

General Guidelines for Road Tube Installation

The following guide is a reference for installing road tubes for portable counting and classification purposes. This guide is meant to help you insure that installation is done properly and safely. Please make sure to take caution when out on the road to avoid injury or possible death.



Safety

- 1. Working in the roadway is dangerous. Make sure drivers can see you. Wear a bright orange or yellow safety vest and hat at all times.**
- 2. Don't assume that drivers always see you. Never turn your back on traffic.**
- 3. Don't assume that drivers know which direction you are going to move next. They may steer the vehicle into the vacant space that you were planning to use as a safe refuge. Always stay clear of roadway when traffic is approaching.**
- 4. Don't hold onto the road tube while vehicles drive over it. They can snag the tube pulling it through your hands.**

Supplies

- Useful hardware to have on hand to make the life of the field man easier:
 - ◆ Four pound sledge hammer
 - ◆ Gloves
 - ◆ Pry bar to remove nails
 - ◆ Duct Tape
 - ◆ Six foot lengths of chain
 - ◆ Padlock(s)
 - ◆ Tape measure
 - ◆ Safety vest and hat
 - ◆ Road tube end plug(s)
 - ◆ 2 ½ " and 3 ½ " concrete nails
 - ◆ 12" dirt spikes
 - ◆ A selection of your favorite road tube grips and anchors.
 - ◆ Road tube(s) and traffic counter(s)



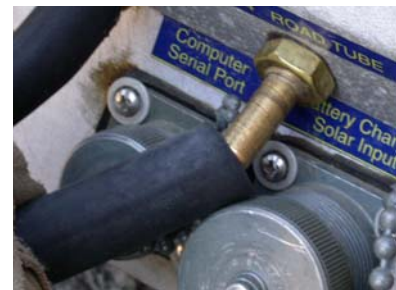
Procedure

- Use rubber tubing that is designed for vehicle counting. Normally this tubing has a 9/16" outside diameter and either 3/16" or 1/4" inside diameter. We recommend that you use the 1/4" inside diameter.
- Use road tube made from 60% natural rubber from rubber trees or EPDM, which is a synthetic rubber. The EPDM generally costs less and works well except it tends to be stiffer and less resilient than the natural road tube in cold weather (freezing or below).
- Keep the length of the road tube no shorter than 30 feet and no longer than 100 feet. The ideal length is 40 to 60 feet. Road tubes shorter than 20 feet will damage the air switches very quickly.
- **NOTE: For *slow speed* applications (TT 2, 4, 6, 8 and 77), we recommend a road tube length of 20 to 25 feet relaxed, or unstretched. You will get accurate counts and no modification to your counter will be necessary.**
- The end of the road tube that is not connected to the counter should have a plug in it to keep out water, dirt and insects to allow the air switch to function properly. A concrete nail will work in a pinch however they will work themselves out of the tube over time.



(Road tube plug being inserted.)

- The road tube needs to be secured to the road at the edges of the road. If the distance between securing devices is over 50 feet you should have a securing device in the middle to keep the tube from bowing or drifting at the center.
- Lay the road tube out so that it is perpendicular to traffic flow. You want vehicles to stroke the tube squarely so that both of the front tires hit at the same time. If the tires hit at different times you may get an inaccurate test.
- Make sure that you stretch the road tubes about 10%-30%.
- Plug the tube into the counter. (picture shown right.)



(Road tube being connected.)

Checking the tubes

- Road tubes can have holes or cuts in them. We recommend that you check the tube for holes at 2 to 5 PSI of air pressure with the tube submersed in water. If there are any bubbles then the tube is bad.

- Road tubes can contain water in them from rain; one tablespoon of water can stop the pulse from reaching the counter. To remove water start from the far end of the tube and raise it to chest height then slowly walk the length of the tube causing each section to be raised.
- Dirt and insects can get into the tube; clear out tube with compressed air.
- Bend the tube over your finger and look for small cracks that indicate that the tube is going bad.
- Make sure that tubes used for classification are the **same length**. If they are more than 6 inches in difference, you need to cut them to be equal length.

Selecting your counting site

- Pick a spot preferably on a straight, flat roadway with free flowing traffic between 10 and 70+ mph. Diamond air switches will work consistently down to 6mph and up to 100mph.
- Stay away from traffic signals and other places where cars are likely to stop, drastically slow down or speed up.
- Avoid rutted and potholed roads. They cause the road tube to slap and could make the counter double count.
- Hills and off ramps can be counted, but take precautions to prevent the tube from being rolled or pulled down the road causing tears in the tube and inaccuracy in speed calculations. Use road tape to secure the tube in each lane to the road surface for best results.

Average speed of traffic	Suggested Tube spacing
10-25mph	4'
25-40mph	6'
40-60mph	8'
60mph & above	10'



- Measure the tube spacing at both ends to insure accurate classification and speed calculations. (Shown at the left)
- We recommend that you secure the end of tube opposite the counter first. Take two or three nails, a hammer and your tube to the far side of the road and drive the nail into the asphalt, concrete, or dirt.

- Hook your securing hardware that you pre-attached to the end of the road tube over the nail's head (shown at the right). When you have plenty of space between traffic, lay out the road tube across traffic lane or lanes.



(Properly set up figure 8 fastener)

- Drive a nail into the road edge on the side of the counter so that the tubes are perpendicular to the road. (shown at the right)



(Properly driving in a nail)

- Do not hold onto a road tube when a car drives over it. Occasionally a vehicle can “grab” the tube pulling it and all of the metal attached to it right out of your hands
- When you install the second tube, make sure that your spacing is correct, and follow the above directions.

