Installation Manual

GLOBAL SENSOR SYSTEMS INC.
**SYSTEM OPERATION**

The system is turned on by placing the gear shift lever in the reverse position. The green light on the cab Control Box will illuminate to indicate the system is operating.

When an object is detected, the yellow warning light will illuminate, an audible alarm will be heard, and the vehicle brakes will automatically be applied. If it is desired to back closer to the object, the brakes can be disabled by pressing the “auto brake OFF” switch on the Control Box. This will cause the red auto brake off light to illuminate and an intermittent audible sound will be heard indicating the brakes **WILL NOT** automatically engage. The yellow light and audible alarm will still operate in this mode as a safety precaution.

To deactivate, move the gear shift lever out of reverse. This will cause the green light to extinguish and the system will be deactivated. If the auto brakes had been disabled prior to deactivating the system, they will be automatically reset the next time the vehicle is place in reversed.

Illumination of the “reset” or “fail” light indicates that the circuit breaker at the rear of the Control Box needs to be reset.

If the Circuit breaker is reset and the “fail” light remains on, remove the control box for service.

**Note:** On vehicles equipped with the Parking Brake Lockout switch, the Global Sensor System will not operate when the Parking Brake is applied.

**IMPORTANT CAUTIONS**

The Lenses of the sensors MUST be kept clean to ensure proper operation of the system. If the lenses are allowed to become dirty, the system range will decrease. Avoid direct high pressure washing. A simple wipe of the sensor windows will suffice.

The green “system on” light should NEVER BE ON when the truck is moving FORWARD. (If this happens the truck should NOT BE OPERATED until the system has been serviced).

**THE DRIVERS RESPONSIBILITIES**

1. To ensure when the truck is put in reverse gear, the green “system on” indicator light on the control box **illuminates**, and when the truck is taken out of reverse gear, the green “system on” indicator on the control box **extinguishes**.

2. To ensure that the sensor lenses are kept clean on a routine basis. Avoid direct high pressure washing. A simple wipe of the sensor windows will suffice.

3. Using no less than 2 people on a routine basis, as per user company policy, ensure that the sensors are detecting objects and applying brakes, as per the system operating description above.
INSTALLING COMPONENTS

MOUNTING BOXES
1. Using diagrams on Page 3, make three mounting boxes, or use boxes supplied.

ASSEMBLING UNIVERSAL MOUNT (IF REQUIRED)
1. Using diagrams and instructions on Page 3 build mount (if required) and attach Sensor Mounting Boxes.

JUNCTION BOX
Mount the supplied junction box behind the center sensor

BRAKE VALVE
Install brake valve and shuttle valve as shown on Page 5. Clean hands and ensure a clean work area while installing fittings on valves, use thread sealant, (NEVER USE TEFLOON TAPE), sparingly and only on 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 brake valve using a threaded union. The inlet and outlet ports of the shuttle valve are identified, with the extra unused outlet port plugged. Horizontal is identified by a decal. Using the supplied mounting bracket, mount the assembly to the truck 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.
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 air flow and positioned as shown with the top of the valve up, see picture. Attach the outlet to the N.C. port on the brake valve using the appropriate size brake hose.
(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.)

PARKING BRAKE LOCKOUT SWITCH
1. Locate the parking brake valve on the dash of the vehicle and tee the switch in the output line. (This line will have pressure when the parking brakes are off and no pressure when they are on.) If the vehicle is equipped with multiple parking brake valves, follow the output line to the manifold and tee the switch into the exit line from the manifold. See picture page 6.
2. Wire as below

WIRING
1. Connect the red, green and black wires from each sensor to the corresponding yellow, green and brown wires in the junction box as per wiring diagram on page 7.
2. Connect the two black wires on the brake valve to the orange and blue wires using the connectors supplied and following the instructions on page 9.

CONTROL BOX
1. Mount the Control Box on the dash where it is easily accessible and visible to the driver.
2. Connect the black, green and brown wires from Control Box Cable to corresponding wires using the Terminal Block supplied, as per wiring diagram on Page 7.
3. Connect the red and yellow wire from the control box cable and one of the yellow wires from the Dual Relay to the yellow wire from the Main Harness, as per the wiring diagram on Page 7.
4. Connect the fused red wire to ignition power (ensure this is a steady 12.6V), cut the wire to length and connect the other end to the Parking Brake Lockout switch, connect the remaining wire to the other side of the Lockout switch and using the Terminal Block connect it to the other Yellow wire on the Dual Reverse Relays as per the wiring diagram on Page 7.
5. Connect the white and black wires from the brake light relay to the orange and blue wires from the control box cable and the main harness.
6. Locate the brake light switch; vehicles with dual drive will have two brake light switches attached in parallel.
7. Attach two wires to either side of one of the brake light switches and attach these to the red and yellow wires on the relay harness.
8. Install the supplied Dual Reverse Circuit Relay assembly as indicated on Pages 7 and 8.
9. Connect supplied red fused wire to +12V side of ignition.
10. Connect supplied black wire to vehicle ground.
CAUTION: Connect +ve and –ve power lines last.
ASSEMBLING UNIVERSAL MOUNT (IF REQUIRED)

1. Measure full width of truck and subtract 26” to determine length of horizontal bar (1” square tubing is suggested).
2. Determine length of vertical risers to best accommodate a maximum of 42” from ground to Top of mounting boxes as per diagram (1” square tubing also suggested for vertical risers).
3. Determine position of vertical risers to best accommodate mounting on truck body.
4. Weld completed Universal Mount a maximum of 1 ft. in from the back of vehicle (refer to diagram Page 3).
5. Refer to diagrams on Pages 3 and 4 for positioning of mounting boxes and sensors.
6. Weld or bolt mounting boxes to horizontal bar.
7. Drill Holes in horizontal bar to allow sensor wires to feed through tubing.
8. Weld two bolts to rear side of bar for mounting of junction box.
Sensors are angled to obtain low coverage to ground. Correct angle is achieved by following installation instructions.

The Sensors are to be mounted a maximum height of 42” and a minimum height of 35”, (to the top of the Mounting Box), from the ground. The angle of the sensors must be increased or decreased to pick up an object with a height of 24” at a distance of 72” from the sensors. Coverage closer to the ground can be achieved by increasing the angle of the sensor downward.

To avoid sensor detecting the ground, sensing area should not be adjusted any closer to the ground than 12”

Sensors mounted to specifications, will cover approximately 10” beyond the outside edge of the truck.

**CAUTION**
The steeper angle shortens the distance between the sensor and the object and as a result, lessens the reaction time available.

**RANGE ADJUSTMENT – CONTACT GLOBAL SENSOR AT 905-507-0007**
IMPORTANT
The connection from the supplied brake valve must be BEFORE the relay valve to insure the correct operation of the full service brakes on both axles.

CAUTION
All air lines must be leak proof. Use only D.O.T. approved materials and methods.

Note: Electric Brake Solenoid Valve is vertical with vent pointed down and Shuttle Valve is Horizontal.
SINGLE PARKING BRAKE VALVE INSTALLATION

BEFORE

AFTER

MULTIPLE PARKING BRAKE VALVE INSTALLATION

BEFORE

AFTER
AIR BRAKE APPLICATION

WIRING DIAGRAM

NEGATIVE GROUND ONLY

CONTROL BOX
CONTROL BOX CABLE

TERMINAL BLOCK
REVERSE RELAYS
(SEE PAGE SEVEN FOR DETAILS)

JUNCTION BOX

PARKING BRAKE LOCKOUT SWITCH

FUSE

IGNITION
GROUND

YELLOW
RED
BLACK
BLUE
ORANGE
GREEN
BROWN
YELLOW

SUPPLIED SHRINK CONNECTORS

BRAKE VALVE

GLOBAL SENSOR SYSTEM GS-100

SENSOR

GLOBAL SENSOR SYSTEM GS-100

SENSOR

GLOBAL SENSOR SYSTEM GS-100

SENSOR

CAUTION: Connect +ve and -ve power lines last.

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Reverse Relay Installation

OEM RELAY REMOVAL

1. Locate the reverse relay in the vehicle electrical panel. (This relay will no longer be used except for installation reference.)
2. Remove and flip the relay so that the electrical prongs are facing toward you, do this without turning the relay left or right. The relay has the terminal markings, the socket might not, so we’ll use the relay as a guide and since the relay has been flipped it will be a mirror image of the socket.
3. Peel the decal from its backing and place it on the relay socket so that it corresponds with image.

Dual Relay Assembly Installation

1. The dual relay assembly has six wires; two control wires, white and black, two red power wires for the existing reverse circuit and two yellow wires for the Global reverse circuit.
2. Plug the two control wires into the relay socket, white to white and black to black.
3. Plug the two red wires into the OEM relay socket either wire can go into either of the red Terminals.
4. Attach the yellow wires as per wiring diagram on page 6.
5. Secure this wiring, (using plastic ties), to existing wiring harness.

Note: On some vehicles it may be necessary to replace the small 1/8” terminals with larger ¼”.

Testing

1. Start the vehicle and with the brake on, place the vehicle in reverse. The reverse lights on the vehicle should illuminate and the Global System should turn on.

Caution

The purpose of this reverse relay assembly is to ensure that the Global Sensor System is protected with a dedicated, uncontaminated power source.

Be certain that the Global System is only activated, by this reverse relay assembly, when the vehicle is placed in reverse, and not by any other means, switches or devices.

If it becomes necessary to replace either of these relays, use only SONG CHUAN part number 896H-1CH-S1-R1-T.
BRAKE VALVE HEAT SHRINK CONNECTORS

The supplied connectors for attaching the Brake Valve to the Wiring Harness are Crimp, Solder, Seal and Shrink. To ensure proper installation follow the instructions below.

Strip the wire 3/8". Select a connector that matches the wire gauge and insert the wire into the connector barrel.

Make sure the wire is properly seated and crimp the connector using an insulated connector crimping tool nest that matches the color or gauge of the connector. **Do not** crimp the solder sleeve.

Repeat steps 1 thru 2 for the other side. Apply heat evenly around the length of the tubing (including the crimp area) from the center out to the ends until the tubing fully recovers and the adhesive flows.

Continue distributing the heat over the entire connector barrel until the solder flows into the center opening. Remove from the heat and let cool for the ULTIMATE connection.
COMPONENT TEST
PROCEDURES

SENSOR TEST

Connect a 12V DC power supply across red and black wires. Connect a meter or 12V bulb across the green and red wire. When an object is detected, the red indicator light in the sensor and test light should light or the meter should read 12V. Cover the top window with black electrical tape, 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

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 release when connection is broken. Brake should work normally when voltage is not connected.

CONTROL BOX

1. Before starting the test, ensure that none of the wires of the control box are touching and the reset and fail breakers are not tripped.
2. Connect the red wire to the positive side of a 12V DC power supply and the black wire to the negative.
3. Connect the yellow wire to the positive of the supply. The green “system on” lamp should illuminate. Do not disconnect this wire.
4. Using a voltmeter place the positive lead to the orange wire, and the negative lead to the blue wire. The meter should indicate 0V. Do not disconnect meter.
5. Connect the green wire to the brown wire. The yellow “warning” lamp should illuminate, the beeper should be on continuously and the meter should indicate 12V. Do not disconnect wire.
6. Press the “auto brake off” on the front panel, the only change from condition 5 above should be that the meter should indicate 0V and the red “auto brake off” indicator should be illuminated.
7. Remove the green wire from the brown. The yellow “warning” lamp should be off, the green “system on” and the red “auto brake off” lamp should be illuminated and the beeper should be beeping on and off.
8. Disconnect all wires at this time.

CAUTION

Damage short circuit condition will occur if the orange and blue wires come into contact with each other. This situation would cause the “reset” light to illuminate.
Similarly, if the blue or brown wires come into contact with a positive connection, the resulting short circuit would cause the “fail” light to come on.
After correction of any such conditions, the “reset” and “fail” circuit breakers can be found at the back of the control box for resetting if necessary.
Note: If any of the above procedures do not produce the required results, return the component to the manufacturer for repair.