

PLC-AC Networks

Safety, Operation, Maintenance & Parts Manual

SW for AC '98+ mills

rev. D



Safety is our #1 concern! Read and understand all safety information and instructions before operating, setting up or maintaining this machine.

Form #913

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SECTION 1 INSTALLATION

1.1 Required Tools and Steps

Required Tools Include:

- Medium Flat Blade Screwdriver
- Medium Phillips Screwdriver
- Open-Ended Wrench or Socket Ratchet #8
- Open-Ended Wrench #13
- Socket Screw Key #3
- Open-Ended Wrench #10

Recommended (But Not Required) Tools Include:

- Torque Wrench (with capability to measure up to 85 in-lbs)

Required Installation Steps Include:

- Sawmill Control Box Pre-Installation
- Wiring Installation
- Linear Sensor Installation

1.2 Pre-Installation

IMPORTANT! Make sure the mill is properly set up before performing setworks installation and/or operation.



WARNING! Failure to put front outrigger down before moving cutting head from the rest position (rear of the mill) may result in serious injury.

1. Return the saw carriage to the front of the mill.
2. Raise the cutting head to the 300 mm mark on the blade height scale.
3. Turn the sawmill control box key to the OFF (#0) position.



WARNING! Before performing any service to the sawmill control box panel, turn the key to the OFF position, remove the key and remove all rings, watches, etc... Set the main switch, located on the main electrical box, in "0" position. Disconnect the power supply cable. Failure to do so may cause serious injury and machine damage.

1.3 Sawmill Control Box Pre-Installation

See Figure 1-1.

1. Unbolt and remove the front panel from the control box. Leave all wires connected.
2. Unbolt and remove the top hinged cover from the control box. Set aside.

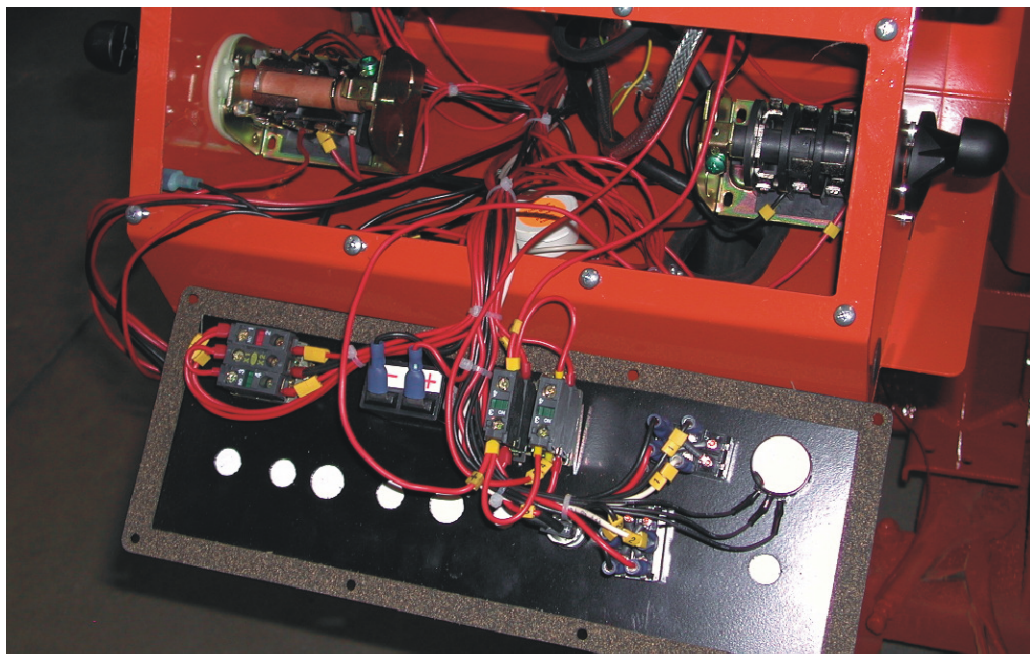


FIG. 1-1

3. Install the provided L-shaped bar clamp to the top of the control box. Position the bracket as shown. Use the four provided #10 flat washers and 10-24 x 1/2" screws to loosely secure in place from the bottom (do not tighten).

1

Installation

Sawmill Control Box Pre-Installation

See Figure 1-2.

4. Remove the plug from the 1" diameter hole in the top of the control box. Install the provided HV19 grommet to the hole.

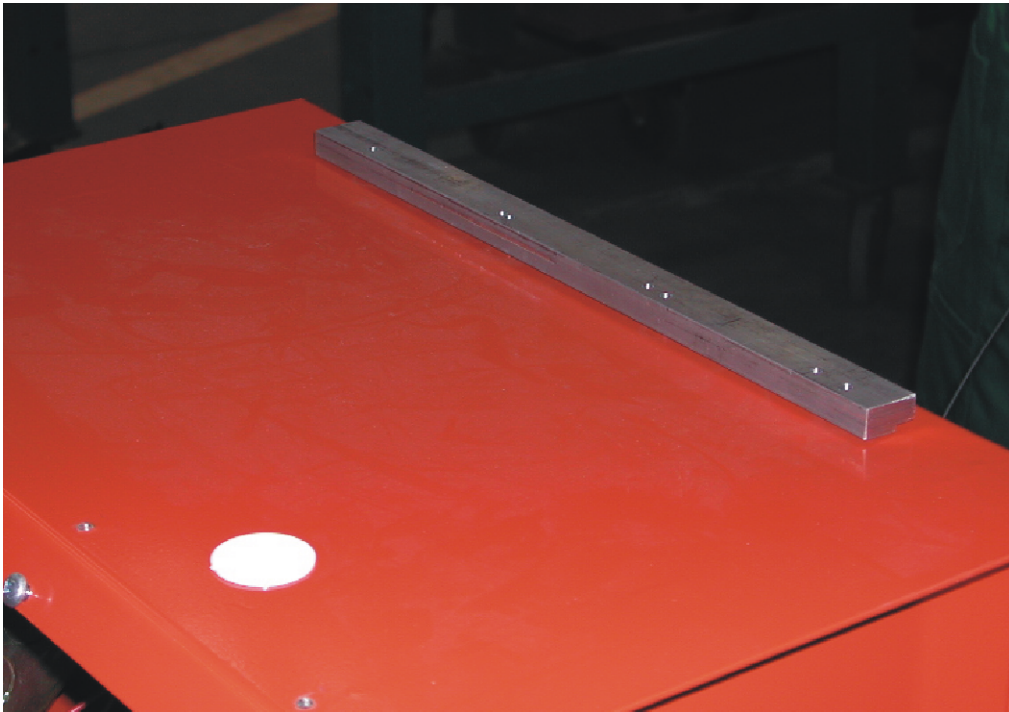


FIG. 1-2

5. Remove the anti-rotation screw from the right side of the control box.

See Figure 1-3.

6. Unbolt and remove the up/down drum switch handle from the right side of the control box. Loosen the two screws securing the up/down drum switch to the control box.

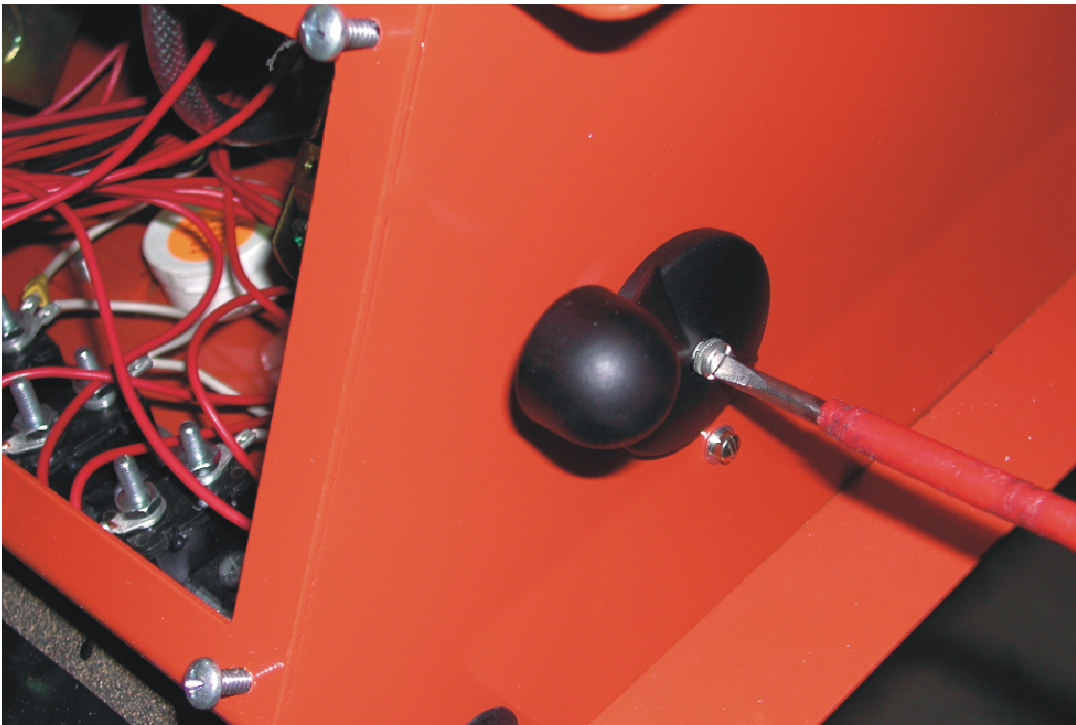


FIG. 1-3

7. Disconnect the existing harness wires from terminal #1 and #4 on the up/down drum switch.

1

Installation

Sawmill Control Box Pre-Installation

8. Temporarily place the provided Networks control panel on top of the control box.

See Figure 1-4.

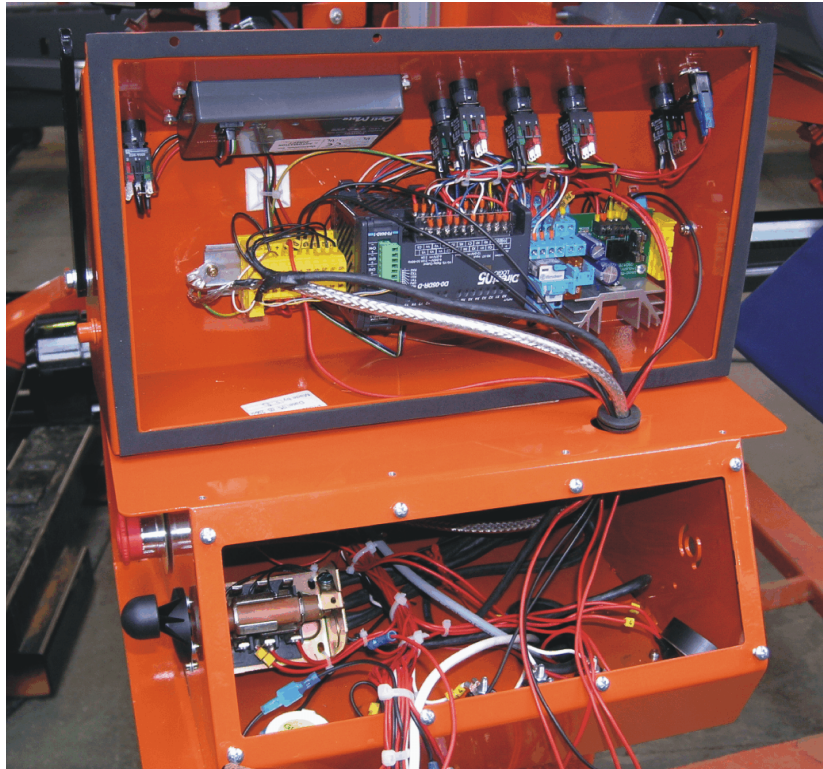


FIG. 1-4

9. Route the existing harness wires through the grommet in the top of the control box.
10. Locate the shielded cord lying loose in the sawmill control box and route it through the grommet to the Networks control box.

11. Connect the wire labeled 24 to terminal #3 of the key switch.

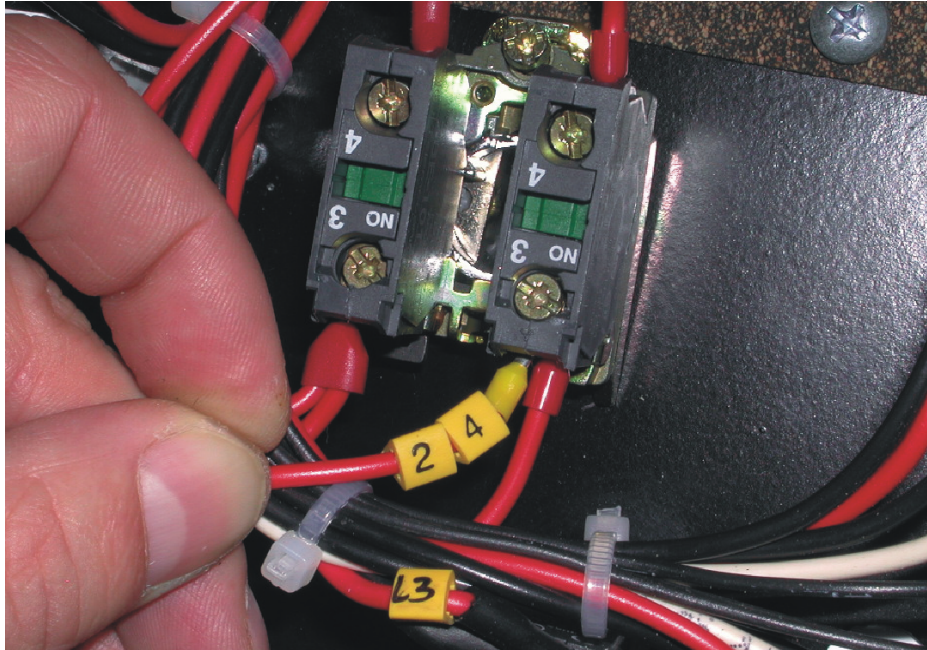


FIG. 1-5

12. Connect the wire labeled G to terminal #1 of the up/down drum switch.

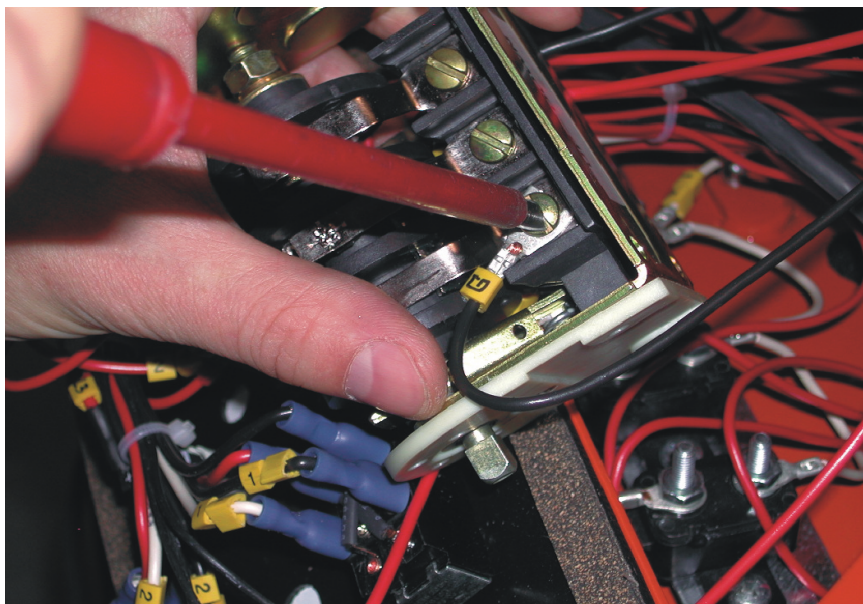


FIG. 1-6

1 Installation

Sawmill Control Box Pre-Installation

13. Connect the wire labeled D to terminal #4 of the up/down drum switch.

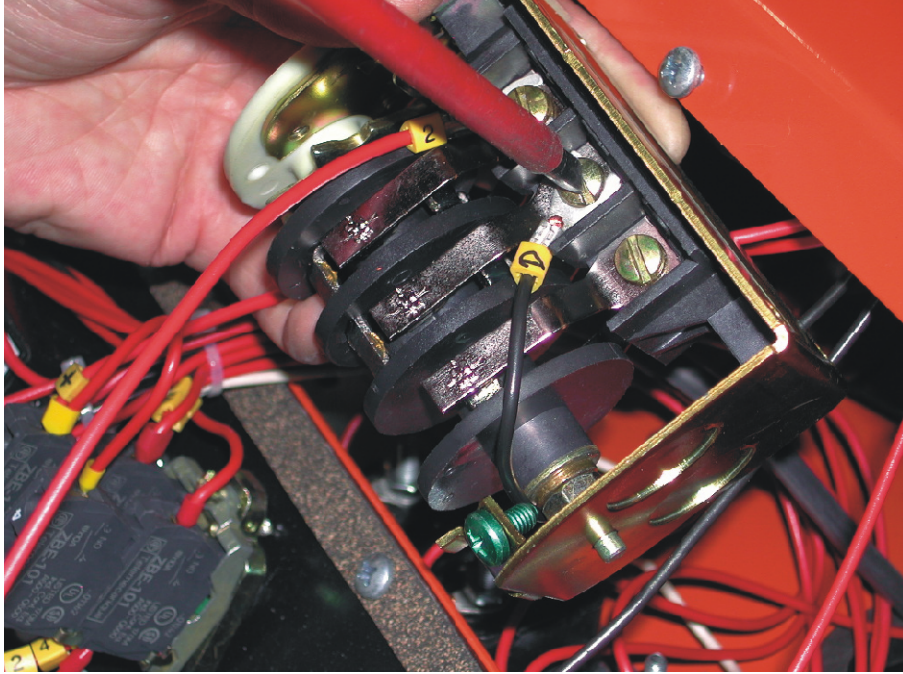


FIG. 1-7

14. Install two additional ZBE 101 contacts to the key switch.

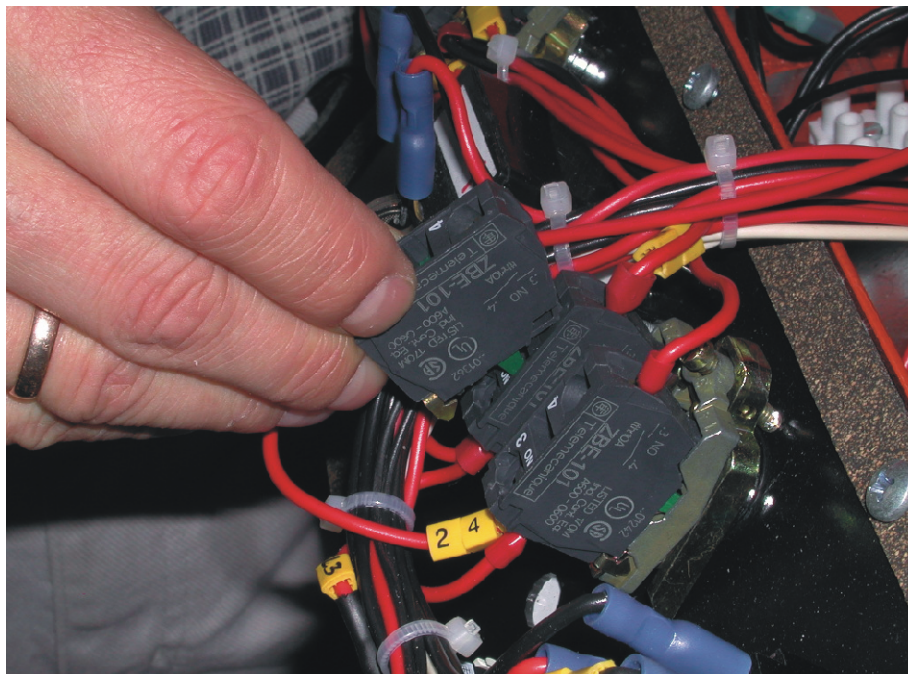


FIG. 1-8

1 Installation

Sawmill Control Box Pre-Installation

15. Connect the wire labeled "+" to terminal #4 of the additional contacts.

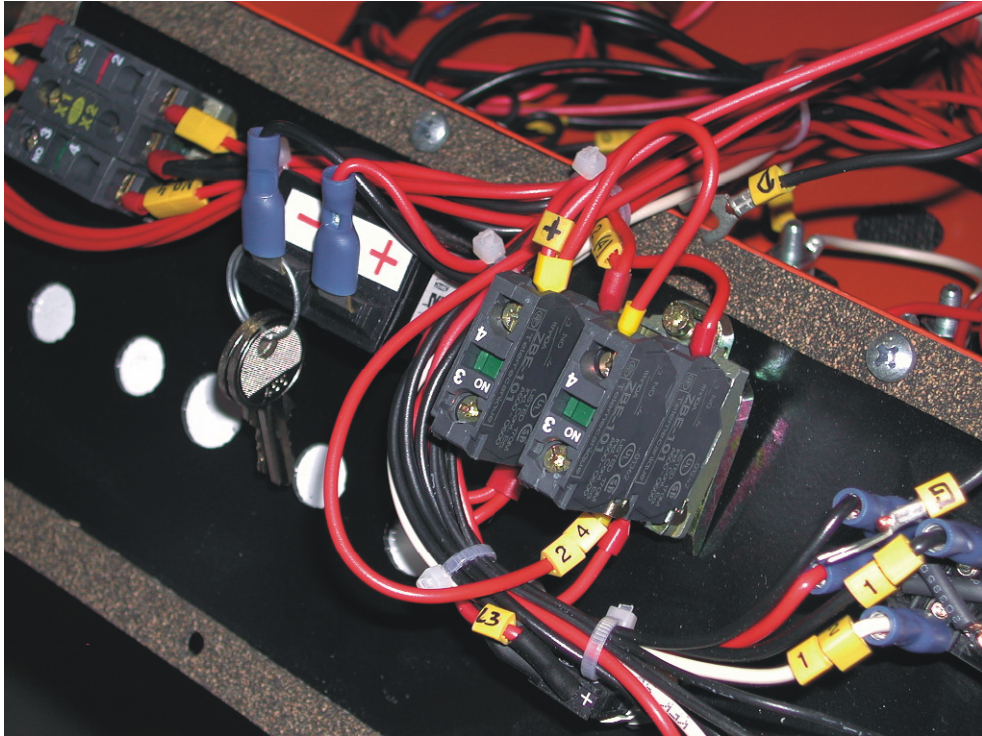


FIG. 1-9

16. Connect the wire #2 from the additional contacts to terminal #2 of the up/down drum switch.

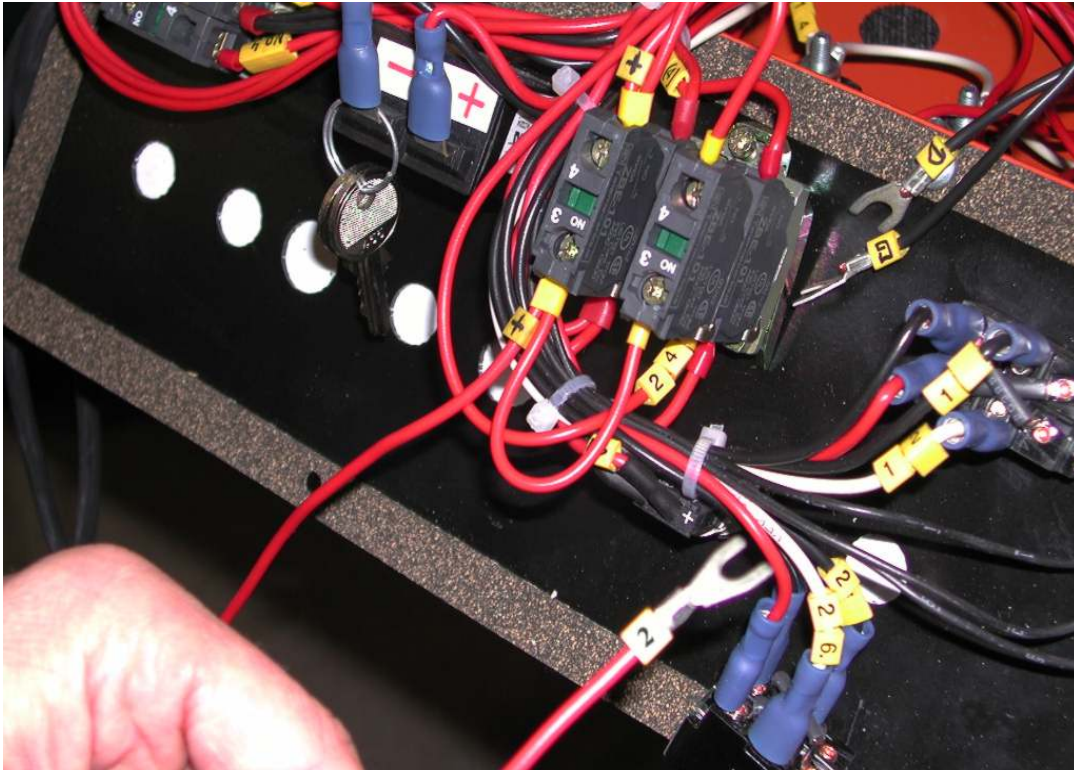


FIG. 1-10

17. Connect the wire labeled DOWN to the terminal #4.

1 Installation

Sawmill Control Box Pre-Installation

18. Install the additional pair of ZBE 101 contacts, provided in the kit, to the key switch.

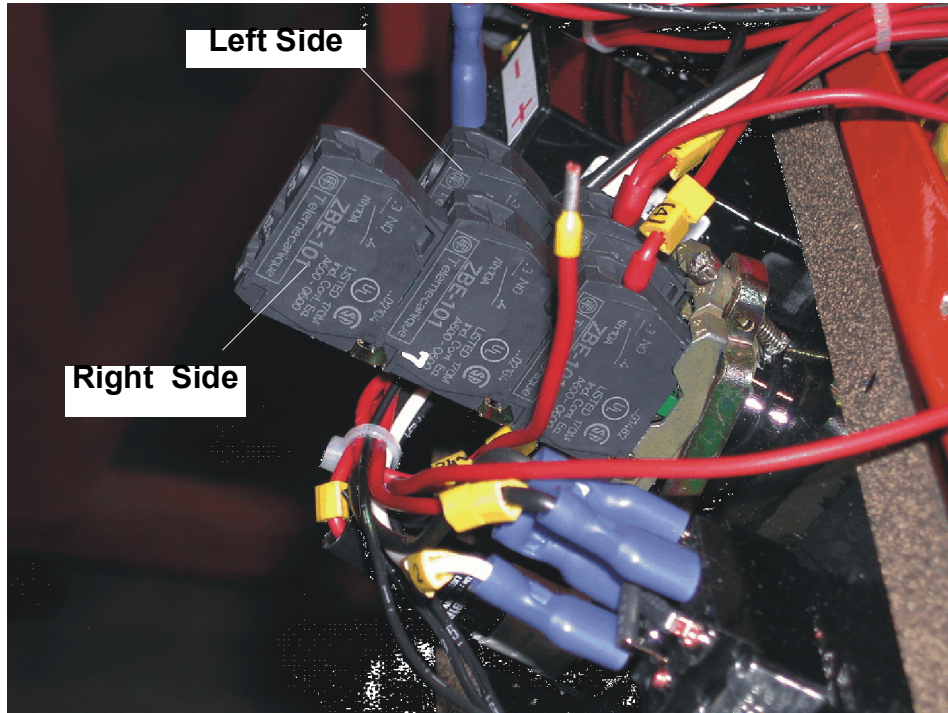


FIG. 1-11

19. Connect the wire #23 to the contact #23 of the key switch.

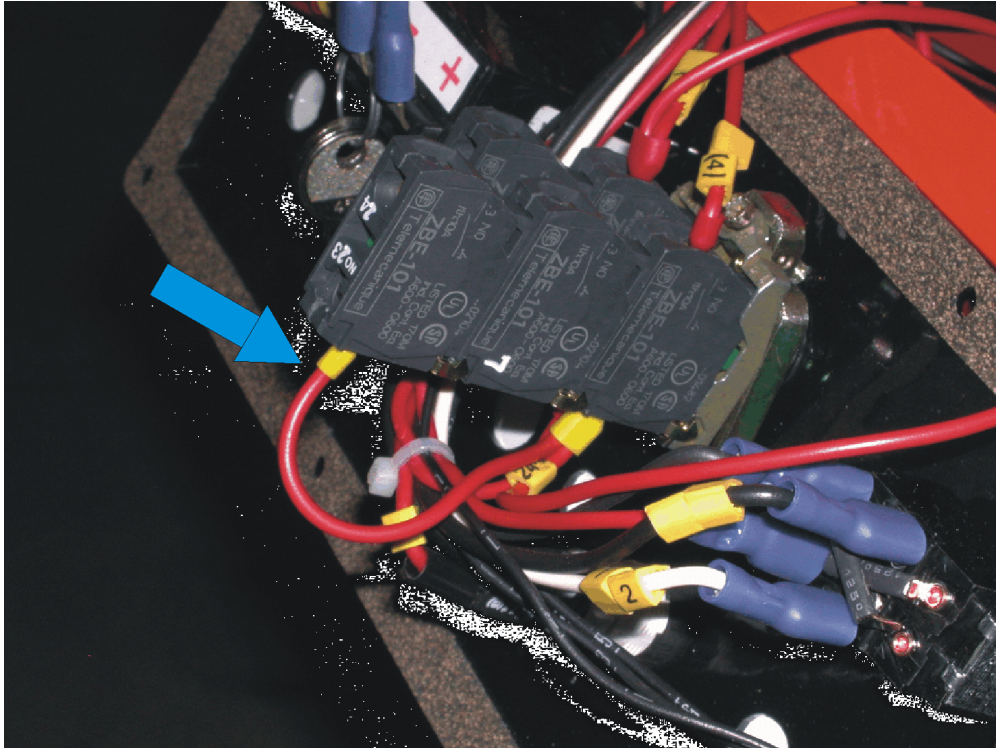


FIG. 1-12

1 Installation

Sawmill Control Box Pre-Installation

20. Connect the wire #24 to the contact # 24 of the key switch.

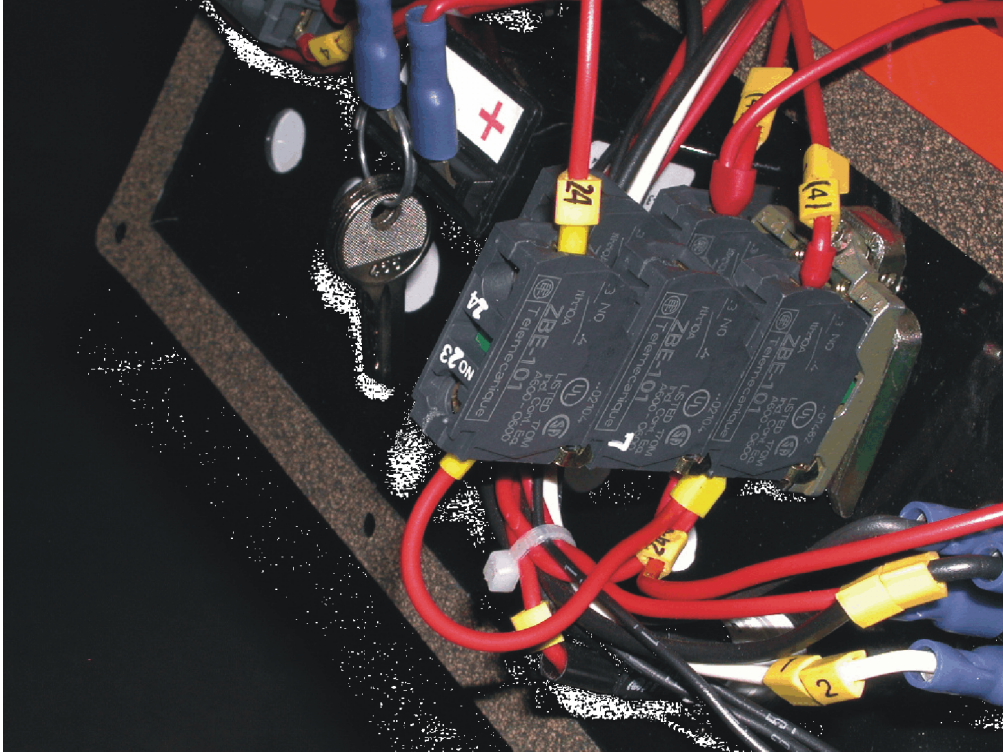


FIG. 1-13

21. Connect the wire labeled GND to the ground stud located inside the control box.



FIG. 1-14

1 Installation
Sawmill Control Box Pre-Installation

22. Install the electronic speed controller (ALTIVAR) in its place as shown below.

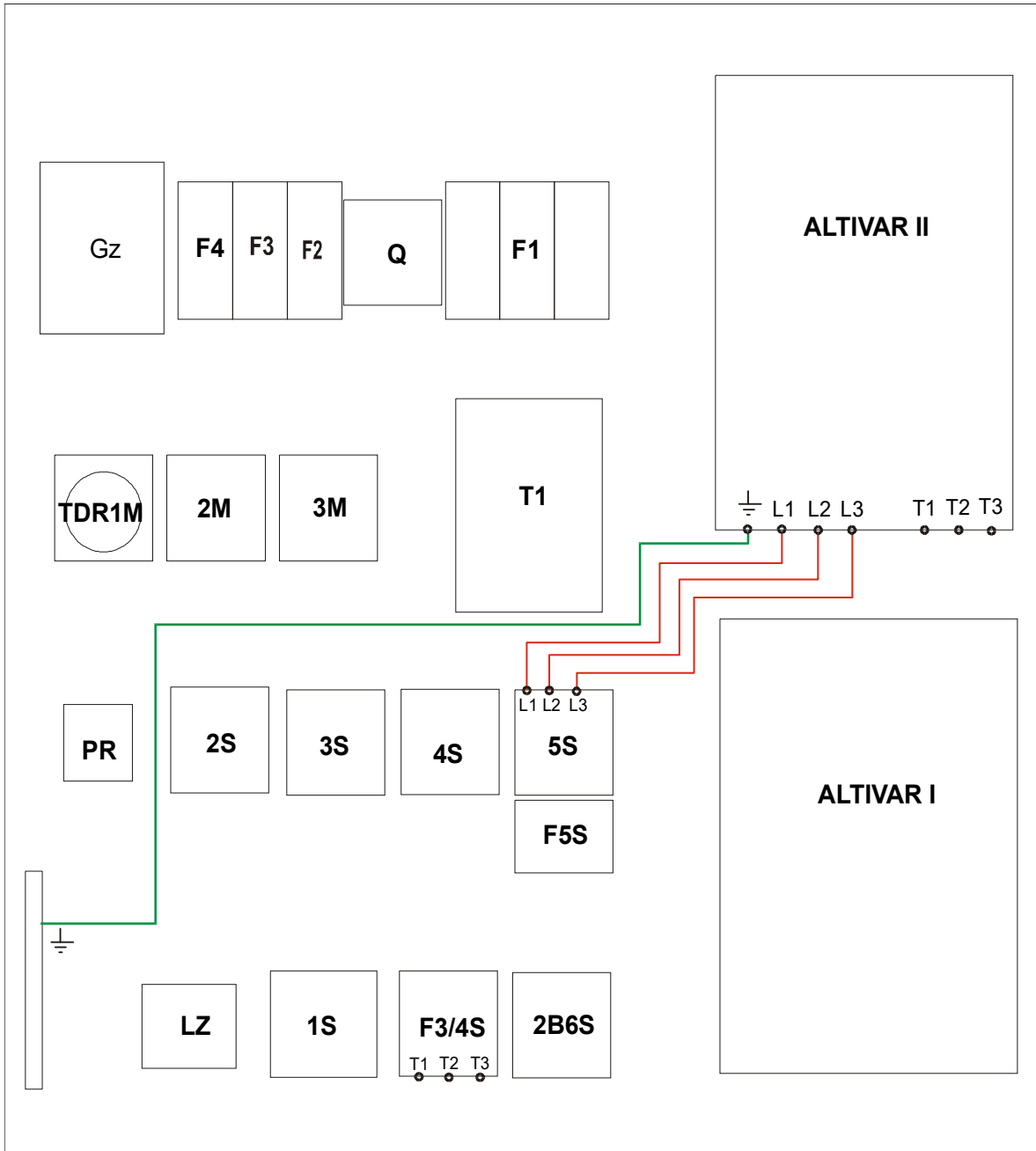


FIG. 1-15

23. Pull the free end of the shielded cord out of the cable duct running along the speed controllers.

24. Insert the free end of the shielded cord into the speed controller. Make all necessary wire connections between the PLC controller and the speed controller (See the figures below).

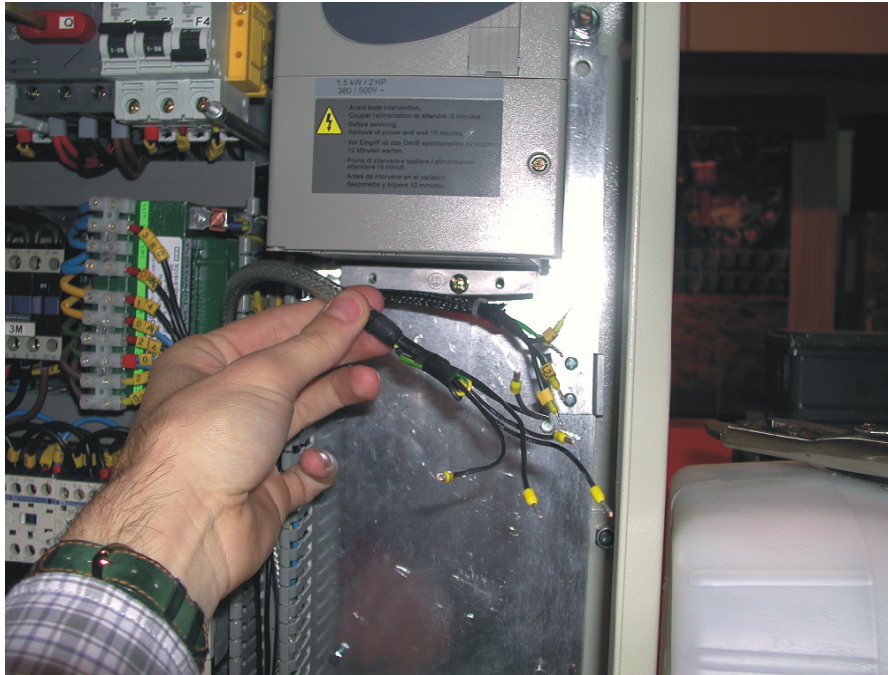


FIG. 1-16

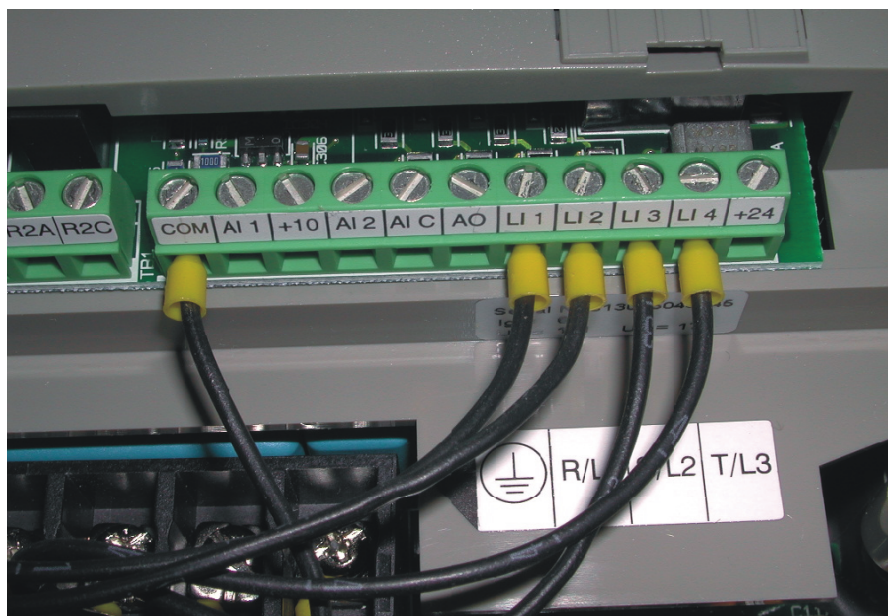


FIG. 1-17

1 Installation

Sawmill Control Box Pre-Installation

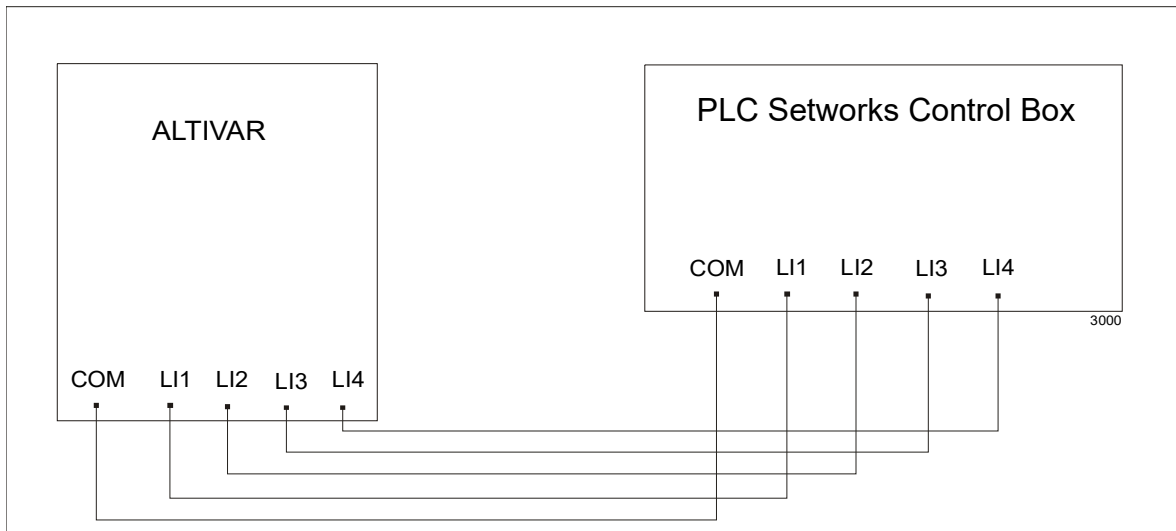


FIG. 1-18



FIG. 1-19

25. Using the provided wires, connect the L1, L2 and L3 terminals of the speed controller to the L1, L2 and L3 terminals of the 5S contactor respectively (See the figures below).

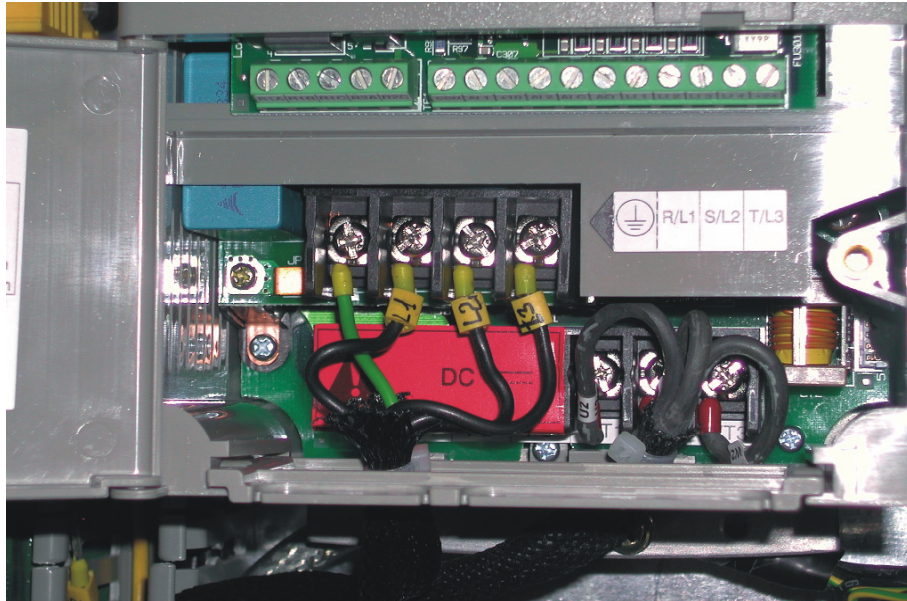


FIG. 1-20

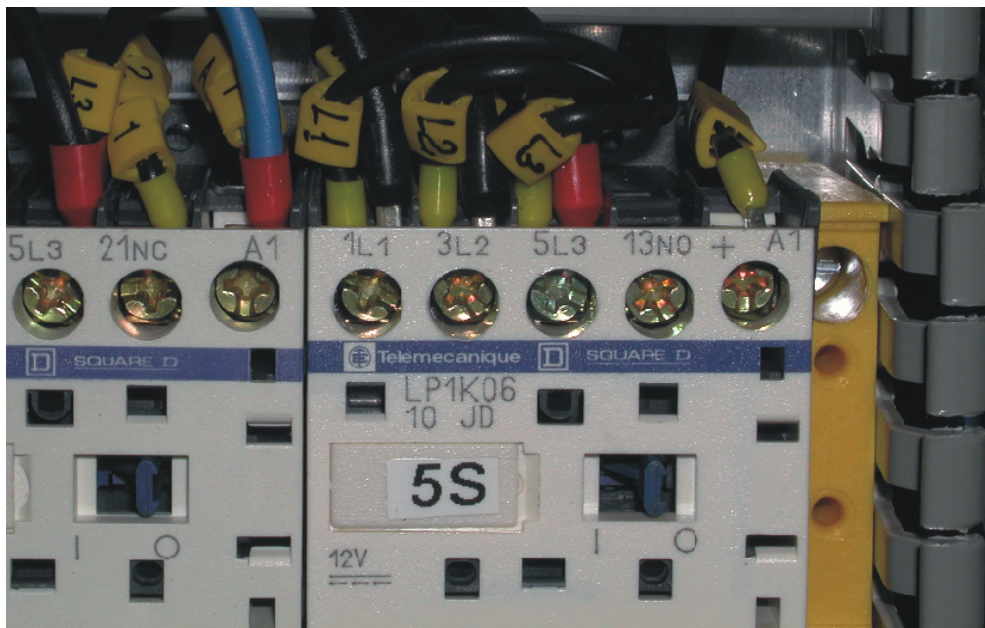


FIG. 1-21

1

Installation

Sawmill Control Box Pre-Installation

26. Disconnect the wires connected to the T1, T2 and T3 terminals of the F3/4S thermal relay and connect them to the T1, T2 and T3 terminals of the speed controller (See the figure below).

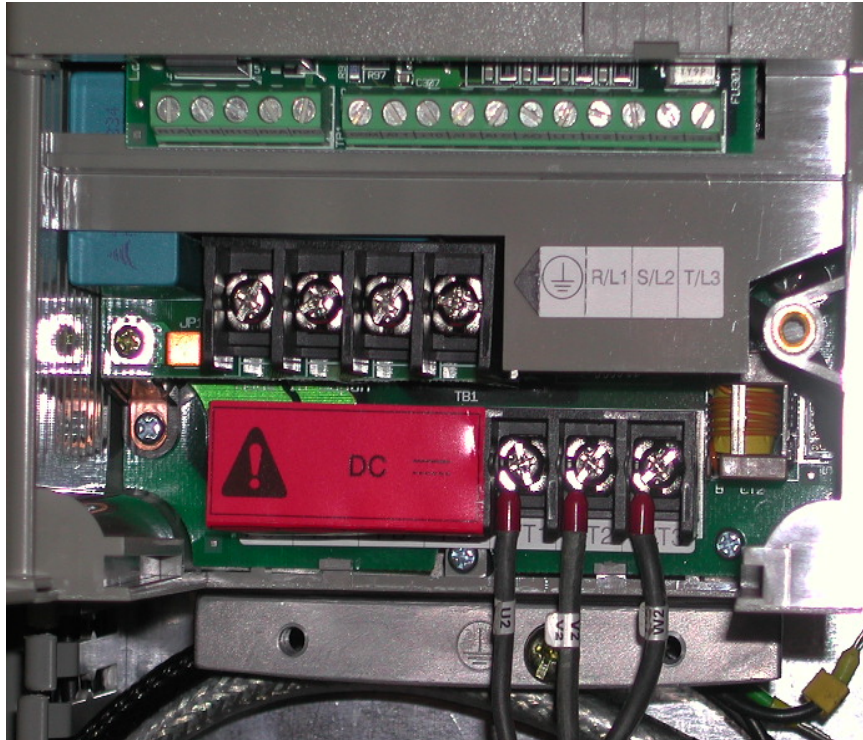


FIG. 1-22

1.4 Linear Sensor Installation

1. Before installing the linear sensor, remove the guard and the mount bracket of the blade height scale.

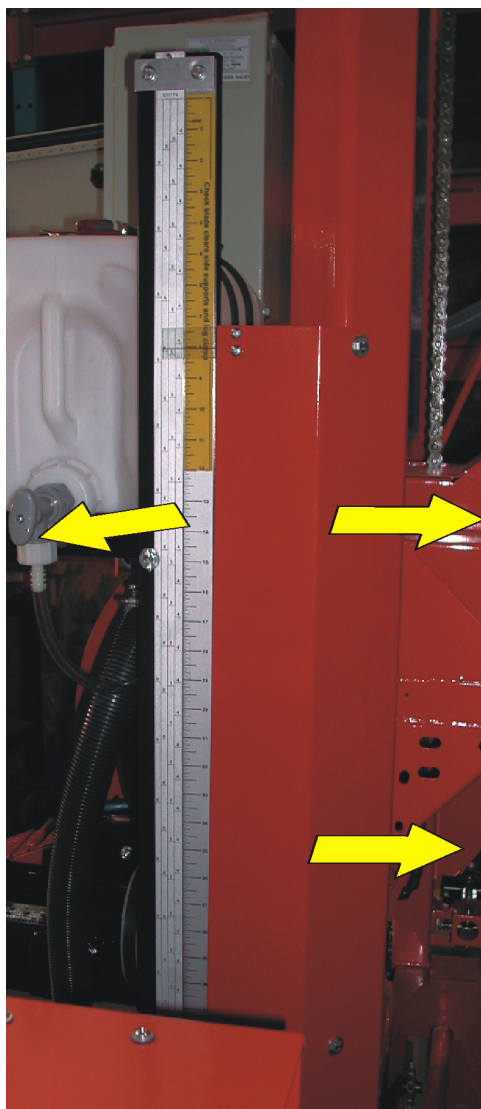


FIG. 1-23

2. The linear sensor should be mounted on the sawmill vertical mast. Use the provided bracket to mount the sensor.

1 Installation

Linear Sensor Installation

3. If necessary, drill and thread \varnothing M5 holes as the figure below shows.

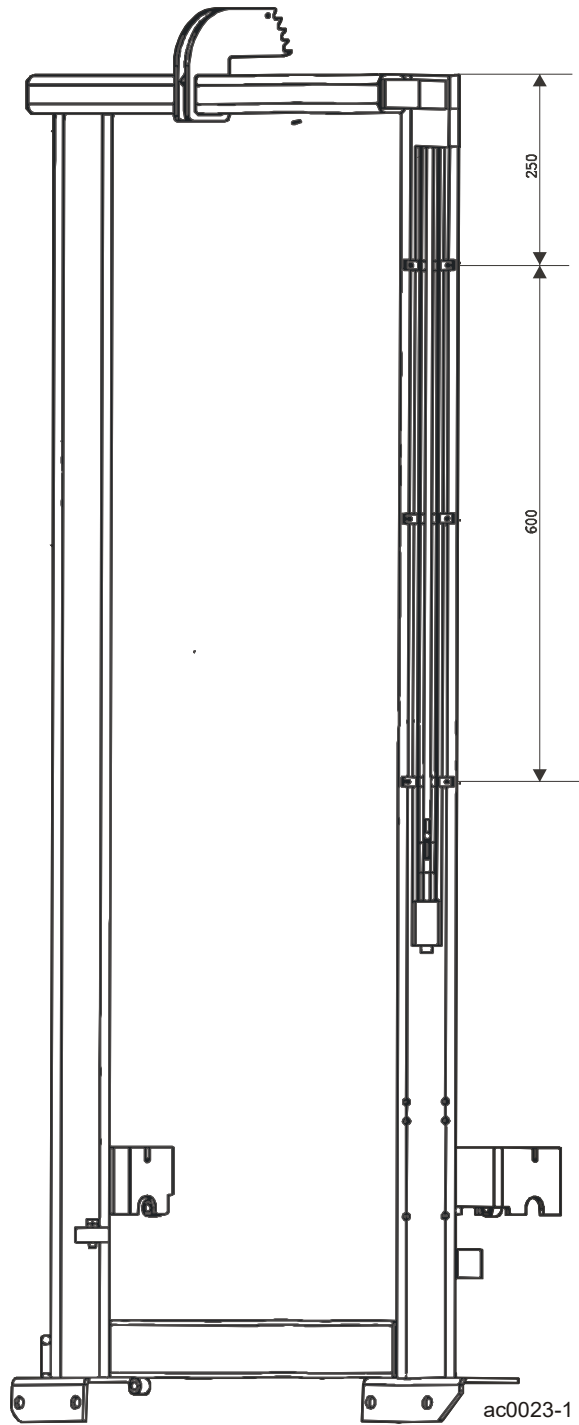


FIG. 1-24

4. Route the sensor cable through the control box mount bracket to the inside of the sawmill control box as shown below.



FIG. 1-25

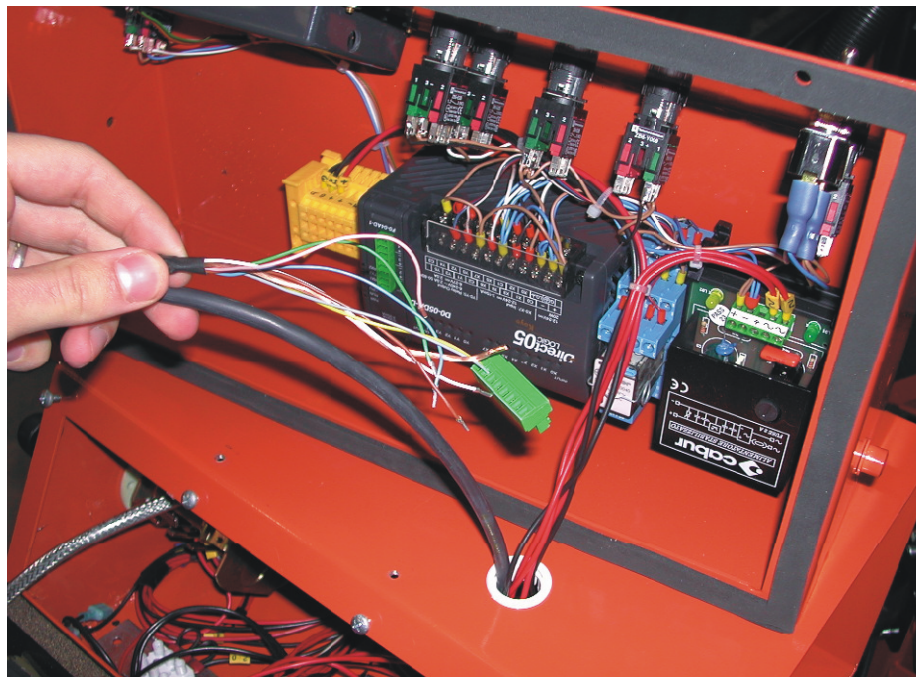


FIG. 1-26

1 Installation

Linear Sensor Installation

5. Connect the wires as shown below.

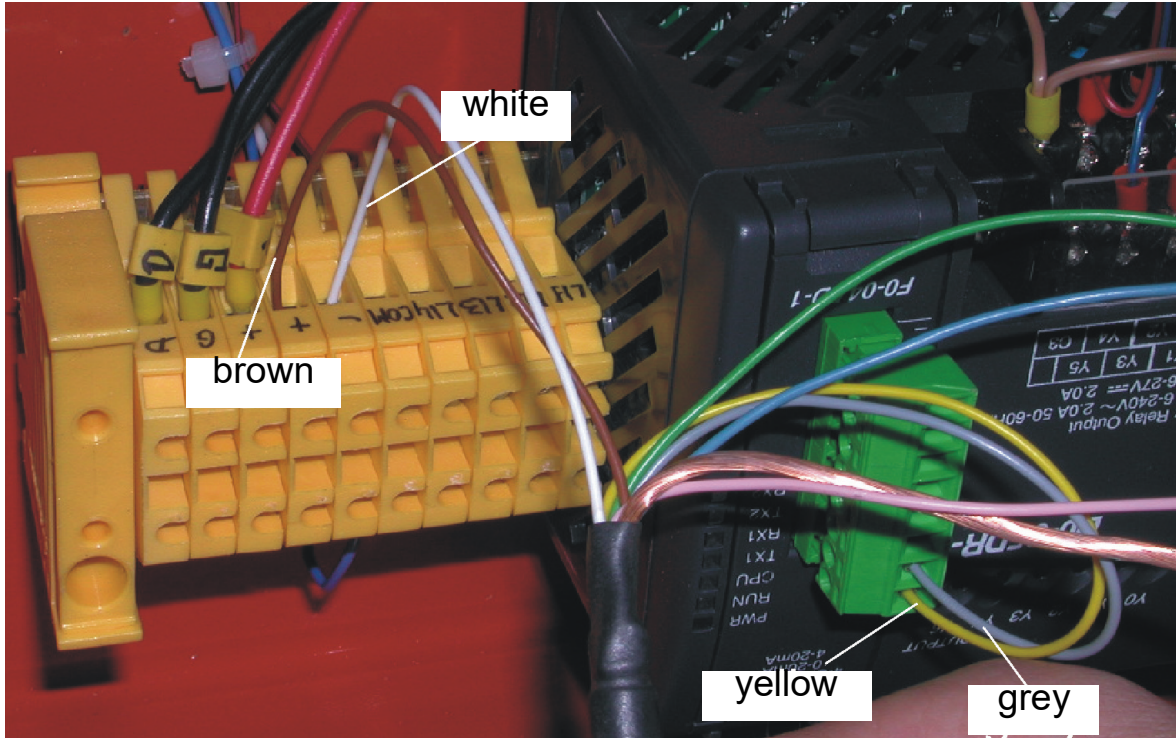


FIG. 1-27

6. Connect shield of the shielded cord to the ground stud located on the mount strip (See FIG 1-25).

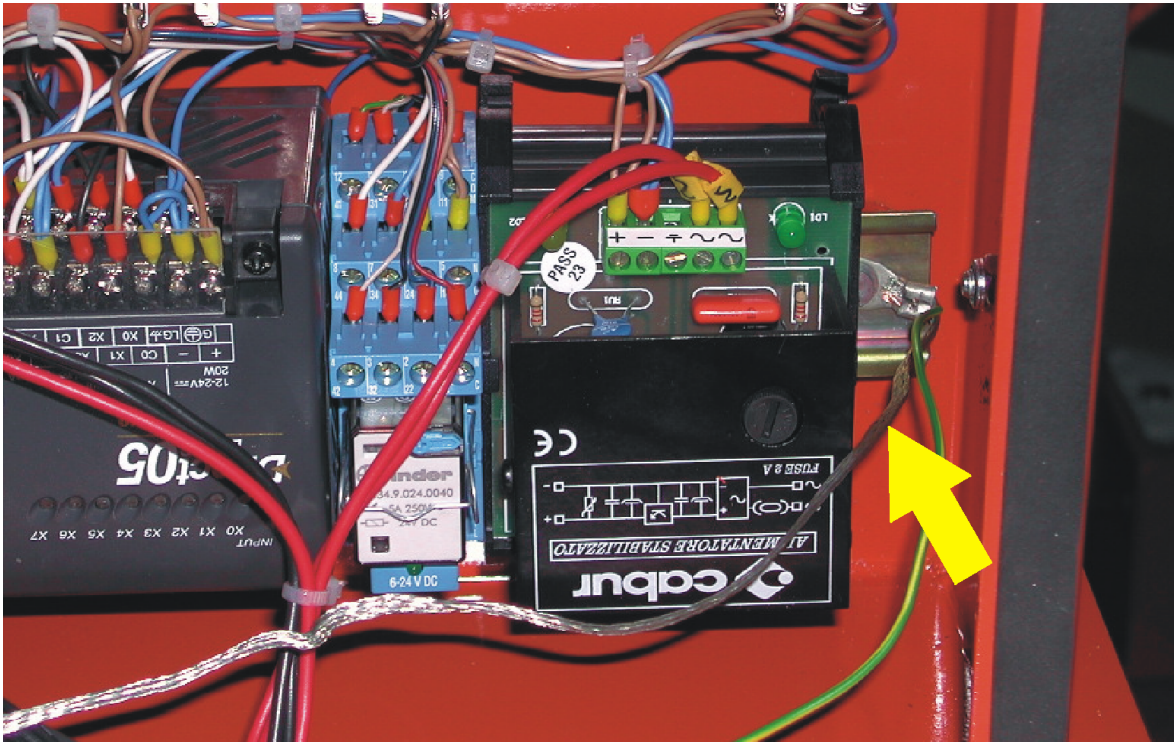


FIG. 1-28

1 Installation

Linear Sensor Installation

7. Install the sensor magnet mount bracket and the scale pointer.

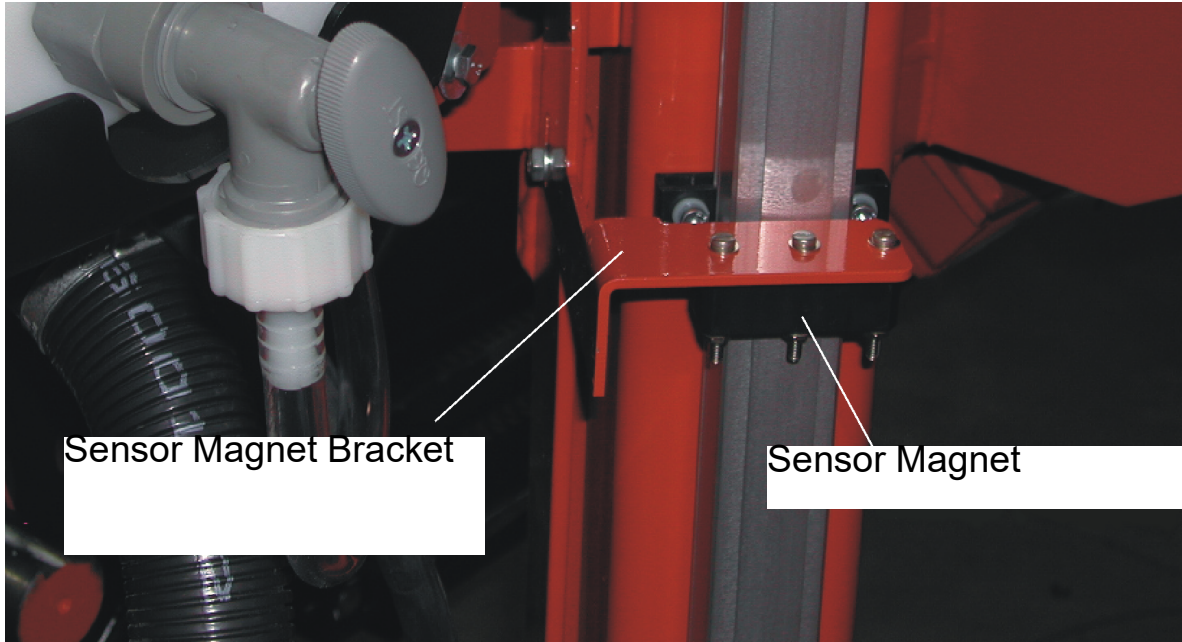


FIG. 1-29



FIG. 1-30



FIG. 1-31

8. Measure the actual distance from the bottom edge on a down-set tooth of the tensioned blade to the top of the bed rail.

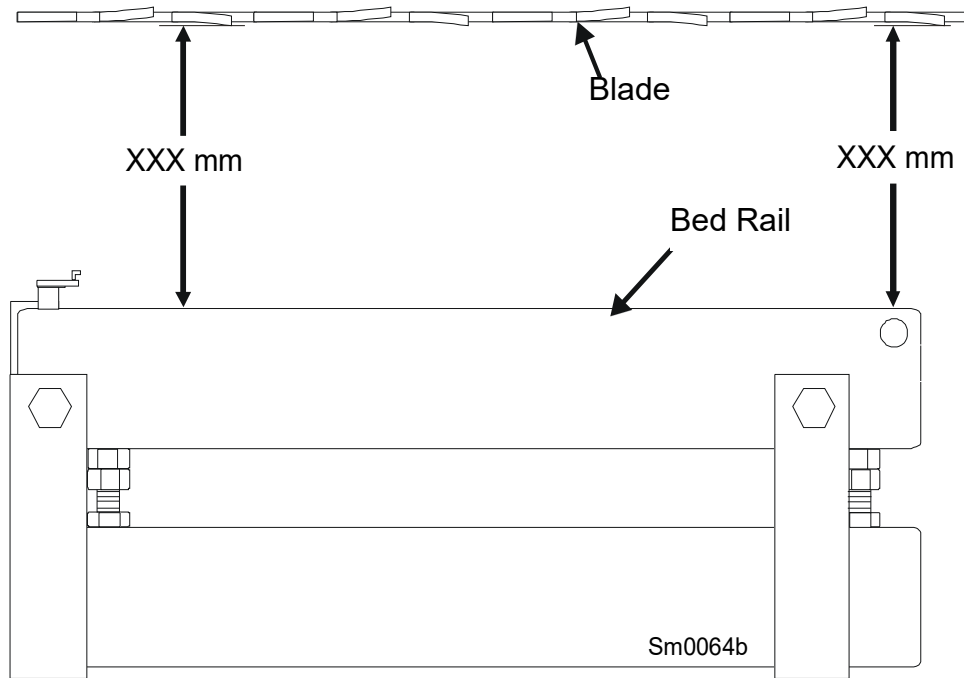


FIG. 1-32

1 Installation

Linear Sensor Installation

9. Attach the blade height scale to the mast so it shows the pre-measured distance.

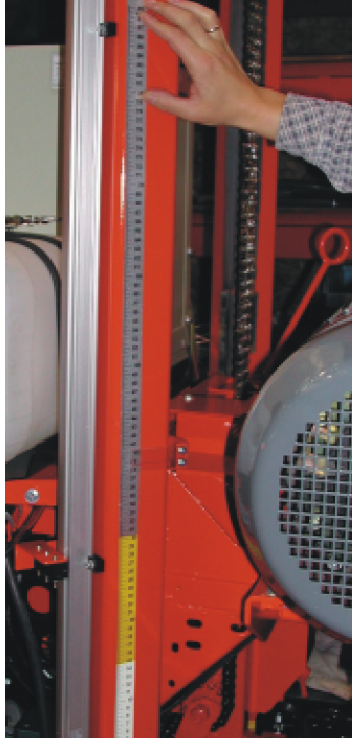


FIG. 1-33

1.5 Control & Cover Installation

1. Install the Setworks control panel to the top of the sawmill control box.

Insert the Setworks control panel under the L-shaped bar clamp and slide forward into place. The four holes in the front of the Setworks control panel should align with the four holes in the top of the sawmill control box. Tighten the bar clamp mounting screws to secure the back of the Setworks control panel to the sawmill control box. Use the four existing #10-24 x 3/8" self-tapping screws (removed when original cover was removed) to secure the front of the Setworks control panel to the sawmill control box.

See Figure 1-34.

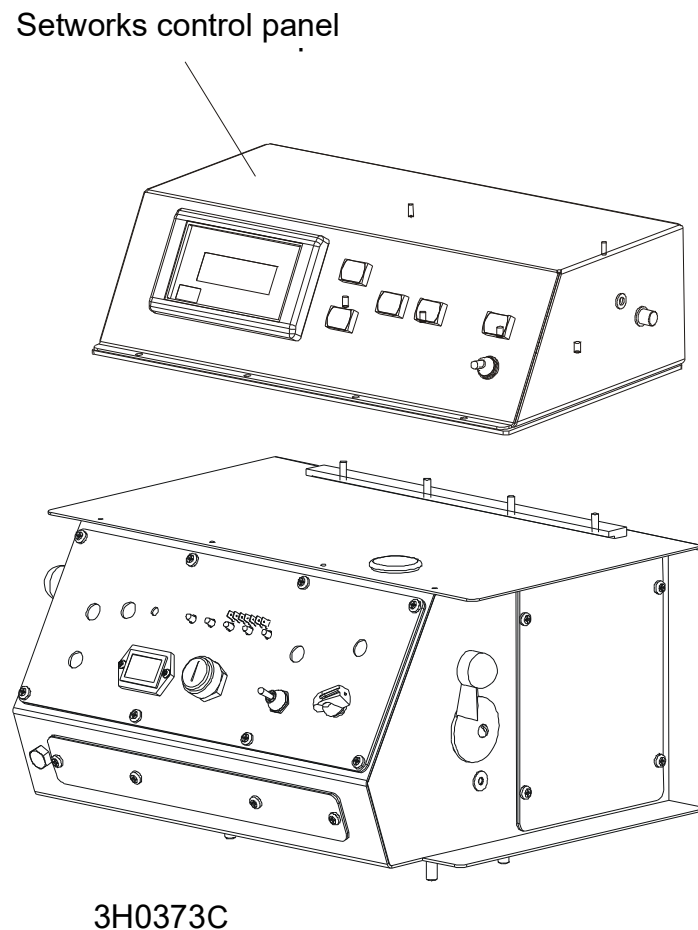


FIG. 1-35

2. Reinstall the front control panel to the sawmill control box.

1.6 Setworks Adjustment

NOTE: When PLC Setworks is powered for the first time, press REF and MEM1 buttons before turning the sawmill power on. Holding these buttons, turn the sawmill power on (turn on the main switch located on the side panel of the electric box). When "Reset, Default Settings" is displayed, release both buttons.

- 1 After turning on the main switch, "Head Height" will be displayed in the Setworks display window.
- 2 F1 (A) and F2 (B) buttons under the display allow to select the language.



FIG. 1-36

3. Using the scale located on the mast, position the saw head at the height of 300 mm.
4. Loosen the sensor mounting bolts and adjust the sensor so that the display shows 300 mm.
5. Tighten the sensor mounting bolts.

Now that the above settings have been made, the Setworks is ready for use.

SECTION 2 PLC-AC NETWORKS OPERATION

IMPORTANT! Read and understand the entire Operation section before using your Setworks!

PLC-AC Setworks is a sawmill option which automatically lowers the saw head to a pre-set cutting height. The option of automatic head setting functions only for downward saw head movement. The saw head height measurement is made continuously and is independent of gear clearance, saw head chain wearing, etc. The data about saw head height are not lost even when the sawmill power is turned off and then on again. PLC-AC Setworks is based on a programmable logic controller, PLC, a magnetostrictive measuring strip (which reads a given saw head height), a programmable control panel and a speed controller used in asynchronous motors.

2.1 Networks usage principles

The following buttons are located on the Networks control panel:

1. REF – used to confirm entered or modified data (board thicknesses, blade kerf, etc.)
2. MEM 1 – first board thickness memory
3. MEM 2 – second board thickness memory, in the Manual Mode – in the display window it shows the height to which you should lower the saw head to get the whole number of the same dimension boards.

EXAMPLE: If the saw head height is 380 mm and you want to get boards 50 mm thick, the saw head height shown on the display will be 350 mm (which means that if you want the last board as well as the previous ones to be 50 mm thick, the saw head should be lowered to the position of 350 mm above the bed rails). Complete description of how and when to use this button you will find in further points of our instructions.

NOTE: In the above example the kerf size was not taken into account.

4. To use the third or the fourth memory, press MEM1 button twice to choose the third memory or press MEM2 button twice to choose the fourth memory.
5. AUTO/MANUAL – lets you switch between Manual Mode and Automatic Mode. MANUAL – Networks shows the current saw head height only, the up/down switch, located on the sawmill control panel, works in the same manner as in the sawmill without the Networks option. AUTO – automatic saw head lowering, the up/down switch is used only to initiate the saw head's downward movement or to raise the saw head after any cutting operation.
6. UP/DOWN ARROWS – used to change entered parameters such as thickness of the sawn log, blade kerf, etc.

2.2 Blade Kerf Setting

For maintaining accuracy (proper thickness) of the sawn boards it is especially important to set the blade kerf. The kerf setting can be whole numbers only (not fractional ones, e.g. 1.2, 2.3). The typical Wood-Mizer blade's kerf is approximately 2 mm and that value should be entered into the Networks memory.

To change/set the blade kerf:

1. The Auto/Manual button in the Manual position.
2. Press the Ref Button.
3. The display reads "Blade kerf...mm".
4. Using the up/down arrows scroll to the desired value (typically 2 mm).
5. Press Ref again to store the setting.
6. The display should read "Stored". The kerf value has been entered into the Networks memory.

See Figure 2-1.

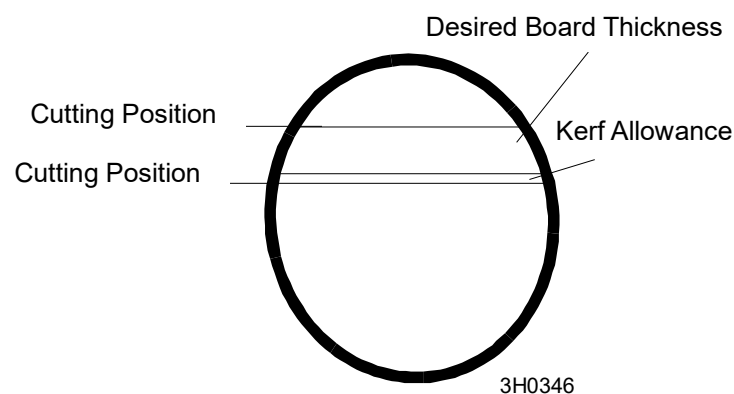


FIG. 2-1

2.3 Simple lowering the saw head by a pre-set value:

1. The Auto/Manual button in the Manual position.
2. Using the up/down switch move the saw head to the height from which you want to start cutting.
3. Press the Auto/Manual button to change to the Auto position.
4. Set the desired board thickness with the up/down arrows. If the blade kerf has already been set (e.g. 2 mm), the entered board thickness will be the real one i.e. after being sawn, the board will be exactly of the thickness shown on the display. Therefore you should not add the kerf value to your board thickness (e.g. you should not enter the value of 27 mm to get a 25-mm-thick board). Setworks will automatically add the pre-set blade kerf to the board thickness that has been entered.
5. Press the Ref button (to confirm the board thickness setting).
6. Make a cut (when returning the saw head to the front of the mill you can raise it - Setworks remembers the last cutting height).
7. If you are ready for the next cutting, press and release the up/down drum switch handle to initiate the saw head's downward movement.
8. Wait until the display shows the message "Ready".
9. You can start cutting.

To cut next boards of the same thickness, repeat steps 7-9. If you want to change the board thickness dimension, set the new value (by using the up/down arrows or choosing one of the values stored in MEM1 and MEM2 memories) before lowering the saw head for the next cut.

Confirm the change by pressing the Ref button and then use the same procedure as described in points 7-9.

NOTE: If you have raised the saw head after the cutting prior to the board thickness change without exiting the Automatic Mode, the Setworks still remembers the last cutting height and the change will be counted from the last cutting height.

If you have raised the saw head after any cutting in the Automatic Mode and you want to return to the last cutting height, you should change the board thickness to 0.

If you raise the saw head in the Automatic Mode (after pressing the Ref button to activate the automatic saw head lowering) and you want to lower the head from a given new point, you must exit the Automatic Mode for a while by switching to the Manual one. Then return Setworks to the Automatic Mode. Next steps as above.

2.4 Lowering the saw head to get a whole number of identically-thick boards

This Networks function allows you to figure the height at which the saw head should be set to get the whole number of the cut boards, i.e. each board down to the last one will be of the same thickness.

1. Position the saw head at the height from which you would start cutting.
2. Switch the Auto/Manual button to the Auto position.
3. Set the desired board thickness with the up/down arrows or choose MEM1/MEM2.
4. **Press the Ref button** to confirm the setting.
5. Press the Auto/Manual button to change to the Manual position.
6. Press MEM2.
7. The display shows the height to which the saw head should be lowered to get the whole number of the cut boards (so the first and the last board be the same).
8. Move the up/down switch to the down position and release. The saw head will start to move down.
9. The saw head will lower to the height allowing you to get the whole number of the cut boards (each board down to the last one will be of identical thickness).
10. Switch the Auto/Manual button to the Auto position.
11. **Press Ref to confirm.**
12. Press and release the up/down switch to move the saw head down.
13. Make a cut.
14. The remaining activities are the same as described in the chapter above.

2.5 Storing new board thicknesses in MEM1 and MEM2 memories

1. The Auto/Manual in the Auto position.
2. Using the arrows set the board thickness dimension you want to program.
3. Press and hold for about 3 s the MEM1 button (or MEM2 if you want to store the new value in the second memory). If you want to store the new value in the third or in the fourth memory, choose the memory first (press MEM1 button twice to choose the third memory or press MEM2 button twice to choose the fourth memory). Then hold for about 3s the MEM1/MEM2 button.
4. The stored value will appear on the display after the indication "Memory 1" (or Memory 2 or 3 or 4).
5. The stored values will remain in the Networks memory until you change the setting to another or restart (reset) the system (return to the factory values).

Press the up/down arrow again to exit the memory (MEM1 or MEM2) and return to the set board thickness display. If you want to use the setting stored in the Networks memory in the Auto Mode (the Auto/Manual button in the Auto position), press MEM1 (or MEM2) and then **confirm the chosen board thickness dimension with the Ref button**.

Return to the factory settings (initial)

If Networks is not functioning properly, it may be necessary to return to the factory settings.

Networks restarting (resetting):

1. Turn the main power supply off with the main switch located on the side panel of the electric box (which is placed on the saw head).
2. Press Ref and MEM 1 and then, still holding both buttons, turn the power on.
3. Release the buttons after about 3 seconds from turning the power on.
4. The display reads "///RESET///".
5. Networks has returned to the factory settings, the board thicknesses stored in MEM1 and MEM2 memories and the kerf setting will return to the initial values (MEM1-25 mm, MEM2-50 mm, blade kerf – 2 mm).
6. If Networks is still not working properly, contact the Wood-Mizer Customer Service.

2.6 Restrictions/protections:

1. The minimum thickness of the last board cannot be less than 25 mm, therefore Setworks in the Automatic Mode makes it impossible to lower the saw head to the height below 25 mm. Sawing at a position lower than 25 mm may cause the top metal part of the log clamps to be cut. EXAMPLE: The current saw head height is 80 mm and we want to cut a board 60 mm thick (the kerf is set to 0). Because of the above restriction it is impossible, so the display will show the message "Insufficient height! Minimum saw head height: 25 mm". In such a case you should lower the cutting thickness (in our example to 50 mm which will result in the saw head's height of 30 mm).
2. The upper limit of the saw head travel is 890 mm. Setworks will automatically stop the up/down motor after reaching this height. Only downward movement of the saw head will be possible then.
3. If the display shows the message "Sensor bad" or "Check sensor connections and power supply" it means that the sensor is not functioning properly. In this case the sensor's further work is impossible. Locate cause of the failure. First inspect the connections between the sensor and the PLC unit. If they are good, check 24 V DC voltage on the 24 V DC Telemecanique power supply. Voltage should be about 24V. If the power supply is adequate and the sensor still does not work, you should restart (reset) the Setworks. The description of the restart function can be found above. If the sensor and the Setworks do not work after being restarted, you should contact WM service.
4. If you switch the up/down switch to the up position during the saw head's automatic lowering (the saw head's downward movement) in the Auto mode, the saw head's downward movement will be stopped. Simultaneously, the data concerning the current lowering (the height to which the head should be lowered) will be lost. This function has been inserted for safety's sake. A similar result can be obtained when the Auto/Manual button is switched to the Manual position during the saw head's automatic downward movement.

2.7 Networks bypass

See Figure 2-2. You can bypass Networks by pressing BYPASS button.

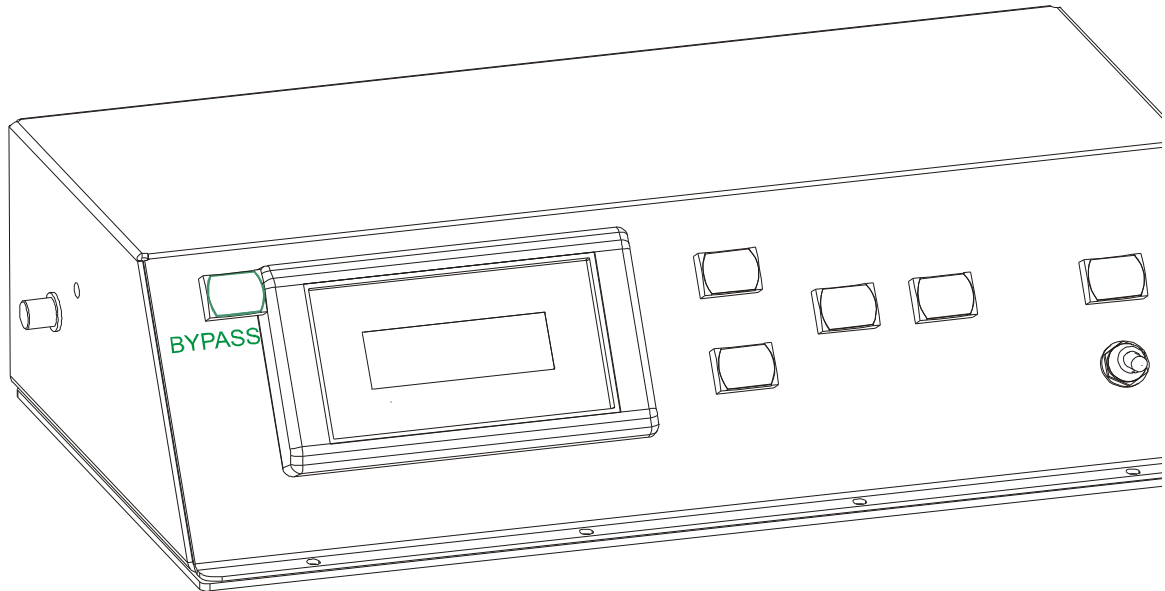


FIG. 2-2

From now on the up/down system will be working as in the standard mill without PLC-Setworks. Although Setworks seems to be still working (the saw head height is still being measured, etc.), after pressing the BYPASS button it cannot control the up/down operation.

SECTION 3 TROUBLESHOOTING GUIDE

3.1 Networks Malfunction

PROBLEM	CAUSE	SOLUTION
Networks does not work	Toggle switch located on the PLC controller improperly set	Locate the RUN/TERM/STOP switch on the back plate of the PLC controller (See Figure 3-1) and push it to the RUN position.
	Bypass function disable Set-works operation	Check position of the BYPASS button (See Section 2.7)
Networks does not work properly	PLC controller improperly set	Turn on the sawmill power holding MEM1 and REF buttons. Hold the buttons until “Reset, Default Settings” is displayed (See Section 1-6).



FIG. 3-1

SECTION 4 REPLACEMENT PARTS

4.1 How To Use The Parts List

- Use the index above to locate the assembly that contains the part you need.
- Go to the appropriate section and locate the part in the illustration.
- Use the number pointing to the part to locate the correct part number and description in the table.
- Parts shown indented under another part are included with that part.
- Parts marked with a diamond (◆) are only available in the assembly listed above the part.

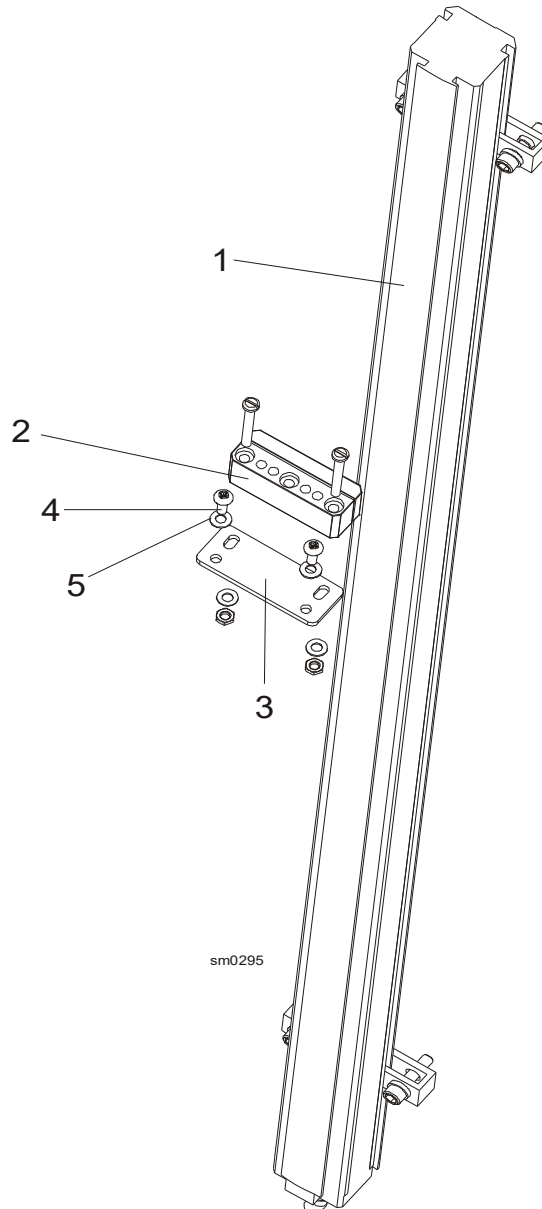
See the sample table below. Sample Part #A01111 includes part F02222-2 and subassembly A03333. Subassembly A03333 includes part S04444-4 and subassembly K05555. The diamond (◆) indicates that S04444-4 is not available except in subassembly A03333. Subassembly K05555 includes parts M06666 and F07777-77. The diamond (◆) indicates M06666 is not available except in subassembly K05555.

4.1 Sample Assembly				
REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	Sample Assembly, Complete (Includes All Indented Parts Below)	A01111	1	
5	Sample Part	F02222-22	1	
	Sample Subassembly (Includes All Indented Parts Below)	A03333	1	
6	Sample Part (◆ Indicates Part Is Only Available With A03333)	S04444-4	1	◆
	Sample Subassembly (Includes All Indented Parts Below)	K05555	1	
7	Sample Part (◆ Indicates Part Is Only Available With K05555)	M06666	2	◆
8	Sample Part	F07777-77	1	

To Order Parts:

- From Europe call our European Headquarters and Manufacturing Facility in Kolo, Poland at **+48-63-2626000**. From the continental U.S., call our toll-free Parts hotline at **1-800-448-7881**. Have your customer number, vehicle identification number, and part numbers ready when you call.
- From other international locations, contact the Wood-Mizer distributor in your area for parts.

4.2 Sensor Assembly



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.
1	ANALOG SENSOR, BTL6-E500-M0900-PF-S115	088297	1
2	ANALOG SENSOR MAGNET, BTL5-P-5500-2	088298	1
	PLATE ASSEMBLY, SENSOR MAGNET MOUNT ¹	092521	1
3	Plate, Sensor Magnet Mount Painted	502951-1	1
4	Screw, M4x12-5.8-B Cross Recessed Pan Head Zinc	F81011-43	2
5	Washer, 4.3 FE/ZN5 PN-M/82005	F81051-2	4

¹ LT70 Sawmills only.

4

Replacement Parts Electrical Components

4.3 Electrical Components

See Figure 4-1. The electrical components are listed in the table below.

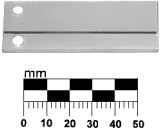


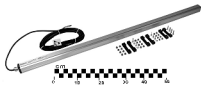
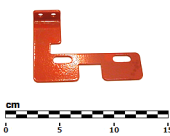

View	Wood-Mizer Part #	Qty	Description
	094821	1	INDICATOR, BLADE HEIGHT SCALE
	P03027	1	SWITCH, SPST ON/OFF 15A .25 TABS TOGGLE
	050163	1	PLC MODULE, 4CH ANALOG INPUT, 4-20MA
	088297	1	LINEAR SENSOR TLM 0900-001-423-203
	088298	1	MAGNET, BTL5-P-5500-2 SENSOR
	088314	2	MODULAR PLUG WM 6P6C
	088321-1	1	SCALE POINTER REMOTE AC - PAINTED
	502699	1	EA1-S3MLW-RB GRAPHIC PANEL

TABLE 4-1




	088152	4	PUSHBUTTON GREEN XB6-DA35B
	088153	1	PUSHBUTTON RED XB6DA45B
	088425	1	CONTROLLER, PLC - DO-05DR-D
	088663-1	1	PLC SET BOX WELDMENT, PAINTED
	088828	1	RELAY, FINDER TYPE 58.34.9.024.0050
	088833	1	BUTTON XB6 DF3 B5B
	F81086-2	10	FITTING SAK2,5/35 (038046SAK)
	R80575-1	0,8m	CONDUIT TLWY 12x0,12mm
	085746	1	DECAL MOVABLE METRIC SCALE

TABLE 4-1

4 Replacement Parts

Electrical Components



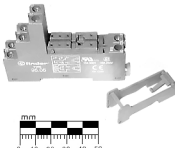


	087817	3	CONTACT, ZBE 101
	090354	1	RELAY FINDER 40.52.8.024.00.00
	090355	1	FINDER 40.95.05 SERIES RELAY SOCKET
	090428	1	VOLTAGE REGULATOR 24V 1A
	P11764	1	GROMMET, 5/8 ID RUBBER
	R01887-1	0,2m	GROMMET, .062-.099 CONT PLASTIC
	092521	1	COMPLETE SENSOR MAGNET MOUNT PLATE, BALLUFF
	092519-1	1	SENSOR MAGNET MOUNT PLATE, BALLUFF PAINTED
	086773	1	SPEED CONTROL SWITCH

TABLE 4-1


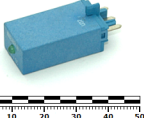
	093488-320	1	ALTIVAR ATV320U11N4C
	092693	1	LED MODULE + DIODE 6-24V 99.02.9.024.99

TABLE 4-1

4.4 Decals

See Figure 4-2. SW-PLC Decals are listed in the table below.

View	Wood-Mizer Part #	Qty	Description
	088825	1	Decal, PLC Setwork

TABLE 4-2