

# TROUBLE SHOOTING GUIDE

AIR



## TROUBLE SHOOTING FOR NEGATIVE GROUND TRUCKS

### IMPORTANT CAUTIONS

WHEN CHECKING SENSOR SYSTEM, DO NOT HAVE VEHICLE ENGINE RUNNING EXCEPT WHERE TOLD TO DO SO.

Ensure that the electrical system is negative ground.  
System should be tested with no objects at the rear of the vehicle and all test steps should be carried out in sequence.

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

### CONTROL BOX

1. Turn ignition to the 'ON' position, with the vehicle not running and the vehicle in any gear except reverse. (If your vehicle requires the engine to be running to have the reverse circuit energized start the vehicle, but do not put the vehicle in reverse.) There should be no lights illuminated on the control box at this time. If the green **system on** light is lit on the control box, refer to Guide 1a on page 5. If the yellow **warning** light is lit on the control box or the alarm beeper is on, refer to Guide 1b on page 5. If the red **auto brake off** light is lit on the control box, refer to Guide 1c on page 5. If either the yellow **reset** or **fail** light is lit on the control box, refer to Guide 1d,e on page 5.

# TROUBLE SHOOTING GUIDE

2. With ignition key in the 'ON' position, the vehicle's engine not running place the vehicle in reverse with the parking brake off, the green **system on** light should illuminate. (Certain vehicles require the engine to be running for the reverse circuit to be energized if so place vehicle in reverse and apply service brakes.) If the green **system on** light is not lit see Guide 3 page 6. If the yellow **warning** light or alarm is on refer to Guide 4 on page 6.
3. Push **auto brake OFF**, the red **auto brake off** light should illuminate and the audible warning should be beeping intermittently. Push **auto brake ON**. The audible warning should cease and the red **auto brake off** indicators should go out. If this does not happen, refer to Guide 2 on Page 6.

**WARNING:** THE FOLOWING STEPS SHOULD BE CARRIED OUT USING NO LESS THAN 2 PEOPLE

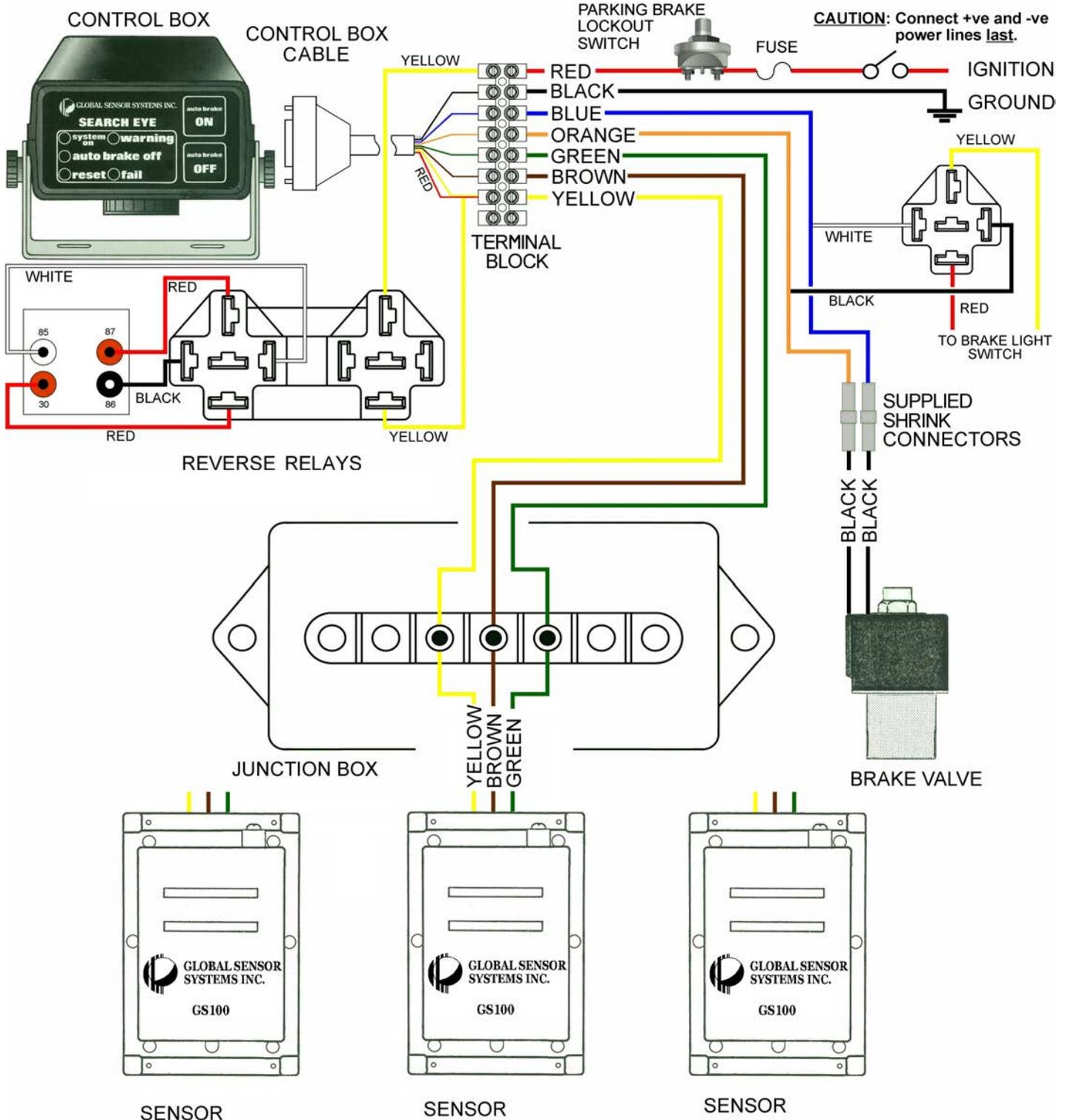
4. At this time, clean the lenses of all three sensors. Avoid direct high pressure washing. A simple wipe of the sensor windows will suffice. With the vehicle in reverse, ignition on and the vehicle not running with the parking brake off, (Vehicle may need to be running depending on your application if it does apply service brakes) and the green **system on** indicator on the control box illuminated, check each sensor on the back of the vehicle to ensure that, as each sensor is approached, the red indicator light in the center of the lower lens illuminates, the yellow warning light on the control box should illuminate and the alarm beeper should sound each time a sensor's red light illuminates. If the yellow warning light does not illuminate or beeper sound, refer to Guide 6 on page 6. At this time, check for sensor detection range. Move slowly towards the sensor; the red light should illuminate when you are 5½ to 6 feet from the sensor. If the range is shorter or longer than this distance, the sensor may require adjustment (Contact Global Sensor Systems at 905-507-0007 for sensor adjustment). If the red light on sensor does not illuminate at any time, refer to Guide 5 on page 6.
5. With the vehicle in reverse, ignition on, engine running with the parking brake off and the service brakes on, slowly back up and flag the sensors, the vehicle should stop and the yellow **warning** light should illuminate and the audible alarm should come on with a solid tone. If not, refer to Guide 7 on Page 6. **(Always Flag sensors from side of vehicle.)**
6. Clear sensor Area, with the vehicle in reverse, ignition on, engine running with the parking brake off and the service brakes on, push the **auto brake OFF** switch the red **auto brake off** light should be lit, and the audible warning should be sounding intermittently. Reverse slowly, flag the sensors, the vehicle should continue to reverse, the yellow **warning** light should illuminate and the intermittent audible warning should go to a solid tone. If the air brakes engage, refer to Guide 7 on page 6. Clear the sensor area, the yellow **warning** light should go out and the audible warning should go back to the intermittent beeping. If this does not happen, refer to Guide 1d on page 5.

# TROUBLE SHOOTING GUIDE

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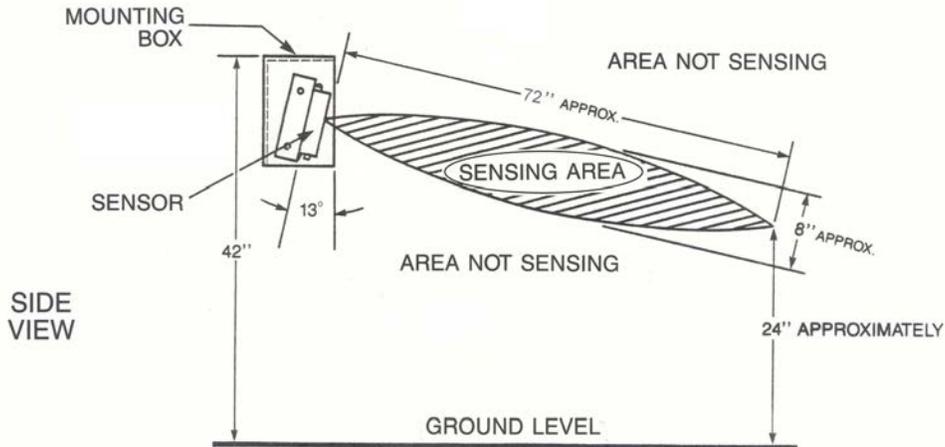
## WIRING DIAGRAM

### NEGATIVE GROUND ONLY



# TROUBLE SHOOTING GUIDE

## SENSOR PATTERNS



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.

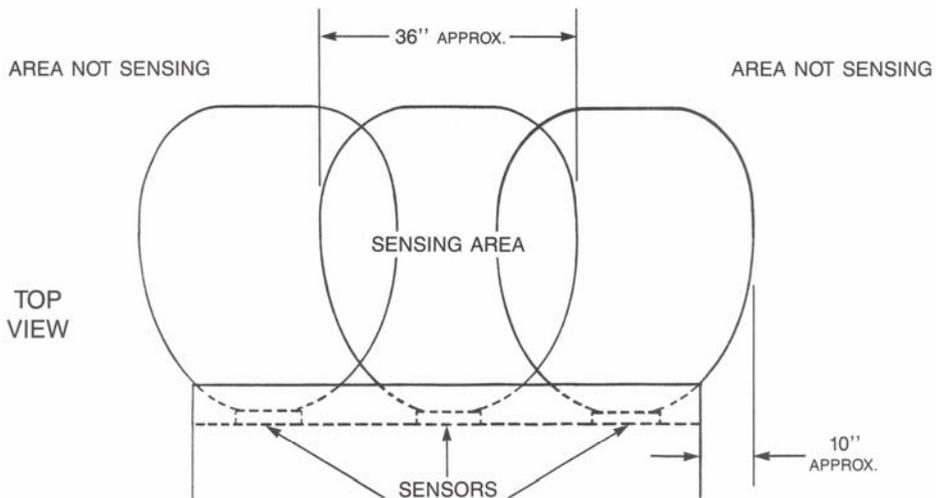
To avoid sensor detecting the ground, sensing area should not be adjusted any closer to the ground than 12"

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**



# TROUBLE SHOOTING GUIDE

AIR



## GUIDE ONE

**Indicators illuminated at incorrect time:**  
(These tests require the ignition on, but the engine off.)

- (a) If the green **system on** indicator is illuminated, check that the reverse lights are off. If they are not, then repair them **immediately** or **disconnect** the system **before** moving the vehicle. If the reverse lights are not on, then check the yellow wire from the control box to the dual reverse relay assembly. If wiring checks out, remove the relay with the yellow power wires. If the light remains on replace the control box, if not replace the relay.
- (b) If the yellow **warning** indicator is illuminated or the beeper is on, check the reverse lights to be sure they are off and that none of the sensors are detecting anything. If any of the sensors are detecting something, the indicator light in the center of the bottom sensor window will be illuminated. If both are OK, then check that the green wire of the sensors has not shorted to the truck chassis. If the green wire is OK then replace the control box.
- (c) If the red **auto brake off** light is illuminated, then press the **auto brake on**. If the light goes out, then turn the ignition key off and then on again. If the red **auto brake off** light illuminates again, replace the control box.
- (d) If the yellow reset light is illuminated, check the blue and orange wires from the control box to the brake valve. Check that the orange wire is not shorted to any ground, including the truck chassis. If all the connections are OK then depress the “**reset**” circuit breaker located on the back of the control box.
- (e) If the yellow fail light is illuminated, the brown and/or blue wire from the control box has touched a positive connection. Check both of these wires for proper connections and that they are not touching any positive connections. Press the “**fail**” circuit breaker button located on the back of the control box. If the light is still illuminated, replace the control box.

## GUIDE TWO

### The auto brake off indicator and beeper do not function:

- Check that the ignition key is on, and that there is 12V between the red and black wires of the control box.
- If only the beeper is working, replace the control box.
- If only the red indicator is working, replace the control box.
- If the red indicator will not go out, replace the control box.

## GUIDE THREE

### The system on indicator is not illuminated when vehicle is put into reverse:

- Check that the vehicle is in reverse, and that the reverse lights are on (Some vehicles require the engine to be running for the reverse lights to come on).
- If reverse lights are on and the **system on** indicator is not illuminated, check for 12V between the yellow wire of the control box and the vehicle ground. If there is 12V, replace the control box. If there is no voltage, check the yellow wire from the control box to the dual reverse relay assembly. If there is no voltage on either yellow wire on the dual reverse relay see (c). If wiring checks out, replace the relay with the yellow power wires.
- Located the parking brake lockout switch, (ensure parking brakes are off), check for 12V on the fused side of the switch. If 12V is present check the other terminal, if 12V is present check wiring to the dual reverse relay. If 12V is not present, cycle the parking brakes on and off, if 12 V is still not present replace lockout switch.
- If 12V was not found on the fused side of the lockout switch, check fuse and wiring to 12V source.

## GUIDE FOUR

### Yellow warning light and alarm beeper activate when reverse gear selected, but no object is in the sensing area:

PLACE BLACK ELECTRICAL TAPE OVER THE TOP LENS OF THE SENSOR – THIS WILL ENSURE THAT THE SENSORS WILL NOT DETECT ANYTHING.

IMPORTANT: Observe that the red indicator light in the bottom window of the sensor does not go on to make certain that the sensor is not detecting an object.

- Check the green wire between the control box and the sensor for shorting to truck chassis. If all the indicators on the sensors are off and there is no short between the green wire and ground then replace the control box.

REMOVE TAPE WHEN COMPLETED.

## GUIDE FIVE

### Indicator light on sensor does not go on when the green system light is illuminated and an object is in the sensing area:

- Check for 12V on the yellow and brown wires at the sensor. If 12V is found replace the sensor.

## GUIDE SIX

### Control box yellow warning light or alarm beeper not working:

- If the alarm beeper is on but the yellow **warning** light is not, replace the control box.
- If the **warning** light is on but the alarm beeper is not, then replace the control box.
- If neither the alarm beeper or the yellow **warning** light function, then check the green wire from the sensors to the control box for damage or faulty connection. If wiring is OK then replace the control box.

## GUIDE SEVEN

### Air brakes do not engage when object detected, or air brakes do not disengage when auto brake OFF is pressed:

- When the yellow **warning** light and alarm beeper are on (object detected) and the **auto brake off** light is not illuminated, check for 12V between the blue and orange wires at the control box. Also check for 12V at the valve. If 12V is not found, replace the control box.
- If 12V is present and brakes do not come on check pressure in the secondary tank this must be over 90lbs. If pressure is good, check the air flow direction and orientation of the pressure protection valve see pages 8 and 9. If direction and orientation are correct replace valve.
- If 12V is present but does not turn off when **auto brake off** is pressed, replace the control box.
- If the yellow reset light is on, see Guide 1 (d) on page 5.
- If control box checks out OK, but brakes do not function, check the valve installation
- If the brakes come on but will not disengage even when placed in a forward gear, make sure the VENT on the brake valve is clear.

# TROUBLE SHOOTING GUIDE

AIR

## COMPONENT TEST PROCEDURES

### SENSOR TEST

Connect a 12V DC power supply across yellow (positive) and brown (negative) wires. Connect a meter 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 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 indicated 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.

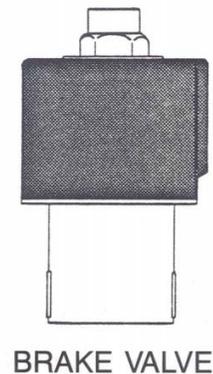
### CAUTION

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 some 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.

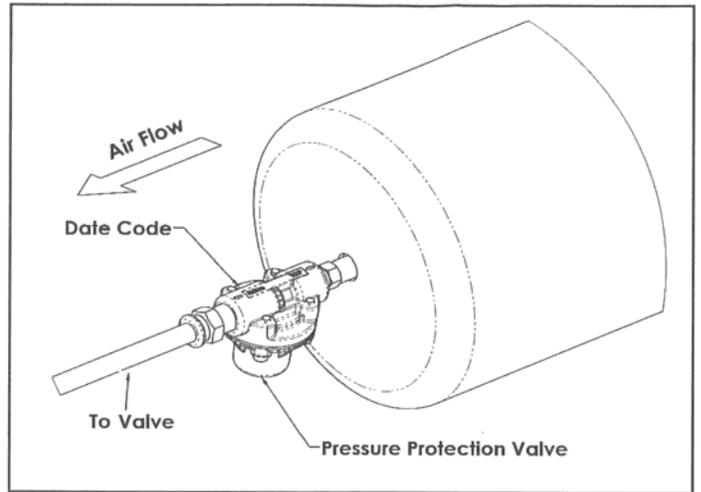


# TROUBLE SHOOTING GUIDE

## VALVE TROUBLE SHOOTING



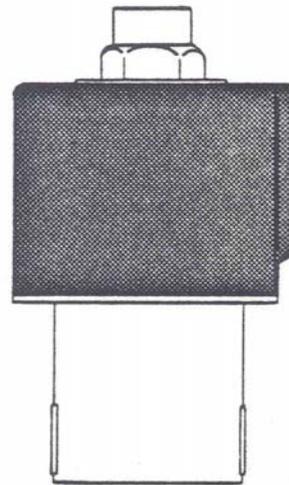
Valve Installation Example  
(Photo from underneath – Looking up)



Pressure Protection Valve Installation  
Note Proper Air Flow Direction and Orientation

### Unit operates but brakes do not automatically apply:

- (a) **Auto brake off** light should not be illuminated.
- (b) Solenoid should click when power is applied.
- (c) Recheck connection of orange and blue wires from control box.
- (d) Check to make sure wires from control box to valve are not shorting to truck chassis.
- (e) Check for 12V between the Orange and blue wires.
- (f) Check Valve connections for correct installation.
- (g) Check for blocked airlines.
- (h) Check Pressure in tank is above 85PSI.
- (i) Check Pressure Protection Valve.
- (j) Check Pressure Reduction Valve.



**BRAKE VALVE**

# TROUBLE SHOOTING GUIDE

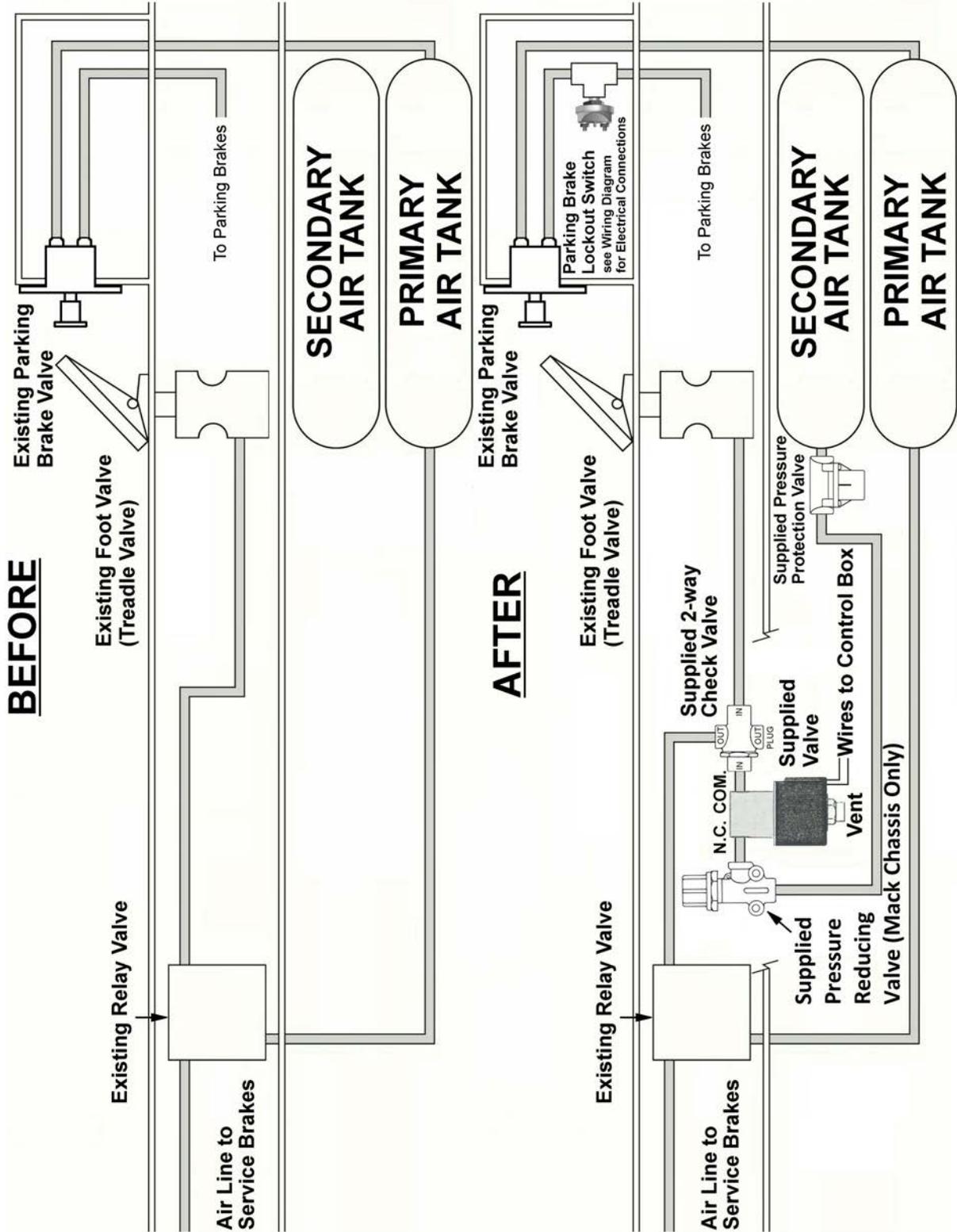


## IMPORTANT

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.

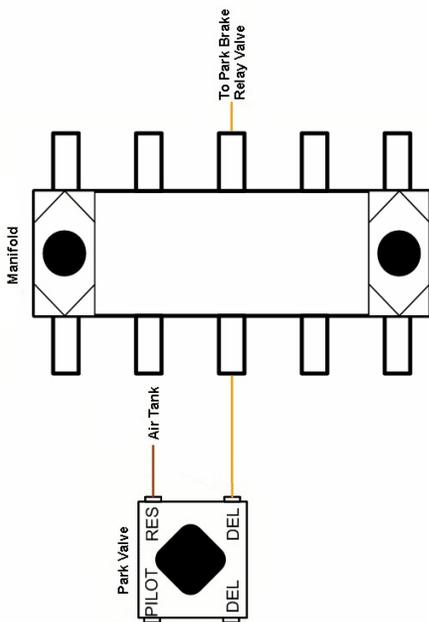


**Note:** Electric Brake Solenoid Valve is vertical with vent pointed down and Shuttle Valve is Horizontal.

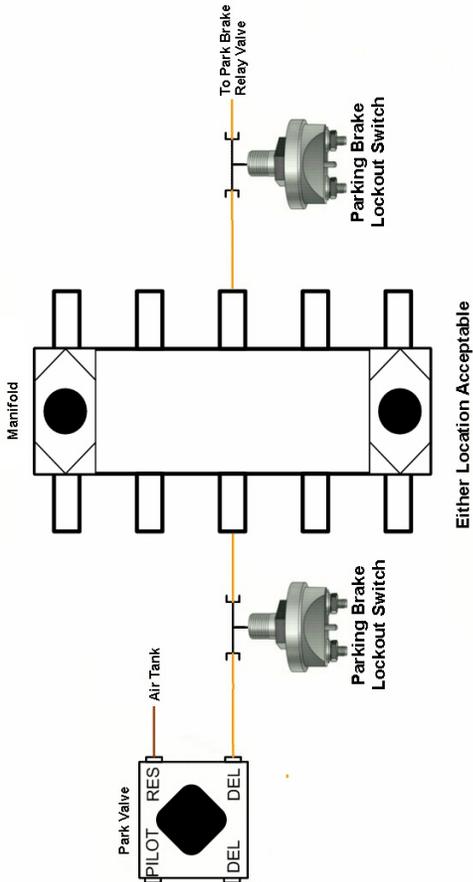
## PARKING BRAKE LOCKOUT SWITCH INSTALLATION

### SINGLE PARKING BRAKE VALVE INSTALLATION

**BEFORE**

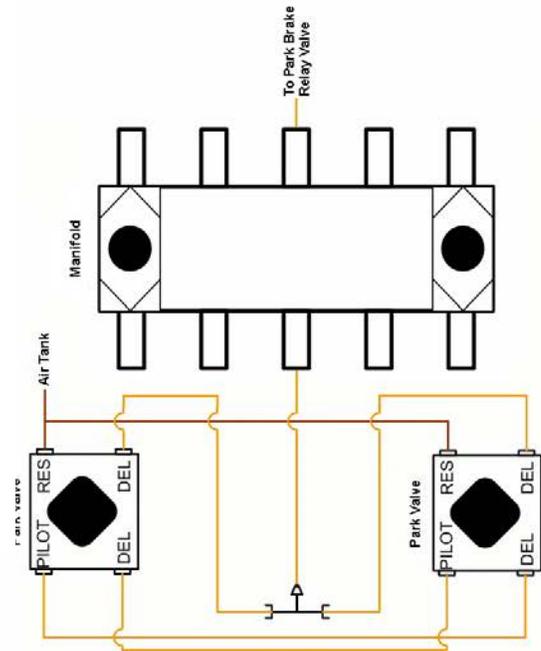


**AFTER**

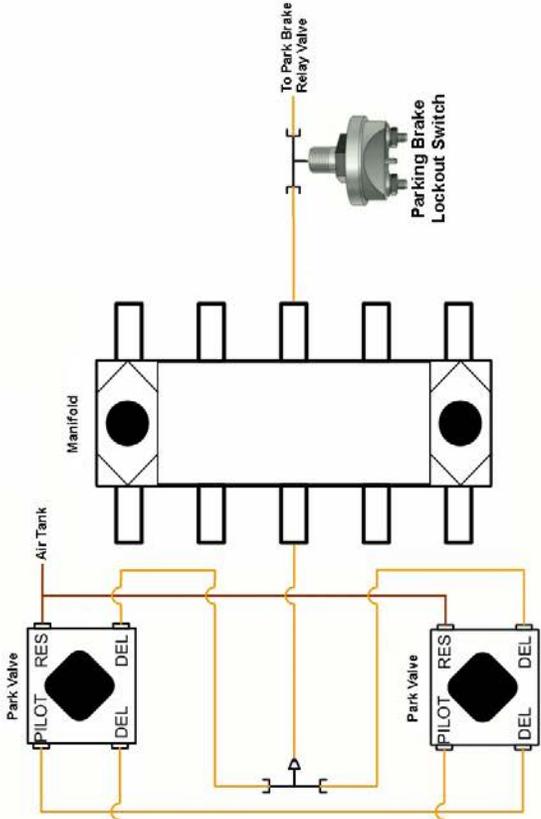


### MULTIPLE PARKING BRAKE VALVE INSTALLATION

**BEFORE**



**AFTER**



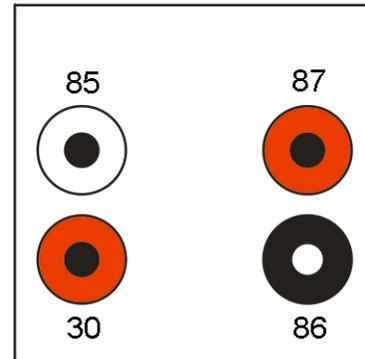
# TROUBLE SHOOTING GUIDE

AI R

## 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.



Decal for Dual Relay Wire Insertion

### 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 1/4".

### Testing

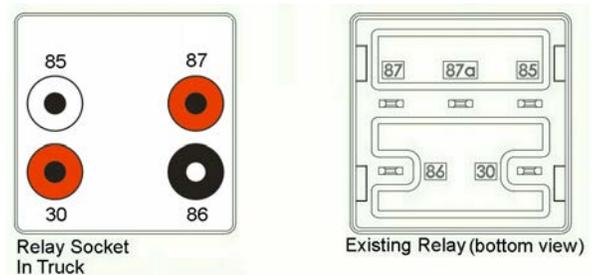
1. Start the vehicle and with the brake on, place the vehicle in reverse. The reverse lights on the vehicle should illuminate and the Global System should turn on.

### 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.**



Decal Application  
(Note Flipped Relay and Decal are Mirror Images)



Dual Relay Assembly