Wood-Mizer®

Automatic Setter

Safety, Operation, Maintenance

BMT300 **rev. C1.01**

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

Form #1033

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SECTION 1 GENERAL INFORMATION AND SAFETY

This symbol calls your attention to instructions concerning your personal safety. Be sure to observe and follow these instructions. This symbol accompanies a signal word. The word **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. **WARNING** suggests a potentially hazardous situation which, if not avoided, could result in death or serious injury. **CAUTION** refers to potentially hazardous situations which, if not avoided, may result in minor or moderate injury to persons or equipment. Read all safety instructions before operating this equipment and observe all safety warnings!

Warning stripes are placed on areas where a single decal would be insufficient. To avoid serious injury, keep out of the path of any equipment marked with warning stripes.

Read and observe all safety instructions before operating this equipment! Also read any additional manufacturer's manuals and observe any applicable safety instructions including dangers, warnings, and cautions.

Always be sure that all safety decals are clean and readable. Replace all damaged safety decals to prevent personal injury or damage to the equipment. Contact your local distributor, or call your Customer Service Representative to order more decals.

Always properly dispose of all by-products, including debris, coolant and oil.

Safety instructions are listed in this section by the following operations:

- Electrical Safety
- Blade Handling
- Machine Operation

1.1 Electrical Safety

DANGER! Make sure all electrical installation, service and/or maintenance work is performed by a qualified electrician and is in accordance with applicable electrical codes.

DANGER! HAZARDOUS VOLTAGE can cause shock, burns, or death. SHUT OFF & LOCK OUT POWER before performing service in any area of this machine. DO NOT

restore power until all access panels are replaced and secured.

WARNING! Always turn off and disconnect power at control console AND at main supply circuit breaker before performing any service to the machine.

1.2 Blade Handling

WARNING! Always wear gloves and eye protection when handling bandsaw blades. Keep all persons away from area when coiling or carrying a blade.

1.3 Machine Operation

DANGER! Make sure all guards and covers are in place and secured before operating the toothsetter. Failure to do so may result in serious injury.

DANGER! Keep all persons away from moving parts when operating this machine. Failure to do so will result in serious injury.

DANGER! Always keep hands away from moving bandsaw blade. Failure to do so will result in serious injury.

WARNING! Always wear eye protection when operating this machine. Failure to do so may result in serious injury.

WARNING! Secure all loose clothing and jewelry before operating this machine. Failure to do so may result in serious injury or death.

1.4 Noise Level

See Table 1-1. The level of noise generated by the BMT300 Toothsetter is given in the table below[1].

	Max. Noise Level
BMT300	74.8 dB (A)

TABLE 1-1

1.5 Motor Specifications

See Table 1-2. The motor specifications are listed below.

Type	Manufacturer	Model	Power	Other Data
Electric Motor	Klauber	K01134J800	0.04 kW	65 r.p.m.

TABLE 1-2

1.6 Technical Data

See Table 1-3. See the table below for technical data on the BMT300 Toothsetter.

Maximum Blade Width	76 mm
Feed Rate	24 teeth / min
Cam Motor Power	0.04 kW
Total Power	0.25kW
Weight	83 kg

TABLE 1-3

1. The measured values refer to emission levels, not necessarily to noise levels in the workplace. Although there is a relation between emission levels and exposure levels, it is not possible to determine with certainty if preventives are needed or are not needed. The factors affecting a current level of noise exposure during work are inter alia room characteristics and characteristics of other noise sources, e.g. number of machines and machining operations nearby. Also, the permissible exposure level value may vary depending on country. This information enables the machine's user to better identify hazards and a risk.

See the table below for air supply specifications:

Air Supply	Pressure
BMT300	Min. 4 bar

TABLE 1-4

1.7 Setter Components

The BMT 300 toothsetter is designed to work with the Wood-Mizer blades only (types of the blades are shown in Table 1-5 on page 10).

See Figure 1-1. The major component and dimensions of the Automatic Setter are listed below.

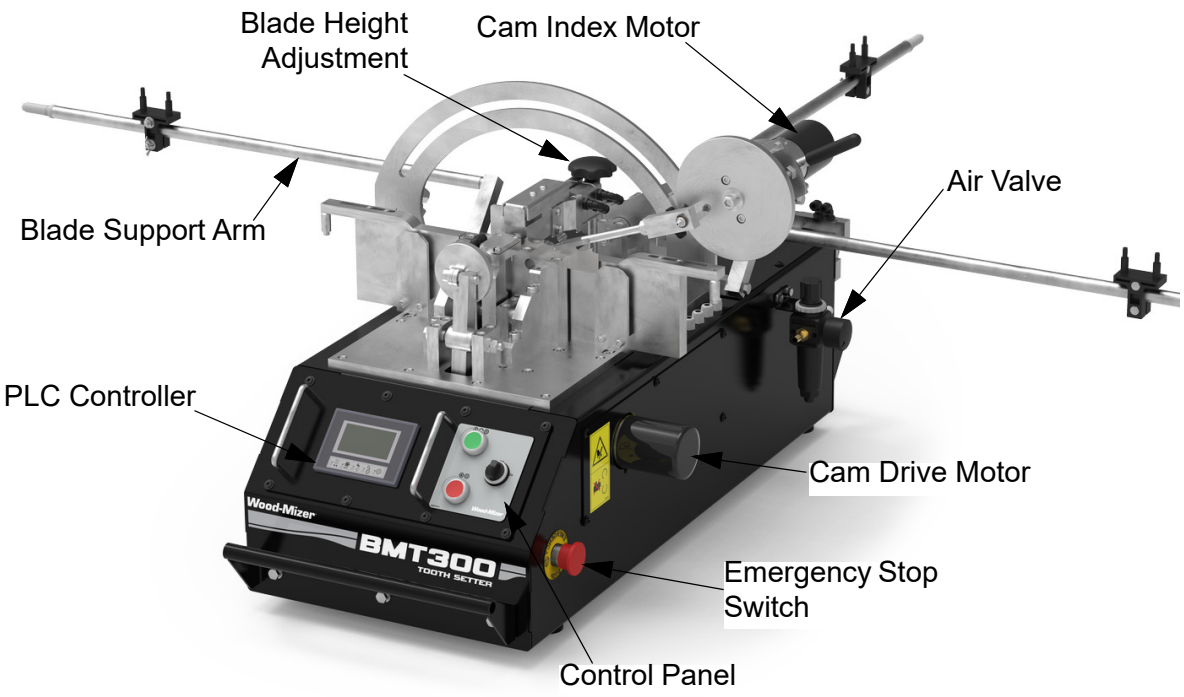

FIG. 1-1

1.8 Control Panel Components

See Figure 1-2. The control panel component locations and their functions are listed below.

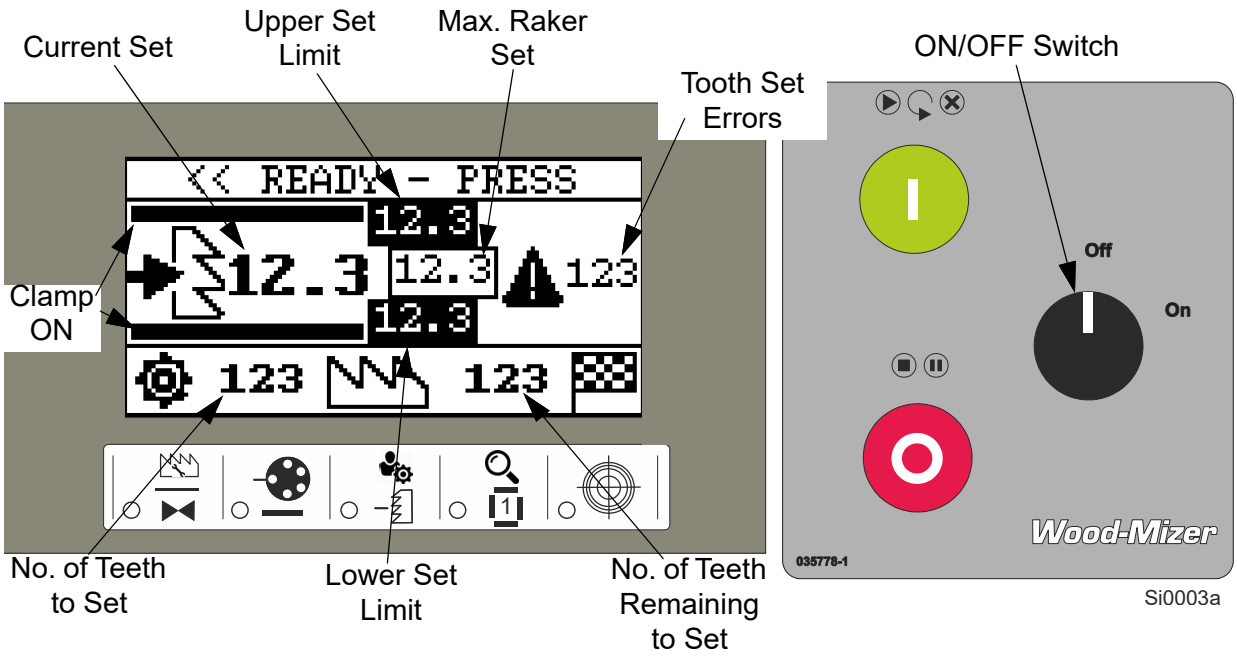

FIG. 1-2

On/Off Switch - turn the switch to the ON position to turn on electrical power to the machine.

Start/Resume/Clear - press to start or resume setting cycle; button also used to clear an error.

Stop/Pause - press to stop or pause machine.

Clamp - **press once** to close or open the blade clamp. **Press and hold** to enter *Blade Settings* mode. *See Section 1.10 Blade Settings*.

Manual Index - **press once** to move the blade to the next tooth. **Press and hold** to enter *Start Up* modes. *See Section 1.9 Start Up Modes*.

Manual Bend - **press once** to bend the blade teeth manually regardless of set; the tooth set is not checked. **Press and hold** to enter *System Parameters* mode. *See Section 1.11 System Parameters*.

Single Cycle - **press once** to set the blade using the single cycle mode. The indexer pawl moves the blade. The blade is clamped and the tooth set is checked. The setter sets the tooth if necessary. **Press and hold** to enter *Diagnostic&Setup* Mode. *See Section 1.12 Diagnostic & Setup*.

Calibration - used during calibration of the blade clamp. *See Section 3.1 Setter Calibration*.

1.9 Start Up Modes

Press and hold  button to get to the menu selection mode. Press the UP or DOWN button to choose the MODE option. Press  button to exit the settings.

The following options are available in the MODE menu:

Set Single Clamp - The setter clamps and checks the blade tooth. The tooth is set if necessary. The blade is unclamped, and moved to the next tooth. The setter skips the pattern recognition while using the Set Single Clamp mode. The final tooth correction follows, i.e. if the toot is unbend not enough - setter bend it, if the tooth is bended too much - setter unbend it.

Set Double Clamp - Just like using the Set Single Clamp mode, but the blade is clamped once more after releasing and checked for the tooth set. The pattern recognition is turned off. The Set Double Clamp mode is more accurate but more time-consuming.

Pattern Single Clamp - The mode similar with the Set Single Clamp mode, but the setter checks the teeth pattern. See System Parameters, for how to set the maximum number of pattern errors (only 1 in most cases). When the number of possible errors is exceeded, the setter stops the setting process and the "Error --- Blade Set Pattern" message appears.

Pattern Double Clamp - Using the Pattern Double Clamp mode, the setter works like using the Pattern Single Clamp mode, but the blade is released and clamped again to check the tooth set. The Pattern Double Clamp mode takes more time to set the whole blade but it is more accurate.

Inspection - After the Inspection mode has been selected, the setter checks the tooth set only. The process is stopped when the number of pattern errors has been exceeded.

NOTE: The Pattern Single Clamp and Pattern Double Clamp modes can be used only when the tooth setter has been set to push every tooth of the blade.

1.10 Blade Settings

Press and hold  button on the control panel to enter the BLADE SETTINGS mode. Use the arrows if necessary. Press  button to exit the settings.

The following options are available in the BLADE SETTINGS menu:

Teeth to set - The number of teeth to be set. Use the UP and/or DOWN arrows to enter the number of teeth to be set (you can also use the touch panel to enter this value). See **Table 1-1** below. **NOTE:** Enter the number of teeth divided by three if the setter pushes every third tooth of the blade.

Upper Set Limit - The desired tolerance for the upper set. When entered the "Upper Set Limit " appears. Use the UP and/or DOWN arrows to set the limit value (you can also use the touch panel to enter this value). The upper set limit is the upper limit of the tolerance for the blade tooth set. If the tooth set exceeds the upper limit, the setter adds the tooth to the group of teeth with the incorrect set. The setter stops and error message appears when the number of set errors is exceeded.

Lower Set Limit - The desired tolerance for the lower set. When entered the "Lower Set Limit #" appears. Use the UP and/or DOWN arrows to set the limit value (you can also use the touch panel to enter this value). The lower set limit is the lower limit of the tolerance for the blade tooth set. If the tooth set is below the limit, the setter adds the tooth to the group of teeth with the incorrect set. The setter stops and error message appears when the number of set errors is exceeded.

Maximum Raker Set - The desired tolerance for raker set teeth. When entered the "Max. Raker Set #" appears. Enter the desired tolerance for rakers. Use the lowest possible tolerance that still allows the setter to efficiently operate. If the raker set exceeds the provided limit, the tooth set error appears.

See Table 1-5. Recommended blade settings are shown below.

Blade Type [1]	Blade Thickness	Number of teeth (standard blades) [2]	Lower Set Limit (Value Entered)	Upper Set Limit (Value Entered)	Raker Set (Value Entered)
175 158 10 S	.035"	180	0.017" (17.0)	0.019" (19.0)	0.009" (9.0)
274 158 10 S	.042"	180	0.020" (20.0)	0.022" (22.0)	0.009" (9.0)
274 158 9 S	.042"	180	0.019" (19.0)	0.021" (21.0)	0.009" (9.0)
275 158 9 S	.042"	180	0.020" (20.0)	0.022" (22.0)	0.009" (9.0)
375 158 10 S	.045"	180	0.024" (24.0)	0.026" (26.0)	0.009" (9.0)
375 158 9 S	.045"	180	0.020" (20.0)	0.022" (22.0)	0.009" (9.0)
376 158 13 S	.045"	180	0.024" (24.0)	0.026" (26.0)	0.009" (9.0)
376 158 10 S	.045"	180	0.024" (24.0)	0.026" (26.0)	0.009" (9.0)
376 158 9 S	.045"	180	0.020" (20.0)	0.022" (22.0)	0.009" (9.0)
475 158 9 S	.055"	180	0.024" (24.0)	0.026" (26.0)	0.009" (9.0)
475 158 10 S	.055"	180	0.027" (27.0)	0.029" (29.0)	0.009" (9.0)
476 158 10 S	.055"	180	0.027" (27.0)	0.029" (29.0)	0.009" (9.0)
476 158 13 S	.055"	180	0.027" (27.0)	0.029" (29.0)	0.009" (9.0)
656 158 12 S	.038"	240	0.018" (18.0)	0.020" (20.0)	0.009" (9.0)

TABLE 1-5

[1] Only standard blade types are shown.
[2] Increase the number of teeth to be set by 1 or 2 to make sure all the teeth have been checked and set.

1.11 System Parameters

Press and hold  button on the control panel to enter the SYSTEMS PARAMETERS menu. Press  button to exit the settings.

When selected, the following parameters can be set:

Teeth Set Errors[1] **-** press UP and DOWN buttons to adjust the maximum number of teeth that can be set incorrectly in the setting process (you can also use the touch panel to enter this value). When the number of errors is exceeded the setting process will be stopped. The "Error -- Bld !! Tooth Set #" message appears. The # mark is the current tooth set. **NOTE:** To decrease set, bend the tooth back with the slot in the correction tool provided. Press the green  button to cancel the error. Push button to allow the setter to set the tooth again.

Pattern Errors - press UP and DOWN buttons to adjust the maximum number of the pattern errors. The setter is stopped and *PATTERN ERRORS* message is displayed when this value has been exceeded. The number of the pattern errors is automatically increased by 1.

Units Imperial/MM - Use the UP and DOWN arrows to switch the units of measure to Imperial or Metric. **NOTE:** Always turn the setter off after changing the units of measure. Turn the setter on to use new units of measure. The units of measure currently used is highlighted.

Language- this option allows to choose one of five languages by pressing the button under the language requested. The language currently used is highlighted.

1. Number of the straightening teeth cylinder cycles. It allows to limit too many cylinders hits (it is used when the teeth is broken, damaged or it is hard to set it.)

1.12 Diagnostic & Setup

To enter the DIAGNOSTIC/SETUP menu, press and hold  button on the control panel. Use the LEFT and RIGHT arrows to switch options.

The following options are available in the DIAGNOSTIC/SETUP menu:

Indexer Right Prox - indicates the right indexer proximity sensor status: ON or OFF.

Indexer Left Prox - indicates the left indexer proximity sensor status.

Indexer Home - indicates the indexer cam proximity sensor status.

Cam Home - indicates the drive cam proximity sensor status.

Indexer - allows to activate the indexer manually.

Cam - allows to activate the cam manually.

Clamp - allows to activate the clamp manually.

Bend Back - allows to bend back the tooth manually.

Cycles Counter - indicates the total number of cycles processed.

Analog Input - RAW Analog sensor value.

Press  button to exit the settings.

1.13 Power Supply Specification

The power supply must meet the specifications given below.

Voltage	Fuse [A]	Suggested Wire Size
230 VAC	2 A	1.5 mm at least

TABLE 1-6

SECTION 2 OPERATION

2.1 Machine Setup

1. Install the blade to the setter. Rest the blade on the inside of the two blade guides and in between both blade clamps. Center the blade on the setter stand. Position the three adjustable blade guide supports so they lightly touch the inside of the blade. The adjustable guides should lightly support the blade and keep it from wobbling.

2. Use the blade height knob to adjust the blade height so the bottom of the gullet is aligned with the top of the blade clamps.

   See Figure 2-1.

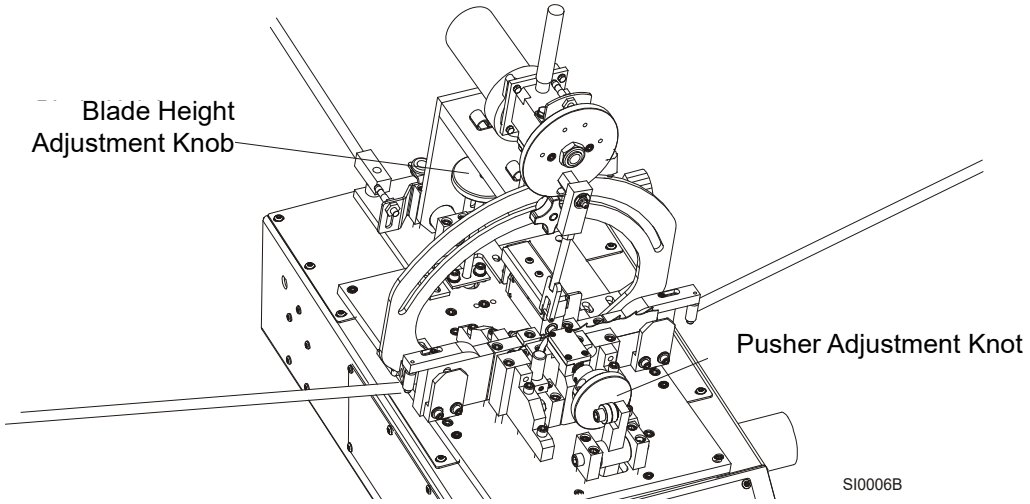

FIG. 2-1

3. Adjust the pusher pin. To adjust, manually rotate the pusher adjustment knob. Turn the pusher adjustment knob clockwise to increase the pusher pin force, turn the knob counterclockwise to decrease the force. Make sure the tooth is not being bent too much. Read the display to check the tooth set while adjusting.

   IMPORTANT! Avoid pinching fingers or hand when turning the cam.

   DANGER! Keep all persons away from moving parts when operating this machine. Failure to do so will result in serious injury.

4. Adjust the index ramp. The push pawl should push one tooth at a time. To adjust, loosen the blade ramp set screw. Slide the blade ramp as necessary and retighten the set screw.

   The pawls should contact the point of the tooth where the face and gullet meet. Manually rotate the index cam until the pawl is against the tooth radius. Loosen the index pawl adjustment nut to position the pawl as necessary. Retighten the nut when adjustment is complete.

2.2 3" Blade Support Setup (Option)

See Figure 2-2.

1. Position the optional blade supports on proper sides of the toothsetter. Using the connectors (1), connect the right and left blade supports with the toothsetter arms.
2. Position the blade support kits so that the blade is not too loose and moves freely during the setting operation.
3. Install the bushings (2) on the guide assembly (3) - see Detail B in the figure below. Adjust the height of the third blade support (5) and rest the toothsetter arm (4) on this support.
4. The blade supports should be adjusted vertically so that the bottom of the blade is at the same height along entire length of the blade.

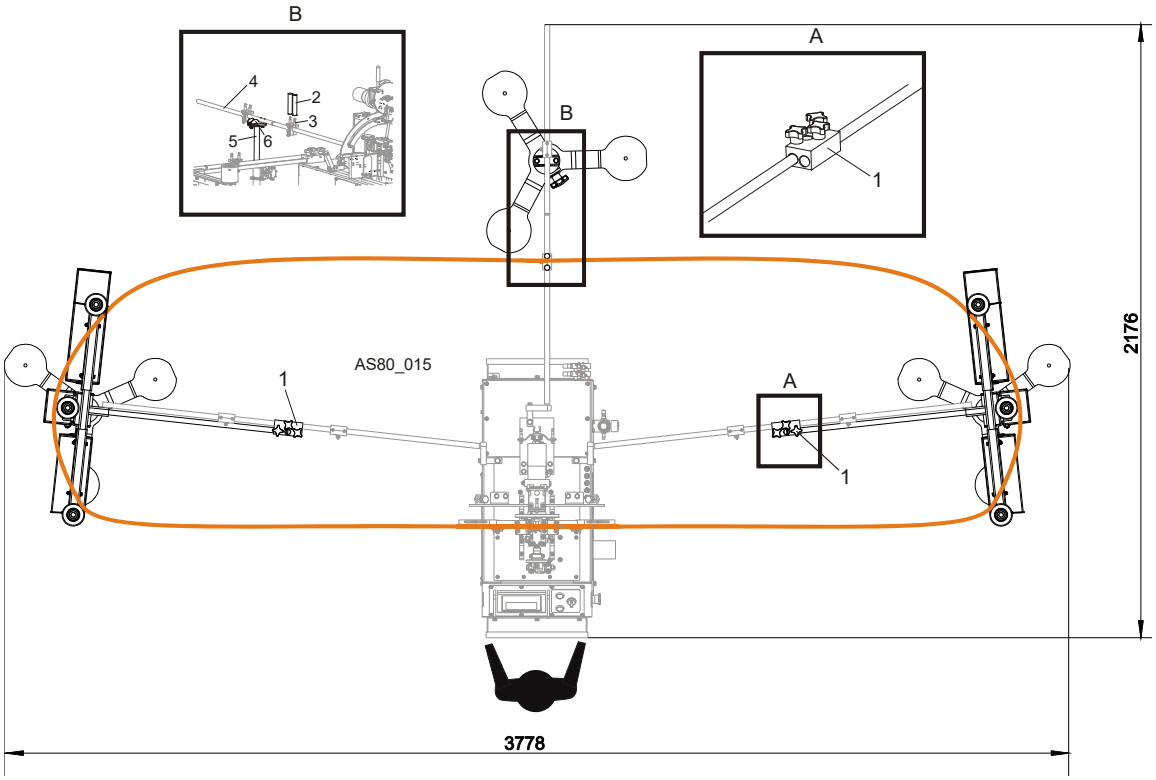

FIG. 2-2

2.3 Preliminary Setup

1. Clean the machine as needed with a solution of 1 part liquid Dawn detergent to 9 parts water. Use an air hose to blow any dust or debris from the blade clamp and up/down components.

   

   WARNING! Never use WD-40 or any other non-specified lubricant to clean the machine.

   Keep liquid away from the sensor assembly.

2. Make sure the voltage selector plate is set properly before turning on electrical power to the setter.

3. Plug the power cord in the socket at the rear of the setter.

4. Locate the air assembly at the rear right side of the setter. Connect the incoming air supply line to the fitting. Make sure the air gauge indicates 60 P.S.I. Adjust the pressure if needed. To adjust the pressure, lift the black cap located behind the air gauge. Turn the cap clockwise to increase pressure, turn the cap counterclockwise to decrease pressure. Push the cap down to secure when adjustment is complete.

See Figure 2-1.

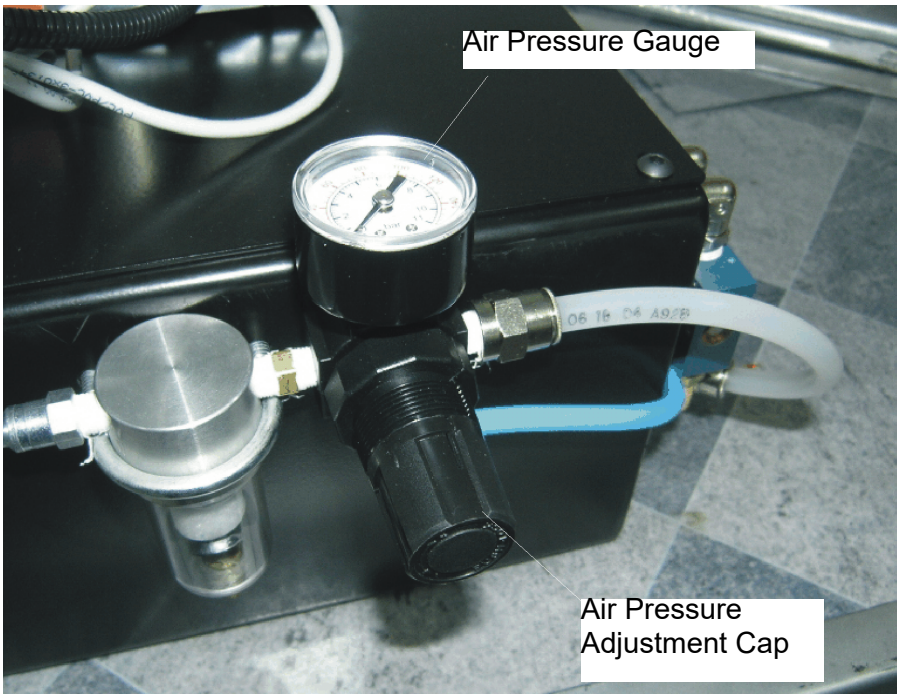

FIG. 2-1

5. Turn the ON/OFF switch to the ON position.

6. Calibrate the setter if necessary. *See Section 3.1 Setter Calibration*.

7. Make all the adjustments necessary to start the setting operation. *See Sections 1.6 through 1.8.*

2.4 Machine Operation

1. Clean the blade and deburr before putting in the toothsetter. Otherwise, sap buildup on the blade or tooth will give false set readings. Metal burrs created by sharpening will also cause false readings.

2. Mount the blade in the toothsetter. Place blade between the clamping plates and on the three guide assemblies. Use the weld as a reference point for starting.

   See Figure 2-2. Position the tooth in front of the sensor pin so its edge is approximately .0625" (1.6mm) away from the edge of the pusher pin.

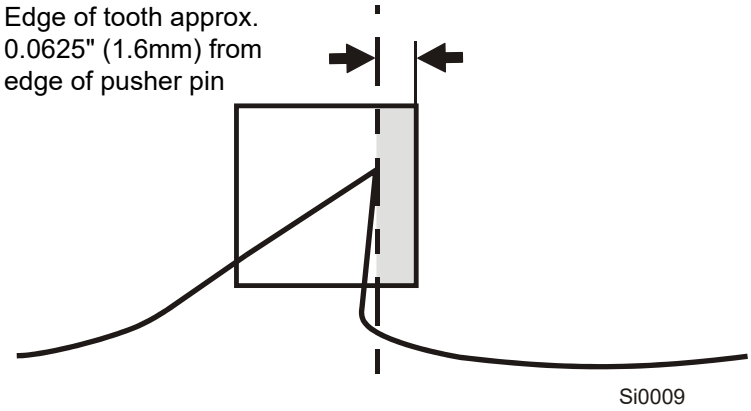

FIG. 2-2

3. Turn the ON/OFF switch to the ON position.

4. Now all of the adjustments have been made. Push START to begin the setting operation. All values will remain as set.

5. Toothsetter works automatically.

   To adjust the pusher adjustment knobs, push the  button. Tooth bend value will appear on the display. This value should be between upper and lower set limit. If, it will be smaller, turn the pusher adjustment knob to adjust as small value as possible. Next, press  button and observe display readings. Increase tooth tilt by adjusting the knob.

   If the unbended tooth value is between upper and lower set limit, push the START button. Tooth will be setting automatically.

(Repeated bending of the same tooth can occur. During the setting operation, tooth bend value should be corrected by using the pusher adjustment knob.)

6. The machine will automatically stop after the setting operation has been completed.

7. Remove the blade and invert it.

8. Swing the index motor assembly to the other side. Repeat the setting operation.

SECTION 3 MAINTENANCE

3.1 Setter Calibration

To calibrate:

1. Clean each clamp block with air. If oily, wipe dry with a clean rag.

   WARNING! Never spray a liquid on or near the sensor assembly.

2. Inspect the blocks for chips and/or other damage. Replace if necessary.

3. Place the calibration plate into the clamp assembly. Position the calibration plate so the top of the plate is slightly above the top of the sensor pin.

   DANGER! Always keep hands away from moving clamp. Failure to do so will result in serious injury.

4. Press button on the control panel to clamp the calibrate plate.

5. Press button to calibrate the setter.

   NOTE: If the "Error -- CAL Clamp Zero CAL Block" message appears, you need to adjust the sensor first. *See Section 4.1 Sensor Adjustment*, for the adjustment procedure.

6. Hold the calibrate plate with the tips of your fingers. Press button to unclamp the calibration plate. Remove the calibration plate.

3.2 Miscellaneous

1. Check the chain every 40 hours of operation. Lubricate if needed.

2. Check chain tension periodically. Adjust the chain tension if necessary.

3. Grease the threads on the up/down height adjustment rods with a heavy axle grease every 40 hours of operation.

SECTION 4 ALIGNMENT

Check and align the setter each time the linear sensor is replaced.

4.1 Sensor Adjustment

1. Turn the ON/OFF switch to the ON position.

2. Check the air pressure. Make sure the air pressure gauge indicates 60 P.S.I. Adjust the pressure if necessary.

3. Place the calibration plate in the setter clamp assembly. (Use the appropriate calibration plate as thick as the blade you want to set.) Keep the upper edge of the plate and the sensor pin level. Press  button.

   DANGER! Always keep hands away from moving clamp. Failure to do so will result in serious injury.

4. Press and hold  button. Push the RIGHT arrow until you see the CALIBRATION screen.

See Figure 4-1. The sensor is adjusted properly if the white square come up with the white cross.

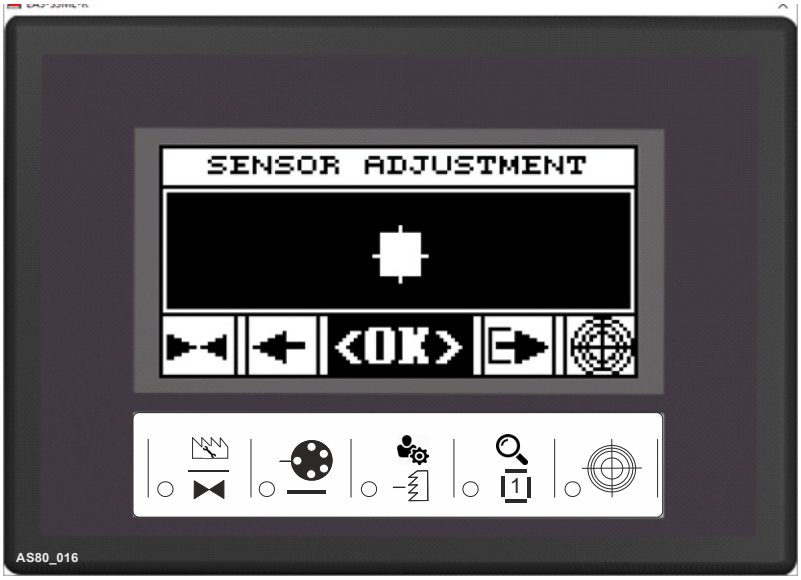

FIG. 4-1

NOTE: If the white square is on the left or right side of the white cross, the sensor needs adjustment.

5. Remove the two screws securing the sensor guard and remove the sensor guard.

See Figure 4-2.

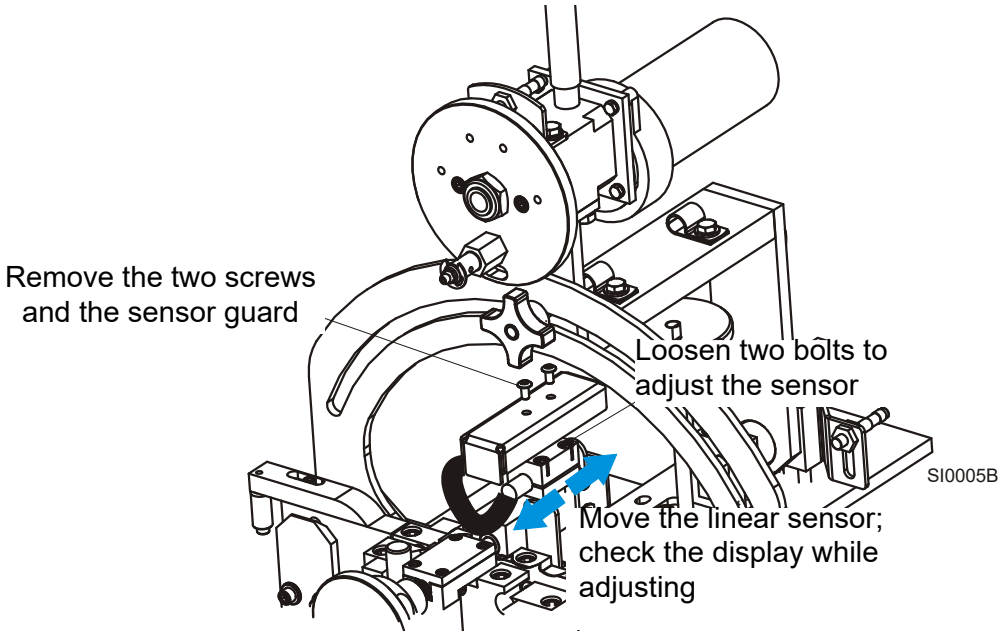

FIG. 4-2

6. Loosen the two bolts securing the linear sensor. Move the linear sensor back or forth until the white square come up with the white cross.

7. Tighten the mounting screws to secure the linear sensor when adjustment is complete.

8. Press  button.

SECTION 5 TROUBLESHOOTING

5.1 Error Messages

See Table 5-1. The possible error messages and their causes are listed below:

MESSAGE	CAUSE	SOLUTION
ERROR-A/D CONVERTER OR SENSOR FAILURE	Power supply failure. A/D module has broken. Linear sensor is out of range.	Check connecting cable. Check the A/D module connections. Replace if necessary. Adjust the linear sensor. *See Section 4.1*
INDEXER ERROR-HOME SENSOR	Circuit breaker failure. Proximity sensor is not adjusted. Index motor is not plugged.	Check the 3 Amp circuit breaker located at rear of the setter. Turn on the circuit breaker or replace if necessary. Adjust the proximity sensor. Plug the indexer motor.
INDEXER ERROR-ARM NOT FULLY SEATED	Indexer is not seated properly. (Proximity sensor light is off).	Adjust the indexer assembly. Check if the proximity sensor light is on.
CAM ERROR-HOME SENSOR	Circuit breaker failure. Cam proximity sensor not adjusted Cam motor is unplugged.	Check the 3 Amp circuit breaker located at rear of the setter. Reset the circuit breaker or replace if necessary. Adjust cam proximity sensor. Check if the proximity sensor light is on. Plug the cam motor.
CALIBRATION ERROR-CLAMP ZERO CAL BLOCK	While calibrating: metal pattern block is not clamped.	Clamp the metal pattern block to adjust the sensor pin.
CALIBRATION ERROR-SENSOR OUT OF RANGE	Linear sensor is out of range.	Adjust the linear sensor. *See Section 4.1*
ERROR-SENSOR RETURN ZERO	Sensor pin is stuck.	Inspect the sensor pin. Clean the sensor if necessary.
ERROR-BLADE TOOTH SET	Tooth set is incorrect.	Adjust the pusher. Inspect the blade.
ERROR-BLADE SET PATTERN	Tooth set pattern is not correct.	Inspect the blade teeth. Correct the teeth pattern.
LOWER SET LIMIT >= UPPER SET LIMIT	Lower tooth set limit is above the upper limit.	Increase the upper tooth set limit. OR decrease the lower tooth set limit.
RAKER LIMIT >= LOWER SET LIMIT	Raker limit is above the lower limit.	Increase the lower tooth set limit. OR decrease the raker tooth set limit.

TABLE 5-1

RUN-TERM-STOP	Program is stopped or not available	Remove back cover of the setter. Switch the PLC controller to the STOP position, next to the RUN position and after that to the TERM position. The two upper green lights located on the right side of the setter should be on.

TABLE 5-1

See Figure 5-1. Functions of PLC Controller lights.

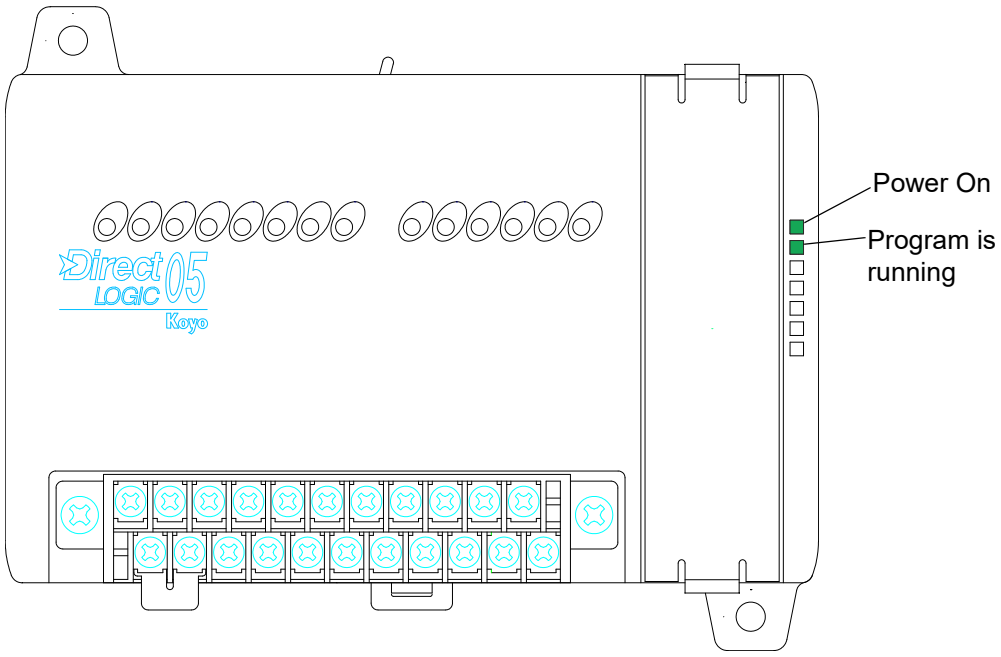

FIG. 5-1

To reset PLC controller to factory settings, turn off the setter. Press and hold ■ ⏸ button and turn on the setter.

See Figure 5-2. Reset screen.

FIG. 5-2

EC declaration of conformity

according to EC Machinery Directive 2006/42/EC, Annex II, 1.A

Manufacturer,

Wood-Mizer Industries sp. z o.o.
Nagórna 114, 62-600 Koło; Poland
Tel. +48 63 26 26 000

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Following machine in our delivered version complies with the appropriate essential safety and health requirements of the EC Machinery Directive 2006/42/EC based on its design and type, as brought into circulation by us. In case of alteration of the machine, not agreed by us, this declaration is no longer valid.

We, the undersigned herewith declare, that:

Designation of the machine:	**Automatic Setter**
TYPE:	BMT300
Serial Number:	……
Is in conformity with the following EC directives:	EC Machinery Directive 2006/42/EC EC Electromagnetic Compatibility Directive 2014/30/WE
And is in conformity with the following Harmonized Standards:	PN-EN ISO 12100:2012 PN-EN ISO 14118:2018-05 PN-EN 60204-1:2018-12 PN-EN ISO 13849-1:2016-02 PN-EN ISO 14120:2016-03
Responsible for Technical Documentation:	Piotr Adamiec / Engineering Manager Wood-Mizer Industries Sp. z o.o. 62-600 Koło, Nagórna 114, Poland Tel. +48 63 26 26 000
Place/Date/Authorized Signature:	Koło, 05.11.2012 
Title :	Engineering Manager