

# **OPERATORS MANUAL FOR AGL6450**



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**Preface**

Your Advanced Greig Laminators, Inc. (AGL) laminator is a finely engineered and designed piece of equipment.

Standard equipment includes a 1/2 HP DC drive (variable and reversible), air operated brake and clutch, plus an air-operated laminating section with easily adjustable spacer system for controlled laminating nip opening.

The nip rolls are the heart and soul of the laminator. To insure a quality end product, the rolls are rigid enough to carry their weight, plus the working pressures against them without deflecting. The covering is ground straight and concentric to the bearing journals to insure a constant uniform opening at the laminating nip between the top and bottom roll. The power transmission from the drive motor to the bottom laminating roll and the release liner windup clutch is with chain. The laminating nip section is protected with an electric photo-cell and safety cable system.

The AGL design has a rigidly constructed steel frame. All parts are machined to prints, ensuring complete interchangeability of all parts, manufactured or purchased. Adjustable air pressure to the laminating nip section and brake and clutch tension is supplied via your regulated plant air supply

## Selecting Area

Select an area that has a smooth, level surface for the laminator to set on, this will allow for easier maneuverability of the machine if it requires moving later on. The area should be large enough to allow an operator ample room to properly handle your largest product on the infeed and outfeed sides of the laminator. The sides of the laminator should also be easily accessible in case service or maintenance is required. AGL approximates this area should be about 7-8 feet in front and back of the machine and 3-4 feet on either end. This is only a suggestion, your plant and the products to be laminated will be the determining factor.

## Uncrating

Your new laminator may come in a full crate. The crate is designed to be usable for future shipping if required, so careful disassembly of the crate is important if the crate is to be reused. The crate is held together by screws (phillips head) a power screwdriver with a phillips bit is recommended but not required for uncrating. First, remove the top of the crate, keep the screws for future use on the crate. Next, remove the front of the crate (it is recommended that two people disassemble the crate, so one person can hold the panels while the other removes the screws). Move around the crate and remove the remaining panels. Remove the bolts holding the laminator down to the skid. A fork truck can now lift the laminator off the skid (it is possible to get the laminator out of the crate after removing only the top and front and the hold down bolts). With the laminator on the fork truck, thread the adjusting bolts into the lower cross bar, make sure that the bolt heads are about ½" above the caster. Lower the machine down onto the casters. With 3-4 people to guide the machine, roll the machine into the final position.



### CAUTION

*The laminator is a large heavy piece of equipment. Do not attempt to move the machine with one person. Injury is possible as well as permanent damage to the laminator. The laminator should only be rolled on a relatively smooth and level surface. Tipping or forcing the machine over large bumps can destroy the alignment of the rolls, idlers, and unwind/windup shafts. This alignment is required for proper lamination. Advanced Grieg Laminators, Inc.'s warranty does not cover malfunction of the machine due to improper handling of the machine during installation.*

Turn the leveling bolts down until they touch the floor. Remove the shrink wrap, bands, and protective coverings from the rolls.



### CAUTION

*Do Not use a knife or other sharp object to remove the shrink wrap from the laminator and the protective coverings from the rolls. This can cause irreparable damage to the laminator enclosures and rolls.*

## Leveling

The laminator has been trammed and burned in at the factory, but to insure the alignment of the machine it must be leveled in its final position. To level the machine, set a level on the upper front unwind/windup shaft. Turn the front leveling bolts until the bubble shows that the shaft is level. Repeat this procedure on the upper rear unwind/windup shaft. Next place the level across the upper unwind/windup shafts (front to rear) and adjust the leveling bolts to achieve a level reading. Repeat this procedure on the other end of the machine. Be sure to check the left to right level as it may have shifted when leveling from front to back. Repeat the previous procedures until you have a level reading at all four places. Tighten the jam nuts on the leveling bolts up tight against the lower cross bar to lock the bolts in place.



### CAUTION

*Do Not lift the casters more than ½" off the floor. This will cause the machine to be unstable.*

### Electrical Connection

Refer to the **Electrical Requirements** under Specifications for the proper requirements for your laminator. All connections to components and terminal blocks should be checked for tightness before initial startup. This will help avoid and electrical problems caused by connections that may have loosened due to vibration during shipping. A readily accessible disconnect device shall be incorporated into the fixed wiring circuit. The switch on the laminator is not considered a disconnect device. Consult a qualified, licensed electrician to ensure that the power supply for the machine is properly installed in your facility. Qualified personnel can remove the RH enclosure cover to allow access to the terminal strip and grounding lug. Advanced Grieg Laminators, Inc. will not be responsible for damage caused by incorrect electrical installation.

### Pneumatic Connection

Refer to the Pneumatic Requirements under Specifications for the proper requirements for your laminator. The air supply should be clean, dry, and regulated. Failure to properly clean and dry the air supplied to the laminator will cause damage to the cylinders, brakes, and clutches. The laminator is supplied with a 1/4npt port for your final connection.



### **CAUTION**

***The air supply to the laminator must be clean and dry. Particles and moisture can damage the cylinders, brakes and clutches.***

### Recycling Packaging

If your machine came in a fully enclosed crate, the crate can be stored flat for future use or dismantled and the wood can be recycled. The screws can be kept for future use of the crates or stored for some other use. The shrink wrap is not recyclable and should be thrown away. The foam protective coverings over the rolls can be recycled to be used for other shipping purposes.

### Machine Dimensions

Width: 89"  
Height: 58"  
Depth: 57"  
Weight: 3000 lbs.

### Electrical Requirements

220/230 VAC single phase, 50/60 Hz, 60 Amp service.

### Pneumatic Requirements

Approximately 2-3 cfm at 90 psi line pressure supplied via your cleaned/dried/regulated plant air.

### Material Capacity

Upper Front Station:	10" Diameter x 56 long x 3" Diameter core. (Thermal) 10" Diameter x 63 long x 3" Diameter core. (Pressure Sensitive)
Lower Front Station:	10" Diameter x 56 long x 3" Diameter core. (Thermal) 10" Diameter x 63 long x 3" Diameter core. (Pressure Sensitive)
Upper Rear Station:	10" Diameter x 56 long x 3" Diameter core. (Thermal) 10" Diameter x 63 long x 3" Diameter core. (Pressure Sensitive)
Lower Rear Station:	10" Diameter x 56 long x 3" Diameter core. (Thermal) 10" Diameter x 63 long x 3" Diameter core. (Pressure Sensitive)
Middle Front Station:	8" Diameter x 56 long x 3" Diameter core. (Thermal) 8" Diameter x 63 long x 3" Diameter core. (Pressure Sensitive)
Middle Rear Station:	6" Diameter x 63 long x 3" Diameter core (Pressure Sensitive)

## IMPORTANT READ THIS SECTION BEFORE OPERATING YOUR LAMINATOR

### General Machine Safety

The following messages are written here for your safety, all operators and others around the laminator should read, understand and follow these messages.

1. Read and understand all the safety instructions.
2. Keep this manual in a place where it can be easily referenced by all operators.
3. **All connections to components and terminal blocks should be checked for tightness before initial startup. This will help avoid and electrical problems caused by connections that may have loosened due to vibration during shipping.**
4. Use only the recommended power source to run the laminator. Consult a qualified and licensed electrician if you are unsure of the power supply and the safety features of the supply.
5. If power supply cord is run across the floor, provide adequate protection to the cord to avoid damage from foot traffic, dropped items or rolling items.
6. Do not attempt to service the laminator without qualified personnel available. Damage to the machine or injury to you could be caused by moving parts or high voltage.
7. Do not operate the laminator with out all guards in place. If a guard is damaged or not working properly, replace or repair before returning the machine to operation. If the machine is run without all guards in place the safety obligation of the manufacturer is null and void.
8. Do not insert fingers, hands, or items into openings in the sideframes. Items may become entangled in moving parts or in contact with high voltage.
9. Disconnect or lockout power from machine when any service is required and when cleaning the nip rolls.
10. Disconnect or lockout power from the machine and refer to service personnel if the performance of the machine changes indicating a problem or if machine does not operate normally to correct operational procedures.

### Operator Safety

Your laminator is designed to protect the operator from injury when used properly. Do not operate the machine without all guards and protection devices in place, serious injury could occur.



### WARNING

***The nip section can pull you into laminator! Do not place fingers into the nip section when the rolls are rotating. It is recommended that operators tie long hair back and not wear neckties, loose clothing and jewelry since they can be caught in the nip section and pull the operator into the machine. Proper equipment such as gloves should be used if the material being laminated requires it. The nip rolls will lower if there is a loss of air pressure.***

The nip section is protected by a photoelectric eye that shoots a light beam across the machine in front of the nip rolls. When the machine is in continuous run mode, the rolls will stop when the beam is broken by an item too close to the nip section. However, if the machine is in jog mode, an alarm will sound warning the operator that he/she is very close to the nip section, but the rolls will not stop rotating. The jog mode is useful for starting prints into the laminator and smoothing the print corners out as they enter the nip section, but this mode should be used as sparingly as possible since it puts the operator at a greater risk than the run mode.



### CAUTION

***When the machine is in jog mode, an alarm will sound to warn the operator but the rolls will not stop rotating when the light beam is broken. Use this mode sparingly and with respect.***

There are E-stop switches on all four corners of the machine, as well as an E-stop cable in front and back. The machine will stop and the nip section will open if any of these switches are tripped. Striking the red mushroom heads on the switches with your palm can activate the four switches. The cables can be tripped by using your foot and pressing on the cable. The machine must be reset after an E-stop condition has occurred. Refer to the **Operation** section for further details.

## General

1. Power: A red and yellow power switch switches the main power on and off. The switch is labeled clearly so the operator can tell if the power is on or off.
2. Reset: A reset button is used to start the machine initially and restart the machine after an E-stop condition has occurred. After the power is turned on, the reset button is held for 15 seconds to allow the machines electrical controls to reset to initial settings.
3. Speed: A controller with feedback is used to control the speed that the laminator will run product through. Your laminator has the electrical and mechanical capability to run up to 20 feet per minute, but the quality of the product output is the governing factor in maximum process speed.
4. E-stops: E-stop switches are located at all four corners to allow the operator to stop the machine and open the nip rolls and pull rolls in case of emergency. The button must be pulled back out before pressing the reset button to restart the machine.
5. Nip Rolls: The nip rolls are the heart and soul of the laminator and must be cared for properly in order to give years of quality product output. Always dial the shim wheel to a shim setting greater than "0" when the machine is not in use. This will prevent the rolls from forming a flat spot from resting against each other. This also applies to the pull rolls.



## CAUTION

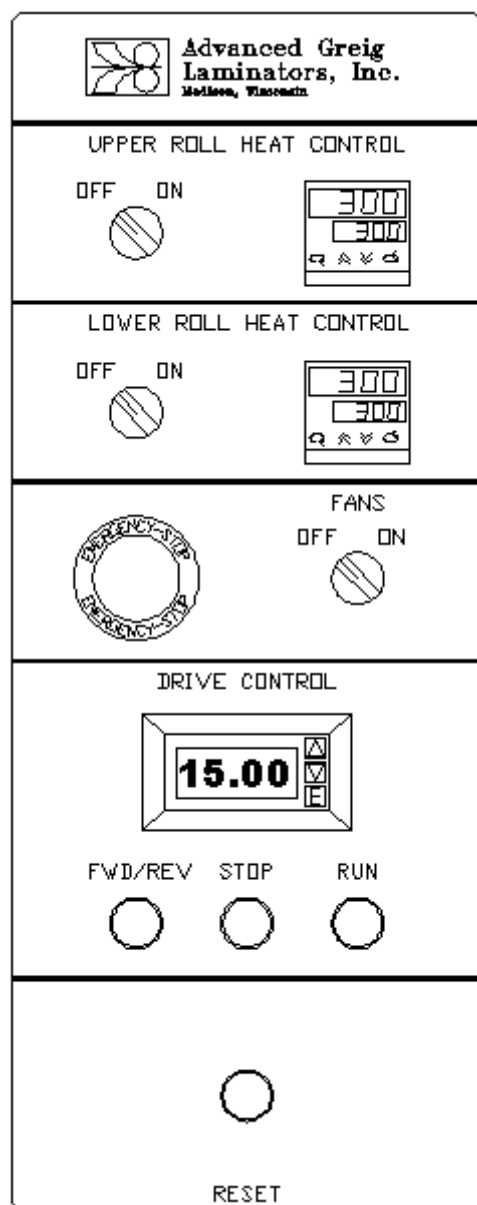
***Always set the shim wheel to a setting greater than "0" when the machine is not in use. This will prevent the roll from coming together and forming a flat spot. Permanent damage can be caused to the rolls if this warning is not heeded.***

6. Fwd/Rev: This button is a lighted button that will determine which direction the machine will run. If the button is not lit, the machine will run from front to back. If the button is lit, the machine will run from back to front.
7. Stop: This button will stop the rotation of the nip rolls.
8. Run: This button will allow the machine to run continuously in the direction depicted by the Fwd/Rev button and at the speed set by the controller.
9. Foot Switch: The foot switch will run the laminator in the direction depicted by the Fwd/Rev button and at the speed set by the controller. To transfer to continuous run mode, press and hold the run button while pressing the footswitch. Let off the footswitch, there will be a slight hesitation in the drive as it transfers to continuous run mode. Finally release the run button.
10. Temperature Control with switch: The two position switch allows the operator to turn the heater in the roll on or off. The temperature controller allows the operator to set a desired temperature for a process.



## Right Hand Control Panel

The right hand control panel looks like the figure below.



**Figure 1 Right Hand Control Panel**

### Upper Roll Heater Controls:

Two position switch turns heater for upper roll on and off. The temperature controller allows the operator to set a desired temperature for the process. The controller will maintain that temperature during the process.

### Lower Roll Heater Controls:

Two position switch turns heater for upper roll on and off. The temperature controller allows the operator to set a desired temperature for the process. The controller will maintain that temperature during the process.

**E-Stop** switch will stop the laminator and open the rolls.

**Fans** switch turns the web cooling system on and off for web cooling during thermal lamination.

### Drive Control:

**Controller** sets the laminators speed. 0-15 FPM

**FWD/REV** button toggles the drive between forward and reverse. If the button is lit the machine is in reverse mode.

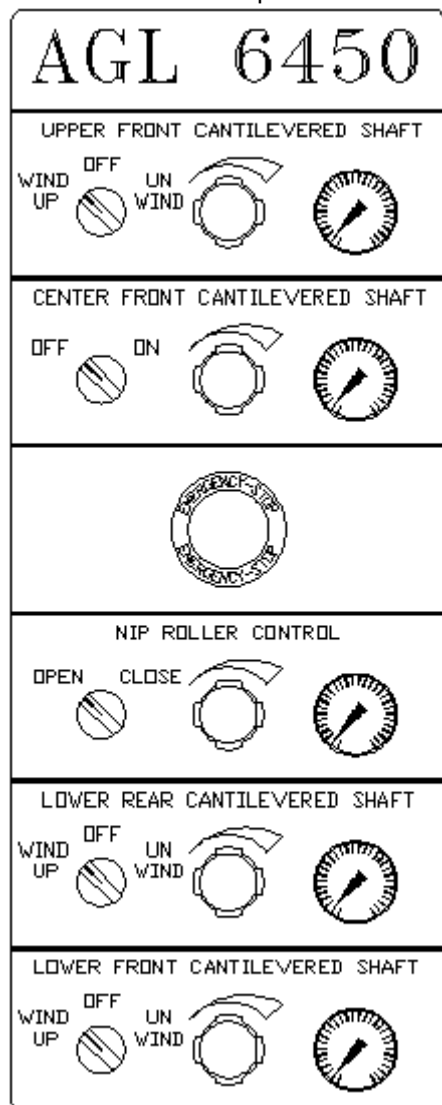
**STOP** button stops the drive from turning thus stopping the rolls.

**RUN** button switches the laminator from jog mode to run mode.

**Reset** button resets the machine after an E-stop condition or at initial startup. Hold button for 15 seconds after turning main power switch on.

## Left Hand Control Panel

The left hand control panel looks like the figure below.



### Upper Front Cantilevered Shaft:

The 3 position switch changes the station between a windup and unwind. The regulator adjusts the air pressure to the brake/clutch changing the web tension. The gauge indicates air pressure which allows for repeatable results.

### Center Front Cantilevered Shaft:

The 2 position switch changes the station between off and on. This station is unwind only. The regulator adjusts the air pressure to the brake changing the web tension. The gauge indicates air pressure which allows for repeatable results.

**Estop** switch will stop the machine and open the rolls.

### Nip Roller Control:

The open/close switch will open and close the rolls, the regulator adjusts the air pressure to the cylinders and the gauge indicates air pressure.

### Lower Rear Cantilevered Shaft:

The 3 position switch changes the station between a windup and unwind. The regulator adjusts the air pressure to the brake/clutch changing the web tension. The gauge indicates air pressure which allows for repeatable results.

### Lower Front Cantilevered Shaft:

The 3 position switch changes the station between a windup and unwind. The regulator adjusts the air pressure to the brake/clutch changing the web tension. The gauge indicates air pressure which allows for repeatable results.

**Figure 2. Left Hand Control Panel**

## Rear Control Panel

### Drive Control:

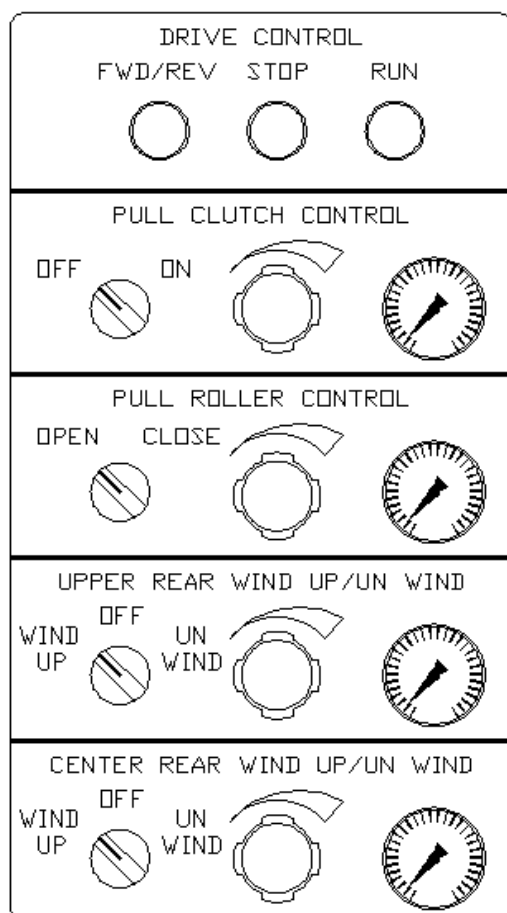


Figure 3. Rear Control Panel

**FWD/REV** button toggles the drive between forward and reverse. If the button is lit the machine is in reverse mode.

**STOP** button stops the drive from turning thus stopping the rolls.

**RUN** button switches the laminator from jog mode to run mode.

### Pull Clutch Control:

The switch turns the clutch on and off. The regulator adjusts air pressure to the clutch changing the amount of pull the rollers exert on the web. The gauge indicates air pressure which allows for repeatable results.

### Pull Roller Control:

A 2 position switch open and closes the pull rolls. The regulator adjusts the air pressure to the cylinders and the gauge indicates air pressure which allows for repeatable results.

### Upper Rear Cantilevered Shaft:

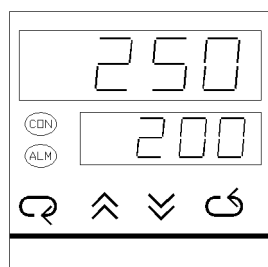
The 3 position switch changes the station between a windup and unwind. The regulator adjusts the air pressure to the brake -clutch changing the web tension. The gauge indicates air pressure which allows for repeatable results.



### Rear Center Windup/Unwind:


The 3 position switch changes the station between a windup and unwind. The regulator adjusts the air pressure to the brake/clutch changing the web tension. The gauge indicates air pressure which allows for repeatable results.


## Temperature Controls

Your laminator has heated rolls that allow you to laminate with thermal films and pressure sensitive films that require heat to activate the adhesive. The temperature controls have a maximum temperature set at the factory. The operator cannot set the temperature above this point. The controllers are also set up with an over temp alarm. If there is a failure and the heater coils heat out of control, the temperature controller will create an e-stop condition.



The temperature controller looks like the graphic shown at the left. The operator only needs to press the  to raise the "Set Point Temperature" or the  to

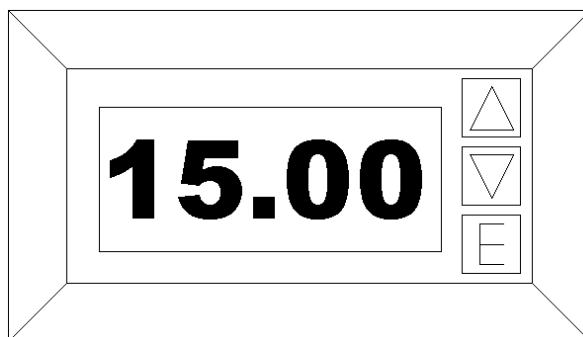
lower the "Set Point Temperature". The  light will stay on initially as heater comes up to temperature and flash as the controller pulses electricity to maintain

the heat in the rolls. The  light will stay on continuously unless there is a


failure in the roll. In this case the controller will cause an E-stop condition. The rolls must be allowed to cool down before restarting machine. The machine can be restarted by pressing and holding the Reset button for 15 seconds. If the machine fails again in the same manner, the laminator should be serviced by qualified personnel.


## Drive Control

The AGL6450 has been equipped with a drive control that incorporates feedback from the motor to give more precise speed control. This will allow better control of the laminating process. The controller has been calibrated and set up at the factory, the only setting that needs to be adjusted by the operator is the run speed. All other settings should not be tampered with as it will change how the machine functions. AGL, Inc. is not responsible damage to machine or product due to parameter changes in the drive controller. The controller is shown below:



The speed is set by pressing the “E” or enter button. The left digit will flash. Using the up or down arrow buttons adjust the number to the desired setting and press enter. The next digit to the right will flash. Proceed through all four digits adjusting by the arrow buttons and pressing enter to move to the next digit. Once the last digit is adjusted, press enter and the controller is set for that speed. The speed can be changed while the laminator is running by simply following the steps above. Once the last digit is adjusted and the enter button is pressed the drive will move to that speed.

 **CAUTION** Parameters in drive controller are preset at the factory. The only parameter that should be changed by the operator is the run speed and jog speed set point. AGL, Inc. is not responsible for any damage to machine or product due to parameter changes in the drive controller.

 **CAUTION** The machine should be stopped before changing directions of the drive. Damage to the drive components is possible if this warning is not heeded.

## Laminator Setup

Your laminator has been designed to make the setup and lamination process as easy and repeatable as possible, however, there will be techniques that make this phase easier that you will only learn by using the machine. Do not get frustrated if the setup process takes longer than you expected, the process will get quicker and easier the more you use your laminator.

The set up process is comprised of the following steps:

1. Loading and positioning the film.
2. Webbing the laminator.
3. Setting the process controls to initial settings.
4. Warm up time (if required by process)

### Loading and Positioning the Film

1. Determine the way the film is wound, adhesive inside or outside. This will determine the way it is placed on the unwind shaft. If the adhesive is wound to the inside, the web will be pulled from the bottom of the supply roll. The web path configuration figures show the film in this configuration.
2. Rotate the shaft so that it can be removed from the coupling. Slide the quick release collar back from the end of the unwind/windup shaft. Swing the cantilevered shaft out towards you.
3. Remove the locking core chuck and the core idler. The locking core chuck has teeth that rotate out to hold the core as it turns. When looking at the locking core chuck from flange end, the core can rotate counter clockwise freely, but is held if it rotates clockwise. Determine which end of the film the locking core chuck should be on to hold the roll back with the brake. Slide the locking core chuck on the shaft, slide the film on the shaft, and finally slide the core idler on the shaft. You may lightly tighten the setscrews in the core chuck and idler but do not tighten completely.
4. Swing the unwind/windup shaft with film back into the coupling and slide the collar over the end of the shaft.
5. Measuring from the sideplates, make sure the film is centered on the shaft. Once the measurements from each end of film to the sideplates are equal, tighten the locking core chuck and core idler down. **(Note: Be sure the set screws are over the flat of the unwind/windup shaft, if you tighten the set screws down on any other part it will make assembly and disassembly of the core chuck and core idler onto the shaft very difficult.)**
6. Repeat this process on any other unwind station.
7. If the film is a pressure sensitive with a release liner, you will need to set up a wind up station. This is done by webbing the film under an idler and separating the film and liner. Once the liner has been separated from the film, it must be routed up over the second idler and taped to a windup core.
8. The wind up core is loaded and positioned exactly like the film was in steps 1-5. Keep in mind that the windup cores will rotate the exact same direction as the lower nip roll.
9. Tape the release liner to the core and windup any slack by hand. Feed the film with adhesive around and through the nip opening. **Note: You may require feeder stock to keep the film from sticking to the lower nip roll.**

### Webbing the Laminator

The term webbing means routing the film through the laminators' idlers and nip rolls and thus creating a web. The easiest way to web the machine up after loading the film is by using a piece of feeder stock. The stock can be anything that is relatively stiff, but still flexible enough to route around the nip roll. A common example would be tag board.

The first step in webbing the machine is to have a planned web path configuration. There are four web path configurations shown and two processes described in this manual. The encapsulation process uses thermal film from top and bottom to "encapsulate" the substrate being fed into the laminator. This process seals the edges and protects the substrate. Refer to figure 4 as the webbing process is described below.

## Encapsulation Process

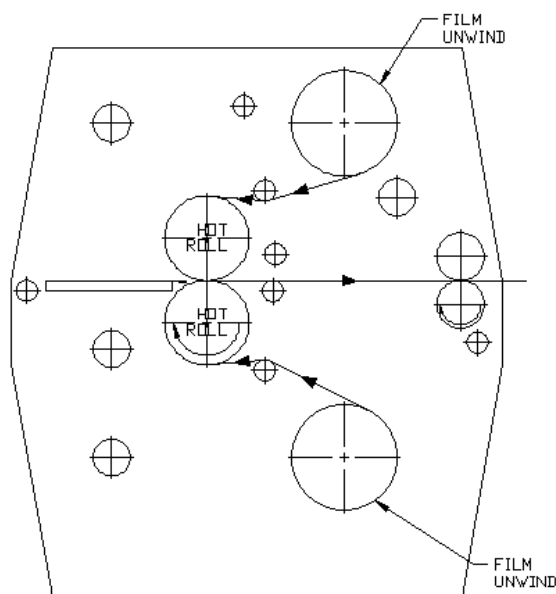
1. Load thermal film on the rear upper and lower unwind stations. Turn the selector switch on these two stations to "Off".
2. Set the shim wheels to "0", place a piece of feeder stock into the nip rolls with plenty of stock hanging out the front. Close the nip rolls onto the piece of feeder stock.



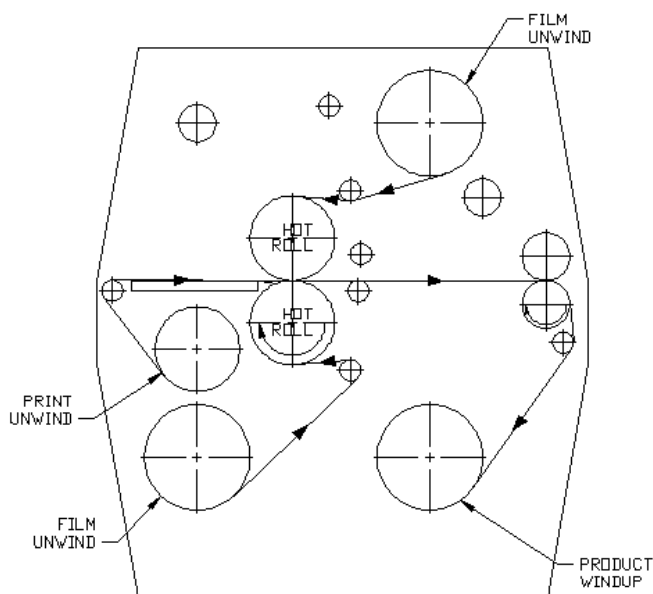
### CAUTION

*The nip section can pull you into laminator! Do not place fingers into the nip section when the rolls are rotating. It is recommended that operators tie long hair back and not wear neckties, loose clothing and jewelry since they can be caught in the nip section and pull the operator into the machine*

3. Pull the film from the upper rear station down under the idler roller directly behind the nip roll and over the top of the top nip roll. Tape the film to the feeder stock.
4. Remove the infeed table for easier access to the lower rear station. Pull the film from the lower rear station up over the idler roller directly behind the bottom nip roll and under the bottom nip roll. Tape the film to the feeder stock.
5. Replace the infeed table.
6. Set the controller to a low setting and move to the rear of the machine.
7. Set the machine to run in the FWD direction (the FWD/REV button should not be lit) and press the foot switch.
8. Guide the feeder stock into the gap between the pull rolls. Once the feeder stock has cleared the pull rolls, close the pull rolls.
9. Turn the heater controls to "On" and set the desired temperature. While the rolls are heating up use your process control chart to make all initial settings on the brakes, speed and nip pressure.
10. With rolls at the desired temperature you may feed the substrate into the nip section.
11. If your substrate is in roll form, you may use the center front unwind station to feed it into the nip. Route the substrate from the unwind station around the infeed table roller and into the nip. Figure 4 shows the front lower station being used as the unwind and the lower rear being used as the product windup. Follow the procedure to load the film as discussed in the **Loading Film** section.



Sheet Feed Encapsulation Process



Roll Fed Encapsulation Process

Figure 4. Encapsulation Process

## Pressure Sensitive Process

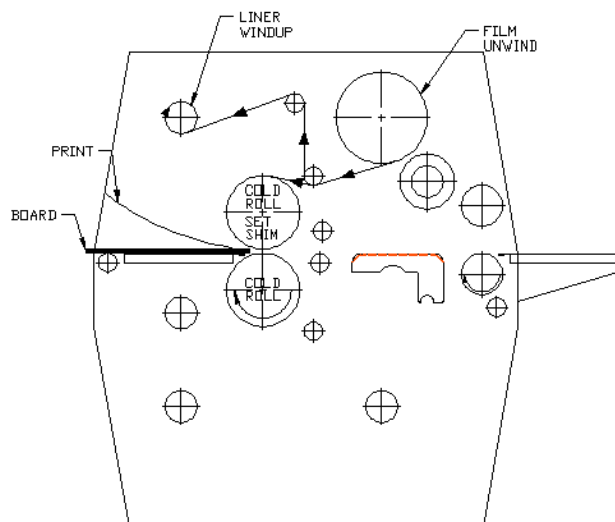
1. Load film on the rear upper unwind station. Turn the selector switch to that station to "Off".
2. Set the shim wheels to "0", place a piece of feeder stock into the nip rolls with plenty of stock hanging out the front. Close the nip rolls onto the piece of feeder stock.



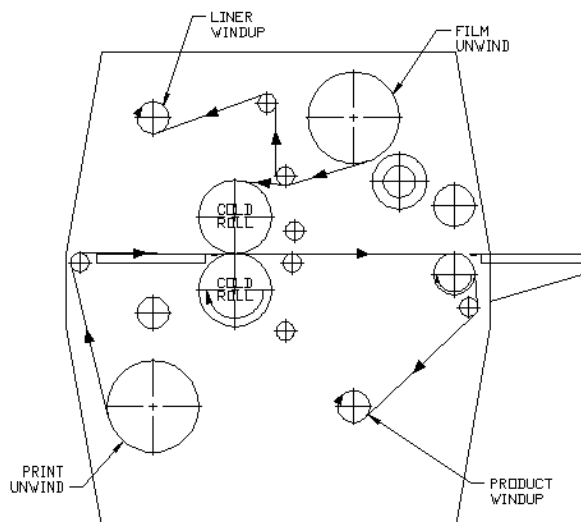
### WARNING

*The nip section can pull you into laminator! Do not place fingers into the nip section when the rolls are rotating. It is recommended that operators tie long hair back and not wear neckties, loose clothing and jewelry since they can be caught in the nip section and pull the operator into the machine*

3. Pull the film from the upper rear station down under the idler roller directly behind the nip roll and over the top of the top nip roll. Separate the release liner from the film and tape the film to the feeder stock.
4. Route the release liner in an "S" wrap on the idler rolls and back to the front upper windup station. Tape the release liner to the wind up core.
5. Set the controller to a low setting and move to the rear of the machine.
6. Set the machine to run in the FWD direction (the FWD/REV button should not be lit) and press the foot switch.
7. Guide the feeder stock into the gap between the pull rolls
8. Turn the heater controls to "On" and set the desired temperature. While the rolls are heating up use your process control chart to make all initial settings on the brakes, speed and nip pressure.
9. With rolls at the desired temperature you may feed the substrate into the nip section.
10. If your substrate is in roll form, you may use the center front unwind station to feed it into the nip. Route the substrate from the unwind station around the infeed table roller and into the nip. Figure 5 shows the lower rear station being used as the product windup. Follow the procedure to load the film as discussed in the **Loading Film** section.

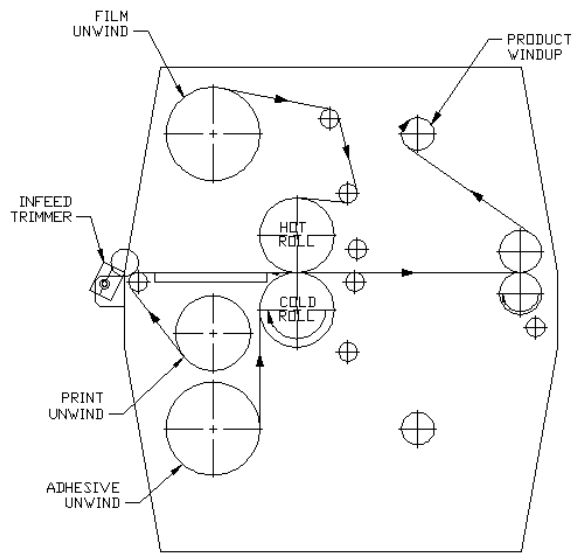


Sheet Fed Pressure Sensitive Process

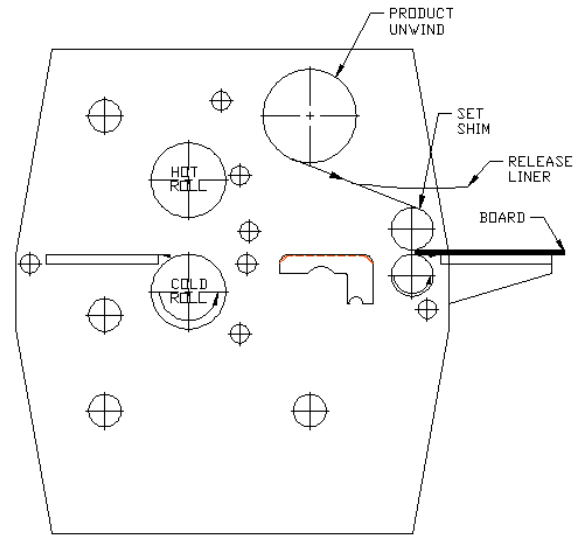


Roll Fed Pressure Sensitive Process

Figure 5. Pressure Sensitive Process

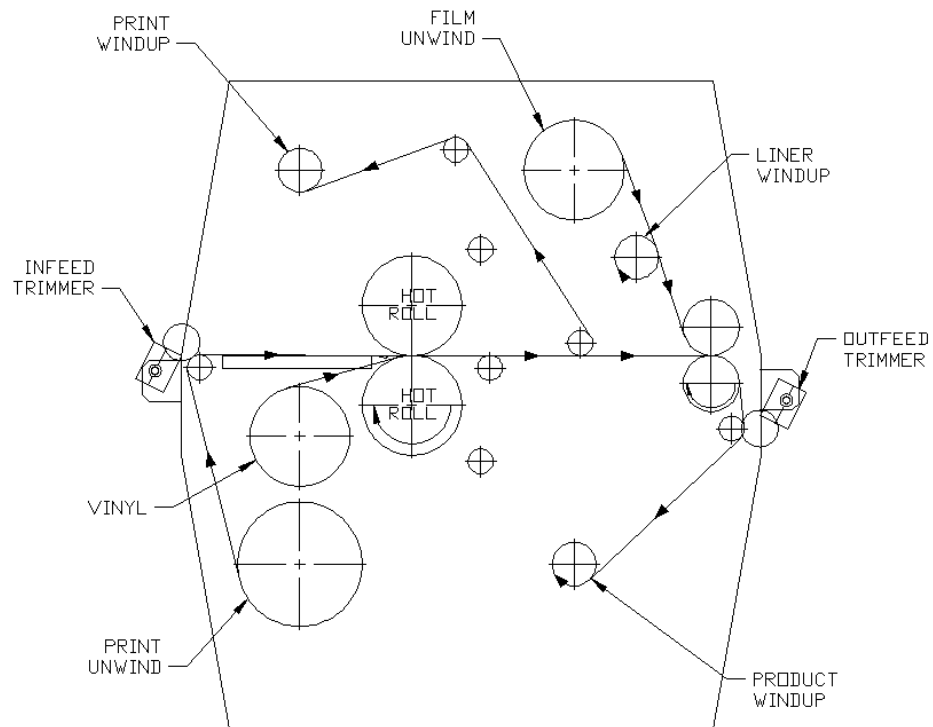


**First pass, Lamination**



**Second Pass, Mounting**

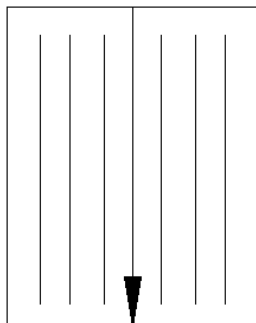
**Figure 6. Two Pass, Lamination and Mounting**



**Figure 7. One Pass, Vinyl Transfer and Lamination**



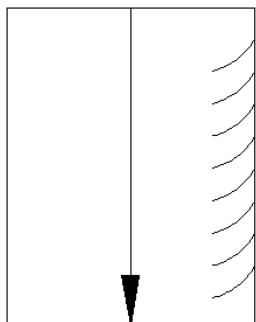
## Process Output Trouble Shooting



### Straight waves in output

Pull roll creating too much tension → Decrease clutch air pressure

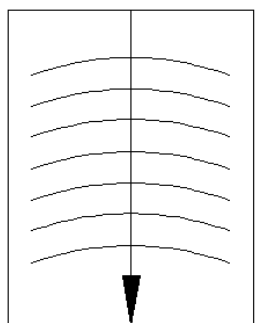
Film not cooling fast enough → Slow feed rate down and turn on cooling system.



### Waves on one side of output

Nip “zero” setting may be incorrect → Check nip setting and adjust if necessary. Refer to **Zeroing the Nip** in the maintenance section.

Pull roll “zero” setting may be incorrect → Check nip setting and adjust if necessary. Refer to **Zeroing the Nip** in the maintenance section. Pay particular attention to sides opposite the waves.



### D-Waves in Product

#### If waves are in the substrate and not film

Substrate problem → Check the substrate moisture content and the substrate tension.

#### If waves are in the film

Low tension between nip & pull roll → Increase air pressure to pull roll clutch.  
Roll pressure settings → Adjust nip and pull roll settings as required.

## Web Breaks

Web breaks caused by excess tension: If the web breaks between the unwind station and the nip, reduce the unwind brake tension. If the web breaks between the laminating opening and the rewind station, reduce the rewind clutch tension.

Web breaks will occur from faulty material. The AGL laminator will not correct this; the material must be replaced.

## Curl in Product

1. Running a hot mount material in cold-mount machine sometimes creates a curl in the finished product.
2. Too much web tension: Reduce unwind brake pressure.
3. Excessive roll pressure: Reduce upper roll pressure.
4. Wrong spacers being used.

### Wrinkles in Product

1. Check the adhesive stock for wrinkles while operating. If wrinkles exist, this is a manufacturing material defect, and must be cut out of the roll. A laminator will not correct material defects.
2. String the web straight and square between the unwind and the windup shafts. If it is not straight and square, the tension will not be even across the web and will cause wrinkling.
3. If the web is loose between the unwind and the drive roll, there is not enough pressure on the unwind brake. Increase the pressure on the unwind brake to correct.
4. If the web is loose between the windup and the drive roll, there is not enough pressure on the windup clutch. Increase the pressure on the windup clutch to correct.
5. If the web gets narrow between the unwind and the drive roll, there is too much pressure on the unwind brake. Decrease the pressure on the unwind brake to correct.
6. Top and bottom laminating rolls may not be parallel. Make sure spacer shims are the same size, then zero the nip. Refer to **Zeroing the Nip** in the maintenance section.

### Poor Lamination

1. All substrate materials must be cleaned and free of dust, dirt, grease, and any other type film.
2. Poor lamination is usually caused by thickness variation in the substrate materials such as plywood, hard board or other such non-precisely made materials. To overcome this, cylinder spacers may have to be removed and materials laminated without the use of cylinder spacers, or the next smaller spacer may be used or special spacer utilized.
3. Material such as Plexiglas or glass sometimes carry a greasy or oily film. These materials may need to be cleaned with a solvent prior to lamination.
4. Poor lamination can be caused by defective material. To correct this, replace defective material with higher quality material.

### Bubbles in Product

1. Visually inspect materials, mounting or overlays for any voids in the adhesive film. If any exist, it cannot be corrected by any laminating machine - that part of the material should be discarded.
2. Low pressure on nip rolls → Increase air pressure to nip rolls.
3. Incorrect shim setting → Adjust shim wheel to correct setting.
4. Nip “zero” setting may be incorrect → Check nip setting and adjust if necessary. Refer to **Zeroing the Nip** in the maintenance section.

### Process Control Charts

In order to consistently output high quality product, the operator must have a definite starting point on the many process variables. This can be achieved by having the operators document system settings when you have achieved acceptable quality output. The process control chart will allow any operator to set the machine up for a given process. Keep in mind that the system variables may require adjusting as the process is being run, but the chart gives an excellent starting point. Factors such as temperature, humidity, changing film roll diameters all affect the process, therefore, operator technique in running the machine is inevitable. There is a blank process control chart located on page 4-10, copy this page as often as needed for new processes.

## PROCESS CONTROL CHART

Process: \_\_\_\_\_  
 Product: \_\_\_\_\_  
 Material Top: \_\_\_\_\_  
 Material Bottom: \_\_\_\_\_  
 Other Material: \_\_\_\_\_  
 Date Settings Documented: \_\_\_\_\_

<b>Front Control Settings</b>			
Speed (Ft/min):		Direction:    Forward    Reverse	
Nip Roll:    Up        Down		Shim Dial Setting:	
Roll Pressure: (PSI)		Top Temp. Setting:            Deg. F	
Top Roll Heater:        On    Off		Bottom Temp. Setting:        Deg. F	
Bottom Roll Heater    On    Off			
<b>Rear Control Settings</b>			
Pull Roll Clutch:        On    Off		Pull Roll:    Up        Down	
Pull Roll Clutch Setting:(PSI)		Pull Roll Pressure:(PSI)	
Shim Dial Setting:			
<b>Film Station Settings</b>			
Upper Rear Station: Unwind    Off    Windup			Pressure Setting:(PSI)
Upper Front Station: Unwind    Off    Windup			Pressure Setting:(PSI)
Center Front Station: Unwind    Off    Windup			Pressure Setting:(PSI)
Center Rear Station: Unwind    Off    Windup			Pressure Setting: (PSI)
Lower Rear Station: Unwind    Off    Windup			Pressure Setting:(PSI)
Lower Front Station: Unwind    Off    Windup			Pressure Setting:(PSI)

Other Instructions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

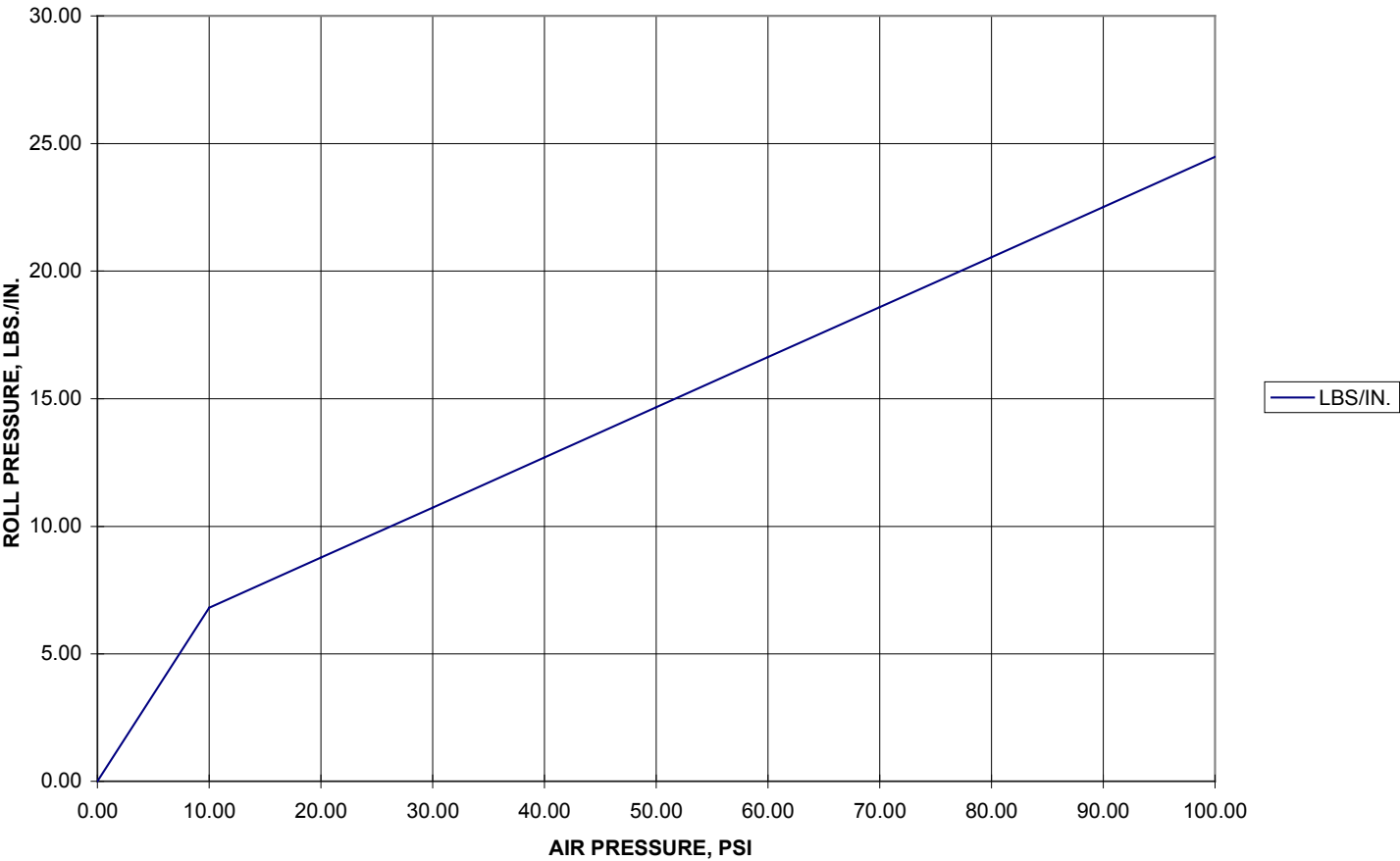
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AGL6450 LAMINATOR ROLL PRESSURE



## Maintenance

As a result of years of experience, refined engineering and construction techniques, very little time need be lost to maintenance. However, regular maintenance will keep your laminator operating at its optimum level.



### **WARNING**

***Removing the enclosure covers to work on machine exposes person to electrocution and moving parts hazard. Only trained service personnel should perform maintenance with any guards or covers removed.***

## Nip Roll Section

The most critical adjustment of the nip and pull rolls is the “zero” position. This adjustment makes the top roll parallel to the bottom roll which creates even pressure and pull distribution across the face of the roll. If the rolls are out of adjustment, the machine will not laminate properly. Zeroing the nip is done at the factory before shipment, but should be checked at startup and if laminator is not creating quality output.

### Checking the Nip

1. Place two pieces of thin paper (approximately 1.0” wide by 12.0” long) between the upper pressure roll and the lower roll (about 3.0” from each end).
2. Set the shim dial to the “0” setting and put the upper pressure roll in the down position by activating pressure roll valve.
3. Pull gently on both pieces of paper, if both pieces of paper have the same drag, the nip is fine, if the drag is different, follow the procedure below to correct the setting. The pull rolls are adjusted the same as the nip rolls.

### Zeroing the Nip

1. Loosen the jam nut on the top of the cylinder rod.
2. Adjust the cylinder stop clockwise to raise the roll and counter clockwise to lower the roll.
3. Check the nip using the 3 steps shown in the **Checking the Nip** section.
4. Once the drag on the pieces of paper has been equalized, turn each cylinder stop ¼ turn and lock the jam nut down on top of it.

## Cleaning the Nip Rolls



### **WARNING**

***Cleaning the nip rolls may require the nip rolls to be rotating. Rotate the rolls at a very slow rate to avoid being pulled into the nip section. Do not wear neck ties, loose clothing or hanging jewelry that could be pulled into the nip section.***

The nip rolls should be cleaned as often as necessary, the frequency will vary on the products used and the processes being run. AGL recommends a mild detergent solution or denatured alcohol with a 100% lint free cloth to clean the rolls. Your film manufacturer can recommend solvents that will remove the adhesive from silicone and neoprene rolls without causing damage to the coverings. To facilitate the cleanup process, adhesives should be cleaned from the rolls as soon as possible and while the roll is still warm. A rubber “eraser” has been included in your accessory kit that can be used to clean the adhesive from the warm rolls. Rub the eraser over the adhesive with the rolls turning very slowly. The cloth and alcohol can be used to remove the residue.



### **CAUTION**

***Use of incorrect solvents on your nip and pull rolls can cause irreparable damage to the coverings. Advanced Grieg Laminators, Inc. is not responsible for damage to roll coverings caused by these solvents.***

### Roller open and close rate

The rollers must open and close evenly to prevent excessive wear on the cylinders and bearings. This rate is set at the factory, but can be adjusted in the field. Follow the procedure below to adjust either the pull rolls or nip rolls.



### **WARNING**

***Maintenance that requires working on the machine while power and air are connected poses and imminent danger of electrocution or extremities being caught in rotating parts. Only qualified personnel should work on a machine in this state***

1. There are flow control fittings on both cylinders, but the fittings on the left hand cylinders will require most of the adjusting.
2. To increase the rate, turn the adjustment screw counter clockwise, to decrease the rate turn the adjustment screw clockwise. The upper fitting controls the "Open" rate, and the lower fitting controls the "Close" rate. Do not rotate the screw more than ½ turn at a time.
3. Adjust the open rate until the rolls open correctly, then proceed with the close rate.
4. Lock the adjustment screw in place with the jam nut. Be careful not to turn the adjustment screw as you tighten the nut.
5. Replace enclosure covers.

### Lubrication

The high temp grease that is packed into the nip roll bearings will begin to pass by the seal as the machine is used in high temperature applications. The frequency of high heat processes will determine the frequency of adding grease to the bearings. Inspect the nip roll bearings at least weekly for grease outside the seals, regrease as necessary with a high temperature No. 2 consistency bentone-based grease with petroleum oil. Your lubrication vendor can recommend a quality product with this specification. The bearings on the lower pull roll should be checked for grease leakage after 3 months of use and then every 6 months from there on. The grease is a standard lithium based grease. The grease should be added slowly with the shaft turning until a slight bead forms at the seal.

When the bearings are being greased, the bearing gibs should also receive a coating of lithium grease.

The chain should be lubricated as needed with a Lubriplate spray chain lubricant. The tension in the chain should be checked at 6 months and tightened to take up any stretching that may have occurred, and then inspected yearly from that point on.

## Warranty and Conditions

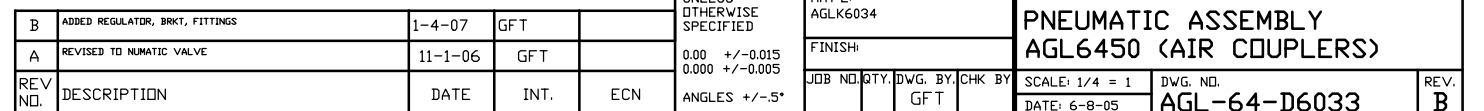
AGL warrants all models of the laminator's product line manufactured to be free from defects in workmanship and materials for a period of one year with the exception of operator caused damage, or surface abrasions to the laminating rolls or other obvious caused damage. The warranty period will commence on the date it ships from AGL.

This warranty does not apply to any equipment which after delivery has been subject to abuse, accident or alterations by anyone other than persons authorized by AGL.

Component parts such as controls, motors, heating elements, air cylinders, etc. which are incorporated into the design and manufacture of our laminators are purchased from reputable manufacturers and suppliers and, as such carry their respective warranties. Failure of any components purchased by AGL and incorporated in the laminators carry supplier warranty and to insure proper credit all parts that should fail must be returned freight prepaid for evaluation **LABOR AND ALL RELATED COSTS TO REPLACE THE DEFECTIVE PART WILL BE BORNE ENTIRELY BY THE END USER.** AGL assumes the responsibility of incorporating these various component parts into the fabrication of the laminator and warrants that this will be done in a suitable and workable manner.

AGL offers no warranty for the laminated product and/or process that the machine produces and as such will not be liable for any special, indirect or consequential damages.

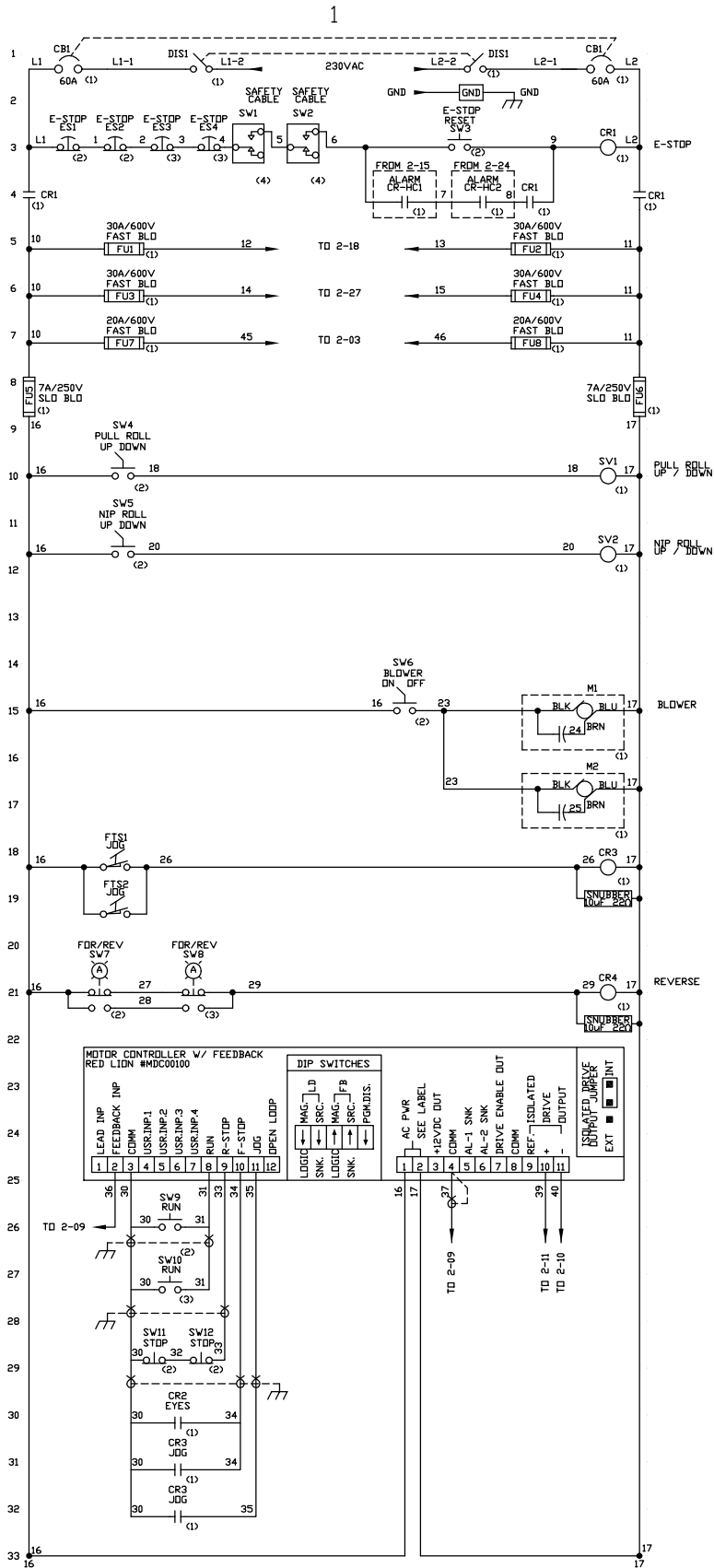
**NO OTHER WARRANTY IS EXPRESSED OR IMPLIED INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE. AGL is not liable for incidental or consequential damage such as, but not limited to, lost profits, loss of use of other equipment or increases in operating costs or expenses.**



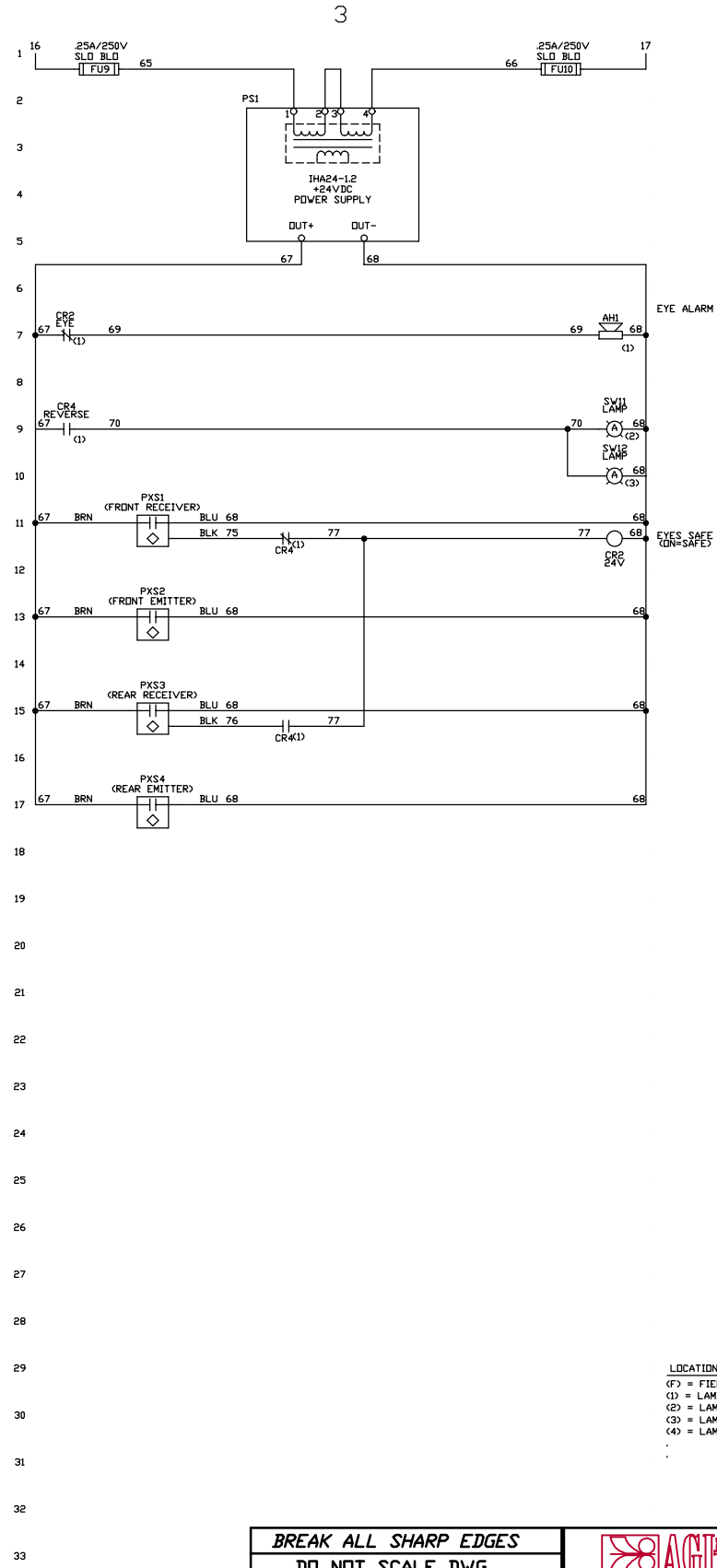
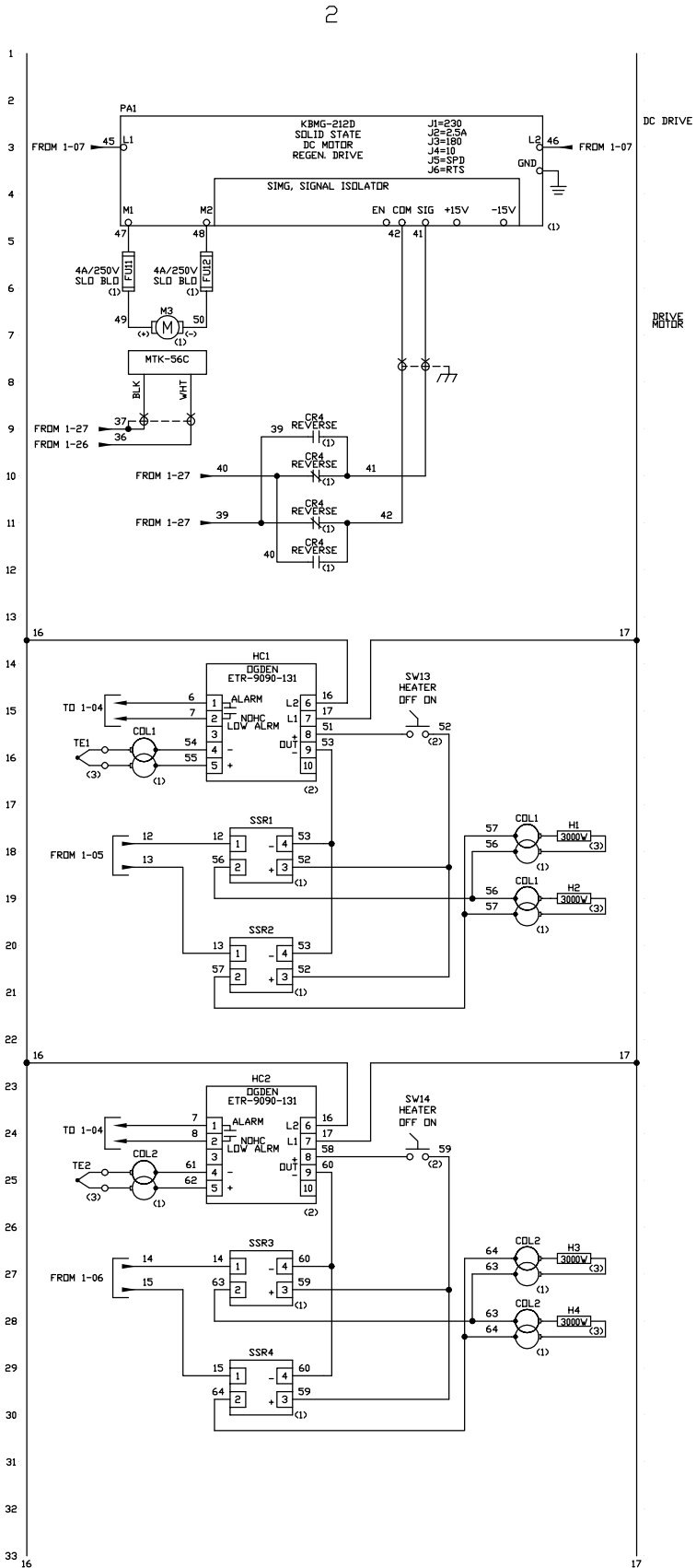
B	ADDED REGULATOR, BRKT, FITTINGS	1-4-07	GFT		OTHERWISE SPECIFIED	AGLK6034				PNEUMATIC ASSEMBLY AGL6450 (AIR COUPLERS)		
A	REVISED TO NUMATIC VALVE	11-1-06	GFT		0.00 +/-0.015 0.000 +/-0.005	FINISH:						
REV NO.	DESCRIPTION	DATE	INT.	ECN	ANGLES +/- .5°	JOB NO.	QTY.	DWG. BY.	CHK BY.	SCALE: 1/4 = 1	DWG. NO.	REV.
								GFT		DATE: 6-8-05	AGL-64-D6033	B



230 VAC 60 HZ  
1 PHASE 60A BRANCH  
SUPPLY FROM DISCONNECT.  
CONSULT LOCAL CODES FOR  
APPROPRIATE WIRE SIZE.



NOTES:  
5 IN/LB MINIMUM TORQUE,  
ALL TERMINAL SCREWS  
USE STRANDED COPPER WIRE WITH  
60 DEGREE C / 300 VOLT INSULATION  
FOR ALL EXTERNAL CONNECTIONS.



LOCATION CODE  
(F) = FIELD  
(1) = LAMINATOR CONTROL CABINET  
(2) = LAMINATOR FRONT OPERATOR CONSOLE  
(3) = LAMINATOR BACK OPERATOR CONSOLE  
(4) = LAMINATOR

**BREAK ALL SHARP EDGES**  
**DO NOT SCALE DWG.**



Advanced Greig Laminators, Inc.  
801 Burton Blvd.  
DeForest, WI 53532

**CONNECTION DIAGRAM**  
**AGL6450**

SCALE: N.T.S.  
DATE: 1-7-02

DWG. NO.  
**AGL-64-D4300**

REV.

REV. NO.	DESCRIPTION	DATE	INT.	ECN

# Bill Of Material

**Part #:** AGL-64-K3130-2

**Appl #:**

**Assy #:**

**BOM Rev: -**

**Model #:**

**Rev:**

**Rev:**

**Date:** 11/7/2006

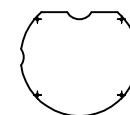
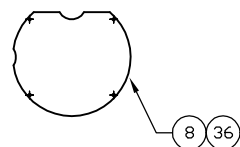
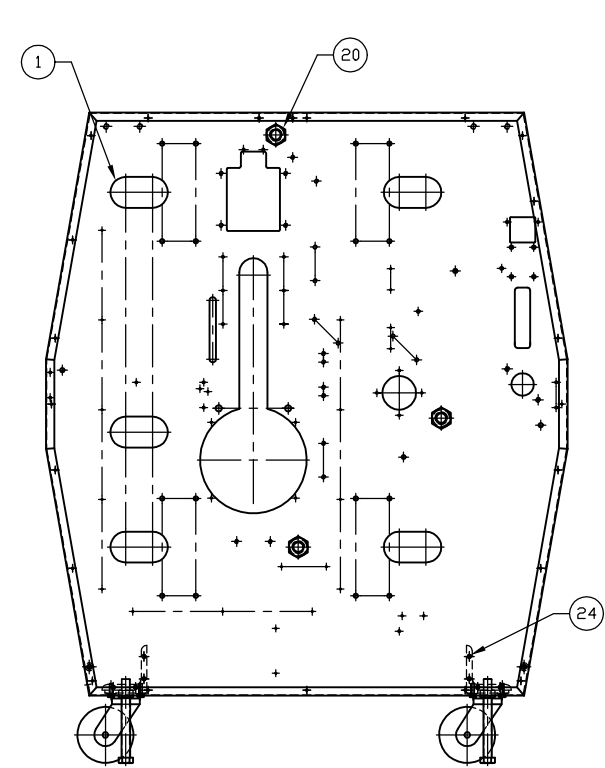
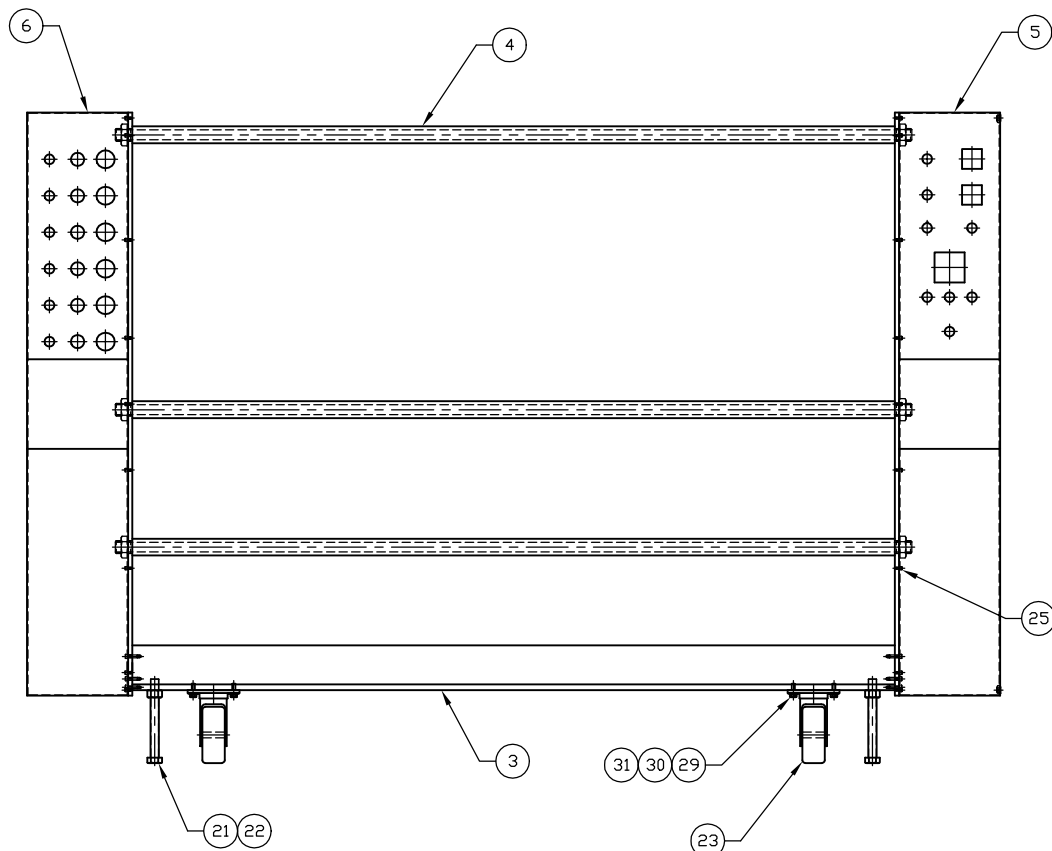
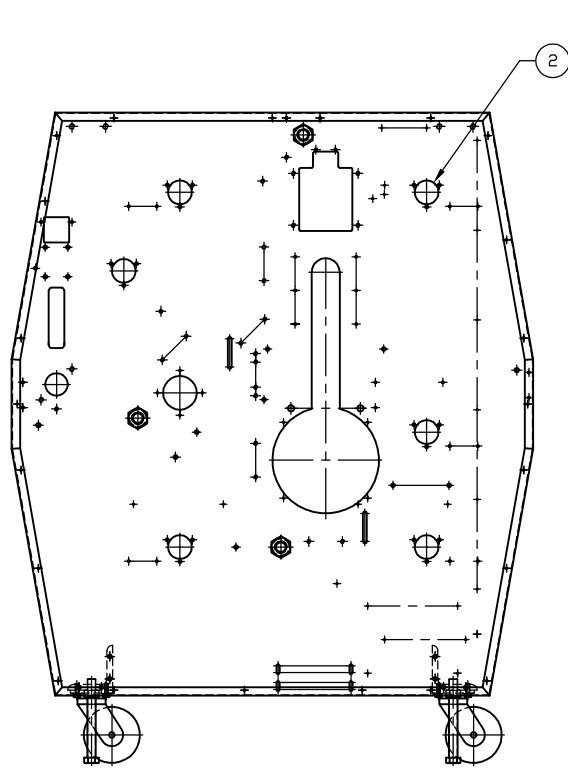
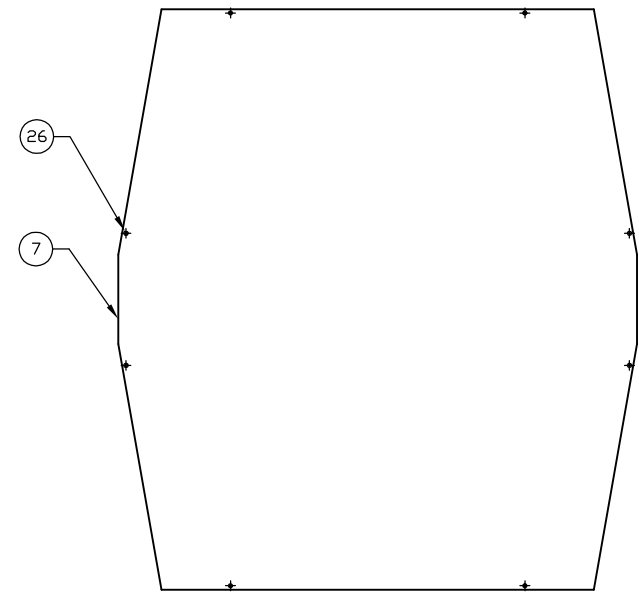
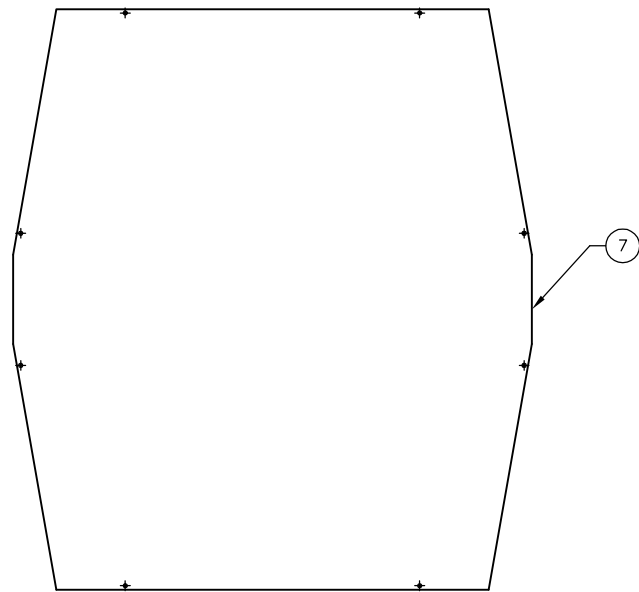
**Description:** MASTER BILL OF MATERIALS, AGL6450 (2006)

Item:	Part #:	Description:	Qty:
1	AGL-64-K3063-2	MAIN MACHINE FRAME ASSEMBLY, AGL6450 (UL STD 2006)	1
2	AGL-64-K3066-1	NIP ROLL ASSEMBLY, AGL6450 (BAUMER EYE)	1
3	AGL-64-K1371-1	DRIVE ASSEMBLY, AGL6450, 15 FPM	1
4	AGL-64-K0043-1	FRONT UNWIND/WINDUP STATION ASSEMBLY, AGL6400	1
5	AGL-64-K0041-1	REAR UNWIND/WINDUP STATION ASSEMBLY, AGL6400	1
6	AGL-64-K0086	INFEED/OUTFEED TABLE ASSY	1
7	AGL-64-K0918-3	PULL ROLL ASSEMBLY, AGL6400 (SENSORS INSIDE)	1
8	AGL-64-K1367	IDLER ROLLER ASSY, AGL6450	1
9	AGL-64-K6034	PNEUMATIC ASSEMBLY, AGL6450 (AIR COUPLERS)	1
10	AGL-64-K1385-4	ELECTRICAL ASSEMBLY, AGL6450, UL STD 2006	1
11	AGL-64-K2514	WEB COOLING ASSEMBLY, AGL6450	1
12	AGL-64-K0096-1	FRONT CENTER UNWIND STATION, AGL6400	1
13	AGL-64-K1378-1	WINDUP STATION, SOLID SHAFT, AGL6450	1
14	AGL-64-K1390-1	FRONT TRIMMER W/ HARDENED ROLLER, ASSY, AGL6400/6450	1
15	AGL-64-K1392-1	REAR TRIMMER W/ HARDENED ROLLER ASSY, AGL6400/6450	1
16	AGL-XX-K2660	ACCESSORIES KIT, 44/4400/64 SERIES/6400/6450	1
17	AGL-XX-K3357	PULL CABLE SWITCH ASSEMBLY, 64" LAMINATORS	1


# Bill Of Material

**Part #:** AGL-64-K3063-2      **Appl #:**      **Assy #:** AGLD3062-2      **BOM Rev:** -  
**Model #:**      **Rev:**      **Rev:** -      **Date:** 11/7/2006  
**Description:** MAIN MACHINE FRAME ASSEMBLY, AGL6450 (UL STD 2006)

Item:	Part #:	Description:	Qty:
1	AGL-64-D3060-1	RH. SIDEPLATE, AGL6450	1
2	AGL-64-D3061-1	LH. SIDEPLATE, AGL6450	1
3	AGL-64-B0011	LOWER TIE BAR	2
4	AGL-64-B0010-01	CROSS TUBE	3
5	AGL-64-D1364-2	RH. WRAP, AGL6450	1
6	AGL-64-D1365-1	LH. WRAP, AGL6450	1
7	AGL-64-C1366	ENCLOSURE COVER, AGL 6450	2
8	AGL-64-B3064	COVER, AGL6450	2
20	000198-15	NUT, HEX, JAM, 1-1/8-12UNF, ZINC	6
21	000358-36	HHCS, 3/4-10UNC, 7 LG, ZINC	4
22	000195-12	NUT, HEX, JAM, 3/4-10UNC, ZINC	4
23	001451	CASTER, SWIVEL, 5 DIA 900 LBS.	4
24	000011-08	SHCS, 5/16-18UNC, 1 LG, BLACK	16
25	000007-03	SHCS, #10-24UNC, 3/8 LG, BLACK	41
26	000055-03	BHSCS, #8-32UNC, 3/8 LG, BLACK	16
27	000207-04	WASHER, FLAT, SAE, #10 DIA, 1/2 OD, 7/32 ID, ZINC	41
29	000340-08	HHCS, 5/16-18UNC, 1 LG, ZINC	16
30	000493-07	WASHER, LOCK, 5/16 DIA, SPLIT, ZINC	16
31	000207-07	WASHER, FLAT, SAE, 5/16 DIA, 11/16 OD, 11/32 ID, ZINC	16
36	000057-04	BHSCS, #10-24UNC, 1/2 LG, BLACK	8



REV. NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES				 <div>Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532</div>				
DO NOT SCALE DWG.								
UNLESS OTHERWISE SPECIFIED		MAT'L: AGLK3063-2		MAIN MACHINE FRAME ASSEMBLY AGL 6450				
0.00 +/-0.015 0.000 +/-0.005		FINISH:						
ANGLES +/- .5°		JOB NO.	QTY.	DWG. BY:	CHK BY:	SCALE: 1/8" = 1	DWG. NO.	REV.
				GFT		DATE: 11-7-06	AGL-64-D3062-2	

# Bill Of Material

<b>Part #:</b> AGL-64-K3066-1	<b>Appl #:</b>	<b>Assy #:</b> AGLD3065-1	<b>BOM Rev:</b> B
<b>Model #:</b>	<b>Rev:</b>	<b>Rev:</b> A	<b>Date:</b> 1/2/2002
<b>Description:</b> NIP ROLL ASSEMBLY, AGL6450 (BAUMER EYE)			

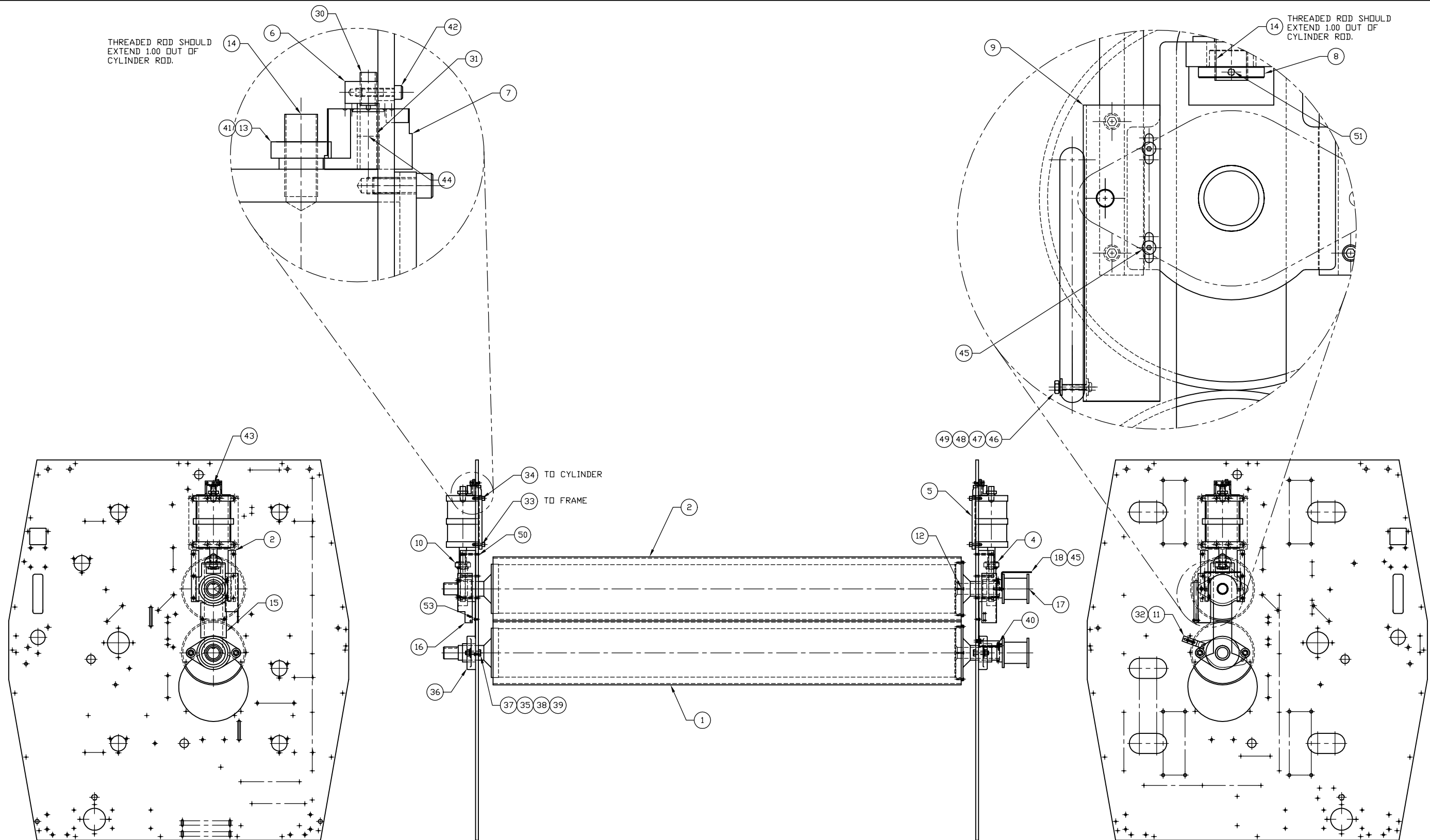
Item:	Part #:	Description:	Qty:
1	AGL-64-D2543	BOTTOM NIP ROLL, AGL6450 (crowned)	1
2	AGL-64-D3468	TOP NIP ROLL, AGL6450	1
3	AGL-64-B0019	BEARING GIB	4
4	AGL-64-B1118-1	BEARING SPACER MODIFICATION (ALTER AGL-64-B1118)	2
5	AGL-64-B2546	CYLINDER MTG. PLATE, AGL6450	2
6	AGL-80-B2103	SHIM SHAFT SUPPORT, AGL8000	2
7	AGL-64-B0015	SHIM WHEEL	2
8	AGL-64-B2547	CENTERING COLLAR, AGL6450	2
9	AGL-64-B3067-1	RH. EYE MTG. BRKT, 6450, SERIES 10	1
10	AGL-64-B0023	BEARING, TAKE-UP, MODIFIED (ALTER AMI #UCST210-32C4HR5)	2
11	AGL-XX-B1070	BRACKET, SLIP RING STOP	1
12	AGL-64-B0536	PLUG, JOURNAL	2
13	AGL-80-B2102-1	CYLINDER STOP, TAPPED, 8000/6450	2
14	AGL-64-B3068-01	THREADED STUD, 1.75 LG. AGL6450	4
15	AGL-64-B2429	NIP SLOT GUARD, AGL6400/6450	2
16	AGL-64-B3067-2	LH. EYE MTG. BRKT, 6450, SERIES 10	1
17	AGL-XX-B2992	SLIP RING MOD. (ALTER UE #S15GN07AUW1)	1
18	AGL-XX-B2991	SLIP RING GUARD	1
30	001392-15	PLUNGER, SPRING, LEP, 3/8-16UNC, 5/8 LG	2
31	000289-16	PIN, DOWEL, 3/8 DIA, 2 LG	2
32	000007-04	SHCS, #10-24UNC, 1/2 LG, BLACK	2
33	000013-08	SHCS, 3/8-16UNC, 1 LG, BLACK	8
34	000041-08	SHCS, 3/8-24UNF, 1 LG, BLACK	8
35	000195-11	NUT, HEX, JAM, 5/8-11UNC, ZINC	4
36	012108-32	BEARING, FLANGE, 2-BOLT, 2 DIA BORE, HIGH TEMP	2
37	012372-14	HHCS, 5/8-11UNC, 1-3/4 LG, PLAIN BLACK FINISH	4
38	000493-12	WASHER, LOCK, 5/8 DIA, SPLIT, ZINC	4
39	000207-12	WASHER, FLAT, SAE, 5/8 DIA, 1-5/16 OD, 21/32 ID, ZINC	4

**Part #:** AGL-64-K3066-1**Appl #:****Assy #:** AGLD3065-1**BOM Rev:** B**Model #:****Rev:****Rev:** A**Date:** 1/2/2002**Description:** NIP ROLL ASSEMBLY, AGL6450 (BAUMER EYE)

Item:	Part #:	Description:	Qty:
40	000005-04	SHCS, #8-32UNC, 1/2 LG, BLACK	4
41	012378-04	SSS, BRASS TIP, 1/4-20UNC, 1/4" LG.	4
42	000035-06	SHCS, #10-32UNF, 3/4 LG, BLACK	4
43	000155-08	SSS, CUP PT, #10-32UNF, 1/2 LG, BLACK	4
44	000732-06	BUSHING, BRONZE, 3/8 ID, 1/2 OD, 3/4 LG	4
45	000055-03	BHSCS, #8-32UNC, 3/8 LG, BLACK	6
46	000553-06	PHMS, SLOTTED, #4-40UNC, 3/4 LG, ZINC	2
47	000207-01	WASHER, FLAT, SAE, #4 DIA, 5/16 OD, 1/8 ID, ZINC	4
48	000493-01	WASHER, LOCK, #4 DIA, SPLIT, ZINC	2
49	000201-01	NUT, HEX, #4-40UNC, ZINC	2
50	000009-17	SHCS, 1/4-20UNC, 2-1/4 LG, BLACK	12
51	000127-08	SSS, CUP PT, #8-32UNC, 1/2 LG, BLACK	2
52	012061-01	HEATER ASSY, AGL 6400/6450	2

THREADED ROD SHOULD  
EXTEND 1.00 OUT OF  
CYLINDER ROD.

THREADED ROD SHOULD  
EXTEND 1.00 OUT OF  
CYLINDER ROD.



**BREAK ALL SHARP EDGES**  
**DO NOT SCALE DWG.**



Advanced Greig Laminators, Inc.  
801 Burton Blvd.  
DeForest, WI 53532

**NIP ROLL ASSEMBLY**  
**AGL6450 (BAUMER EYE)**

A	ADDED SLIP RING GUARD	11-07-06	GFT	
REV NO.	DESCRIPTION	DATE	INT.	ECN

UNLESS OTHERWISE SPECIFIED	MAT'L: AGLK3066-1	FINISH:
0.00 +/-0.015		
0.000 +/-0.005		
ANGLES +/-5°		

JOB NO.	QTY.	DWG. BY	CHK BY	SCALE: 1/6 = 1	DWG. NO.	REV.
		GFT		DATE: 1-2-02	AGL-64-D3065-1	A

# Bill Of Material

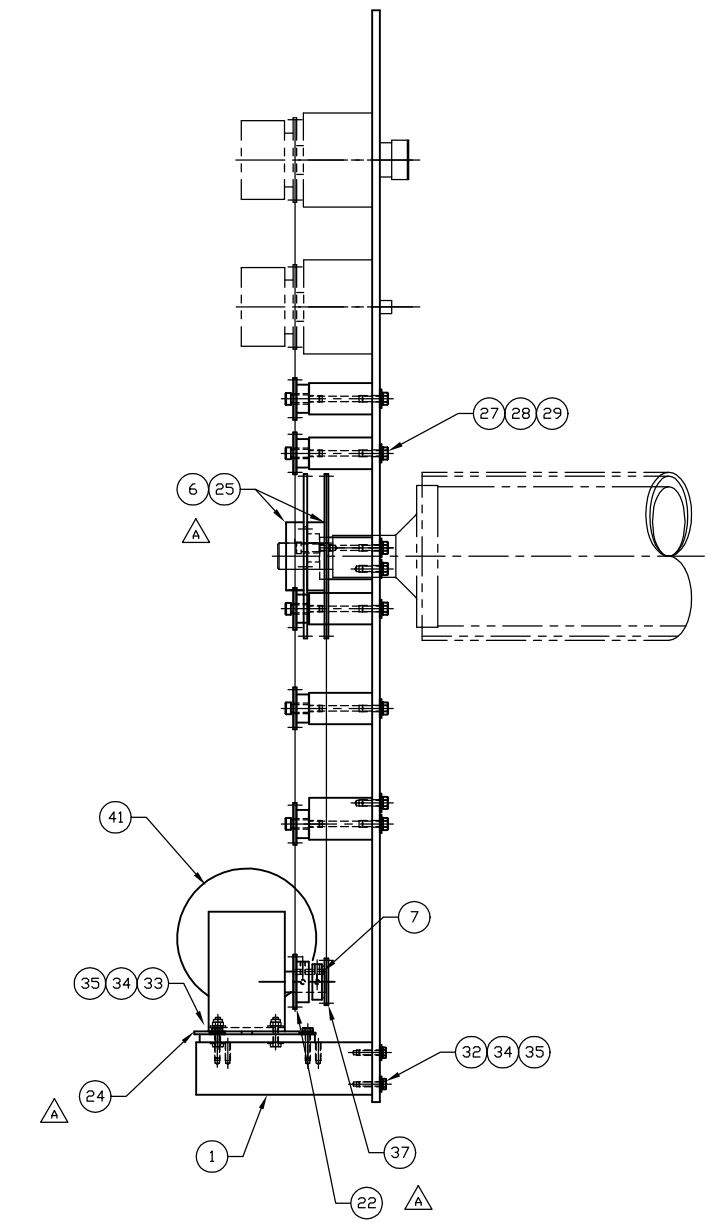
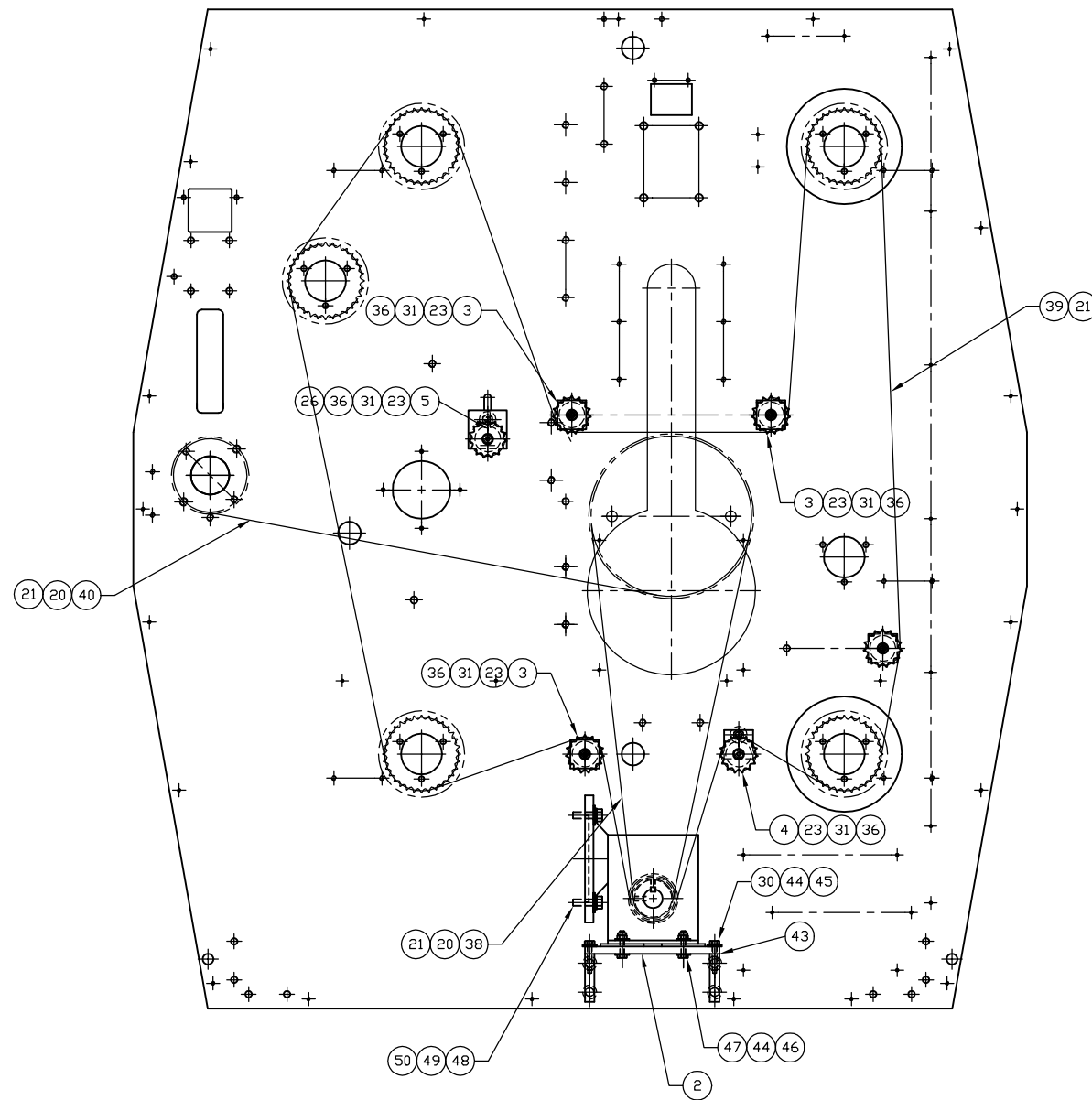
<b>Part #:</b> AGL-64-K1371-1	<b>Appl #:</b>	<b>Assy #:</b> AGLD1372-1	<b>BOM Rev:</b> B
<b>Model #:</b>	<b>Rev:</b>	<b>Rev:</b> A	<b>Date:</b> 1/4/2002
<b>Description:</b> DRIVE ASSEMBLY, AGL6450, 15 FPM			

Item:	Part #:	Description:	Qty:
1	AGL-64-B0046	MOTOR SUPPORT BAR	2
2	AGL-64-B0047	MOTOR MOUNTING PLATE	1
3	AGL-64-B0048-1	IDLER SPACER, 3.00 LG.	4
4	AGL-64-B0049-1	IDLER TENSIONER, 3.00 LG.	1
5	AGL-64-B0928-1	IDLER TENSIONER, 3.63 LG.	1
6	001330-14	KEY, 0.25 SQ, 1.75 LG, CRS	1
7	001330-17	KEY, 0.25 SQ, 2.13 LG, CRS	1
20	001275-01	CHAIN, #35, HALF LINK	2
21	001275	CHAIN, #35, CONNECTING LINK	3
22	001460-20	SPROCKET, 3/8 PITCH, 1 BORE, 20 TEETH	1
23	000912-15	SPROCKET, 3/8 PITCH, 0.50 DIA BORE, 15 TOOTH	6
24	012495-03	WASHER, RUBBER, 2.25 OD, X .38 ID, X .13 THICK	4
25	001401-70	SPROCKET, 3/8 PITCH, 1-1/4 BORE, 70 TEETH	2
27	012417-10	HHCS, 5/16-18UNC, 1-1/4 LG, BLACK OXIDE	8
28	012416-07	WASHER, FLAT, SAE, 5/16 DIA, 11/16 OD, 11/32 ID, BLACK OXIDE	8
29	012415-08	WASHER, LOCK, 8mm DIA, SPLIT, BLACK OXIDE	6
30	000337-08	HHCS, 1/4-20UNC, 1 LG, ZINC	4
31	000635-08	SHOULDER SCREW, 3/8 DIA, 1 LG (5/16-18UNC)	6
32	012418-10	HHCS, 1/4-20UNC, 1-1/4 LG, BLACK OXIDE	4
34	012416-06	WASHER, FLAT, SAE, 1/4 DIA, 5/8 OD, 9/32 ID, BLACK OXIDE	4
35	012415-06	WASHER, LOCK, 6mm DIA, SPLIT, BLACK OXIDE	4
36	000732-06	BUSHING, BRONZE, 3/8 ID, 1/2 OD, 3/4 LG	6
37	001460-16	SPROCKET, 3/8 PITCH, 1 BORE, 16 TEETH	1
38	001461	CHAIN, #35, 147 PITCHES	1
39	001479	CHAIN, #35, 435 PITCHES	1
40	012141-180	CHAIN, #35, 180 PITCHES	1
41	012022-01	GEAR BOX, 60:1,56C, WITH SINGLE OUTPUT SHAFT	1
42	012022-04	NOW PURCHASED AS PART OF #012022-01	1



**Part #:** AGL-64-K1371-1**Appl #:****Assy #:** AGLD1372-1**BOM Rev:** B**Model #:****Rev:****Rev:** A**Date:** 1/4/2002**Description:** DRIVE ASSEMBLY, AGL6450, 15 FPM

Item:	Part #:	Description:	Qty:
43	012214-04	WASHER, RUBBER, 1/4 ID. X 5/8 OD.	4
44	000207-06	WASHER, FLAT, SAE, 1/4 DIA, 5/8 OD, 9/32 ID, ZINC	12
45	000493-06	WASHER, LOCK, 1/4 DIA, SPLIT, ZINC	4
46	000651-05	NUT, HEX, NYLOCK, 1/4-20UNC, ZINC	4
47	000337-10	HHCS, 1/4-20UNC, 1-1/4 LG, ZINC	4
48	000343-17	HHCS, 3/8-16UNC, 2-1/4 LG, ZINC	4
49	000207-08	WASHER, FLAT, SAE, 3/8 DIA, 13/16 OD, 13/32 ID, ZINC	4
50	000493-08	WASHER, LOCK, 3/8 DIA, SPLIT, ZINC	4



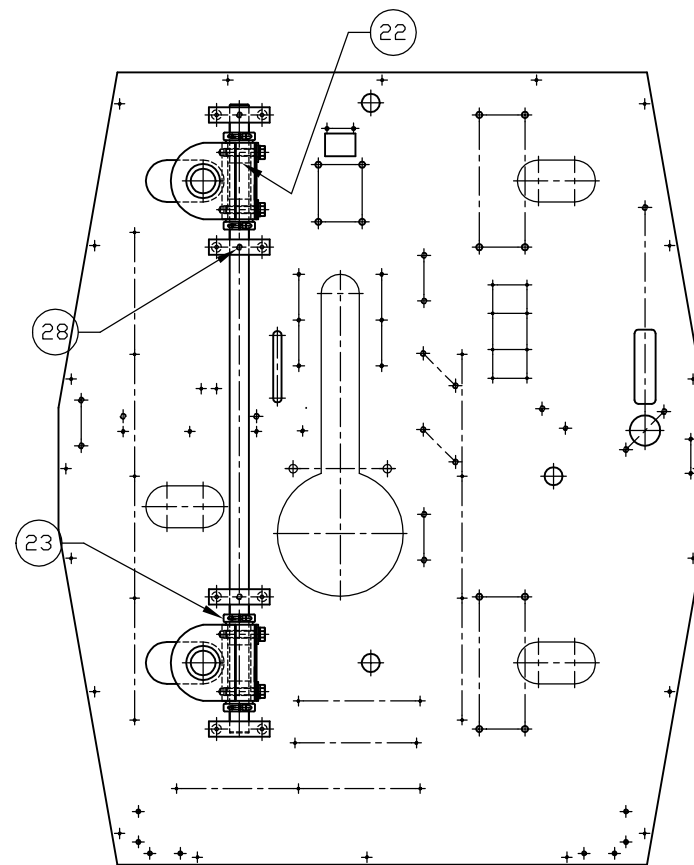
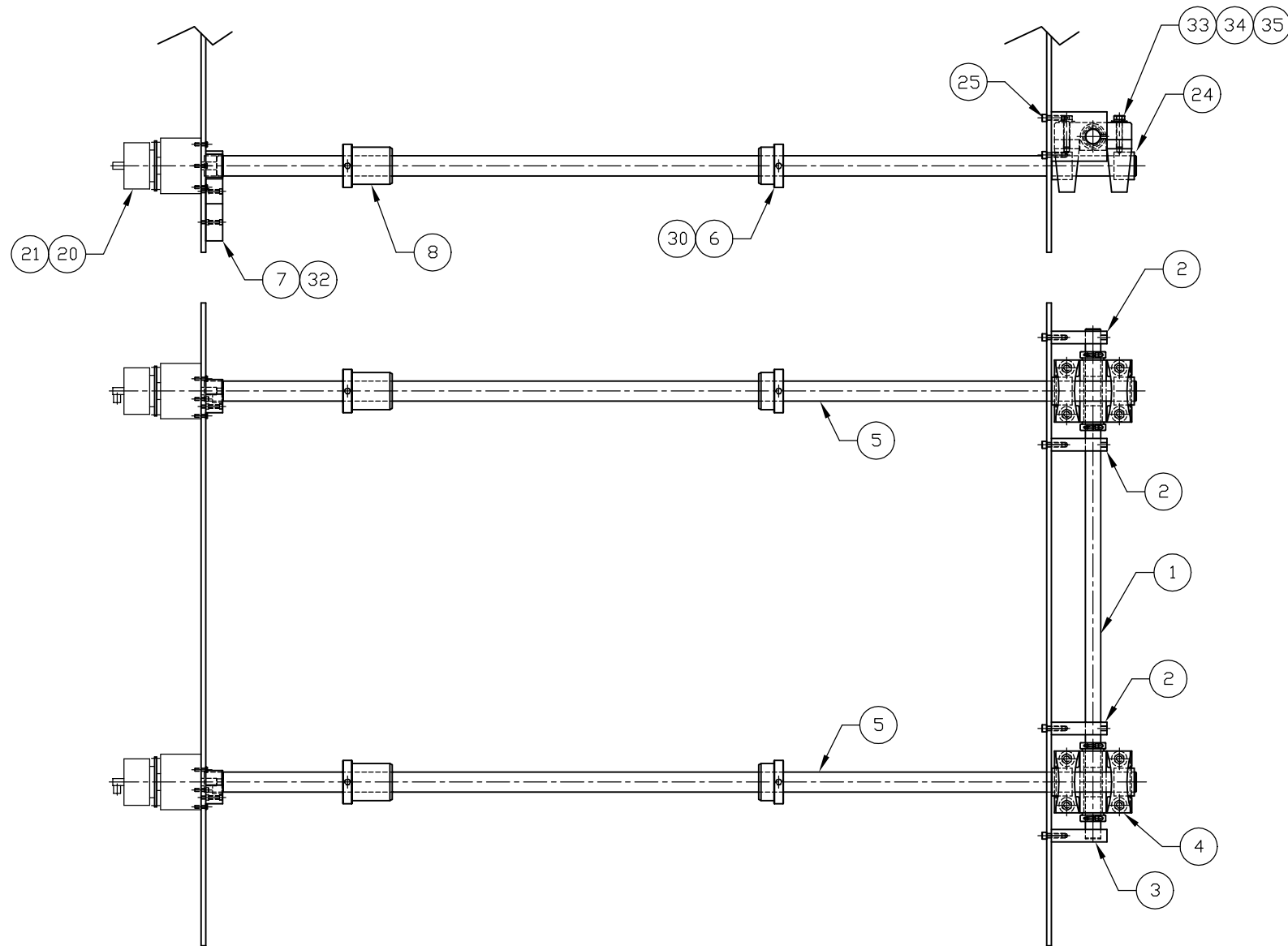
A	ADDED RUBBER WASHERS, REVISED TO 15FPM	11-7-06	GFT	
REV. NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES				AGL Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532			
DO NOT SCALE DWG.							
UNLESS OTHERWISE SPECIFIED		MATERIAL AGLK1371-1		DRIVE ASSEMBLY , AGL6450 (PNEUMATIC COUPLER)			
0.00 +/-0.015 0.000 +/-0.005		FINISH:		SCALE: 1/4" = 1"		DWG. NO.	
ANGLES +/- .5°		JOB NO. QTY. DWG. BY. CHK. BY		DATE: 1-4-02		AGL-64-D1372-1	
		GFT				REV. A	

# Bill Of Material


**Part #:** AGL-64-K0043-1      **Appl #:**      **Assy #:** AGLC0042-1      **BOM Rev:** B  
**Model #:**      **Rev:**      **Rev:** -      **Date:** 12/19/2001  
**Description:** FRONT UNWIND/WINDUP STATION ASSEMBLY, AGL6400

Item:	Part #:	Description:	Qty:
1	AGL-64-B0003	VERTICAL SHAFT, CANTILEVERED UNWIND	1
2	AGL-64-B0004	SHAFT BRACE, CANTILEVERED UNWIND	3
3	AGL-64-B0005	SHAFT SUPPORT, CANTILEVERED UNWIND	1
4	AGL-64-B0940	MAIN PIVOT BLOCK	2
5	AGL-64-B0007	UNWIND SHAFT	2
6	AGL-64-B0044	CORE COLLAR	2
7	AGL-64-B2070	RAMP, UNWIND/WINDUP	2
8	AGL-XX-B2917-1	CORE HOLDER, 1-5/8 BORE (ENCORE)	2
20	012115-05	BRAKE / CLUTCH COMBO, PNEUMATIC COUPLER	2
21	000059-07	BHSCS, 1/4-20UNC, 7/8 LG, BLACK	6
22	001356-12	BUSHING, FLANGED, BRONZE, 1 1/4 ID., 1 1/2 OD, 1 1/2 LG	4
23	000411-20	COLLAR, SHAFT, 1.25 DIA BORE, 1/2 WIDE	4
24	001355-26	BEARING, TAPPED BASE, 1 5/8 BORE	4
25	000013-10	SHCS, 3/8-16UNC, 1-1/4 LG, BLACK	8
28	000135-08	SSS, CUP PT, 3/8-16UNC, 1/2 LG, BLACK	3
30	012265-06	SSS, NYLON TIPPED, 1/2-13UNC, 3/4 LG. BLACK	2
32	000009-12	SHCS, 1/4-20UNC, 1-1/2 LG, BLACK	4
33	000349-17	HHCS, 1/2-13UNC, 2-1/4 LG, ZINC	8
34	000207-10	WASHER, FLAT, SAE, 1/2 DIA, 1-1/16 OD, 17/32 ID, ZINC	8
35	000493-10	WASHER, LOCK, 1/2 DIA, SPLIT, ZINC	8



REV NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES				
DO NOT SCALE DWG.				
UNLESS OTHERWISE SPECIFIED		MAT'L: AGLK0043-1		
0.00 +/-0.015		FINISH:		
0.000 +/-0.005		JOB NO. QTY. DWG. BY. CHK BY		
ANGLES +/- .5°		GFT		

 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532			
FRONT UNWIND/WIND-UP STATION AGL 6400			
SCALE: 1/8" = 1"		DWG. NO.	
DATE: 12-19-01		AGL-64-C0042-1	
REV.		REV.	

# Bill Of Material

**Part #:** AGL-64-K0041-1

**Appl #:**

**Assy #:** AGLC0040-1

**BOM Rev:** B

**Model #:**

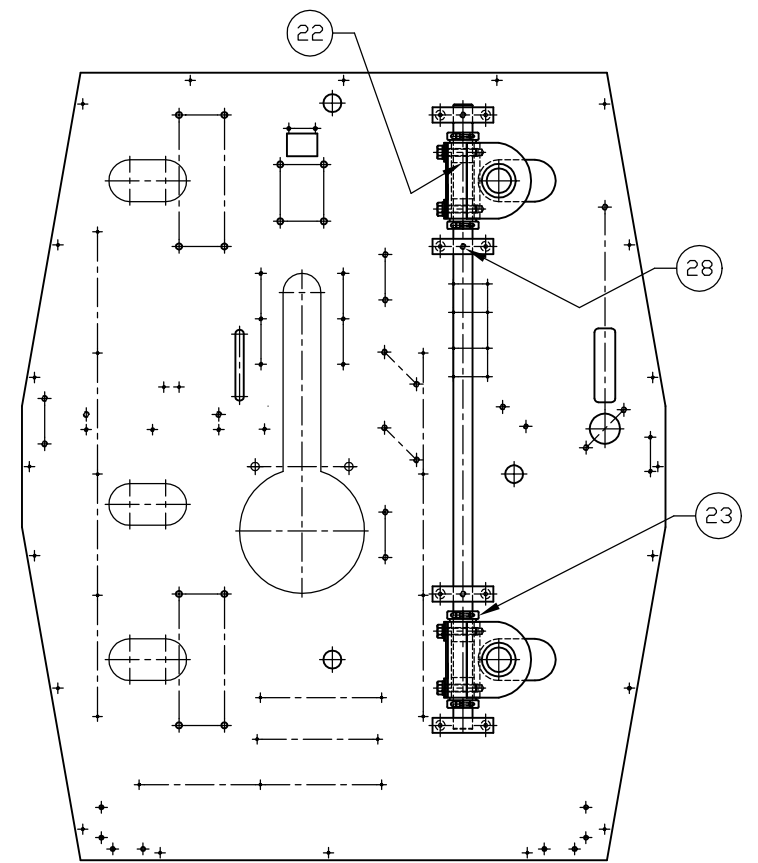
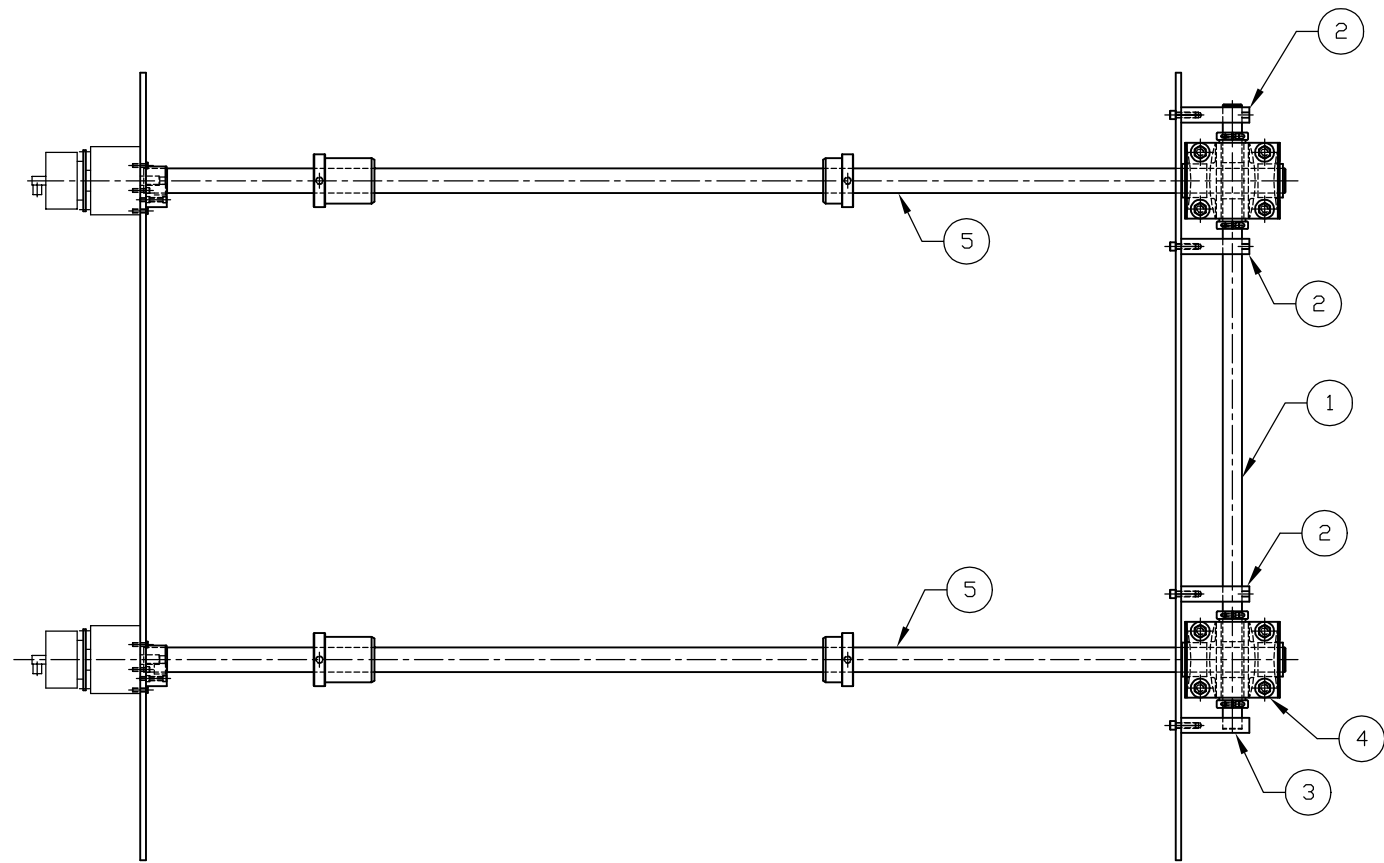
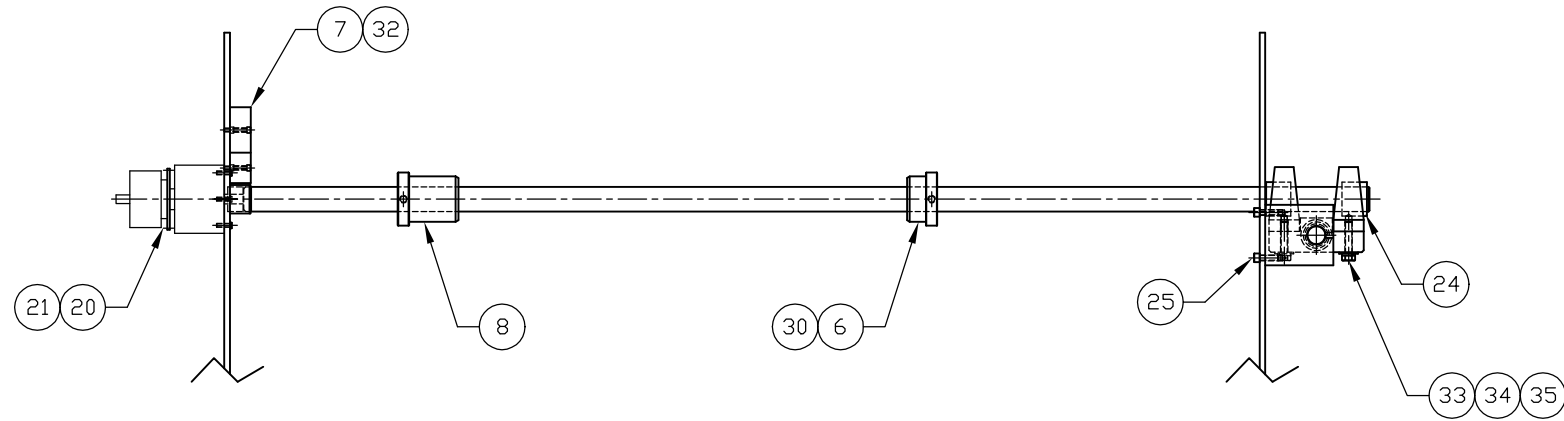
**Rev:**

**Rev:** -


**Date:** 12/19/2001

**Description:** REAR UNWIND/WINDUP STATION ASSEMBLY, AGL6400

Item:	Part #:	Description:	Qty:
1	AGL-64-B0003	VERTICAL SHAFT, CANTILEVERED UNWIND	1
2	AGL-64-B0004	SHAFT BRACE, CANTILEVERED UNWIND	3
3	AGL-64-B0005	SHAFT SUPPORT, CANTILEVERED UNWIND	1
4	AGL-64-B0940	MAIN PIVOT BLOCK	2
5	AGL-64-B0007	UNWIND SHAFT	2
6	AGL-64-B0044	CORE COLLAR	2
7	AGL-64-B2070	RAMP, UNWIND/WINDUP	2
8	AGL-XX-B2917-1	CORE HOLDER, 1-5/8 BORE (ENCORE)	2
20	012115-05	BRAKE / CLUTCH COMBO, PNEUMATIC COUPLER	2
21	000059-07	BHSCS, 1/4-20UNC, 7/8 LG, BLACK	6
22	001356-12	BUSHING, FLANGED, BRONZE, 1 1/4 ID., 1 1/2 OD, 1 1/2 LG	4
23	000411-20	COLLAR, SHAFT, 1.25 DIA BORE, 1/2 WIDE	4
24	001355-26	BEARING, TAPPED BASE, 1 5/8 BORE	4
25	000013-10	SHCS, 3/8-16UNC, 1-1/4 LG, BLACK	8
28	000135-08	SSS, CUP PT, 3/8-16UNC, 1/2 LG, BLACK	3
30	012265-06	SSS, NYLON TIPPED, 1/2-13UNC, 3/4 LG. BLACK	2
32	000009-12	SHCS, 1/4-20UNC, 1-1/2 LG, BLACK	4
33	000349-17	HHCS, 1/2-13UNC, 2-1/4 LG, ZINC	8
34	000207-10	WASHER, FLAT, SAE, 1/2 DIA, 1-1/16 OD, 17/32 ID, ZINC	8
35	000493-10	WASHER, LOCK, 1/2 DIA, SPLIT, ZINC	8



REV NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES					 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532			
DO NOT SCALE DWG.								
UNLESS OTHERWISE SPECIFIED		MAT'L: AGLK0041-1			REAR UNWIND/WIND-UP STATION AGL 6400			
		FINISH:						
0.00 +/-0.015 0.000 +/-0.005		JOB NO.	QTY.	DWG. BY.	CHK BY.	SCALE: 1/8" = 1	DWG. NO. AGL-64-C0040-1	REV.
ANGLES +/- .5°				GFT		DATE: 12-19-01		

# Bill Of Material

**Part #:** AGL-64-K0086

**Appl #:**

**Assy #:** AGLD0085

**BOM Rev:** G

**Model #:**

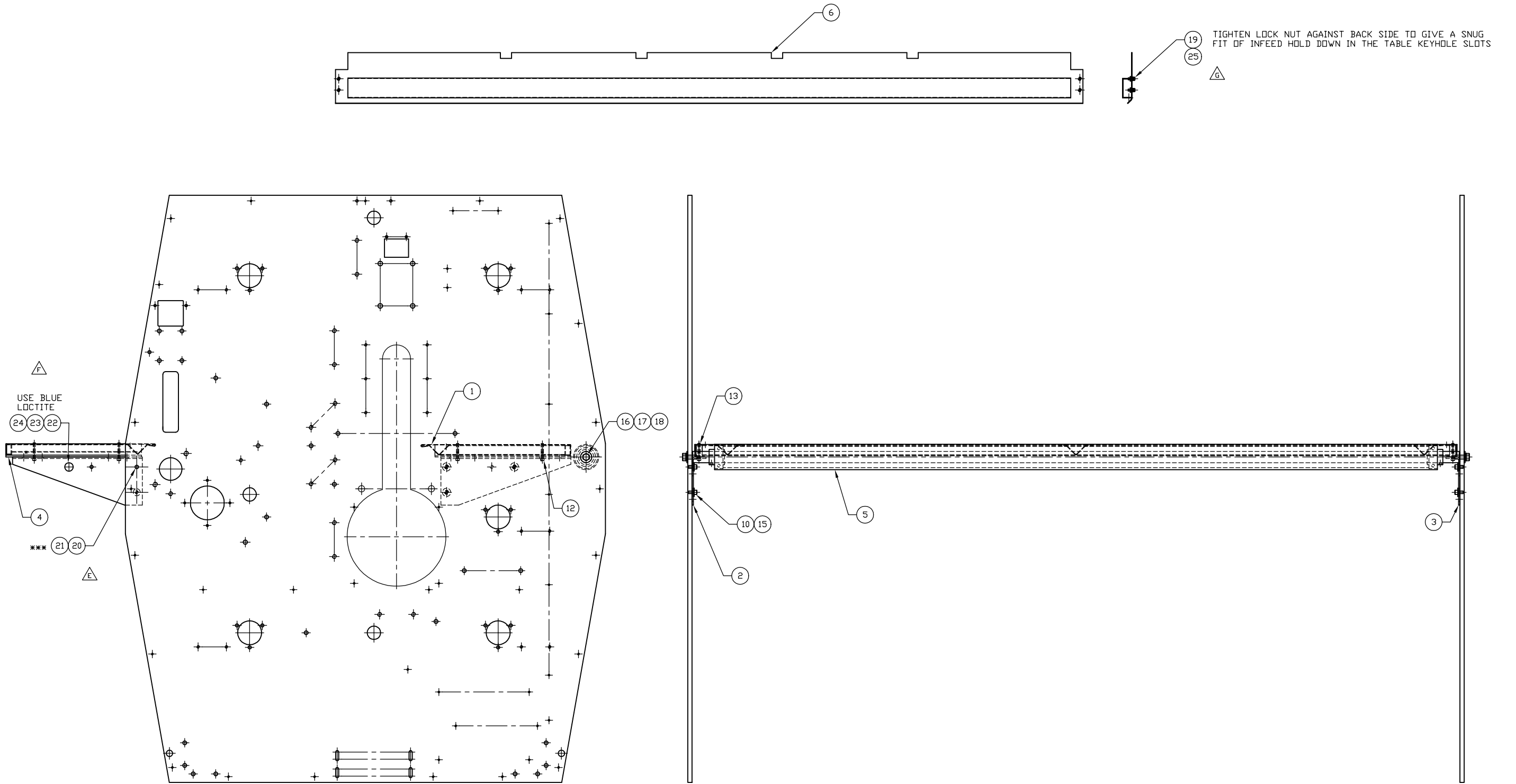
**Rev:**

**Rev:** G


**Date:** 5/19/1999

**Description:** INFEED/OUTFEED TABLE ASSY

Item:	Part #:	Description:	Qty:
1	AGL-64-C0955-01	INFEED TABLE, REMOVABLE (LIGHT GREY)	2
2	AGL-64-B0082-01	TABLE SUPPORT, RIGHT HAND (LIGHT GREY)	2
3	AGL-64-B0083-01	TABLE SUPPORT, LEFT HAND (LIGHT GREY)	2
4	AGL-64-B0923	MOUNTING ENDS, OUTFEED TABLE	4
5	AGL-64-B0992	IDLER ROLLER SUB ASSY	1
6	AGL-64-C2904-01	INFEED HOLD DOWN, 64/6400 SERIES (LIGHT GREY)	1
10	000009-04	SHCS, 1/4-20UNC, 1/2 LG, BLACK	10
12	000007-04	SHCS, #10-24UNC, 1/2 LG, BLACK	8
13	000129-08	SSS, CUP PT, #10-24UNC, 1/2 LG, BLACK	8
15	000207-06	WASHER, FLAT, SAE, 1/4 DIA, 5/8 OD, 9/32 ID, ZINC	6
16	000343-08	HHCS, 3/8-16UNC, 1 LG, ZINC	2
17	000207-08	WASHER, FLAT, SAE, 3/8 DIA, 13/16 OD, 13/32 ID, ZINC	2
18	000493-08	WASHER, LOCK, 3/8 DIA, SPLIT, ZINC	2
19	000055-04	BHSCS, #8-32UNC, 1/2 LG, BLACK	4
20	012362-01	PIN, QUICK RELEASE, 5/16 DIA, 0.8 LG	2
21	012029-03	LANYARD, QUICK RELEASE PIN, 6" LG., MTG. TAB	2
22	001411-01	BUMPER, ROUND, 3/4 DIA x 7/16 LG #8-32UNC MALE	1
23	000201-03	NUT, HEX, #8-32UNC, ZINC	1
24	000207-03	WASHER, FLAT, SAE, #8 DIA, 7/16 OD, 3/16 ID, ZINC	1
25	000651-03	NUT, HEX, NYLOCK, #8-32UNC, ZINC	8



⚠ \*\*\* DRILL 9/32 HOLE IN BRACKETS OUT TO 5/16 DIA.

G	ADDED #25	8-22-07	GFT		<b>BREAK ALL SHARP EDGES</b> <b>DO NOT SCALE DWG.</b>				 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532		
F	ADDED 22,23,24	9-23-04	GFT								
E	ADDED 20 & 21 AND NOTE	6-14-02	GFT		UNLESS OTHERWISE SPECIFIED 0.00 +/-0.015 0.000 +/-0.005 ANGLES +/-5°				INFEED/OUTFEED TABLE ASSEMBLY		
D	ADDED INFEED HOLD DOWN TO DRAWING	7-6-00	GFT	2059							
C	REMOVED ROLLER SUPPORTS, USED NEW IDLER ROLLER	5-19-99	GFT		MAT'L: AGLK0086				FINISH:		
B	REVISED TO SHOW NEW REMOVABLE TABLE	7-17-98	GFT		JOB NO. QTY. DWG. BY: GFT						
A	REVISED AFTER PROTOTYPE MARKUPS	2-13-98	GFT		SCALE: 1/4" = 1"				DWG. NO. AGL-64-D0085		
REV NO.	DESCRIPTION	DATE	INT.	ECN	DATE: 8-21-97						
									REV. G		



# Bill Of Material

<b>Part #:</b> AGL-64-K0918-3	<b>Appl #:</b>	<b>Assy #:</b> AGLC0917-3	<b>BOM Rev:</b> F
<b>Model #:</b>	<b>Rev:</b>	<b>Rev:</b> A	<b>Date:</b> 4/18/2002
<b>Description:</b> PULL ROLL ASSEMBLY, AGL6400 (SENSORS INSIDE)			

Item:	Part #:	Description:	Qty:
1	AGL-64-B0842-4	UPPER PULL ROLL, SUB ASSY, 45-55 DUR. SILICONE	1
2	AGL-64-B0913-1	STOP, CYLINDER, TAPPED	2
3	AGL-64-B0072-1	PULL ROLL GUIDE BLOCK, INSIDE SENSORS	2
4	AGL-64-B0018-1	LOWER PULL ROLL, 60-70 SILICONE	1
5	001317-16	KEY, 0.188 SQ, 2.00 LG, CRS	1
6	AGL-64-B4388-2	SENSOR BRACKET, RH. AGL64R/64i	1
7	AGL-64-B0915	SHIM WHEEL SUPPORT	2
8	AGL-64-B0015	SHIM WHEEL	2
9	AGL-64-B1331-1	EYEBOLT MODIFICATION (ALTER FASTENAL #44428)	1
10	AGL-64-B4388-1	SENSOR BRACKET, LH. AGL64R/64i	1
20	000011-06	SHCS, 5/16-18UNC, 3/4 LG, BLACK	8
21	012378-04	SSS, BRASS TIP, 1/4-20UNC, 1/4" LG.	4
23	000346-08	HHCS, 7/16-14UNC, 1 LG, ZINC	4
24	000493-09	WASHER, LOCK, 7/16 DIA, SPLIT, ZINC	4
25	000198-07	NUT, HEX, JAM, 3/8-24UNF, ZINC	2
26	000131-08	SSS, CUP PT, 1/4-20UNC, 1/2 LG, BLACK	2
27	000764-16	BEARING, FLANGE, 2-BOLT, 1.00 DIA BORE	2
28	012255-07	CLUTCH, PNEUMATIC, 32 TOOTH INPUT, 7/8 BORE, LOCO PADS	1
29	000009-08	SHCS, 1/4-20UNC, 1 LG, BLACK	1
30	000195-07	NUT, HEX, JAM, 3/8-16UNC, ZINC	1
31	000055-04	BHSCS, #8-32UNC, 1/2 LG, BLACK	4
32	000573-06	PHMS, PHILLIPS, #4-40UNC, 3/4 LG, ZINC	2
33	000007-06	SHCS, #10-24UNC, 3/4 LG, BLACK	4
34	001392-15	PLUNGER, SPRING, LEP, 3/8-16UNC, 5/8 LG	2
35	000732-06	BUSHING, BRONZE, 3/8 ID, 1/2 OD, 3/4 LG	4
36	000289-16	PIN, DOWEL, 3/8 DIA, 2 LG	2
37	000129-06	SSS, CUP PT, #10-24UNC, 3/8 LG, BLACK	2
38	001350-07	WASHER, FLAT, USS, 5/16 DIA, 7/8 OD, 3/8 ID, ZINC	2

**Part #:** AGL-64-K0918-3

**Appl #:**

**Assy #:** AGLC0917-3

**BOM Rev:** F

**Model #:**

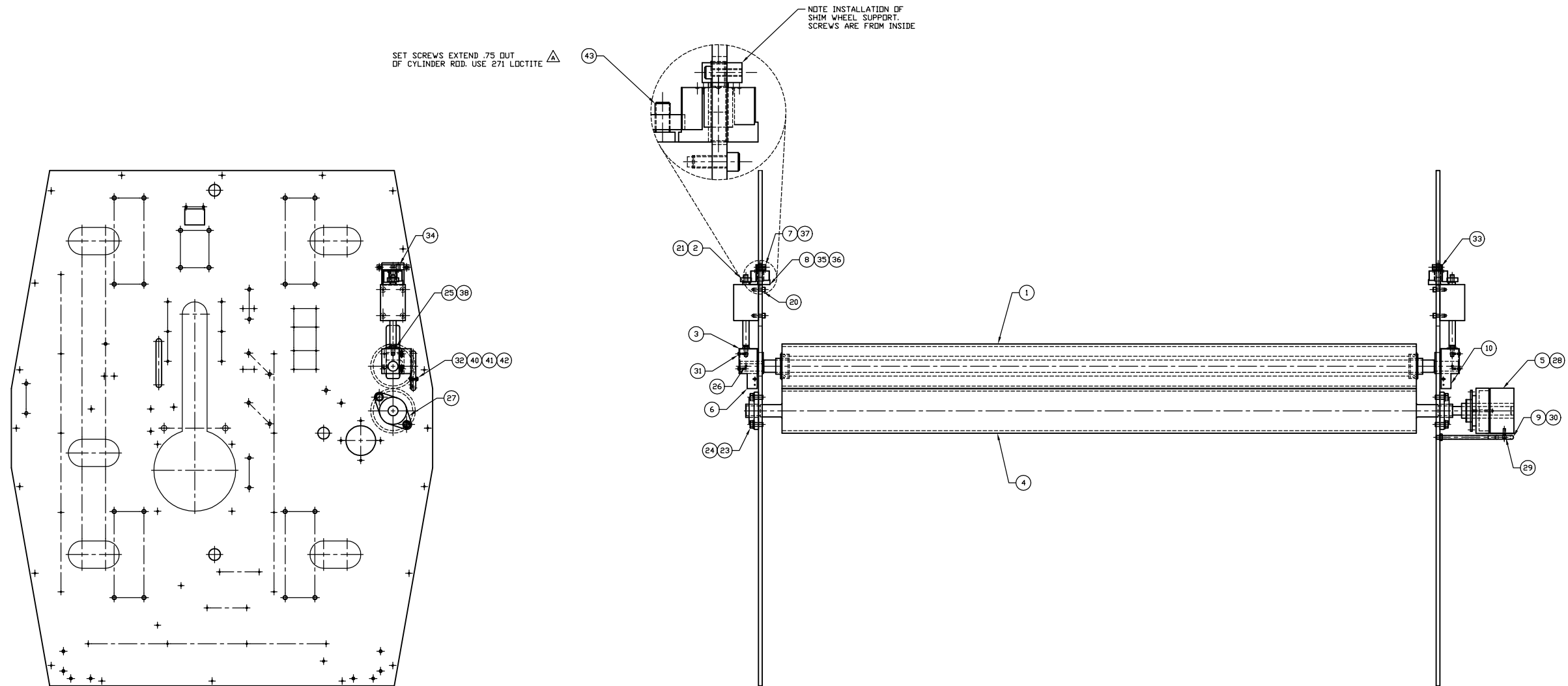
**Rev:**

**Rev:** A


**Date:** 4/18/2002

**Description:** PULL ROLL ASSEMBLY, AGL6400 (SENSORS INSIDE)

Item:	Part #:	Description:	Qty:
40	000493-01	WASHER, LOCK, #4 DIA, SPLIT, ZINC	2
41	000207-01	WASHER, FLAT, SAE, #4 DIA, 5/16 OD, 1/8 ID, ZINC	4
42	000201-01	NUT, HEX, #4-40UNC, ZINC	2
43	000161-24	SSS, CUP PT, 3/8-24UNF, 1-1/2 LG, BLACK	4



A	ADDED #43	2-2-05	GFT	
REV NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES				 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532			
DO NOT SCALE DWG.							
UNLESS OTHERWISE SPECIFIED		MAT'L: AGLK0918-3		PULL ROLL ASSEMBLY AGL6400 (SENSORS INSIDE)			
		FINISH:					
0.00 +/-0.015	JOB NO.	QTY.	DWG. BY.	CHK BY.	SCALE: 1/8" = 1	DWG. NO.	REV.
0.000 +/-0.005			GFT		DATE: 4-18-02	AGL-64-C0917-3	A
ANGLES +/- .5°							

# Bill Of Material

**Part #:** AGL-64-K1367

**Appl #:**

**Assy #:** AGLC1368

**BOM Rev:** A

**Model #:**

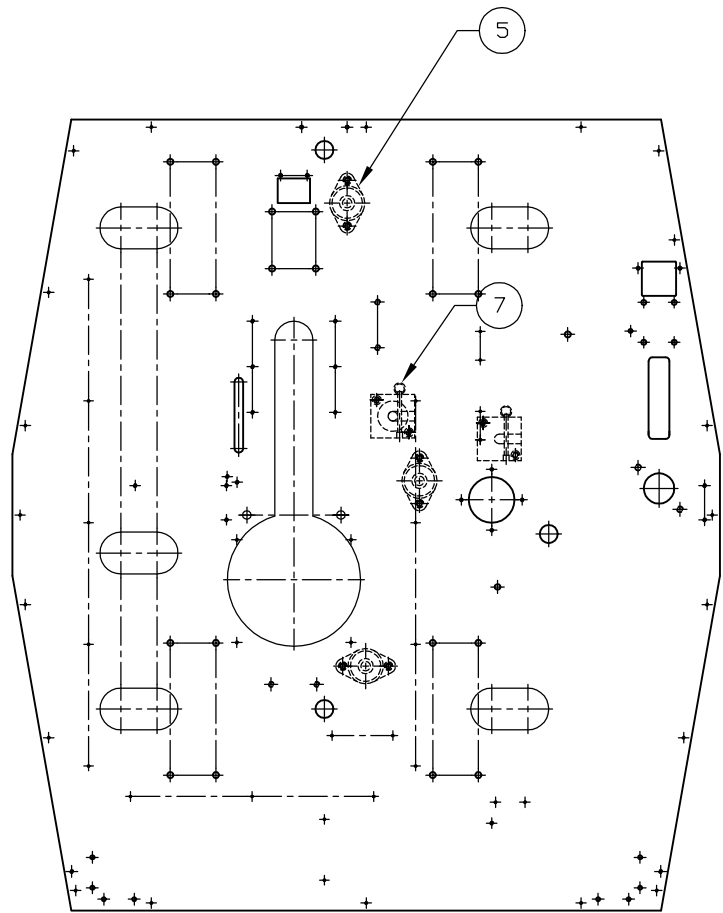
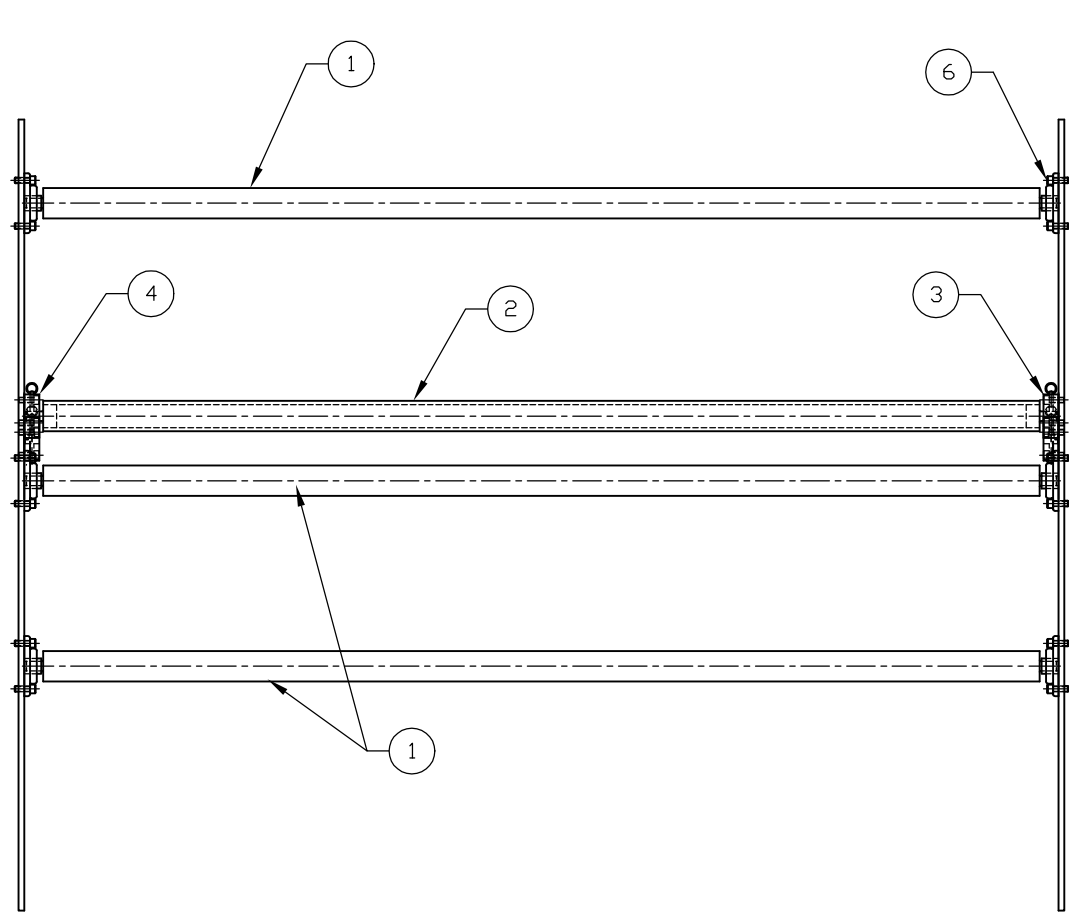
**Rev:**

**Rev:** B


**Date:** 5/19/1999

**Description:** IDLER ROLLER ASSY, AGL6450

Item:	Part #:	Description:	Qty:
1	AGL-64-B0029	IDLER ROLLER	3
2	AGL-64-B2130	MOVABLE IDLER, AGL6450	1
3	AGL-64-B2018	BEARING BLOCK, LH. , AGL6450	2
4	AGL-64-B2019	BEARING BLOCK, RH. , AGL6450	2
5	001459-10	BEARING, FLANGE, 2-BOLT, 5/8 DIA BORE	6
6	000013-08	SHCS, 3/8-16UNC, 1 LG, BLACK	20
7	012133-01	PIN, QUICK RELEASE, 1/4 DIA. x 2.5 LG.	4



B	REVISED LOCATION OF IDLERS	1-18-01	GFT	
A	REVISED TO MOVABLE TYPE IN CENTER	5-19-99	GFT	
REV NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES				 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532				
DO NOT SCALE DWG.								
UNLESS OTHERWISE SPECIFIED		MAT'L: AGLK1367		IDLER ROLLER ASSEMBLY AGL 6450				
		FINISH:						
0.00 +/-0.015 0.000 +/-0.005		JOB NO.	QTY.	DWG. BY: GFT	CHK BY:	SCALE: 1/8" = 1"	DWG. NO. AGL-64-C1368	REV. B
ANGLES +/- .5°						DATE: 8-6-98		

# Bill Of Material

**Part #:** AGL-64-K1385-4      **Appl #:**      **Assy #:**      **BOM Rev:** B  
**Model #:**      **Rev:**      **Rev:**      **Date:** 11/15/2006  
**Description:** ELECTRICAL ASSEMBLY, AGL6450, UL STD 2006

Item:	Part #:	Description:	Qty:
0	AGL-64-D3377-1	CONTROL SCHEMATIC, AGL6450, UL STD 2006	REF.
1	AGL-64-A3543	TERMINAL MARKER, AGL6450	1
2	AGL-64-C1107	SUBPANEL	1
6	002506	SWITCH ASSY, PUSHBUTTON, E-STOP	4
7	002510-02	SWITCH, PB, MAINT., LIGHTED, 1NC-1NO, 24V, AMBER	2
8	002318-06	SWITCH, PUSHBUTTON, FLUSH, 1NC, RED	2
10	002318-02	SWITCH, PUSHBUTTON, FLUSH, 1NO, BLACK	3
11	001998-03	CONTROLLER, MOTOR, 240V INPUT, 90 or 180VDC OUTPUT	1
12	001625-04	CONTROLLER, TEMP, THERMOCOUPLE, PULSED, ALARM	2
13	001623-50	RELAY, 50A, 240V, 1-PHASE	4
14	002728-01	EMITTER, SERIES 10	2
15	002427-04	SWITCH, FOOT, SPDT, MTD. IN GUARD, 16' CABLE	2
18	002339-02	CLIP, HOLD-DOWN, RELAY SOCKET	3
19	001569-060	CIRCUIT BREAKER, CLASS 720, 2 POLE, 240V, 60A	1
20	002099-10	LABEL, .50 x 1.50, VINYL, SELF LAMINATING	200
21	001883-05	TERMINAL BLOCK, 35MM, 10-26 AWG, GRAY, UK5N 12K5521	55
22	001879-01	DIN RAIL, 35MM WIDE, 7.5MM HIGH, 2 MT LG, NS35/7.5	28
23	000716-00	WIRE, STRANDED, 16 AWG, BLACK	45
24	000719-00	WIRE, STRANDED, 10 AWG, BLACK	50
25	002324-01	SWITCH, KNOB, 2 POS, 1NO	5
26	001153-05	CORD GRIP, BELL-MOUTH, BLACK, 5/8" MTG HOLE	2
27	001089-01	CABLE TIE, NYLON, WHITE, 4" LG	50
28	001090-01	CABLE TIE, MOUNT, ADHESIVE-BACKED, 3/4" SQ	50
29	001876-10	TERMINAL BLOCK, GND, 35MM, 8-20 AWG, USLKG10 29C3451	7
30	002544-02	WIRE, THERMOCOUPLE, TYPE J, #20AWG,SHIELDED, 1000 FT ROLL	30
31	002337-04	SOCKET, RELAY, 8-PIN, DIN RAIL MTG	2
32	001886-01	BAR, JUMPER, 10-POS, #FB10-6 ( 10 pcs.per bag)	1
33	002696-02	MOTOR, PERM MAGNET, 180VDC, 1/2 HP, 1750 RPM	1

<b>Part #:</b> AGL-64-K1385-4	<b>Appl #:</b>	<b>Assy #:</b>	<b>BOM Rev:</b> B
<b>Model #:</b>	<b>Rev:</b>	<b>Rev:</b>	<b>Date:</b> 11/15/2006

**Description:** ELECTRICAL ASSEMBLY, AGL6450, UL STD 2006

Item:	Part #:	Description:	Qty:
34	000720-00	WIRE, STRANDED, MTW, 6 AWG, BLACK	20
36	001089-02	CABLE TIE, NYLON, WHITE, 5.5" LG	15
37	001090-02	CABLE TIE, MOUNT, ADHESIVE-BACKED, 1" SQ	15
38	001875-01	FUSE HOLDER, TERMINAL BLOCK, 35MM MTG, (NOW INCLUDES 001881-01)	6
39	001881-01	NOW PURCHASED AS PART OF 001875-01	6
40	001882-01	FUSE HOLDER, TERMINAL BLOCK, 6-20 AWG, UK 10.3 HESi, 30A	6
41	001530-070	FUSE, SLO-BLO, 7.0A, 250V, 1/4X1-1/4"	2
42	006113-030	FUSE, FAST-BLO, 30A, 600V, CC RATED, 13/32x1-1/2"	4
43	002507-04	END COVER, TERMINAL BLOCK, D-UK4/10	2
44	002542-04	SLIP RING, 5 POLE, 3@45A, 2@2A, 2 BORE	2
45	002728-02	RECEIVER, SERIES 10	2
46	001504-03	TERMINAL, MALE, INSULATED, w/INSUL GRIP, 12-10 AWG	8
47	001503-02	TERMINAL, FEMALE, INSULATED, w/INSUL GRIP, 16-14 AWG	9
48	001509-08	TERMINAL, RING, INSULATED, BRAZED SEAM, 12-10 AWG, #10 STUD	8
49	001509-07	TERMINAL, RING, INSULATED, BRAZED SEAM, 16-14 AWG, #6 STUD	12
50	000557-03	PHMS, SLOTTED, #8-32UNC, 3/8 LG, ZINC	8
51	000559-03	PHMS, SLOTTED, #10-24UNC, 3/8 LG, ZINC	4
52	000577-02	PHMS, PHILLIPS, #8-32UNC, 1/4 LG, ZINC	32
53	002509-60	CONTACTOR, 3-POLE, 70A, 220V, 1 AUX	1
54	002512-01	LEGEND, HIGH VOLTAGE	2
55	002511-01	ALARM, PANEL MTG, 3-28VDC	1
56	002448-02	CORD GRIP, LIQUID-TIGHT, 1" NPT, 0.71-0.98 DIA, BLK	1
57	001966	LUG, GROUNDING, 1/0-14AWG	1
58	001006-08	NUT, LOCK, CONDUIT, 1"	1
59	000337-04	HHCS, 1/4-20UNC, 1/2 LG, ZINC	1
60	000493-06	WASHER, LOCK, 1/4 DIA, SPLIT, ZINC	1
61	002728-03	CABLE, SERIES 10, 2M LG.	2
62	001826-11	POWER SUPPLY, SINGLE, 24VDC, 1.0A	1
63	000715-00	WIRE, STRANDED, 18 AWG, BLACK	500

<b>Part #:</b> AGL-64-K1385-4	<b>Appl #:</b>	<b>Assy #:</b>	<b>BOM Rev:</b> B
<b>Model #:</b>	<b>Rev:</b>	<b>Rev:</b>	<b>Date:</b> 11/15/2006

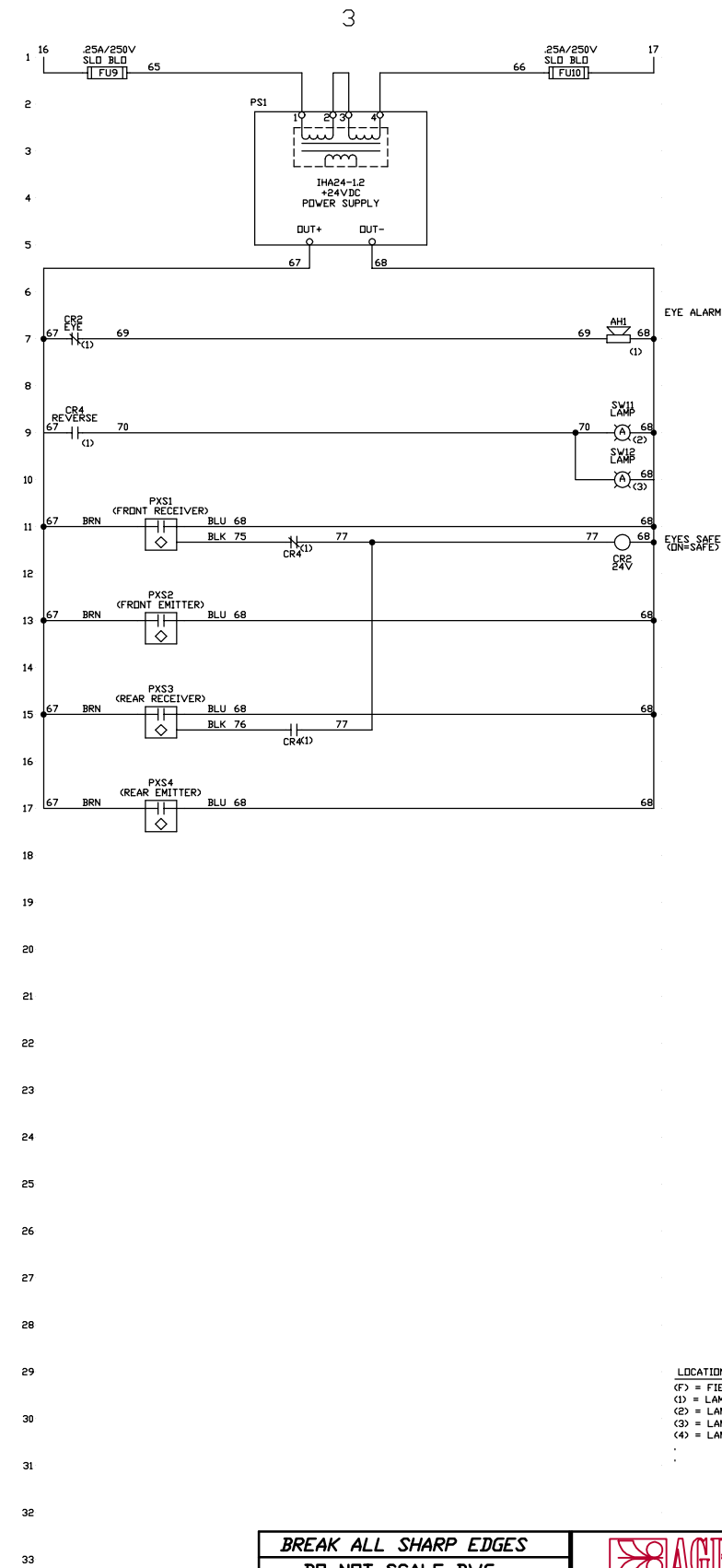
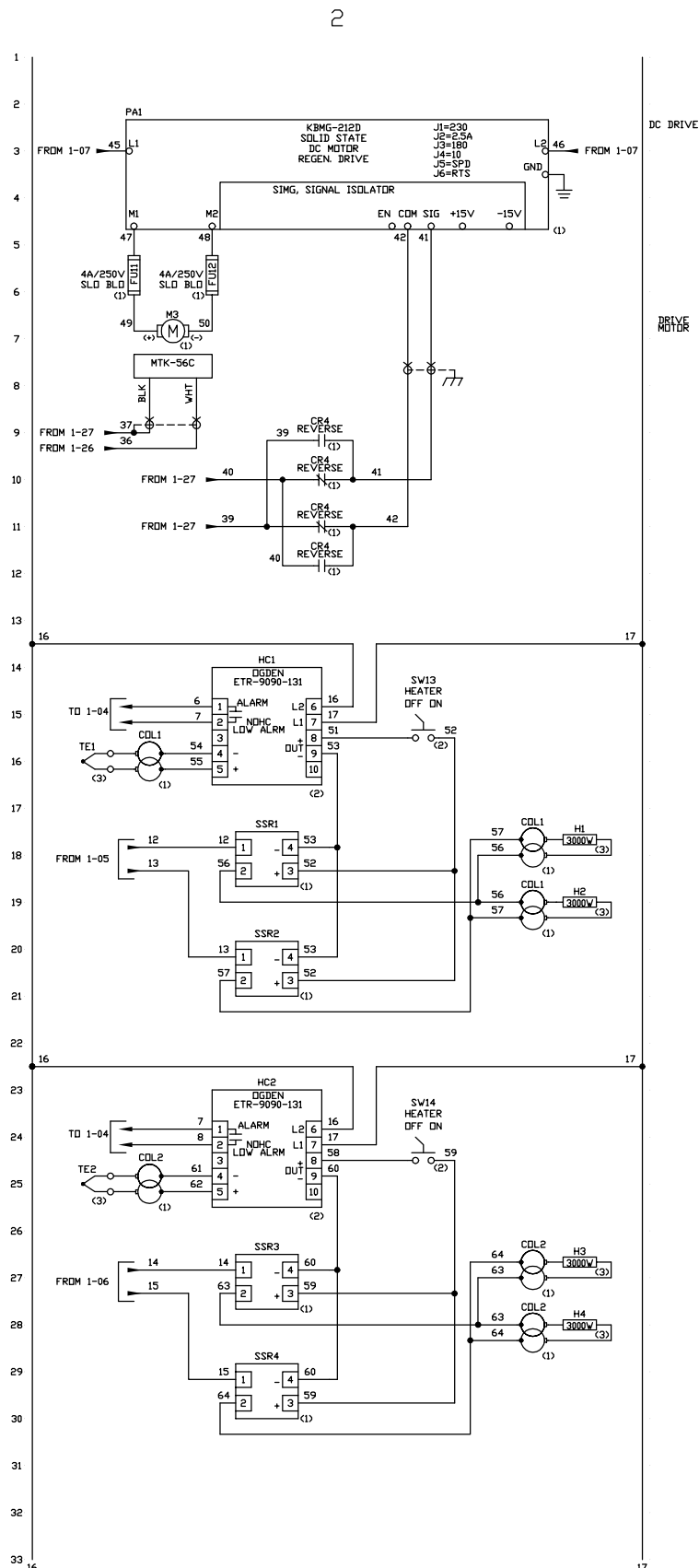
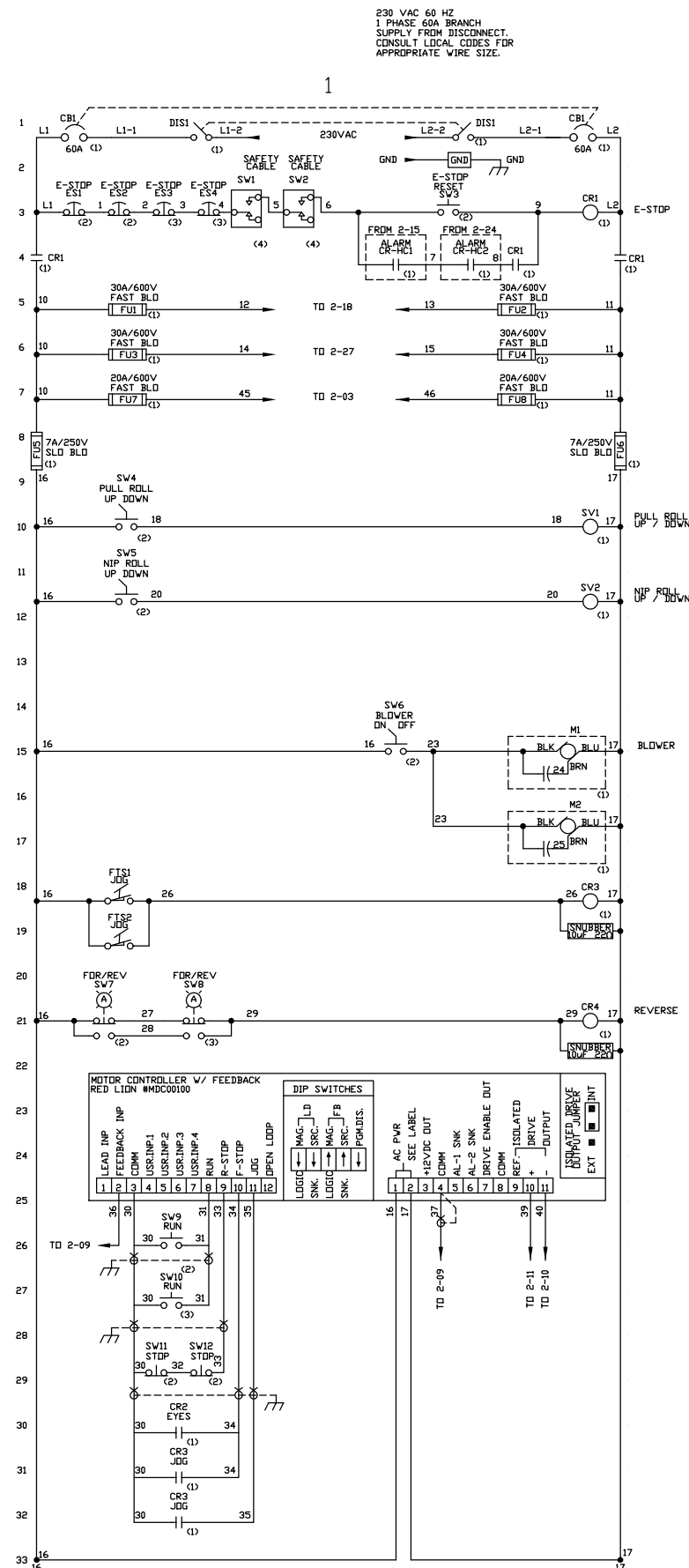
**Description:** ELECTRICAL ASSEMBLY, AGL6450, UL STD 2006

Item:	Part #:	Description:	Qty:
64	002974-05	RELAY, MIDGET, 2PDT, 24VDC	2
65	001530-008	FUSE, SLO-BLO, 3/4A, 250V, 1/4X1-1/4"	2
66	002561-01	TERMINAL, POWER, 2POS., 90A	1
67	001352-06	STANDOFF, HEX, M/F, #10-32UNC, 3/4 LG, AL	5
68	002523-08	FERRULE, INSULATED, 18AWG, WIDE COLLAR	206
69	002523-01	FERRULE, INSULATED, 16AWG, STD LENGTH, BLACK	12
70	002523-02	FERRULE, INSULATED, 14AWG, STD LENGTH, BLUE	6
71	000717-24	WIRE, STRANDED, 14 AWG, GREEN/YELLOW	30
72	002955-01	WIRE DUCT, 1 x 1-1/2, WHITE	144
73	002955-02	WIRE DUCT, 1 x 2-1/4, WHITE	48
74	002955-04	WIRE DUCT, 1-1/2 x 3, WHITE	96
75	000343-16	HHCS, 3/8-16UNC, 2 LG, ZINC	4
76	000493-08	WASHER, LOCK, 3/8 DIA, SPLIT, ZINC	4
77	002512-03	LEGEND, DO NOT OPERATE WITHOUT GUARDS IN PLACE	2
78	002512-04	LEGEND, CAUTION HOT	2
79	002512-05	LEGEND, DANGER PINCH POINT	4
80	001509-10	TERMINAL, RING, INSULATED, 16-14AWG, 1/4 STUD	1
81	000557-04	PHMS, SLOTTED, #8-32UNC, 1/2 LG, ZINC	6
82	000561-03	PHMS, SLOTTED, #10-32UNF, 3/8 LG, ZINC	6
83	000553-04	PHMS, SLOTTED, #4-40UNC, 1/2 LG, ZINC	2
85	000719-24	WIRE, STRANDED, 10 AWG, GREEN/YELLOW	11
86	001530-040	FUSE, SLO-BLO, 4.0A, 250V, 1/4X1-1/4"	2
87	006113-020	FUSE, FAST-BLO, 20A, 600V, CC RATED, 13/32x1-1/2"	2
89	001731-03	CABLE, 3 x 20 AWG, SHIELDED	25
90	012063-04	DECAL, MOVING MACHINERY	2
91	012063-03	DECAL, CABLE ACTIVATION	4
92	002950-1	CONTROLLER, MOTOR, CLOSED LOOP, SPEED	1
93	002952	FEEDBACK, RING GEAR, MAGNETIC, 56C	1
94	002951	SIGNAL ISOLATOR	1



**Part #:** AGL-64-K1385-4**Appl #:****Assy #:****BOM Rev:** B**Model #:****Rev:****Rev:****Date:** 11/15/2006**Description:** ELECTRICAL ASSEMBLY, AGL6450, UL STD 2006

Item:	Part #:	Description:	Qty:
95	002914-02	CABLE, 2 x 18 AWG, SHIELDED	100
96	002974-04	RELAY, MIDGET, 4PDT, 24VDC	1
97	002337-05	SOCKET, RELAY, 14-PIN, DIN RAIL MTG, FINGER SAFE	1
98	002727-01	CONNECTOR, 90 DEG. FLAG DISCONNECT 16-14AWG	2
99	002727-02	CONNECTOR, 90 DEG. FLAG DISCONNECT 12-10AWG	2
100	002728-05	CABLE, SERIES 10, 5M LG.	2



LOCATION CODE

(F) = FIELD


(1) = LAMINATOR CONTROL CABINET

(2) = LAMINATOR FRONT OPERATOR CONSOLE

(3) = LAMINATOR BACK OPERATOR CONSOLE

(4) = LAMINATOR

NOTES:  
5 IN/LB MINIMUM TORQUE,  
ALL TERMINAL SCREWS  
USE STRANDED COPPER WIRE WITH  
60 DEGREE C / 300 VOLT INSULATION  
FOR ALL EXTERNAL CONNECTIONS.

<b>BREAK ALL SHARP EDGES</b>				 <div>Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532</div>		
<b>DO NOT SCALE DWG.</b>						
UNLESS OTHERWISE SPECIFIED  0.00 +/-0.015 0.000 +/-0.005  ANGLES +/--.5°	MAT'L:			<b>CONNECTION DIAGRAM</b> <b>AGL6450</b>		
	FINISH:					
	JOB NO.	QTY.	DWG. BY:	CHK BY:	SCALE: N.T.S.	DWG. NO.
			GFT		DATE: 1-7-02	<b>AGL-64-D4300</b>
					REV.	

# Bill Of Material

**Part #:** AGL-64-K6034

**Appl #:**

**Assy #:** AGLD6033

**BOM Rev:** B

**Model #:**

**Rev:**

**Rev:** B

**Date:** 6/8/2005

**Description:** PNEUMATIC ASSEMBLY, AGL6450 (AIR COUPLERS)

Item:	Part #:	Description:	Qty:
1	012262-05	TUBING, 5/32" OD, BLACK	110
2	012263-05	TUBING, 1/4" OD, BLACK	75
3	001294	REGULATOR, PRESSURE, 1/8NPT	10
4	012234-03	GUAGE, PRESSURE, 0-100PSI, 1/8NPT, PANEL MNT.	9
5	001455-01	SWITCH, AIR, 3 POSITION	5
6	000854-04	FITTING, TUBE, TEE, 1/4 OD TUBE	6
7	000847-06	FITTING, PIPE, ELBOW, MALE, 5/32 OD, 1/8 NPT	13
8	000861-03	FITTING, PIPE, FLOW CONTROL, ELBOW, 1/4 OD, 1/8 NPT	4
9	000847-10	FITTING, PIPE, ELBOW, MALE, 1/4 OD, 1/8 NPT	12
10	000851-02	FITTING, PIPE, ELBOW, FEMALE, 5/32 OD, 1/8 NPT	7
11	000849-05	FITTING, PIPE, TEE, BRANCH, 5/32 OD, 1/8 NPT	7
12	000849-08	FITTING, PIPE, TEE, BRANCH, 1/4 OD, 1/8 NPT	9
13	000851-04	FITTING, PIPE, ELBOW, FEMALE, 1/4 OD, 1/8 NPT	2
14	000855-01	FITTING, TUBE, "Y", 5/32 OD TUBE	5
15	000855-04	FITTING, TUBE, "Y", 1/4 OD TUBE	11
16	012280-05	FITTING, REDUCER, PLUG-IN, 1/4 TUBE-5/32 TUBE	8
17	000847-12	FITTING, PIPE, ELBOW, MALE, 1/4 OD, 1/4 NPT	5
18	000822-02	FITTING, PIPE, BULKHEAD, 1/4 NPT, 3/4-16UNC	1
19	012303-04	VALVE, SOLENOID, 2 POSITION, 24VDC, EXT. PILOT	2
20	012011-01	MUFFLER, EXHAUST, 1/8NPT	2
21	012139-16	AIR CYLINDER, 2 STAGE, 4 DIA BORE, 2" STROKE, FINE THD	2
22	001457-20	AIR CYLINDER, 2 DIA BORE, 2 1/2" STROKE, FINE THD	2
23	012388-01	VALVE, PUSHBUTTON, 5/32 TUBE	6
24	001418	AIR SWITCH, NO, 1 POLE	2
25	000577-08	PHMS, PHILLIPS, #8-32UNC, 1 LG, ZINC	4
26	000845-02	FITTING, PIPE, MALE, 5/32 OD, 10-32UNF	8
27	000861-04	FITTING, PIPE, FLOW CONTROL, ELBOW, 1/4 OD, 1/4 NPT	2
28	012198-02	FITTING, FLOW CONTROL, INLINE, 1/4 OD	2

**Part #:** AGL-64-K6034

**Appl #:**

**Assy #:** AGLD6033

**BOM Rev:** B

**Model #:**

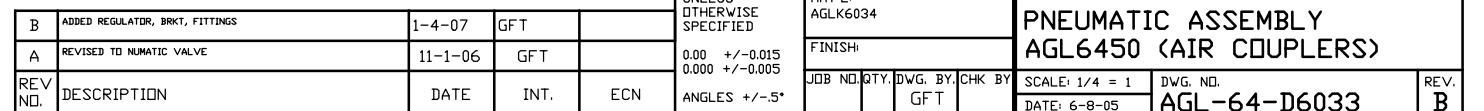
**Rev:**

**Rev:** B

**Date:** 6/8/2005

**Description:** PNEUMATIC ASSEMBLY, AGL6450 (AIR COUPLERS)

Item:	Part #:	Description:	Qty:
29	001544-03	MUFFLER, EXHAUST, 1/4 NPT	2
30	012572-04	CONNECTOR, SOLENOID VALVE	2
31	012010-02	BRACKET KIT, REGULATOR	1



B	ADDED REGULATOR, BRKT, FITTINGS	1-4-07	GFT		OTHERWISE SPECIFIED	AGLK6034				PNEUMATIC ASSEMBLY AGL6450 (AIR COUPLERS)		
A	REVISED TO NUMATIC VALVE	11-1-06	GFT		0.00 +/-0.015 0.000 +/-0.005	FINISH:						
REV NO.	DESCRIPTION	DATE	INT.	ECN	ANGLES +/- .5°	JOB NO.	QTY.	DWG. BY	CHK BY	SCALE: 1/4" = 1"	DWG. NO.	REV.
								GFT		DATE: 6-8-05	AGL-64-D6033	B

# Bill Of Material

**Part #:** AGL-64-K2514

**Appl #:**

**Assy #:** AGLD2515

**BOM Rev:** C

**Model #:**

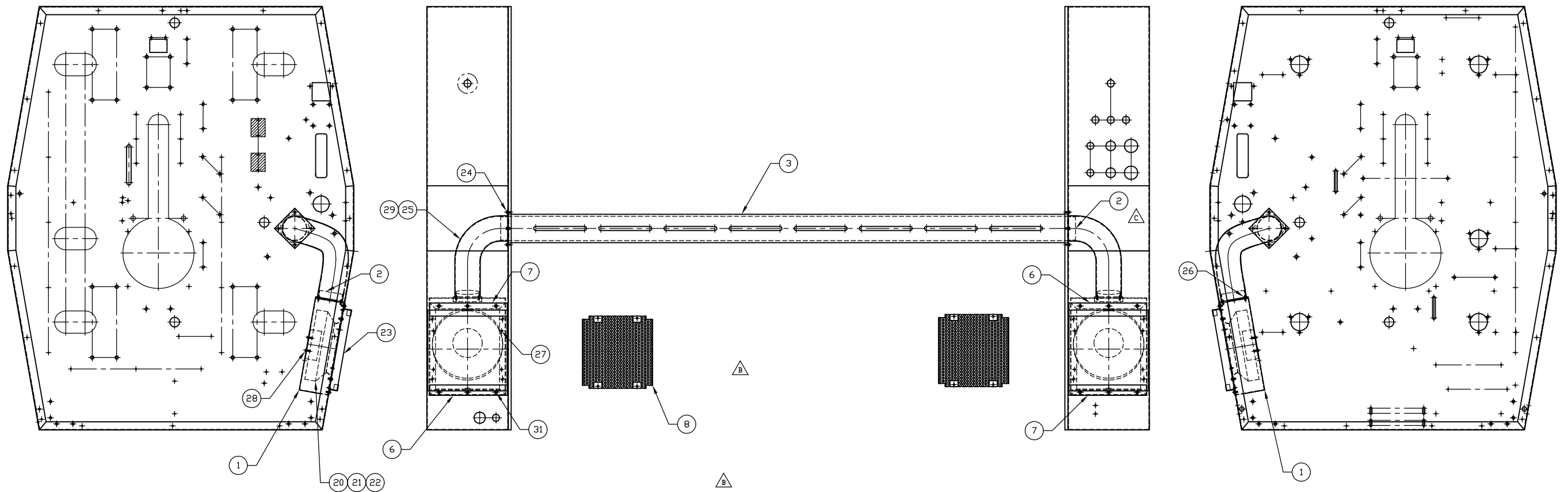
**Rev:**

**Rev:** C


**Date:** 12/20/1999

**Description:** WEB COOLING ASSEMBLY, AGL6450

Item:	Part #:	Description:	Qty:
1	AGL-64-C2511	PLENUM, AGL6400	2
2	AGL-64-B2510	ADAPTER RING, AGL6400	4
3	AGL-64-C2925	COOLING TUBE, AGL6400	1
6	AGL-64-B2512	RH. FILTER GUIDE, AGL6400	2
7	AGL-64-B2513	LH. FILTER GUIDE, AGL6400	2
8	AGL-XX-B2918	IMPELLER GUARD	2
20	001362-01	IMPELLER, MOTORIZED, 460cfm, 230VAC	2
21	001362-02	INLET RING, MOTORIZED IMPELLER	2
22	001362-03	CAPACITOR	2
23	001363	AIR FILTER, 1 x 10 x 10	2
24	000005-03	SHCS, #8-32UNC, 3/8 LG, BLACK	8
25	001364	FLEXIBLE DUCT, 3.0 DIA x 15 FT. LG	.5
26	000055-03	BHSCS, #8-32UNC, 3/8 LG, BLACK	8
27	000053-02	BHSCS, #6-32UNC, 1/4 LG, BLACK	12
28	001366-10	BHSCS, M4x10 LG, BLACK	8
29	001365	HOSE CLAMP, 3.0 DIA	4
31	000057-03	BHSCS, #10-24UNC, 3/8 LG, BLACK	20



NOTE:  
ITEM 8 IS FOR UL LISTED MACHINES ONLY. REQUIRED ON  
ALL 6450 MACHINES. PLACE OVER TOP OF INLET RING

					BREAK ALL SHARP EDGES				 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532			
					DO NOT SCALE DWG.							
C	CHANGED #5 TO #2	1-15-03	GFT		UNLESS OTHERWISE SPECIFIED	MAT'L: AGLK2514 AGLK3511		WEB COOLING AGL6400/6450				
B	ADDED ITEM 8 AND NOTE	11-28-00	GFT	2075		FINISH:						
A	REMOVED ITEM 4 AND 30, LENGTHENED TUBE	7-6-00	GFT	2058		0.00 +/-0.015 0.000 +/-0.005						
REV NO.	DESCRIPTION	DATE	INT.	ECN	ANGLES +/- .5°	JOB NO.	QTY.	DWG. BY	CHK BY	SCALE: 1/6 = 1 DATE: 12-21-99	DWG. NO. AGL-64-D2515	REV. C

# Bill Of Material

**Part #:** AGL-64-K0096-1

**Appl #:**

**Assy #:** AGLC0097-1

**BOM Rev:** B

**Model #:**

**Rev:**

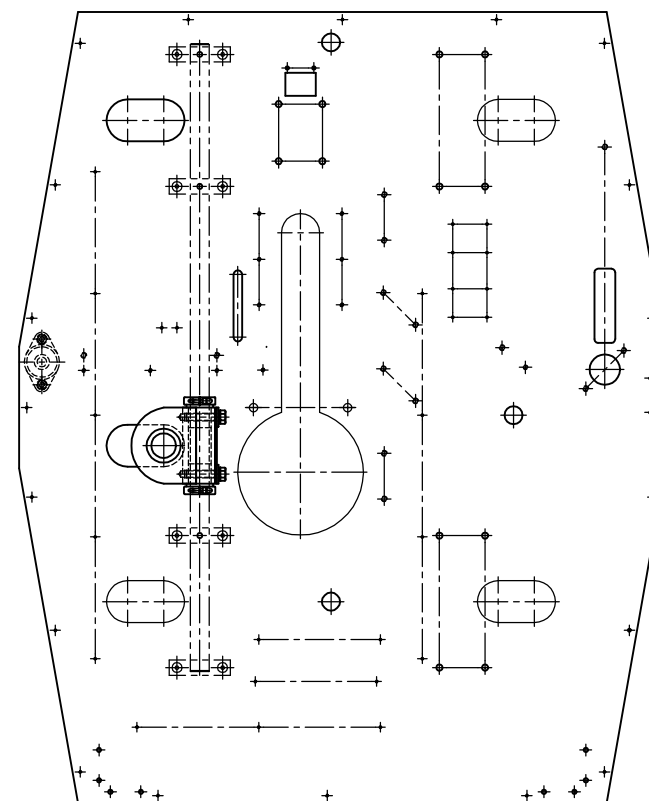
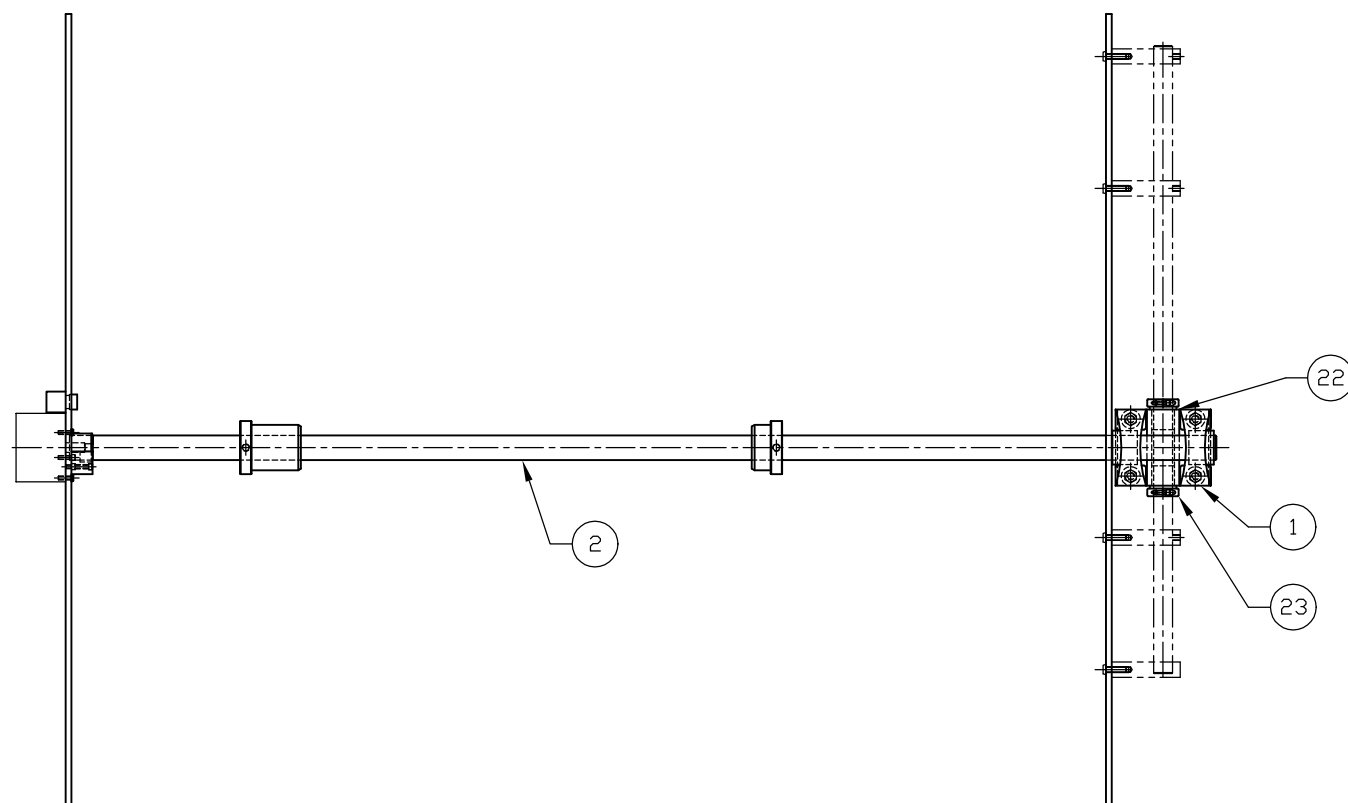
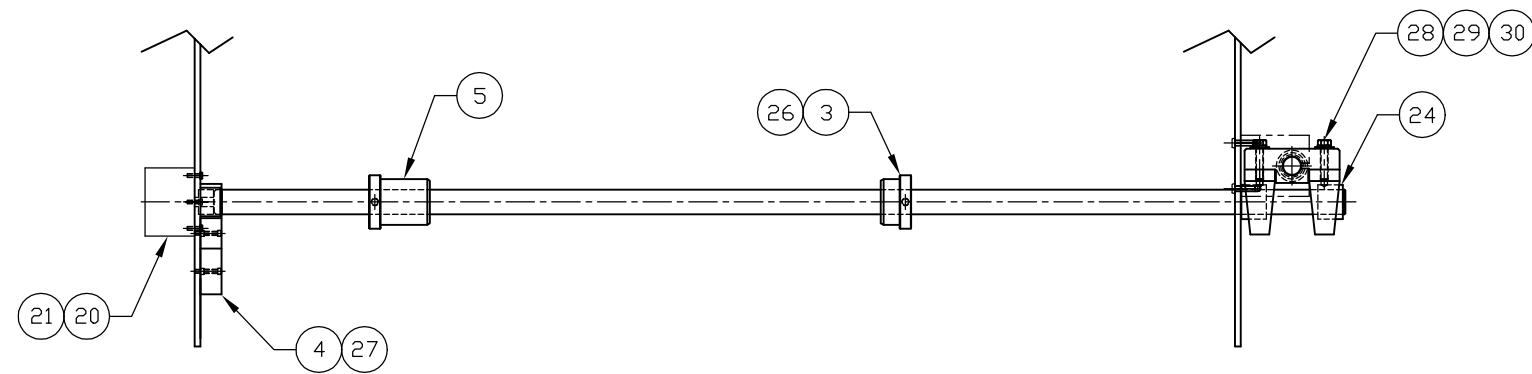
**Rev:** -

**Date:** 12/19/2001


**Description:** FRONT CENTER UNWIND STATION, AGL6400

Item:	Part #:	Description:	Qty:
1	AGL-64-B0940	MAIN PIVOT BLOCK	1
2	AGL-64-B0007	UNWIND SHAFT	1
3	AGL-64-B0044	CORE COLLAR	1
4	AGL-64-B2070	RAMP, UNWIND/WINDUP	1
5	AGL-XX-B2917-1	CORE HOLDER, 1-5/8 BORE (ENCORE)	1
20	001379-1	BRAKE, PNEUMATIC COUPLING	1
21	000059-07	BHSCS, 1/4-20UNC, 7/8 LG, BLACK	3
22	001356-12	BUSHING, FLANGED, BRONZE, 1 1/4 ID., 1 1/2 OD. 1 1/2 LG	2
23	000411-20	COLLAR, SHAFT, 1.25 DIA BORE, 1/2 WIDE	2
24	001355-26	BEARING, TAPPED BASE, 1 5/8 BORE	2
26	012265-06	SSS, NYLON TIPPED, 1/2-13UNC, 3/4 LG. BLACK	1
27	000009-12	SHCS, 1/4-20UNC, 1-1/2 LG, BLACK	2
28	000349-17	HHCS, 1/2-13UNC, 2-1/4 LG, ZINC	4
29	000207-10	WASHER, FLAT, SAE, 1/2 DIA, 1-1/16 OD, 17/32 ID, ZINC	4
30	000493-10	WASHER, LOCK, 1/2 DIA, SPLIT, ZINC	4





REV NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES					 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532				
DO NOT SCALE DWG.									
UNLESS OTHERWISE SPECIFIED		MAT'L: AGLK0096-1			FRONT CENTER UNWIND STATION AGL 6400				
		FINISH:							
0.00 +/-0.015 0.000 +/-0.005		JOB NO.	QTY.	DWG. BY. GFT	CHK BY	SCALE: 1/8 = 1		DWG. NO. AGL-64-C0097-1	REV.
ANGLES +/- .5°						DATE: 12-19-01			

# Bill Of Material

**Part #:** AGL-64-K1378-1

**Appl #:**

**Assy #:** AGLC1376-1

**BOM Rev:** -

**Model #:**

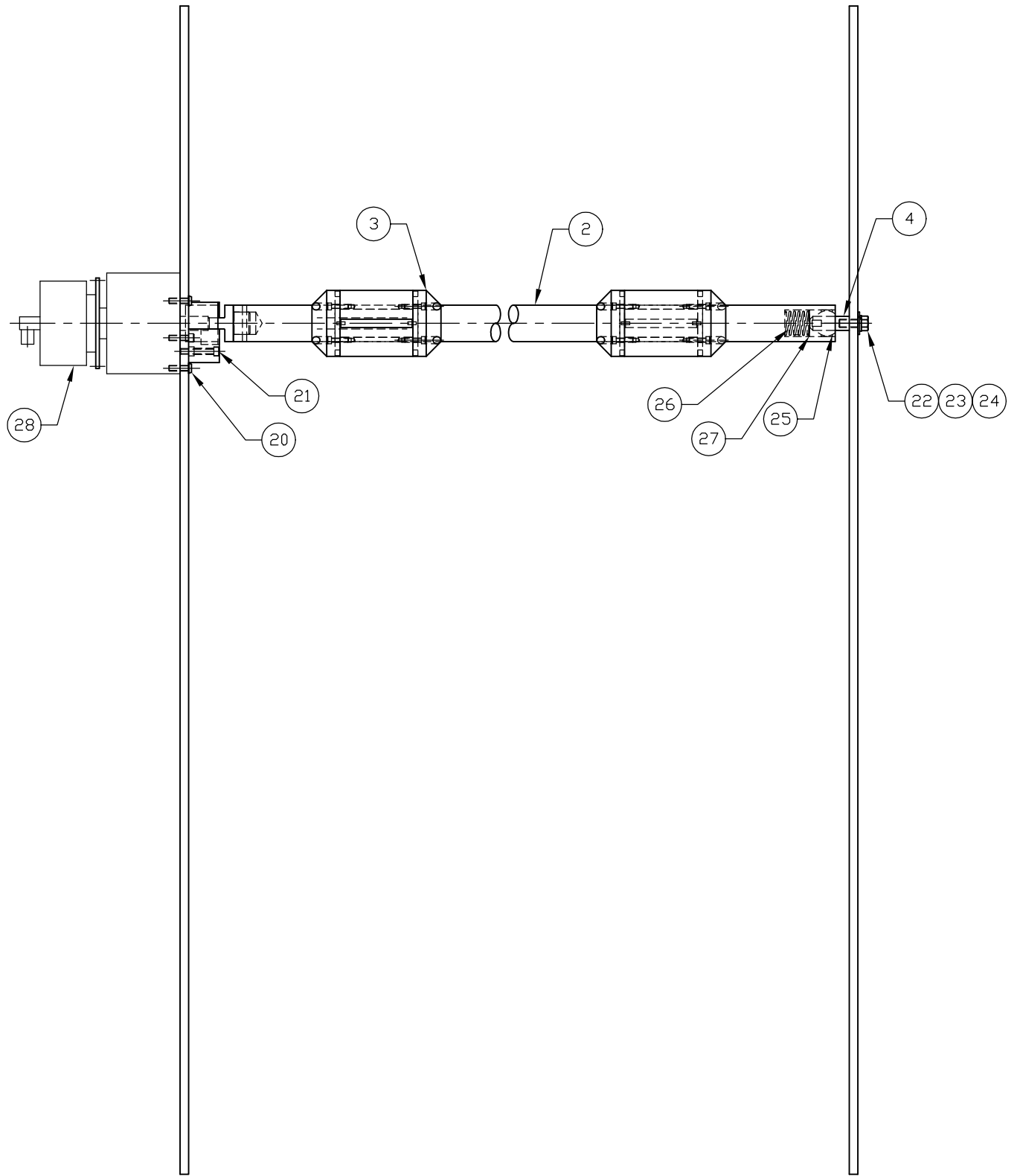
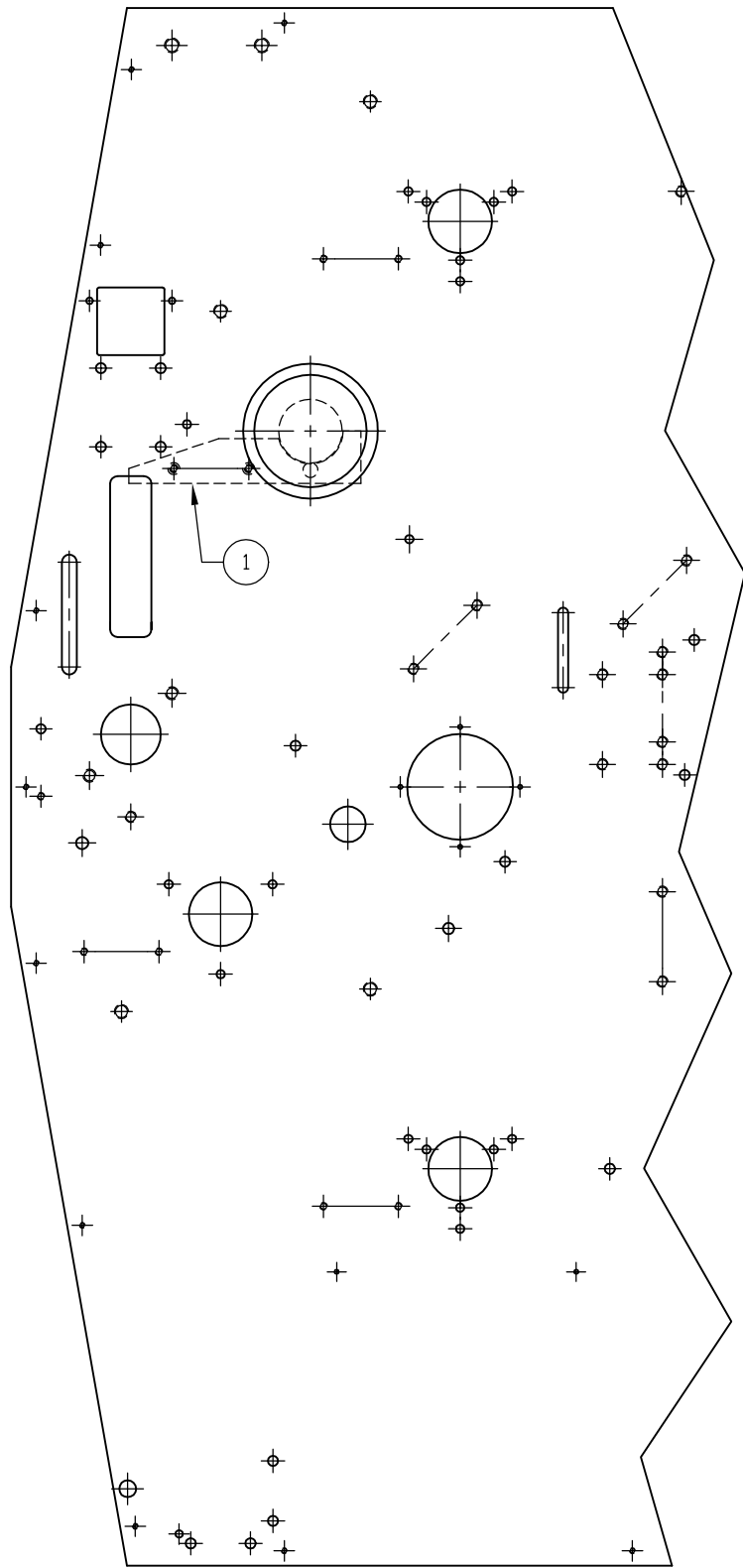
**Rev:**

**Rev:** -


**Date:** 11/6/2006

**Description:** WINDUP STATION, SOLID SHAFT, AGL6450

Item:	Part #:	Description:	Qty:
1	AGL-64-B2070	RAMP, UNWIND/WINDUP	1
2	AGL-64-B5130-1	WINDUP SHAFT ASSEMBLY, AGL6450	1
3	AGL-XX-B5124	CORE HOLDER, 1-5/8 BORE, NO FLANGE	2
4	AGL-XX-B5122	STUB SHAFT, REAR WINDUP	1
20	000059-06	BHSCS, 1/4-20UNC, 3/4 LG, BLACK	3
21	000009-12	SHCS, 1/4-20UNC, 1-1/2 LG, BLACK	2
22	000343-08	HHCS, 3/8-16UNC, 1 LG, ZINC	1
23	000207-08	WASHER, FLAT, SAE, 3/8 DIA, 13/16 OD, 13/32 ID, ZINC	1
24	000493-08	WASHER, LOCK, 3/8 DIA, SPLIT, ZINC	1
25	012406-10	BEARING, SPHERICAL, 5/8 BORE COM-10	1
26	012405-05	SPRING, COMPRESSION, 1.095 OD, 0.082 THICK, 1.75 LG, MUSIC WIRE	1
27	012404-01	WASHER, 1.120 OD. x .160 ID. x .03 THK, SST	1
28	012115-05	BRAKE / CLUTCH COMBO, PNEUMATIC COUPLER	1



REV NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES				 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532			
DO NOT SCALE DWG.				WIND UP, AGL 6450 SOLID SHAFT			
UNLESS OTHERWISE SPECIFIED		MAT'L: AGLK1378-1					
0.00 +/-0.015 0.000 +/-0.005		FINISH:		SCALE: 1/4" = 1" DATE: 11-6-06			
ANGLES +/- .5°		JOB NO. QTY. DWG. BY. CHK BY. GFT					
				DWG. NO. AGL-64-C1376-1		REV.	

# Bill Of Material

**Part #:** AGL-64-K1390-1

**Appl #:**

**Assy #:** AGLC1389-1

**BOM Rev:** B

**Model #:**

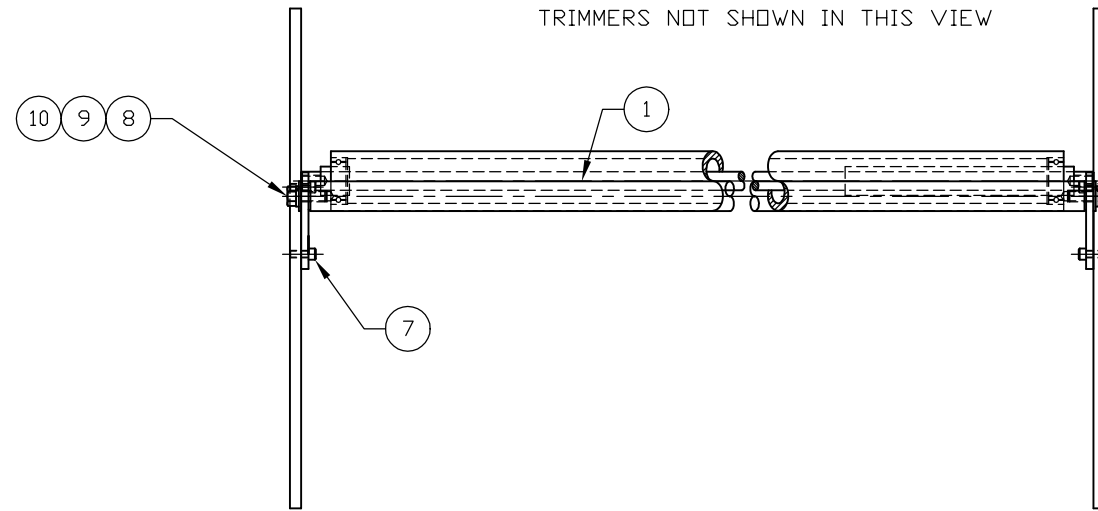
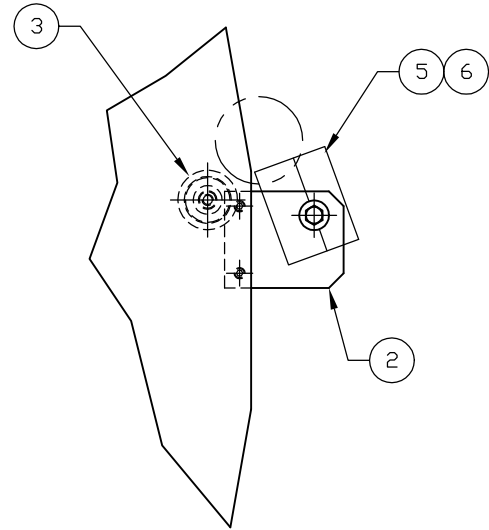
**Rev:**

**Rev:** -


**Date:** 3/20/2002

**Description:** FRONT TRIMMER W/ HARDENED ROLLER, ASSY, AGL6400/6450

Item:	Part #:	Description:	Qty:
1	AGL-64-B1388	BAR, TRIMMER ADJUST	1
2	AGL-64-B1387	TRIMMER PLATE, MOUNTING	2
3	AGL-64-B0992-1	ROLLER SUB ASSEMBLY, HARDENED	1
5	012073-01	BLADE HOLDER, MECHANICAL, ADJUSTABLE	2
6	012073-03	BLADE, 3 DIA. 45 DEGREE BEVEL, SHARP	2
7	000009-05	SHCS, 1/4-20UNC, 5/8 LG, BLACK	4
8	000343-08	HHCS, 3/8-16UNC, 1 LG, ZINC	2
9	000207-08	WASHER, FLAT, SAE, 3/8 DIA, 13/16 OD, 13/32 ID, ZINC	2
10	000493-08	WASHER, LOCK, 3/8 DIA, SPLIT, ZINC	2
11	001446-12	ALLEN WRENCH, LONG ARM, 5/16	1



REV NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES				 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532				
DO NOT SCALE DWG.								
UNLESS OTHERWISE SPECIFIED		MAT'L: AGLK1390-1		FRONT TRIMMER ASSEMBLY AGL6400/6450				
		FINISH:						
0.00 +/-0.015 0.000 +/-0.005		JOB NO.	QTY.	DWG. BY.	CHK BY	SCALE: 1/4" = 1"	DWG. NO.	REV.
ANGLES +/- .5°				GFT		DATE: 3-20-02	AGL-64-C1389-1	

# Bill Of Material

**Part #:** AGL-64-K1392-1

**Appl #:**

**Assy #:** AGLC1391

**BOM Rev:** B

**Model #:**

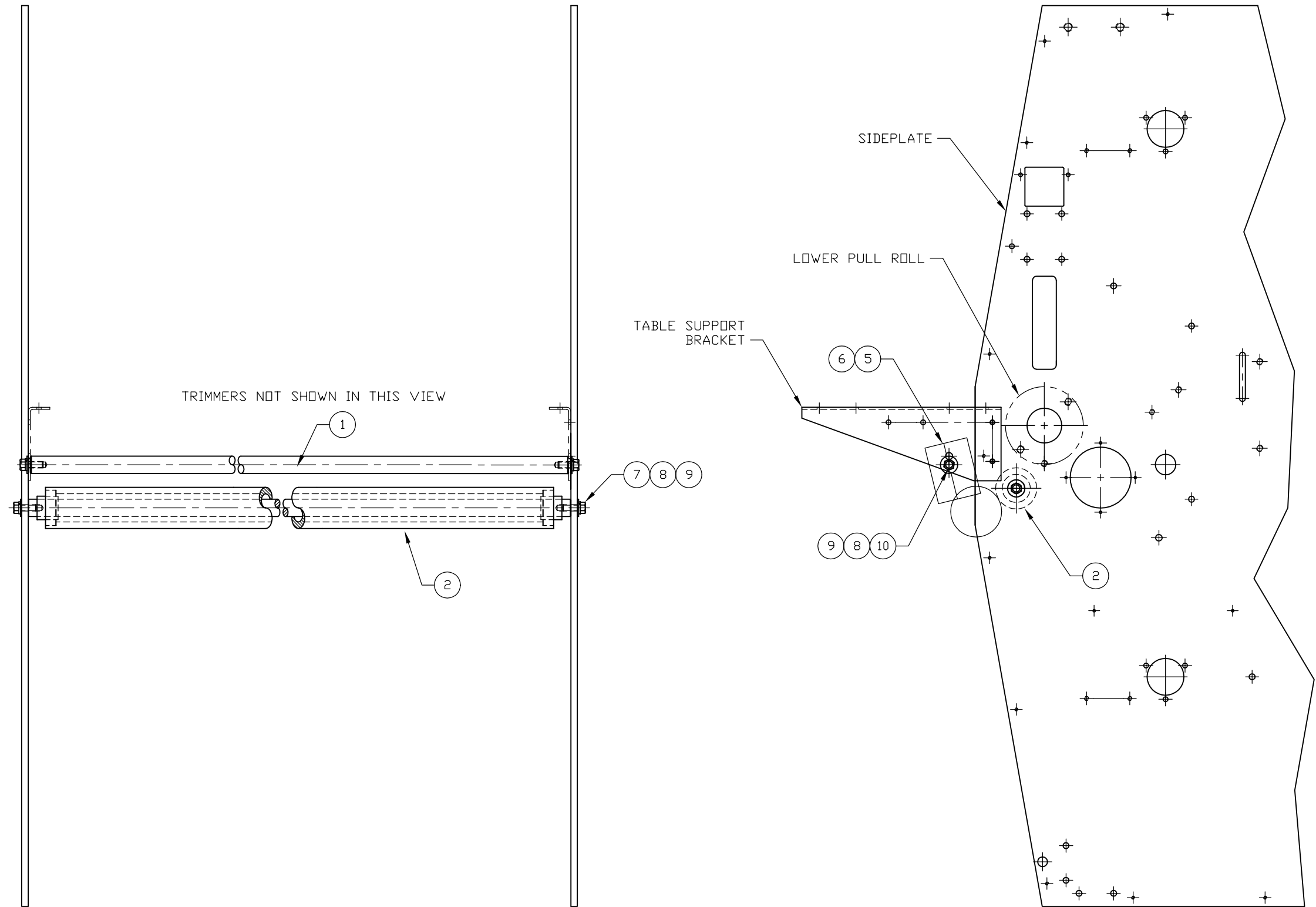
**Rev:**

**Rev:** B

**Date:** 3/20/2002


**Description:** REAR TRIMMER W/ HARDENED ROLLER ASSY, AGL6400/6450

Item:	Part #:	Description:	Qty:
1	AGL-64-B2002	BAR, TRIMMER ADJUST, REAR	1
2	AGL-64-B0992-1	ROLLER SUB ASSEMBLY, HARDENED	1
5	012073-01	BLADE HOLDER, MECHANICAL, ADJUSTABLE	2
6	012073-03	BLADE, 3 DIA. 45 DEGREE BEVEL, SHARP	2
7	000009-05	SHCS, 1/4-20UNC, 5/8 LG, BLACK	4
8	000343-08	HHCS, 3/8-16UNC, 1 LG, ZINC	4
9	000207-08	WASHER, FLAT, SAE, 3/8 DIA, 13/16 OD, 13/32 ID, ZINC	4
10	000493-08	WASHER, LOCK, 3/8 DIA, SPLIT, ZINC	4
11	001446-12	ALLEN WRENCH, LONG ARM, 5/16	1



B	REVISED AND REDRAWN	10-16-00	GFT	
A	REMOVED BRACKETS, ADDED TUBE AND BHSCS	5-19-99	GFT	
REV NO.	DESCRIPTION	DATE	INT.	ECN

BREAK ALL SHARP EDGES				
DO NOT SCALE DWG.				
UNLESS OTHERWISE SPECIFIED	MAT'L: AGLK1392			
	FINISH:			
	JOB NO.	QTY.	DWG. BY.	CHK BY
ANGLES +/- .5°			GFT	

 Advanced Greig Laminators, Inc. 801 Burton Blvd. DeForest, WI 53532			REAR TRIMMER ASSEMBLY AGL6450	
SCALE: 1/4" = 1"		DWG. NO. AGL-64-C1391		REV. B
DATE: 8-12-98				

# Bill Of Material

**Part #:** AGL-XX-K2660

**Appl #:**

**Assy #:**

**BOM Rev:** D

**Model #:**

**Rev:**

**Rev:**

**Date:**

**Description:** ACCESSORIES KIT, 44/4400/64 SERIES/6400/6450

Item:	Part #:	Description:	Qty:
1	012235-01	CUTTER, ZIPPY	1
2	012236-01	ROLL ADHESIVE ERASER, PLAIN, SHRINKWRAPPED	1
3	001446-04	ALLEN WRENCH, LONG ARM, 3/32, T-HANDLE	1
4	AGL-XX-B0823	LIFTING BRACKET	2
5	001446-11	ALLEN WRENCH, LONG ARM, 1/4 T-HANDLE	1
6	000349-08	HHCS, 1/2-13UNC, 1 LG, ZINC	4
7	012248	CLOTH, LOW LINT, 12x13	1
8	012249	ALCOHOL, ISOPROPYL, 1 PINT	1
9	000493-10	WASHER, LOCK, 1/2 DIA, SPLIT, ZINC	4
10	001530-070	FUSE, SLO-BLO, 7.0A, 250V, 1/4X1-1/4"	2
11	X6	OPERATORS MANUAL	1



# Bill Of Material

**Part #:** AGL-XX-K3357

**Appl #:**

**Assy #:** AGLB3358

**BOM Rev:** B

**Model #:**

**Rev:**

**Rev:** -

**Date:** 10/31/2000

**Description:** PULL CABLE SWITCH ASSEMBLY, 64" LAMINATORS

Item:	Part #:	Description:	Qty:
1	AGL-XX-B3195	BUSHING, PULL CORD	2
2	AGL-XX-B3356	ADJUSTMENT PLATE	2
5	001400-20	EYEBOLT, WIRE, 1/4-20UNC, 2-1/2 LG	4
6	000201-05	NUT, HEX, 1/4-20UNC, ZINC	4
7	000207-06	WASHER, FLAT, SAE, 1/4 DIA, 5/8 OD, 9/32 ID, ZINC	2
8	000207-08	WASHER, FLAT, SAE, 3/8 DIA, 13/16 OD, 13/32 ID, ZINC	6
9	002022-02	SWITCH, MICRO, SPDT, SIMULATED ROLLER LEVER, 11A, HI-FORCE	2
10	000573-04	PHMS, PHILLIPS, #4-40UNC, 1/2 LG, ZINC	4
11	000055-06	BHSCS, #8-32UNC, 3/4 LG, BLACK	4
12	000207-03	WASHER, FLAT, SAE, #8 DIA, 7/16 OD, 3/16 ID, ZINC	4
13	000493-03	WASHER, LOCK, #8 DIA, SPLIT, ZINC	4
14	000201-03	NUT, HEX, #8-32UNC, ZINC	4
15	012273-06	SPRING, COMPRESSION, 0.60 OD, 0.092 THICK, 1.50 LG	2
16	001399-03	SPLICE, WIRE ROPE, ALUMINUM, 1/8 DIA	4
17	001398-03	WIRE ROPE, VINYL COATED, 1/8 DIA RED	15

