

Installation (cont)

Electrical Installation

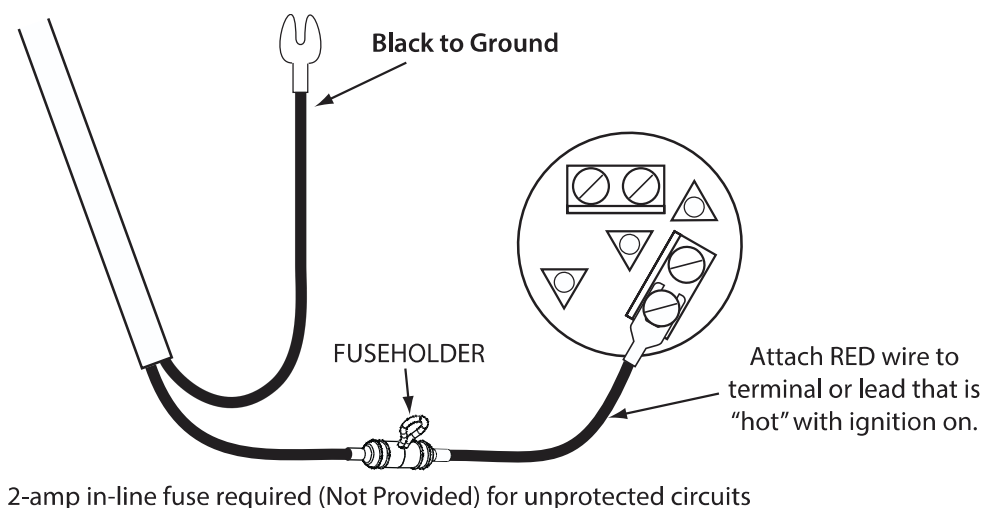
CALC-AN-ACRE must be connected to a 12-volt DC electrical system. Using your test light, locate a terminal or wire connected to your ignition switch which is "hot" when the ignition is turned on and "dead" when the ignition is off.

Locate the power cable on main wiring harness. Connect the RED wire to the contact point you have located. Attach the BLACK wire (ground) to a screw or bolt on the equipment frame. *See Illustration 3.* Be sure there is a good metal-to-metal contact. The terminal connectors have been supplied for your convenience. You may wish to substitute other types

of connectors or make a direct solder connection. In routing cable to console, avoid areas where the cable may be subjected to abrasion or excessive heat.

Your CALC-AN-ACRE is equipped with an advanced electronic memory which does not require a constant supply of power to retain daily totals or calibration values. The advantage with this type of memory is that it conserves battery power and will not discharge the vehicle's battery when equipment is not in use.

Illustration 3



Mounting Magnetic Sensor to Non-Driven Wheel

The following is a set of general procedures to follow. You may find it necessary to modify the mounting bracket and hardware to work with your particular equipment.

Only **THREE** requirements must be met for the wheel-mounted sensor installation:

1. Be sure that both the magnets and the sensor assembly are securely fastened.
2. The tip of the sensor must be positioned over the center of the magnets and must maintain a 1/4" to 1/2" (6mm to 13mm) spacing.

3. The two magnets must be spaced correctly. Position them exactly opposite each other (180 degrees apart). When using more than two magnets, always use an even number and always space them evenly.

Select the most accessible non-driven wheel on the tractor, vehicle or implement. This wheel must provide a clear area on the hub for attaching the magnets and an adjacent area on the axle or frame for attaching the speed sensor/bracket assembly. *(While the sensor can be mounted to any wheel, a non-driven wheel is less affected by slippage and will provide more accurate readings).*

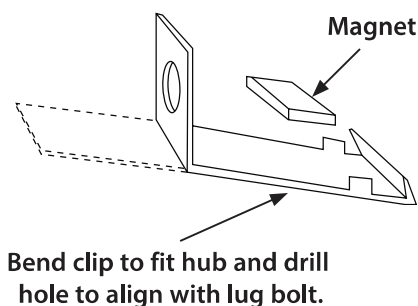
Installation (cont)

Attaching Magnets to Hub

Two magnets are required for proper speed sensor operation. Position them exactly opposite each other (**180 degrees apart**). The polarity (north and south poles) detected by the Hall-effect speed sensor must alternate as the hub is turned. An easy way to make sure you attach the magnets with alternate polarities follows:

Stick the two magnets together in a stack. The top surface of each magnet will have the same polarity. With a pencil or marker, mark the "top" of one magnet, and the "bottom" of the second as they are stuck together. When you attach the magnets to the wheel hub, make sure each pencil mark is facing away from the hub. The magnets will be correctly attached with alternate polarities.

Illustration 4

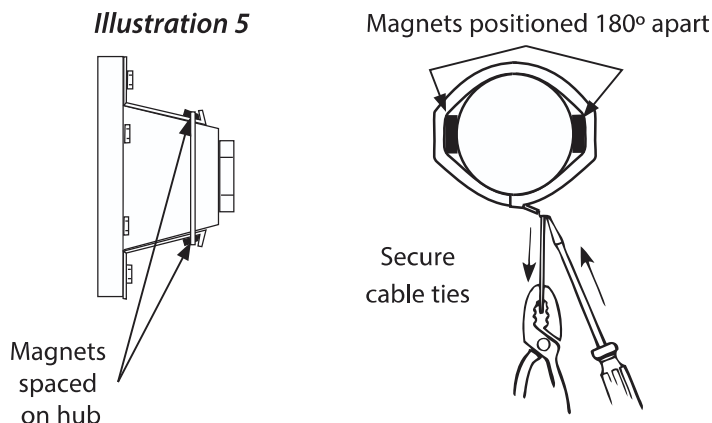


To attach the magnets:

1. Bend magnet clips to fit the shape of the wheel hub. See Illustration 4.
2. Mark the position of a lug bolt on the vertical portion of each clip, drill appropriately-sized hole and secure clip to hub with existing lug bolt. On a tractor wheel it may be necessary to substitute a longer hub bolt or tap threads into the hub.
3. Place magnets against stop at end of each clip; longest dimension of magnet should be turned in direction of turning wheel.
4. Place cable tie around hub and over the magnets. Hold lock tab down with tip of screwdriver, pull tight with pliers and trim off excess. See Illustration 5.

For large hubs, two ties can be connected together for extra length. To minimize interference, the cable tie grip or hose clamp screw must not be located on top of the magnets.

Illustration 5



Multiple Magnet Installation

If you are using more than two magnets, please read the following information about magnet spacing and polarity.

The number of magnets that must be used depends on where you mount the sensor. On tractor or implement wheels the general rule of thumb is one magnet for each wheel bolt (minimum of two, and always an even number). For drive shafts or small wheels (ATV's), a minimum of two magnets are required.

The magnets provided by Micro-Trak are marked with a punched, dashed line on the SOUTH pole side of the magnet. See Illustration 6A.

Always use an even number of magnets, and always alternate the polarities of the magnets as you go around the wheel hub or drive shaft. To install, mount the first magnet with the SOUTH pole side (dashed line) facing toward the hub or shaft. Mount the second magnet with the NORTH pole side facing toward the hub or shaft. See Illustration 6B.

For proper operation, the magnets must be evenly spaced around the wheel or drive shaft. The magnets must be at least 1" apart. See Illustration 6C.

Illustration 6A

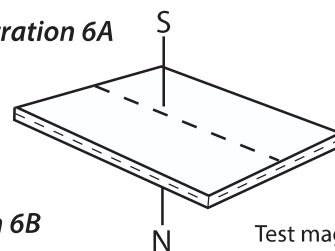


Illustration 6B

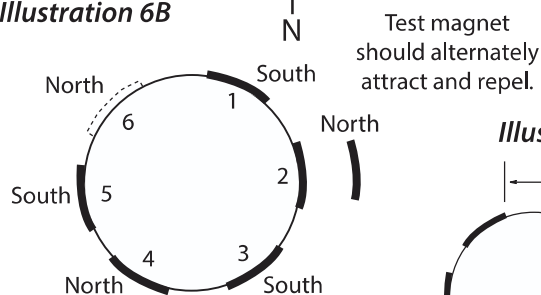
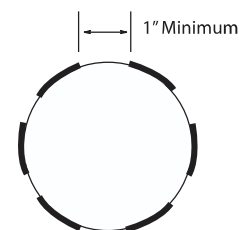


Illustration 6C



Optional Method

The magnets may also be attached directly to the hub using an epoxy or similar high quality permanent adhesive. Be sure the area is free of dirt and oil.

With either method, a layer of tape wrapped around the hub and over the magnets will help prevent the magnets from being dislodged by field debris.

Installation (cont)

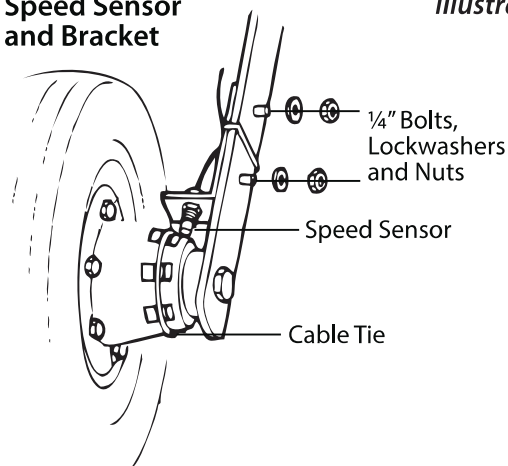
Mounting Sensor Bracket

Implement Wheel

Position "L" bracket on either long or short side so that one of the large diameter holes is directly over the position of the magnets on the hub. Allow enough room between the bracket and the magnets so that when properly spaced, the tip of the sensor will extend 1/4" (7mm) or more beyond the locking nut. Mark the position of two small bracket mounting holes on the supporting frame, drill and secure with bolts, lockwashers and nuts provided. *See Illustration 7.*

Speed Sensor and Bracket

Illustration 7



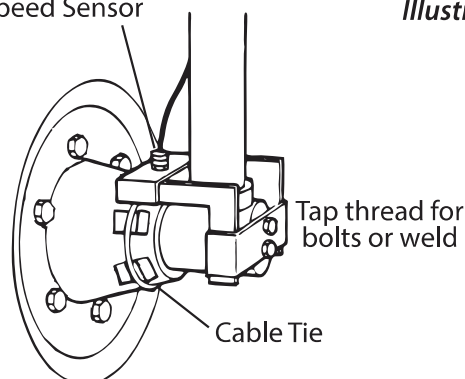
Tractor Wheel

The front wheel of a tractor is often a desirable location for mounting the magnetic speed sensor. Because of the wide variation of tractor designs, you may find that the "L" bracket provided will not work on your make or model. You can fabricate a bracket from a minimum of materials which can be adapted to a wide variety of equipment. *See Illustration 8.*

NOTE: Be sure not to attach the sensor mounting bracket to any part of the steering mechanism or similar component whose position to the wheel changes as the equipment is turned.

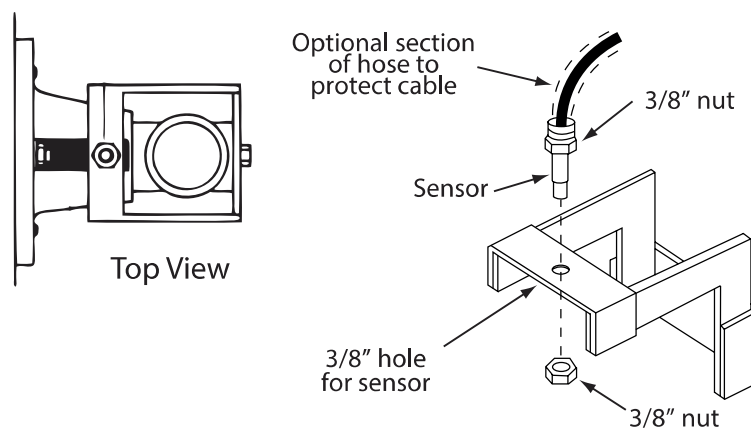
Speed Sensor

Illustration 8



Hub

FABRICATED BRACKET



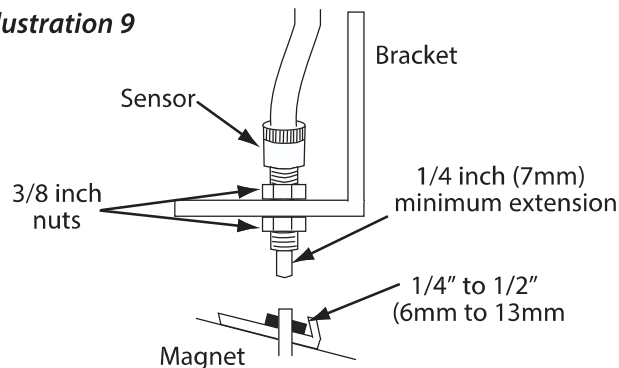
Installation (cont)

Adjusting Sensor

To set speed sensor to correct distance from magnets ($1/4"$ to $1/2"$, or 6mm to 13mm), first turn one locking nut onto sensor. Then insert sensor into large hole selected on bracket and turn on remaining locking nut. Adjust nuts to achieve proper distance. When distance is set, turn both lock nuts tight to hold sensor in place. End of sensor must be directly over the magnets but does not have to be exactly perpendicular. *See Illustration 9.* Secure sensor cable to equipment frame with cable ties. Place first tie as close to sensor assembly as possible.

NOTE: Sensor assembly must not be mounted more than 45 degrees from perpendicular.

Illustration 9



Adjusting sensor/magnet spacing

Speed Sensor Mounting on Drive Shaft

Determine the best location for the magnets on drive shaft according to which is the most practical spot to attach sensor mounting bracket. This position should be no more than 12" (.30 meters) behind the front U-joint. For best results, mount "L" bracket to transmission and mount magnets on drive shaft as close to transmission as possible. This will ensure proper alignment if the drive train shifts under heavy loading.

Two magnets are required for proper Hall-effect speed sensor operation. Position them exactly opposite each other (180 degrees apart). The polarity (north and south poles) detected by the Hall-effect speed sensor must alternate as the shaft is turned.

- Attach magnets onto drive shaft by wrapping cable tie around shaft and magnets. Position each magnet so that its longest dimension moves in the direction of rotation. Pull cable tie tight and trim off excess. An adjustable, non-magnetic (stainless steel) band clamp may also be substituted.

- Attach sensor bracket to vehicle transmission with bolts, lockwashers and nuts provided. See Illustration 10. Use either the short or long end of the bracket as a base. Allow enough room between the bracket and the magnets so that when properly spaced, the tip of the sensor will extend $1/4"$ (7mm) or more beyond the locking nut.
- Turn one locking nut onto threaded sensor and insert sensor into large hole selected on mounting bracket. Turn on remaining locking nut. Set sensor to proper distance from magnets ($1/4"$ to $1/2"$, or 6mm to 13mm). When distance is set tighten nuts to lock sensor in place.
- Secure cable to frame with cable ties. Place first tie as close to sensor assembly as possible.

NOTE: If you are using more than two magnets, please follow the directions on page 8.

Illustration 10

