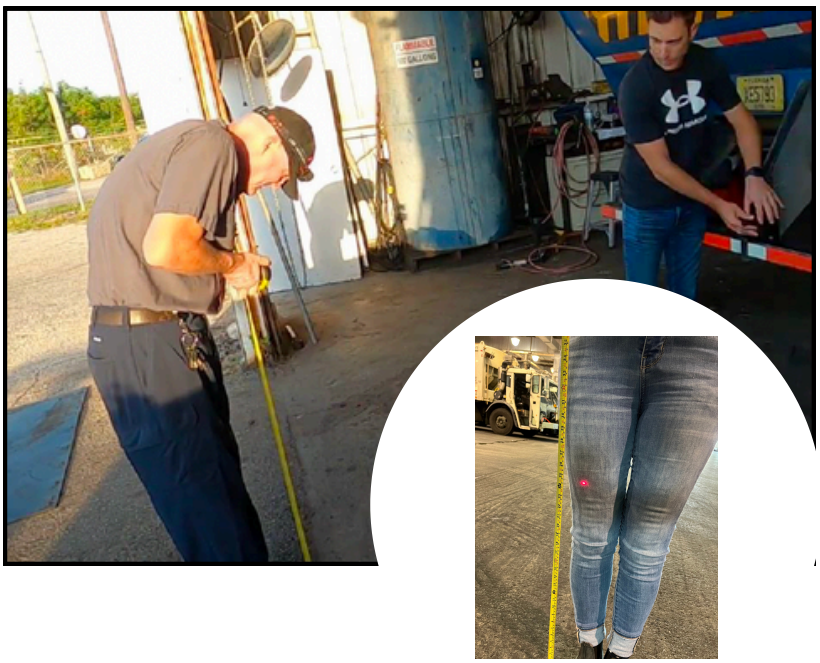
Laser pointer

1. Place the metal cover squarely over the front of the sensor unit.

2. Twist the knob to turn on the laser.



3. Using a measuring tape, measure 5 1/2-feet out from the sensor and remain there.



4. One person remains at the 5 1/2-foot mark, while the other adjusts the angle of the sensor with the alignment tool - So that the dot hits 25 inches.

5. Tighten the sensor mounting hardware to lock the newly adjusted sensor into position. Ensure that the dot remains at the 25 inch mark.

DO NOT over-tighten. **DO NOT** use drills or impact drivers to tighten the bolts. Over-tightening the bolts will cause damage to the sensor case.

Note: Depending on the driver's route, adjustments to the sensor may need to be made from time to time to avoid it being triggered by reflective materials such as road signs or changes in ground gradation. We recommend tilting the sensor 1/4 inch up or 1/4 inch down for accurate coverage and an overall better experience for the driver.

Component Test Procedure

Sensor Test

Disconnect the sensor from the system then connect a 12V DC power supply across yellow (positive) and brown (negative) wires. Connect a meter (meter positive to yellow and negative to green) or 12V bulb across the green and yellow wire. When an object is detected, the red indicator light in the sensor and test light should light up or the meter should read 12V. Cover the top window with black electrical tape, and the red indicator light in the sensor and test light should go out or the meter should read 0V. **Ensure green wire does not connect to the +12V anytime during testing.**

Valve Test

Disconnect the system, then ground one side of the brake valve (either wire) and apply 12V DC to the other wire. With air in the tank, the brakes should go on. The brakes should be released when the connection is broken. The brake should work normally when the voltage is not connected. Listen for the valve.

Control Box

1. Connect the red wire to the positive side of a 12V DC power supply and the black wire to the negative.
2. Connect the yellow wire to the positive of the supply. The green “system on” lamp should illuminate.

Note: The “reset” and “fail” circuit breakers can be found at the back of the control box for resetting if necessary.

System Operation

The system is turned on by having the ignition of the vehicle in the “ON” position and placing the vehicle in reverse. The green “System On” light on the control box in the cab of the vehicle will illuminate to indicate that the system is operating.

When an object is detected by the mounted rear sensors, the yellow “Warning” light on the in-cab control box will illuminate, and an audible tone will be heard. The vehicle's air brakes will automatically be applied by the system.

If you wish to reverse closer to an object, you can disable the auto braking feature by pressing the "Auto Brake OFF" button on the control box. This action will turn on the red "Auto Brake OFF" light and activate a pulsing alarm tone, indicating that the vehicle's brakes will not be applied automatically. If the sensor detects an object, the yellow "Warning" light will come on, accompanied by a continuous audible tone.

The illumination of the “Reset” or “Fail” light indicates that one of the circuit breakers on the rear of the control box needs to be reset.

Note: The "System On" green light should illuminate only when the vehicle is in reverse. If the light turns on while driving forward, immediately turn off the truck and disconnect the system. This indicates a potential installation issue, and the wiring should be inspected.

Maintenance

The IR sensor beam is looking for something to bounce its light off of.

- A dust cloud in a dusty lot may trigger the sensor.
- In a snow flurry, the sensor might get triggered.
- When there is heavy rain, the sensor might get triggered.

In these environments and conditions, the driver may need to use the “OFF” button on the Control Box. Always check your mirrors and GOAL (Get Out And Look) when the situation requires it.

This is a dirty industry. The sensors will get dirty. Keep the sensor faceplates clean. For every layer of snow, dust, salt or debris that covers the sensor, it will decrease the sensor detection zone. Like the face of the

The operator’s responsible for ensuring the sensors are in operational order. Pre and Post inspection should include:

VISUAL

- Look for the red LED light inside the face of the Sensor when the sensor is triggered. (Figure 1)
- Making sure the alignment of the Sensor is accurate- use a tire marker to help. (Figure 2)
- When you put the truck in reverse, you should see a GREEN “System On” light appear on the Control Box, if you don’t see that light, do not run the truck. (Figure 3)

AUDIBLE

Have someone in the truck, put it in REVERSE, and keep their foot on the brake. Second person at the back, walking from one corner of the truck to the other (see Figure 4); triggering each individual sensor. When a sensor gets triggered, you will hear the ‘hiss’ of the brakes and the solenoid valve opening

FIGURE 1
Red led light

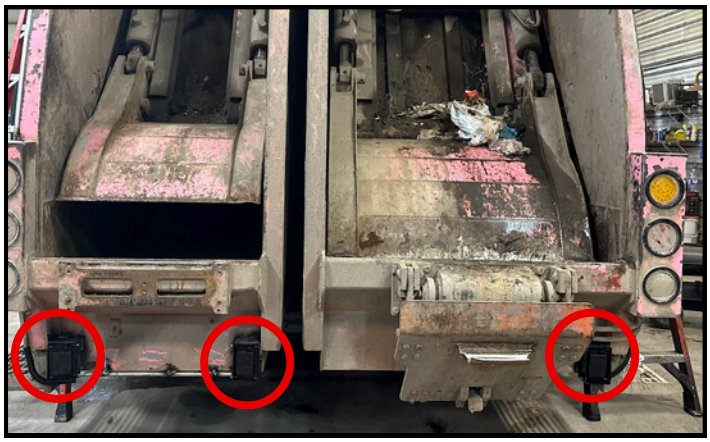
FIGURE 2
Alignment mark

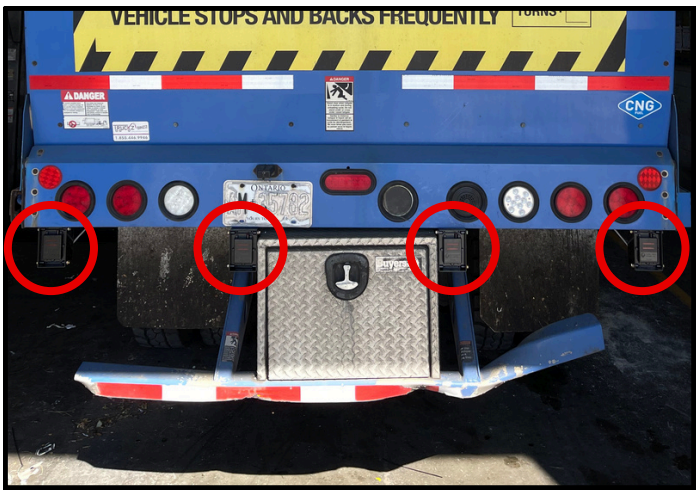
FIGURE 3
System ON light

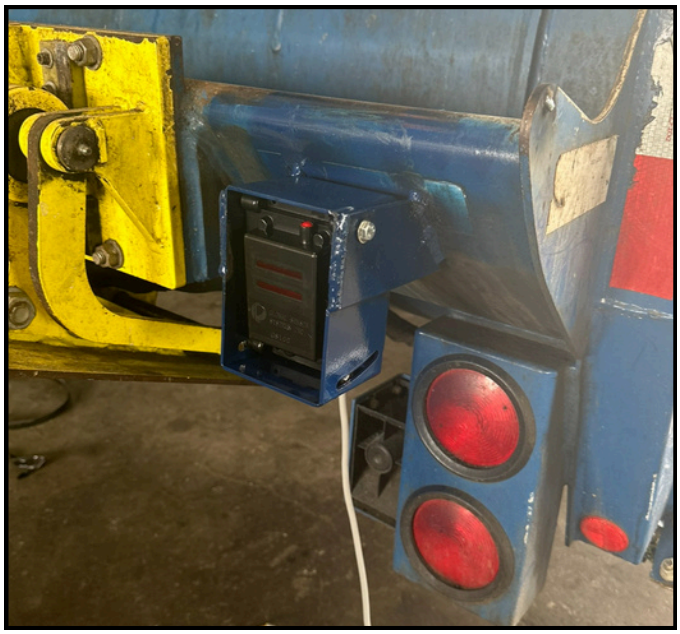
FIGURE 4
Audible check

Sensor Installations

Examples of how the sensors have been installed on various trucks.







Best Practices

1. Secure Connections with Heat Shrink

When making wire connections a best practice is to use **Heat Shrink Solder Butt Connectors**. These are foolproof and seal up tight so no water can get in and start corrosion. This video will show you how it's done: https://www.youtube.com/watch?v=unxEdyW8RP8

2. Situations Requiring Welding

Welding may be necessary in specific situations, such as when the truck's height is too high, or if a toolbox kit is positioned too far outside the truck, triggering the sensor beam. Additionally, if the truck has a large bubble or protrusion that affects sensor placement, welding can help position the sensor further outward for proper functionality.

Warranty

Global Sensor Systems, Inc., 2-Year Limited Manufacturer's Warranty

Global Sensor Systems, Inc. warrants to the owner of the enclosed product that the product will be free from defects in materials and workmanship for a period of two (2) years from the shipment date, independent of the installation date by an authorized service representative. If the product fails to perform as published, Global Sensor Systems, Inc. will, at its sole and exclusive discretion, either (a) repair or replace any defective product or component; or (b) accept the return of the product and refund the money actually paid by the original purchaser for the product. Repair or replacement may be made with a new or refurbished product or components, at Global Sensor Systems, Inc.'s sole and exclusive discretion. If the product or a component incorporated within it is no longer available, Global Sensor Systems, Inc. may, at Global Sensor Systems, Inc.'s sole and exclusive discretion, replace the product with a similar product of similar function. This is your sole and exclusive remedy for breach of this Limited Warranty.

Any product that has either been repaired or replaced under this Limited Warranty will be covered by the terms of this Limited Warranty for the longer of (a) ninety (90) days from the date of delivery of the repaired product or replacement product, or (b) the remaining warranty period. Global will only cover up to $4,000.00 worth of products over 2 years. This Limited Warranty is transferable from the original purchaser to subsequent owners, but the warranty period will not be extended in duration or expanded in coverage for any such transfer.

For more on our warranty please visit https://www.globalsensorsystems.com/refund-policy

Disclaimer

Global Sensor Systems Inc. (GSSI) and its affiliates do not guarantee or promise that the use of our systems will prevent accidents, collisions, or other incidents involving vehicles, objects, or people. GSS systems are not a substitute for responsible driving practices, including careful observation, cautious decision-making, and adherence to all traffic laws and motor vehicle safety regulations. Our products are not intended to replace rearview mirrors or any other equipment required by law. These systems provide a limited field of view and do not offer a comprehensive visual or sensory representation of the entire vehicle's surroundings. It is essential to always use mirrors, check blind spots, and physically verify that your vehicle can move safely.

GSSI and its affiliates shall not be held responsible for any damages, injuries, or accidents involving vehicles equipped with GSSI products. The distributor, seller or GSSI assumes no liability for any loss, injury, or damage—whether direct, indirect, incidental, or consequential—arising out of the use or misuse of our products. This includes but is not limited to, property damage, personal injury, and loss of life.

GSSI and its affiliates are not liable for any decisions, actions, or inactions taken by users relying on the functionality of our systems or for any delays, errors, or inaccuracies in their performance. Always use proper safety measures and do not rely solely on GSSI systems for vehicle safety decisions.

Inspection Checklist

Daily Checks

- Clean the face of the Sensor ☐
- Check for damages (Cracks in plastic, etc) ☐
- Visual confirmation of sensor light when truck is positioned in reverse, as well as the green warning light on the control box in cab ☐
- Regular brake pressure check ☐
- Ensure proper Allignment (Mark bolt position to make this step quicker) ☐

Monthly Checks

- Full alignment inspection with the alignment tool and proper measurements. ☐
- Check all wire connections ☐
- Check that all wire connections are receiving a 12 Volts ☐
    - Solenoid valve ☐
    - Control Box ☐
    - Sensor ☐

Add your Notes

Contact Us

Address
6600 Goreway Dr. Unit D, Mississauga, ON L4V 1S6

Phone Number
(905) 507-0007

Email
sales@globalsensorsystems.com

customer.service@globalsensorsystems.com

Website
www.globalsensorsystems.com

Global Sensor Systems Inc.