Chapter 8

Hardware Troubleshooter

Hardware (HW) Troubleshooter Page

The Spectrum includes the ability to review the status of the numerous sensors found on the engraver. These sensors include carriage limits, end seeking proxes and many others. A Hardware Troubleshooter function is found on the Diagnostics page.

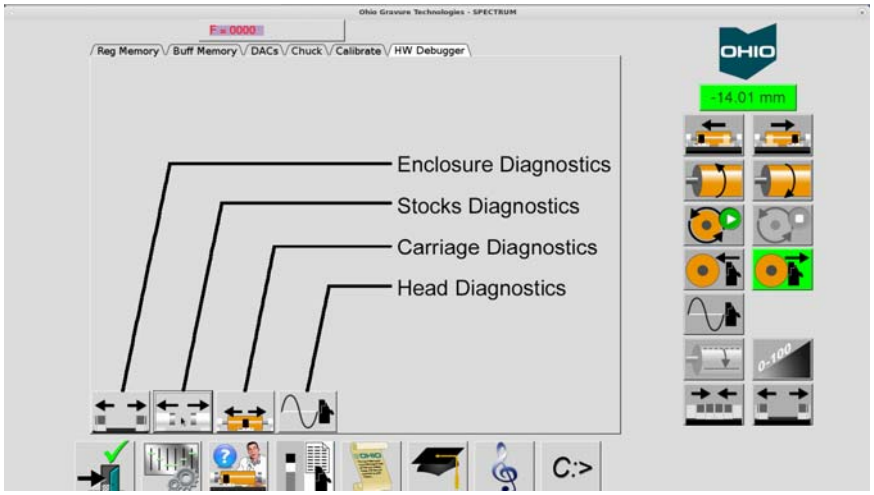
To use this page:

1. Open the Utilities page.

2. Open the Configuration page.

3. Click the Key button and enter the password 1234. The button shows a green key when active.

4. Select the HW Troubleshooter tab from the top of the window. The following page displays.



Hardware Troubleshooter Tab and buttons

There are two pieces to the Troubleshooter functions. Four buttons in the lower left group machine sensors by function/location. The four buttons are:

- Enclosure Diagnostics – Displays sensors controlling the motorized enclosures.
- Stocks Diagnostics – Displays sensors pertaining to stock movement or items installed on the stocks, like AutoChucks.
- Carriage Diagnostics – Displays sensors found on the carriage or that affect the carriage.
- Head Diagnostics – Displays sensors found on the engrave head and sub-carriage.

What It Does

The purpose of this page is to easily identify if a sensor or proximity switch is working. The function is simple, activate the sensor/switch and watch the Hardware Troubleshooter to see if the icon flashes. If it does, the sensor/switch is working, if it does not, the sensor/switch is likely defective. Brief instructions for each sensor/switch will be given in the appropriate group.

All tests are performed with the engraver power turned ON.

Sensor Description

There are different types of sensors used on the Spectrum. The type of sensor is identified so that you know the type of material needed to trip the sensor. The three types used on the machine are:

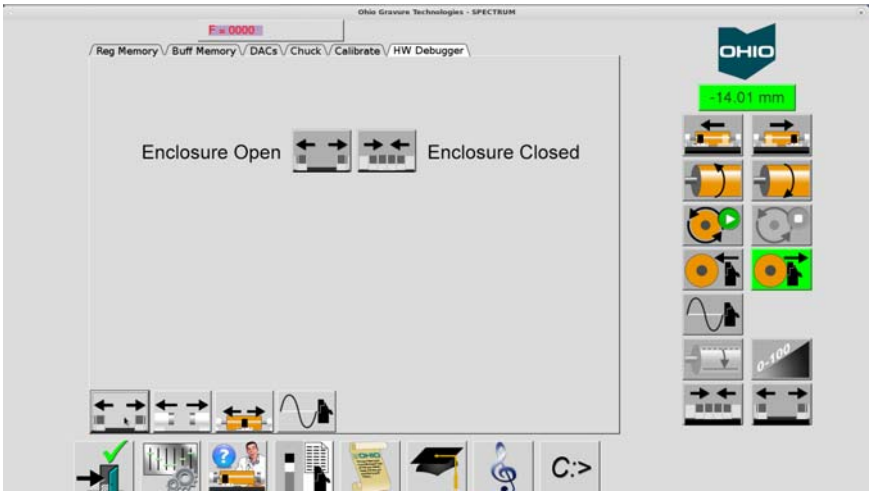
Electro-Magnetic Field – Emits a signal that is disrupted by magnetic materials, like steel and iron. This disruption is recognized by the sensor. For electro-magnetic sensors, a screwdriver blade or a knive blade should be used to verify operation.

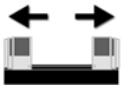
Ultrasonic – Transmits and receives a sound “wave”. The wave reflects off any type of surface and returns to the sensor, which detects the returned signal. For ultrasonic sensors, something as simple as your finger can be used to verify the sensor operation.

Optical – Consists of two pieces, one a emitter and the second a receiver. Light from the emitter reflects off of a surface and is seen by the receiver. Optical sensors are used on the End-Seeking detectors.

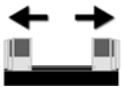
Note: The operation of each sensor can be verified by using the particular feature it is related to. A second method, where possible, is also explained for each. For example, the enclosure sensors can be verified by opening or closing the enclosures. They can also be tested by placing your finger in front of the ultrasonic sensors.

Enclosure Diagnostics





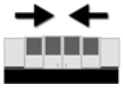
Select the Enclosure button to display the Enclosure Diagnostics group. There are two sensors in this group and one of these two should always be ON, unless the enclosures are stopped in the middle of travel.



Ultrasonic

Enclosure Open – Active when the enclosures are fully open. Found on the back of the machine by the electronics enclosure.

With enclosures closed, verify operation by placing your finger or other flat item in front of the sensor and watching the indicator.

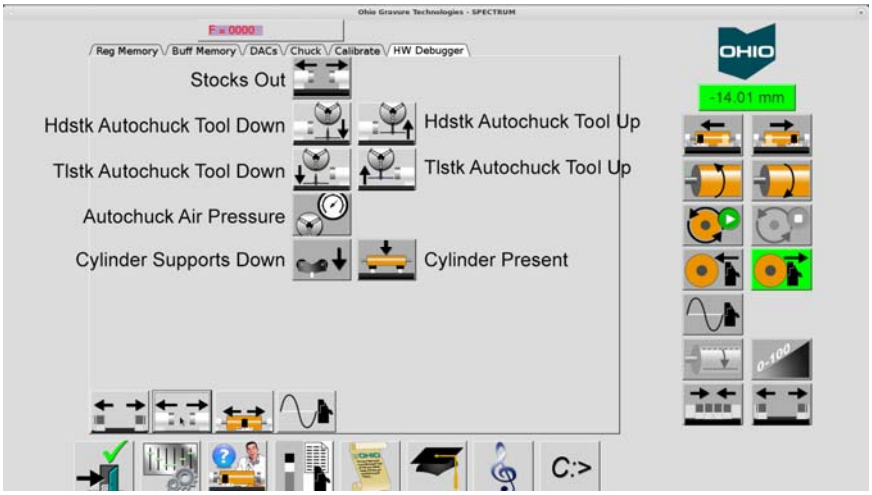


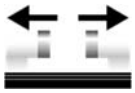
Electro-Magnetic

Enclosure Closed – Active when the enclosures are fully closed. Found on the back of the machine where the enclosures come together.

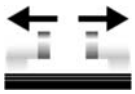
With enclosures open, verify operation by placing your finger or other flat item in front of the sensor and watching the indicator.

Stocks Diagnostics





Select the Stocks button to display the Stocks Diagnostics group. There are eight sensors in this group.

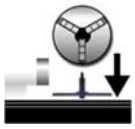


Electro-Magnetic

Stocks Out – Active when the headstock and tailstock are moved to their widest spacing. Can be found either at the tailstock end of the machine on earlier machines or the headstock end on later machines. The bellows must be freed to expose the sensor.

Check operation by placing a ferrous item in front of the sensor.

Note: The stocks must be moved by the operator using the Stocks Open button on the display or rear control panel. Using the Home Stocks buttons will not activate the sensor.



Electro-Magnetic

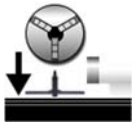
Headstock Autochuck Tool Down – Active when the chuck tool is retracted and clear of the autochuck. This should never be active when the Headstock Autochuck Tool Up sensor is active.

Check operation by placing a ferrous item in front of the sensor.

Electro-Magnetic

Headstock Autochuck Tool Up – Active when the chuck tool is inserted into the chuck. This should never be active when the Headstock Autochuck Tool Down sensor is active.

Check operation by placing a ferrous item in front of the sensor.



Electro-Magnetic

Tailstock Autochuck Tool Down – Active when the chuck tool is retracted and clear of the autochuck. This should never be active when the Tailstock Autochuck Tool Up sensor is active.

Check operation by placing a ferrous item in front of the sensor.

Electro-Magnetic

Tailstock Autochuck Tool Up – Active when the chuck tool is inserted into the chuck. This should never be active when the Tailstock Autochuck Tool Down sensor is active.

Check operation by placing a ferrous item in front of the sensor.

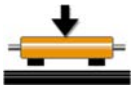
Autochuck Air Pressure – Active when air pressure is correct for autochuck operation.

Check by disconnecting the air supply from the rear of the machine.

Electro-Magnetic

Cylinder Supports Down – Active when the cylinder supports are lowered and in the retracted position and clear of the cylinder. This sensor should never be active when the Cylinder Supports Up sensor is active. Found on the headstock side support, near the support base.

Check operation by placing a ferrous item in front of the sensor.

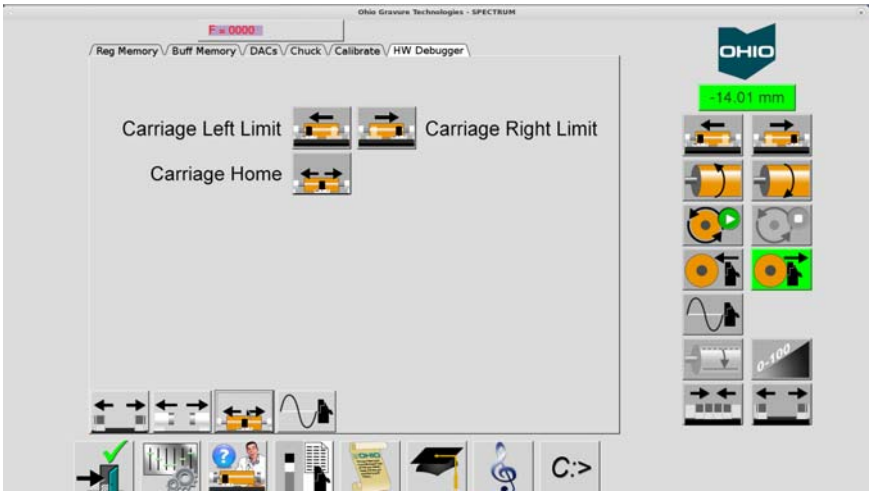


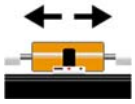
UltraSonic

Cylinder Present – Active when a cylinder is resting on the supports. Found on the tailstock side support, facing up through the support block.

Check operation by placing a finger or other object in front of the sensor.

Carriage Diagnostics



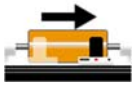


Select the Carriage button to display the Carriage Diagnostics group. There are three sensors in this group.

Electro-Magnetic

Carriage Left Limit – Active when the carriage is moved to the far left and stopped to prevent collision with the headstock. Found under the headstock side of the carriage.

Check operation by placing a ferrous item in front of the sensor.



Electro-Magnetic

Carriage Right Limit – Active when the carriage is moved to the far right and stopped to prevent collision with the tailstock. Found under the tailstock side of the carriage.

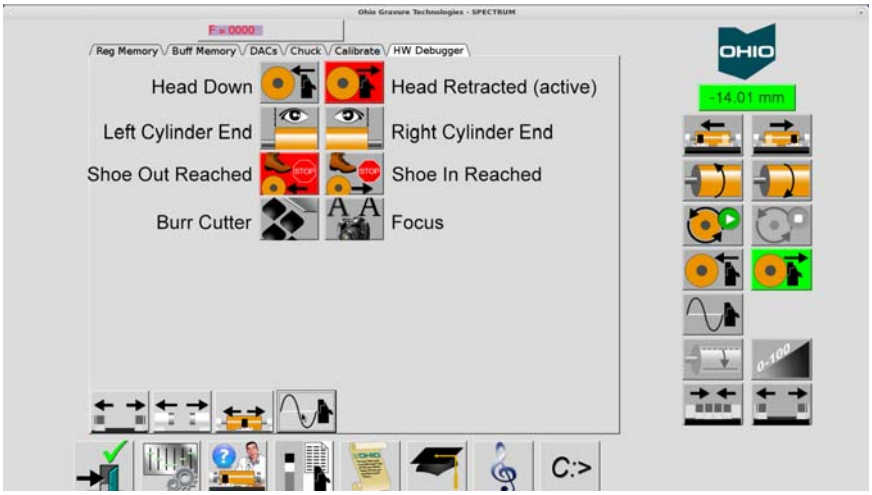
Check operation by placing a ferrous item in front of the sensor.

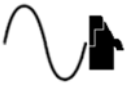
Electro-Magnetic

Carriage Home – Active when the carriage is positioned at the Home location in the center of the machine.

Check operation by placing a ferrous item in front of the sensor.

Engrave Head Diagnostics





Select the Head button to display the Engrave Head Diagnostics group. There are eight sensors in this group.

Electro-Magnetic

Head Down – Active when the engrave head is lowered against the cylinder. Found behind the engrave head on the back left corner of the sub-carriage.

Check operation by lowering the head against a cylinder or pulling back gently on the head while it is lowering. Watch the indicator light to verify.

Electro-Magnetic

Head Retracted – Active when the engrave head is fully retracted from the cylinder. Found on the carriage at the back of the engrave head travel.

Check operation by placing a ferrous item in front of the prox or by fully retracting the head. Watch the indicator light to verify.

Optical

Left Cylinder End – Active when the left end-seeking sensor is detecting the cylinder. Should become inactive when the sensors moves off the cylinder surface. Found on the pier mounted on the left side of the engrave head.

Check operation with a cylinder installed and the head at the Head Up position (minimum retract), not Head Retracted (fully back). Move the carriage to the left until the indicator lights.

Optical

Right Cylinder End – Active when the right end-seeking sensor is detecting the cylinder. Should become inactive when the sensors moves off the cylinder surface. Found on the pier mounted on the right side of the engrave head.

Check operation with a cylinder installed and the head at the Head Up position (minimum retract), not Head Retracted (fully back). Move the carriage to the right until the indicator lights.

Electro-Magnetic

Shoe Out Reached – Active when the motorized shoe has moved to the farthest position from the head. This is the equivalent of decreasing the cell size until the shoe can no longer move. Found on the shoe motor drive.

Verify the shoe out sensor works by moving the shoe from the Vista Tools page.

Check by repeatedly moving the shoe -50 until the sensor is reached and further travel is prevented. Keep track of the total moves and return to the starting point when finished.

Electro-Magnetic

Shoe In Reached – Active when the motorized shoe has moved to the closest position to the head. This is the equivalent of increasing the cell size until the shoe can no longer move. Found on the shoe motor drive.

Check by repeatedly moving the shoe +50 until the sensor is reached and further travel is prevented. Keep track of the total moves and return to the starting point when finished.

Electro-Magnetic

Burr Cutter – Active when the burr cutter is moved to the Home position. This happens during burr cutter positioning. Found on the top of the engrave head.

Check operation by placing a ferrous item between the prox and the burr cutter yoke. The light on the prox changes when the prox is tripped as will the indicator on this Debug page.

Electro-Magnetic

Focus – Active when the focus motor moves the camera ssembly to the start (home) position of the focus routine. Found on the camera assembly between the camera tube and focus motor.

Check operation by placing a ferrous item under the focus prox. Watch the indicator on the Debug page to verify it is working.