MiTek®
Machinery Division

Service Bulletin

Machinery Affected:	***Miser II*™ Linear Saw**
Document:	**SB226**
Title:	**Replacing a Safety Motion Sensor**
Distribution:	**Customers Upon Order**

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Overview

The safety motion sensor is an important part of the safety circuit on the *Miser II* saw. The safety motion sensor detects voltage that the *Miser II* generates when its blade is spinning. When the safety motion sensor detects voltage from a spinning blade, it prevents the saw chamber door from opening.

Purpose and Scope

This document explains how to replace the obsolete Honeywell® safety motion sensor with an Omron® STI safety motion sensor.

The parts included in this kit are shown in Table 1. Please ensure all parts are present before starting this procedure.

Table 1: Parts in SB226

Qty.	Part Description	Part #
1	Service bulletin document	SB226
1	STI safety motion sensor	515976
1	Terminal block	504800
2	8-32 x 5/8 socket head cap screws	326064
1	14-gauge wire	508861

Before beginning the procedure, gather the supplies listed here:

- Slotted screwdrivers
- Standard Allen wrench set
- Drill
- Size 29 pre-tap drill bit
- Pliers
- Wire cutters
- Wire stripper
- Fine-tipped permanent marker
- Multimeter

If you have any questions, call MiTek Machinery Division Customer Service at 800-523-3380.

Procedure

Electrical Lockout/Tagout Procedures

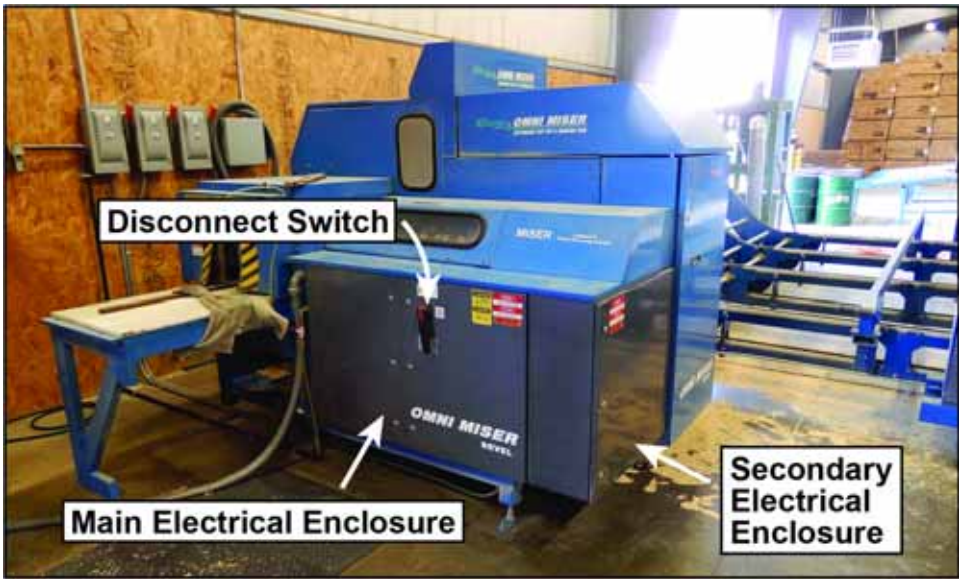
	**⚠ WARNING** **ELECTROCUTION HAZARD!** **Verify that all power to the machine has been turned off and follow approved lockout/tagout safety procedures before performing any maintenance.** **All electrical work must performed by a qualified electrician.** **If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E for proper procedures and personal protective equipment.**

Working on a Machine Inside the Machine's Electrical Enclosure

Before opening the secondary electrical enclosure, lockout/tagout the machine properly. Follow your company's approved lockout/tagout procedures which should include, but are not limited to the steps here.

1. Engage an E-stop on the machine.
2. Turn the machine's disconnect switch to the Off position. See Figure 1 for the location of the disconnect switch.

Figure 1: Disconnect Switch Location



3. Shut the power to the machine off at the machine's power source, which is usually an electrical service entry panel on the facility wall. One example of a locked-out power source panel is shown in Figure 2.

4. Attach a lock and tag that meets OSHA requirements for lockout/tagout to the electrical service entry panel.

5. Open the door to the secondary electrical enclosure, which you need to access. Using a multimeter, verify that the power is off. See Figure 1 for the location of the secondary electrical enclosure.

Figure 2: Lockout/Tagout on the Electrical Service Entry Panel

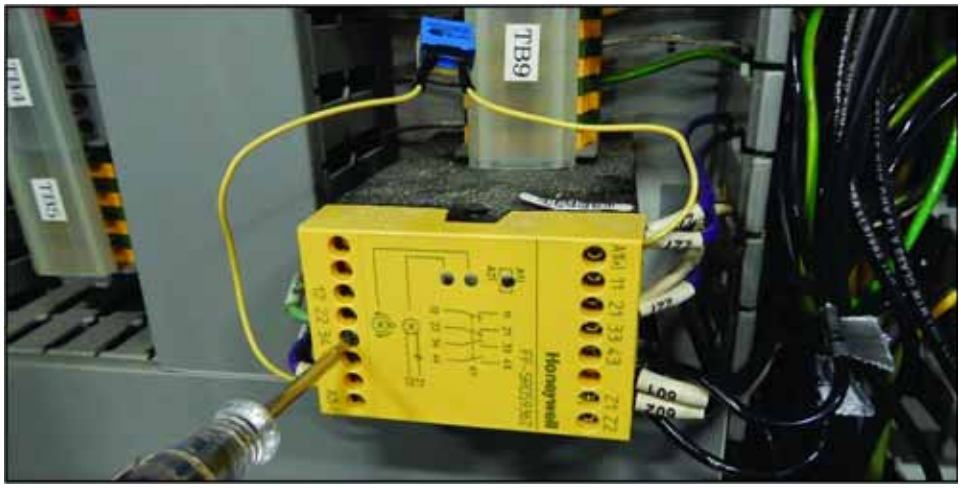
Removing the Obsolete Safety Motion Sensor

1. Locate the obsolete safety motion sensor in the secondary electrical enclosure. The sensor is positioned below terminal block TB9. See Figure 3.

Figure 3: Safety Motion Sensor in Secondary Electrical Enclosure

2. Remove the wires from the terminals on the left-hand side of the obsolete safety motion sensor.

Figure 4: Removing Wires

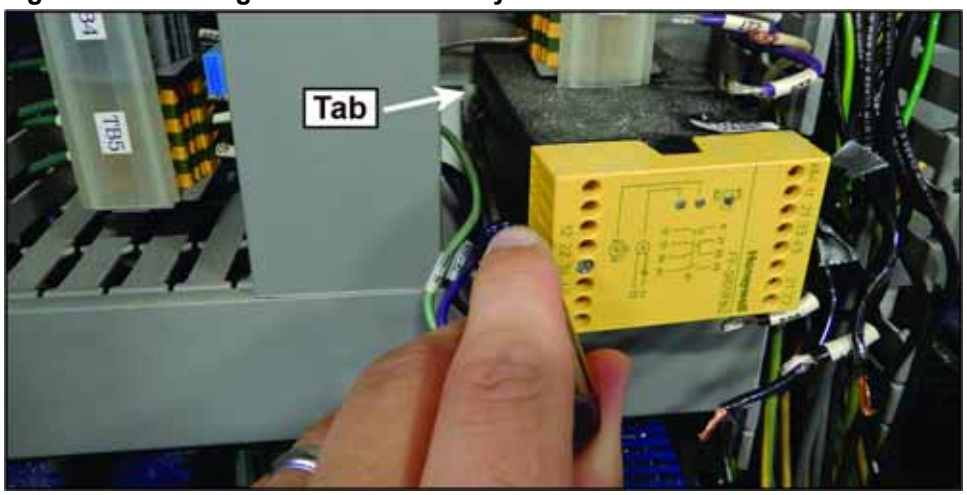


3. Remove the wires from the terminals on the right-hand side of the obsolete safety motion sensor. Discard the blue surge suppressor with the yellow wires connected to it.

Figure 5: Removing Wires

4. Use a screwdriver to pull the tab on the left rear side of the obsolete safety motion sensor and tilt the sensor to the right. See Figure 6. Swing the sensor slightly to the right and pull to remove it from the DIN rail.

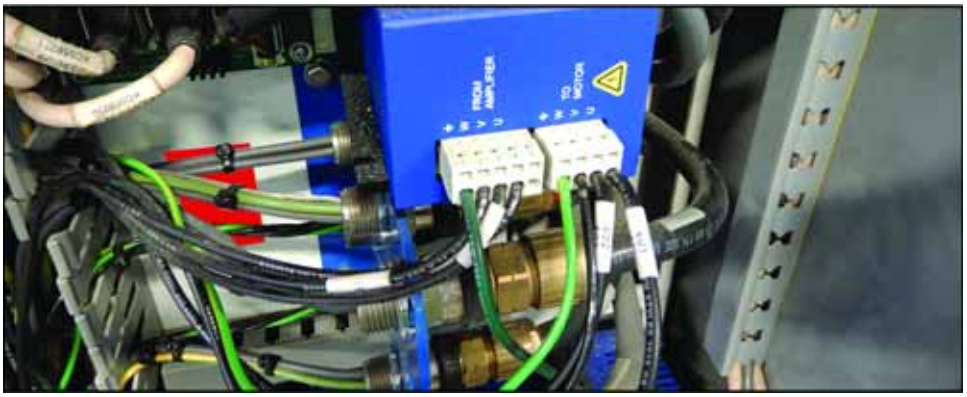
Figure 6: Removing the Obsolete Safety Motion Sensor



Installing Terminal Block TB10

1. Some saws already have terminal block TB10 installed.
   - If your saw has terminal block TB10 installed already, skip to Installing the New Safety Motion Sensor on page 8.
   - If it does not, continue with the steps below.
2. Locate the space to mount terminal block TB10. The space, colored in red in Figure 7, is below and to the left of the edge filter.

Figure 7: Terminal Block Mounting Location



3. Use the permanent marker to mark approximate locations for the screws.
4. Use the permanent marker to label the terminal block “TB10.”
5. Drill and tap holes for the screws used to mount terminal block TB10. Use the screws to mount terminal block TB10 to the rear wall of the enclosure.

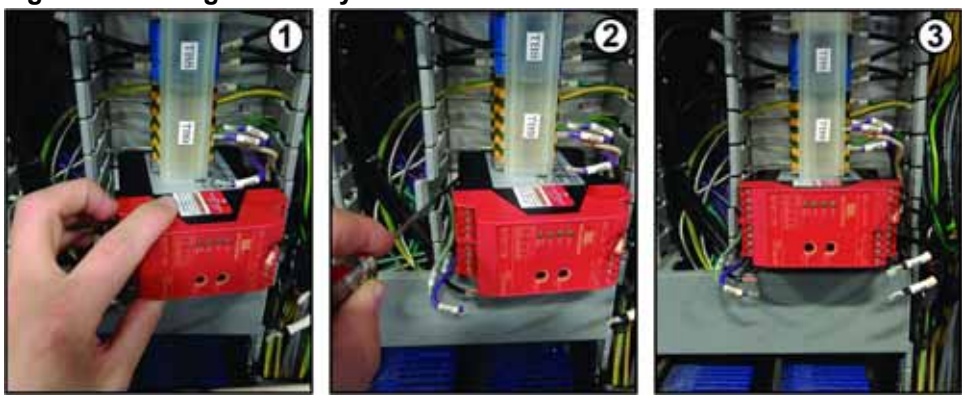
Installing the New Safety Motion Sensor

Seating the Safety Motion Sensor on the DIN Rail

1. Locate the space on the DIN rail from which you removed the old safety motion sensor.

2. Incline the safety motion sensor as shown in Figure 8 and hook the right-hand rear of the safety motion sensor onto the DIN rail.

Figure 8: Seating the Safety Motion Sensor



3. Use a screwdriver to pull the tab on the left-hand rear of the sensor, and tilt the sensor to the left until it locks onto the DIN rail.

Connecting Control Voltage Wires

1. Connect the control voltage wires on the left-hand side of the new safety motion sensor by using Table 2. See Figure 9 for reference.

Table 2: Left-Hand Side of New Safety Motion Sensor

Terminal	A2	14		22		Y33/43	Y44	Y34
Wires	228 MM-A2	MM-34						

Figure 9: Left-Hand Side of New Safety Motion Sensor

2. Connect the control voltage wires on the right-hand side of the new safety motion sensor by using Table 3. See Figure 10.
   The 3-phase wires are connected in a later step.

Table 3: Right-Hand Side of the New Safety Motion Sensor

Terminal	A1		13	21	Z1			Z3
Wires	226 227		MM-33 227					
Terminal							Z2	
Wires								

Figure 10: Right-Hand Side of New Safety Motion Sensor

Connecting 3-Phase Wires

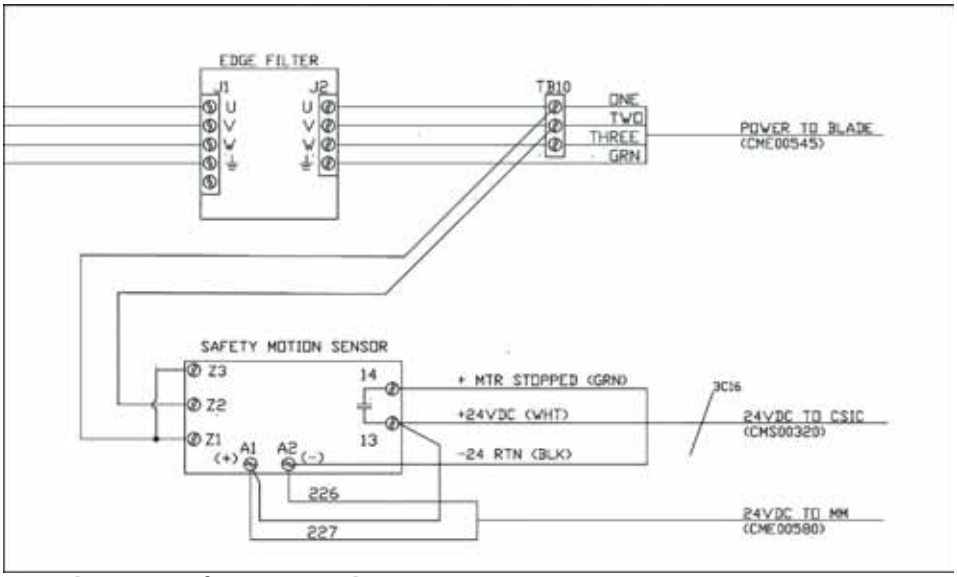
	NOTICE
	**If terminal block TB10 was already installed, some of the 3-phase wires described in the following section may already be connected.**

	DANGER
	**The 3-phase wires must not be crossed while wiring the edge filter, safety motion sensor, and terminal block TB10.** **Connecting the 3-phase wires incorrectly may cause the saw blade to accelerate until it fragments, causing equipment damage or injury.**

1. Connect two of the existing 3-phase wires from the edge filter to terminal block TB10. See Figure 11.
   The 3-phase wire in output terminal W connects directly to the motor.

2. Use the supplied 3-phase wires to connect the new safety motion sensor with terminal block TB10. See Figure 11.

Figure 11: 3-Phase Wiring



Note the jumper from terminal Z1 to Z3

3. Connect two of the existing 3-phase wires from the motor to terminal block TB10. See Figure 11.

Set the Sensitivity for Potentiometer Switches

	⚠ WARNING
	**Having an open electrical enclosure with energized components is required to verify the function of the safety motion sensor.** **Only a qualified electrician, using personal protective equipment and following the procedures recommended in NFPA 70E should ever attempt service or repair of or near an energized area or component of the machine.** **Do NOT touch anything in the electrical enclosure other than the potentiometer switches described below.** **Touching energized components may cause electric shock.**

The safety motion sensor has two potentiometer switches, which adjust the sensitivity of the safety motion sensor. These potentiometer switches need to be set so that the saw knows when the blade reaches “zero” speed.

Turning the potentiometers to the:

• Far left (counterclockwise) adjusts the sensor to detect small amounts of voltage (10mV).

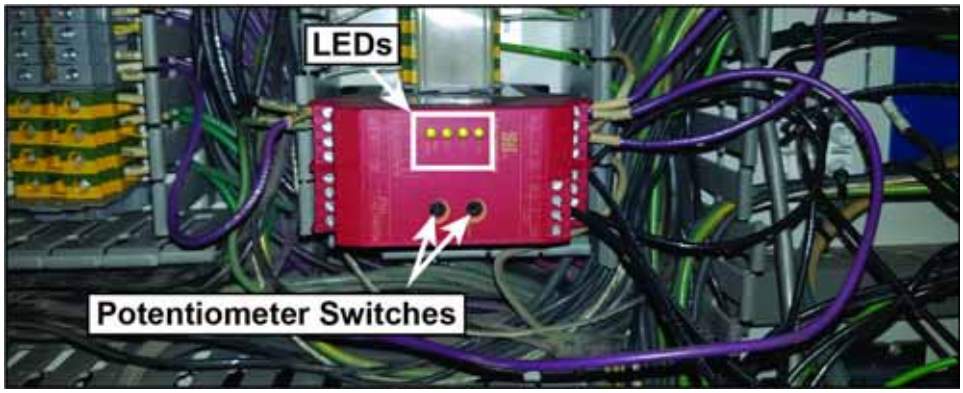
• Far right (clockwise) adjusts the sensor to detect only larger amounts of voltage (100mV).

The farther clockwise the setting, the more saw blade movement is allowed for “zero” speed.

1. Remove the lock and tag.
   The door to the secondary electrical enclosure needs to remain open to check the function of the safety motion sensor.

2. Turn both potentiometer switches counterclockwise until you feel resistance. Once you feel resistance, do not turn the potentiometer switches more. See Figure 12 for the location of the potentiometer switches and the LEDs.

Figure 12: Potentiometer Switches



3. Restore power to the saw.

4. Verify that the Ch. 1, Ch. 2, and Zero Speed LEDs are illuminated.
   The A1/A2 LED, which indicates the presence of supply voltage, is illuminated as well.
   - If they are, skip to step 5.
   - If they are not, continue to step a below to adjust the potentiometer switches.

   a) Cycle power to the saw.

   b) Run the saw blade and then allow it to coast to a stop.

   c) Turn the Adjust Ch. 1 potentiometer switch 90 degrees clockwise.

   d) Turn the Adjust Ch. 2 potentiometer switch to the same position as the Adjust Ch. 1 potentiometer switch.

   e) Cycle power to the saw.

   f) Run the saw blade and then allow it to coast to a stop. While the saw blade is coasting to a stop, watch the Ch. 1 and Ch. 2 LEDs. Those LEDs should illuminate within less than a second of one another.
      - If the LEDs illuminate as expected, skip to step 5.
      - If the LEDs do not illuminate as expected, the Zero Speed LED should not illuminate either. Continue to step g.

   g) Check the potentiometer switches to make sure that they are adjusted the same.
      - If they are, repeat steps a through g.
      - If they are not, turn the Adjust Ch. 2 switch to the same position as the Adjust Ch. 1 switch. Then repeat steps a, b, e, and f.

5. When the saw blade is stopped and all four LEDs are illuminated, close the door to the secondary electrical enclosure.

6. Resume cutting.

If you adjust the potentiometer switches twice without success, Customer Service is available at **800-523-3380**.

END OF SERVICE BULLETIN