



Automating the Truss Industry Since 1999

# EZ-TRIMMER



## OPERATOR'S MANUAL AND TROUBLESHOOTING GUIDE

P.O. Box 1659, Sorrento, FL 32776 - Ph: 352-735-5070 Fax: 352-735-5071 - [www.tctmanufacturing.com](http://www.tctmanufacturing.com)

Copyright ©2007 TCT Manufacturing, Inc.  
All Rights Reserved.

*Revised: March 14, 2007*

## Table of Contents

Section 1: Preamble .....	3
Section 2: Introduction .....	4
Section 3: Installation .....	5
Section 4: Operation .....	6
Section 5: General Maintenance .....	8
Section 6: Advanced Maintenance and Calibration .....	10
Section 7: Troubleshooting .....	17
Appendix A: Warranty .....	19
Appendix B: Index .....	20
Appendix C: Circuit Diagram .....	21

## Preamble

Congratulations on your purchase of TCT Manufacturing, Inc.'s EZ-Trimmer Double-45 Bevel-Cutter. The EZ-Trimmer will provide years of service and countless hours of production, if it is used properly and maintained regularly. A few steps of cleaning and upkeep now will save hours of frustration and down-time in the future.

This manual assumes the user has some experience with electricity and mechanics. Some of the procedures and steps outlined here may be too advanced for the average user. If you are uncomfortable with attempting any procedure explained in this manual, we advise you to seek professional assistance, or you may contact TCT Manufacturing, Inc. to schedule a Service Technician to visit your site and perform training or maintenance on the EZ-Trimmer or any of our products.

We at TCT Manufacturing, Inc. developed this manual with you, the customer, in mind. We designed it to contain all the information you will need to properly maintain and care for your new EZ-Trimmer. However, we value feedback on the quality of our materials, and we welcome suggestions on how it can be improved or expanded. If you would like to submit a comment or suggestion, please contact us:

### **POSTAL MAIL:**

TCT Manufacturing, Inc.  
P.O. Box 1659  
Sorrento, FL 32776  
Tel: (352)-735-5070  
Fax: (352)-735-5071

### **E-MAIL:**

#### **President:**

Jim Urmson → [jimu@tctautomation.com](mailto:jimu@tctautomation.com)

#### **Vice-President:**

Shirley Urmson → [shirleyu@tctautomation.com](mailto:shirleyu@tctautomation.com)

#### **Sales:**

Doug Johnson → [dougj@tctautomation.com](mailto:dougj@tctautomation.com)

#### **Parts:**

Colleen → [colleenc@tctautomation.com](mailto:colleenc@tctautomation.com)

#### **Service:**

Ian Nicholson → [iann@tctautomation.com](mailto:iann@tctautomation.com)

## Introduction

The TCT EZ-Trimmer is:

- **Capable:** The TCT EZ-Trimmer cuts double 45° bevels on jack chords and similar pieces from 0/12 to 12/12 pitch, on 2x3, 2x4, and 2x6 lumber.
- **Safe:** Completely enclosed for maximum safety, dramatically reducing the possibility of accidents and mishaps.
- **Fast:** Possibly the fastest machine of its kind available, capable of cutting up to 15 cuts per minute, without reducing accuracy or safety.
- **Flexible:** Can be used as is, or can be paired with the TCT Linear-Feed Saw, allowing multiple tasks to be accomplished at the same station.

### **FEATURES:**

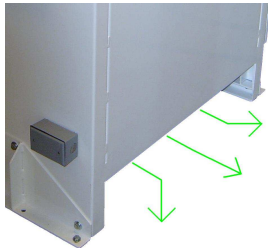
- **Motor:** 5 HP, 3 Phase, VFD (AC-Tech)
- **Pneumatics:** NFPA Bosch-Rexroth Industrial Pneumatics
- **Blades:** Pair of "Off-the-Shelf" Bevel Edge, 3 Wing Carbide Shaper Blades
- **Warranty:** One-Year Parts Warranty



## Installation

### EZ-TRIMMER REQUIREMENTS

- **Power:** 3-Phase 208V or 240V 30A 60Hz  
(NOTE: 3 Phase, 440V or 480V may be used if a transformer is supplied to step the voltage down. A suitable transformer can be purchased from TCT Manufacturing, Inc.)
- **Air Supply:** Compressed air, 90 PSI (9 CFM)



TCT Manufacturing, Inc. suggests that the EZ-Trimmer is positioned so that all four sides are easily accessible, to aid in cleaning and maintenance. (NOTE: Sawdust that is generated by the EZ-Trimmer is expelled underneath the machine. It is advisable to position the machine in such a way that the sawdust waste can easily be removed.)

It is recommended that the EZ-Trimmer be bolted to 4x4 timbers placed underneath both “feet” of the machine. This will aid in reducing vibrations, especially on concrete flooring, and will help to keep the machine from sinking if it is located on soft floor material (i.e. dirt or grass).

Electrical connections should consist of the following: 3-phase power input, along with a ground. A junction box is provided on the lower right side of the EZ-Trimmer. The connection should be sealed to avoid the possibility of moisture damage.

The EZ-Trimmer is protected internally by circuit-breakers, but it is advisable to install a protected disconnect in-line with the 3-phase input power. This allows for easy shutoff at the end of shifts, and also adds extra protection in the event of an emergency. (NOTE: A disconnect may be required to comply with some local electrical-codes. Please check your local building-code for additional details and requirements.)

Before the EZ-Trimmer is operated for the first time, make sure that the oil cup is 3/4 full, using standard Pneumatic Tool Oil, available from most hardware- and auto-parts stores. Upon initial operation, the oil adjustment should be set for one drop of oil per every 5 cycles of the blade motor carriage (you can use the **MANUAL CUT** button to cycle the carriage manually).

After connecting the air supply, set the regulator to 90 PSI. It is best not to allow the pressure to drop below 85 PSI in an idle state.



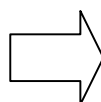
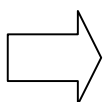
## Operation

### Startup and Operation

(Note that the red **E-STOP** button is used to stop the blade motor and halt the machine's operation in the event of an emergency.)



1. Inspect all electrical connections, check the oil level in the oil cup, and ensure the lid is fully closed and latched (one latch on each side of the machine).
2. Turn on the main disconnect (if applicable), and turn on the red disconnect switch on the lower left side of the machine.
3. Set the desired angle by placing the piece to be cut against the angle-indicator...

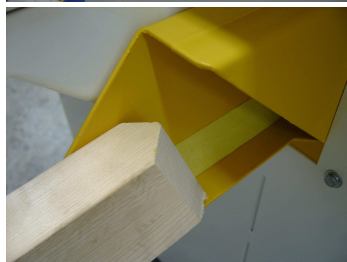


...and turn the adjustor crank to match the indicator with the angle on the piece.

4. Twist the **E-STOP** button to the right to disengage it (if it is pushed-in), then press the green **START** button, which will start the blade motor. Wait a few seconds for the blade motor to reach its full speed. (NOTE: To avoid jamming the machine, make sure the blade motor is running before inserting your lumber.)



5. Carefully but firmly insert the piece into the mouth of the EZ-Trimmer, using a swift motion. The machine will cycle, and the piece will be released. Inspect it, checking for correct angle, and that there is a small flat surface at the peak of the cut. If tweaking is necessary, adjustments for the angle and width of the flat surface are detailed in the *Advanced Maintenance and Calibration* section, beginning on page 10.



6. Repeat step 5 for the remainder of pieces with the same angle. Repeat step 3 to set the angle for a new piece.



If desired, the machine can be manually cycled by pressing the yellow **MANUAL CUT** button. This is especially beneficial on lumber with imperfections, or to re-cut a piece that wasn't inserted firmly into the saw the first time. (NOTE: The manual cut will operate the machine's cycle even when the blade motor is stopped. To avoid jamming the machine, make sure the blade motor is running before inserting your lumber.)

### **Shut-Down**

Shutting the EZ-Trimmer down is essentially the reverse of the startup procedure.

1. Press the red **STOP** button to stop the blade motor. You can also use the stop button to stop the blade motor when you take breaks, or between jobs while you are gathering materials.



**⚠ IMPORTANT:** Do not use the E-STOP button to stop the blade motor, except in an emergency, as it may damage the machine if used inappropriately. Damage of this type is not covered under warranty.

2. If you are shutting the machine off (at the end of a shift, for example), turn the machine's disconnect off, then turn the main disconnect off.

### **Emergency-Stop**

The operation of the EZ-Trimmer is protected by an Emergency-Stop (E-Stop) circuit. This circuit includes the **E-STOP** button, and a lid sensor. A plunger switch senses whether the lid of the machine is closed, and will not allow it to operate unless the lid is closed and latched.

If either the **E-STOP** button is pushed in, or the lid is not closed, the clamp will engage, the blade motor will refuse to start, and the carriage will not cycle, even when you press the **MANUAL CUT** button. Close the lid, or release the **E-STOP** button (by turning slightly clockwise), to enable operation of the machine. If neither of these actions enables operation of the machine, then there may be a problem with the E-Stop circuit. Refer to the *[Troubleshooting](#)* section for possible solutions.

**⚠ IMPORTANT:** NEVER rely on the E-STOP circuit alone to protect you or others! Always treat the machine with the same respect you would for any power-tool, and practice safety when you are using the machine. Deliberately disabling any component of the E-STOP circuit can lead to serious injury—if any problems develop with the machine, have it serviced by a TCT Service Technician immediately. The EZ-Trimmer was designed to be a safe, easy-to-operate machine, but a safety-minded operator is a necessity to ensure the safety



## General Maintenance

The TCT EZ-Trimmer requires little maintenance, but proper care is essential to keeping it operating efficiently. Certain steps can be taken to ensure that the EZ-Trimmer runs at its peak performance for years to come. If you have any questions or concerns about cleaning or maintenance, contact TCT Manufacturing, Inc. We are pleased to provide information on maintaining and caring for the TCT EZ-Trimmer, or any of our products.

### Cleaning

The EZ-Trimmer should be blown out with compressed air at the end of each shift, but with careful attention given to sensitive elements of the machine. If possible, it is suggested that the compressed air supply be regulated low enough not to force sawdust into components. In particular, the two muffler/filter elements attached to the pneumatic valve set tend to attract sawdust, but can be one of the worst causes of machine-downtime, if not cleaned regularly.

It is also recommended that the EZ-Trimmer be cleaned thoroughly once per week. We find that Zep® Orange Gel degreaser cleans the EZ-Trimmer well. As always, do not overuse any cleanser, and avoid introducing the cleanser into sensitive components of the machine.

### Changing the Air Filter

The air filter (located on the electrical panel door) should be blown out carefully at the end of each shift. It should be replaced monthly, or as needed. It is important that this filter be clean at all times. This will allow enough volume of air to flow around and through the electrical components, and keep them at proper operating temperatures, while limiting the amount of sawdust that enters the panel box. Use one of the following part numbers (or equivalent):

**Purolator:** (OEM)  
**Napa:**

**A13192**  
**6120**

**Fram:**  
**Motorcraft:**

**CA3559**  
**FA949**



### **Changing the Blades**

The two shaper blades on the EZ-Trimmer should be changed monthly if the machine is used one shift (8 hours) per day, 5 days a week, or as required. These blades can be purchased from TCT Manufacturing, Inc. Remember that the two blades are different part numbers—when ordering, make sure you purchase both blade part numbers.



### **Lubrication**



The EZ-Trimmer should be lubricated from time to time, but it is best not to lubricate grease fittings too frequently. We recommend lubricating once per three month period (one 8-hour shift each day, five days per week), using about one “squeeze” of a standard grease gun per grease fitting. It is especially important to avoid over-lubricating the blade motor. Any type of standard bearing-grease is acceptable

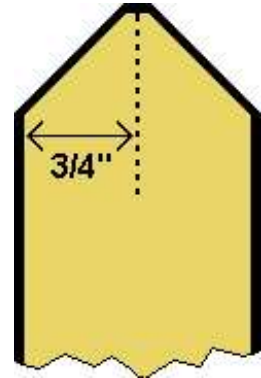
The EZ-Trimmer’s angle adjustor rod is enclosed with a plastic or rubber flexible sheath, to keep sawdust from entering the mechanism. To lubricate it, slide the sheath back to expose the threads of the rod. If necessary, clean any sawdust and contaminated grease from the threads, and apply an adequate amount of fresh grease. Then, slide the sheath to its original position, using wire-ties to hold it in place if needed.

## Advanced Maintenance and Calibration

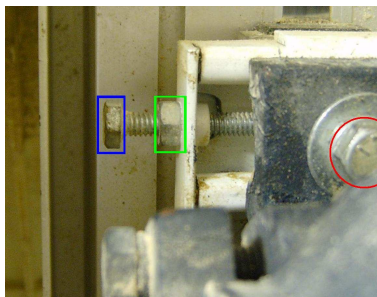
From time to time, certain systems of the TCT EZ-Trimmer may require repair or calibration. This section gives insight into how the EZ-Trimmer operates, and what actions to take when adjustments are necessary.

### Centering the Cut

If the double-bevel is consistently cut off-center, you will need to adjust the blade motor the amount needed to center the cut. Note that the width of your lumber will affect the appearance of the cut (for example, a piece that is less than 1 ½ inches thick will falsely cause the cut to look off center to the right), thus it is important during calibration to use pieces which are exactly 1 ½ inches thick, and to measure the cuts from the left side of the board (when looking down upon a freshly cut piece).



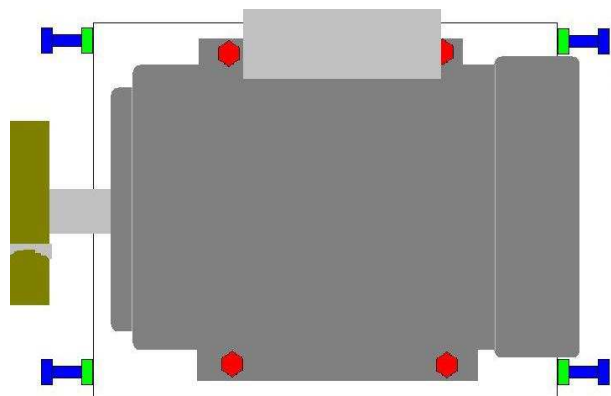
Cut a double bevel on a standard piece of lumber (making sure the angle adjustor is set properly, best tested with a 90° bevel). Take note of the direction the piece was inserted into the EZ-Trimmer, by marking the top side of the piece. Measure from the left face of the board to the center of the flat surface at the peak of the cut. This measurement should be ¾ of an inch from the left side of the board. If it is less than ¾ of an inch, the blade motor needs to be adjusted in the direction of the blades (toward them). If it is greater than ¾ of an inch, the blade motor should be adjusted in the opposite direction of the blades (away from them).



Loosen the four motor mounting bolts (shown in red, two on top, two on the bottom) enough to free the motor, but not enough to risk them falling out. Loosen all four adjustment bolt lock nuts (shown in green). It is helpful to mark one facet of each bolt, to determine how far it is adjusted. Turn the two adjustment bolts (shown in blue) on the side the motor needs to move, the amount needed to correctly align the motor (i.e. if the motor needs to move toward the blades, loosen the bolts that are closest to the blades). NOTE: 1 turn of the bolts equals about 1/16" of movement for the motor.

Turn the remaining two adjustment bolts (in blue) to push the motor in the direction it needs to travel; they should be turned the same amount as the first two you adjusted above. It may help to loosen the motor mounting bolts (red) slightly if the motor feels tough to move.

**⚠ IMPORTANT:** Do not over-tighten the adjustment bolts. They can bend or break if care is not taken. Failure of the bolts due to abuse is not covered under warranty.



After the adjustment has been made, re-tighten the adjustment bolt lock nuts (green, do not over-tighten), and re-tighten the motor mounting bolts (red, these are more tolerant of over-tightening, but as always take precautions to avoid damaging any hardware).

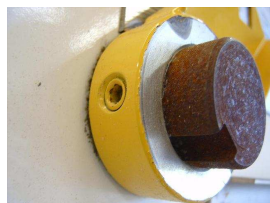
Inspect all mounting and adjustment points of the motor once more before attempting to run the machine. Close the lid, and cut another double-bevel with the machine. Check the cut to be sure it is in the center, and if necessary, repeat the steps here to fine-tune the centerline.

### **Calibrating the Angle Indicator**

Calibrating the angle indicator is simply a matter of cutting a double-bevel on a piece with a known-correct angle (90° is recommended) and checking to make sure the cut was straight.



Set the angle indicator, using the angle adjustor crank, to match the angle on your piece to be cut. Then cut the piece as normal. Inspect the cut, and determine if the angle was too steep (flat surface is wider at the top than the bottom), or not steep enough (flat surface is wider at the bottom than at the top).



The first machines used set-screws.

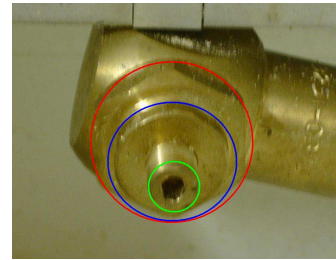
Re-set the angle (using the angle adjustor crank) in small (1°) increments as you cut the same cut (be sure to use pieces that have the same, correct angle). Once the cut is made correctly, loosen the two bolts (or the set-screw, used on first-generation machines) that secure the angle indicator, and rotate it so that the correct angle is shown. Be sure to tighten the bolts or set-screw before attempting to use the indicator. Re-set the angle indicator, and make another test cut to check for proper alignment of the indicator.

### **Setting Cycle Speed**

Depending on the average density of the pieces you intend to cut on the EZ-Trimmer, the time it takes for the carriage to reach the bottom of its travel should be within 1.5-2.5 seconds. If you find that your EZ-Trimmer “bogs down” when cutting denser lumber, or if it takes a considerable amount of time for the machine to complete its cycle, fine-tuning the carriage-down speed could yield a great improvement. **NOTE:** Dull blades can also cause slow cut-speeds. Check to be sure the blades are not dull before performing these adjustments.

Note that the time it takes for the carriage to return to its top is controlled primarily by the air pressure supplied to the machine (which should be between 85-90 PSI). Thus, if the return time is longer than normal (1-2 seconds), there is likely a problem with the air supply, either inside the machine, or leading up to it. (NOTE: The carriage cylinder cushions will affect how long it takes for the machine to unclamp a piece, however they do not affect the speed of the carriage traveling to the top. Refer to *Adjusting Cylinder Cushions* in this Section for more information.)

On some machines, the flow-adjustor is located underneath the left air cylinder; other machines locate this adjustment at the top-right corner of the carriage. Loosen the lock nut (shown in blue), and adjust the valve with the socket screw (shown in green), 1/8 turn each time. Turning clockwise will slow the carriage speed, and turning counter-clockwise will increase its speed. Repeat if necessary, until a suitable speed is reached. NOTE: Do not loosen the nut shown in red. It is what holds the valve together.



**⚠ IMPORTANT:** The flow-adjustor is made of brass, which is a soft material. The screw can easily be stripped. Take care to loosen the lock nut before adjusting, and use the correct Allen-wrench. Damage to flow adjustment due to improper usage is not covered under warranty.

### **Adjusting Cylinder Cushioning (Rodless-Cylinders only)**

If, after cycling successfully, the machine takes excessive time to unclamp, or never unclamps at all, it could be a sign of a bad upper proximity sensor or cable, or that the sensor has come out of adjustment. But often times, this symptom is caused by the cushion adjustment on one or both of the carriage cylinders. “Banging” of the carriage upon return to the top can be another symptom of incorrectly adjusted cylinder cushions.



The cushion softens the impact when the cylinders reach their extremes of travel, “cushioning” the shock of the cylinder reaching one end or the other. The cushion adjustment allows only a small amount of air to pass by the valve, but only for the last inch or so of travel. It serves no purpose during normal travel of the cylinder—it only affects the extremes.

Initially, all four (one on each end of both cylinders) cushion adjustments on the EZ-Trimмер should be set to one turn out. Turn the adjustment screw clockwise gently until it stops, then turn it counter-clockwise the amount of the adjustment (one turn in this case). If the carriage hits too hard when it returns to its top position, you may achieve improved results from turning the adjustment clockwise, ¼ turn or less at a time, and testing using the **MANUAL CUT** button. Likewise, if the carriage never fully reaches the top (signified by a slow reaction time of the clamp cylinder when the cycle should be complete), you can turn the adjustment counter-clockwise, again ¼ turn or less each time. When complete, the carriage should not jolt the machine as it returns to the top, while still allowing the clamp to unclamp in a reasonable amount of time.

### **Adjusting and Replacing Proximity Sensors**

The proximity sensors used on the EZ-Trimмер are secured with a nut and an inverted-star washer on either side of the mounting bracket. Adjusting the depth of the sensor is as easy as loosening and turning the nuts, and locking them down (without over-tightening—they are fragile). Adjusting the height is even easier; just loosen the mounting nuts, and position the sensor at the correct height. Then carefully tighten the nuts to lock the sensor in place.





The sensors should be set so that when the carriage returns to the top, it should trigger the upper sensor about ½ of an inch before it reaches the top, and that when the carriage drops to the bottom, it should trigger the lower sensor about ½ of an inch before it rests at the bottom. To adjust the lower sensor, disconnect the air supply, and let the carriage rest in the down position. This will allow you to measure ½ of an inch between the bottom side of the sensor, and the bottom of the flag.

To replace the sensor, remove the cable from the end of the sensor (the connector is held on with a threaded locking-ring—turn it counter-clockwise to remove, clockwise to reinstall). Loosen the mounting nuts, and remove one of them (again, counter-clockwise, when looking at it straight on). The sensor will then be freed. Reinstall the replacement sensor in the reverse order, taking care to line up the cable connector when you reconnect it. Make sure the sensor can not “rub” on the surface of the flag, as this will damage the sensor, and is not covered under warranty.

### **Adjusting and Replacing Plunger Switches**

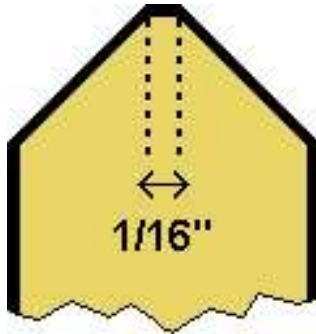
Both plunger switches (lid sensor and infeed sensor) should be adjusted so only the wheel protrudes from the sensing surface, and the solid shaft of the switch is flush with the surface. This is illustrated in the picture to the right. This adjustment is important because the amount of force that is applied to the sensor during normal use can cause damage if the shaft is stressed directly. This adjustment also helps to control the distance the sensor is required to move before the switch activates.



The two mounting screws that attach each switch to the machine also permit adjustment of the sensor. When adjusting an existing switch or mounting a new one, align it perpendicular (at a right-angle) to the sensing surface; don't attempt to angle the switch for any purpose. The switch performs best when the sensing force is applied directly to the wheel, not at an angle.

The screws are slotted to allow for proper depth-correction (how far the plunger shaft protrudes from the sensing surface). It may help to temporarily tighten one of the two screws while adjusting the depth of the sensor, and avoid tightening both screws until the correct depth and angle is attained.

**⚠ IMPORTANT:** The contact pins in the end of the proximity sensors and plunger switches are delicate, and can be damaged easily if force is applied when attempting to connect the sensor cable. Be sure to gently align the index pin before fully inserting the connector. Damage to the sensor from improper installation is not covered under warranty.



### **Adjusting the Cut-Depth**

The depth of the cut (and the resulting flat surface left by the cut) is controlled by the distance the piece is allowed to travel into the machine, before starting its cycle.

If there is no visible flat surface left at the peak of the cut, the piece is traveling too far into the machine, and the blades are cutting more material from the piece than they should be. This can be remedied by removing spacers (or sets of four washers) sandwiched between the infeed plunger switch bracket and the carriage, allowing the bracket to move closer to the mouth of the machine. Remove one spacer or set of washers at a time, then retest the cut. One spacer or set of washers is usually equal to 1/16 width of the flat surface left by the cut.

If the flat surface left by the cut is too wide, the infeed sensor plunger switch bracket needs to move farther from the mouth of the EZ-Trimmer (which will allow the board to travel deeper into the blades). This is best accomplished by removing the bracket, putting one washer on each of the four mounting bolts, reinstalling the bracket, then testing the cut. In rare instances, another washer added to each mounting bolt may be necessary for the machine to cut a proper flat surface.

## Programming the AC-Tech Variable-Frequency Drive (VFD)

(Programming the AC-Tech is only advised in certain situations, such as replacing the unit, and can damage the drive if not done properly. Contact TCT Manufacturing, Inc. if you are unsure.)

Confirm that the red LED display shows “- - -” before beginning the process.

To enter programming mode on the AC-Tech:



1. Press MODE. The display will show “00”.
2. Use the  $\wedge$  and  $\vee$  buttons to change the display to the password (default is “255”)
3. Press MODE. If the password is correct, the display will show “P01”.
4. Use the  $\wedge$  and  $\vee$  buttons to change the display to the parameter you need to modify (See **Parameter List** on the next page for a list of available parameters)  
EXAMPLE: “P19” for Parameter 19
5. Press MODE, and the parameter value will be displayed.  
EXAMPLE: “20.0” for a value of 20
6. Use the  $\wedge$  and  $\vee$  buttons to change the value.
7. If more parameters need to be changed, press the MODE button twice, so the display shows “P # #”, and repeat steps 4-8. Otherwise press MODE until the display shows “- - -”.

### AC-Tech Parameters

(Parameters in **bold** print are different from defaults)

P #:	VALUE:	DESCRIPTION:
P01	<b>01 or 02</b>	Line Voltage (NOTE: Set to 01 if your 3-phase has a high leg, otherwise set to 02)
P02	02	Carrier Frequency
P03	01	Start Method
P04	<b>3</b>	Stop Method
P05	<b>2</b>	Standard Speed
P06	<b>2</b>	TB14 Output
P08	1	TB30 Output
P09	1	TB31 Output
P10	1	TB13A
P11	1	TB13B
P12	1	TB13C
P13	1	TB15 Output
P14	1	Control
P15	2	Serial
P16	2	Units Edit
P17	1	Rotation
P19	<b>2.0</b>	Acceleration Time
P20	<b>8.0</b>	Deceleration Time
P21	0.0	DC Brake Time
P22	0.0	DC Brake Amount
P23	0.0	Min Frequency

P #:	VALUE:	DESCRIPTION:
P24	<b>120.0</b>	Max Frequency
P25	<b>100</b>	Current
P26	<b>72</b>	Overload Threshold
P27	60.0	Base Frequency
P28	1.0	FX Boost
P29	0.0	AC Boost
P30	<b>3.0</b>	Slip Compensation
P31 thru P37	<b>110.0</b>	Preset Speeds (All should be set to “110”)
P38	0.0	Band Width
P39	0.0	Speed SCL
P40	60.0	Frequency SCL
P41	200	Load SCL
P42	20.0	Accel/Decel #2
P43	1	Address
P44	225	Password
P47	1	History
P48	1	Program
P51	0	Keypad Speed
P52	0	Direction
P61 thru P68		Stored Faults



### AC-Tech Fault-Codes

(Fault-codes are case-sensitive; CF is not the same as cF.)

CODE	DESCRIPTION & POSSIBLE CAUSES
---	<b>DRIVE IN IDLE MODE: Does not indicate a problem.</b> If this code is displayed, but the <b>START</b> button fails to start the blade, check for loose/damaged wires or connections on the AC-Tech control strip (smaller terminals) and in the switch panel-box.
110	<b>DRIVE RUNNING SPEED: Does not indicate a problem.</b>
AF	<b>HIGH TEMPERATURE FAULT: Ambient temperature is too high; Cooling fan has failed (if equipped).</b> Turn machine off, and allow drive to cool. Also, check that the cooling fan (on the bottom of the drive) runs when the drive is powered up.
LF	<b>LOW DC BUS VOLTAGE FAULT: Line voltage is too low.</b> Check that power to the machine was not shut-off, and check for loose or bad connections leading to the AC-Tech.
OF	<b>OUTPUT TRANSISTOR FAULT: Phase to phase or phase to ground short circuit on the output; Failed output transistor; Boost settings are too high; Acceleration rate is too fast.</b> Generally caused by a short in the wiring leading to the blade motor; check for damaged conduit and/or wires.
SF	<b>SINGLE-PHASE FAULT: Single-phase input power has been applied to a three-phase drive.</b> Check input power for all three phases.
UF	<b>START FAULT: Start command was present when the drive was powered up.</b> Turn machine off, wait five minutes, and restart. Contact TCT Manufacturing, Inc. if the error reappears.

For all other fault-codes, contact TCT Manufacturing, Inc. for assistance. **NOTE:** It is recommended that you contact TCT Manufacturing, Inc. before attempting to run the machine after any fault-code is shown. Any damage occurring from running the machine after a fault-code was shown on the AC-Tech will not be covered under warranty.

## Troubleshooting

The TCT EZ-Trimmer was designed to give many hours of service, with minimal interruptions in production resulting from mechanical failure, circumstantial conditions, or even operator error. However, problems can develop. This section presents some of the most common situations, and likely solutions, for when a problem does occur.

(NOTE: Solutions are presented in order of frequency—consider each solution in progression, until the problem can be solved.)

SYMPTOM	RESOLUTION(S)
Machine does not power-up.	<ul style="list-style-type: none"> <li>• Input power low or non-existent. Check power input to machine.</li> <li>• Circuit-breaker(s) tripped. Find cause of tripped circuit-breaker, then reactivate it/them.</li> </ul>
Blade motor will not start, or stops during cycle.	<ul style="list-style-type: none"> <li>• Power off. (see ‘Machine does not power-up’)</li> <li>• <b>E-STOP</b> button pushed in. Twist clockwise and pull out.</li> <li>• Lid sensor plunger switch misaligned. Readjust switch (refer to <i>Advanced Maintenance and Calibration</i> → <i>Adjusting and Replacing Plunger Switches</i>, page 13)</li> <li>• Missing a phase. Check that all three phases are live.</li> <li>• Lost power to AC-Tech. Check wiring and input power to unit.</li> <li>• Faulty AC-Tech. Replace defective unit.</li> <li>• Faulty blade motor. Replace motor.</li> </ul>
Machine does not cycle when piece is inserted.	<ul style="list-style-type: none"> <li>• Power off (see ‘Machine does not power up’).</li> <li>• Blade motor not started (see ‘Blade motor will not start, or stops during cycle’).</li> <li>• Angle indicator set incorrectly. Re-check and set indicator (refer to <i>Operation</i>, page 6)</li> <li>• Infeed plunger switch adjusted incorrectly. Readjust switch (refer to <i>Advanced Maintenance and Calibration</i> → <i>Adjusting and Replacing Plunger Switches</i>, page 13)</li> <li>• Faulty infeed plunger switch and/or cable. Replace sensor and/or cable.</li> <li>• 24VDC signal not reaching carriage valve. Check wiring and connections to the valve and inside the electrical panel box.</li> <li>• Faulty valve. Replace defective unit.</li> </ul>
Lid will not fully open or close.	<ul style="list-style-type: none"> <li>• Angle setting too steep. Use angle adjustor to increase angle higher than 65°.</li> <li>• Object in lid movement path. Clear any blockage from around lid.</li> </ul>

Clamp is activated (machine will not allow piece to be inserted).	<ul style="list-style-type: none"> <li>• <b>E-STOP</b> button pushed in. Twist clockwise and pull out.</li> <li>• Lid open. Close lid.</li> <li>• Lid sensor plunger switch misaligned. Readjust switch (refer to <u><i>Advanced Maintenance and Calibration</i></u> → <i>Adjusting and Replacing Plunger Switches</i>, page 13)</li> <li>• Faulty lid plunger switch. Inspect and replace damaged sensor and wiring.</li> <li>• Carriage is down. Check air supply; check proximity sensors.</li> </ul>
Machine never finishes cycling (never returns to top).	<ul style="list-style-type: none"> <li>• Air supply diminished. Check air supply.</li> <li>• Cylinder lower cushion(s) incorrect, not allowing flag to reach lower proximity sensor. Readjust cushions (refer to <u><i>Advanced Maintenance and Calibration</i></u> → <i>Adjusting Cylinder Cushioning</i>, page 12)</li> <li>• Faulty carriage lower proximity sensor and/or cable. Replace sensor and/or cable.</li> </ul>
Carriage “bounces” continuously, never releases piece.	<ul style="list-style-type: none"> <li>• Faulty carriage lower proximity sensor or cable (always on). Check cable—replace sensor or cable.</li> </ul>
Piece is pulled into machine during cycle.	<ul style="list-style-type: none"> <li>• Clamp not firmly clamping piece. Check for debris in cleats; inspect air hoses for splits/damage.</li> <li>• Clamp not activating (see ‘Clamp does not activate’)</li> </ul>
Peak of bevel is off-center.	<ul style="list-style-type: none"> <li>• Blade motor adjustment is off-center. Adjust blade motor (refer to <u><i>Advanced Maintenance and Calibration</i></u> → <i>Centering the Blade Motor</i>, page 10)</li> </ul>
Angle is incorrect.	<ul style="list-style-type: none"> <li>• Angle adjustor set improperly. Set angle adjustor (refer to <u><i>Operation</i></u>, page 6)</li> <li>• Angle indicator calibrated incorrectly. Calibrate indicator (refer to <u><i>Advanced Maintenance and Calibration</i></u> → <i>Calibrating the Angle Indicator</i>, page 11)</li> </ul>
Angle is not consistent.	<ul style="list-style-type: none"> <li>• Sloppiness/wear present in angle adjustor rod or its hardware. Replace rod or tighten hardware.</li> </ul>
Flat surface at peak of cut is too small or too large.	<ul style="list-style-type: none"> <li>• Board is not being firmly inserted into machine. Train on proper operation procedures (refer to <u><i>Operation</i></u>, page 6)</li> <li>• Infeed plunger switch mounting bracket needs shimming/adjustment. Adjust bracket (refer to <u><i>Advanced Maintenance and Calibration</i></u> → <i>Adjusting the Cut Depth</i>, page 14)</li> </ul>

## Warranty

The TCT EZ-Trimmer carries a parts warranty against manufacturer's defects in materials and workmanship for a period of ONE year (365 days) from the date of purchase. During this period, TCT Manufacturing, Inc. will, at its discretion, replace any part that fails prematurely if it can be determined that the failure was not a result of misuse, abuse, neglect, improper care, or natural occurrences. This warranty applies only to parts—labor costs are not covered under these terms. This warranty does not cover parts deemed “high-wear”, including, but not limited to: blades and fuses. For additional details, please contact TCT Manufacturing, Inc.

## INDEX

AC-Tech.....	4, 15
Air Pressure.....	5
Angle-Adjustor .....	6, 9, 10, 11, 18, 19
Angle-Indicator .....	6, 11, 17, 18
Bevel .....	4, 10, 11, 13
Blade Motor .....	5, 6, 7, 9, 10, 17
Blade .....	9, 10, 14
Calibration.....	6, 11, 17, 18, 19
Carriage.....	5, 7, 11, 12, 13, 14, 17, 18
Compressed Air .....	5, 8
Cushions.....	11, 12, 17, 18
Cut-Depth.....	14
Cycle .....	5, 6, 7, 11, 12, 17, 18
Degreaser .....	8
Disconnect.....	5, 6, 7
E-Stop .....	6, 7, 17, 18
Fault-Codes .....	16
Filter .....	8
Flag .....	13
Flat of Cut .....	6, 10, 11, 14, 19
Grease Fittings .....	9
Lubrication.....	9
Manual Cut.....	5, 7, 12
Mouth.....	6, 14
Muffler .....	8
Oil .....	5, 6
Parameter .....	15
Peak.....	6, 10, 14, 18, 19
Plunger Switch .....	13, 14, 16, 18, 19
Proximity Sensor.....	12, 13, 14, 18
Regulator.....	5, 8
Start.....	6, 17
Stop .....	7
Variable-Frequency Drive (VFD).....	4, 15

## Circuit Diagram

