



Irrigation Electrical Troubleshooting

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- Do you guys get any questions about controller or electrical problems at the Counter? What makes you an expert?
- It's the Magic Kingdom when you are behind the counter!



Topics

- Basics of Irrigation Electricity
- Steps to follow when troubleshooting
- Troubleshooting Clocks
- Troubleshooting Field Wiring
- Irrigation Electrical Tools

Basics of Irrigation Electricity

- Voltage without anything being energized is similar to static water pressure
- They both represent potential energy
- A true test of voltage to an irrigation valve is only accurate when the solenoid is activated.

Never Assume

- Section Valve is in the middle of the area it controls
- Color of wire at clock is the same as at the valve
- Irrigation plan (if present) is accurate
- Valve is not in backwards
- Correct solenoid is on valve
- Valve is not wired to another valve in the field



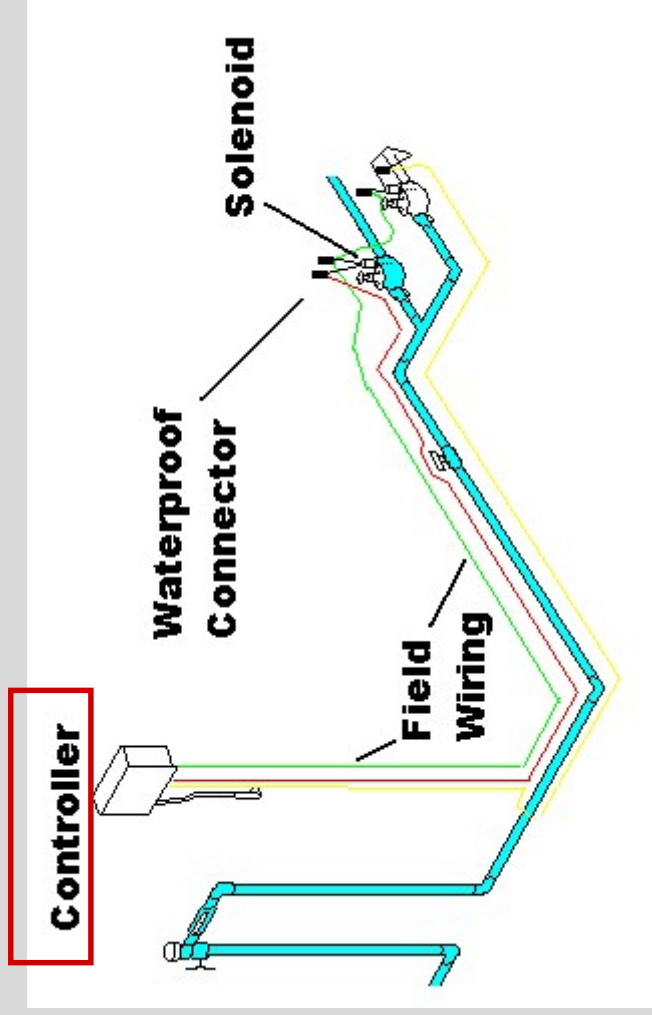
3 Electrical Components

- Controller
- Field Wiring
- Valve

Controller Failures

- Transformer
- Facepack
- Expansion Modules
- Main Circuit Board
- Homeowner is Stupid
- Contractor is a Moron
- Over 90% Of controllers sent back for warranty are fine

Where to Start?





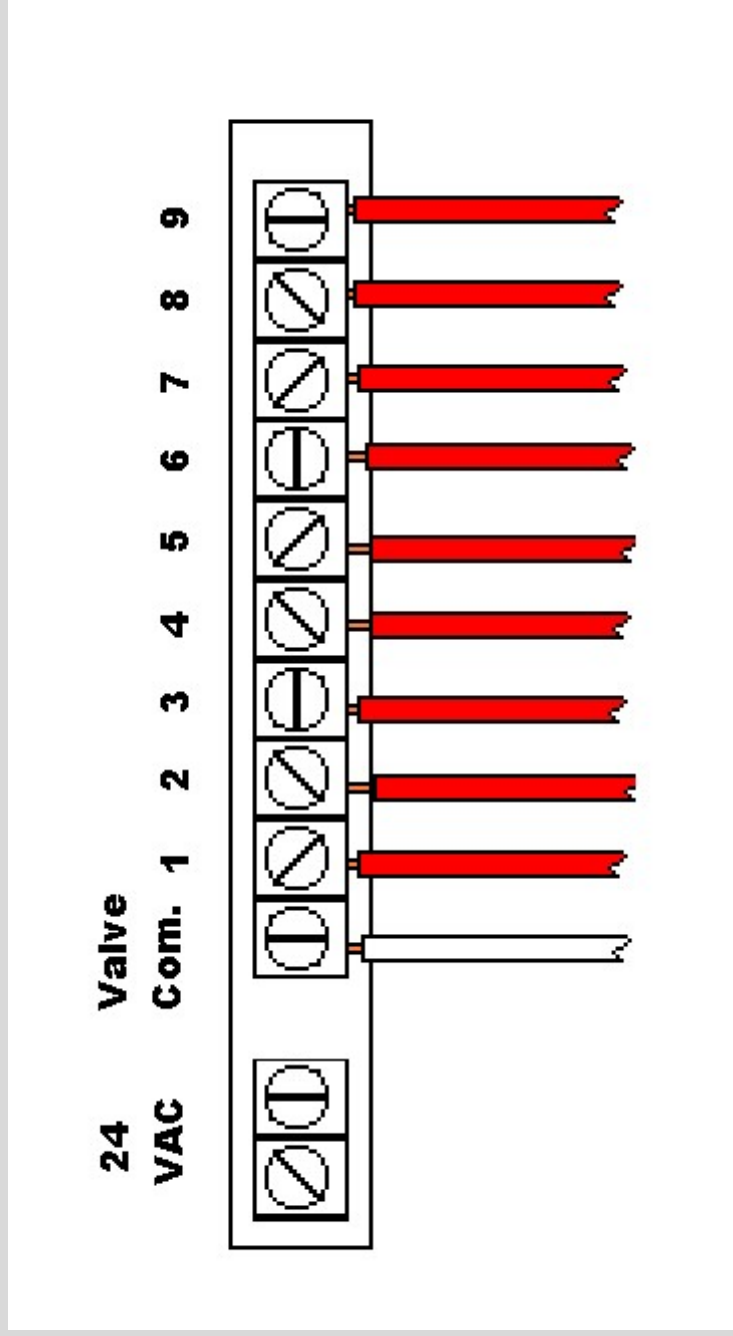
Do NOT Start Here



Or Here



Start the Process Here

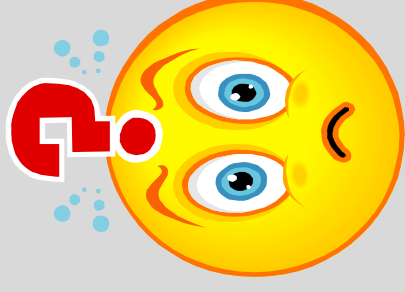


Problems

- 1.No valves will come on**
- 2.Numerous valves will not come on**
- 3.One valve will not come on**
- 4.Valve will come on and short out**
- 5.Valve will not turn off**

Problem 1

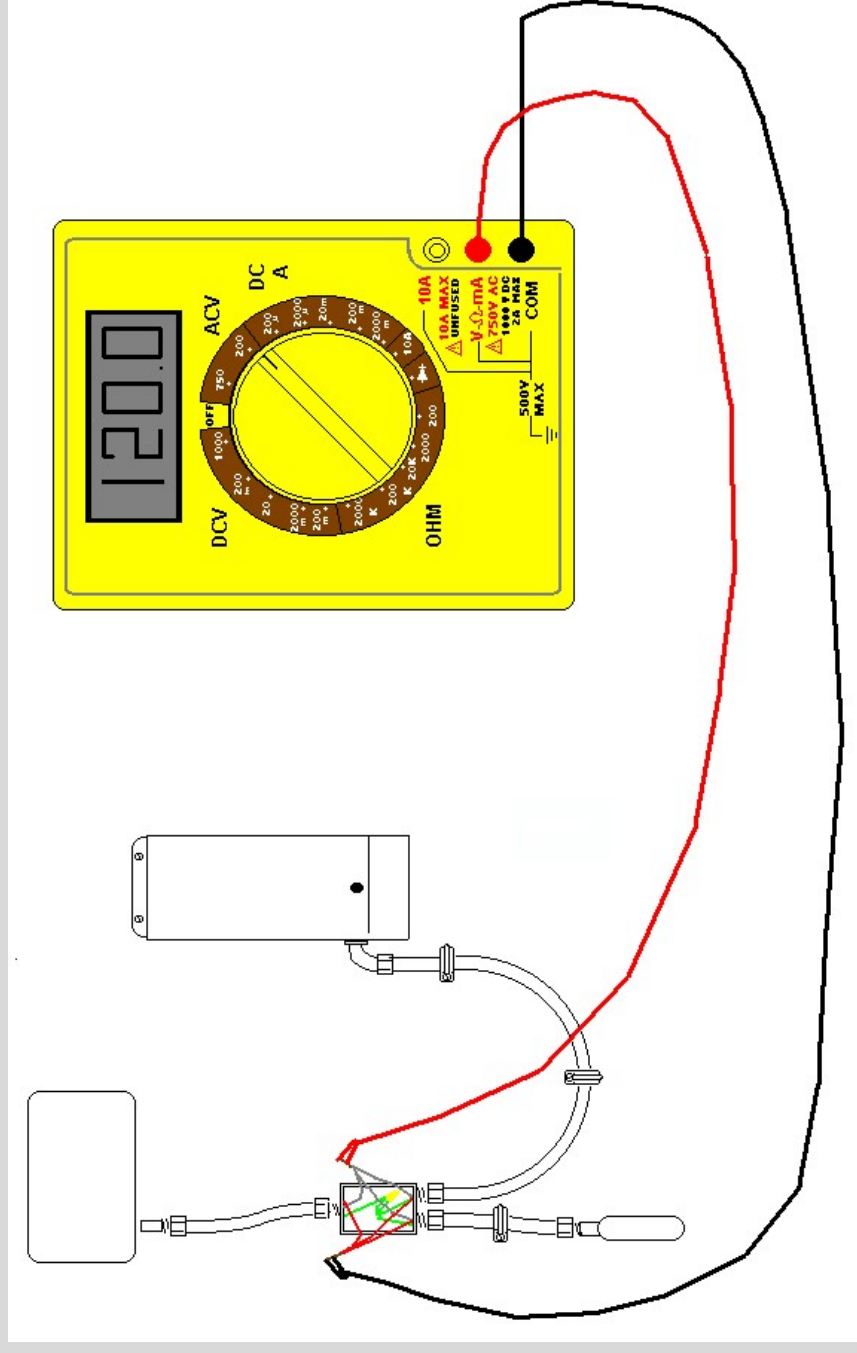
Customer calls and says none of his electric valves will come on. What could possibly be the problem???



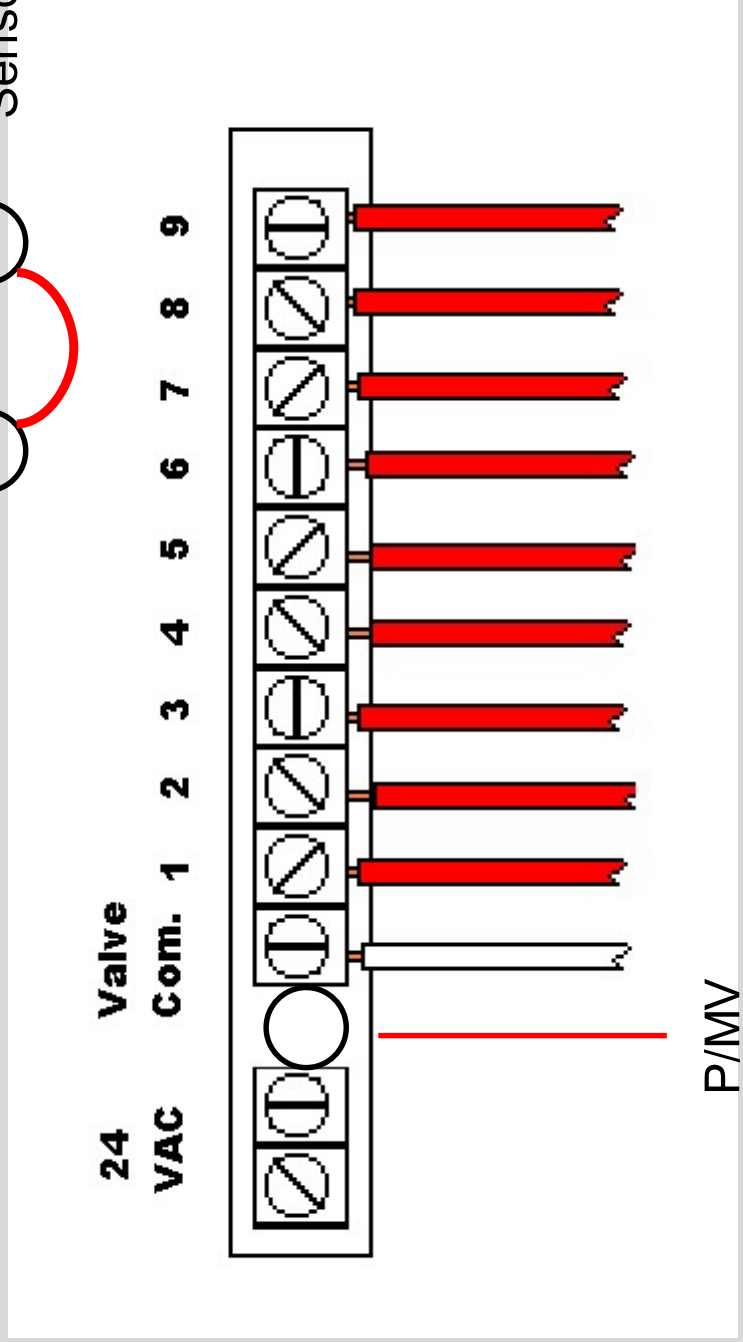
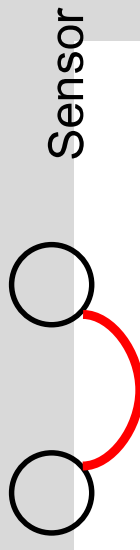
No Valves will Come On

- 1. Make sure water is on*
- 2. Check AC power coming to the controller*
- 3. Check power past the transformer*
- 4. Check for Rain or Freeze Sensor*
- 5. Check for electric master valve or pump*
- 6. Check power at station terminal*
- 7. Ohm out station at clock*
- 8. Ohm out solenoid at valve*
- 9. Track and detect wire problem*

Measure AC Voltage at Clock

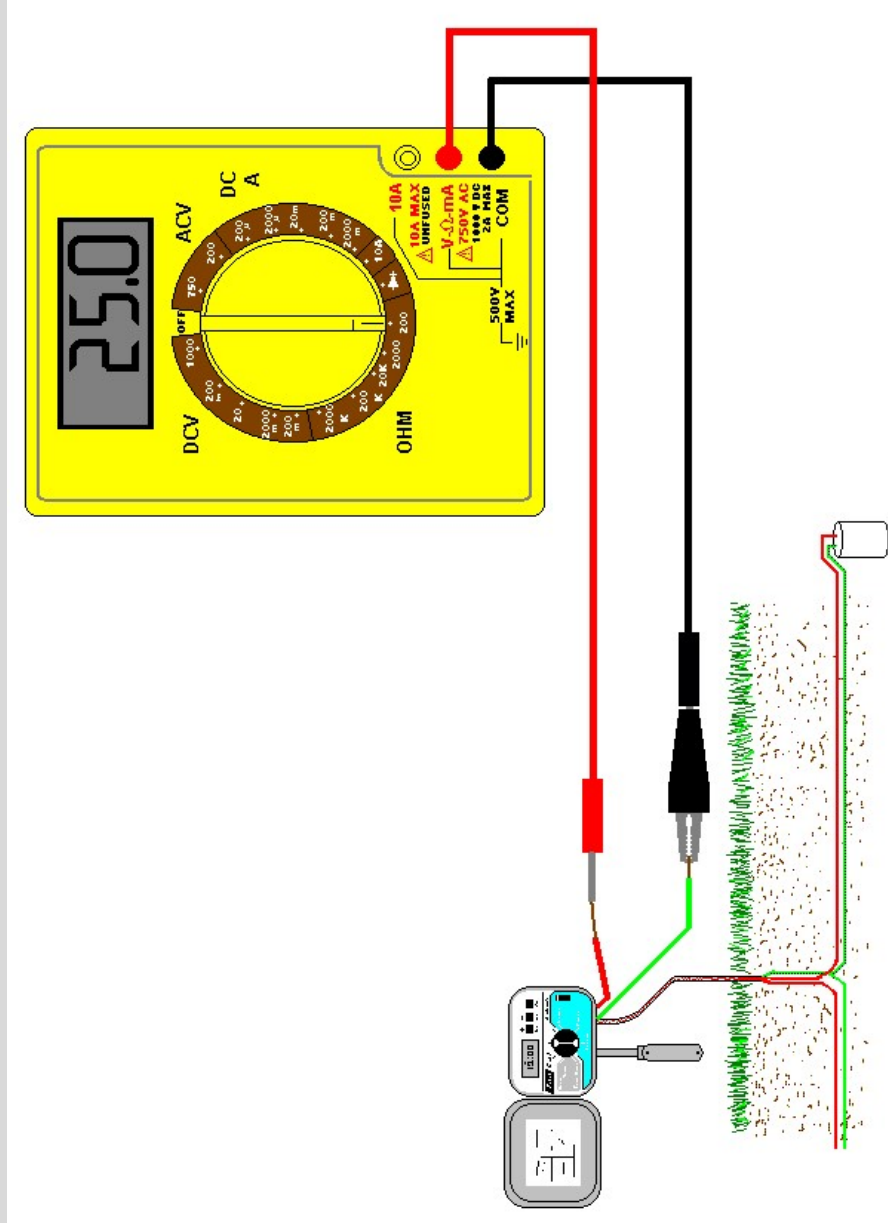


Start the Process Here



Perform a resistance test on each valve on the clock

- Set meter to 200 ohms scale
- Connect black lead to the valve common wire coming from the field(common should be disconnected from clock)
- Alternately touch each station wire.

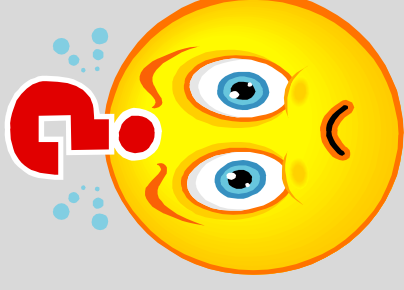


Typical Solenoid Ohm Readings

• Hunter	25	Hunter DC	5
• Irritrol	25	Toro DC	5
• R/B DV	52	R/B DC	10
• R/B PGA	36	Irritrol DC	5
• W/M	31		
• LP	27		
• Toro 1"	53		
• Toro 252	30		

Problem 2

Customer calls and says they have 18 valves on the system and 3 are not working. What could be the problem?

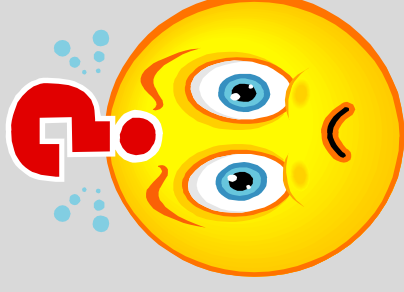


Numerous Valves will not Come On

- Check AC power going to stations (could be a module out on the controller)
- Ohm out each station wire at controller
- Ohm out solenoids at valve
- Track and detect wire problem
- Problem is possibly immediately past last working station.

Problem 3

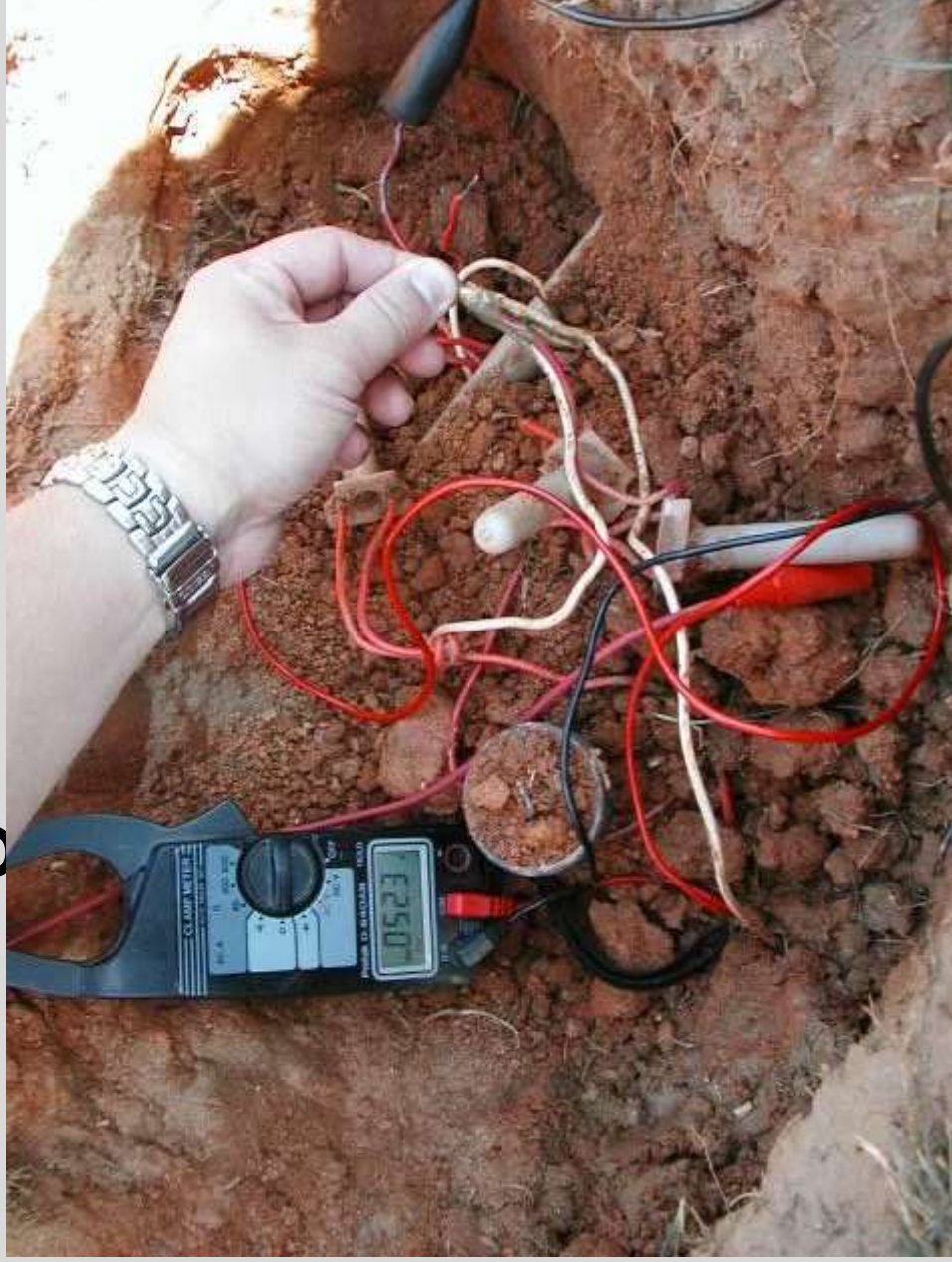
Customer calls and says all of his stations are working except one. What could be the problem?



One Valve will not Come On

1. Ohm out station wire at controller
2. Check AC power at station terminal
3. Ohm out solenoid at valve if possible
4. Track and detect wire problem

Isolating the Field Wires



Adding a Valve

- Run new wires from controller
- Use a doubler or add-a-zone device
- Install a DC device at new valve



Electrical Troubleshooting Devices

Volt Meter

- Measure Resistance or ohms
- Measure AC Voltage
- Measure DC Voltage
- **Price-\$5-\$200**



Station Master Pro

- Troubleshoot irrigation systems.
- Chatter mode for audible locating of valves.
- Activate any 24V AC valve solenoid.
- Test solenoids for continuity.
- Send tone to identify wires.
- Check clock AC voltage.



Station Master Pro Kit

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- Check clock AC voltage.
- Includes Probe



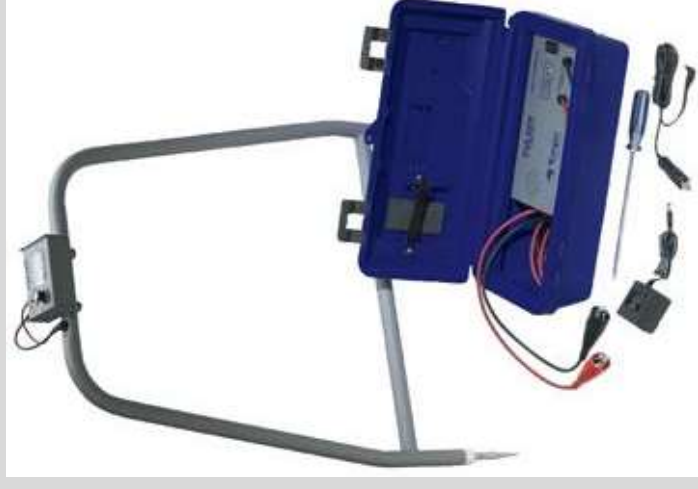
521 Wire Locator

- Track wires
- Locate Solenoids
- Determine wire depth
- Locate shorts?



Pulser

- Track wires first with 521
- Find wire *shorts*
- Find wire *nicks*
- Find wire *breaks*



Problem-Valve will not Turn Off

- Check outgoing power at station terminal to make sure controller is not sending out continuous voltage to station
- If there is no power present, proceed to troubleshoot valve because this is a NON electrical problem

When in doubt..... **Buy Complete Valve**

REASONS

- 1. Sometimes complete valve is cheaper than buying parts separately**
- 2. There could be a problem with the bonnet or other parts of the valve**
- 3. You will have parts left over for the next repair**



- Do NOT even THINK about calling for help with an electrical problem if you do NOT own a voltmeter.....
- If you call for help, you must be able to give accurate information for assistance.