



An expert on the other end of this telephone line can detect the trouble on 99 percent of the electric tractor problems that demand hotline service, says a spokesman for General Electric.

## Tractor Troubleshooting by phone

The introduction of electric tractors for lawn, garden and grounds tasks has brought a new technology into some maintenance shops serving this market. Described here is the manner in which the electronic technology of these machines permits use of telephone for long-distance troubleshooting to shorten repair time.

*"HOTLINE. Lee Freeman."  
 "This is Bob Abbey at All Seasons Equipment, Lee. We need your help on an E-15 I've got here. The owner says the acceleration is a little funny."  
 "OK, Bob. Is the tractor set up the way we requested for hotline service?"  
 "Yes. I've pulled the tractor panels and I'm ready to go."*

All Seasons is only a few miles away but it could be 2,000 miles away from General Electric's Elec-Trak headquarters in Scotia, New York. They are using GE's unique "service hotline." The electric tractor, in for service, is driven close to the phone and the upper control panel and control cabinet cover are removed, exposing coded wires, relays and other circuitry. The phone is held close to this nerve center, and Bob turns

the key and pushes the dashboard speed control forward.

"I'm in neutral, so listen," Bob says.

Since the tractor is electric, Lee Freeman can actually hear the switches, contactors and relays click in and out over the phone as the tractor's controls go through their acceleration mode.

"OK, Bob, you're missing a speed in there. Take your volt-ohm meter and measure the voltage on that plug you see between the two stud terminals on the drive motor. Use your service jumper on the seat safety switch so the motor will run without you on the seat." (Normally a driver must be on the seat for the motor to run).

"I've got the measuring prongs in that plug, Lee."

"Move the speed control forward. Here's the voltage progression you should be getting", and Lee reads off a series of numbers.

"Nope. Lee, it looks like I'm missing fourth speed."

"I know. Take out the three screws holding the speed control, unplug it from the wire harness and check the switches."

"Yup. It's the fourth switch. Thanks, Lee."

Ten minutes later, Bob Abbey has replaced the switch, plugged it into the harness, replaced the three screws, reinserted the dropped panels. His hands are clean, and the whole job probably took less than 40 minutes. The E-15 tractor's owner now has all seven speeds forward in each of four ranges (28 all told).

General Electric's service hotline puts all franchised Elec-Trak tractor dealers in direct and immediate contact with a service expert at GE's Outdoor Power Equipment Operation, makers of six totally electric tractors and equipment.

Actually, however, the short dialogue in the beginning is not a typical hotline conversation. Why? Missing a speed in a tractor could be diagnosed immediately by any trained dealer, certainly Bob Abbey of All Seasons, an Elec-Trak veteran. The hotline call would have been unnecessary. Before the hotline service is used at all, the dealer taps his own considerable troubleshooting resources: a

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