SOLO®

MEGA

Automatic Wrapper

Service Manual

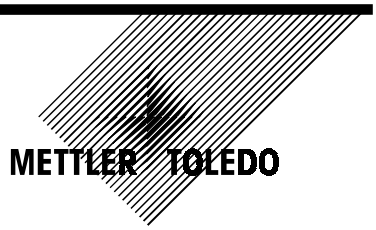
83166500A
(11/00).00

METTLER TOLEDO®

Customer Feedback

Attention: Retail Quality Manager - MTWR

If you have a problem with one of our products or publications, or just a suggestion on how we can serve you better, please fill out this form and send it to the address on the opposite side of this page (U.S. postage paid), or fax it to us at **(614) 438-4355**. Your feedback will help us to improve product performance, quality, and service.



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Part / Model Number:	**Date:**
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SOLO® Mega Service Manual 83166500A 11/00

METTLER TOLEDO
1900 Polaris Parkway
Columbus, Ohio 43240

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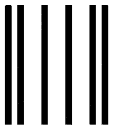

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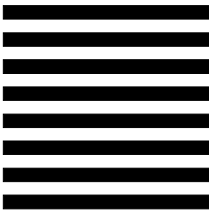

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Training

This publication is provided as a guide for individuals who have received Technical Training in servicing the METTLER TOLEDO product. Information regarding METTLER TOLEDO Technical Training may be obtained by calling (614) 438-4940 or writing to:

METTLER TOLEDO, Training Dept., 1900 Polaris Parkway, Columbus, Ohio 43240

FCC Notice

This device complies with Part 15 of the FCC Rules and the Radio Interference Requirements of the Canadian Department of Communications. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Trademarks

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Change Notice

METTLER TOLEDO® reserves the right to make refinements or changes without notice.

PRECAUTIONS

READ this manual BEFORE operating or servicing this equipment.

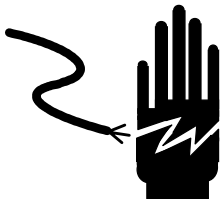
FOLLOW these instructions carefully.

SAVE this manual for future reference.

DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

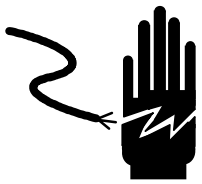
ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL METTLER TOLEDO for parts, information, and service.



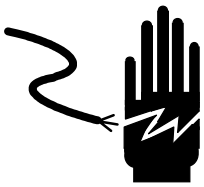
WARNING

ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



WARNING

FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY. DO NOT REMOVE THE GROUND PRONG.



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING.

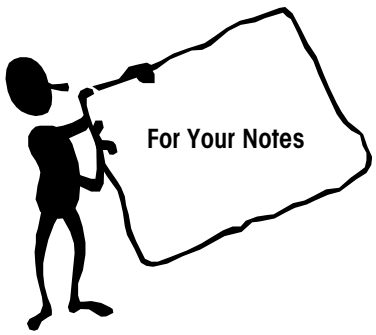
CAUTION

BEFORE CONNECTING OR DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT, ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTIONS ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO, OR DESTRUCTION OF THE EQUIPMENT OR BODILY HARM.

CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

CONTENTS


For Your Notes

1

Introduction

The **METTLER TOLEDO®** SOLO® Mega Automatic Wrapper has been designed to wrap a variety of products using a single size of stretch film. You will find the Mega is versatile and easy to use and will optimize your production time and materials.

The SOLO® Mega is designed to wrap tray-contained products with stretch film. The SOLO® Mega is not designed to wrap loose or liquid products. The Mega is designed for use in prepackaging backroom environments. It is not intended for washdown or hazardous area operation or for operation in environments of extreme dust, heat, or humidity.

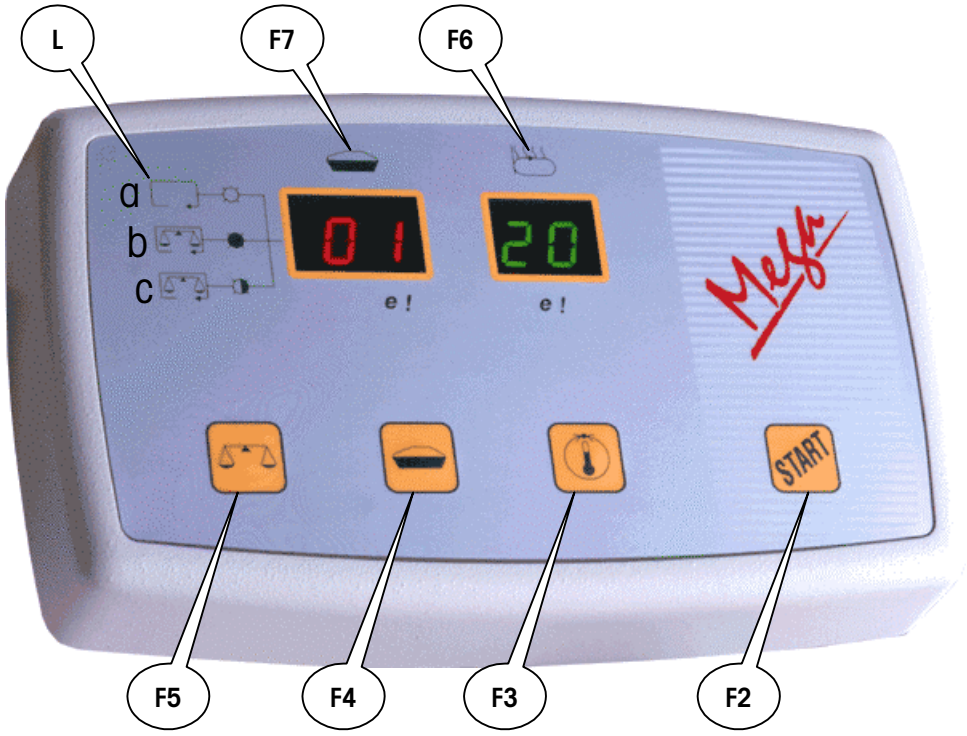
SOLO® MEGA

Major Components

1	Main Power Switch
2	Infeed Conveyor
3	Top Cover
4	Control Panel
5	Sealing Belt
6	Emergency Stop Pushbutton
7	Film Supply
8	Adjustable Feet

Control Panel

F2 START button (machine start).
F3 Film Cut Button.
F4 Wrapping program selection button.
F5 Wrapping mode (with weighing system) button.
F6 Sealing belt temperature display.
F7 Working program display.
L Led for the selection of the wrapping with weighing system (optional).
a - led off = Wrapping Only
b - led on = Wrapping and weighing
c - led flashing = Weighing Only

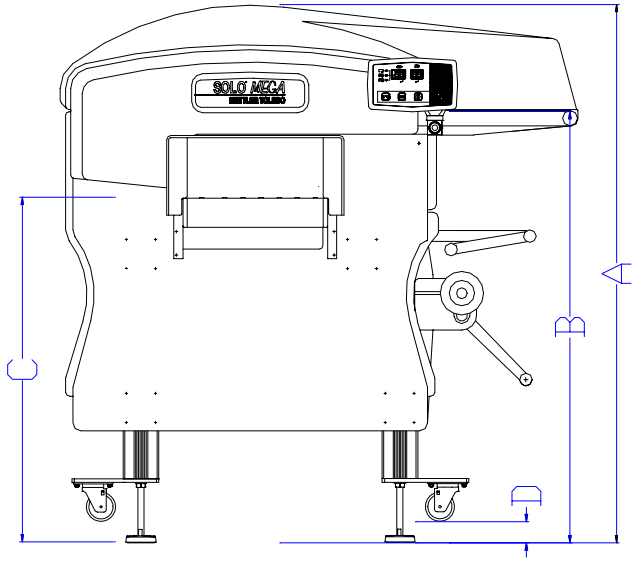


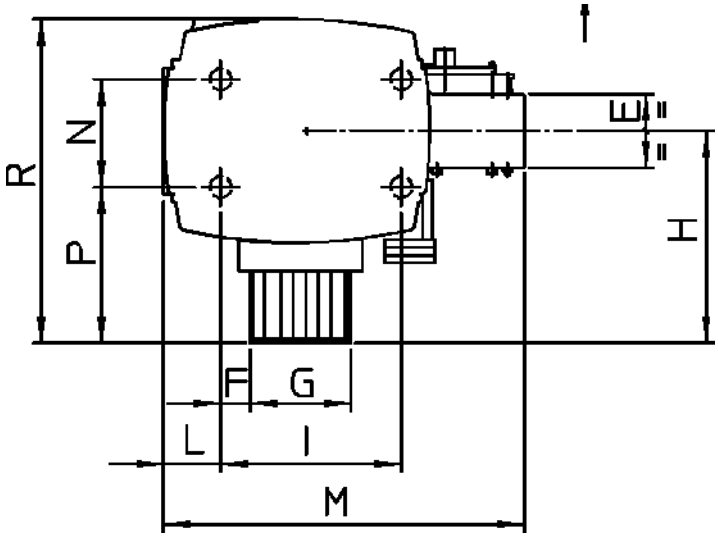
General Specifications

Shipping Weight	kg	235
	lb	518
Speed	Packs/minute	35
Voltage	Volts	208 VAC/50-60 Hz, Single Phase 230 VAC/50-60 Hz, Single Phase
Power Consumption	VA	3000
Recommended Operating Temperature Range	°F	+40°F to +95°F
	°C	+5°C to +35°C
Humidity	%	5% to 95% Non-condensing
Agency Approvals		ETL Approval (pending) Conforms to UL 763 and CSA C22.2
Noise Level Specifications	db	Equivalent continuous weighted sound pressure level at the workstation is 75 dB. Tests performed in conformance with EN ISO 11202
Film Specifications	11″ stretch film	Film is available through Mettler Toledo Aftermarket. Contact your **METTLER TOLEDO®** representative for recommendations for other films that will work on the wrapper.

Dimensions

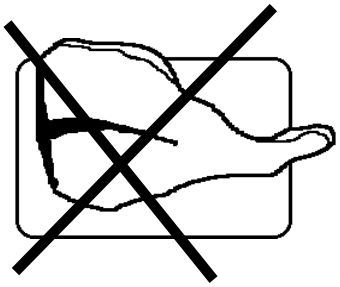
		INCH	MM
Dimensions	A	57.75	1467
	B	46.25	1175
	C	36.75	933.5
	D	2.25	57
	E	11.6	295
	F	4.6	116
	G	15.7	400
	H	33.1	842
	I	28.1	715
	L	8.9	227
	M	56.3	1431
	N	15.0	381
	P	24.4	618,5
	R	50.6	1286





Trays

All products must be completely contained in the trays. The trays must be stiff enough to support the product properly.

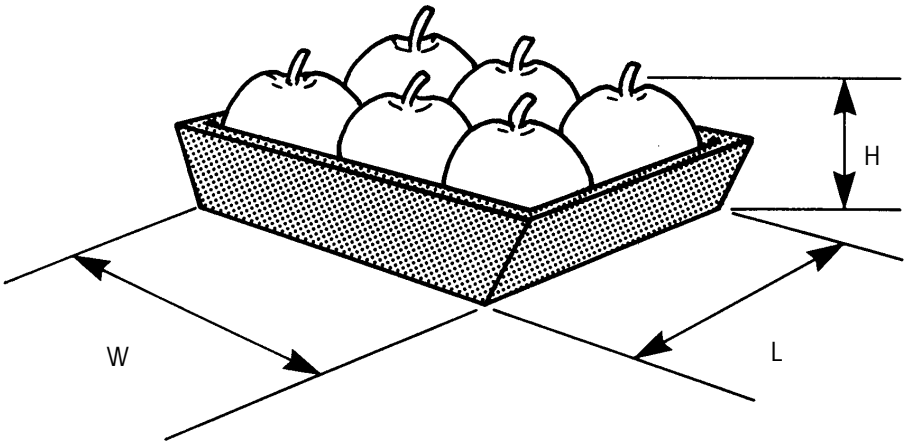


✓ **NOTE**

The dimensions of the trays must fall within the following limits.

MEGA tray specifications:

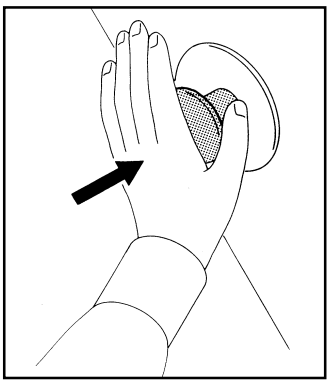
	Minimum (mm)	Minimum (Inches)	Maximum (mm)	Maximum (Inches)
L	120	4.7	350	13.8
W	100	3.9	230	9.1
H	10	0.4	130	5.1



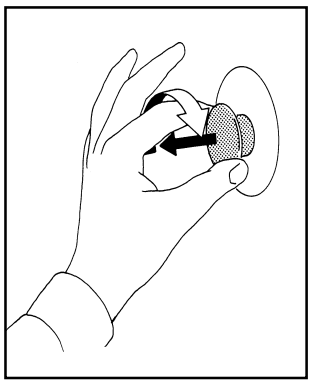
2 Safety Information

Stopping the Machine

The SOLO® Mega is equipped with an Emergency Stop Button located below the Control Panel as shown below.



To stop the machine, push the Stop Button.



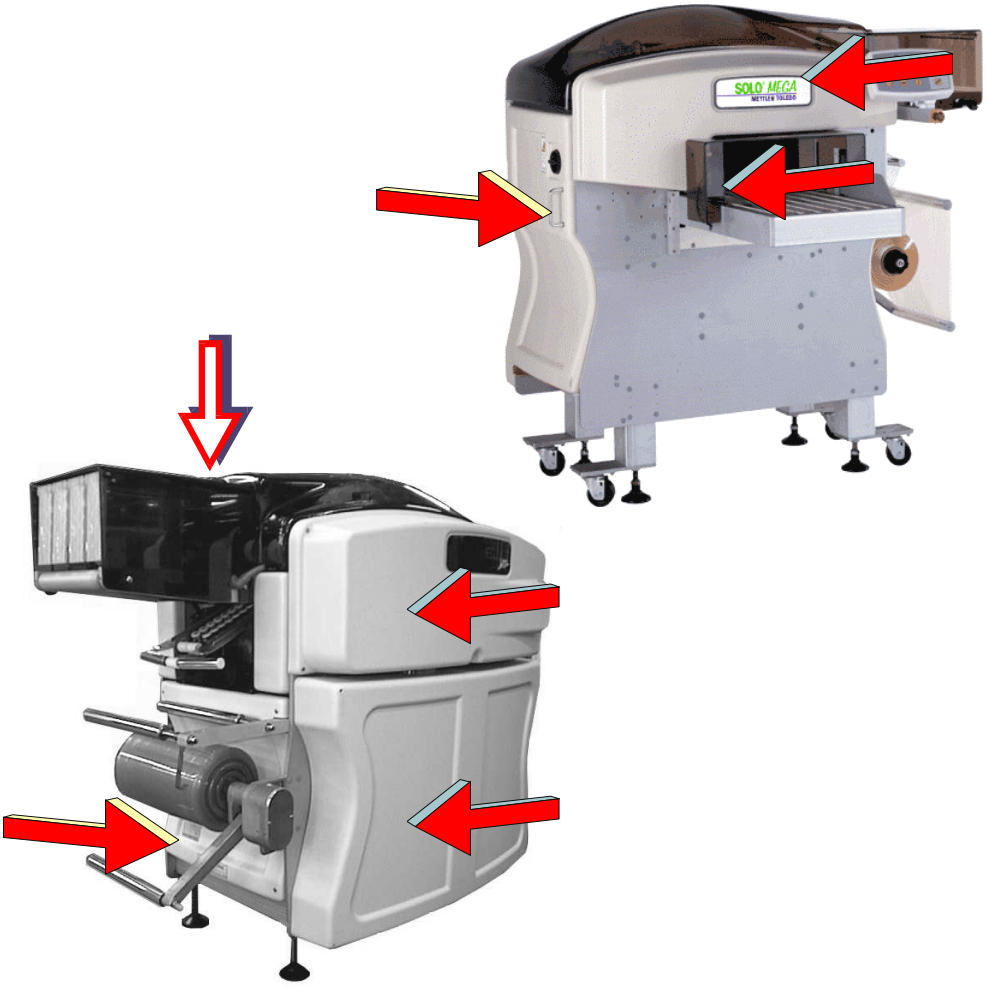
To restart the machine, turn the Stop Button and pull it back out, then press the START button.

The possible ways of stopping the machine are:

- Pushing the Stop Button.
- Opening the Top Cover.
- Opening the End Cover.

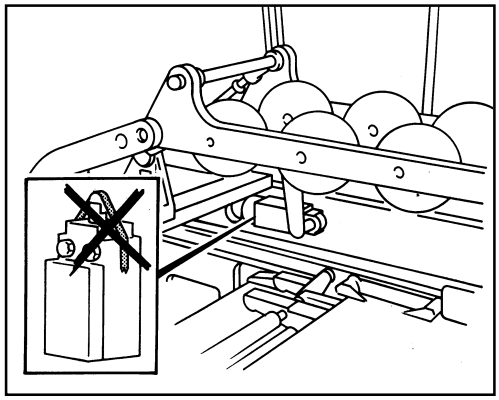
Covers

Do not run the machine with any of the covers removed. Always replace all covers after checking the machine, clearing packages, or performing cleaning or maintenance.



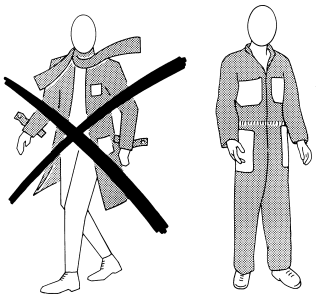
Some of the covers have safety interlock switches that stop the machine when it is running if a cover is removed, or they will prevent the machine from accidentally starting when a cover is removed.

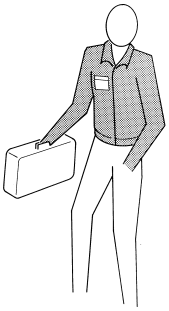
Do not tamper or bypass these important safety interlock switches.



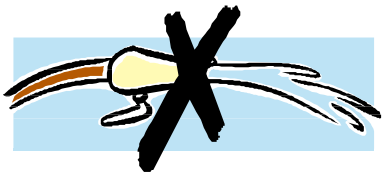
Safety Guidelines

Avoid loose fitting clothing or accessories that could get caught in the machine.

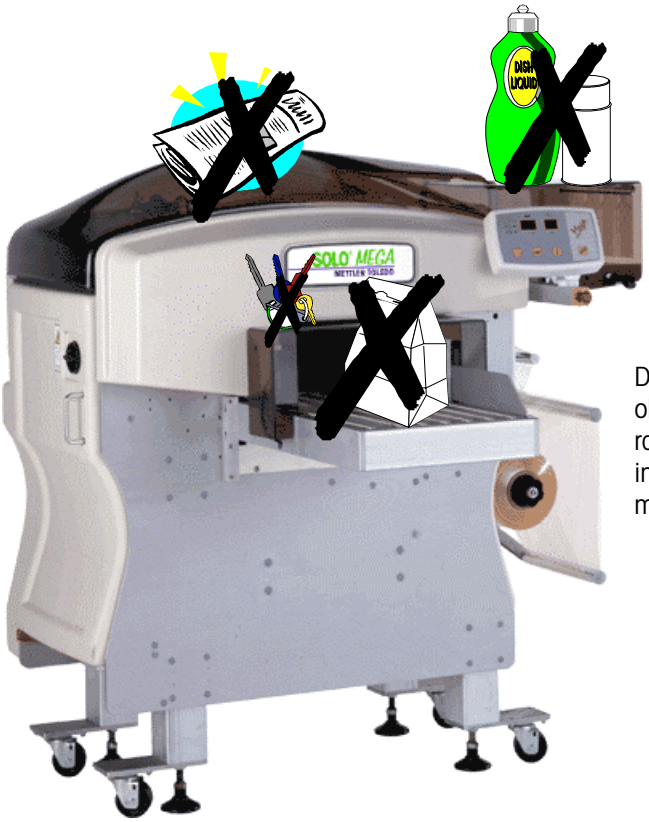




Only a qualified trained technician must perform maintenance and repairs. Contact your dealer for information.



Do not spray the machine with water or steam.

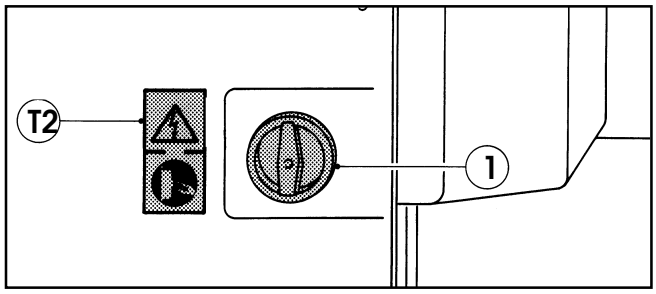


Do not set or store liquids on the machine, especially near the electronics and the sealing belt.

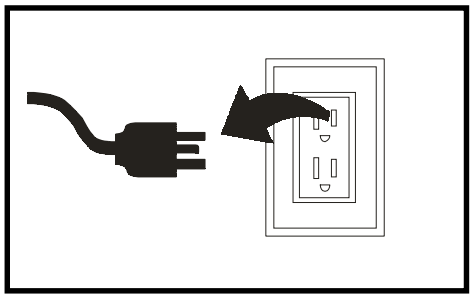
Do not leave objects, cleaning rags or materials inside or on the machine.

Before Cleaning

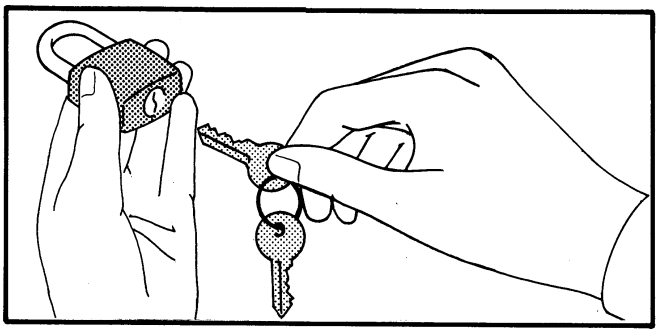
Always disconnect power to the machine before performing cleaning and maintenance. The main power switch should always be turned off.



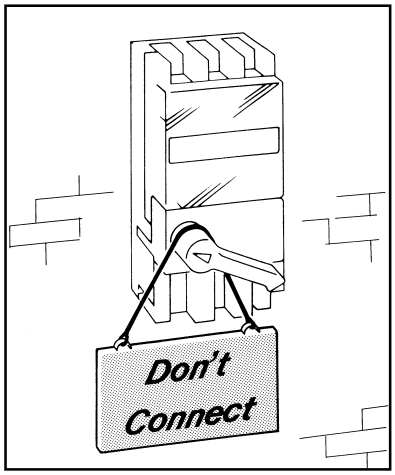
Remove the power cord from the power receptacle.



A padlock can be used to lock the main power switch in the off position while cleaning to prevent someone else from turning the machine on.



The circuit breaker that supplies power to the machine can also be used to disconnect power to the machine.

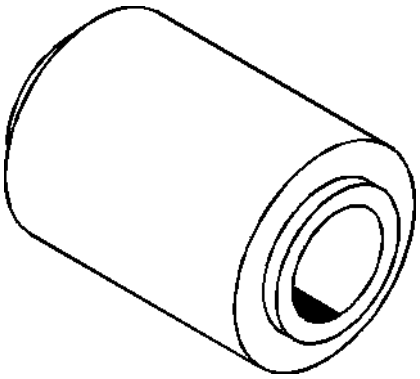


3 Film

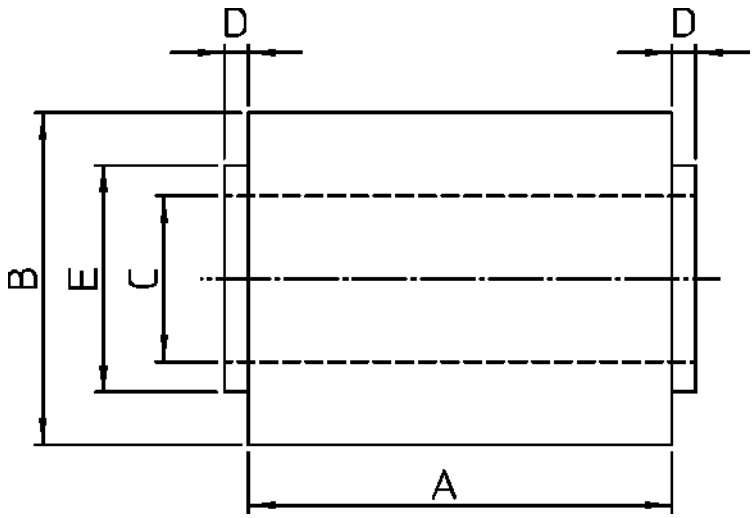
Film Specifications

A high quality stretch film, designed to work on the MEGA wrapper, is available through Mettler Toledo, Inc. Aftermarket services. Contact your local **METTLER TOLEDO®** representative for more information on this film and recommendations for other films that will work on the MEGA wrapper.

The MEGA uses 11″ film with the following specifications.

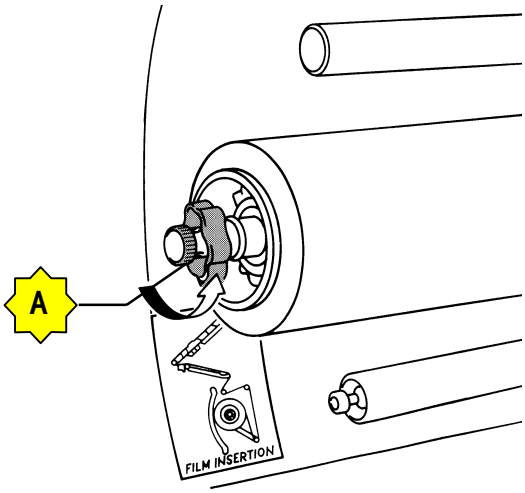


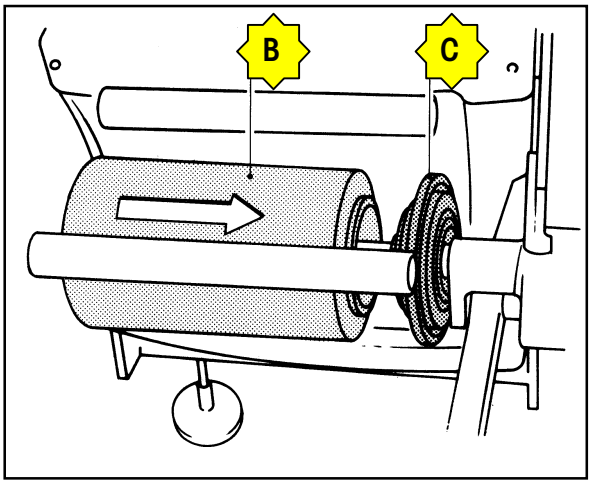
A = 280mm (11.0″)
B = Outer diameter of the reel max 220mm (8.66″)
C = Inner diameter 75mm (3″)
D = Less or equal to 16mm (0.63″)
E = Less than 130mm (5.12″)



Loading Film

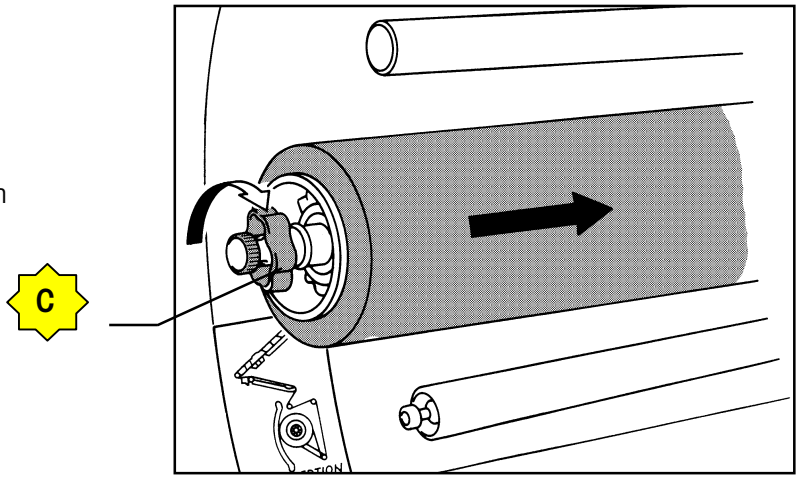
Press the Stop Button. Rotate knob (A) counterclockwise to release the reel. Slide the empty film roll out.



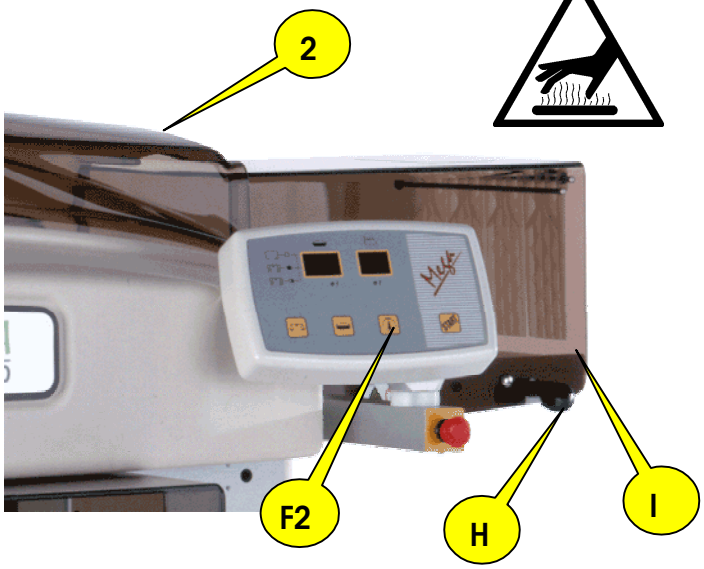


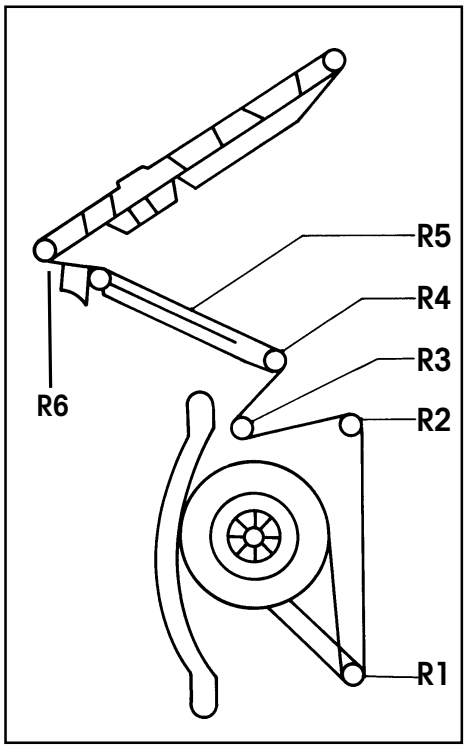
Insert the new film roll (B) onto the shaft until the edge contacts the film roll stop (C). The film should unroll clockwise over the top of the roll.

Rotate the knob (C) clockwise to tighten the film reel.



Open the top cover (2). Using handle (H), lift the sealing belt (I). **Careful! The sealing belt may be hot.**





Unroll the film and route the film:

- Under Roller R1
- Over Roller R2
- Under Roller R3
- Over Roller R4
- Into the Film Folders R5
- Between the Pressure Rollers and Distributor (R6)
- Be sure the film pulls freely and is not caught on any of the film folder wheels.

Hold the film so it will not slip back, then using Handle (H), lower the sealing belt I back down to the rest position.

Hang on to the film and close the top cover (2). Release the Stop Button. Keeping the film slightly stretched, press and hold the film cut button F2 (on the control panel) to cut the film.

For proper operation, the film must be centered in the machine.

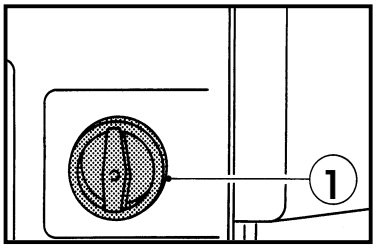
Installed Film

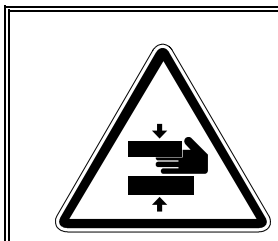
4 Operating Instructions

Starting the Machine

Switch the machine on by turning the main power switch (1) to on. Release the Stop Button below the console by rotating and pulling the button. When the machine is warming up, the display will show machine code 00 and the sealing belt temperature program will blink off and on. When the preset sealing belt temperature has been reached, the display will be on steady (not blinking).

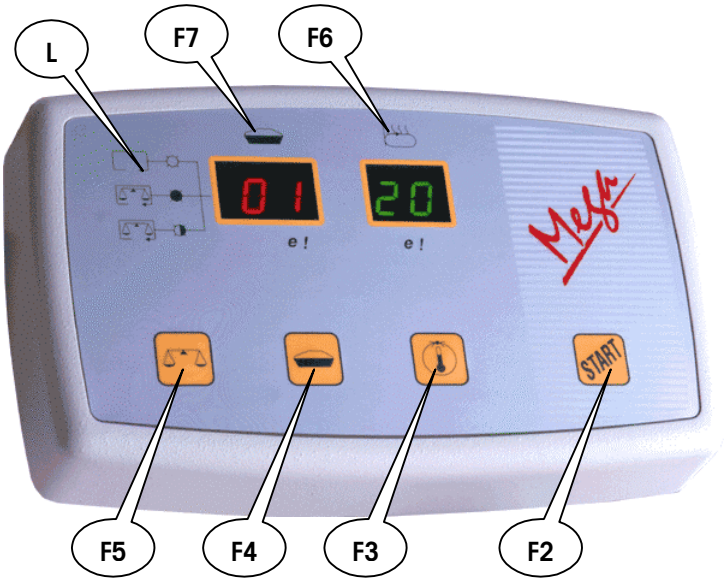
When the Start Button (F2) is pressed, the machine will perform a timing cycle. At the end of the timing cycle, the machine is ready for use.





WARNING

Keep hands clear of all the machines during powerup. Some will run a self-test. During the self-tests, Infeed Belts are in motion and other motors are running. Do not place materials on the belts during this test. Keep hands clear of the machine during the test and while the machines are running.



DISPLAY	OPERATION	DESCRIPTION
F7 F6	Machine ready to wrap	F6 shows the sealing belt temperature. F7 shows the working program.
F6	Change sealing belt temperature	Press button F3 until the display F6 shows the required temperature. To modify the code, press and hold both buttons F3 and F2 simultaneously until F6 shows the required code.
F7	Select different wrapping program	Press button F4 until the display F7 shows the required wrapping program.
F7 F6	Machine in emergency stop	Display F6 (first and second figure) and F7 (third figure) will shown the error code. To start again after taking care of what caused the stop code, press button F2.
	Film cut	Press and hold button F3 for more than 5 seconds.

Machine Wrapping Programs

Button F4 is used to select the package-wrapping program.

PROGRAM NUMBER	WRAP TYPE	TRAY TYPE
01	Standard program for wrapping at maximum speed.	For use with all tray sizes.
03	Speed reduced for more reliable operation.	Use when speed is not important.
05	Wrapping with film less stretched on the pack (for delicate and/or soft packs).	Use for large, tall and unstable packs.
07	Speed reduced further for most reliable operation.	Use when speed is not important.

Sealing Belt Temperature

On the control board, press the button F3 and the display F6 will show:

CODE	SEALING PLATE TEMPERATURE
00	Heating OFF
01	78°C (172ºF)
02	81°C (178ºF)
..	Every time the code changes by one unit, it corresponds to a temperature change of 3°C (5.5ºF)
40	Maximum 195ºC (383ºF)

To set the sealing-plate temperature, press and hold buttons **F3** and **F2** simultaneously until display **F6** shows the required temperature code. The recommended temperature range is between 20 (135ºC) and 21 (138ºC). In colder rooms, the sealing belt temperature may need to be set slightly higher. Sealing belt temperatures in warmer rooms may need to be set slightly lower. In either case, the wrapped tray must be inspected as follows.

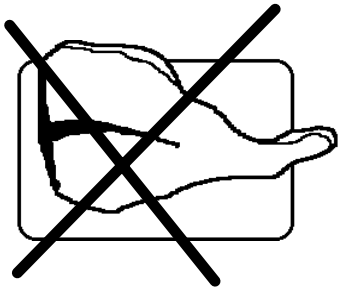
✓ **NOTE**

Check the film on the bottom of the wrapped tray:

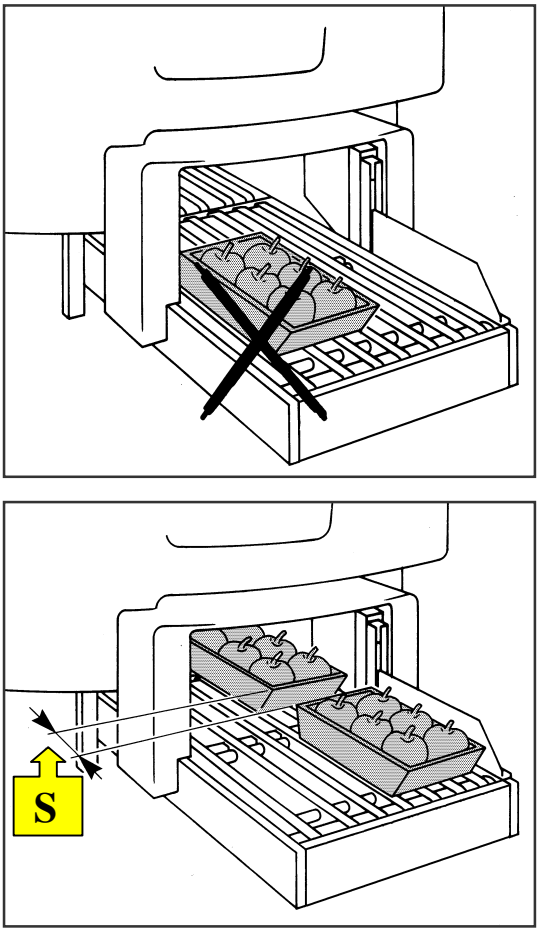
- If the film is melted or appears to have been heated too much, reduce the temperature.
- If the film tightness is not uniform or if the film opens, increase the set temperature.

Loading Trays

All products must be completely contained in the trays. The trays must be stiff enough to support the product properly.

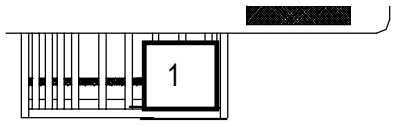


The machine detects the tray when it is placed on the infeed conveyor using a photoeye. The tray must be set against, and aligned with, the infeed guide, as shown below. The trays must not be spaced closer than 3 cm (1.2 inches), shown as measurement S in the illustration below.

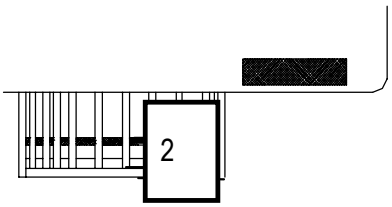


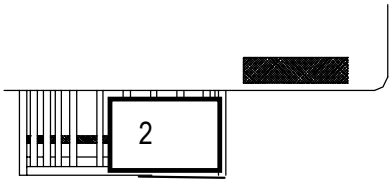
If the dimensions of the tray exceed the maximum allowed by the machine, the machine will stop in emergency mode and reject the tray.

Tray Reference



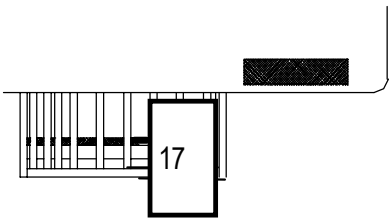
If tray height is less than 3”

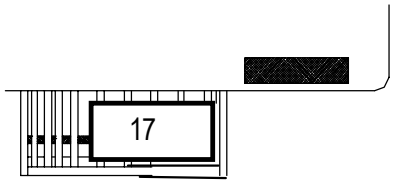




If tray height is greater than 3”

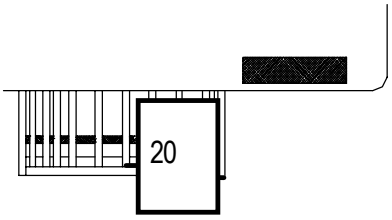
If tray height is less than 3”

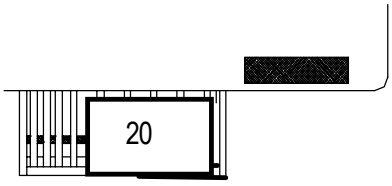




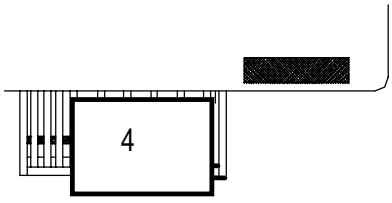
If tray height is greater than 3”

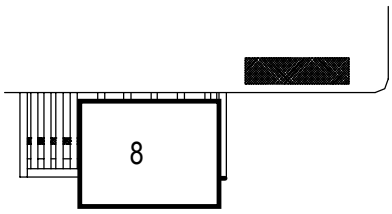
If tray height is less than 3”

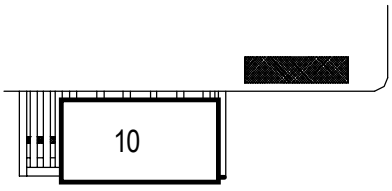


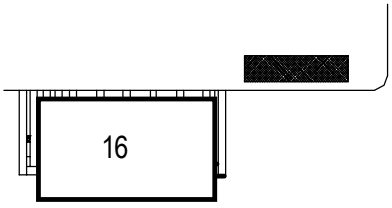


If tray height is greater than 3”









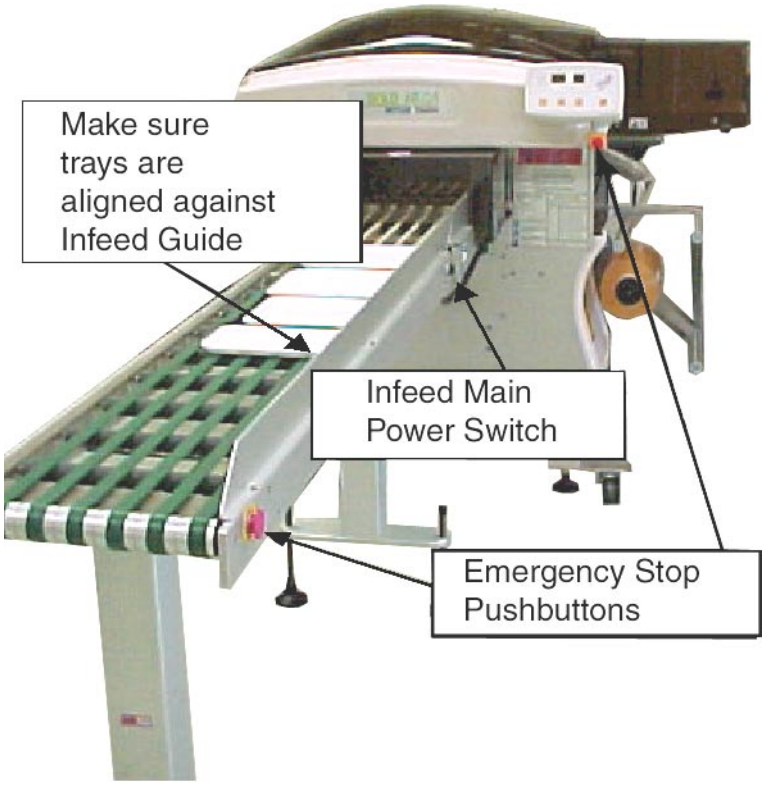
Extended Infeed Operation

To operate the extended infeed:

- ❑ Turn on the main power switch for the wrapper.
- ❑ Turn on the main power switch for the extended infeed which is located at the right end of the infeed closest to the wrapper.
- ❑ If the red emergency stop pushbutton is depressed on the right side of the extended infeed or the right front of the wrapper, turn the pushbutton clockwise to release it.
- ❑ Push the start button on the wrapper.
- ❑ Load trays against the guide on the right side of the extended infeed conveyor. Refer to pages 4-4 and 4-5 for correct package position on infeed

To stop the extended infeed and wrapper:

- ❑ Depress either the red emergency stop pushbutton on the right side of the extended infeed or the red emergency stop pushbutton on the right front of the wrapper.

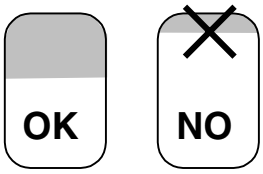


Package Wrapping Check

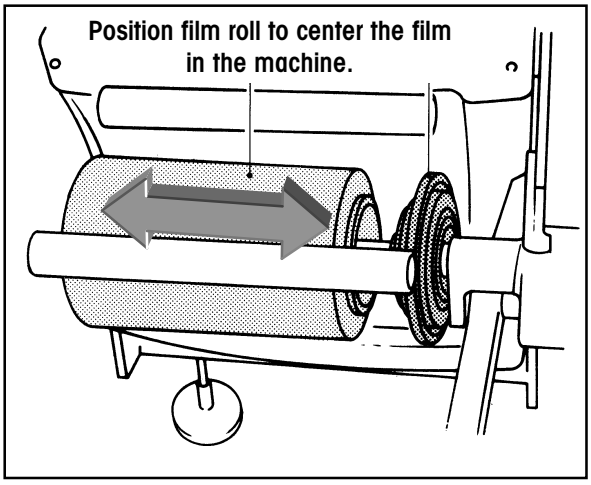
When starting a run, check some of the trays coming out the machine to determine the wrapping quality. The trays should be checked for proper amount of film overlap and sealing. If the sealing is not adequate, adjust the sealing belt temperature and allow the new setting to stabilize (when the display stops blinking) before rechecking the packages.

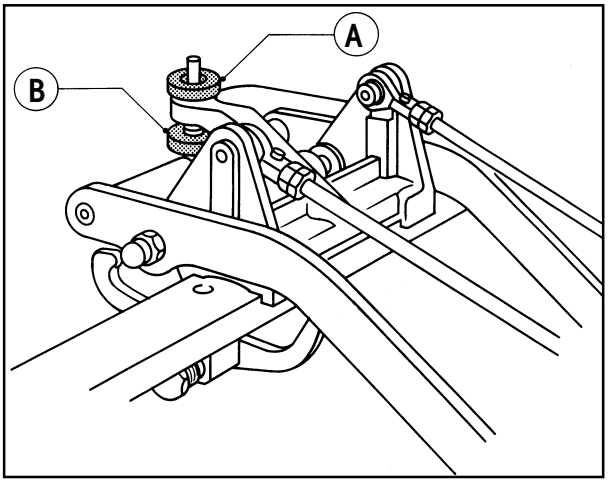
If there is not enough film overlap:

- Make sure the film is centered in the machine. If the film is not centered, adjust the location of the film roll on the supply shaft.
- The pressure rollers may need adjustment. To adjust the roller pressure, loosen ring nut A and adjust the height using ring nut B.



Film Overlap





Machine Idle Time

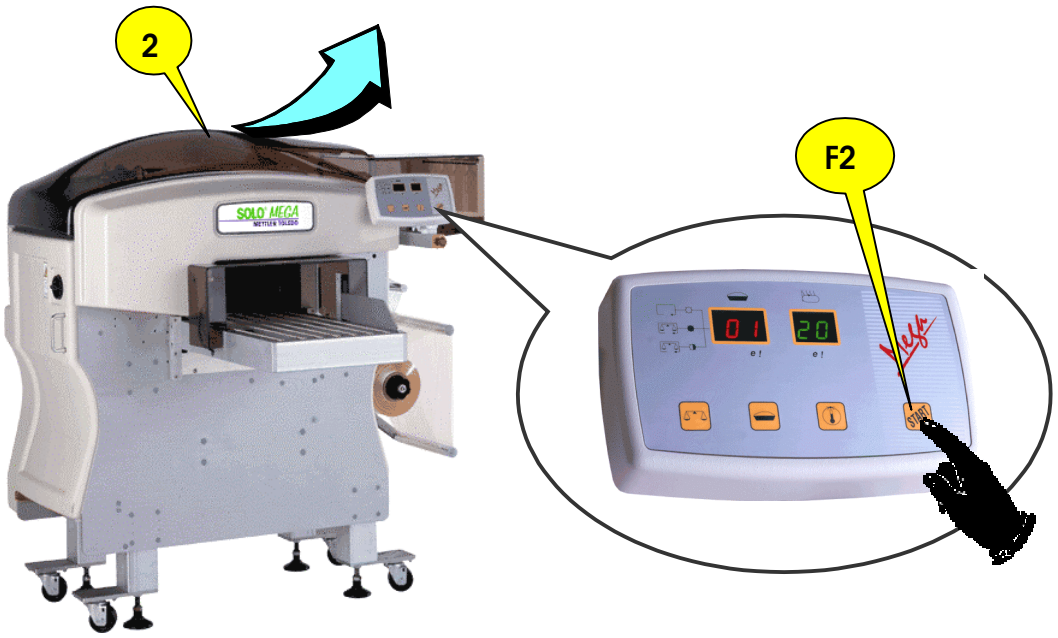
If you will not be using the machine for an extended time, the main power switch should be turned off.

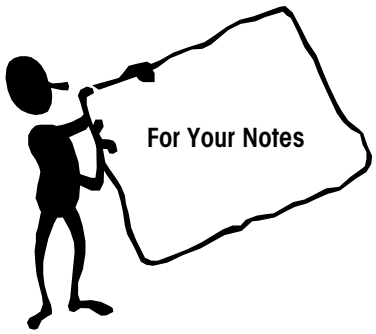
When the machine is not in use for more than 30 seconds (default, adjustable in setup), it will go into a standby mode (energy saving). To start the machine again, press the START button F2.

Machine Stop Due to Error

If the machine stops and displays an error code:

- Open the top cover (2)
- Solve the error problem.
- Close the top cover.
- Press the Start button F2.




For Your Notes

5 Cleaning and Maintenance

Daily Cleaning

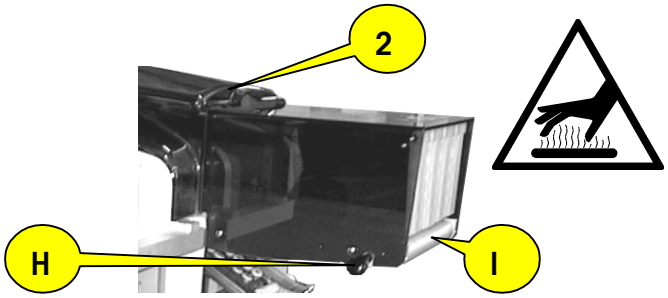
WARNING

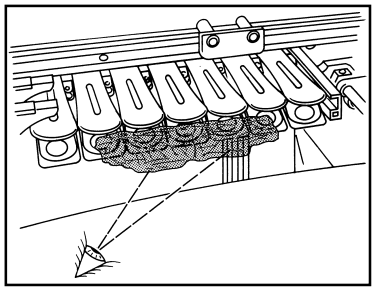
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

Always disconnect power before cleaning or performing maintenance on the machine. Turn the main power switch to off (0). A padlock can be used to lock the machine off to prevent others from starting the machine while it is being serviced.

Open the top cover (2). Using handle (H), lift the sealing belt to the raised position for cleaning. Daily, remove any film or product from the following locations and clean with a soft cloth and hot water:

- Infeed conveyor rollers and belts
- Infeed photoeyes
- Package lifter
- Center clamp
- Side clamps
- Film folders
- Sealing belt
- Film folders



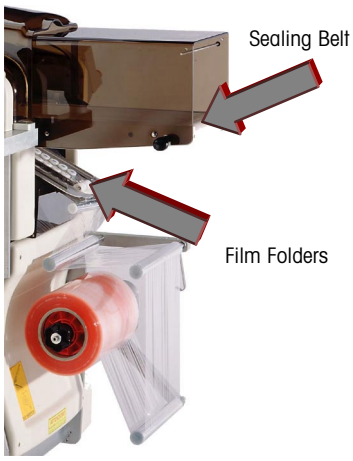


Remove any film or product from the side clamps

Open top cover for access to the lifter, center clamp, and side clamps.

Infeed Area and photoeyes

Daily, remove any film or product from the machine and clean these locations with a soft cloth and hot water.



Sealing Belt

Film Folders

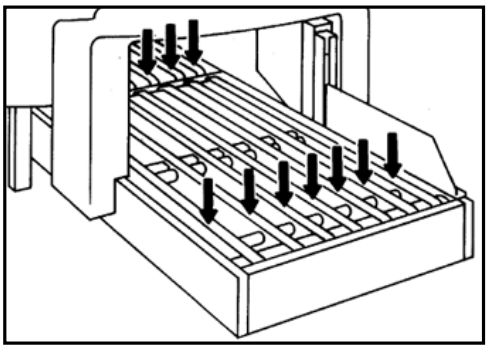
Weekly Cleaning and Maintenance

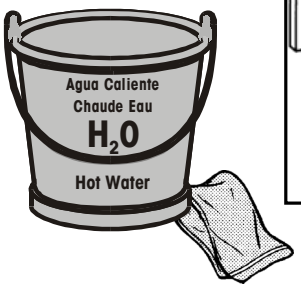
ONCE A WEEK clean the following areas using a cloth dampened with hot water on the parts detailed in this section.

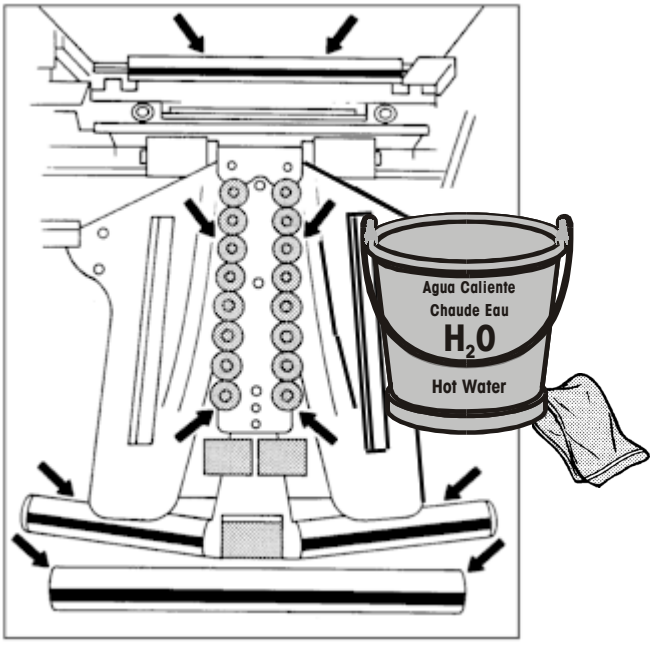
✓ **NOTE**

Do not use solvents or abrasives for cleaning the following parts.

Clean the Infeed conveyor belts and rollers.



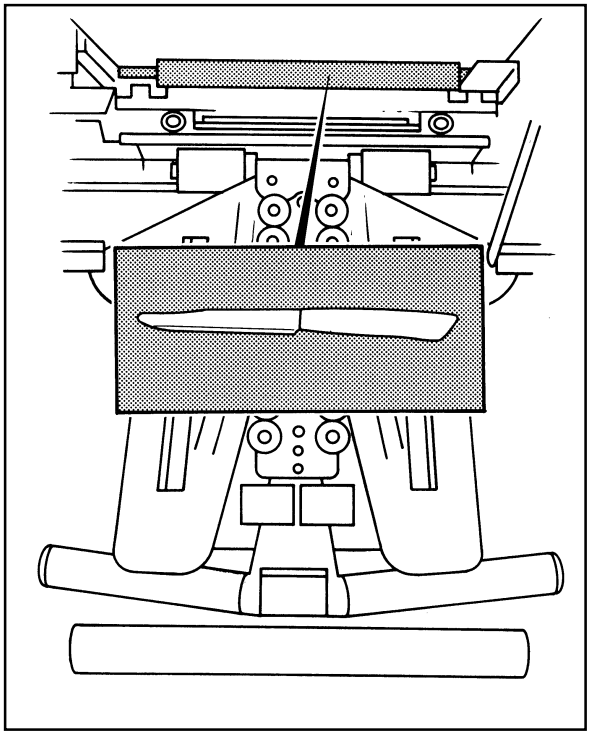


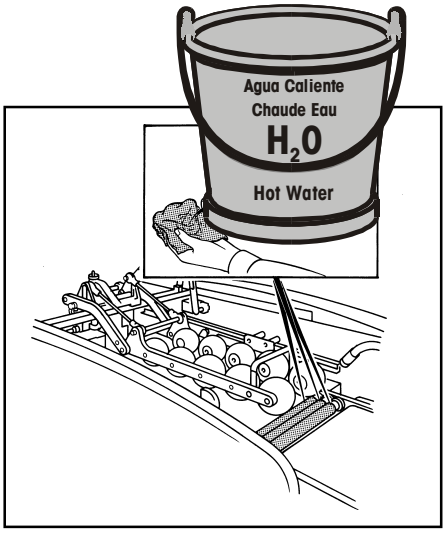


Clean the:

Package lifter
Center Clamp and Film Folders
Film rollers

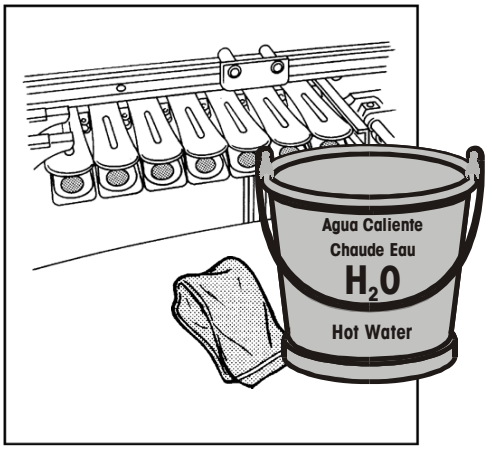
If film is wrapped around the first roller, use a knife to cut the film by running it through the provided slot. Caution! Do not to cut into the polished surface of the roller.



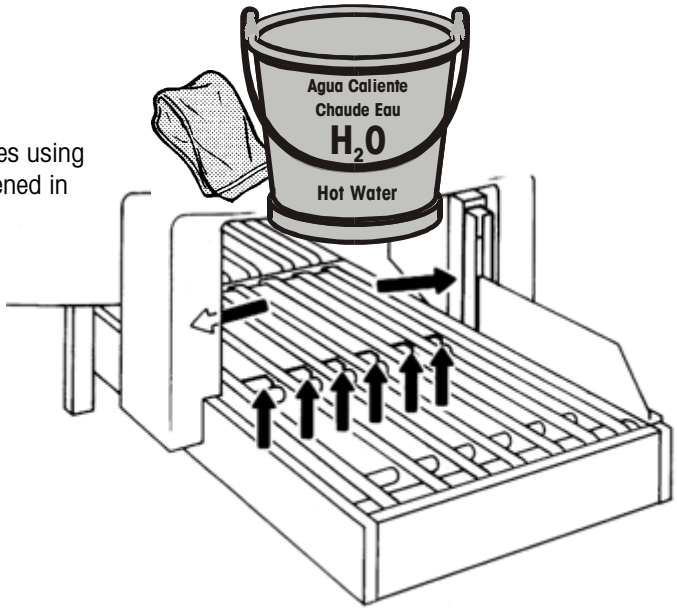


Clean the discharge rollers on the Sealing Belt.

Clean the Side Clamps.

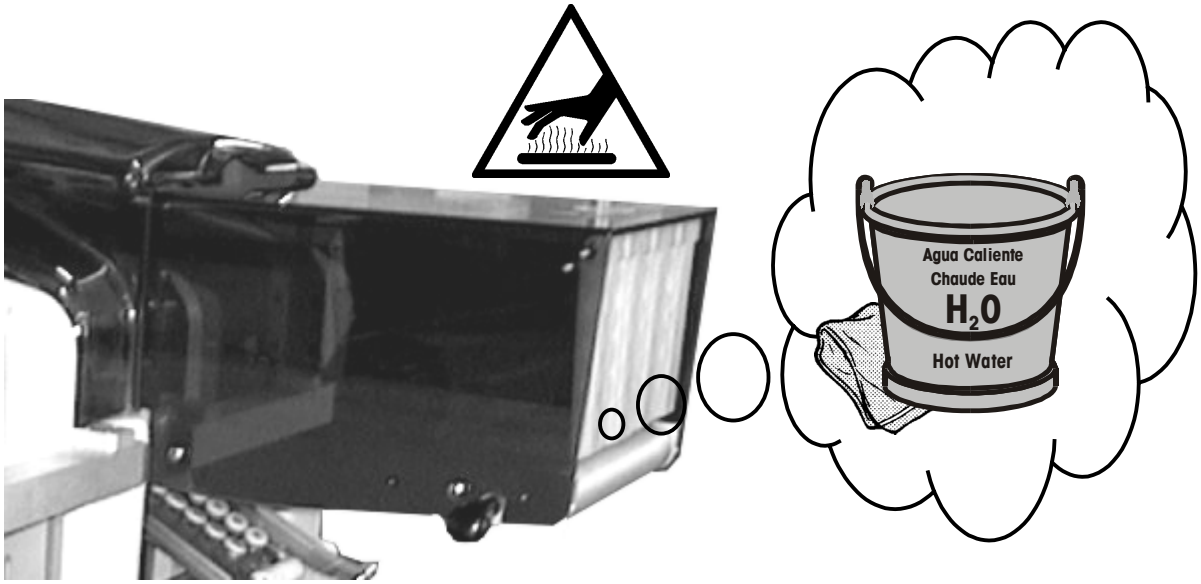


Clean the photoeyes using a soft cloth dampened in hot water.



✓ **BE CAREFUL**

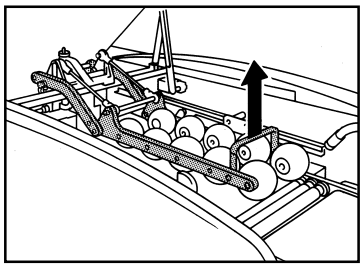
Clean the Sealing Belt. Wait for the surface to cool before cleaning.



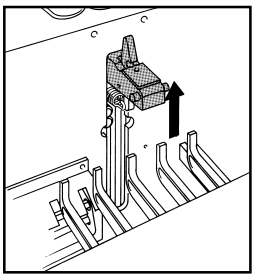
Cleaning the Package Lifter

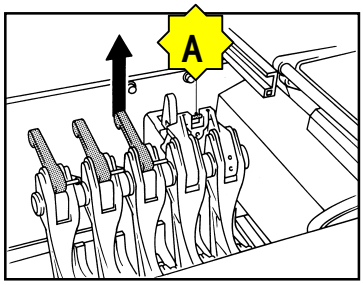
For proper machine operation, the Package Lifter must be kept clean. Use this procedure for removing and cleaning the lifter assembly.

Raise the pressure rollers.

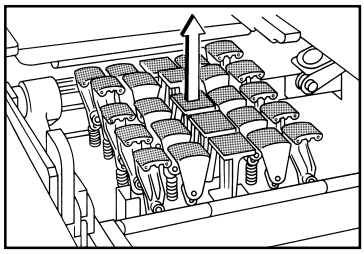


Pull the lifter up, open the lifter hook (A) and tilt the lifter down.

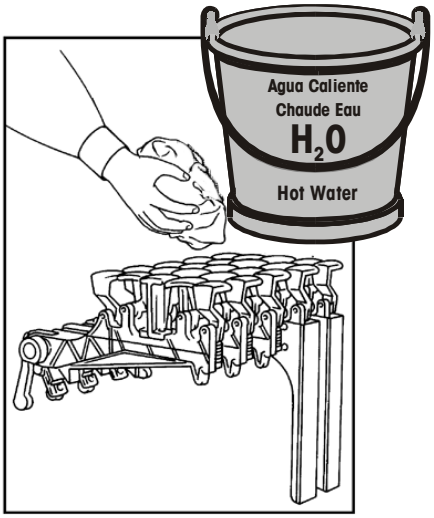




Pull the lifter up and remove it from the machine.

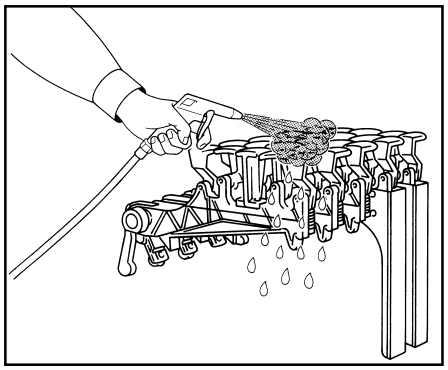


Clean the lifter using a food-grade neutral detergent to remove any product and dirt or grease.



Make sure the slides are clean. If necessary, scrape any buildup from the slides.

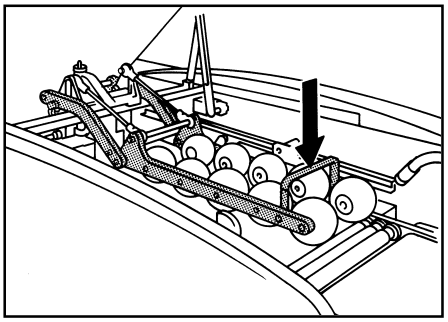
Rinse the lifter with water and use compressed air to dry (if available).



✓ **NOTE**

Insert the lifter in the support guides and block it using hook (A).

Re-install the lifter in the machine and lower the pressure rollers.



Lubrication

Only a trained technician should lubricate the machine. Lubrication should be performed twice a year, or more frequently depending on package volume. Follow the instructions outlined below for the lubrication required on the SOLO® Mega Wrapper.

General Lubrication

Use light oil (FMO350 Spray Oil, Part Number 81863500A) on the following parts:

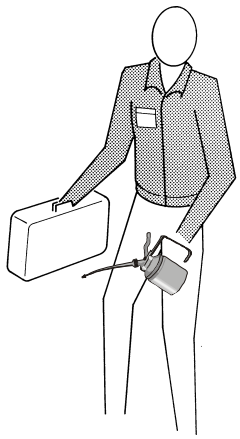
- All plastic bearings
- The three mobile lifter segments, including the latches.
- Cutter guide rods.
- Any pivot points which can rotate or spin during the wrapping cycle.

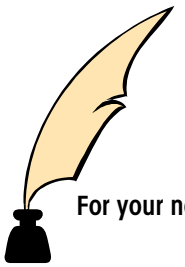
Use "Lead Screw Oil" (Part Number 83145200A, Vaseline Oil) for these points:

- The four leadscrews in the linear actuator cases for the Side Clamps, the Lifter and the Center Clamp.

Food-grade lithium grease (CPI Grease, Type GRS-460-F, Part Number 82909400A) should be applied to the following parts:

- The bearing guides for the Side Clamps Lifter, and the Center Clamp.
- The four tracks in the linear actuator cases for the side clamps, the lifter, and the Center Clamp.





For your notes

6 Installation

Unpacking

The SOLO® Mega is shipped on a special shipping crate. Carefully inspect the wrapper for damage and report any shipping damage to your carrier immediately. Unbolt the wrapper from the shipping crate and remove all the packing straps and material.

Use extreme caution when lifting and moving the equipment to the desired location. Do not attempt to lift and move the equipment by yourself or injury could occur.

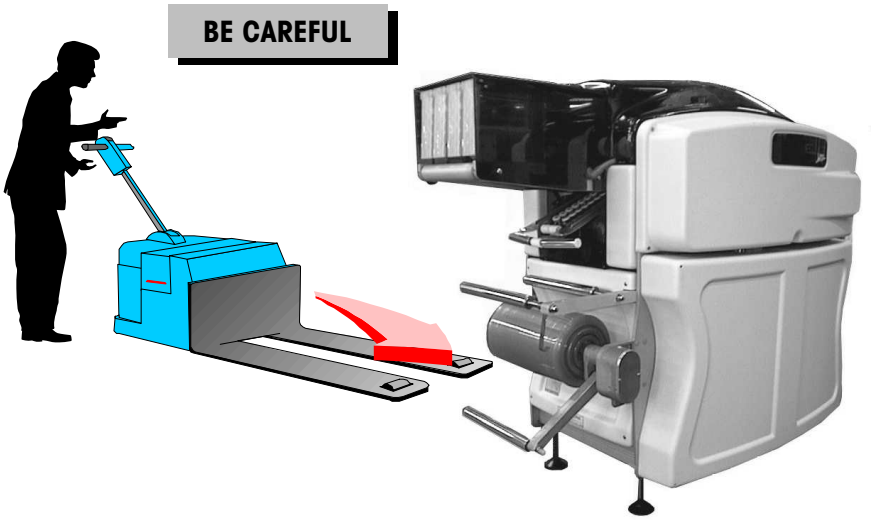
Caution: The wrapper is top heavy. Use extreme caution when removing it from the shipping pallet. Lift the wrapper by the main frame only. ***Do not lift or move the wrapper using the Infeed Table or the Sealing Belt.***

Lifting

⚠ WARNING

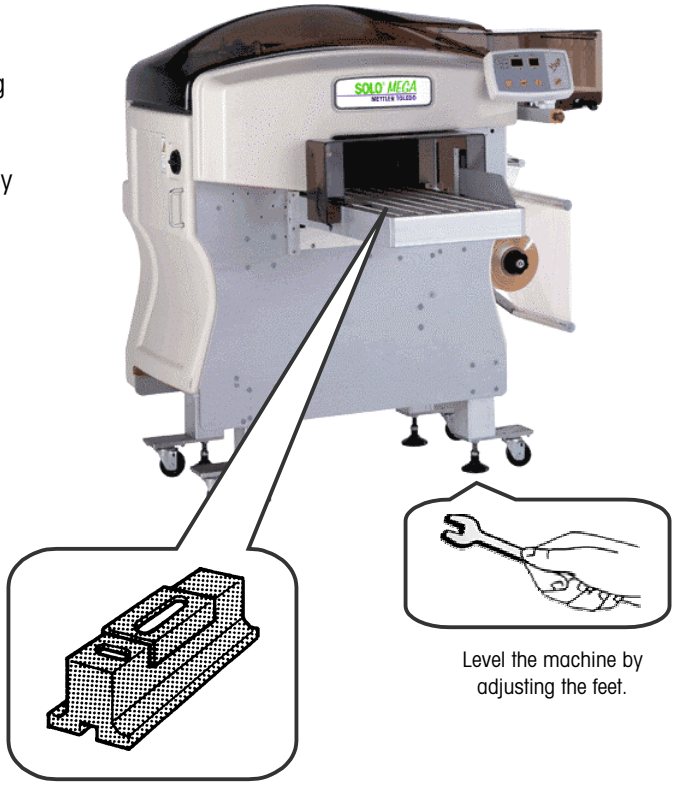
Use extreme caution when lifting and moving the equipment to the desired location. Do not attempt to lift and move the labeler by yourself or injury could occur.

Lift the machine by the main frame only. Do not use ropes or chains to lift the machine. Use a forklift of adequate size to lift the machine into position.



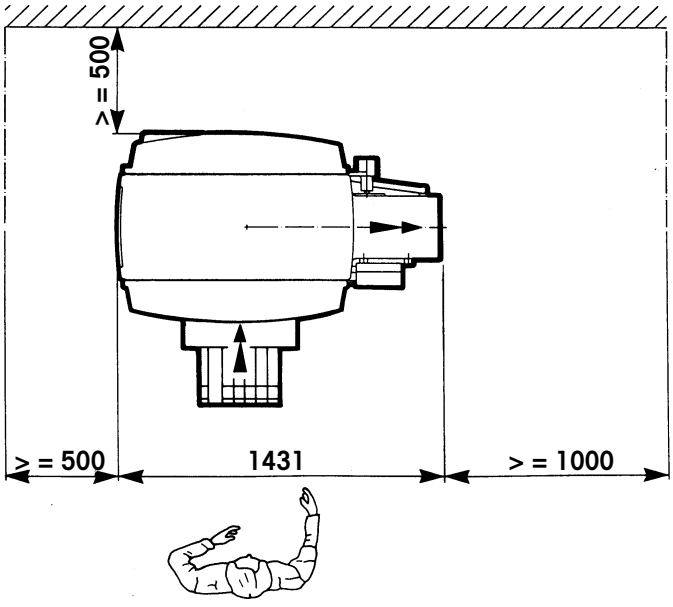
Carefully set the machine in place and remove all packing material.

Level the machine using the infeed frame as a reference by adjusting the four feet. The machine must be leveled and not rock in any direction.



Level the machine by adjusting the feet.

Use a level on the infeed frame for reference



Adequate working and maintenance clearance must be provided around the machine.

A minimum distance is required on the rear and side of the machine to perform maintenance.

Electrical Connections

Before connecting any power to the machine, first, verify the voltage the machine is configured for, and then connect the supply line.

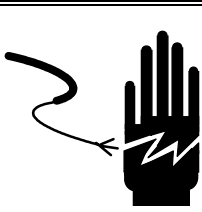
Verify Voltage

Verify the machine voltage matches the voltage source you are connecting. The machine requires 208 VAC or 230 VAC, 50/60 Hz, Single Phase with a power rating of 3 kVA.

To verify the machine voltage setting, look at the 14-pin connector (CN3) on the left side of the Fuse Board by the transformer (see below). There will be three wires at the bottom: one black, one brown, and one blue. Terminal 13 determines the voltage setting.

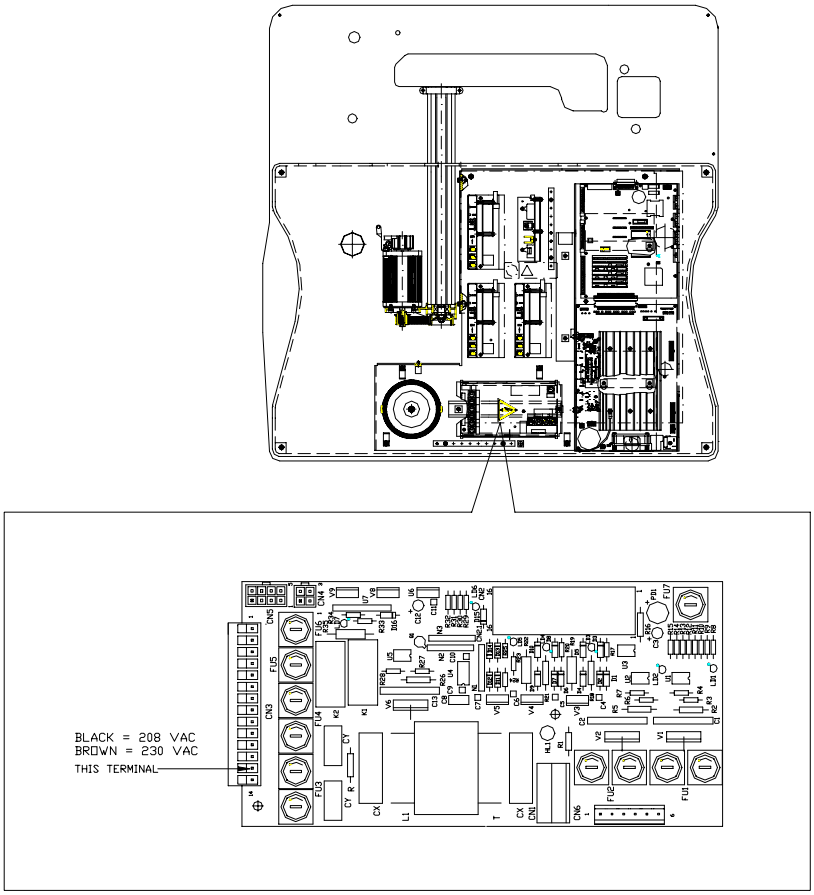
For 208 VAC, install the black wire on Terminal 13.

For 230 VAC, install the brown wire on Terminal 13.

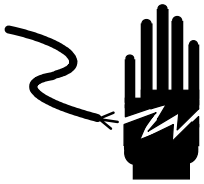


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



Connect Supply Line



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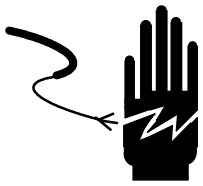
The Mega wrapper comes prewired with a 12′ 12/3 SJ power cord. The power cord terminations are:

Green	Earth (PE)
White	Neutral (N)
Black	Line (LI)

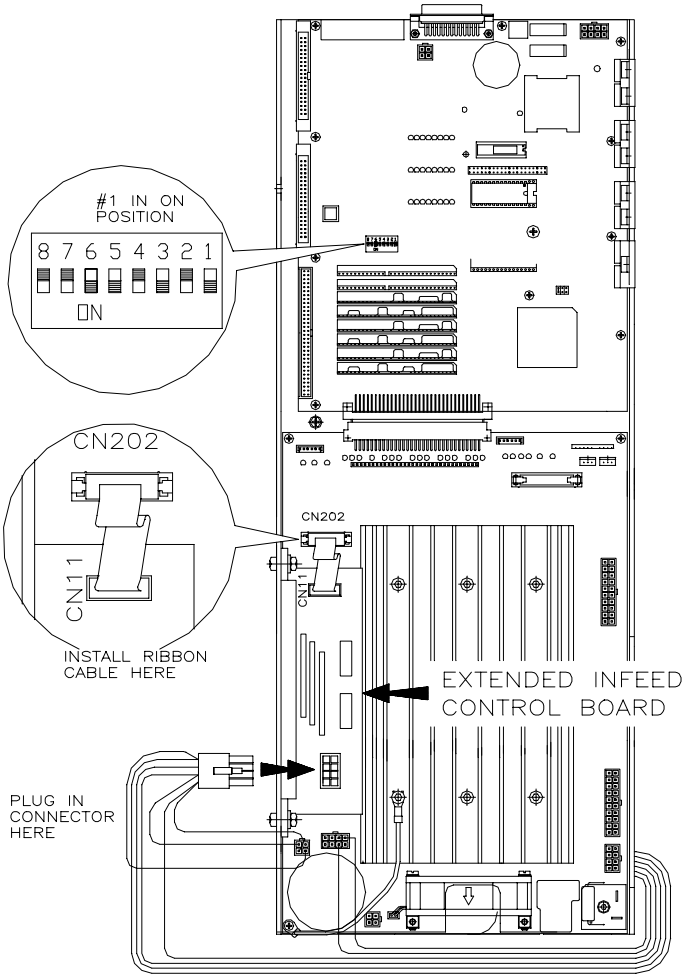
Extended Infeed Installation Instructions



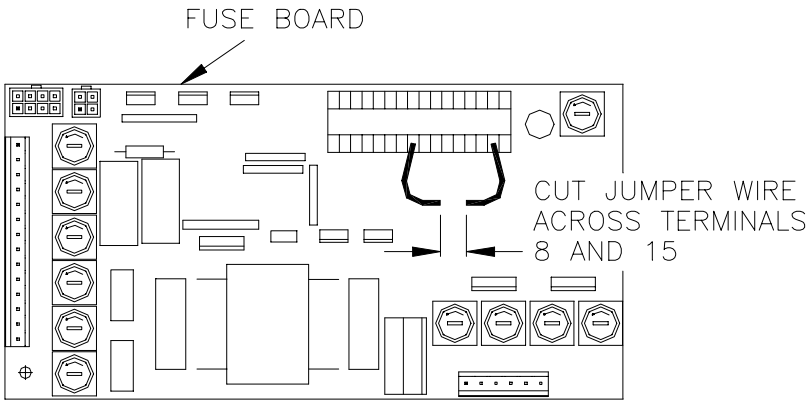
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

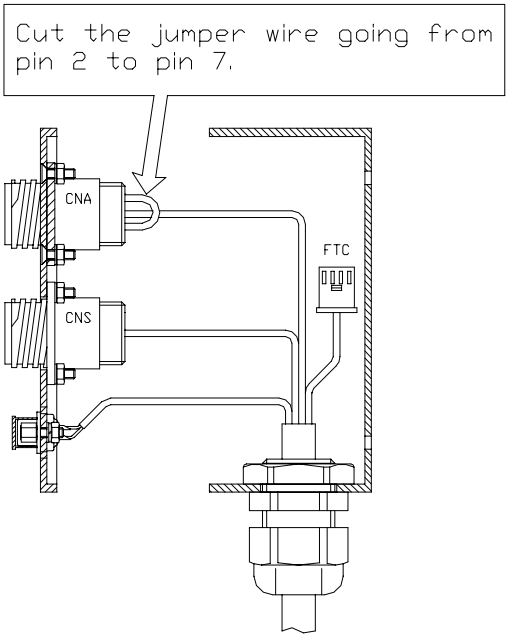
- With the machine power off, install the extended infeed control board. Mount it to the side of the electronic rack in front of the stepper driver board as shown in the illustration. Plug in the power harness, which is hanging loosely at the bottom of the rack, and connect the communication cable, which is provided with the extended infeed to the Stepper Driver board.
- Turn Dipswitch 1 on the CPU board ON if it isn't already. This enables the extended infeed in software.



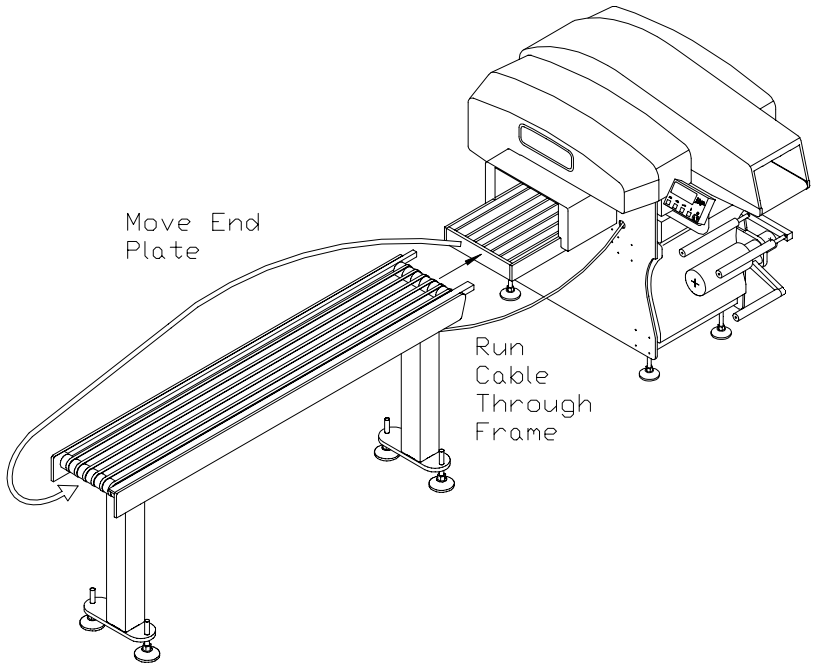
- Two wires need to be cut in order for the E-stop switch on the extended infeed to function. The first one is located on the fuse board at CN2.1 (refer to the illustration below). It is a jumper wire that connects pin 8 and pin 15. Cut the wire in the middle and tape both ends.



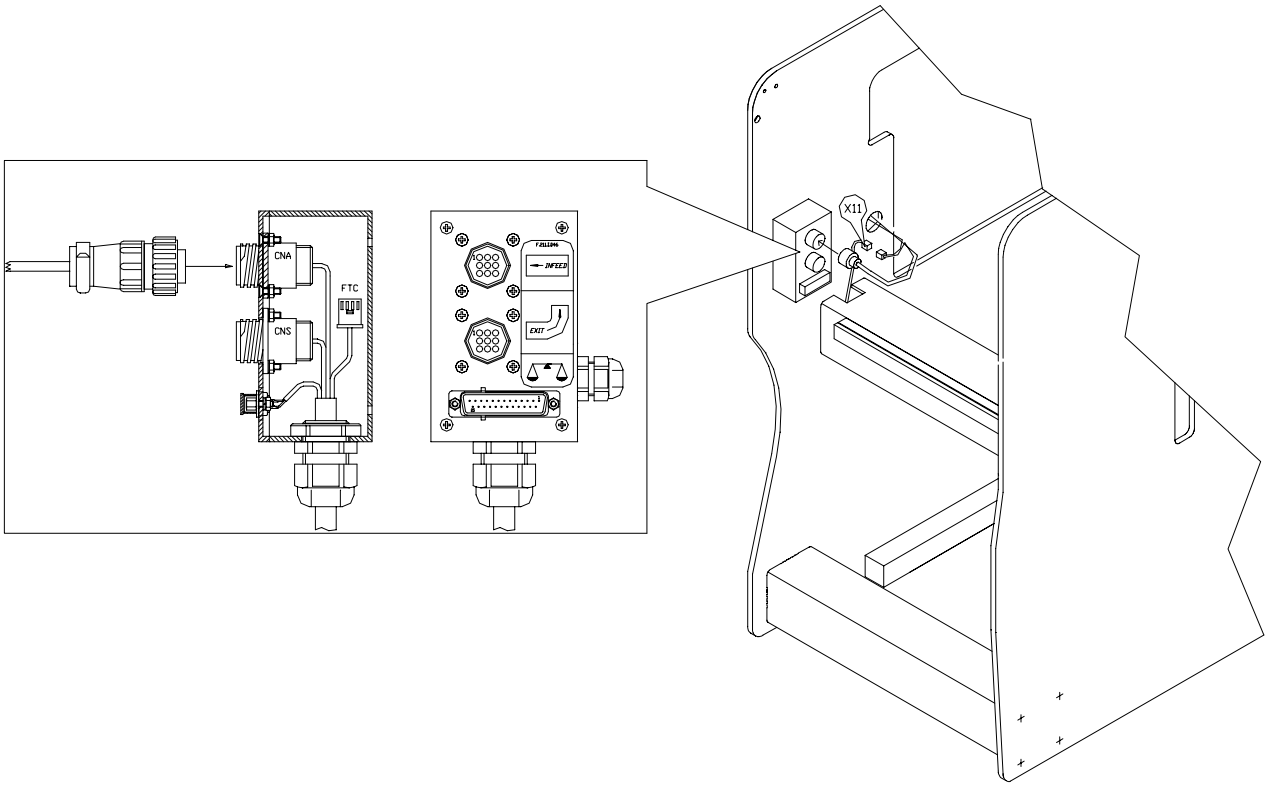
- The second wire is inside the infeed connecting signal box located on the inside face of the front side frame below the sealing belt. Remove the face of the box, the jumper wire is at CNA (refer to the illustration below) and connects pin 2 and pin7. Cut the wire in the middle and tape both ends.



- Remove the end plate with angle brackets from the end of the machine infeed and re-install at the end of the extended infeed.
- Using the leveling feet, adjust the height of the extended infeed to match the height of the machine infeed.
- Slide the extended infeed up to the machine with the mounting tabs between the machine infeed side frames. Insert the screws for fastening the extended infeed to the machine infeed but do not tighten at this time.



- Remove the hole plug from the large hole in the front machine frame on the right side of the infeed. Run cable for the extended infeed through the hole and plug the harnesses into the jack. The round nine pin black connector plugs into the signal box at the connector labeled "infeed" (refer to the illustration below). The square 4 pin white connector connects to the power wire labeled X11 and is usually tucked into the upper cross member next to the signal box.



- Power up the machine and turn on the extended infeed using the black switch on the side of the extended infeed.
- Using the leveling feet on the extended infeed, adjust the extended infeed so that packages do not twist when transferring from the extended infeed to the machine infeed.
- Tighten the mounting screws holding the extended infeed to the machine infeed.
- Check that the extended infeed package guide is a little further out where it meets the machine infeed than it is at the end. This is necessary so that packages are not being pressed against the guide as they are traveling into the machine as this can cause them to twist.

7 Machine Adjustments

Measurements

All of the measurements performed in this chapter are shown in millimeters (mm).

Torque Specifications

The table below lists recommended torque specifications for tightening stainless steel fasteners into aluminum. These limits are assuming a thread engagement of at least three times the thread diameter. Use this chart for reference when servicing METTLER TOLEDO backroom equipment.

Bolt Size	Recommended Torque (Maximum)
M3	15 in/lb
M4	45 in/lb
M5	100 in/lb
M6	175 in/lb
M8	350 in/lb

Torque Specifications
Stainless Fastener to Aluminum

Note: Any tightening method involves certain inaccuracies that are the result of:

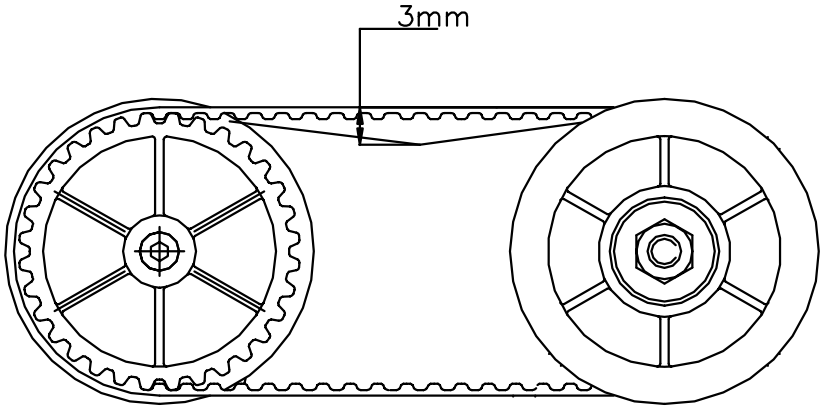
1. Estimating the friction factor
2. Manipulation errors of torque wrench
3. Tolerance of the torque wrench itself

Depending on how much these factors can be controlled, either a higher or lower tolerance can be considered.

Drive Belt Tension Adjustments

Timing belt installation should be a snug fit, neither too tight nor too loose. The positive grip of the belt eliminates the need for high initial tension. Consequently, a belt, when installed with a snug fit (that is, not too taut), assures longer life, less wear and quieter operation. Preloading (often the cause of premature failure) is not necessary. A belt that is too tight will not track properly. This causes the belt to ride up on the lip of the pulley. If the belt is too loose, it may jump a tooth. In such a case, the tension should be increased gradually until satisfactory operation is obtained.

The illustration below shows the center clamp actuator belt with a recommended deflection of 3mm using moderate force (8 oz.) The same example can be used for all other timing belts on the machine.



Drive Belt Tension

Infeed

This section covers adjustments to the Infeed Section.

Infeed Conveyor Alignment

Infeed Height and Roller Adjustment

The alignment of the infeed conveyor assembly is critical to assure proper clearance between the infeed conveyor belts and the lifter when the lifter is in the down position. Misalignment can also cause the horizontal photoeyes to malfunction.

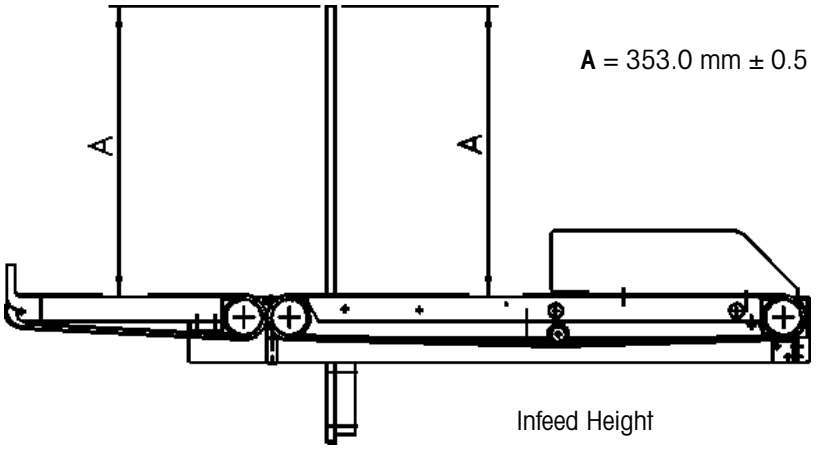
Check the infeed belt guides to make sure they are parallel with the top of the machine frame. Check this measurement at the guide - not the belt - and check it at both ends of the guide. Move the belt to one side to measure. Refer to the illustration "Infeed Height"

Associated Pocket Tests:
300 - Photoeye test
601 - Infeed motor movement test

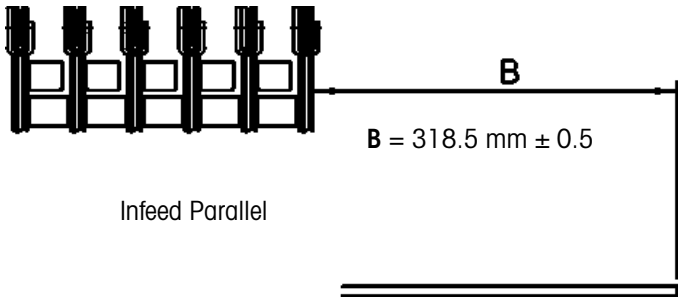
Measure the distance from the right (discharge end) of the machine frame to the nearest belt guide as shown the illustration "Infeed Parallel".

If either of the measurements are not within tolerance, loosen the four mounting screws. Remove one screw at a time, apply blue Loctite, and re-install. Align the infeed conveyor assembly. Once the infeed has been properly positioned, torque the mounting screws to 175 inch pounds.

After making adjustment, check for clearance between the infeed belt guides and the lifter package supports. Also check to make sure that the lifter is below the infeed belts when the lifter is in the down position. Refer to lifter adjustment section.



Infeed Height



Infeed Parallel

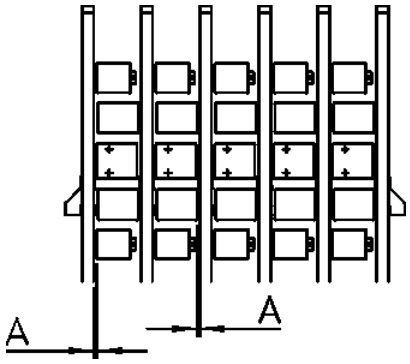
Lifter

This section covers adjustments to the lifter section.

Lifter and Support Clearance

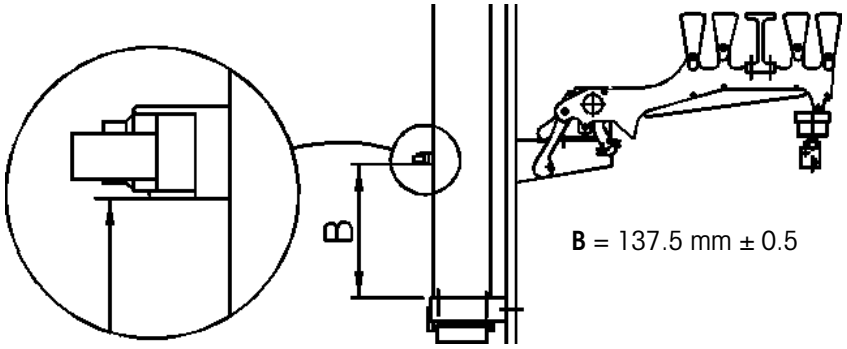
Check the clearance (A) between the lifter and supports.

A = ≥1.0 mm



Lifter Sensor Position

Check the position (B) from the sensor to the lower support.

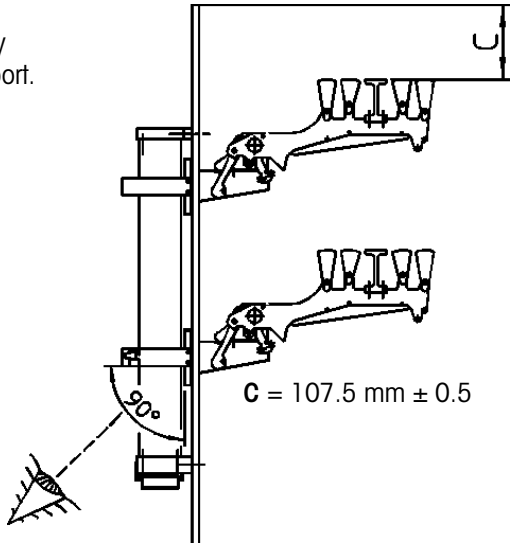


Lifter Sensor Blade

With the lifter in the lowered position, verify the sensor blade is at 90° to the lifter support.

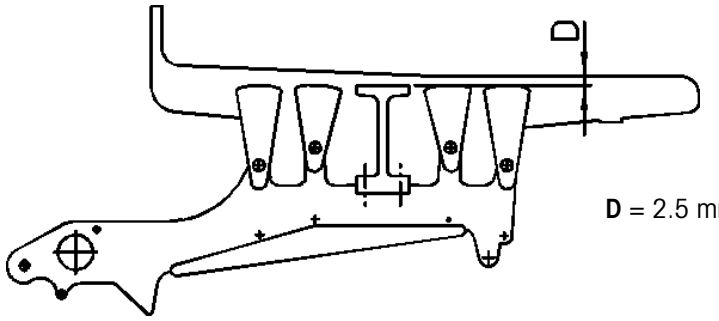
Lifter Up Position

With the lifter in the up position (machine ON), verify the package supports are at distance (C) from the upper edge of the machine frame.



Lifter to Support Position

With the lifter in the down position, the package supports must be lower (distance D) than the plane of the fixed supports and belts.



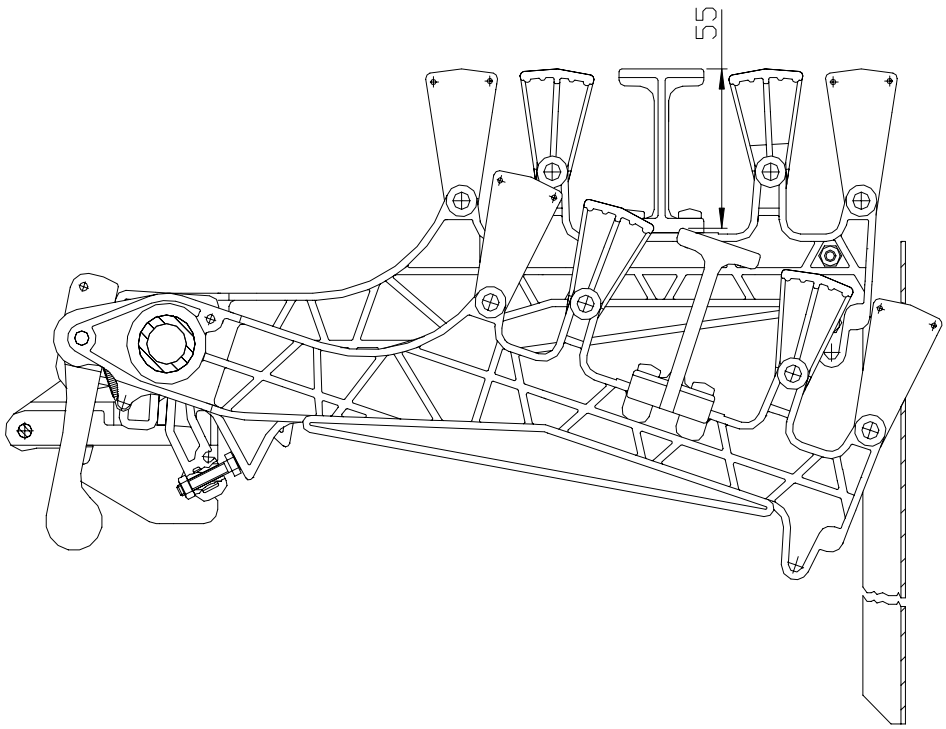
D = 2.5 mm ± 0.5

Lifter Down Over Travel

When the lifter is in the down position, there must be an additional 1mm clearance before engaging the mechanical stop.

Lifter Segment Drop

The lifter in the down position should measure as show below in the illustration.

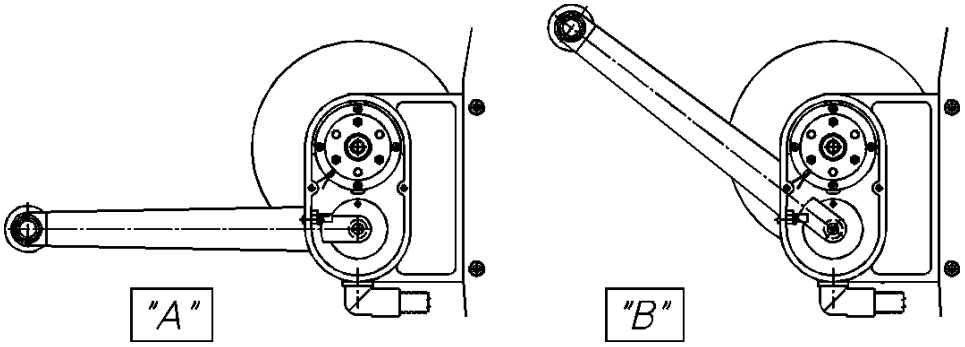


Film Carrier

This section details adjustments to the Film Carrier.

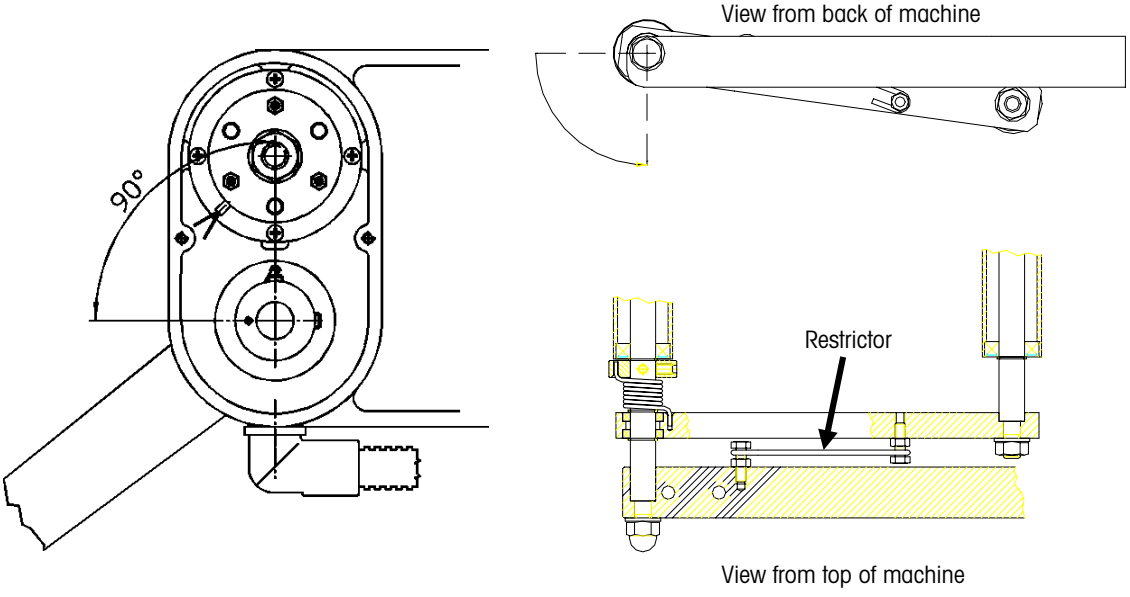
Sensor Blade Position

The sensor blade must start switching the sensor when the lever of the stretcher roller is in position (A). The sensor must remain switched until the lever has reached position (B) of the end stroke.



Spring Preloading

Check out the spring preloading with stretcher roller lever completely down. The upper dancer bar spring should be set so that the arm is stopped by the restrictor as little as possible when wrapping a medium to large pack. Start by setting the collar with 90 degrees of preloading, as shown in the illustration. Then, wrap a few packages and observe the movement of the upper dancer bar. If the arm sits in the low position, increase the preload. If the arm hits the top of the stroke, reduce the preload. Continue to adjust the preload until the arm floats in the middle as much as possible during the wrapping cycle.

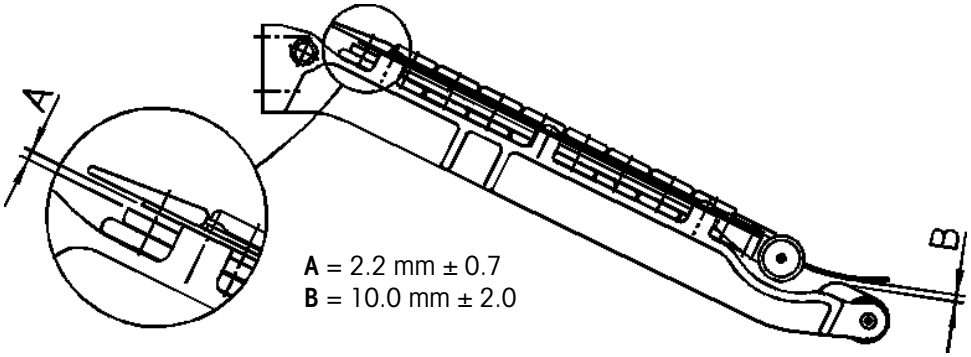


Film Folder

This section details adjustments to the Film Folder.

Side and Center Folder Parallel

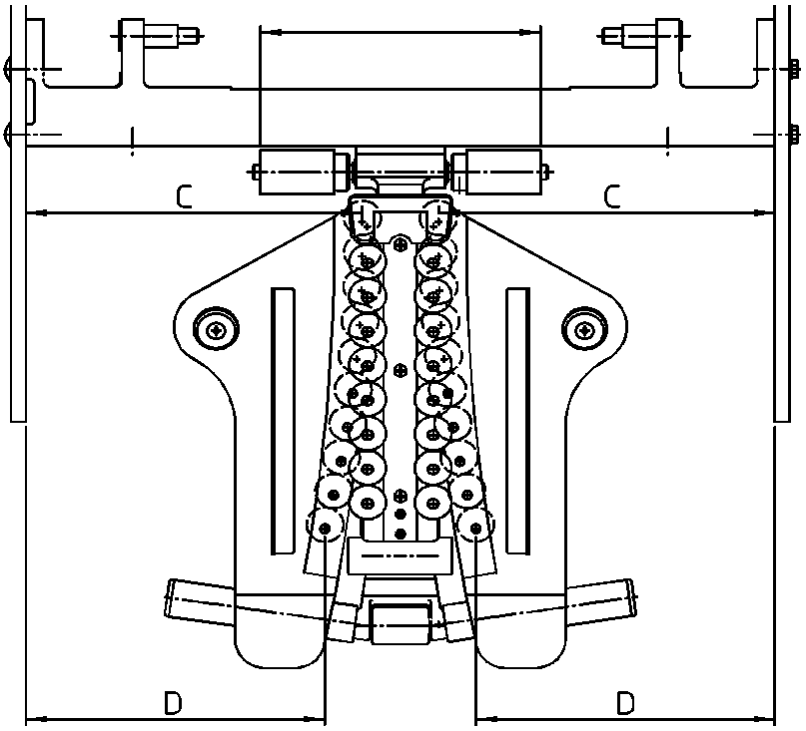
The side and center folders must be parallel to each other. Check distance (A) between the center film folder and the side folders. Check distance (B) between the center film folder and the center roller.



Side Film Folder Alignment

Check out the distances (C) and (D) respectively between the machine side and the center of the rollers (rivet) at the top and at the bottom of film folder.

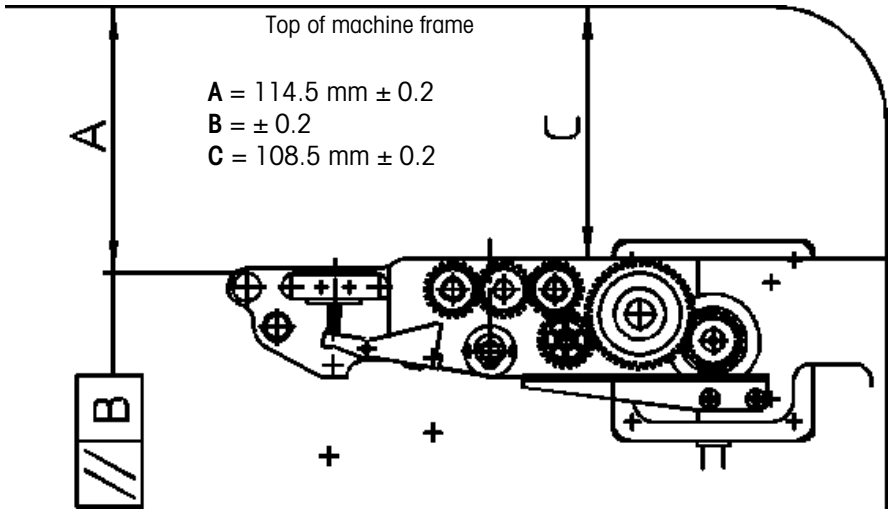
C = 233.0 mm ± 0.5
D = 203.0 mm ± 0.5



Sealing Belt

The following checks should be made on the Sealing Belt.

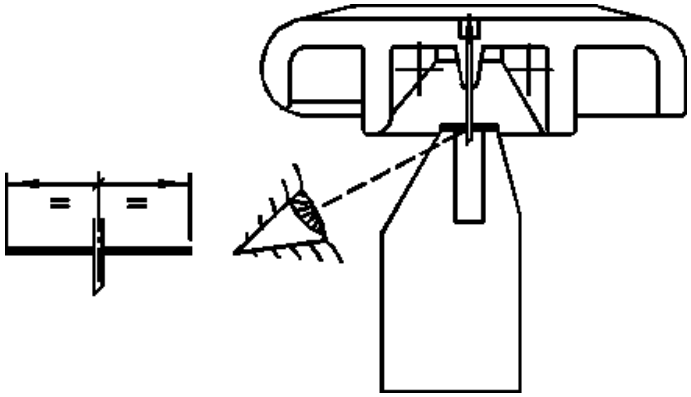
- Distance "A".
- "B" must be parallel between the first roller and the edge of machine sides.
- Distance "C" between the side of welding belt and machine.



Film Cutting Knife

Note: Use PC Pocket Test 603.

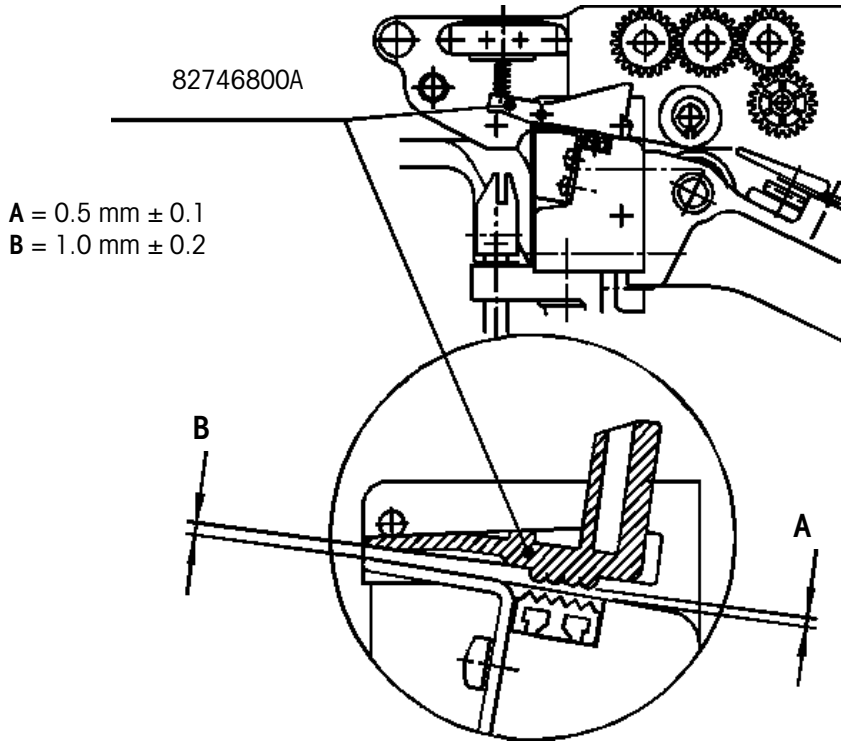
The knife must be centered in the cutter channel. This can be tested using paper and checking the impression of the cutting knife.



Distributor

Check out the distance "A" between the distributor's teeth and the fixed support.

Check out the distance "B" between the distributor and the fixed support.



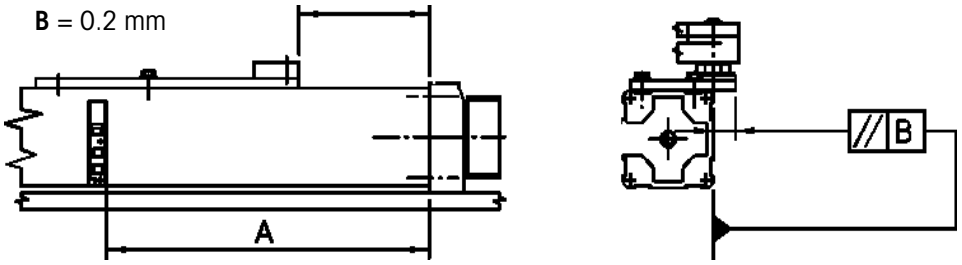
Center Clamp

This section details adjustments to the Center Clamp.

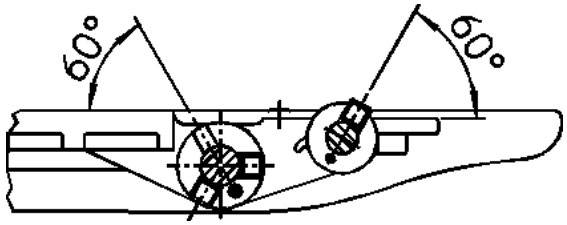
General Checks

Check out the distance "A" between the actuator support and sensor support. Check at position "B" between carriage guide and clamp cam support to make sure the two are parallel.

A = 215.0 mm ± 0.2
B = 0.2 mm

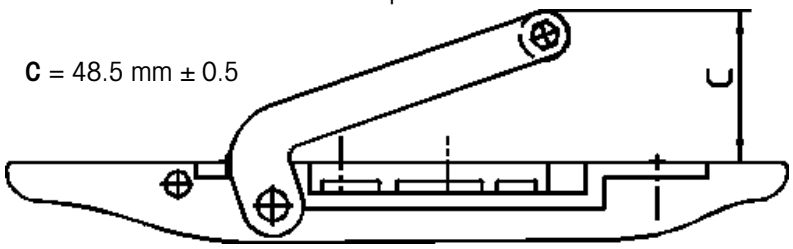


Check out the spring preloading.



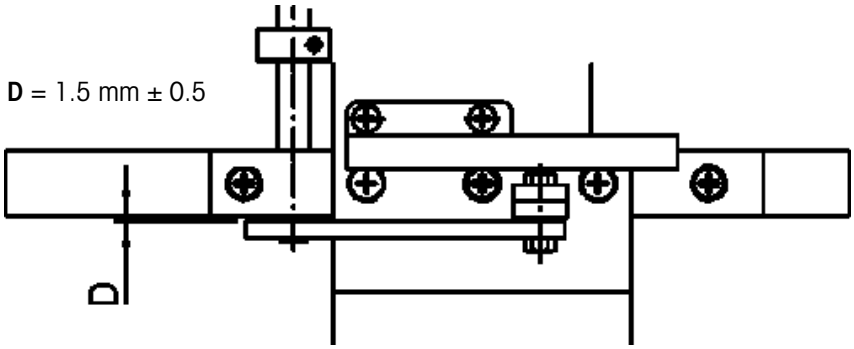
Check distance "C" of the center clamp release lever.

C = 48.5 mm ± 0.5



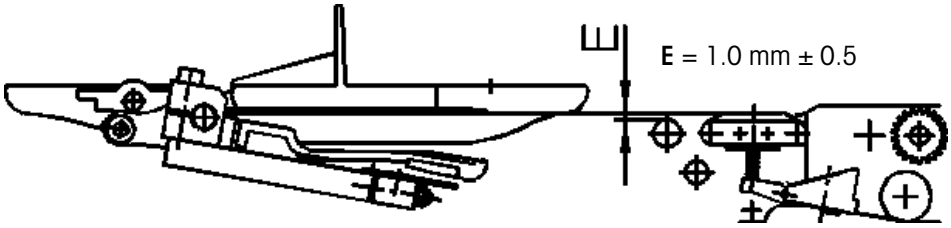
Check distance "D" of the center clamp release lever.

D = 1.5 mm ± 0.5



Center Clamp to Discharge Roller Clearance

With the clamp inside the distributor, check out distance "E" between the lower edge of the center clamp and the upper edge of the sealing belt first roller.

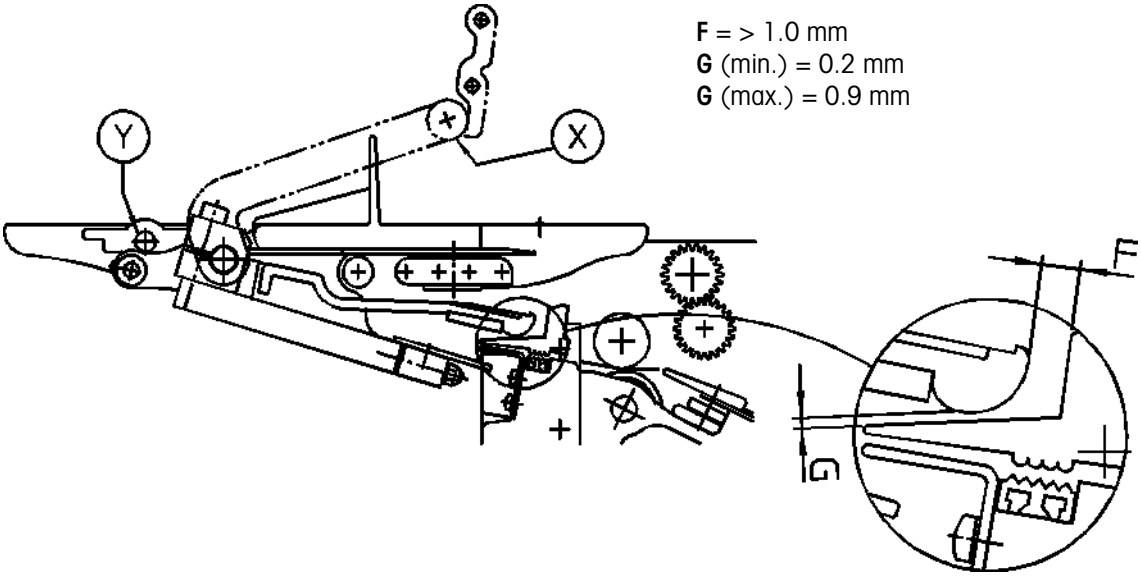


Center Clamp Overtravel

The center clamp must close 1mm before the end of stroke. Check out that there is a distance "F" from the film distributor to the position where the clamp closes.

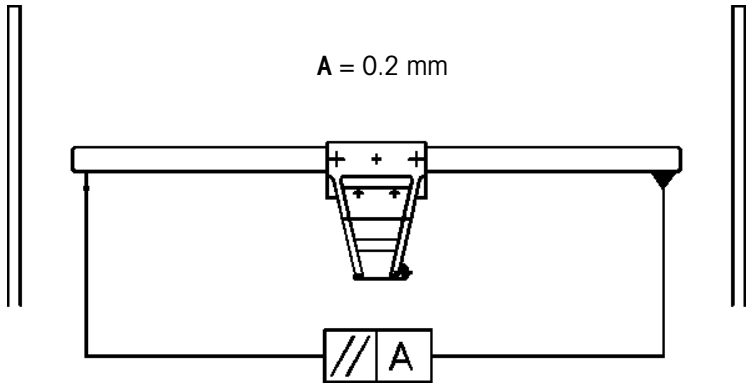
Center Clamp to Distributor Clearance

Put the film clamp opener lever bearing (ref. X) in contact with the release lever and check out the minimum and maximum distance "G" between the lower part of the contrast and the upper plane of the distributor plate (use eccentric Y for the adjustment).



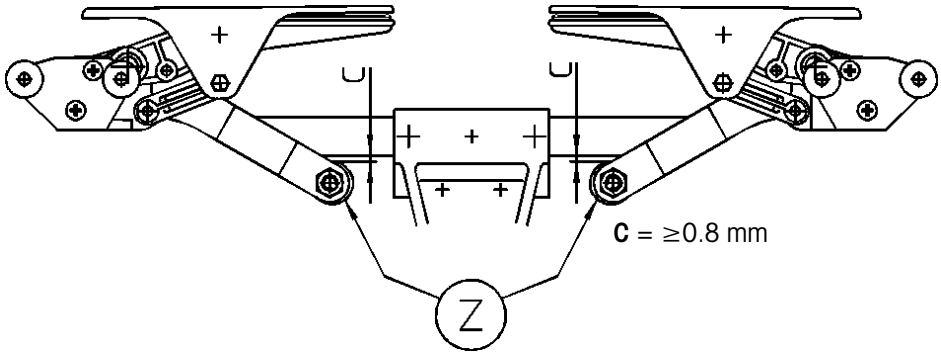
Clamp Opening Bar

Check that position "A" is parallel on the clamp opener bar.



Bearing Eccentric Position

Eccentric Z must be positioned at a distance "C" under the clamp opener rod in the closed position.

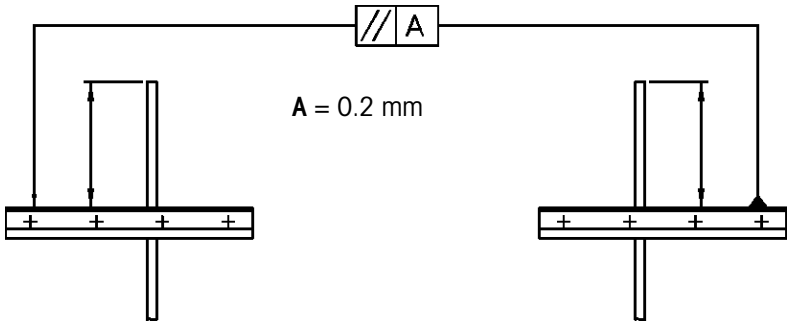


Side Clamps

This section details adjustments to the side clamps.

Carriage Guides

Position "A" must be parallel between the two guides of the side clamp carriage.

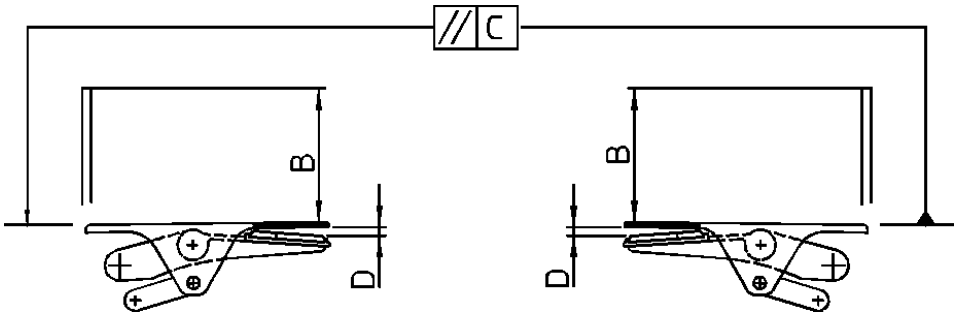


Side Clamp Height

Check distance "B" from the upper edge of the sides to the clamp slightly opened. The clamps must be parallel at position "C" between the clamps.

Side Clamp Open Clearance

Check that all the side clamps have an opening "D" (in the slightly open position).

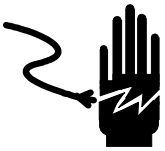


B = 113.0 mm ± 0.5
C = 1.0 mm
D = 2.0 mm ± 0.5

Side Clamp Spring Adjustment

Before making any adjustments, lubricate and check for binds. Adjustment of the side clamp springs is critical to assure proper operation of the side clamps and Center Clamp assemblies. If the setscrews are set too low, the grippers may stick open. If the setscrews are too high, it may cause the Center Clamp to jam.

To test the spring settings, disconnect power and proceed as follows:



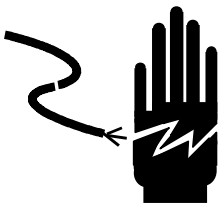
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Push the Center Clamp back away from the sealing belt so that the skis are not touching the side clamps.
2. Pull the t-bar up until the side clamps are fully closed.
3. Place a 100-gram weight on top of the side clamp to be tested. Depress the side clamp to the full open position and release slowly.
4. The side clamp should close, lifting the 100-gram weight. If the side clamp does not lift the weight, back both setscrews out slightly and repeat the test.
5. To be sure the side clamp springs are set properly, place a 150-gram weight on top of the side clamp to be test. Depress the side clamp to the full open position and release slowly.
6. The side clamp should remain open with the 150-gram weight, holding it in this position. If it does not stay in the open position, turn both setscrews in slightly and repeat the test.

Side Clamp Sequential Opening - Individual

To ensure a properly wrapped package, each side clamp should open sequentially starting with the clamp furthest from the sealing belt. If an individual clamp has fallen out of adjustment, the best solution is to adjust this clamp opening alone, using the Side Clamp Adjustment Tool P/N 084050020.

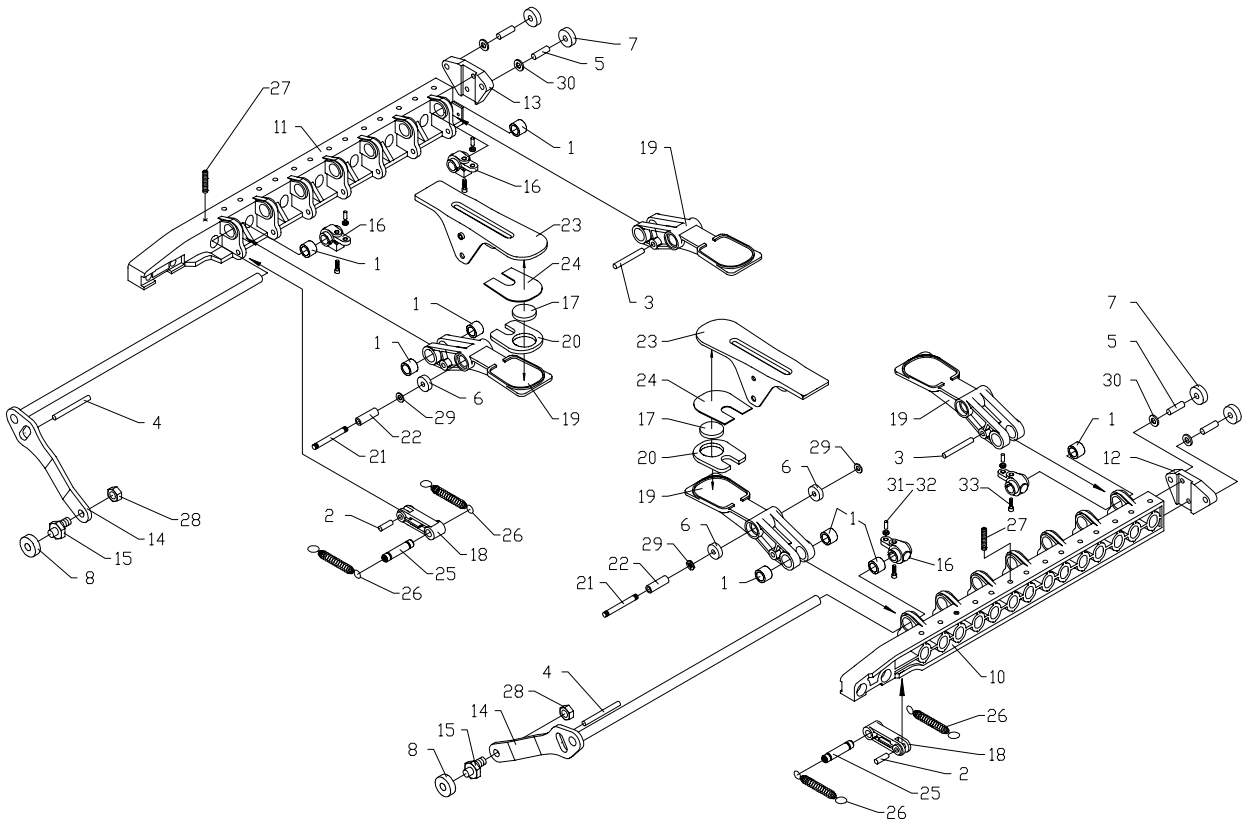


⚠ WARNING

ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

Refer to the illustration "Side Clamp Sequential Opening Test" on the following page and proceed as follows:

1. Be sure the actuator arm retaining screw (Item 33) has been tightened to 90 in-lb.
2. Loosen the jam nut (Item 32) holding the adjustment setscrew (Item 31) in place.
3. If the clamp is opening too soon, back the setscrew out slightly so the clamp opens in time with its neighbors. If the clamp is opening too late, turn the setscrew in slightly. **Note: the clamp farthest from the sealing belt is not adjustable in this manner and must be adjusted as described in the section Side Clamp Sequential Opening - Group.**
4. If there is insufficient travel in the setscrew to bring the clamp into adjustment, adjust the actuator arm as follows:
    - Loosen the clamp retaining screw (Item 33).
    - Turn the adjustment setscrew (Item 31) until it is centered in its travel.
    - Pull up on the clamp opening cam until the clamps are in the closed position, or pull the side clamp out until the eccentrics are clear of the T-bar.
    - Rotate the actuator arm (Item 16) around the shaft until the adjustment setscrew rests against the clamp opening dowel pin (Item 4). Retighten the actuator arm retaining screw to 90 in-lb.
    - Proceed by adjusting the clamp opening timing as described previously.
5. Once the timing for the clamp has been set, retighten the jam nut (Item 32) while holding the adjustment setscrew in position.



Side Clamp Sequential Opening Test

Side Clamp Sequential Opening - Group

To ensure a properly wrapped package, each side clamp should open sequentially starting with the clamp farthest from the sealing belt. The timing for the whole side clamp must be set if the clamp farthest from the sealing belt is not opening in time with its neighbors or the whole side clamp is excessively out of adjustment. The following procedure describes how to set the opening timing using feeler-gauges made of stacks of paper. Refer to the previous illustration "Side Clamp Sequential Opening Test".

1. Be sure the actuator arm retaining screws (Item 33) have been tightened to 90 in-lb.
2. Loosen the jam nuts (Item 32) holding the adjustment setscrews (Item 33) in place.
3. Form rectangles of standard copier paper approximately 40mm x 100mm in size, into 7 stacks containing 1, 2, 3, 4, 5, 6, and 7 rectangles respectively. Staple or otherwise secure one end of each stack. An alternate method is to use sticky notes to form the stacks. For later reference, the stacks can also be labeled with the number of pages each contains.
4. Push the side clamps towards the center of the machine.
5. Insert the thickest stack into the side clamp farthest from the sealing belt.
6. Using PC Pocket test 613, open the clamps until the stack in the side clamp furthest from the sealing belt is somewhat loosely held.
7. Proceed to place the successively smaller stacks of rectangles in the remaining clamps. Open the clamps by hand to insert the stacks of rectangles.

8. Using the inserted stacks of paper as feeler-gauges, set the opening of each clamp by turning the adjustment setscrews (Item 31) in or out. For best results, use the retention force on the clamp furthest from the sealing belt as a guide for each clamp.
9. If there is insufficient travel in the setscrew to bring the clamp into adjustment, adjust the actuator arm as follows:
    - Loosen the clamp retaining screw (Item 33).
    - Turn the adjustment setscrew (Item 31) until it is centered in its travel.
    - Rotate the clamp opening cam until the clamps are in the closed position, or pull the side clamp out until the eccentrics are clear of the T-bar.
    - Rotate the actuator arm (Item 16) around the shaft until the adjustment setscrew rests against the clamp opening dowel pin (Item 4). Tighten the actuator arm retaining screw 90 in-lb.
    - Proceed by adjusting the clamp opening timing as described previously.
10. Once the clamp openings have been set, tighten all the jam nuts (Item 31) to secure the adjustment setscrews in place.
11. Recheck the size of the opening for each clamp and adjust if necessary.

Functional Tests

This section details function tests using the PC Pocket program.

Error Statistics

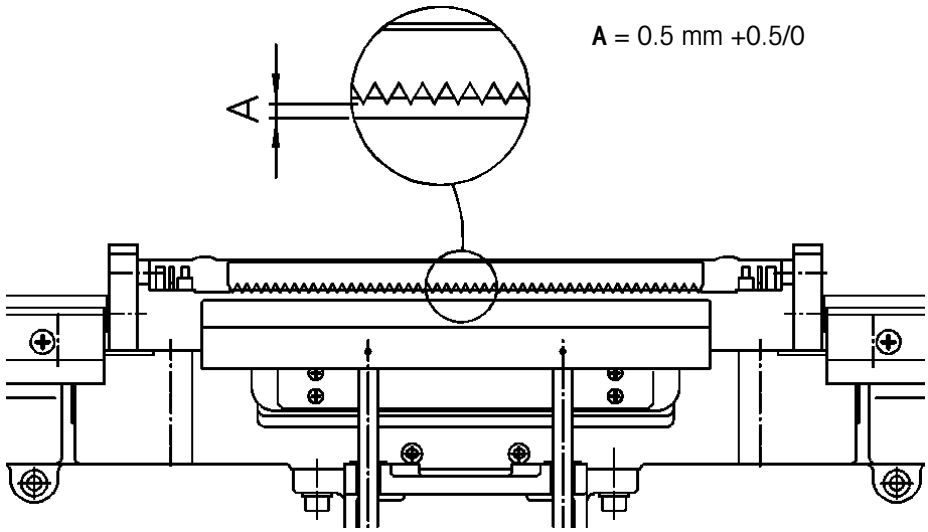
Using the PC Pocket, run test 101 to check for error in the machine.

Photocell Test

Run test 302 to test all of the machine photocells.

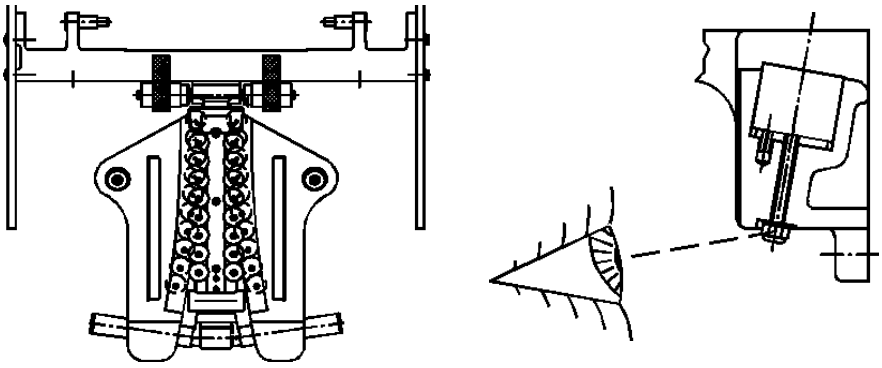
Cutting Knife

Run test 603 to check the cutting knife clearance. Check the up position and distance "A".



Distributor Magnets

Using test 502, check the holding capacity of the magnets. Listen to be sure the magnets clamp down on both sides at the same time. Insert a paper strip between the distributor. Adjust the magnets using the adjustment nuts if needed.



If the paper strips are held with equivalent, but inadequate force:

Check the position of the magnets. If the magnets are protruding, lower both magnets slightly and repeat the test. Continue lowering the magnets until the strips of paper are clamped firmly, or the magnets are flush with the surface of the distributor.

If the magnets are flush with the surface of the distributor, and there is inadequate clamping force, shim the distributor rubber 0.1mm and repeat the test. Be sure the surface of the rubber does not extend above the surface of the distributor.

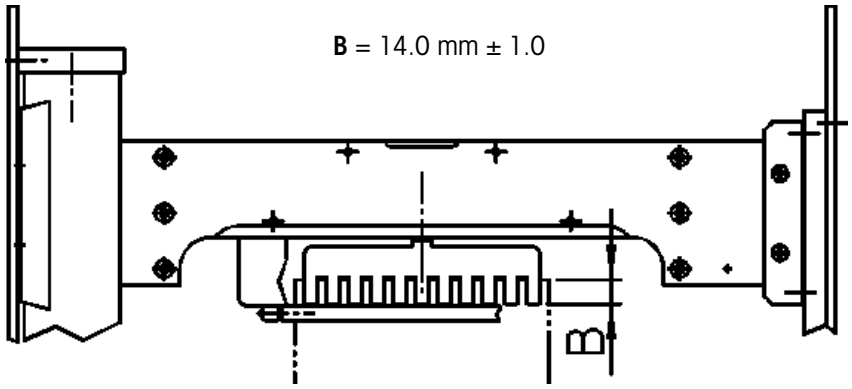
If the paper strips are held with unequal force:

Check the position of the clamp plate when the magnets are energized. If one of the magnets is higher than the other and preventing the clamp plate from holding the paper firmly, lower the height of the higher magnet slightly. Repeat the test.

If the magnets protrude equally, and the distributor clearance (0.5 mm) is correct, position a 0.1 mm thick shim under the distributor rubber in the most weakly held area. Repeat the test.

Center Clamp

Measure the amount of film "B" in the center clamp. Make sure the film is held by all of the teeth.



Side Clamp Eccentric Position and Adjustment

Associated PC Pocket Test:
610 Side Clamp Test With Film

With the side clamps closed, there should be about ⩾0.8 mm of clearance between the underside of the Clamp Opening Bar and the side clamp eccentrics. If this clearance is not maintained, the side clamps can prematurely release the film during the side stretch operation.

1. Without film, run PC Pocket test 613. Using one piece of paper, check when the clamp furthest from the sealing belt releases the paper (with a small amount of force applied). The paper should released in 75-85 motor steps. If not, adjust as follows in the following steps.
2. To make the film release sooner, rotate the eccentric so the roller is closer to the opening bar. For later film release, rotate the eccentric so the roller is further from the opening bar.
3. To make this adjustment, loosen the nut securing the eccentric to the side clamp lever.
4. Using a thin 17mm wrench, rotate the eccentric as required and retighten the nut.
5. Repeat the test and adjustment until the timing of the film release is correct.
6. The film release should be between opposing clamps within 20 steps. If the front side clamp is releasing the film more than 20 steps before the rear side, rotate the eccentric on the front side clamp so the roller is farther from the opening bar. On the other hand, if the rear side clamp is releasing the film more than 20 steps before the front side, rotate the eccentric on the front side clamp so the roller is closer to the opening bar.

8 Parts Replacement

Infeed

This section covers parts replacement on the Infeed Section.

Infeed Removal

⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

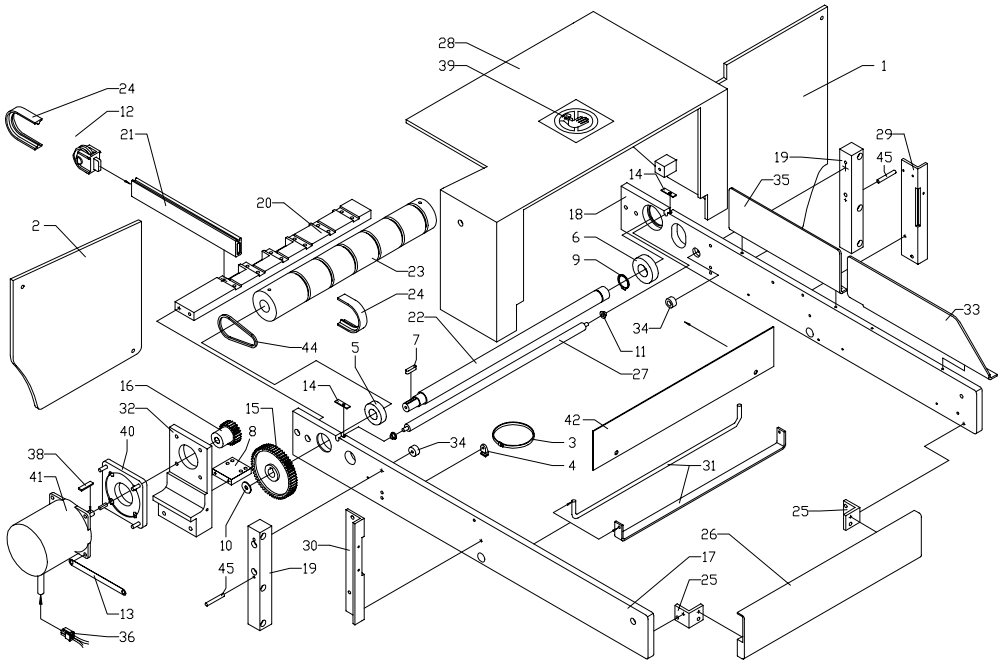


Figure 8-1: Infeed Removal

1. Disconnect power to the machine.
2. Remove the infeed cover (item 28 in Figure 8-1) and the front cover from the machine.
3. Pull side clamps to outer most position.

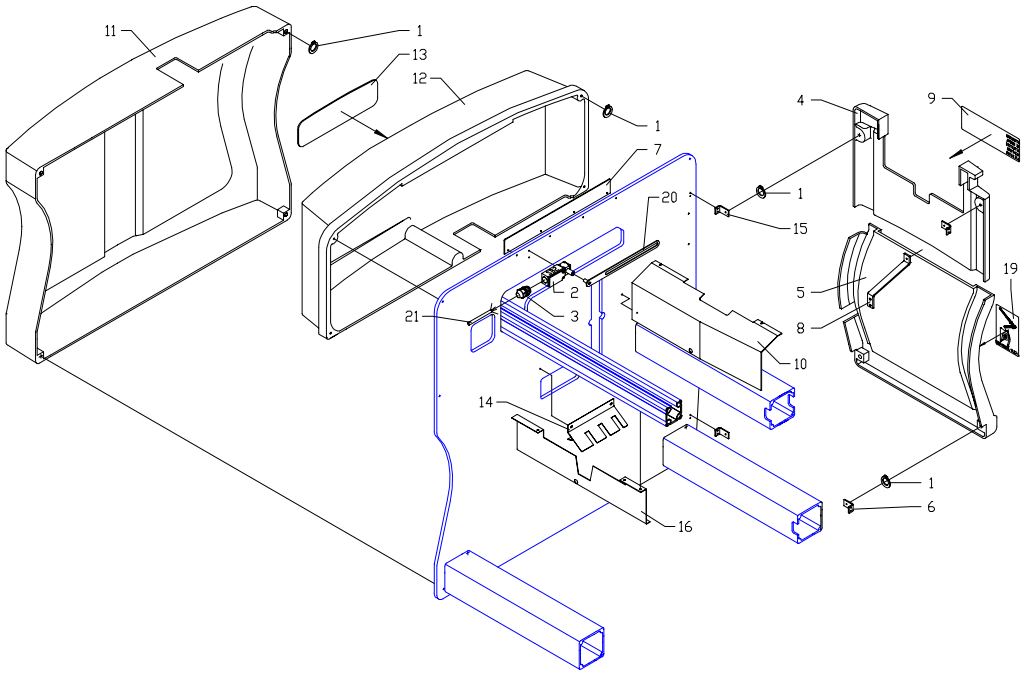


Figure 8-2

4. Remove the inner infeed side shields (items 10 and 16 in Figure 8-2) and the shield below the infeed (item 42 in Figure 8-1).
5. Unplug the three middle connectors (item 26 in Figure 8-5) from the horizontal photoeyes, noting the location of each connector.
6. Cut all wire ties holding the horizontal photoeye cable to the infeed.
7. Remove the lifter as described in the lifter replacement section.
8. Push the side clamps to the inner most position.
9. Remove the mounting bolts that secure the infeed assembly to the main frame. (8 bolts total. Four at Item 19, and four at Item 8).
10. At this point, the infeed assembly may be removed from the machine.
11. Re-assemble in reverse order.

First Conveyor Belt Repair and Replacement

Belt Repair

A broken belt can be repaired on the machine using the Belt Welding Kit, P/N 082536020, available from METTLER TOLEDO Aftermarket. Instructions are available with the kit. If the belt is otherwise intact, it is very easy to repair.

Belt Replacement

Should it become necessary to replace belts on the infeed conveyor, some disassembly may be required. Proceed as follows:

⚠ WARNING

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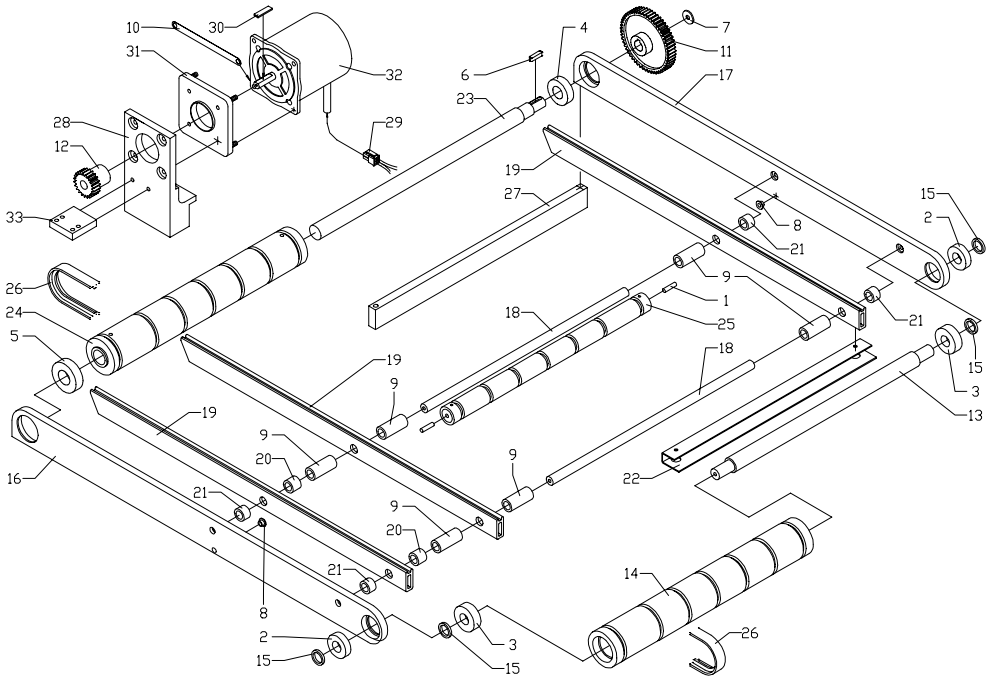
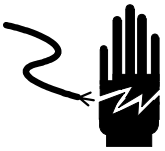


Figure 8-3

1. Disconnect power to the machine.
2. Remove the infeed cover from the machine (item 28 in Figure 8-1).
3. Remove the old belt (cut it if necessary).
4. Remove the belt guard (item 26 in Figure 8-1).
5. Remove the infeed guide(s) (items 33 and 35 in Figure 8-1) if necessary.
6. Feed the belt behind the first conveyor drive roller (item 24 in Figure 8-3) near one side.
7. Weld the belt together off to one side of the infeed using a belt welding kit (P/N 082536020).
8. Stretch the belt over the side of the infeed side frame.
9. Work the belt into position, making sure all belts are in the proper grooves on the drive roller.
10. Re-assemble in reverse order.

Second Conveyor Belt Replacement

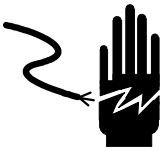


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the old belt (cut it if necessary).
3. Run the belt behind the second conveyor drive roller (item 23 in Figure 8-1) in the belt groove.
4. Weld the belt together off to one side of the belt guide using Belt Welding Kit (P/N 082536020).
5. Stretch the belt onto the infeed pulley (item 12 in Figure 8-1), being sure it snaps into the groove.

First Infeed Drive Motor Replacement

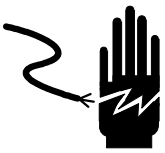


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove sealing belt end machine covers, and raise the sealing belt.
3. Disconnect the motor harness.
4. Cut the wire ties securing the infeed safety photoeye wires .
5. Using the access holes in the cross member, remove the bolts securing the motor mount (item 28 in Figure 8-3) to the cross member using a 6mm standard Allen Wrench. The bolts are installed very tight and it may be necessary to use a vise grip to loosen them. Be careful not to lose the bolts in the crossmember. Exercise care to avoid damaging the photoeyes and the mirror mounted on the motor mount.
6. Loosen nuts holding the motor to the isolator mount (item 31 in Figure 8-3).
7. Remove the motor from the mount.
8. Loosen the setscrews on the drive gear (item 12 in Figure 8-3) and remove the gear from the shaft.
9. Install in reverse order.

First Infeed Gear Replacement



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the first infeed drive motor as described above in steps 2-5.
3. Remove the screw holding the gear (item 11 in Figure 8-3) in place.
4. Gently pry the gear off the shaft with a flat head screwdriver.
5. Install in reverse order.

Second Infeed Drive Motor Replacement

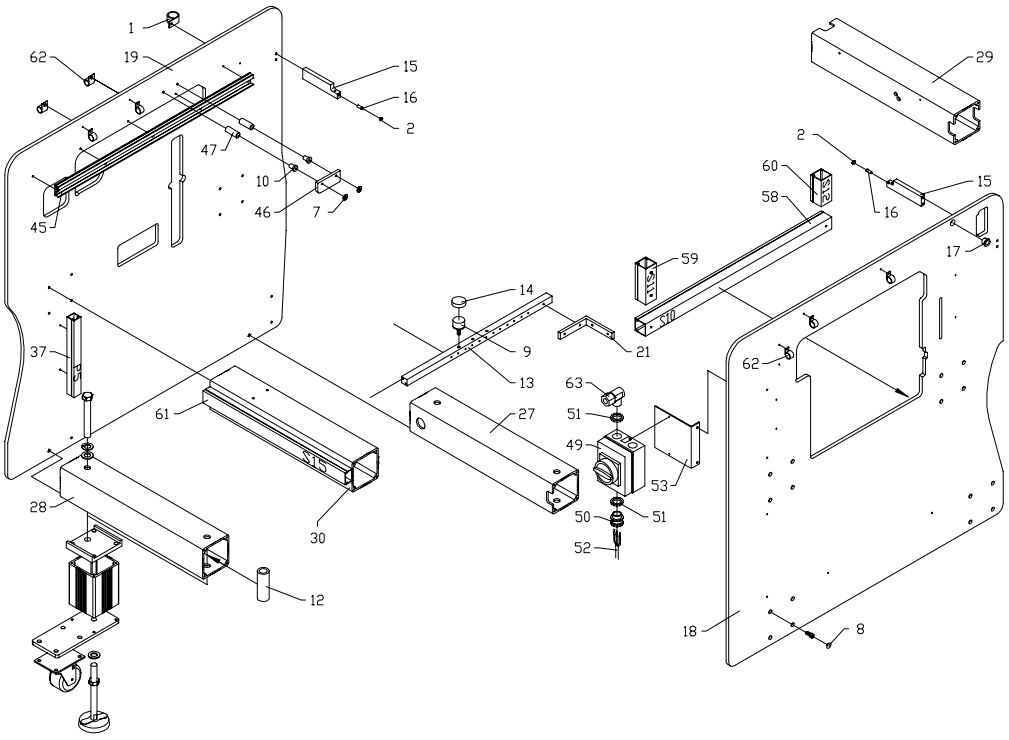


Figure 8-4

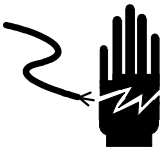
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Open door on the left side of the machine.

3. Disconnect the motor harness.
4. Remove screws holding the cable conduit (item 61 in Figure 8-4) to crossmember.
5. Using the access holes behind the cable conduit, remove bolts holding motor mount (item 32 in Figure 8-1) to crossmember using a 6mm standard Allen Wrench. The bolts are installed very tight and it may be necessary to use a vise grip to loosen them. Exercise care to avoid looses the bolts in the crossmember.
6. Loosen the nuts holding the motor to the isolator mount (item 40 in Figure 8-1).
7. Remove the motor from the mount.
8. Loosen the setscrews on the drive gear (item 16 in Figure 8-1) and remove the gear from the shaft.
9. Install in reverse order.

Second Infeed Gear Replacement



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the second infeed drive motor as described above in steps 2-5.
3. Remove the screw holding the gear (item 15 in Figure 8-1) in place.
4. Gently pry the gear off the shaft with a flat head screwdriver.
5. Install in reverse order.

Vertical Photoeye Replacement

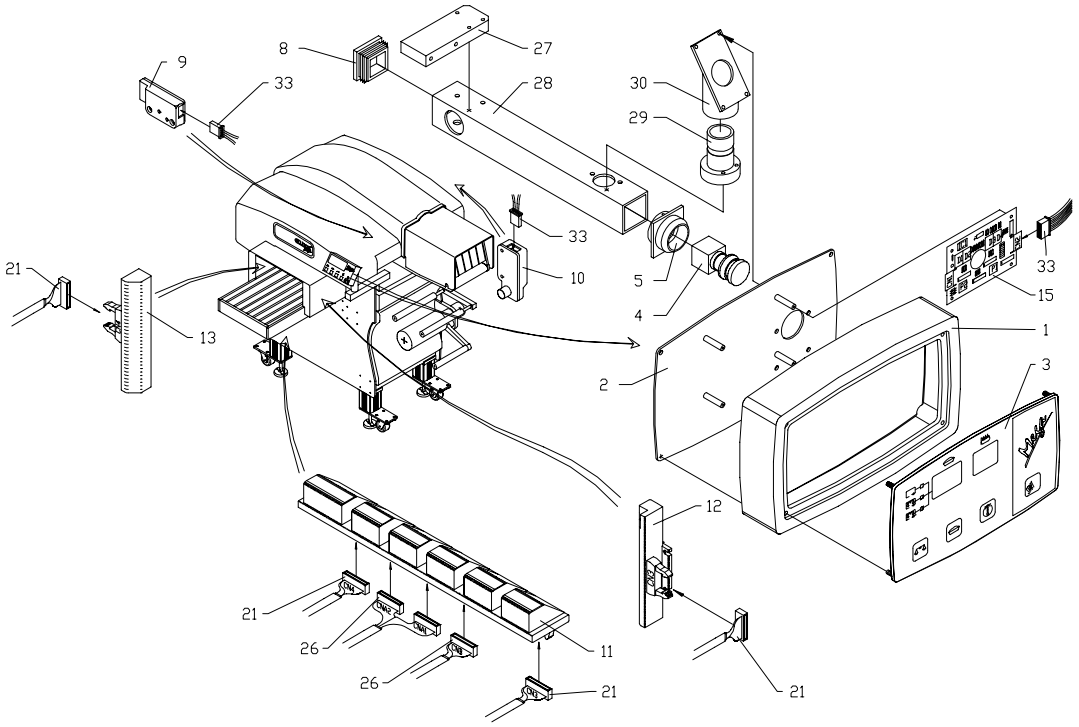
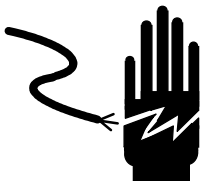


Figure 8-5

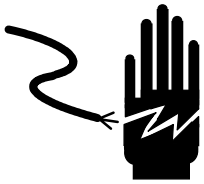


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the infeed cover.
3. Loosen the two mounting screws and slide the vertical Photoeye assembly (item 12 or 13 in Figure 8-5) away from the mounting frame.
4. Disconnect the harness (item 21 in Figure 8-5) from the back of the assembly.
5. Install in reverse order.
6. Using PC Pocket, check the operation of the photoeyes.

Horizontal Photoeye Replacement

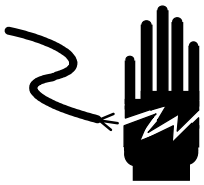


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove shield below the infeed (item 42 in Figure 8-1).
3. Disconnect the harnesses from the horizontal Photoeye assembly.
4. Remove the three Phillips-head screws attaching the assembly to the infeed assembly.
5. Tilt the photoeye assembly (item 11 in Figure 8-5) so the belts are not stretched across the connectors.
6. Turn the photoeye assembly towards parallel with the infeed belts.
7. Carefully guide the assembly out from between the infeed belts and guides.
8. Install in reverse order.
9. Using PC Pocket, check the operation of the photoeyes.

Lifter Photoeye Replacement



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Either open the door on the left end or remove the covers on the right end of the machine.
3. Unplug the photoeye harness.
4. If on the right end remove the two screws holding the mounting bracket.
5. Remove the two screws securing the photoeye.
6. Install in reverse order.
7. Using PC Pocket, check the operation of the photoeyes.

Lifter Safety Photoeye Replacement

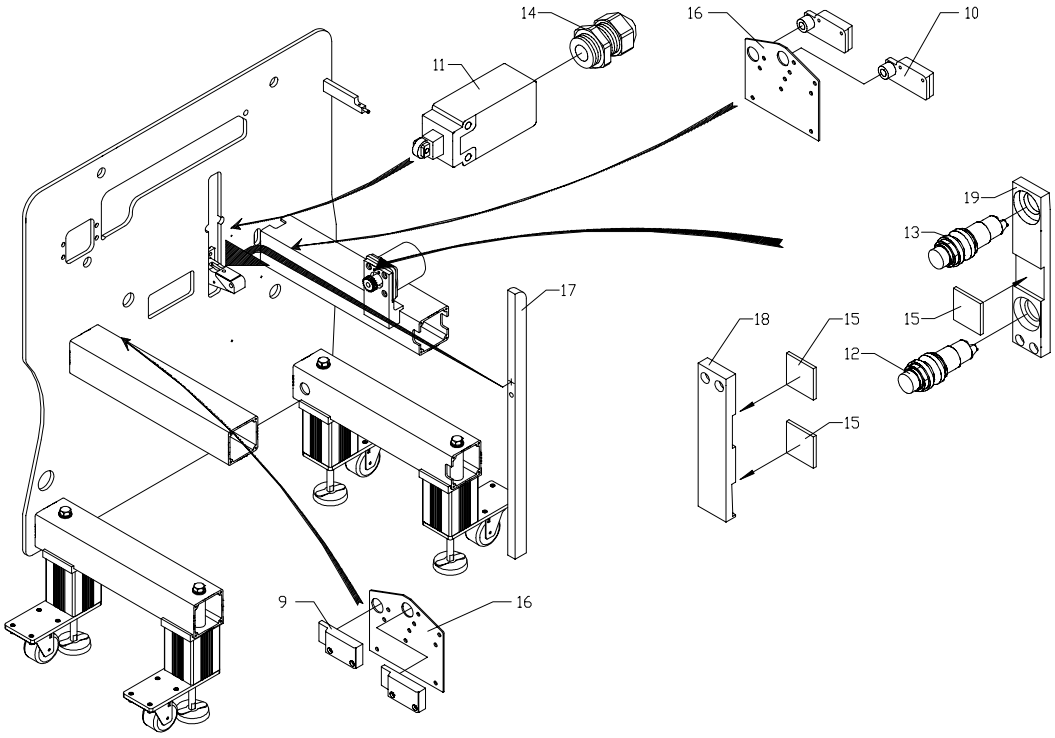
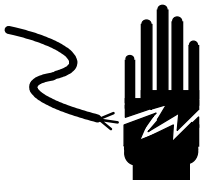


Figure 8-6

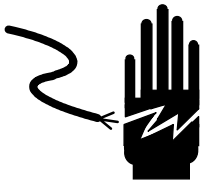


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Either open the door on the left end or remove the covers on the right end of the machine.
3. Unplug the photoeye harness.
4. Remove the two screws, nuts and washers holding the photoeye to the bracket (item 16 in Figure 8-6).
5. Install in reverse order.
6. Using PC Pocket, check the operation of the photoeyes.

Discharge Photoeye Replacement

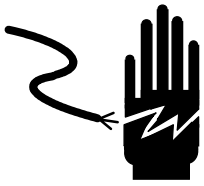


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove both the infeed cover and the front cover, or the upper rear cover.
3. Unplug the photoeye harness (item 33 in Figure 8-5).
4. Remove the two screws holding the photoeye (item 9 or 10 in Figure 8-5) to the frame.
5. Install in reverse order.
6. Using PC Pocket, check the operation of the photoeyes.

Infeed Safety Photoeye Replacement



⚠ WARNING

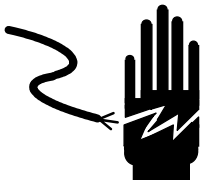
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the covers on the right end of the machine and the right infeed side shield (item 10 in Figure 8-2).
3. Loosen the ring on the front of the photoeye (item 12 or 13 in Figure 8-6) and remove it from the bracket (item 19 in Figure 8-6).
4. Cut the wire ties securing the cable and disconnect the wires from the relay board (item 40 in Figure 8-18). Be sure to note the location of each of the wires.
5. Install in reverse order.
6. Using PC Pocket, check the operation of the photoeyes.

Lifter

This section covers parts replacement on the lifter section.

Lifter Replacement



⚠ WARNING

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1. Disconnect power to the machine
2. Open the top hood.
3. Carefully pull the lifter up to the highest position.
4. Push the lifter release lever (item 37 in Figure 8-8) towards the rear frame and tilt the lifter down.
5. Pull up on the back of the lifter to remove the lifter from the machine.
6. Install in reverse order.

Package Support Replacement

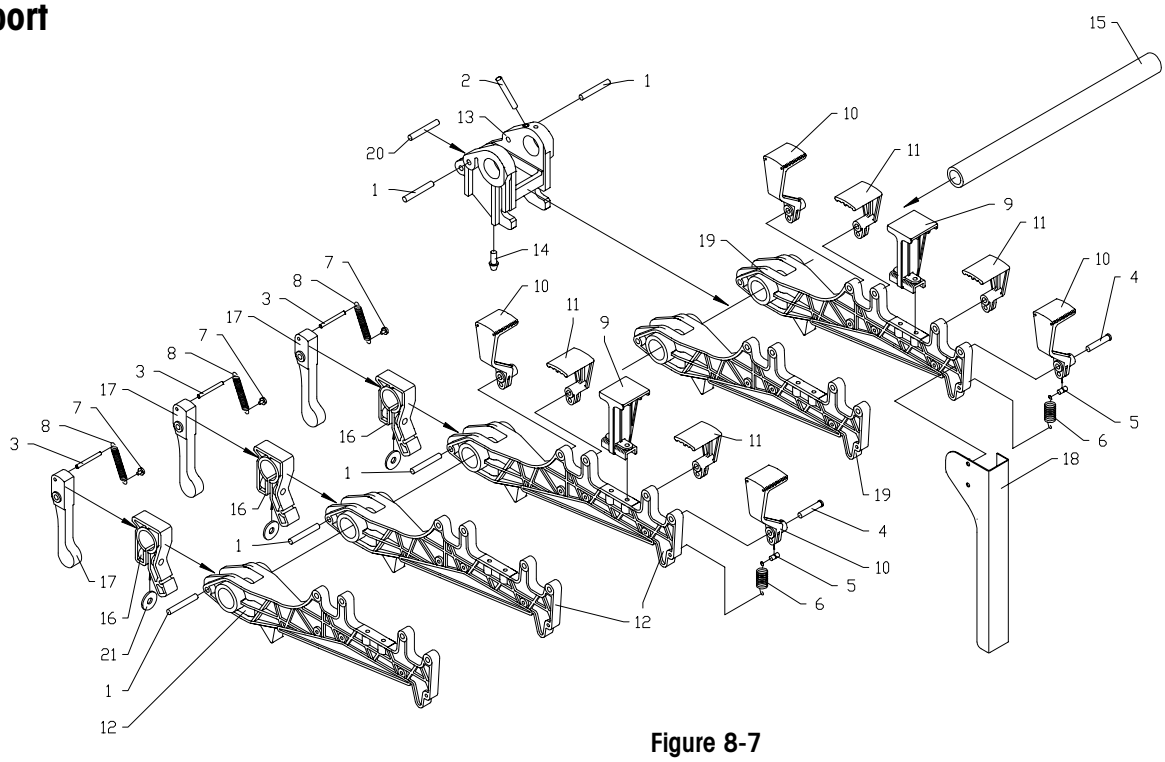
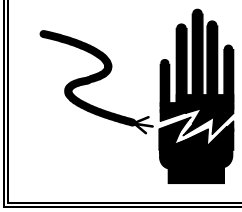


Figure 8-7

The center package supports are held in place with two screws. In order to replace the spring-loaded package supports, a special pin extraction tool, P/N 82890400A (available from METTLER TOLEDO Aftermarket), is required to remove the pivot pins. To replace the spring loaded package supports, proceed as follows:



⚠ WARNING

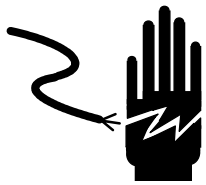
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lifter from the machine as described above.
3. Un-hook the spring (item 6 in Figure 8-7) from the lower spring hook.
4. Carefully remove the spring and the spring hook (item 5 in Figure 8-7) from the package support.
5. Position the Pin Extraction Tool over the package support pivot pin (item 4 in Figure 8-7) so that the screw is aligned with the small end of the pin.
6. Tighten the screw in the Pin Extraction Tool to drive the pivot pin out of the lifter arm. The pin can be driven out about 2/3 of the way with the extraction tool, then removed the rest of the way by hand.
7. Lubricate the pivot pin with FMO 350 lubricant.
8. Install the new package support and pivot pin using the Pin Extraction Tool. Drive the pin in until the small end (tail) of the pivot pin is flush with the lifter arm. Make sure that the package support pivots freely.
9. Re-install the spring hook and the spring to the package support.
10. Re-install the lifter in the machine.

Note: The pivot pin has a head on one end. An attempt to drive the pin out from the wrong side will damage the lifter arm. The head of the pin is located in the package support, while the small end (tail) is located in the lifter arm.

Lifter Arm Replacement

Only the mobile lifter arms are field replaceable. If any of the stationary arms require replacement, the entire lifter assembly must be replaced. The mobile lifter arms are held in place by a cast aluminum arm stop that is adjustable by loosening the retaining bolt on the bottom of the stop. When disassembling the lifter assembly, be certain to note the location of the mobile lifter arms and reassemble in the same location on the support rod. To replace the lifter arm, proceed as follows:



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lifter assembly from the machine and remove the lifter arm (item 12 in Figure 8-7).
3. Remove the package supports and springs from the old lifter arm assembly, and install on the new lifter arm as described in the package support replacement section of this manual.
4. Clamp the lifter-assembly mounting block (item 13 in Figure 8-7) in a vise so the support rod is level.
5. Slide the lifter arms and lifter arm stops (item 16 in Figure 8-7) onto the support rod.
6. Beginning with the lifter arm closest to the stationary arms, position the arm so that it is 50mm from the stationary arm and tighten the lifter arm stop clamp just enough to hold it in position (see Figure 8-below).
7. Rotate the lifter-arm stop so the top of the package supports is on the same plane as the stationary arm package supports. Tighten the lifter arm stop clamp in place by tightening the clamp screw to 175 inch pounds of torque.
8. Repeat this procedure for the remaining lifter arms using the dimensions shown below.
9. As a final check, place a level across the front row of package supports. If not level, readjust as necessary.
10. Re-install the lifter assembly in the machine as described in the lifter replacement section of this manual.

Lifter Drive Motor Replacement

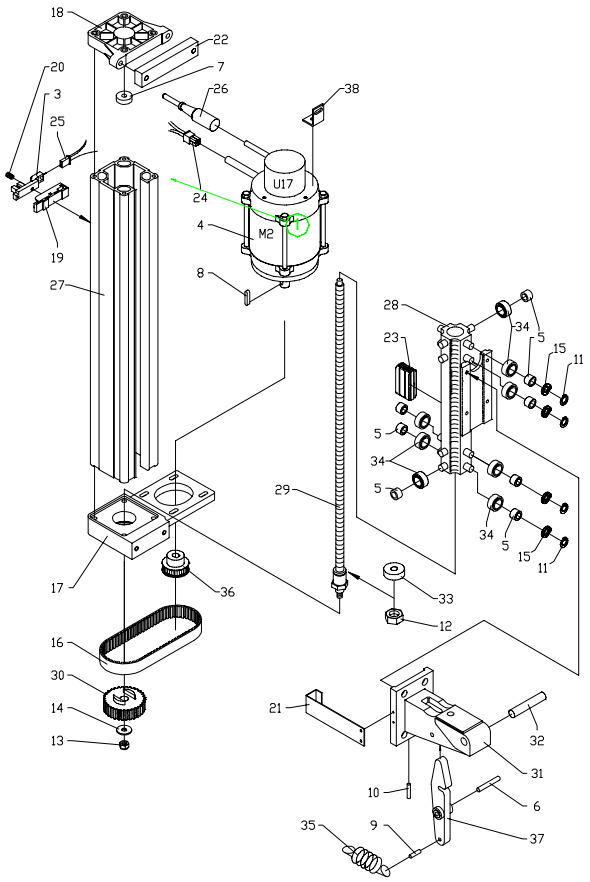
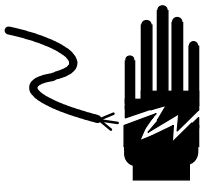


Figure 8-8



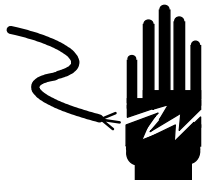
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lower rear cover from the machine.
3. Disconnect the motor harness, and unplug the encoder cable from the servo drive card (item 23 in Figure 8-18). Cut the wire ties securing the encoder cable. Note: do not attempt to swap or adjust the encoder.
4. Remove the four mounting bolts on the motor mount (item 17 in Figure 8-8) and the bolt on the support bracket (item 38 in Figure 8-8).
5. Remove the drive belt (item 16 in Figure 8-8).
6. Remove the drive pulley (item 36 in Figure 8-8) from the motor shaft.
7. Install in reverse order.

Lifter Linear Actuator Service

This procedure describes disassembly and reassembly of the Lifter linear actuator.



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the rear covers from the machine.
3. Unplug the sensor harness (item 25 in Figure 8-8).
4. Remove the end cap (item 18 in Figure 8-8) from the linear actuator case.
5. Loosen the motor and remove the lifter drive belt.
6. Remove the linear actuator case (item 27 in Figure 8-8) from the motor mount.
7. Clean old grease and dirt from all parts and inside of the case. Also clean off the lead screw (item 29 in Figure 8-8) and the lead screw nut (item 23 in Figure 8-8). The lead screw and nut must be clean and free of any grease or dirt.
8. Apply CPI Grease Type GRS-460-F (P/N 82909400A) to the channels in the linear actuator case.
9. Apply liberal amounts of Lead Screw oil (P/N 83145200A) to the lead screw and nut.
10. Reassemble in reverse order.
11. After reinstalling the linear actuator on the machine, perform all checks and adjustments for the lifter section.

Center Clamp

This section covers parts replacement on the Center Clamp.

Center Clamp Removal

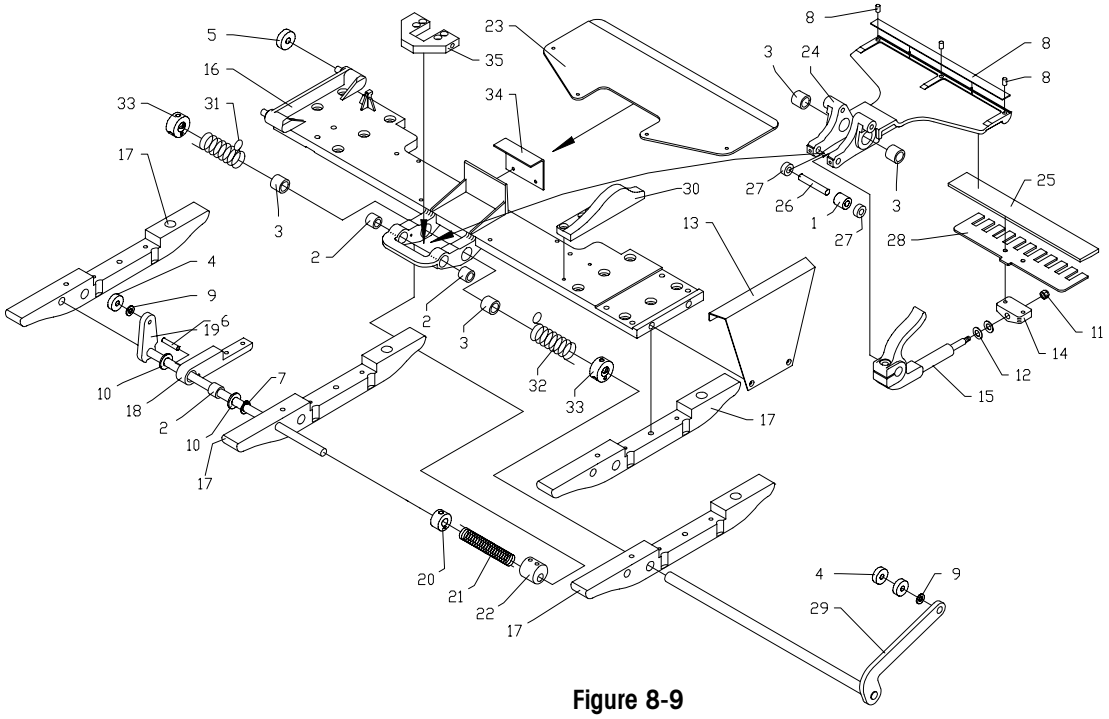


Figure 8-9

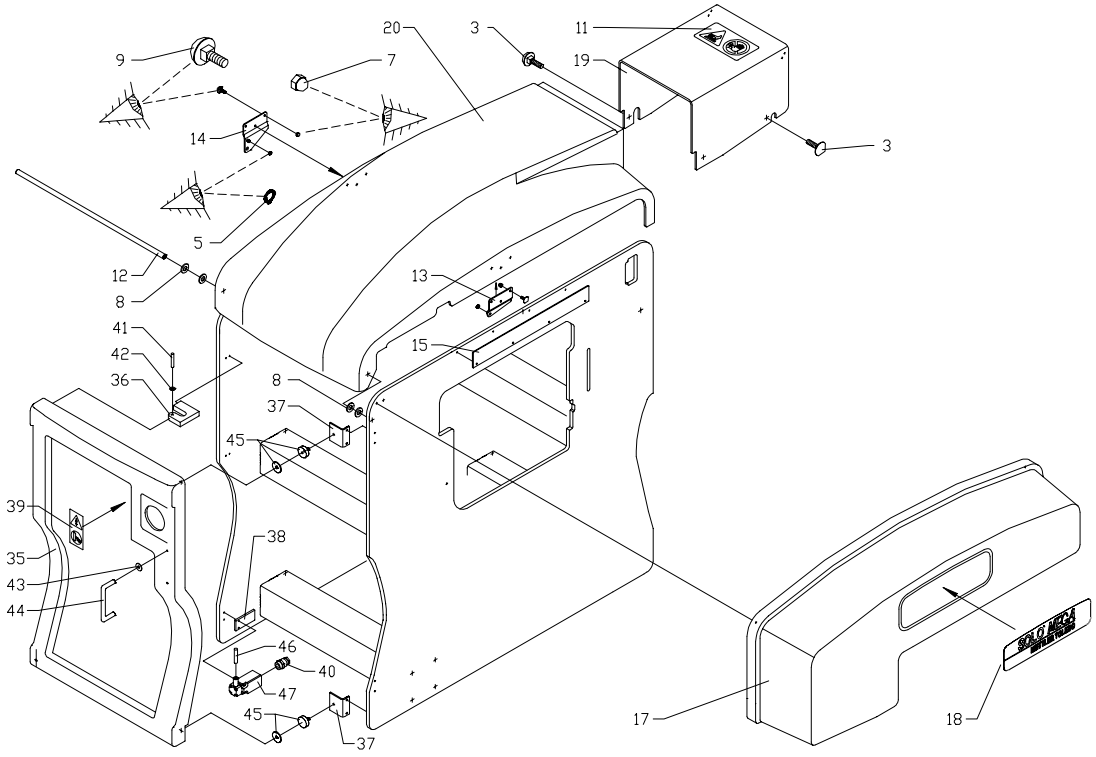
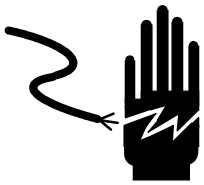


Figure 8-10

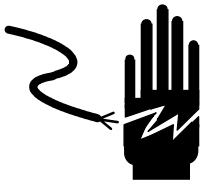


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the infeed, front, and upper rear covers from the machine and open the side door.
3. Remove the upper magnet bracket for holding the door shut (item 37 in Figure 8-10).
4. Remove the two screws holding the sensor flag (item 13 in Figure 8-9) in place. Note that there is an access hole in the machine frame near the upper left corner of the infeed opening.
5. Remove the bolts for the top hood pivot (item 12 in Figure 8-10). It is not necessary to completely remove the hood.
6. Remove the Center Clamp from the machine by removing the 4 retaining screws. Slide the Center Clamp assembly out the left side of the machine.
7. To install the Center Clamp into the machine, reassemble in reverse order.
8. Proceed to the Center Clamp Adjustments section. All Center Clamp adjustments must be checked.

Center Clamp Film Gripper Replacement



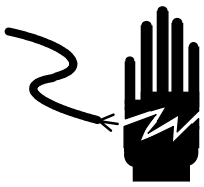
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Push the Center Clamp assembly to the center of the machine.
3. Remove the M4 self-locking nut (item 11in Figure 8-9) and flat washer.
4. Remove the Center Clamp film gripper (item 28 in Figure 8-9) with rocker bearing (item 14 in Figure 8-9) attached.
5. Remove the two screws that hold the rocker bearing to the film gripper.
6. Attach the rocker bearing to the new film gripper.
7. Make sure that the two spring washers (item 12 in Figure 8-9) are installed as shown.
8. Reinstall the new Center Clamp film gripper with rocker bearing attached.
9. Reinstall the flat washer and M4 self-locking nut.

10. Tighten the M4 self-locking nut until it is snug. DO NOT OVER TIGHTEN.
11. Loosen the M4 self-locking nut approximately one turn. This will allow the Center Clamp film gripper to freely rock back and forth. If there is any endplay, tighten the nut until there is no play or replace the spring washers.

Film Gripper Mounting Lever Replacement

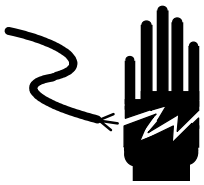


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the center clamp assembly as described above.
3. Loosen the film gripper mounting lever (item 15 in Figure 8-9) screw. Caution: The gripper actuator lever is under spring tension. Loosening this screw relieves the spring tension.
4. Remove the front most ski (item 17 in Figure 8-9).
5. Loosen the set collars (item 33 in Figure 8-9) on the film gripper control rod (item 29 in Figure 8-9).
6. Remove the Center Clamp film gripper (item 28 in Figure 8-9) with rocker bearing (item 14 in Figure 8-9) attached. Also remove the two spring washers. Slide out the film gripper control rod.
7. At this point, the film-gripper mounting-lever can be removed.
8. Reassemble in reverse order.
9. Proceed to the Center Clamp Adjustments section. All Center Clamp adjustments must be checked.

Gripper Torsion Spring Replacement

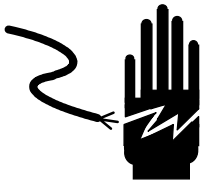


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power from the machine.
2. Remove the center clamp assembly as described above.
3. To replace the rear torsion spring (item 31 in Figure 8-9), carefully loosen the set collars (item 33 in Figure 8-9) for both springs and the film-gripper mounting lever (item 15 in Figure 8-9). Caution: the set collars are under spring tension!
4. Remove the screw holding the inside end of the spring.
5. Remove the front most ski (item 17 in Figure 8-9).
6. Slide out the film gripper control rod (item 29 in Figure 8-9) just enough to remove the spring and set collar.
7. Remove and replace the spring and set collar.
8. Refer to the Chapter 7, Center Clamp for the adjustments. All Center Clamp adjustments must be checked before applying power to the machine.
9. To replace the front torsion spring (item 32 in Figure 8-9), carefully loosen the set collars (item 33 in Figure 8-9) for both springs and the film-gripper mounting lever (item 15 in Figure 8-9). Caution: the set collars are under spring tension!
10. Remove the screw holding the inside end of the spring.
11. Remove the ski closest to the front (item 17 in Figure 8-9).
12. Slide out the film gripper control rod (item 29 in Figure 8-9).
13. Remove and replace the spring and set collar.
14. Refer to the Chapter 7, Center Clamp for the adjustments. All Center Clamp adjustments must be checked before applying power to the machine.

Eccentric Drive Lever Spring Replacement

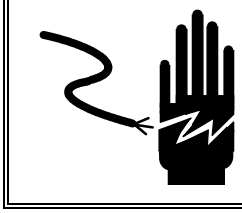


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the center clamp assembly as described above.
3. Remove the rear Center Clamp ski (item 17 in Figure 8-9) from the Center Clamp assembly.
4. Remove the eccentric drive lever pivot arm (item 18 in Figure 8-9).
5. Loosen the set collar (item 20 in Figure 8-9) on the eccentric drive lever spring. Caution: the set collar is under spring tension!
6. Loosen the eccentric (item 22 in Figure 8-9) by loosening the two set screws.
7. Remove the eccentric drive lever (item 19 in Figure 8-9).
8. Remove and replace the torsion spring and the set collar.
9. Reassemble the Center Clamp assembly in reverse order, and reinstall in machine. Apply Blue Loctite to all setscrews.
10. Refer to the Chapter 7, Center Clamp for the adjustments. All Center Clamp adjustments must be checked before applying power to the machine.

Gripper Eccentric Replacement



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the center clamp assembly as described above.
3. Remove the rear Center Clamp ski (item 17 in Figure 8-9) from the Center Clamp assembly.
4. Remove the eccentric drive lever pivot arm (item 18 in Figure 8-9).
5. Loosen the set collar (item 20 in Figure 8-9) on the eccentric drive lever spring. Caution: the set collar is under spring tension!
6. Loosen the eccentric (item 22 in Figure 8-9) by loosening the two set screws.
7. Remove the eccentric drive lever (item 19 in Figure 8-9) far enough to remove the eccentric.
8. Reassemble the Center Clamp in reverse order, and install in machine.
9. Apply a small amount of FMO 350 lubricant between the eccentric and the follower.
10. Refer to the Chapter 7, Center Clamp for the adjustments. All Center Clamp adjustments must be checked before applying power to the machine.

Center Clamp Drive Motor Replacement

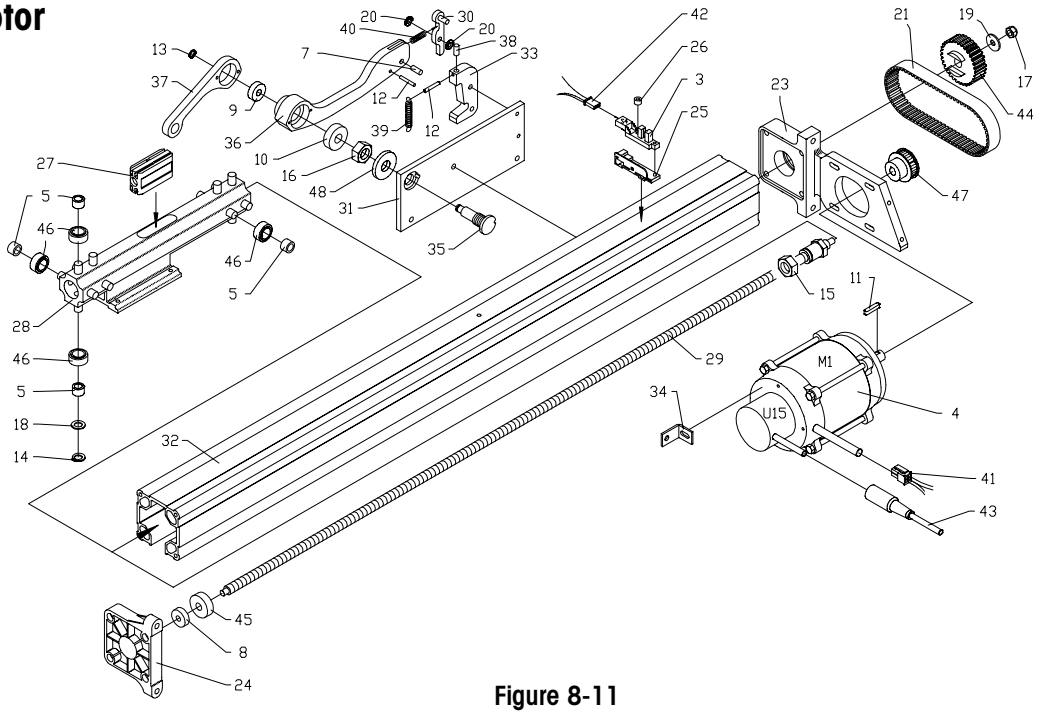
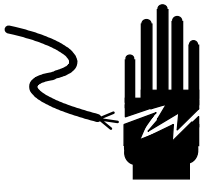


Figure 8-11



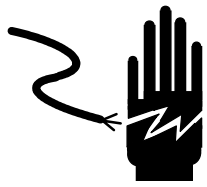
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the infeed cover and the front cover from the machine.
3. Disconnect the motor harness, and unplug the encoder cable from the servo drive card (item 23 in Figure 8-18). Cut the wire ties securing the encoder cable. Note: do not attempt to swap or adjust the encoder.
4. Remove the four mounting bolts on the motor mount (item 23 in Figure 8-11) and the bolt on the support bracket (item 34 in Figure 8-11).
5. Remove the drive belt (item 21 in Figure 8-11).
6. Remove the drive pulley (item 47 in Figure 8-11) from the motor shaft.
7. Install in reverse order.

Center Clamp Linear Actuator Service

The procedure described here is for disassembly and reassembly of the Center Clamp linear actuator.



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the infeed cover, front cover, and upper rear cover from the machine, also open the side door and remove the screws from the pivot (item 12 in Figure 8-10) for the top hood.
3. Loosen the drive motor and remove the drive belt.
4. Remove the end support (item 24 in Figure 8-11).
5. Leaving the center clamp bolted to the carriage assembly, remove both from the end of the actuator case (item 32 in Figure 8-11).
6. Disconnect the sensor harness from the sensors and from the actuator case.
7. Remove the actuator case from the motor mount (item 23 in Figure 8-11) by removing the four mounting screws. This will provide access to the lead screw.
8. Clean old grease and dirt from all parts and inside of the case. Also clean off the lead screw (item 29 in Figure 8-11) and the lead screw nut (item 27 in Figure 8-11). The lead screw and nut must be clean and free of any grease or dirt.
9. Apply CPI Grease Type GRS-460-F (P/N 82909400A) to the guide rollers and to the channels in the linear actuator case. Do not apply grease to the lead screw or lead screw nut.
10. Apply Lead Screw oil (P/N 83145200A) to the lead screw and nut.
11. Reassemble in reverse order.
12. After reinstalling the linear actuator on the machine, perform all checks and adjustments in Chapter 7 for the Center Clamp section.

Side Clamps

This section covers parts replacement on the side clamps.

Side Clamp Pad Replacement

To replace either the upper or lower pads, proceed as follows.

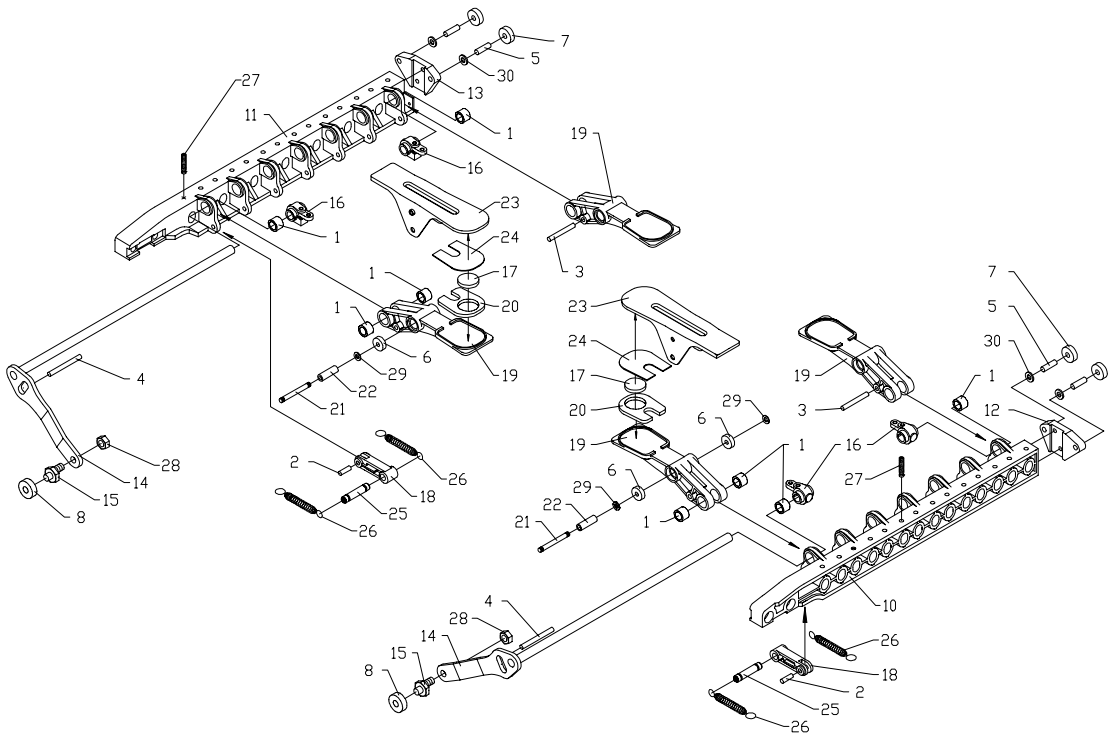
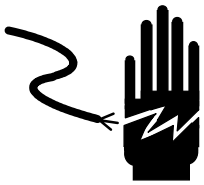


Figure 8-12



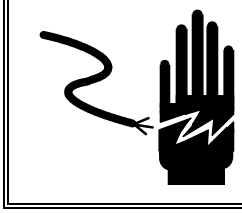
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the old pad (item 20 or 24 in Figure 8-12) by carefully lifting a corner of the pad and peeling it off. The pad should come off in one piece.
3. Inspect the mounting surface to make sure it is free of dirt, debris and oil. If necessary, use the adhesive side of the old pad to remove remaining adhesive or dirt. If necessary, clean any oil or grease off with isopropyl alcohol and a lint free cloth. Allow to dry thoroughly before installing new pad.
4. Peel the backing off and install the new pad.

5. After replacing any side clamp pad, perform the side clamp test with film.

Side Clamp Disc Replacement

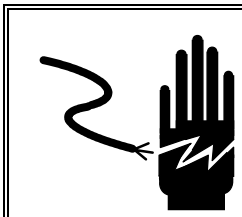


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the old disc (item 17 in Figure 8-12) by carefully prying it off with a flat head screwdriver.
3. Inspect the mounting surface to make sure it is free of dirt, debris and oil. If necessary, clean any oil or grease off with isopropyl alcohol and a lint free cloth. Allow to dry thoroughly before installing new disc.
4. Peel backing off and install the new disc.
5. After replacing any side clamp disc, perform the side clamp test with film.

Side Clamp Spring Replacement

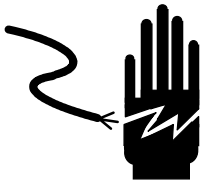


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove old spring (item 26 in Figure 8-12) if necessary.
3. Apply a liberal coating of CPI Grease Type GRS-460-F (p/n 82909400A) to the pivot points (item 21 in Figure 8-12) where the spring is attached.
4. Hook the large end of the spring onto the spring hook pivot pin (item 21 in Figure 8-12).
5. Take a 3" piece of 13 gauge music wire, or equivalent, and bend it in half leaving a 1/8" diameter loop at the end. Clamp the bent wire in locking pliers and use the loop to stretch the small end of the spring over the spring hook set screw (item 27 in Figure 8-12).
6. With the side clamps in the closed position, manually depress the side clamp until it is fully open. Slowly release pressure on the side clamp. Check to make sure that the side clamp returns to the fully closed position. If not, make the necessary spring adjustment following the Side Clamp Spring Adjustment Procedure.
7. After replacing any side clamp spring, perform the side clamp test with film.

Side Clamp Assembly Replacement



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the infeed cover and the front cover or upper rear cover depending on the side clamp assembly being replaced.
3. Push the Center Clamp to the far left end of the machine so that the skis are not touching the side clamps.
4. Pull up on the T-bar until the side clamps are fully closed.
5. Remove the two retaining screws that secure the side clamp assembly to the linear actuator carriage (item 18 in Figure 8-13).
6. Pull the side clamp out from the front or rear of the machine.
7. Reassemble in reverse order.
8. After replacement, perform the side clamp eccentric adjustment and the PC Pocket side clamp test with film.

Side Clamp Drive Motor Replacement

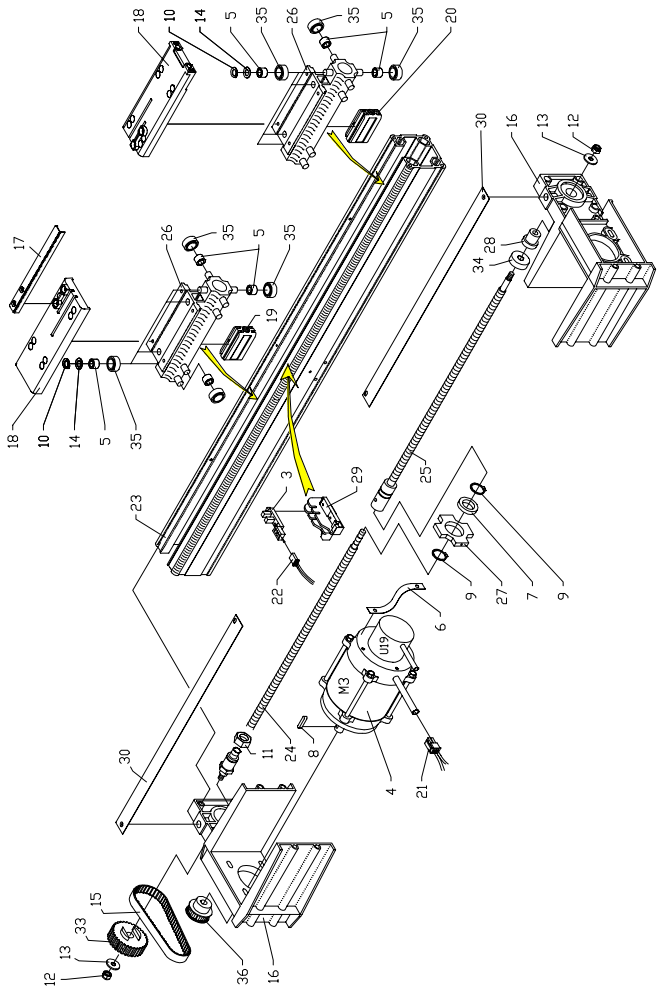


Figure 8-13

⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the upper rear cover.
3. Disconnect the motor harness, and unplug the encoder from the servo drive card (item 23 in Figure 8-19).
4. Cut the wire ties securing the encoder cable. Note: do not attempt to swap or adjust the encoder.
5. Remove the ground strap (item 6 in Figure 8-13).
6. Remove the four mounting bolts on the motor mount (item 16 in Figure 8-13), and remove the drive belt.

7. Remove the motor from the machine.
8. Remove the motor pulley (item 36 in Figure 8-13) by loosening the pulley set screws.
9. Re-install the motor to the machine in reverse order being sure to adjust the belt tension as described in the machine adjustments section.

Side Clamp Linear Actuator Service

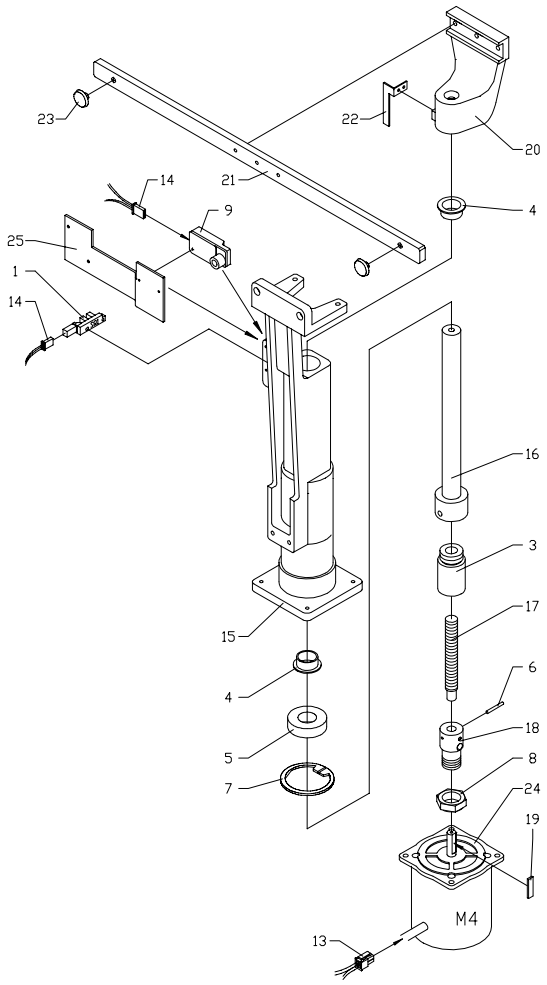
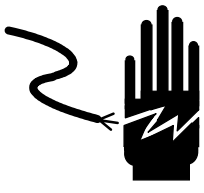


Figure 8-14

The procedure described here is for disassembly and reassembly of the side clamp linear actuators.



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the infeed cover, front cover, and upper rear cover from the machine.

3. Remove the side clamp assemblies from the machine.
4. Remove the heater blower mount (item 2 in Figure 8-18) and the mirror bracket (item 18 in Figure 8-6) from the side clamp actuator case (item 23 in Figure 8-13).
5. Remove the four bolts holding the T-bar mount (item 15 in Figure 8-14) to the side clamp linear actuator case.
6. Cut all wire ties securing any wires to the side clamp actuator case.
7. Unplug the side clamp sensor harness (item 22 in Figure 8-13).
8. Remove the four bolts holding the side clamp motor to the motor mount and remove the drive belt. Gently place the motor on the machine cross brace, be sure the motor is stable and will not fall.
9. Remove the actuator shields (item 30 in Figure 8-13).
10. Remove the screws holding the side clamp actuator case to the front motor mount.
11. Remove the screws holding rear side clamp actuator motor mount to the machine frame.
12. Carefully slide the linear actuator assembly (with carriage) out of the machine.
13. Finish disassembling the actuator by removing the four screws holding the motor mount to the actuator case.
14. Clean old grease and dirt from all parts and inside of the case. Also clean off the lead screws (items 24 and 25 in Figure 8-13) and the lead screw nut assemblies (items 19 and 20 in Figure 8-13). The lead screws and nut assemblies must be clean and free of any grease or dirt.
15. Apply CPI Grease Type GRS-460-F (p/n 82909400A) to the guide rollers (item 35 in Figure 8-13) and channels in the linear actuator case. Do not apply grease to the lead screws or the lead screw nut assemblies.
16. Apply Lead Screw oil (P/N 83145200A) to the lead screws and nut assemblies.
17. Reassemble in reverse order.

Film Cutter

This section covers parts replacement on the cutter assembly.

Cutting Channel Replacement

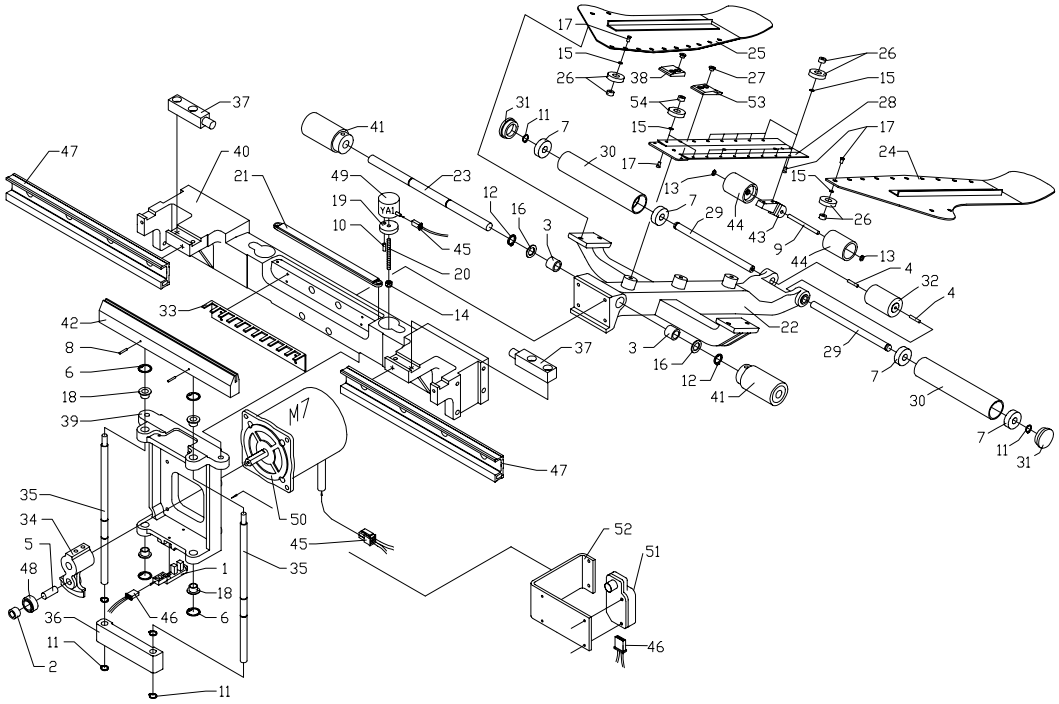


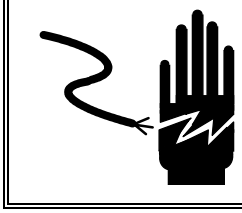
Figure 8-15

⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the right end covers from the machine.
3. Remove the cutter assembly by removing the two mounting bolts from the mount (item 39 in Figure 8-15).
4. Remove the four snap rings on the cutting channel guides.
5. Remove the cutting channel with guide rods and replace.
6. Reassemble in reverse order.
7. Verify that the blade cuts in the center of the cutting channel as described in the adjustments section.

Cutting Channel Drive Motor Replacement



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the right end covers from the machine.
3. Remove the cutter assembly by removing the two mounting bolts from the mount (item 39 in Figure 8-15).
4. Remove the four snap rings on the cutting channel guides.
5. Remove the cutting channel and the follower (item 36 in Figure 8-15).
6. Remove the cam (item 34 in Figure 8-15) by loosening the 2 set screws.
7. Remove the drive motor by removing the 4 screws securing it to the mounting bracket.
8. Reassemble in reverse order.
9. Verify that the blade cuts in the center of the cutting channel as described in the adjustments section.

Knife Replacement

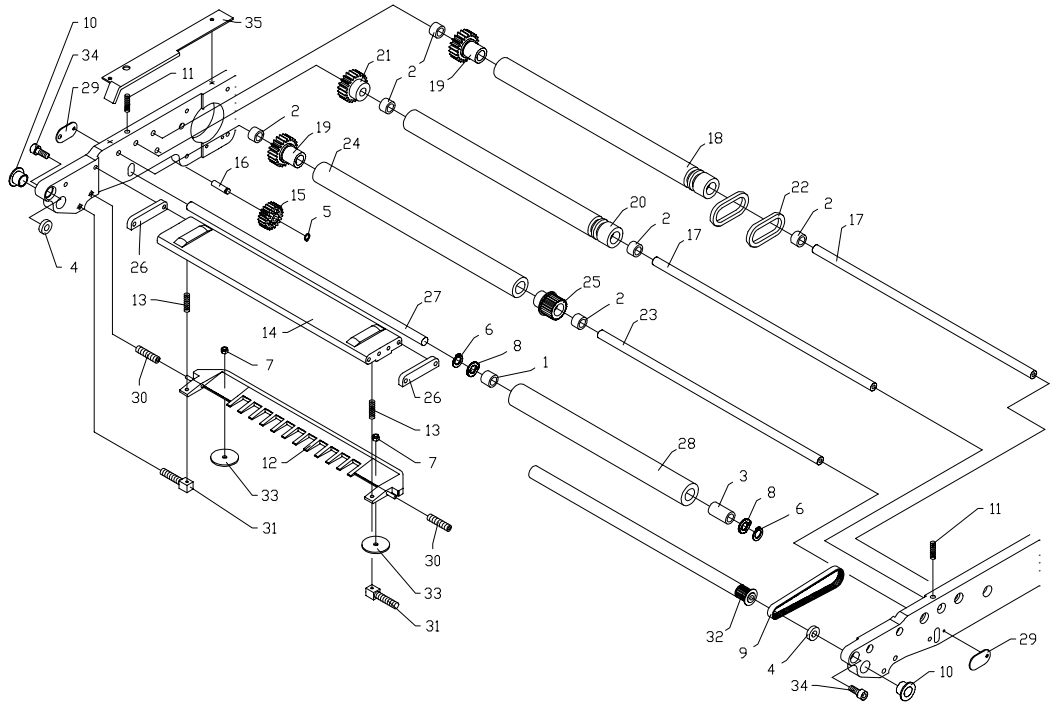
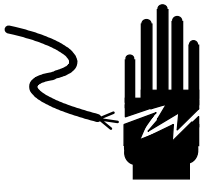


Figure 8-16

To replace a dull or broken cutting blade, proceed as follows:



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the four screws on the sides of the knife mount.
3. Remove and replace the knife mount. Caution: the two distributor springs are under compression and may fly off.
4. Be sure the two springs for the distributor are positioned properly.
5. Verify that the blade cuts in the center of the cutting channel as described in the adjustments section.

Sealing Belt

Heating Element Replacement

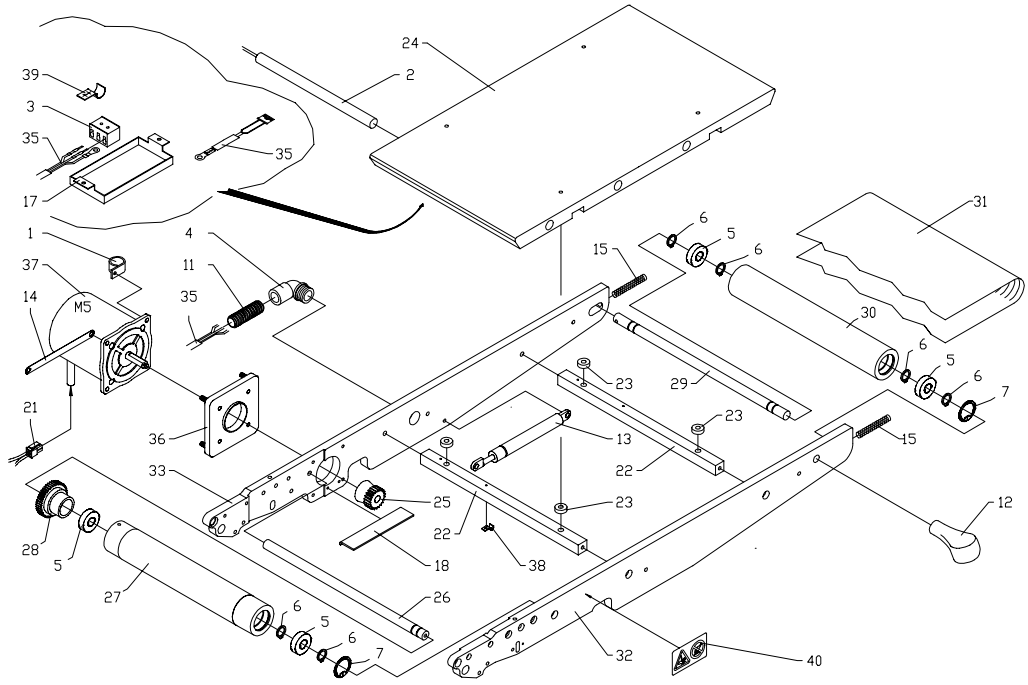
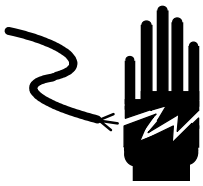


Figure 8-17



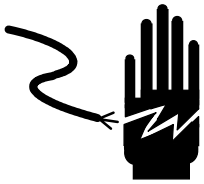
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove both of the rear covers and the right side covers and open the hood.
3. Disconnect the cable harnesses for the motor, the thermistor, and the heating elements and pull them through the machine frame.
4. Remove the snap rings for the air springs (item 13 in Figure 8-17) on the pins and disconnect the ends of the air springs from the pins.
5. Remove the pivots (item 37 in Figure 8-15) by removing the four bolts, and remove the sealing belt assembly from the machine.
6. Remove the sealing belt cover (item 19 in Figure 8-10).
7. Loosen the setscrew for the spring tension of the film pressure roller on the front sealing belt side frame (item 32 in Figure 8-17).
8. On the front sealing belt side frame: remove the bolt for the film drive roller, the two bolts for the knife mount, the bolt for each of the three package drive rollers, remove the bolt for the sealing belt drive roller, and the two bolts for the frame. Be sure not to loose the springs for the distributor.

9. Remove the front side frame. Caution: the end roller on the sealing belt is under spring load.
10. Remove the sealing belt (item 31 in Figure 8-17).
11. Remove the four bolts securing the sealing plate (item 24 in Figure 8-17).
12. Remove the cover over the terminal on the bottom of the sealing plate.
13. Disconnect the heating element wires from the terminal (item 3 in Figure 8-17), and slide the heating elements (item 2 in Figure 8-17) out of the sealing plate.
14. Reassemble in reverse order. Make sure that all the springs are in the correct position and that all the rollers turn freely.
15. After replacement, perform the sealing belt, film cutting knife, and distributor adjustments as described in the machine adjustments section.

Sealing Belt Replacement

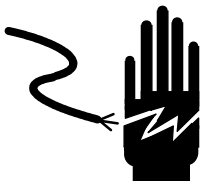


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove both of the rear covers and the right side cover, and then open the hood.
3. Disconnect the cable harnesses for the motor, the thermister, and the heating elements and pull them through the machine frame.
4. Remove the snap rings for the air springs (item 13 in Figure 8-17) on the pins and disconnect the ends of the air springs from the pins.
5. Remove the pivots (item 37 in Figure 8-15) by removing the four bolts, and remove the sealing belt assembly from the machine.
6. Remove the sealing belt cover (item 19 in Figure 8-10).
7. Loosen the setscrew for the spring tension of the film pressure roller on the front sealing belt side frame (item 32 in Figure 8-17).
8. On the front sealing belt side frame: remove the bolt for the film drive roller, the two bolts for the knife mount, the bolt for each of the three package drive rollers, remove the bolt for the sealing belt drive roller, and the two bolts for the frame. Do not lose the springs for the distributor.
9. Remove the front side frame. Caution: the end roller on the sealing belt is under spring load.
10. Remove and replace the sealing belt (item 31 in Figure 8-17).
11. Reassemble in reverse order, be sure that all the springs are in the correct position and that all the rollers turn freely.
12. After replacement, perform the sealing belt, film cutting knife, and distributor adjustments as described in the machine adjustments section.

Sealing Belt Thermistor Replacement

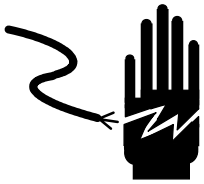


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove both of the rear covers and the right side cover, and open the hood.
3. Disconnect the cable harnesses from the motor, the thermistor, and the heating elements and pull them through the machine frame.
4. Remove the snap rings for the air springs (item 13 in Figure 8-17) on the pins and disconnect the ends of the air springs from the pins.
5. Remove the pivots (item 37 in Figure 8-15) by removing the four bolts, and remove the sealing belt assembly from the machine.
6. Remove the sealing belt cover (item 19 in Figure 8-10).
7. Loosen the setscrew for the spring tension of the film pressure roller on the front sealing belt side frame (item 32 in Figure 8-17).
8. On the front sealing belt side frame: remove the bolt for the film drive roller, the two bolts for the knife mount, the bolt for each of the three package drive rollers, remove the bolt for the sealing belt drive roller, and the two bolts for the frame. Do not lose the springs for the distributor.
9. Remove the front side frame. Caution: the end roller on the sealing belt is under spring load.
10. Remove the sealing belt (item 31 in Figure 8-17).
11. Remove the cover (item 17 in Figure 8-17) over the terminal on the bottom of the sealing plate.
12. Remove the bolt holding the thermistor and replace the thermistor (item 35 in Figure 8-17).
13. Reassemble in reverse order, be sure that all the springs are in the correct position and that all the rollers turn freely.
14. After replacement, perform the sealing belt, film-cutting knife, and distributor adjustments as described in the machine adjustments section.

Sealing Belt Drive Motor Replacement.



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove both of the rear covers, the right side cover, and open the hood.
3. Disconnect the cable harnesses for the motor, the thermister, and the heating elements and pull them through the machine frame.
4. Remove the snap rings for the air springs (item 13 in Figure 8-17) on the pins and disconnect the ends of the air springs from the pins.
5. Remove the pivots (item 37 in Figure 8-15) by removing the four bolts, and remove the sealing belt assembly from the machine.
6. Remove the four nuts on the motor isolation mount (item 36 in Figure 8-17) and remove the motor.
7. Loosen the setscrews on the motor drive gear (item 25 in Figure 8-17) and remove it.
8. Reassemble in reverse order.
9. After replacement, perform the sealing belt, film-cutting knife, and distributor adjustments as described in the machine adjustments section.

Heater/Blower Replacement

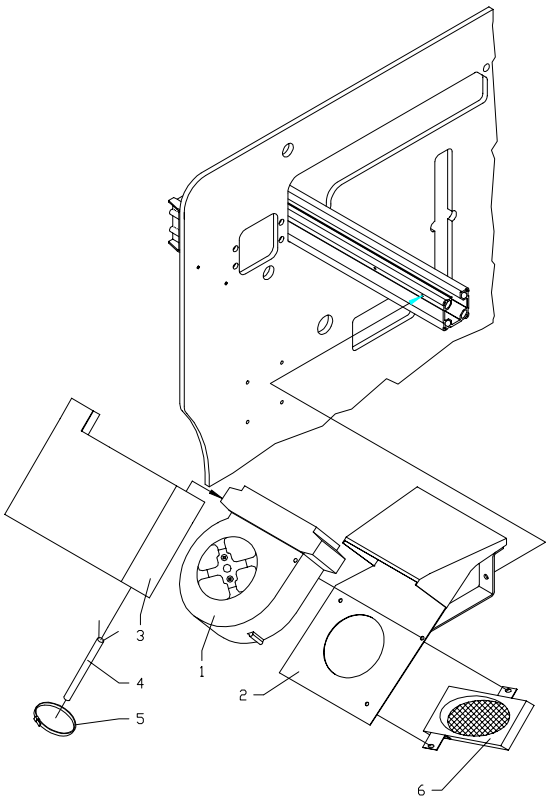
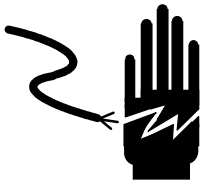


Figure 8-18



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Open the door on the left end of the machine.
3. Remove the two bolts securing the blower mount (item 2 in Figure 8-18) to the side clamp actuator case.
4. Remove the three screws securing the heater/blower (item 1 in Figure 8-18) to the mount.
5. Disconnect the wires to the heater/blower noting the location of each.
6. Reassemble in reverse order.

Electronics

Servo Drive PCB Assembly Replacement

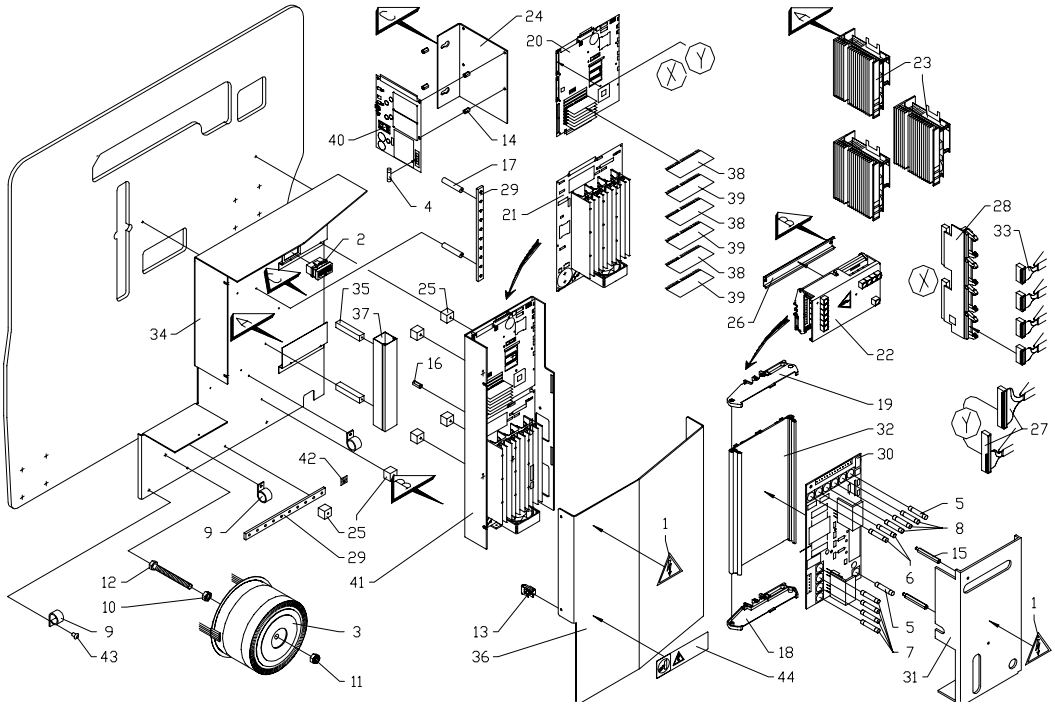
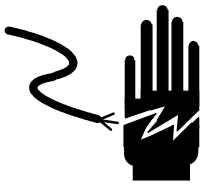


Figure 8-19



⚠ WARNING

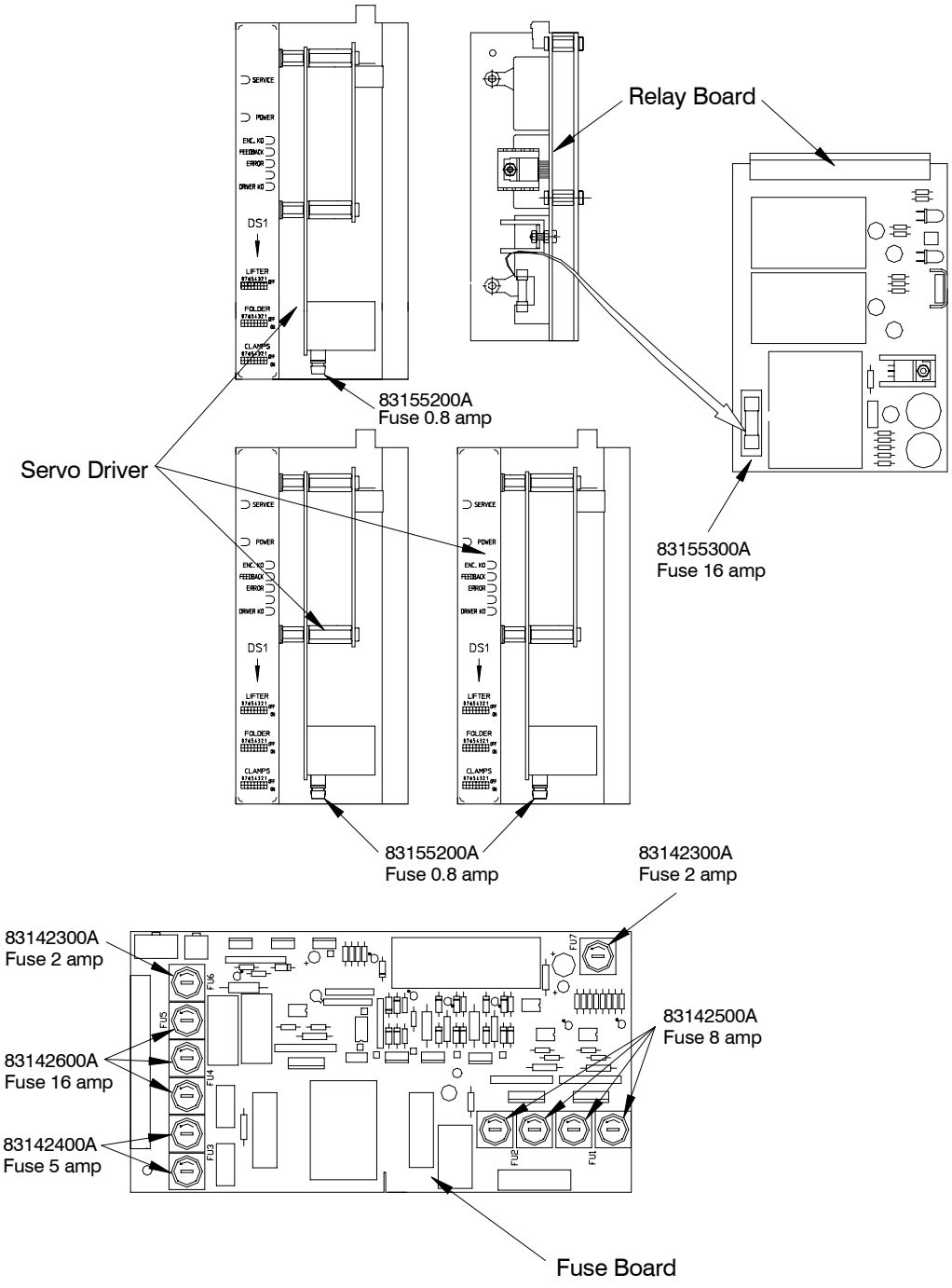
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lower rear cover.
3. Remove the electronic rack cover (item 36 in Figure 8-19).
4. Disconnect the cables to the servo drive (item 23 in Figure 8-1) that needs replacement.
5. Remove the servo drive.
6. Set the switches on the servo drive board to match the component being driven. The settings are shown on the edge of the heat sink on the servo drive assembly.
7. Reassemble in reverse order.

Fuses

⚠ WARNING

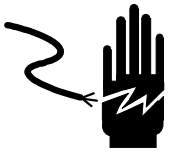
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



Type	Rating	Part #	Description
6.3x32MM T	2A	83142300A	FU6: Transformer Secondary - Film Reel Brake and Safety Photocells
6.3x32MM T	2A	83142300A	FU7: Film Reel Brake
6.3x32mm T	5A	83142400A	FU3: Transformer Primary
6.3x32mm T	8A	83142500A	FU2: Heater Blower
6.3x32mm T	8A	83142500A	FU1: Sealing Plate
6.3x32mm T	16A	83142600A	FU4: Servo Drives
6.3x32mm T	16A	83142600A	FU5: Transformer Secondary - Step Motors and Optional Power

(T = Time Delay)

Fuse Board Replacement

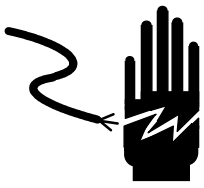


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lower rear cover, the rack cover, and the fuse board cover.
3. Remove the harnesses from the fuse board.
4. Pop the board mount assembly off of the mounting rail.
5. Remove the screws holding the end on the board mount.
6. Slide the board out of the end and replace it with a new one.
7. Remove the fuses from the old board and put them in the corresponding locations on the new board.
8. Reassemble in reverse order, reset the machine, and test.

Display Board Replacement



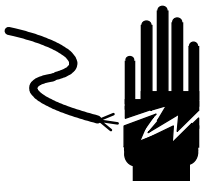
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the 4 screws on the back of the display case and pull the front face off. Caution: there are wires plugged into the face.
3. Unplug the harness from the display board.
4. Remove the 4 mounting screws and replace the display board.

5. Reassemble in reverse order, reset the machine, and test.

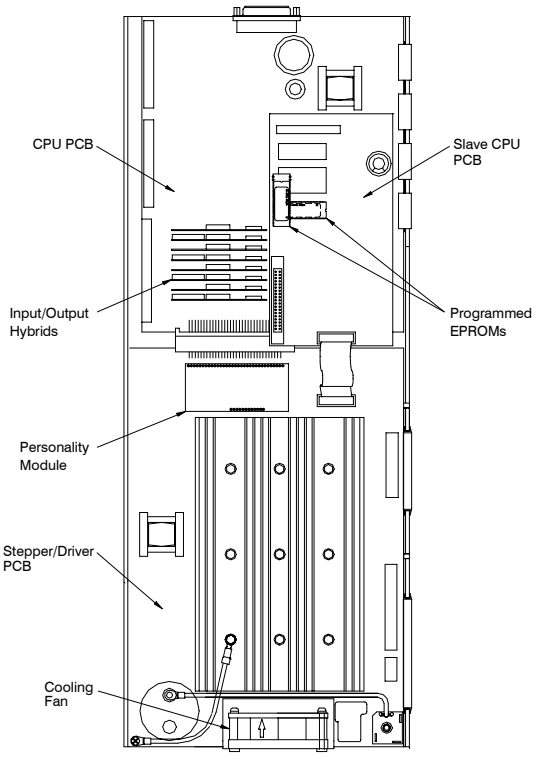
Main CPU PCB Replacement



⚠ WARNING

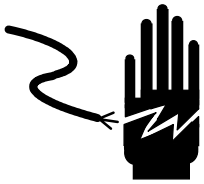
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lower rear cover and the rack cover.
3. Unplug the ribbon cable connecting the slave CPU board to the Stepper Driver board.
4. Remove the screw holding the Slave CPU in place.
5. Carefully remove the Slave CPU board from the Main CPU board.
6. Remove the defective Main CPU board by removing the nine retaining screws, the Slave CPU standoff, and the four heatsink clips at the edge of the board. Replace the board with a new one. At the same time, remove the EPROM from the defective Main CPU board and install it on the new board.
7. Reassemble in reverse order, reset the machine, and test. When reassembling the CPU board to the rack, be sure to place the insulation sheet (if it is loose) between the rack and the MOSFETS before installing the heat sink clips.
8. Configure the dipswitches to match the old board.



Electronics Rack

Slave CPU PCB Replacement

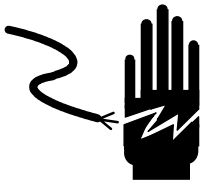


⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lower rear cover and the rack cover.
3. Unplug the ribbon cable connecting the slave CPU board to the Stepper Driver board.
4. Remove the screw holding the Slave CPU in place.
5. Carefully remove the Slave CPU board from the Main CPU board and replace it with a new one. At the same time, remove the EPROM from the defective Slave CPU and install it on the new board.
6. Reassemble in reverse order, reset the machine, and test. In general, if something is wrong with the Slave CPU, the machine will not run.

Stepper Driver PCB Replacement



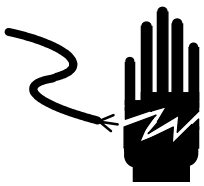
⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lower rear cover and the rack cover.
3. Unplug the ribbon cable connecting the slave CPU board to the Stepper Driver board.
4. Remove the screw holding the Slave CPU in place.
5. Carefully remove the Slave CPU board from the Main CPU board.
6. Remove the defective Main CPU board by removing the nine retaining screws, the Slave CPU standoff, and the four heatsink clips at the edge of the board.
7. Carefully remove the personality module from its position on the Stepper Driver Board.
8. Remove the seven screws holding the Stepper Driver Board in place -- there are five screws located on the board side, and two located on the rack side. Remove and replace the defective Stepper Driver Board.

9. Reassemble in reverse order, reset the machine, and test. When reassembling the CPU board to the rack, be sure to place the insulation sheet (if it is loose) between the rack and the MOSFETS before installing the heat sink clips.

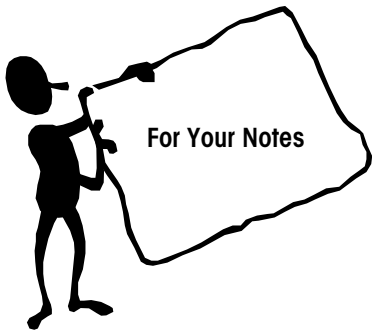
Relay Board Replacement



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

1. Disconnect power to the machine.
2. Remove the lower rear cover and the rack cover.
3. Remove the harness from the relay board.
4. Remove the two screws holding the mounting bracket to the machine frame.
5. Remove the screws securing the board to the mounting bracket, remove the board and replace with a new one.
6. Reassemble in reverse order, reset the machine, and test.


For Your Notes

9 Troubleshooting

General Symptoms

Important Note
For cleaning instructions, refer to Chapter 5 Maintenance before attempting to clean any of the wrapper components.

Listed below are some common symptoms that could be encountered.

SYMPTOMS	CAUSE	SOLUTION
• Film Tearing • Film Tracking Poorly	• Bad Roll of Film.	• Replace Film with New Roll.
• Trays Left Open • Poor Overwrap • No Overwrap	• End of film roll. • Film Pulling Out of Center Clamp. • Film pulling out of side clamps.	• Replace roll of film. • Clean Center Clamp and allow to dry thoroughly. • Clean side clamp gripper pads and allow to dry.
• Not Picking Film	• Sealing Belt Not in Closed Position. • Film Not Loaded Properly. • Center clamp dirty. • Film wrapped around distributor film roller.	• Lift and Re-close Sealing Belt. • Re-load the Film. • Clean Center Clamp and allow to dry. Remove any debris. • Remove any film or debris from distributor film roller.
• Short Overwrap	• Rollers on Sealing Belt Dirty.	• Clean Rollers on Sealing Belt.
• No Power	• Main switch turned to **O.** • Circuit breaker tripped. • Inadequate wiring.	• Turn the Power Switch to **I.** • Reset the circuit breaker on the transformer. • Check store circuit breaker. • Check the wiring.
Irregular package wrapping	• Film roll out of position • Film clamp grasp insufficient • Side Clamps film gripping insufficient • Film Folder dirty • Film loading incorrect	• Arrange the film roll in the correct position. • Check and clean Center Clamp and allow to dry. • Check and clean the side clamps and allow to dry. • Clean the Film Folder. • Reload the film.

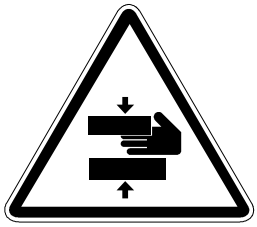
SYMPTOMS	CAUSE	SOLUTION
Package wrapping with irregular film tension	• Film roll out of position • Center Clamp grasp insufficient • Side clamp grasp insufficient • Film Folder dirty • Film loading incorrect	• Arrange the film roll in the correct position. • Check and clean the film clamp. • Check and clean the side clamps. • Clean the Film Folder. • Reload the film.
Package wrapping with irregular film tension	• Work program incorrect	• Check the work program setting. • Enter the proper work program.
Poor package sealing	• Sealing belt temperature incorrect	• Check the set temperature value. • If sealing belt is too hot, lower the temperature value. • If sealing belt is too cold, increase the value.

Self Test

The SOLO® Mega is able to self-test and display the following information:

- The type of program being used on the Status Display.
- A status code indicating machine status or probable reasons for stoppages or malfunctions.

The machine conveys this information by special numerical codes shown on the Control Panel Status Display. The following Status Code List describes the codes. If the code is an error, the section gives steps to take to solve the problem.



WARNING

During the self-test, the wrapper conveyors and motors are in motion. Do not place materials on the belts during this test. Keep hands clear of the machine when the self-test is running.

Error Codes/Messages

Machine Operation Codes

If the SOLO® Mega detects a problem, the following message codes will blink.

Op Code	Problem	Cause
10	Machine not fed for too long of a time.	If it's been more than the preset time since the machine has been fed, the infeed stops and power to the servo driver is cut. To restart, press the start button
66	Photocell in critical condition	The threshold for one or more direct Photocells is lower than the critical threshold. (Version XR and 50 standard versions.)
67	Photocell is flickering.	When the reading procedure for the trays is activated incorrectly it causes a spike in the Photocell. This emergency can only be seen in the error statistics and is not visible to the operator.
80	Waiting for Weigh Complete Signal.	The machine is waiting for the package to be finished weighing (the start weight waits for the end weight signal). This warning will continue indefinitely until a weigh complete signal is received. The warning is displayed 800ms after the start of the weighing process. This warning appears on the control panel, but is not recorded in the error statistics.
81	Waiting for Label Applied Signal.	The machine is waiting for the label application to be completed and will be displayed after 5 seconds.
82	One or two horizontal photocells have been disabled.	One or two horizontal photocells have been disabled because they are inhibited. This warning is displayed if: a) The Photocells are not the first two nearest the infeed package guide. b) There are not two adjacent photocells inhibited. c) There are not three or more inhibited photocells. This is retested during every reset of the machine.

Op Code	Problem	Cause
83	On or two vertical photocells have been disabled.	One or two vertical Photocells have been disabled because they are inhibited. This warning is displayed if: a) The photocells are not part of the first two (lowest) sets, one direct and one reflective. b) There are not two adjacent photocells inhibited. c) There are not three or more inhibited photocells. This is retested during every reset of the machine.
89	The temperature of the sealing plate is higher that the set value.	With the sealing plate signal off, the plate's temperature has remained over the set value for too long of a time.
90	The thermister for the sealing plate is not working due to a short circuit.	The sensor for the sealing plate temperature is reading a voltage value that is too high (resistance is too low). In order to retest the sensor, reset the machine after opening a cover.
91	The thermister for the sealing plate is not working due to an open contact.	The sensor for the sealing plate temperature is reading a voltage value that is too low (resistance is too high). In order to retest the sensor, reset the machine after opening a cover.
92	The sealing plate has not reached the set value.	With the sealing plate heating active, the temperature of the plate has remained too low for too long of a time.
93	The heater/blower is not functioning properly.	After the initial automatic internal heater running (length of time is variable and can be changed using PC Pocket), with the heater constantly running, the internal machine temperature has not reached the set value (Variable can be set using PC Pocket.)
94	Exit full signal activated.	The input signal EXIT FULL is activated and the machine is waiting for the signal to be turned off.
95	The sealing plate's temperature varies with respect to the set value.	The sealing plate's temperature has gone over or fallen under the set value by more than 8 degrees Celsius.

Op Code	Problem	Cause
96	The internal machine temperature thermister is not working properly.	The sensor for the sealing plate temperature is reading a voltage value that is too low (resistance is too high) or a voltage value that is too high (resistance is too low). In this case, the internal heater is turned off until the readings are normal.
97	The machine's input voltage is too low.	The machine has detected the input voltage to the stepper driver PCB to be below 46 VAC. This is checked during the film pick.
98	The machine speed has been reduced because of defective actuator movement (motor stalls).	One or more machine movements have logged a large number of errors causing the movement to be done at a reduced speed. In order to restore high speed, the machine must be turned off and on again.
99	One or more photocells of the infeed have been disabled because they are inhibited.	One or more photocells of the infeed have been disabled because they are inhibited. This warning is displayed if: a) They are not the first 2 lowest vertical photoeyes (1 direct and 1 reflective) b) There are not 2 adjacent photocells inhibited. c) There are not 3 or more inhibited photocells. This is retested during every reset of the machine.

Machine Fault Codes

Op Code	Problem	Cause
000	End emergency / waiting for machine start.	
001	Machine ready / verify appearance of tray / wait to start machine.	After power up, and before the machine is reset, this is displayed. Be sure all trays are removed from machine.
002	Reset machine's CPU program.	Indication of CPU reset.
004	Tray in machine, open cover and remove.	After any emergency that occurs after the side clamps start moving in if the start button is pressed to clear the error, a 004 will come up. It is necessary to open the top cover and remove any trays in the machine if there are any, then close the cover and press the start button again.
006	Battery operated RAM broken.	During power up, or after a reset, after attempting initialization, it's been verified that the battery-operated ram does not work properly.
007	The battery operated RAM has lost data.	During power up of the machine it's been verified that the battery operated RAM has lost memory data. The lost data is replaced with the default settings.
008	Out of film.	For 2 consecutive trays the sensor on the lower dancer bar has not switched.
011	Emergency stop button on the machine or on the extended infeed is pushed.	The contacts for the emergency stop button on the machine or the extended infeed are open.
012	Top cover is open.	The contacts of the switch connected to the top cover are open.
015	Infeed safety photocells blocked.	The infeed safety photocells have been blocked while the switch for the lifter is pressed.
092	The exit full signal time out.	The exit full signal has been activated for a longer time than is permitted (variable can be changed using PC Pocket).
093	Labeling photocell defective, or package has not reached the labeling photocell.	Two possibilities or scenarios: a) The labeling photocell has not been freed after 3.5[sec] (50 filter [ms]) since the sealing belt has started running. b) After the photocell is clear and after the center clamp has ejected a package, the labeling photocell is not blocked after 3.5[sec] (30 filter [ms])
094	An error has occurred during the rising/lowering movement of Infeed 1	The rising/lowering movement of infeed 1 is not consistent with the sensor switching.
095	The machine did not receive a label-applied signal.	The machine waited more that 5 seconds for a label applied signal.

Op Code	Problem	Cause
099	Program 95 has finished the set number of cycles.	Program 95 has completed the number of cycles set in the program (variable set using PC Pocket) without two consecutive errors.
183	Motors are not powered. Verify the Side door is closed.	There are two possibilities: a) The contacts of the cover's switches are closed. But, the contacts of the relay RL1 (CN1:1A) and the contacts of the control relay (CN6:30) are still open 6 sec after the machine is reset. b) One of the 3 servo drivers does not have power (only with software dated 05/25/99 and after).
201	The lifter has not left the lifter sensor.	There are two possibilities: a) During the reset, or at the end of the lifter up movement, the lifter's low sensor is blocked when the lifter is in the high position. b) During the movement of the lifter, the machine stops if the side clamps have not moved out of the way.
202	The lifter has not arrived at the sensor.	During the reset or at the end of the lifter down movement, the lifter sensor is not blocked when the lifter is in the low position.
203	Serial communication error of lifter.	During serial communication between the CPU and the lifter servo drive, non-recoverable errors have occurred.
204	Encoder error of lifter.	The lifter encoder's electronic control circuit received erroneous input signals from the encoder.
207	The temperature of the lifter servo driver PCB is too high.	The lifter driver's protection circuit has shut down due to an over temperature of the power module.
208	a) Lifter movement in Delta limit during a machine reset. b) Multiple sensor switching.	a) The lifter actuator movement was not successful in following the defined path during a machine reset. The error between the position defined by software and the position reported by the encoder has an error greater than allowed. b) The lifter sensor has switched multiple times when the software was not expecting it to do so.
209	Over voltage of the lifter's driver during a machine reset.	The lifter driver's protection circuit is reading an over current/over voltage situation in the motor during a machine reset.
210	The lifter's driver has reset during a machine rest.	During the machine reset, a lifter servo driver reset occurred.

Op Code	Problem	Cause
211	Lifter movement in Delta limit during upward movement.	The lifter actuator movement was not successful in following the defined path during the upward movement. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
212	Over voltage of the lifter's driver during its upward movement.	The lifter driver's protection circuit is reading an over current/over voltage situation in the motor during its upward movement.
213	The lifter's driver has reset during its upward movement.	During its upward movement, a lifter servo driver reset occurred.
214	Lifter movement in Delta limit during downward movement.	The lifter actuator movement was not successful in following the defined path during the downward movement. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
215	Over voltage of the lifter's driver during its downward movement.	The lifter driver's protection circuit is reading an over current/over voltage situation in the motor during its downward movement.
216	The lifter's driver has reset during its downward movement.	During its downward movement, a lifter servo driver reset occurred.
223	Parallel I/O error of the lifter driver.	A CPU signal via parallel interface sent a command, but did not receive an acknowledgement from the lifter driver within the allowed time.
301	The center clamp did not reach the sensor.	The center clamp has not reached the sensor during package ejection, film unwinding, or machine reset.
302	The center clamp has not left the sensor.	The center clamp has not exited the sensor at the end of the back movement during a machine reset.
303	Serial communication error of center clamp.	During serial communication between the CPU and the center clamp servo drive, non-recoverable errors have occurred.
304	Encoder error of the center clamp.	The center clamp encoder's electronic control circuit received erroneous input signals from the encoder.
307	The temperature of the center clamp servo driver PCB is too high.	The center clamp driver's protection circuit has shut down due to an over temperature of the power module.

Op Code	Problem	Cause
308	a) Center clamp movement in Delta limit during a machine reset. b) Multiple sensor switching.	a) The center clamp actuator movement was not successful in following the defined path during a machine reset. The error between the position defined by software and the position reported by the encoder has an error greater than allowed. b) The center clamp sensor has switched multiple times when the software was not expecting it to do so.
309	Over voltage of the center clamp driver during a machine reset.	The center clamp driver's protection circuit is reading an over current/over voltage situation in the motor during a machine reset.
310	The center clamp's driver has reset during a machine reset.	During a machine reset, a center clamp servo driver reset occurred.
311	Center clamp movement in Delta limit during film unwinding.	The center clamp actuator movement was not successful in following the defined path during film unwinding. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
312	Over voltage of the center clamp driver during film unwinding.	The center clamp driver's protection circuit is reading an over current/over voltage situation in the motor during film unwinding.
313	The center clamp's driver has reset during film unwinding.	During film unwinding, a center clamp servo driver reset occurred.
314	Center clamp movement in Delta limit during tension relief movement.	The center clamp actuator movement was not successful in following the defined path during tension relief movement. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
315	Over voltage of the center clamp driver during tension relief movement.	The center clamp driver's protection circuit is reading an over current/over voltage situation in the motor during tension relief movement.
316	The center clamp's driver has reset during tension relief movement.	During tension relief movement, a center clamp servo driver reset occurred.
317	Center clamp movement in delta limit during film prestretch.	The center clamp actuator movement was not successful in following the defined path during flim prestretch. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
318	Over voltage of the center clamp driver during film prestretch.	The center clamp driver's protection circuit is reading an over current/over voltage situation in the motor during film prestretch.
319	The center clamp's driver has reset during film prestretch.	During film prestretch, a center clamp servo driver reset occurred.

Op Code	Problem	Cause
320	Center clamp movement in delta limit during package ejection.	The center clamp actuator movement was not successful in following the defined path during package ejection. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
321	Over voltage of the center clamp driver during package ejection.	The center clamp driver's protection circuit is reading an over current/over voltage situation in the motor during package ejection.
322	The center clamp's driver has reset during package ejection.	During package ejection, a center clamp servo driver reset occurred.
323	Parallel I/O error of the center clamp driver.	A CPU signal via parallel interface sent a command, but did not receive an acknowledgement from the center clamp driver within the allowed time.
338	The package ejection photoeye was blocked during the film unwinding movement.	Two scenarios: a) During film unwinding the package ejection photocell is still blocked. b) Before package ejection, package ejection photocell is already blocked.
339	The package ejection photoeye was not blocked during the package ejection movement.	During the center clamp's package ejection movement, the package ejection photocell was not blocked.
401	The side clamp opening cam has not left the sensor.	During the side clamp closing movement, the side clamp opening cam sensor remained blocked.
402	The side-clamp opening cam has not arrived at the sensor.	During the side clamp small open movement, the side clamp opening cam sensor did not get blocked.
501	During the film cutting movement, the cutter channel sensor was not blocked.	During the film cutting movement, after the cutter channel sensor was cleared it did not get blocked again, meaning the cutter channel did not arrive at its resting position so that it is not obstructing the center clamp.
502	The cutter channel sensor was not blocked when the channel moved down after raising the film.	During the downward movement of the cutter channel, after the film raising movement, the sensor was not blocked.
503	The cutter channel has not left the sensor during the film raise movement.	During the upward movement of the cutter channel for raising the film, the sensor remained blocked.
504	The cutter channel has not left the sensor during the film cut movement.	During the film cutting movement, the cutter channel sensor remained blocked.

Op Code	Problem	Cause
602	Horizontal photocells blocked and/or dirty.	Several scenarios: 1) At the start of the machine, the non-disabled photocells are blocked. 2) At the start of the machine in the photocells check phase (after each reset): 2.a) The photocell nearest to the infeed package guide is blocked (T3xR3). 2.b) There are 2 adjacent horizontal photocells blocked. 2.c) There are 3 or more horizontal photocells blocked.
603	Vertical photocells blocked and/or dirty.	Several scenarios: 1) At the start of the machine, the non-disabled photocells are already blocked. 2) At the start of the machine in the photocells check phase (after each reset): 2.a) The 2 lowest photocells are blocked. 2.b) There are 2 adjacent photocells blocked. 2.c) There are 3 or more photocells blocked.
604	The package has not reached the lifter photocell.	The lifter photocell was blocked more than 40 mm before or after the software expected it to or the lifter photocell was never blocked.
605	Photocells reading inconsistent.	A type of photocell (horizontal front, horizontal back, or vertical) has started or ended the reading of a product much sooner or after another.
606	Foreign object on back of lifter.	The photocells shooting across the back of the lifter where it connects to the actuator is blocked before the raising of the lifter.
611	Tray too big.	The estimated package width is greater than 255 [mm].
621	Tray too small.	The estimated package width is below 60 [mm].
624	Trays too close.	The distance between two packages loaded is lower than 10 [mm].
628	Tray not aligned with the infeed package guide.	The through beam photocell by the infeed package guide did not get blocked when the dimensioning photocells did.
701	The side clamps have not reached the sensor.	The side clamp sensor did not become blocked during a machine reset, or during the inward movement of the side clamps.
702	The side clamps have not left the sensor.	The side clamp sensor remained blocked during a machine reset or during the outward movement of the side clamps.
703	Serial communication error of side clamps.	During serial communication between the CPU and the side clamp servo drive, non-recoverable errors have occurred.

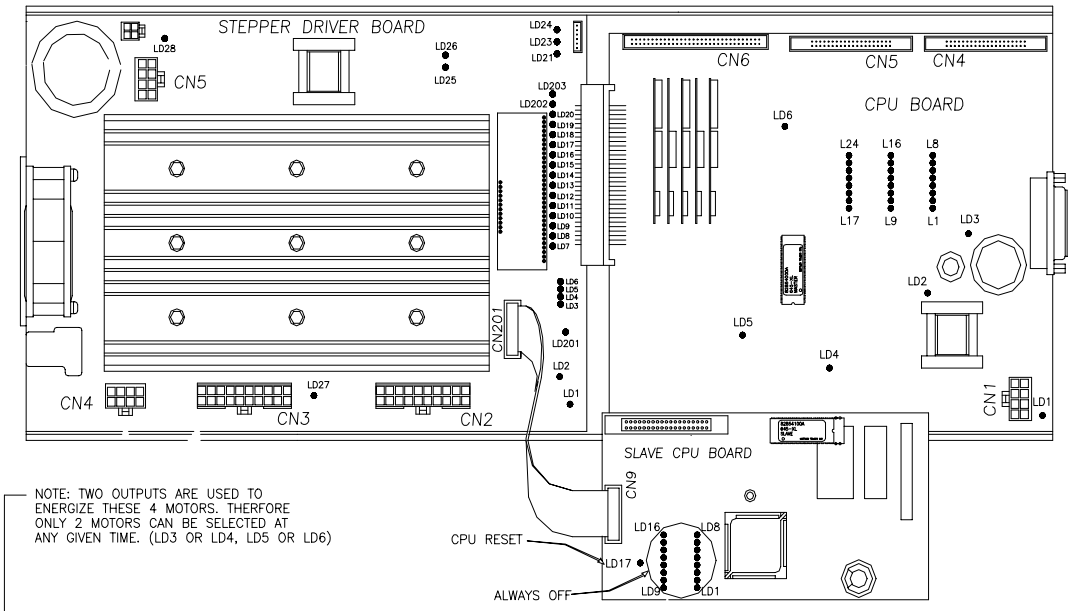
Op Code	Problem	Cause
704	Encoder error of the side clamps.	The side clamp encoder's electronic control circuit received erroneous input signals from the encoder.
707	The temperature of the side clamp servo driver PCB is too high.	The side clamp driver's protection circuit has shut down due to an over temperature of the power module.
708	a) Side clamp movement in Delta limit during a machine reset. b) Multiple sensor switching.	a) The side clamp actuator movement was not successful in following the defined path during a machine reset. The error between the position defined by software and the position reported by the encoder has an error greater than allowed. b) The side clamp sensor has switched multiple times when the software was not expecting it to do so.
709	Over voltage of the side clamp driver during a machine reset.	The side clamp driver's protection circuit is reading an over current/over voltage situation in the motor during a machine reset.
710	The side clamp's driver has reset during a machine reset.	During a machine reset, a side clamp servo driver reset occurred.
711	Side clamp movement in Delta limit during film grasp movement.	The center clamp actuator movement was not successful in following the defined path during film grasp movement. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
712	Over voltage of the side clamp driver during film grasp movement.	The side clamp driver's protection circuit is reading an over current/over voltage situation in the motor during film grasp movement.
713	The side clamp's driver has reset during film grasp movement.	During film grasp movement, a side clamp servo driver reset occurred.
714	Side clamp movement in Delta limit during film stretch movement.	The center clamp actuator movement was not successful in following the defined path during film stretch movement. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
715	Over voltage of the side clamp driver during film stretch movement.	The side clamp driver's protection circuit is reading an over current/over voltage situation in the motor during film stretch movement.
716	The side clamp's driver has reset during film stretch movement.	During film stretch movement, a side clamp servo driver reset occurred.

Op Code	Problem	Cause
717	Side clamp movement in Delta limit during film tuck movement.	The center clamp actuator movement was not successful in following the defined path during film tuck movement. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
718	Over voltage of the side clamp driver during film tuck movement.	The side clamp driver's protection circuit is reading an over current/over voltage situation in the motor during film tuck movement.
719	The side clamp's driver has reset during film tuck movement.	During film tuck movement, a side clamp servo driver reset occurred.
720	Side clamp movement in Delta limit during outward movement.	The center clamp actuator movement was not successful in following the defined path during outward movement. The error between the position defined by software and the position reported by the encoder has an error greater than allowed.
721	Over voltage of the side clamp driver during outward movement.	The side clamp driver's protection circuit is reading an over current/over voltage situation in the motor during outward movement.
722	The side clamp's driver has reset during outward movement.	During outward movement, a side clamp servo driver reset occurred.
723	Parallel I/O error of the side clamp driver.	A CPU signal via parallel interface sent a command, but did not receive an acknowledgement from the side clamp driver within the allowed time.
801	Incorrect switching of lifter control cam sensors.	The switching of the sensors for the lifter control cam was not correct for the performed movement.
802	The lifter control cam sensors did not become blocked.	During the lifter control cam movement, the sensors were not blocked.
803	Switching of the lifter control cam's sensors is out of sequence.	The switching sequence of the sensors for the lifter control cam were incorrect

***The over temperature condition of the servo driver's power module is kept active until the temperature drops to an acceptable level.**

The over current/over voltage condition of a servo driver's power module is kept active for only 2 ms after the condition is detected.

Stepper Driver and CPU LED's



STEPPER DRIVER BOARD			
LED	COLOR	Description	STATUS
LD1	YELLOW	DISTRIBUTOR MAGNETS	ON WHEN MAGNETS ON
LD2	RED	INFEED 2, SEALING BELT MOTOR PROTECTION	OFF UNTIL FAILURE
LD3	YELLOW	INFEED 2 SELECT	ON WHEN ENERGIZED, (SEE NOTE)
LD4	YELLOW	NOT USED	
LD5	YELLOW	CUTTER SELECT	ON WHEN ENERGIZED, (SEE NOTE)
LD6	YELLOW	LIFTER RELEASE SELECT	ON WHEN ENERGIZED, (SEE NOTE)
LD7	GREEN	INFEED 2 ENABLE	ON WHEN MOTOR ENERGIZED
LD8	YELLOW	INFEED 2 DIRECTION	ON WHEN INFEED 2 BELTS GOING FORWARD
LD9	YELLOW	INFEED 2 STEP	ON WHEN MOTOR ENERGIZED
LD10	GREEN	CUTTER/LIFTER RELEASE ENABLE	ON WHEN MOTOR ENERGIZED
LD11	YELLOW	CUTTER/LIFTER RELEASE DIRECTION	ON WHEN CUTTER MOVING UP/ALWAYS ON FOR LIFTER RELEASE
LD12	YELLOW	CUTTER/LIFTER RELEASE STEP	ON WHEN MOTOR ENERGIZED
LD13	GREEN	SIDE CLAMP OPENING CAM ENABLE	ON WHEN MOTOR ENERGIZED
LD14	YELLOW	SIDE CLAMP OPENING CAM DIRECTION	ON WHEN MOVING UP
LD15	YELLOW	SIDE CLAMP OPENING CAM STEP	ON WHEN MOTOR ENERGIZED
LD16	GREEN	INFEED 1 UP/DOWN ENABLE	ON WHEN MOTOR ENERGIZED
LD17	YELLOW	INFEED 1 UP/DOWN DIRECTION	ON WHEN MOVING UP
LD18	YELLOW	INFEED 1 AND INFEED 1 UP/DOWN STEP	ON WHEN MOTOR ENERGIZED
LD19	GREEN	INFEED 1 ENABLE	ON WHEN MOTOR ENERGIZED
LD20	GREEN	SEALING BELT ENABLE	ON WHEN MOTOR ENERGIZED
LD21	YELLOW	NOT USED	
LD23	YELLOW	INTERNAL HEATER ON	ON WHEN INTERNAL HEATER IS ON
LD24	GREEN	LOW VOLTAGE	ON – ALWAYS EXCEPT WHEN DOOR/HOOD INTERLOCK OPEN
LD25	GREEN	+ 12 VOLT SUPPLY	ON – ALWAYS EXCEPT WHEN DOOR/HOOD INTERLOCK OPEN
LD26	GREEN	OUTPUT AND MOTOR POWER	ON – ALWAYS EXCEPT WHEN DOOR/HOOD INTERLOCK OPEN
LD27	RED	CUTTER, LIFTER RELEASE, OPENING CAM MOTOR PROTECTION	OFF UNTIL FAILURE
LD28	RED	INFEED 1, INFEED 1 UP/DOWN MOTOR PROTECTION	OFF UNTIL FAILURE
LD201	YELLOW	SEALING BELT STEP	ON WHEN MOTOR ENERGIZED
LD202	YELLOW	INFEED 1 DIRECTION	ON WHEN INFEED 1 BELTS MOVING FORWARD
LD203	YELLOW	SEALING BELT DIRECTION	ALWAYS ON WHEN SEALING BELT IS MOVING

CPU BOARD			
LED	COLOR	Description	STATUS
L1	YELLOW	LIFTER PACKAGE CENTERING PHOTOCELL	ON WHEN PHOTCELL BLOCKED
L2	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 2	ON WHEN PHOTCELL BLOCKED
L3	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 3	ON WHEN PHOTCELL BLOCKED
L4	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 4	ON WHEN PHOTCELL BLOCKED
L5	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 5	ON WHEN PHOTCELL BLOCKED
L6	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 6	ON WHEN PHOTCELL BLOCKED
L7	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 7	ON WHEN PHOTCELL BLOCKED
L8	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 8	ON WHEN PHOTCELL BLOCKED
L9	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 9	ON WHEN PHOTCELL BLOCKED
L10	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 10	ON WHEN PHOTCELL BLOCKED
L11	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 11	ON WHEN PHOTCELL BLOCKED
L12	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 12	ON WHEN PHOTCELL BLOCKED
L13	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 13	ON WHEN PHOTCELL BLOCKED
L14	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 14	ON WHEN PHOTCELL BLOCKED
L15	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 15	ON WHEN PHOTCELL BLOCKED
L16	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 16	ON WHEN PHOTCELL BLOCKED
L17	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 17	ON WHEN PHOTCELL BLOCKED
L18	YELLOW	HORIZONTAL REFLECTIVE PHOTOCELL NUMBER 18	ON WHEN PHOTCELL BLOCKED
L19	YELLOW	VERTICAL REFLECTIVE PHOTOCELL NUMBER 1	ON WHEN PHOTCELL BLOCKED
L20	YELLOW	VERTICAL REFLECTIVE PHOTOCELL NUMBER 2	ON WHEN PHOTCELL BLOCKED
L21	YELLOW	VERTICAL REFLECTIVE PHOTOCELL NUMBER 3	ON WHEN PHOTCELL BLOCKED
L22	YELLOW	VERTICAL REFLECTIVE PHOTOCELL NUMBER 4	ON WHEN PHOTCELL BLOCKED
L23	YELLOW	VERTICAL REFLECTIVE PHOTOCELL NUMBER 5	ON WHEN PHOTCELL BLOCKED
L24	YELLOW	VERTICAL REFLECTIVE PHOTOCELL NUMBER 6	ON WHEN PHOTCELL BLOCKED
LD1	GREEN	70V POWER	ON WITH MAIN POWER
LD2	GREEN	22V POWER	ON WITH MAIN POWER
LD3	YELLOW	SERIAL COMMUNICATION	FLASHES AS DATA TRANSMITS
LD4	GREEN	12V SERIAL POWER	ON – ALWAYS
LD5	RED	LOW VOLTAGE	ON WHEN LOW VOLTAGE DETECTED
LD6	RED	CPU RESET	ON WHEN RESET

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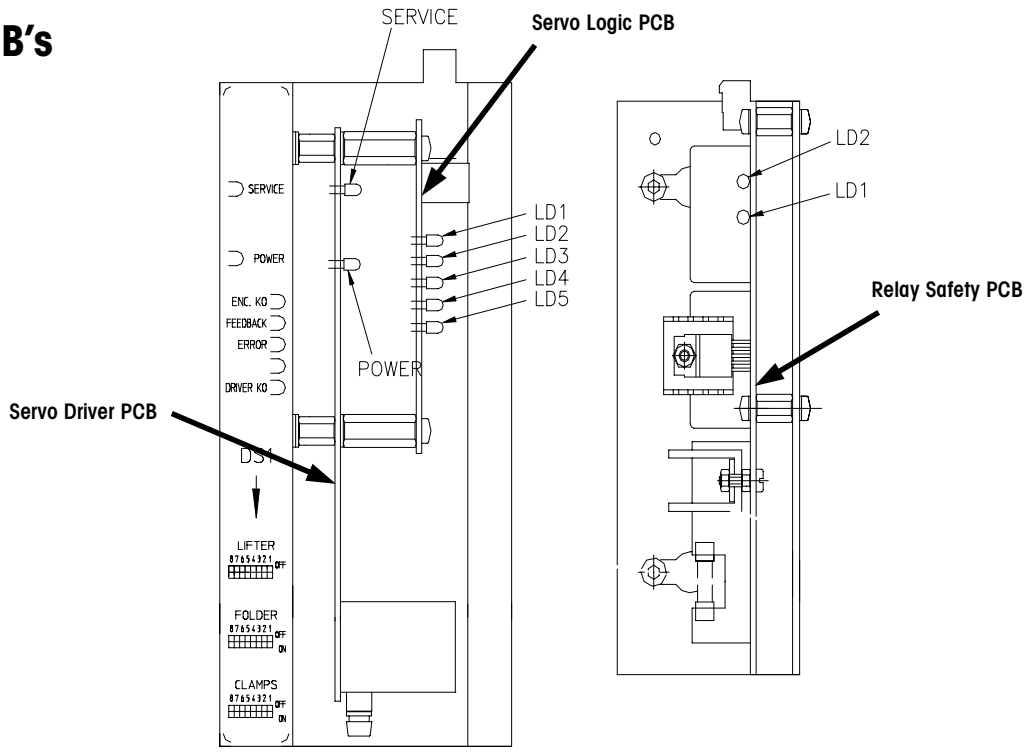
LED's on Other PCB's



Relay/Safety PCB

LD1

LD1 comes "On" when power is applied to Relay/Safety PCB. The power supplied from the Fuse PCB is 22VAC.

LD2

LD2 comes "On" when infeed safety photoeyes are blocked, B3s and B3r (the ones with the mirrors).

Servo Driver PCB

Service

Top "Service" LED is "On" when 70VDC is supplied to the Servo Driver PCB from the Fuse PCB.

Power

Bottom "Power" LED "On" when line voltage is supplied to the Servo Driver PCB from the Fuse PCB. This LED may appear to be dimly lit without power applied to the PCB. Leaking voltage/current through the TRIAC V6 may cause this.

NOTE: When the fuse is blown the Power LED will go out!

Servo Logic PCB

At power up, the CPU PCB will communicate with all three Servo Logic PCB's.

LD1

If the Encoder is unplugged then LD1 and LD3 will come on when start button is pushed.

LD2

LD2 will pulse for a second or two and then stop. If the "start" button is not pushed, LD2 will continue to flash approximately every 10 seconds. When the "Start" button is pushed, LD2 will stop flashing until a package is wrapped and the CPU PCB starts sending commands to the Servo Logic PCB's.

LD3

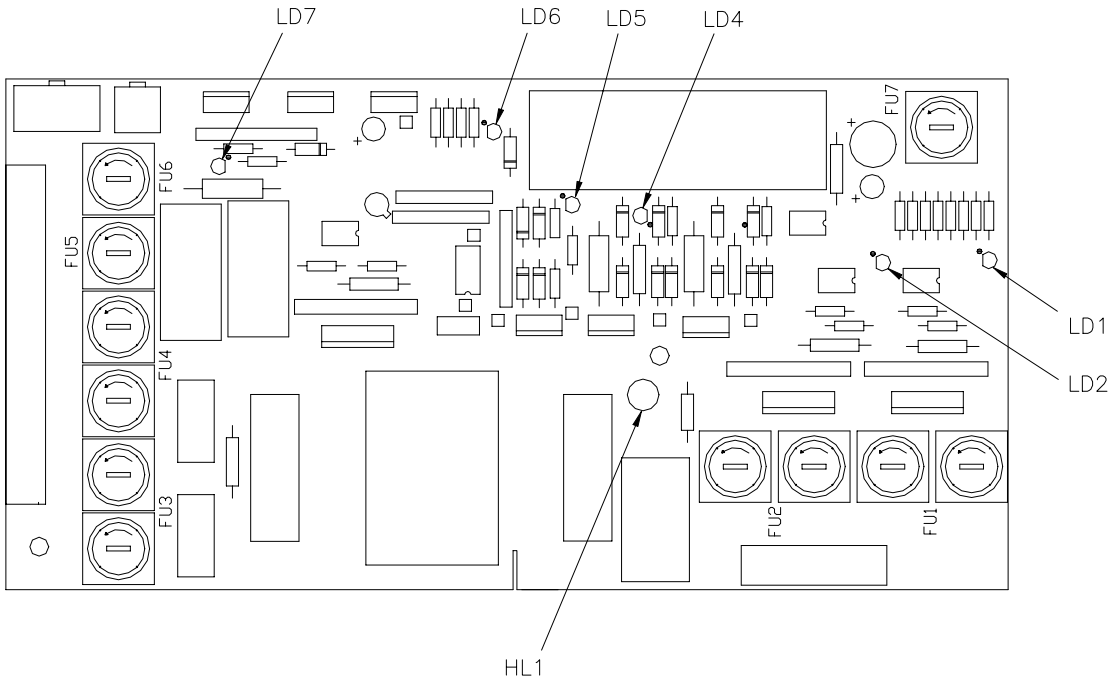
If all is "OK" before and after "Start" button is pushed, then LD3 will be off. Otherwise, LD3 will come on. If fuse on Servo Driver PCB is blown then LD3 will come on.

If CN1: B on Servo Driver PCB is unplugged when "Start" button is pushed then LD3 will come on.

If CN1: A on Servo Driver PCB is unplugged then all LED's will be off and the Mega will not start.

LD5

When LD5 is on, the driver on the PCB is bad.



Fuse PCB

HL1
HL1 "On" means that line voltage is applied to the Fuse PCB from the power switch. This light is not fused!

LD1
LD1 comes "On" when belt sealer is heating up. LD1 will pulse on and off after sealer belt reaches set temperature. Full line voltage is being sent to sealer plate.

LD2
LD2 "On" when internal heater is on heating inside of machine. LD2 will pulse on and off after set temperature is reached. Full line voltage is being sent to internal heater. Fan will run all the time that power switch is turned on. Heater is fused with 2 fuses at FU2. Fan is fused with 1 fuse at FU2.

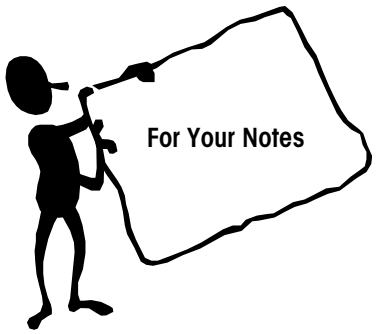
LD3
LD3 not installed, not used.

LD4
LD4 Not Used

LD5
LD5 comes "On" when V5 is on. All interlock switches must be closed and the start button pushed.

LD6
LD6 comes "On" when full line voltage is being delivered to Servo Driver PCB's.

LD7
LD7 Not Used


For Your Notes

10 PC Pocket

Overview

PC Pocket is a diagnostic software program for computers running the Windows 95® or Windows 98® (or higher) operating system. PC Pocket is designed to aid in the service and maintenance of the METTLER TOLEDO® SOLO® Plus, SOLO® XL, SOLO® PRIMA, SOLO® MEGA, and SOLO® MAX automatic wrapping machines.

PC Pocket communicates to the wrapping machine through the PC's RS232 Serial Port to the wrapping machine's serial port. The PC Pocket software can control the program running on the wrapper CPU and collect and analyze errors that occur. Using data uploaded from the wrapping machine, PC Pocket can compare error and problem combinations with the internal database and offer a solution to problem.

Refer to the PC Pocket manual for Hardware requirements and Installation procedure.

Operation

The Computer connects to the Model 647 Interface connector, which is located inside the left side door either mounted on the frame, or hidden inside the cable conduit where it says RS 232. (The power to the machine can be on or off when connecting the PC Pocket.)

Next, the machine power must be on. Choose "Service", "New Service", "Mega", and then enter in the date and the machine number (the last 4 digits of the serial number) and press enter. Click yes when it asks you if you wish to connect to the machine.

Background Screen

When the program first connects to the machine, it brings up the background screen. This screen displays the machine status and if there is an error code and gives a short description of the error. Also, from this screen, the wrapping program and the sealing belt temperature setting can be changed by clicking on the down arrow next to each number. Changing either with the computer will also change them on the machine control panel.

Menus

File

Exit program. This will exit the 647 machine program and return you to the service menu.

Packs

Wrapped

This displays how many cycles the machine has made since the pack count was cleared.

Daily

This displays how many cycles the machine has made since it was last powered up.

Test

Input (Key, sensor, micro)

This test lists the sensors and switches in the machines and displays their current state as well as whether their status has changed since the test began. The number corresponds to the number of the individual sensor test found in the 200 series test menu. Refer to the chart under 200 tests for criteria on individual sensors and switches.

Photocells (infeed 90)

This test displays the current status of all the infeed photocells and whether the status has changed since the test began. This is extremely useful in isolating which single cells are creating errors.

200 = Single key, sensor, micro test.

This series of tests allow you to select a specific sensor or switch and view its status and switching.

TEST	DESCRIPTION	STATE
201	Safety Microswitch	Off = Interlocks closed and start button has been engaged. Note: Both states must be met. On = Interlock open or start button has not engaged.
202	Dandy roll (Dancer bar)	Off = Sensor clear (Bar down) On = Sensor blocked (Bar up)
203	Release sensor 1 (Lifter arm release sensor 1)	Off = Sensor clear On = Sensor blocked
204	Release sensor 2 (Lifter arm release sensor 2)	Off = Sensor clear On = Sensor blocked
205, 206, 207	Not used	
208	Cam sensor (Side clamp opening cam sensor)	Off = Sensor clear On = Sensor blocked
209	Countercutter sensor (Cutter cam sensor)	Off = Sensor clear On = Sensor blocked

TEST	DESCRIPTION	STATE
211	Pack ejection photocell (Mega: Located across top of film drive roller. Max: Located on right side of infeed near package guide.)	Off = Photocell clear On = Photocell blocked
212	Stop and extended infeed stop push button (E Stop)	Off = Button out On = Button in
213	Cover microswitch (Top cover switch)	Off = Cover closed On = Cover open
214	Not used	
216	Low tension input (Low line voltage)	Off = Above 46 VDC On = Below 46 VDC
217	Not used	
219, 220, 221	Used with Scale option	
222	Lifter sensor	Off = Sensor clear On = Sensor blocked
223	Folder sensor (Center clamp sensor)	Off = Sensor clear On = Sensor blocked
224	Side clamp sensor	Off = Sensor clear On = Sensor blocked
225	Lifter driver input 3 (Tests parallel communication between the lifter servo card and the CPU)	The feedback LED (LD2) on the servo card will flicker each time the status is changed.
227	Folder driver input 3 (Tests parallel communication between the folder servo card and the CPU)	The feedback LED (LD2) on the servo card will flicker each time the status is changed.
228	Folder driver input 4 (Tests parallel communication between the folder servo card and the CPU)	The feedback LED (LD2) on the servo card will flicker each time the status is changed.
229	Side clamp driver input 3 (Tests parallel communication between the side clamp servo card and the CPU)	The feedback LED (LD2) on the servo card will flicker each time the status is changed.
231	Full exit input (Wrapper interrupt from labeler)	Off = No interrupt command On = Interrupt command
232	Lifter photocell (Pack centering photocell)	Off = Photocell clear ON = Photocell blocked
233	Used with extended infeed option. Outer (Extended) infeed photocell.	Off = Photocell clear ON = Photocell blocked
234	Used with printer option	
235	Start pushbutton	Off = button not pushed On = Button pushed
236	Temperature/film cut push button	Off = button not pushed On = Button pushed
237	Program selection push button	Off = button not pushed On = Button pushed
238	Scale/machine selection push button	Off = button not pushed On = Button pushed
239	Used with scale option.	
240	Used with extended infeed option. Outer infeed selector. Extended infeed on/off switch.	Off = Extended infeed On On = Extended infeed Off

TEST	DESCRIPTION	STATE
241	Lifter safety photocell input	Off = Lifter microswitch closed and Lifter safety photocells blocked. ON = Lifter safety photoeyes clear or lifter microswitch open
242	Product check photocell (Product behind lifter photocell)	Off = Photoeye clear ON = Photoeye blocked
243	Not used	

300 Single Photocell Test

351 Inhibited Photocell (XR)

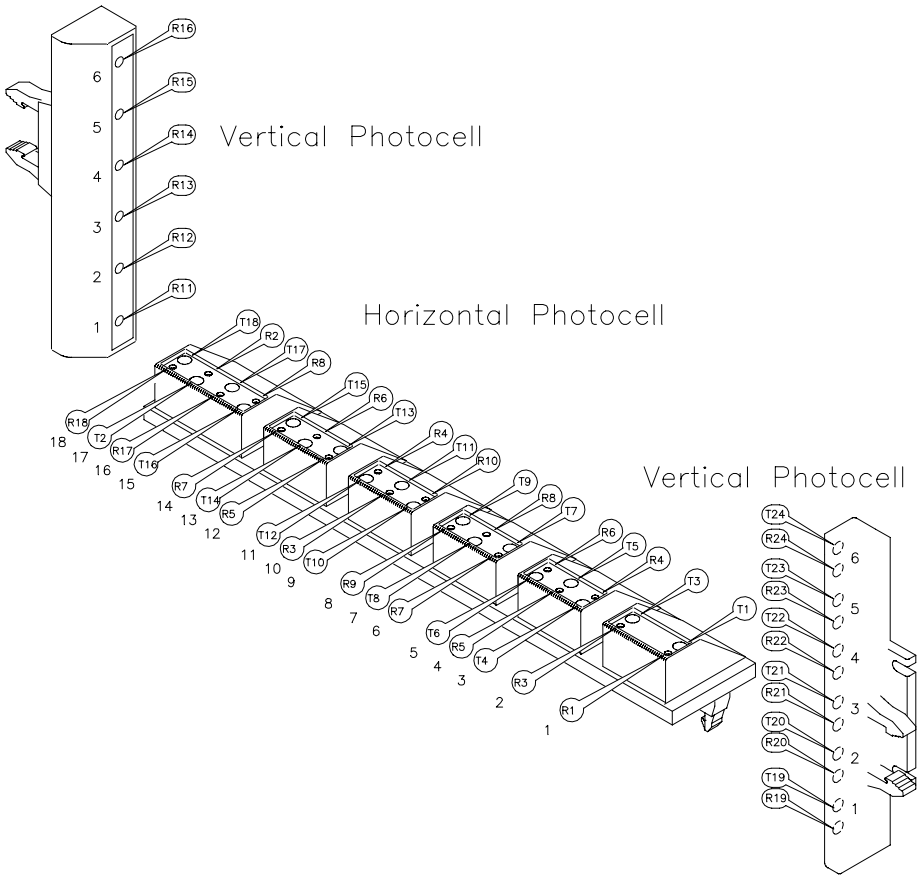
This test displays functional state of all the photocells. Any photocell that is currently disabled because the CPU detected it to be malfunctioning is displayed as 1. Refer to chart below and diagram below.

352- All the photocells of the machine (XR)

This test displays the current status of all the photocells. Any photocell that is blocked will display as 1. Refer to chart below and diagram below.

Photocell :	18	02	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	01
Horizontal :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Photocell:	6d	6r	5d	5r	4d	4r	3d	3r	2d	2r	1d	1r
Vertical:	0	0	0	0	0	0	0	0	0	0	0	0



The remaining tests in this series allow you to select each specific photocell and view its current state, number of times it has switched states, its current level and the switching threshold level. The switching threshold level is calculated by the CPU during the machine reset. Listed in the chart below are typical photocell values.

Test	Description	State	Switching	Level	Threshold
353	cp XR d (Lifter centering photocell)	Off	#	90+	>40
		On		0-5	
354	Horizontal photocell 02 r Tx03-Rx03	Off	#	0-10	<64
		On		120+	
355	Horizontal photocell 03 r Tx04-Rx04	Off	#	0-10	<64
		On		120+	
356	Horizontal photocell 04 r Tx05-Rx05	Off	#	0-10	<64
		On		120+	
357	Horizontal photocell 05 r Tx06-Rx06	Off	#	0-10	<64
		On		120+	
358	Horizontal photocell 06 r Tx07-Rx07	Off	#	0-10	<64
		On		120+	
359	Horizontal photocell 07 r Tx08-Rx08	Off	#	0-10	<64
		On		120+	
360	Horizontal photocell 08 r Tx09-Rx09	Off	#	0-10	<64
		On		120+	
361	Horizontal photocell 09 r Tx10-Rx10	Off	#	0-10	<64
		On		120+	
362	Horizontal photocell 10 r Tx11-Rx03	Off	#	0-10	<64
		On		120+	
363	Horizontal photocell 11 r Tx12-Rx04	Off	#	0-10	<64
		On		120+	
364	Horizontal photocell 12 r Tx13-Rx05	Off	#	0-10	<64
		On		120+	
365	Horizontal photocell 13 r Tx14-Rx06	Off	#	0-10	<64
		On		120+	
366	Horizontal photocell 14 r Tx15-Rx07	Off	#	0-10	<64
		On		120+	
367	Horizontal photocell 15 r Tx16-Rx08	Off	#	0-10	<64
		On		120+	
368	Horizontal photocell 16 r Tx17-Rx17	Off	#	0-10	<64
		On		120+	
369	Horizontal photocell 17 r Tx02-Rx02	Off	#	0-10	<64
		On		120+	
370	Horizontal photocell 18 r Tx18-Rx18	Off	#	0-10	<64
		On		120+	
371	Vertical Photocell 01 r Tx19-Rx19	Off	#	0-10	<100
		On		100+	
372	Vertical Photocell 01 d Tx19-Rx11	Off	#	100+	>40
		On		0-5	
373	Vertical Photocell 02 r Tx20-Rx20	Off	#	0-10	<100
		On		100+	
374	Vertical Photocell 02 d Tx20-Rx12	Off	#	100+	>40
		On		0-5	
375	Vertical Photocell 03 r Tx21-Rx21	Off	#	0-10	<100
		On		100+	

Test	Description	State	Switching	Level	Threshold
376	Vertical Photocell 03 d Tx21-Rx13	Off	#	100+	>40
		On		0-5	
377	Vertical Photocell 04 r Tx22-Rx22	Off	#	0-10	<100
		On		100+	
378	Vertical Photocell 04 d Tx22-Rx14	Off	#	100+	>40
		On		0-5	
379	Vertical Photocell 05 r Tx23-Rx23	Off	#	0-10	<100
		On		100+	
380	Vertical Photocell 05 d Tx23-Rx15	Off	#	100+	>40
		On		0-5	
381	Vertical Photocell 06 r Tx24-Rx24	Off	#	0-10	<100
		On		100+	
382	Vertical Photocell 06 d Tx24-Rx16	Off	#	100+	>40
		On		0-5	

500 Output

Output (Magnet, relay, etc.)

501 Sealing plate output. This turns on and off the sealing belt heating.

502 Distributor Magnet Output

This test will activate the distributor magnets for a short time to verify they are functioning properly.

503 Heater Resistance Output

This test turns on and off the heating element in the heater blower. Note: The blower will continue to run even when the heater is off.

504 Lifter Signal Out 1

This tests the parallel communication between the lifter servo drive and the CPU. When the repeat test button is pushed, the CPU sends a signal to the servo drive and the state on top will switch. If the communication is working properly, the servo drive will send and acknowledgement and the state on the bottom will also change.

506 Folder Signal Out 1

This tests the parallel communication between the lifter servo drive and the CPU. When the repeat test button is pushed, the CPU sends a signal to the servo drive and the state on top will switch. If the communication is working properly, the servo drive will send and acknowledgement and the state on the bottom will also change.

507 Folder Signal Out 2

This tests the parallel communication between the lifter servo drive and the CPU. When the repeat test button is pushed, the CPU sends a signal to the servo drive and the state on top will switch. If the communication is working properly, the servo drive will send and acknowledgement and the state on the bottom will also change.

508 Side Clamp Signal Out 1

This tests the parallel communication between the lifter servo drive and the CPU. When the repeat test button is pushed, the CPU sends a signal to the servo drive and the state on top will switch. If the communication is working properly, the servo drive will send and acknowledgement and the state on the bottom will also change.

510 Power Qualification Output

This tests the safety circuit, the machine will only start when all of the switches are closed and when the CPU sends a signal because the start button is pressed.

511 Scale; Weighing Start

This test is only needed when an integrated scale is present. It causes the machine to send a weigh command.

512 Scale; Labeling Start

This test is only needed when an integrated scale is present. It causes the machine to send a label command.

513 Scale; Machine error signal

This test will activate the signal from the wrapper to a scale controller saying that the machine has and error.

514 Outer Infeed Output

This tests the operation of the extended infeed signal from the wrapper.

515 Unloading Belt Output

This test is not used.

516 Up Roll Magnet

This test is not used.

517 Low Roll Magnet

This test is not used.

519 Control Panel Board Led Output

This test will turn on and off the led on the display board to verify it is working properly.

520 Pack counter output

This test will add one count to the digital package counter every time it is cycled on.

600 Movement

601 Infeed 1 Movement

This test will cause the first infeed to move forward first then backward once the repeat test button is pushed. It is used to visually verify that the first infeed functions properly.

602 Infeed 2 Movement

This test will cause the second infeed to move forward first then backward once the repeat test button is pushed. It is used to visually verify that the second infeed functions properly.

603 Counter Cutter Movement

This will cause the film cutter to move through its various motions. It will start in the "up" position first, then once the repeat test button is pushed, it will move to the "middle" position. When the button is pushed again, it will move to the "down" position, and finally if the button is pushed again it will go through the cutting motion.

604 Sealing Belt Movement

This test will cause the sealing belt to turn for a short distance. It is used to visually verify that the sealing belt is functioning properly.

605 Clamp Opening Cam Movement

This test will cause the side clamp-opening cam to cycle through its various positions. First, it will start at the film grasp position, and then once the repeat test button is pushed, it will move to the closed position. If the button is pushed again, it will move to the small opening position, and finally if the button is pushed once more, it will move to the fully open position.

606 Lifter Release Movement

This test will cause the lifter control cam to go through its movement. First it will go to the release point where all three of the mobile lifters should be released, and second after the repeat test button is pushed, it will go to the stop position where all of the mobile lifter arms should be latched in place.

607 Lifter Movement

This test will cause the lifter to go through its movement. First, it will move up to its highest position, then once the repeat test button if pushed, it will return to its lowest position.

608 Folder Movement

This test will cause the center clamp to go through its movement. First, it will move back into the film unwinding position, then after the repeat test button is pushed, it will move to the short back motion position, and if the button is pushed again it will move to the film grasp position.

609 Side Clamp Movement

This test will cause the side clamps to go through their in-out motion. First, they will move to the film grasp position, then once the repeat test button is pushed, they will move to the film stretch position. If the button is pushed again they will move to the short back motion position, and finally, if the button is pushed once more they will move out to get out of the way of the center clamp.

610 Side Clamp Opening

This test is not used because it produces unreliable results.

611 Up/Down Infeed 1 Movement

This test is only used when an integrated scale is present. This tests the motor that controls up/down movement of infeed one to verify it works correctly.

612 Outer Infeed Movement

This test is only used when an extended infeed is present. This tests the motor that controls the extended infeed belt movement to verify that it works correctly.

613 Sequential Movement of Side Clamp Cam Opening

This test opens the side clamps a given distance based on the number of motor steps entered. A positive number will open the clamps more, and a negative number will close the clamps. This test should be used in conjunction with the side clamp adjustment section of this manual.

614 Lifter Arms Coupling Check

This test checks when the lifter arms re-latch when the lifter moves down. The lifter control cam will release all three mobile lifter arms and move up. Then the lifter will move down most of the way and stop. Pressing the repeat test button will move the lifter down a small distance. Continue to press the button until all the lifter arms have re-latched. If any did not re-latch at xxx +/- x steps, adjust the bumper below the lifter arm and re-test.

700 Various

701 Battery Backed RAM Reset

This resets the Battery Powered Ram

703 Error Statistics Reset

This will reset the error statistics log.

704 Displaying bank SW1 Switch

This displays the status of the DIP Switches on the CPU Board.

705 Battery Backed Ram Test

This will do a self-test on the RAM to be sure it is operating correctly.

800 Manual Checks

802 Photocell test

This tests the infeed photoeyes and the center lifter photoeye for proper operation. When the test is started, it states to be sure all of the photoeyes are not blocked. Verify that the photoeyes are not blocked and press ok. It will then direct you to block all of the infeed photoeyes, horizontal and vertical, as well as the center lifter photoeye. Be sure to use a light colored material to block the photoeyes so that the reflective photoeyes function properly (white trays work well). Once all of the photoeyes are blocked, press ok. The machine will then list any photoeyes that did not function properly.

Final

606 Lifter Release Movement

This test is the same as the test listed in 600 = Movement.

607 Lifter Movement

This test is the same as the test listed in 600 = Movement.

608 Folder Movement

This test is the same as the test listed in 600 = Movement.

609 Side Clamp Movement

This test is the same as the test listed in 600 = Movement.

703 Error Statistics Reset

This will reset the error statistics log.

Errors

Statistics

This lists the number of occurrences of each machine error since the last statistical reset.

Last Errors

This lists the last 10 machine errors to occur.

Functions

Variables

The following is a list of the machine variables and the recommended setting.

122	Set sealing plate standby time [1-255 hours]	3
123	Maximum delay time for tray to wait on sealing belt due to labeler stop signal [0-255 *100 ms]	60
124	Tray stop position adjustment – labeler [0-30 cm]	0*
125	No longer used	0
126	Timeout of blower at startup [0-60 min]	0
128	Infeed timeout due to no packages being fed [0-255 sec]	30
129	Number of cycles for program 95 [0-255 cycles*100]	0
130	Heater/Blower temperature [0-40 °C]	24

*Recommended value if integrated scale system not present

Display Machine Configuration

This screen shows the some of the current machine settings but does not allow you to change the settings.

Straightening Barrier

This is not used.

Manufacture

Only wrapping

If this mode is active, the machine is in wrap only mode and will not weigh the package or apply a label if it is an integrated scale system. This setting is used when a separate automatic labeler is used.

Weigh/wrap/label (tray beginning)

If this mode is active, the machine will weigh the package, wrap it, and then apply a label at the leading edge of the tray.

Weigh/wrap/label (tray center)

If this mode is active, the machine will weigh, the package, wrap it, and then apply a label in the center of the tray.

Weigh/label (tray beginning)

If this mode is active, the machine will weight the package, and then send it through the machine without wrapping it, then it will apply a label at the leading edge of the package.

Weigh/label (tray center)

If this mode is active, the machine will weight the package, and then send it through the machine without wrapping it, then it will apply a label in the center of the package.

Ended Film Emergency

If this box is checked, the machine will display an error 008 when the dancer bar sensor does not switch while wrapping packages. If this box is not checked, the machine will continue to run even without film.

Not continuous movement of the machine

If this box is checked, the machine is in step-by-step motion meaning it will do one motion at a time and will stop until the start button is pressed. When the start button is pressed, it will do one more motion and stop, etc.

Automatic movement of the machine

If this box is checked, the machine is set to run in continuous operation (also known as Program 95). It will continue through cycles without any packages being fed into the machine. The film should be removed before putting the machine into continuous operation.

DIP Switches

This displays the current condition of each of the 8 switches on the CPU board and gives a description of what they are for.

Pack Information

This displays the size the machine dimensioned the last pack to go through the machine, as well as the total weighing and labeling time of the last package if an integrated scale system is present. It also displays the current sealing plate internal machine temperature (Note: The value listed as Room Temperature is really the internal machine temperature.

Machine Program Reset

This causes the machine to reset the program

Program 95

This puts the machine into continuous operation mode. It will continue through cycles without any packages being fed into the machine. The film should be removed before putting the machine into continuous operation. When selected, choose yes to put the machine into program 95, or choose no to go back to normal operation.

Step by Step Motion

This puts the machine into step by step motion meaning it will do one motion at a time and will stop until the start button is pressed. When the start button is pressed, it will do one more motion and stop, etc. When selected, choose

yes to put the machine into step-by-step mode, or choose no to go back to normal operation.

Ended Film Emergency Management

If you choose yes to this command, the machine will display an error 008 when the dancer bar sensor does not switch while wrapping packages. If you choose no to this command, the machine will continue to run even without film and will not give an error 008.

Straightening Barrier

This is not used.

Set Teleservice

This is not used.

Machine Control Board

Program

This allows you to change the wrapping program.

Temperature

This allows you to change the sealing belt temperature.

Machine Start

This is the same as pushing the Start button on the machine control panel; it will start the machine if there is no error.

Film Cutting

This is the same as pushing the film cut button on the machine control panel; it will cut the film and start the machine if there is no error.

Tools

Options

This allows you to enter a password to allow a certain level of access, but is not used at this time.

Display Memory

Displaying and editing the memory for factory trained personnel only.

Online Documentation

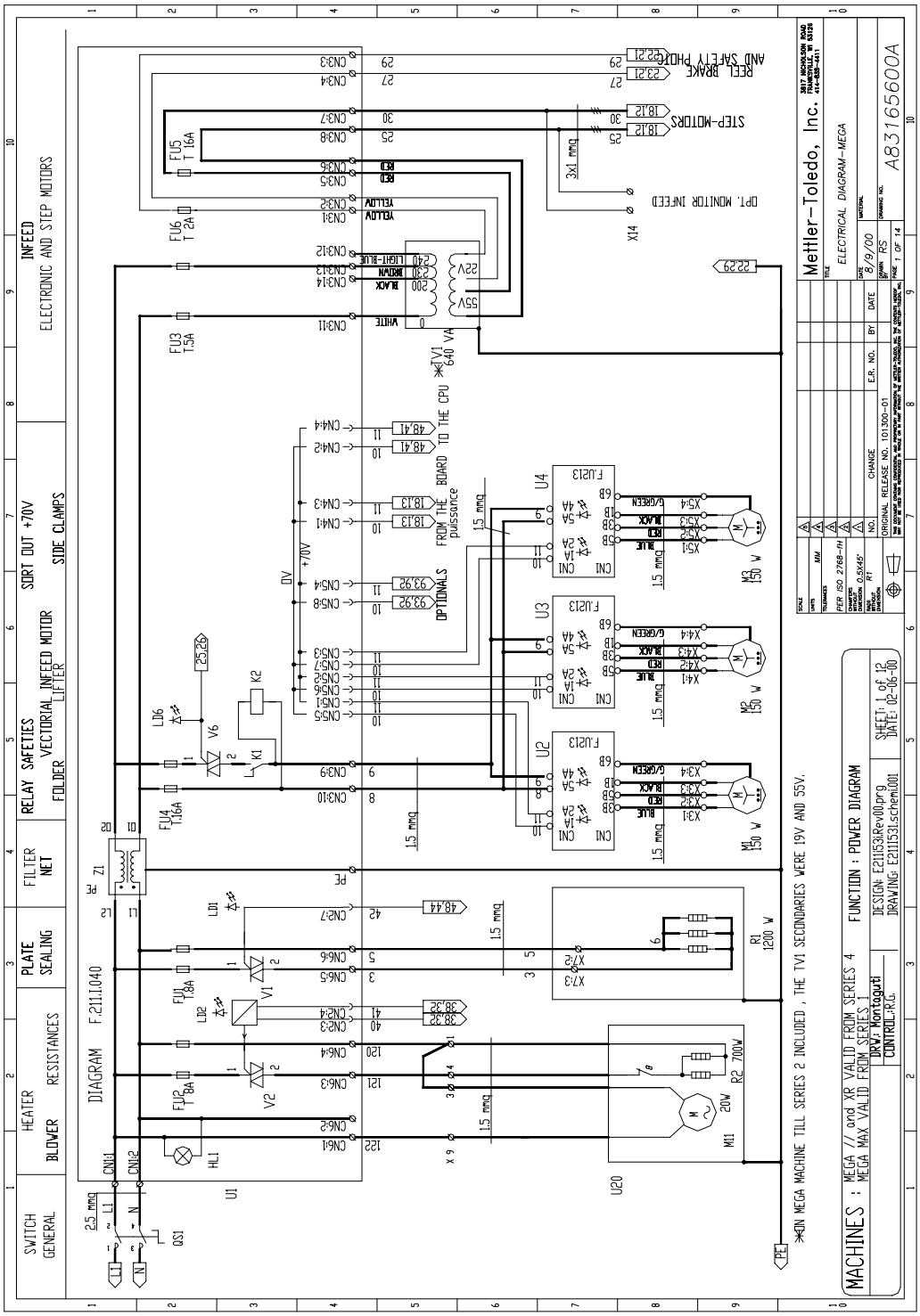
This is not available.

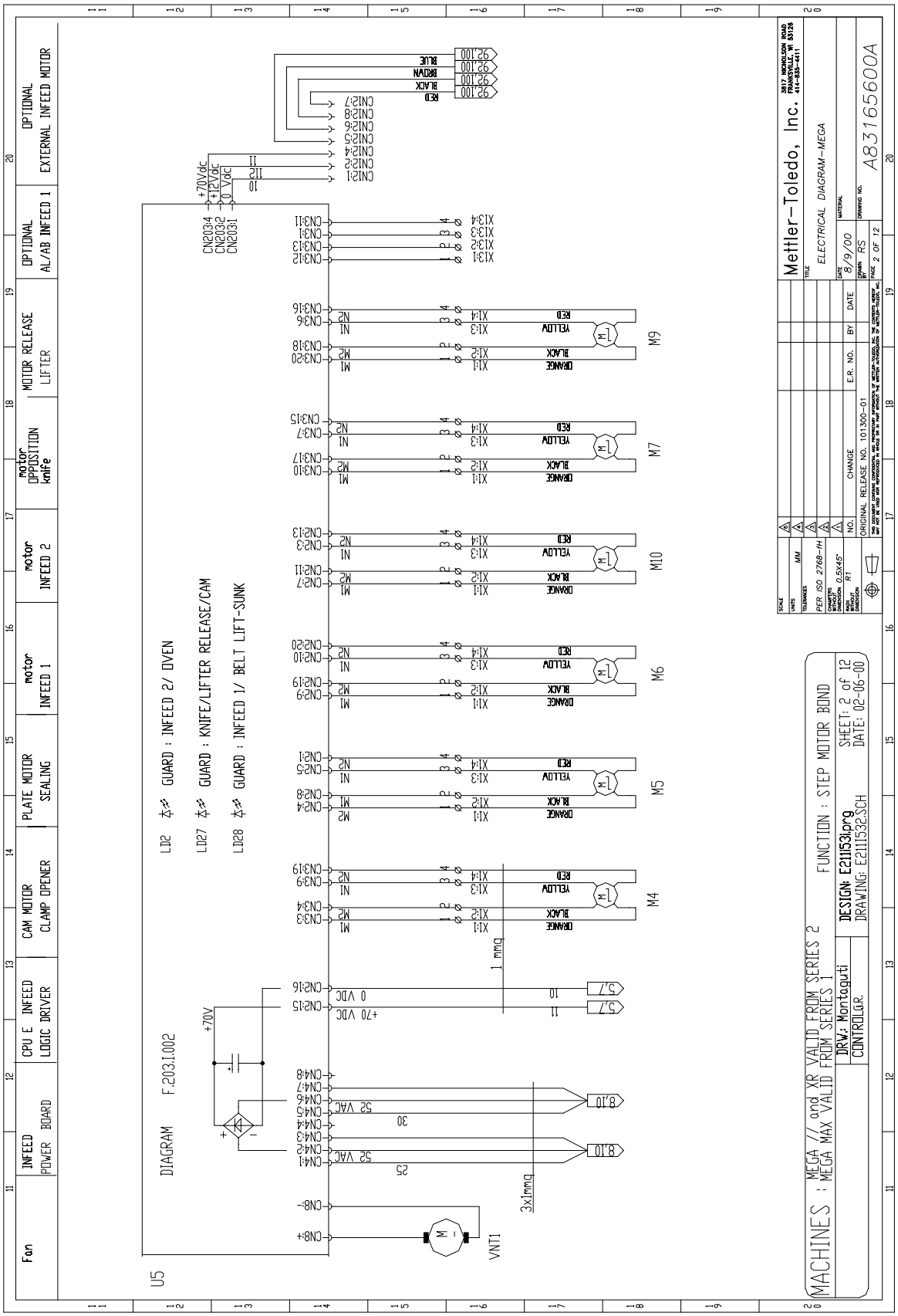
Information about PC Pocket

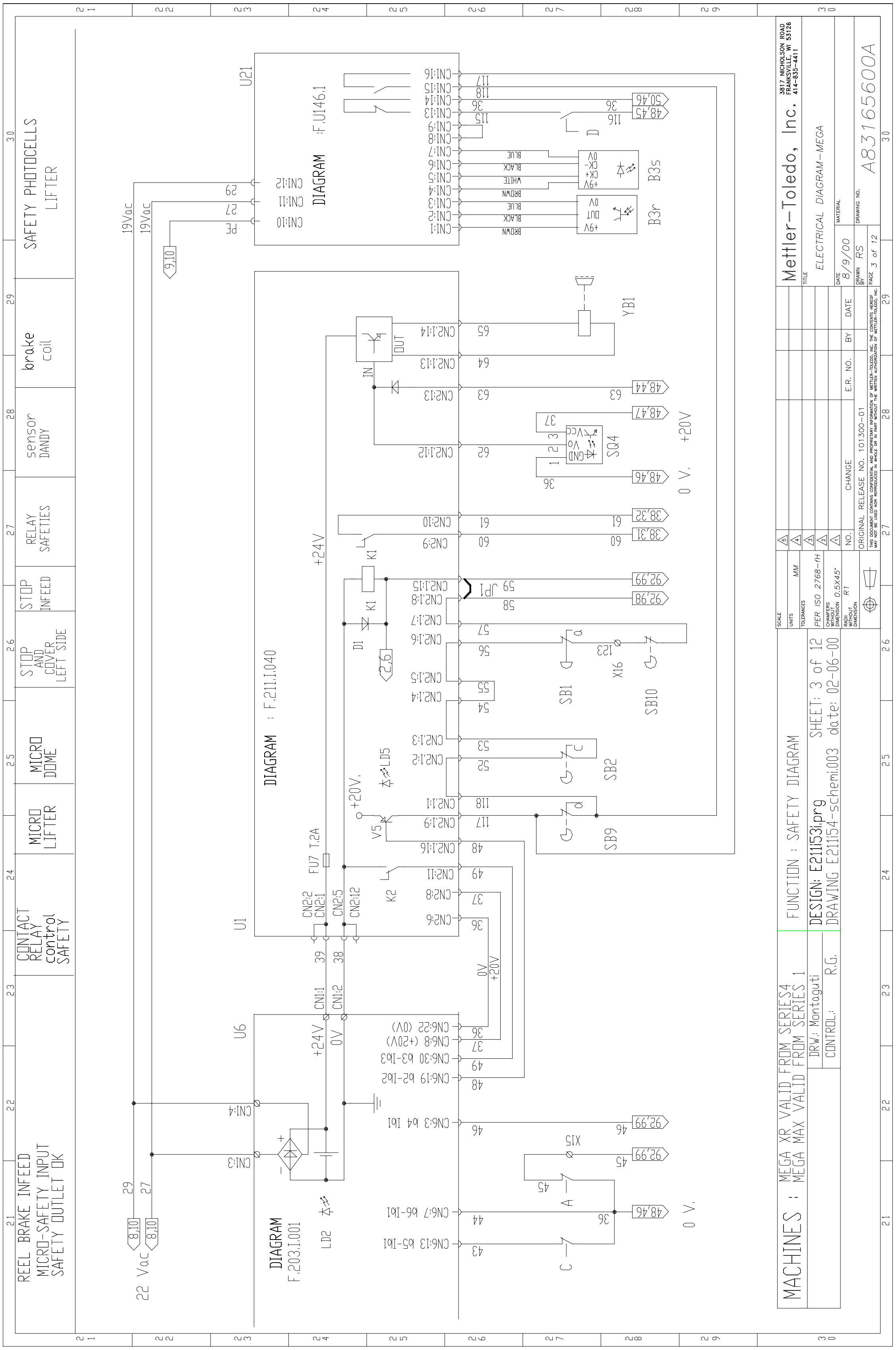
This displays information about the manufacturer of the PC Pocket Software.

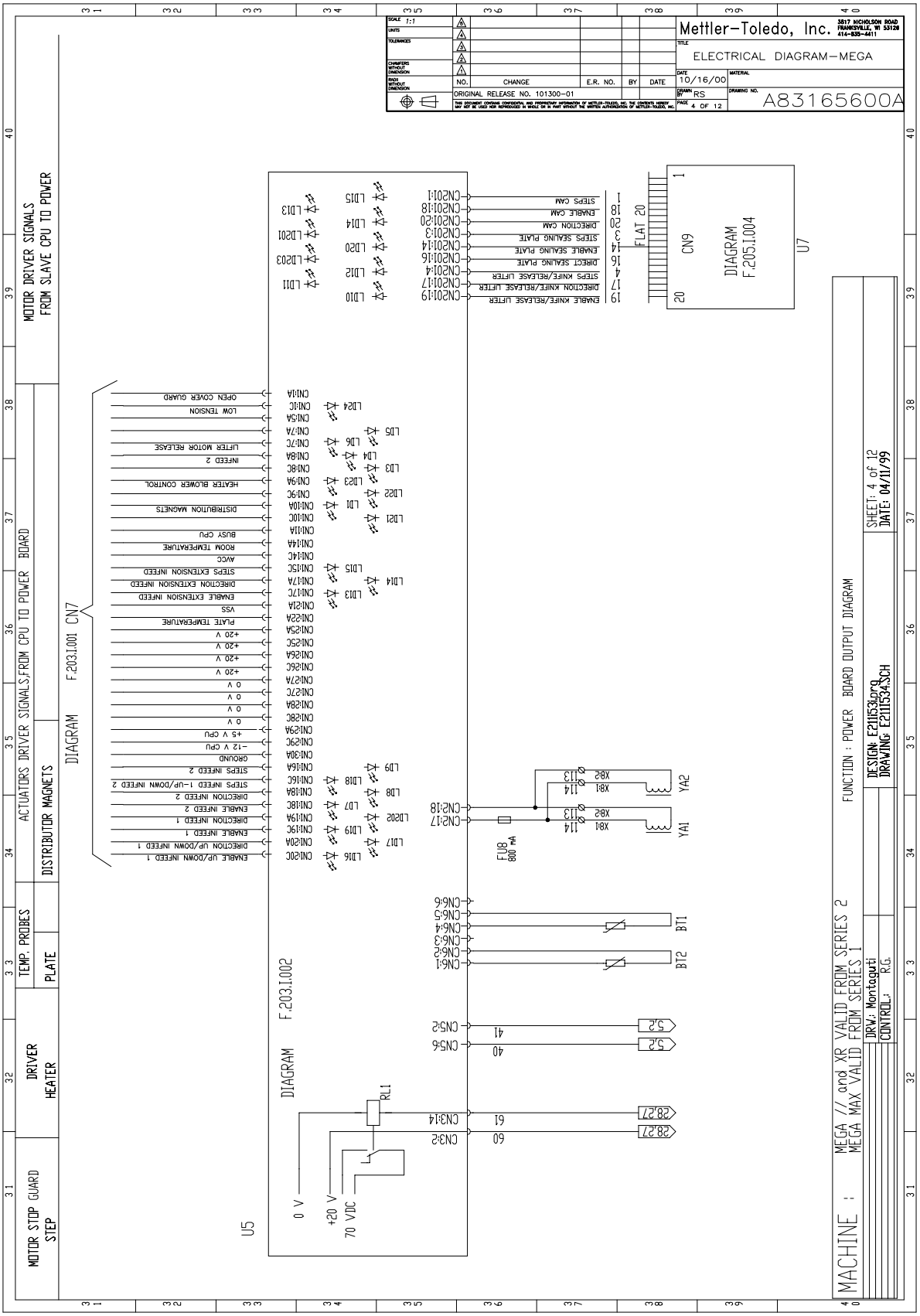
11 Wiring Diagrams

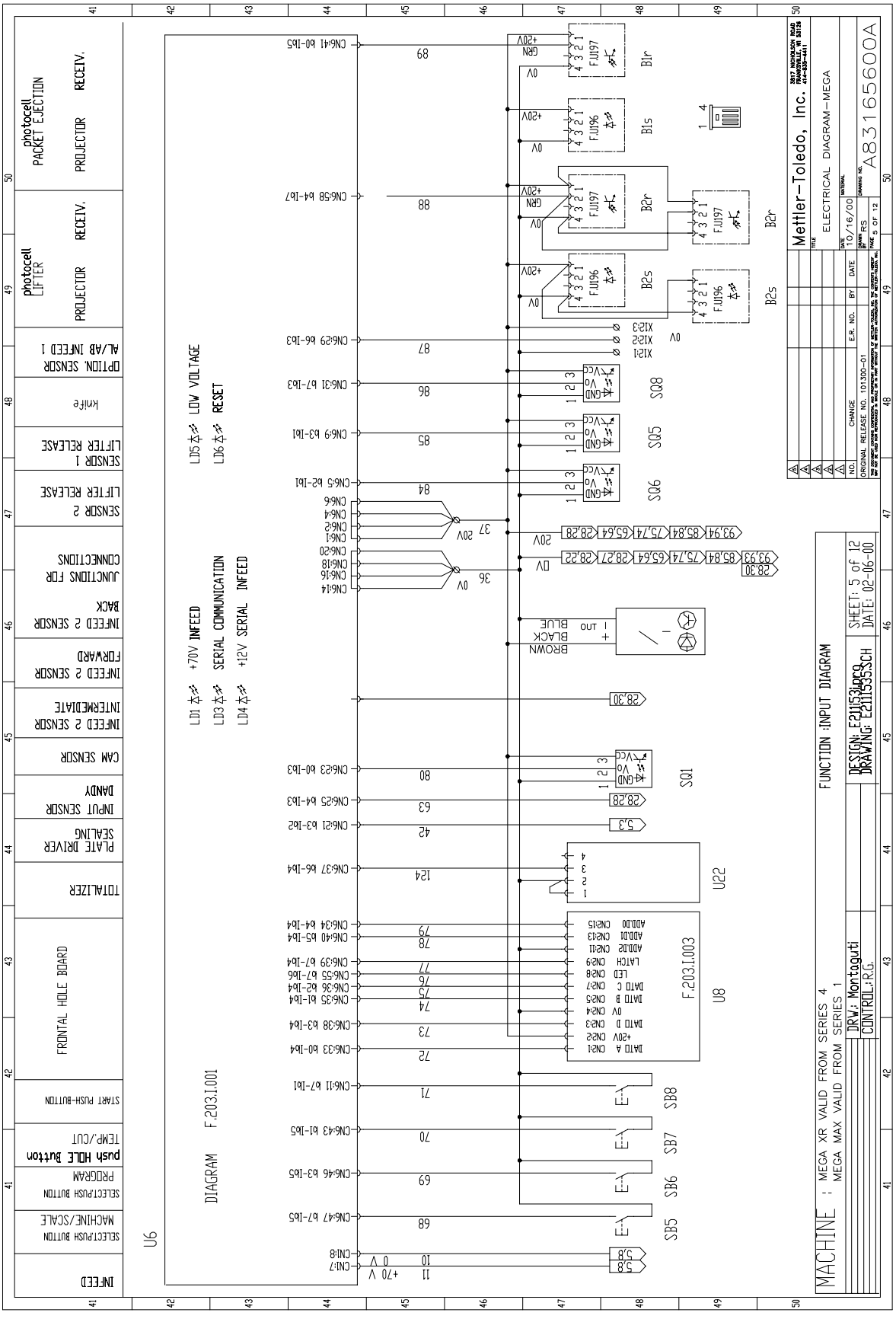
Interconnecting Diagrams




Fan
INFEED POWER BOARD
CPU E INFEED LOGIC DRIVER
CAM MOTOR CLAMP OPENER
PLATE MOTOR SEALING
motor INFEED 1
motor INFEED 2
motor OPPOSITION knife
MOTOR RELEASE LIFTER
OPTIONAL AL/AB INFEED 1
OPTIONAL EXTERNAL INFEED MOTOR
MACHINES : MEGA // and XR VALID FROM SERIES 2
MEGA MAX VALID FROM SERIES 1
FUNCTION : STEP MOTOR BOND
DESIGN: E211153.prg
DRAWING: E211532.SCH
DRW.: Montaguti
CONTROLLER
SHEET: 2 of 12
DATE: 02-06-00
DIAGRAM F.203.I.002
LD2 GUARD : INFEED 2/ DVEN
LD27 GUARD : KNIFE/LIFTER RELEASE/CAM
LD28 GUARD : INFEED 1/ BELT LIFT-SUNK
U5
VNT1
M4
M5
M6
M7
M9
M10
Mettler–Toledo, Inc.
ELECTRICAL DIAGRAM–MEGA
A83165600A
2 OF 12


SAFETY PHOTOCELLS LIFTER
REEL BRAKE INFEED MICRO-SAFETY INPUT SAFETY OUTLET OK
Mettler-Toledo, Inc.
ELECTRICAL DIAGRAM-MEGA
MACHINES : MEGA XR VALID FROM SERIES4 MEGA MAX VALID FROM SERIES 1
FUNCTION : SAFETY DIAGRAM
SHEET: 3 of 12
A83165600A


Mettler-Toledo, Inc.
3817 NICHOLSON ROAD
FRANKSVILLE, WI 53126
414-835-4411
ELECTRICAL DIAGRAM—MEGA
10/16/00
RS
A83165600A
4 OF 12
ORIGINAL RELEASE NO. 101300-01
MOTOR DRIVER SIGNALS
FROM SLAVE CPU TO POWER
DIAGRAM F.205.1004 CN9 U7
FLAT 20
STEPS CAM
ENABLE CAM
DIRECTION CAM
STEPS SEALING PLATE
ENABLE SEALING PLATE
DIRECT SEALING PLATE
STEPS KNIFE/RELEASE LIFTER
DIRECTION KNIFE/RELEASE LIFTER
ENABLE KNIFE/RELEASE LIFTER
ACTUATORS DRIVER SIGNALS,FROM CPU TO POWER BOARD
DISTRIBUTOR MAGNETS
DIAGRAM F.203.1.001 CN7
OPEN COVER GUARD
LOW TENSION
LIFTER MOTOR RELEASE
INFEED 2
HEATER BLOWER CONTROL
DISTRIBUTION MAGNETS
BUSY CPU
ROOM TEMPERATURE
AVCC
STEPS EXTENSION INFEED
DIRECTION EXTENSION INFEED
ENABLE EXTENSION INFEED
VSS
PLATE TEMPERATURE
+20 V
+20 V
+20 V
+20 V
0 V
0 V
0 V
0 V
+5 V CPU
-12 V CPU
GROUND
STEPS INFEED 2
STEPS INFEED 1-UP/DOWN INFEED 2
DIRECTION INFEED 2
ENABLE INFEED 2
DIRECTION INFEED 1
ENABLE INFEED 1
DIRECTION UP/DOWN INFEED 1
ENABLE UP/DOWN INFEED 1
DRIVER HEATER
TEMP. PROBES PLATE
MOTOR STOP GUARD STEP
DIAGRAM F.203.1.002 U5
0 V
+20 V
70 VDC
RL1
FUSE 800 mA
YA1
YA2
BT1
BT2
S2
S2
28.27
28.27
FUNCTION : POWER BOARD OUTPUT DIAGRAM
MACHINE : MEGA // and XR VALID FROM SERIES 2
MEGA MAX VALID FROM SERIES 1
DRW.: Montaguti
CONTROL: R.G.
DESIGN: F2111538.org
DRAWING: F2111534.SCH
SHEET: 4 of 12
DATE: 04/11/99


Mettler-Toledo, Inc.
ELECTRICAL DIAGRAM-MEGA
A831656OOA
MACHINE : MEGA XR VALID FROM SERIES 4
MEGA MAX VALID FROM SERIES 1
FUNCTION :INPUT DIAGRAM
DESIGN: F211538.DSG
DRAWING: F211538S.SCH
SHEET: 5 of 12
DATE: 02-06-00
DRW: Montoguti
CONTROL: R.G.
DIAGRAM F.203.I.001
U6
U8
U22
F.203.I.003
SB5
SB6
SB7
SB8
SQ1
SQ5
SQ6
SQ8
B1r
B1s
B2r
B2s
LD1 +70V INFEED
LD3 SERIAL COMMUNICATION
LD4 +12V SERIAL INFEED
LD5 LOW VOLTAGE
LD6 RESET
INFEED
SELECT.PUSH BUTTON MACHINE/SCALE
SELECT.PUSH BUTTON PROGRAM
push HOLE Button TEMP./CUT
START PUSH-BUTTON
FRONTAL HOLE BOARD
TOTALIZER
PLATE DRIVER SEALING
INPUT SENSOR DANDY
CAM SENSOR
INFEED 2 SENSOR INTERMEDIATE
INFEED 2 SENSOR FORWARD
INFEED 2 SENSOR BACK
JUNCTIONS FOR CONNECTIONS
SENSOR 2 LIFTER RELEASE
SENSOR 1 LIFTER RELEASE
knife
OPTION. SENSOR AL/AB INFEED 1
photocell LIFTER PROJECTOR RECEIV.
photocell PACKET EJECTION PROJECTOR RECEIV.

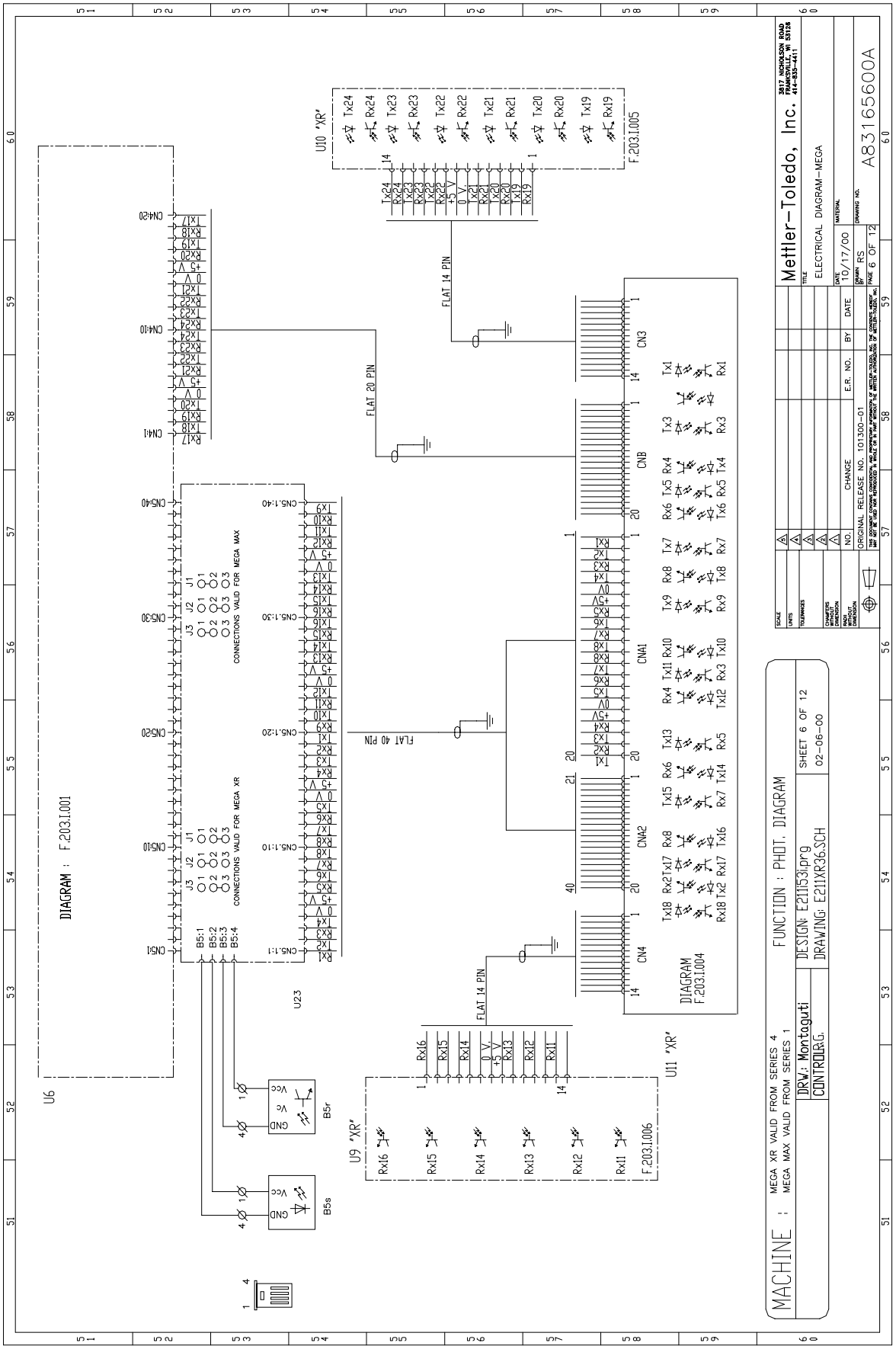
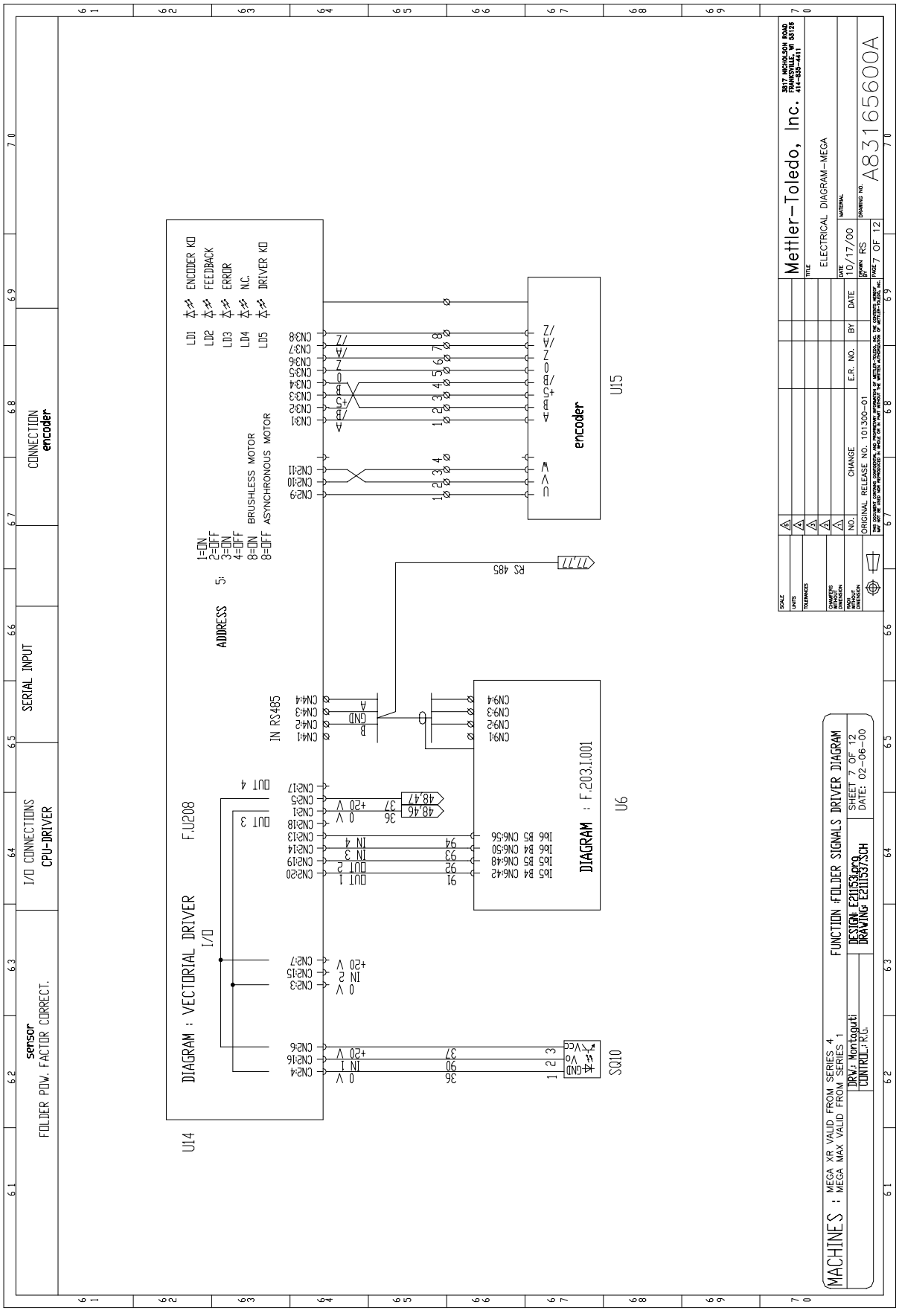
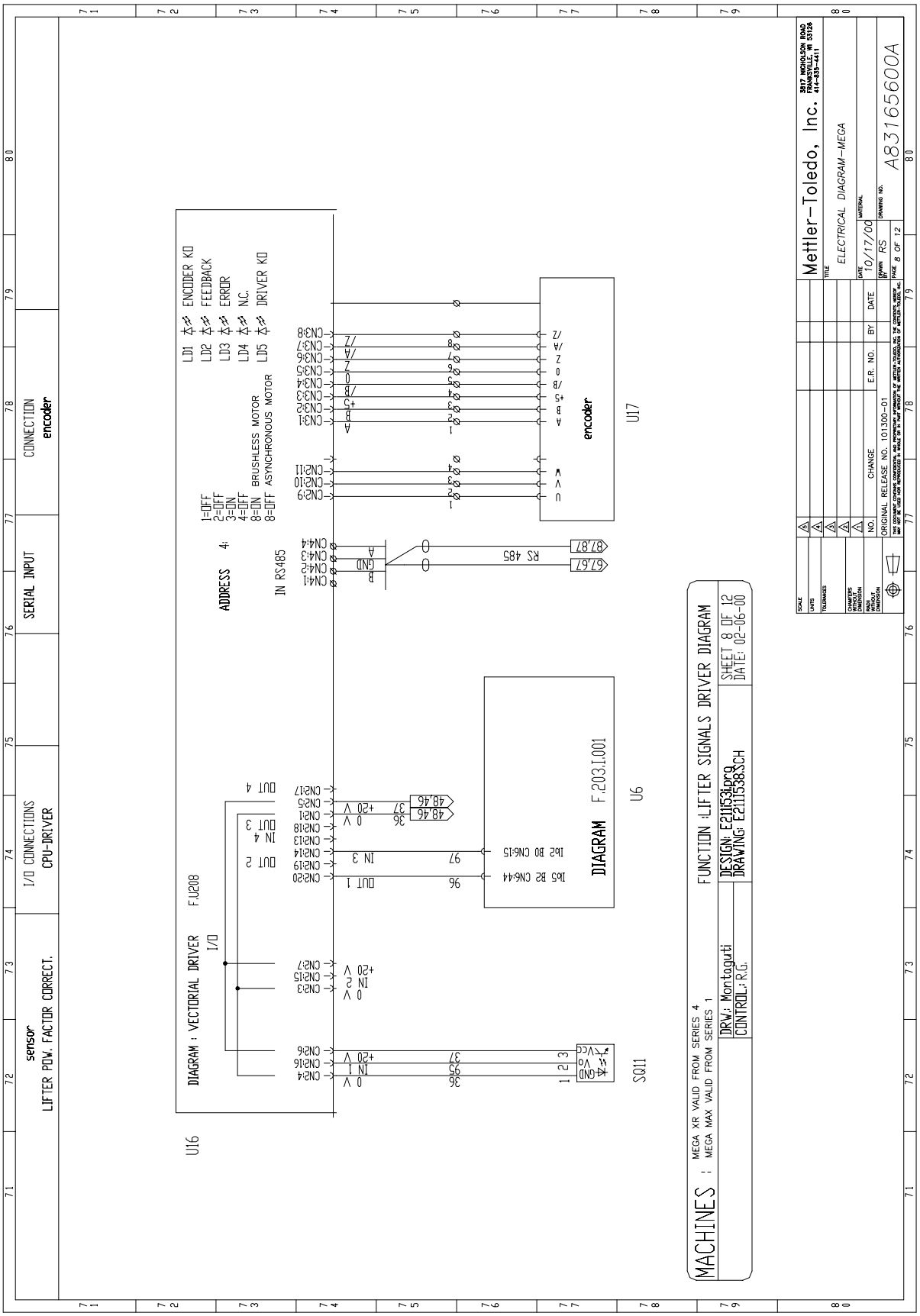
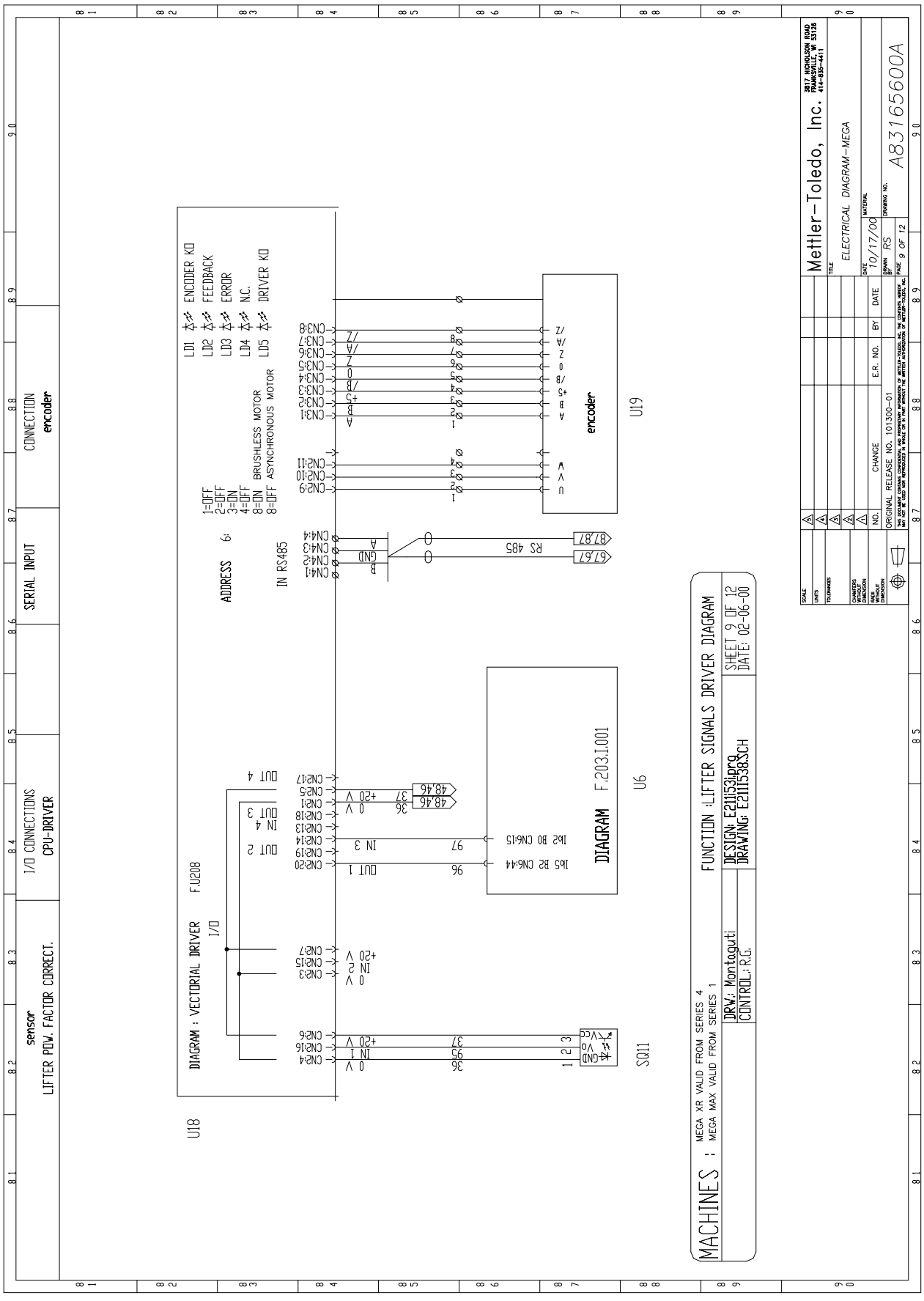
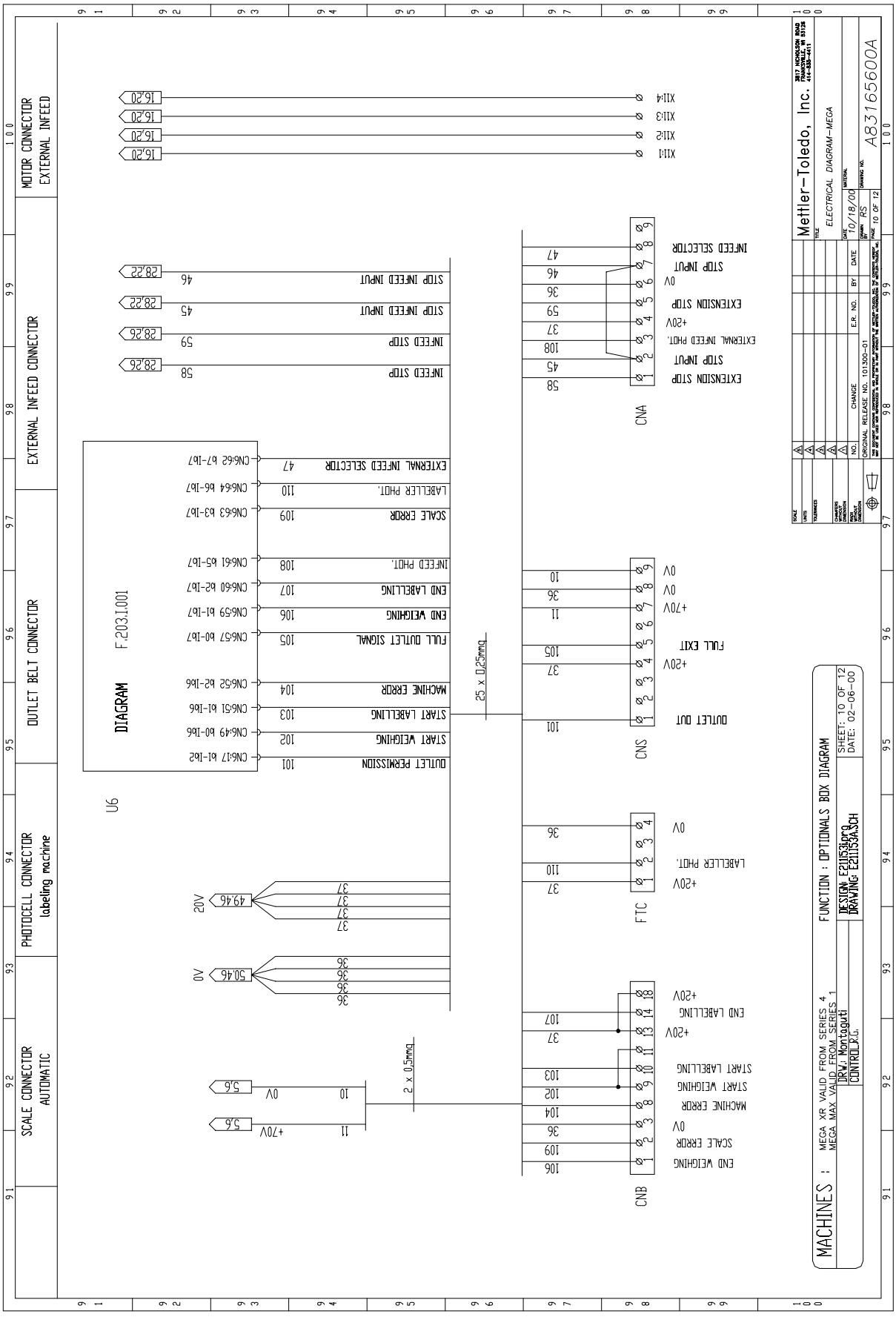


DIAGRAM : F.203.1.001
U6
U10 "XR"
F.203.1.005
FLAT 14 PIN
FLAT 20 PIN
FLAT 40 PIN
CN3
CNB
CNA1
CNA2
CN4
DIAGRAM F.203.1.004
U23
U9 "XR"
U11 "XR"
F.203.1.006
CONNECTIONS VALID FOR MEGA MAX
CONNECTIONS VALID FOR MEGA XR
B5r
B5s
MACHINE : MEGA XR VALID FROM SERIES 4
MEGA MAX VALID FROM SERIES 1
FUNCTION : PHOT. DIAGRAM
DRW.: Montaguti
CONTROLLED
DESIGN: E211153.prg
DRAWING: E211XR36.SCH
SHEET 6 OF 12
02-06-00
Mettler-Toledo, Inc.
ELECTRICAL DIAGRAM-MEGA
ORIGINAL RELEASE NO. 101300-01
CHANGE
10/17/00
RS
PAGE 6 OF 12
A83165600A


MACHINES : MEGA XR VALID FROM SERIES 4
MEGA MAX VALID FROM SERIES 1
FUNCTION «FOLDER SIGNALS DRIVER DIAGRAM
SHEET 7 OF 12
DATE: 02-06-00
DESIGN: E211537.DGN
DRAWING: E211537.SCH
DRW: Montagut
CONTROL: R.G.
sensor
FOLDER POW. FACTOR CORRECT.
I/O CONNECTIONS
CPU-DRIVER
SERIAL INPUT
CONNECTION
encoder
U14
DIAGRAM : VECTORIAL DRIVER
F.U208
I/O
ADDRESS
1=ON
2=OFF
3=ON
4=OFF
8=ON BRUSHLESS MOTOR
8=OFF ASYNCHRONOUS MOTOR
LD1 ENCODER KO
LD2 FEEDBACK
LD3 ERROR
LD4 N.C.
LD5 DRIVER KO
IN RS485
RS 485
U15
encoder
U6
DIAGRAM : F.203I.001
SQ10
Mettler-Toledo, Inc.
3817 NICHOLSON ROAD
FRANKSVILLE, WI 53126
414-835-4411
ELECTRICAL DIAGRAM-MEGA
DATE 10/17/00
DRAWN BY RS
PAGE 7 OF 12
DRAWING NO. A831656600A
ORIGINAL RELEASE NO. 101300-01
CHANGE
E.R. NO.
BY
DATE


sensor
LIFTER POW. FACTOR CORRECT.
I/O CONNECTIONS
CPU-DRIVER
SERIAL INPUT
CONNECTION
encoder
DIAGRAM : VECTORIAL DRIVER F.UE208
I/O
U16
ADDRESS 4:
1=OFF
2=OFF
3=ON
4=OFF
8=ON BRUSHLESS MOTOR
8=OFF ASYNCHRONOUS MOTOR
LD1 ENCODER KO
LD2 FEEDBACK
LD3 ERROR
LD4 N.C.
LD5 DRIVER KO
IN RS485
RS 485
encoder
U17
DIAGRAM F.203I.001
U6
SQ11
MACHINES : MEGA XR VALID FROM SERIES 4
MEGA MAX VALID FROM SERIES 1
FUNCTION :LIFTER SIGNALS DRIVER DIAGRAM
DRW.: Montoguti
CONTROL.: R.G.
DESIGN: E211531prg
DRAWING: E211I538.SCH
SHEET 8 OF 12
DATE: 02-06-00
Mettler-Toledo, Inc.
3617 NICHOLSON ROAD
FRANKSVILLE, WI 53126
414-835-4411
ELECTRICAL DIAGRAM-MEGA
DATE 10/17/00
DRAWN BY RS
PAGE 8 OF 12
MATERIAL
DRAWING NO. A831656600A
ORIGINAL RELEASE NO. 101300-01
NO. CHANGE E.R. NO. BY DATE


sensor
LIFTER POW. FACTOR CORRECT.
I/O CONNECTIONS
CPU-DRIVER
SERIAL INPUT
CONNECTION
encoder
MACHINES : MEGA XR VALID FROM SERIES 4
MEGA MAX VALID FROM SERIES 1
FUNCTION :LIFTER SIGNALS DRIVER DIAGRAM
DESIGN: E211153.prg
DRAWING: E211538.SCH
DRW.: Montaguti
CONTROL.: R.G.
SHEET 9 OF 12
DATE: 02-06-00
U18
DIAGRAM : VECTORIAL DRIVER F.U208
I/O
ADDRESS
IN RS485
LD1 ENCODER KO
LD2 FEEDBACK
LD3 ERROR
LD4 N.C.
LD5 DRIVER KO
1=OFF
2=OFF
3=ON
4=OFF
8=ON BRUSHLESS MOTOR
8=OFF ASYNCHRONOUS MOTOR
encoder
U19
RS 485
DIAGRAM F.203.1.001
U6
SQ11
Mettler-Toledo, Inc.
3617 JACKSON ROAD
FRANKSVILLE, WI 53126
414-835-4411
ELECTRICAL DIAGRAM-MEGA
ORIGINAL RELEASE NO. 101300-01
CHANGE
DRAWN BY RS
DATE 10/17/00
PAGE 9 OF 12
DRAWING NO. A831656004


MOTOR CONNECTOR
EXTERNAL INFEED
EXTERNAL INFEED CONNECTOR
OUTLET BELT CONNECTOR
PHOTOCELL CONNECTOR
labeling machine
SCALE CONNECTOR
AUTOMATIC
MACHINES : MEGA XR VALID FROM SERIES 4
MEGA MAX VALID FROM SERIES 1
DRW.: Montaguti
CONTROL P.C.
FUNCTION : OPTIONALS BOX DIAGRAM
DESIGN: E211153bprg
DRAWING: E211153A.SCH
SHEET: 10 OF 12
DATE: 02-06-00
Mettler-Toledo, Inc.
ELECTRICAL DIAGRAM-MEGA
A83165600A
DIAGRAM F.203.1.001
U6
CNA
CNB
CNS
FTC
EXTENSION STOP INPUT
STOP INPUT
INFEED SELECTOR
EXTERNAL INFEED PHOTL.
+20V
EXTENSION STOP
0V
STOP INPUT
STOP INFEED INPUT
INFEED STOP
EXTERNAL INFEED SELECTOR
LABELLER PHOTL.
SCALE ERROR
INFEED PHOTL.
END LABELLING
END WEIGHING
FULL OUTLET SIGNAL
START LABELLING
START WEIGHING
OUTLET PERMISSION
MACHINE ERROR
+70V
FULL EXIT
OUTLET OUT
25 x 0,25mmq
2 x 0,5mmq
20V
0V

SYMBOL	CIRCUIT	Description	SPECIFICATIONS	Q.TY
B1r	48,50	PHOT. EXIT PRODUCT RECEIVER	AUTOMAC:F.U197	1
B1s	48,50	PHOT. OUTLET PRODUCT PROJECTOR	AUTOMAC:F.U196	1
B2r	48,49	PHOT. LIFTER RECEIVER	AUTOMAC:F.U197	1
B2s	48,49	PHOT. LIFTER PROJECTOR	AUTOMAC:F.U196	1
B3r	28,30	PHOT. SAFETY LIFTER RECEIVER	DIELL SK2/R-C	1
B3s	28,30	PHOT. SAFETY LIFTER PROJECTOR	DIELL SK2/E-C	1
B4	68,66	INFEED TRAY PRESENCE (ONLY FOR MAX) PHOTOCELL	SELECT DCV81/D2ANSCR	1
BT1	38,33	ROOM TEMPERATURE PROBE	NTC SIEMENS 6.8 Kohm	1
BT2	38,33	PLATE TEMPERATURE PROBE	"BFI" 135-104LFW-J01	1
CNA	99,98	EXTENSION INFEED CONNECTOR	AMP 9 POLI	1
CNB	99,91	AUTOMATIC SCALE CONNECTOR	MALE SUB D 25 POLES	1
CNS	99,95	OUTLET CONNECTOR	AMP 9 POLI	1
CN12	14,20	DRIVER EXTERNAL INFEED CONNECTOR	MOLEX 8 POLI	2
FU2	2,2	HEATER FUSE	T 8A	2
FU1	2,3	SEALING PLATE FUSE	FAN BLOWER	5
FU3	2,3	PRIMARY TRANSFORMER FUSE	T 5A	5
FU4	2,4-5	VETT. DRIVER POWER FUSE	T 16A	1
FU5	2,10		T 16A	1
FU6	2,10	24Vdc INFEED FUSES	T 2A	1
FU7	24,24	REEL BRAKE FUSE	T 2A	1
FU8	36,34	DISTRIBUTOR MAGNETS FUSES	T 800mA	1
FTC	99,93	PTC LABELLER CONNECTOR	AMP 4 POLI	
HL1	2,1	IN VOLTAGE MACHINE LAMP	230V	1
V1	3,3	SEALING PLATE RELAY	TRIAC BTA 26/700	1
V2	3,2	BLOWER RELAY	TRIAC BTA 26/700	1
V6	2,5	SAFETY RELAY	TRIAC BTA 26/700	1
K1	25,26	SAFETY RELAY	FEME M2PS0024710	1
K2	3,5	SAFETY CONTROL RELAY	FEME M2PA0029705	1
M1	9,5	FOLDER MOTOR	BRUSHLESS 0,6Nm	1
M2	9,6	LIFTER MOTOR	1.58.8F1.01	1
M3	9,7	SIDE CLAMPS MOTOR		1
M4	18,14	CLAMP OPENER CAM MOTOR	PASSO MAE F.U205	1
M5	18,15	SEALING PLATE MOTOR	PASSO MAE F.U205	1
M6	18,16	INFEED 1 MOTOR	PASSO MAE F.U205	1
M7	18,18	KNIFE OPPOSITION MOTOR	PASSO MAE F.U205	1
M9	18,19	LIFTER MOTOR RELEASE	PASSO MAE F.U187	1
M10	18,17		PASSO MAE F.U207	1
M11	9,2	FAN BLOWER	20W 230V	1
QS1	1,1	GENERAL AUTOMATIC SWITCH	SALZER 25A/600V	1
R1	8,4	SEALING PLATE RESISTANCE	400 W 230V	3
R2	8,2	BLOWER RESISTANCE	700 W 230V	1
SB1	27,26	STOP PUSH-BUTTON	d=16mm 2NC	1
SB2	27,25	MICRO UPPER COVER GUARD	PIZZATO FR 995-1 2NC	1
SB3	27,25	MICRO INFEED COVER GUARD	PIZZATO FR 995-1 2NC	1
SB4	27,24	MICRO INPUT INFEED	PIZZATO FR 995-1 2NC	1
SB5	48,41	MACHINE/SCALE SELECT.PUSH-BUTTON	OMEGA A015 1B	1
SB6	48,41	PROGRAM SELECT.PUSH-BUTTON	OMEGA A015 1B	1
SB7	48,42	TEMPERATURE/CUTTING PUSH-BUTTON	OMEGA A015 1B	1
SB8	48,42	START PUSH-BUTTON	OMEGA A015 1B	1
SB9	27,25	PHOT. MICRO PHASE LIFTER SAFETY	PIZZATO FR 615	1
SB10	28,26	LEFT SIDE MICRO COVER	PIZZATO FR 995-1 2NC	1
SQ1	48,45	CAM SENSOR	SHARP GP1A10	1
SQ2	48,46	FORWARD INFEED 2 SENSOR	SHARP GP1A10	1
SQ3	48,46	BACK INFEED 2 SENSOR	SHARP GP1A10	1
SQ4	27,28	DANDY SENSOR	SHARP GP1A10	1
SQ5	48,48	LEFT RELEASE LIFTER SENSOR	SHARP GP1A10	1
SQ6	48,47	RIGHT RELEASE LIFTER SENSOR	SHARP GP1A10	1
SQ8	48,48	KNIFE OPPOSITION SENSOR	SHARP GP1A10	1
SQ9	48,45	INTERMEDIATE INFEED 2 SENSOR	SHARP GP1A10	1

SYMBOL	CIRCUIT	Description	SPECIFICATIONS	Q.TY
SQ10	67,62	FOLDER AT REST SENSOR	SHARP GP1A10	1
SQ11	77,72	BACK LIFTER SENSOR	SHARP GP1A10	1
SQ12	87,82	CLAMPS SENSOR	SHARP GP1A10	1
TV1	5,9	transformer	ERC P=640VA Pr=0-200-230 Sec1=0-55V 12A Sec2=0-22V 2A	
U1	1,2	AUXILIARY SAFETY HOLE BOARD	AUTOMAC F.211.I.040	1
U2	7,5	FOLDER DRIVER POWER BOARD	AUTOMAC F.U213	1
U3	7,6	DRIVER LIFTER POWER CARD	AUTOMAC F.U213	1
U4	7,7	CLAMPS DRIVER POWER CARD	AUTOMAC F.U213	1
U5	12,11	POWER HOLE BOARD	AUTOMAC F.203.I.002	1
U6	42,41	CPU HOLE BOARD	AUTOMAC F.203.I.001	1
U7	38,39	CPU SLAVE HOLE BOARD	AUTOMAC F.205.I.004	1
U8	47,42	FRONTAL BOARD	AUTOMAC F.203.I.003	1
U9	58,56	LEFT INFEED 1 BARRIER	AUTOMAC F.211.I.022	1
U9 "XR"	53,51	LEFT INFEED 1 BARRIER	AUTOMAC F.203.I.006	1
U10	56,56	INFEED 1 RIGHT BARRIER	AUTOMAC F.211.I.021	1
U10 "XR"	53,60	INFEED 1 RIGHT BARRIER	AUTOMAC F.203.I.005	1
U11	58,51	LEFT INFEED 2 BARRIER	AUTOMAC F.211.I.024	1
U11 "XR"	58,52	HORIZONTAL BARRIER	AUTOMAC F.203.I.004	1
U12	56,51	RIGHT INFEED 2 BARRIER	AUTOMAC F.211.I.023	1
U13	53,51	PTC CONNECTOR HOLE BOARD	AUTOMAC F.211.I.015	1
U14	62,61	FOLDER CPU DRIVER	AUTOMAC F.U208	1
U15	67,68	FOLDER ENCODER MOTOR	ELTRA EN30M500Z5L6X3PR	1
U16	72,71	LIFTER CPU DRIVER	AUTOMAC F.U208	1
U17	77,78	LIFTER ENCODER MOTOR	ELTRA EN30M500Z5L6X3PR	1
U18	82,81	CLAMPS CPU DRIVER	AUTOMAC F.U208	1
U19	87,88	CLAMPS ENCODER MOTOR	ELTRA EN30M500Z5L6X3PR	1
U20	7,1	BLOWER	"DBK" tipo LA 09 ELEDIS	1
U21	23,30	PTC SAFETY BOARD	AUTOMAC F.U146.1	1
U22	49,44	TOTALIZER	HENGSTLER 0 731 101	1
VNT1	16,11	BLOWER FAN BOARDS	PAPST 8414G (12-24VDC)	1
X1	SHEET 2	STEP-MOTORS CLAMPS		6
X3	SHEET 1	FOLDER MOTOR CONNECTOR		1
X4	SHEET 1	LIFTER MOTOR CONNECTOR		1
X5	SHEET 1	CLAMP MOTOR CONNECTOR		1
X7	SHEET 1	SEALING PLATE TERMINAL BLOCK		1
X8	38,34	MAGNET DISTRIBUTOR CONNECTORS		11
X9	8,6	BLOWERS TERMINALS		2
X11	99,100	EXTERNAL INFEED MOTOR CONNECTOR	MOLEX 4 POLI	1
X12	49,49	AL/AB MOTOR INFEED 2 SENSOR	AMP 4 POLI	1
X13	16,19	AL/AB MOTOR INFEED 2 CONNECTOR	MOLEX 4 POLI	1
X14	8,10	OPT. INFEED MONITOR CONNECTOR		1
X15	27,22	terminal		1
X16	28,26	SERIES SB1-SB10 TERMINAL		1
YA1-YA2	38,34	DISTRIBUTOR MAGNETS		2
YB1	27,29	REEL BRAKE		1

SUPPLY VOLTAGE 230V MONOPHASE
FREQUENCY: 50/60 HZ
HIGHEST POWER INSTALLED : 3000VA
HIGHEST ABSORBED CURRENT 13A

MACHINES : MEGA // and XR VALID FROM SERIES 2
MEGA MAX VALID FROM SERIES 1

FUNCTION : COMPONENT LEGEND

DRW.: Montaguti
CONTROL.: R.G.

DESIGN: E211153i.prg
DRAWING: E211153B.SCH

SHEET: 11 OF 12
02-06-00

SCALE | UNITS | TOLERANCES | CHAMFERS WITHOUT DIMENSION | RADII WITHOUT DIMENSION

NO.	CHANGE	E.R. NO.	BY	DATE
	ORIGINAL RELEASE NO. 101300-01			

Mettler-Toledo, Inc. 3817 NICHOLSON ROAD FRANKSVILLE, WI 53126 414-835-4411

TITLE: ELECTRICAL DIAGRAM-MEGA

DATE: 10/18/00 | MATERIAL:

DRAWN BY: RS | DRAWING NO.: A83165600A

PAGE 11 OF 12

OUTPUT HYBRID MEMORY MAP

HYBRID 0

PIN 20--- BIT 0	=CAM AT REST 5A CN7	5A CN7
PIN 22--- BIT 1		5C CN7
PIN 23--- BIT 2		6A CN7
PIN 25--- BIT 3		6C CN7
PIN 21--- BIT 4	=KNIFE	7A CN7
PIN 27--- BIT 5	= LIFTER RELEASE	7C CN7
PIN 24--- BIT 6	= CAM	8A CN7
PIN 26--- BIT 7		8C CN7

HYBRID 1

PIN 20--- BIT 0	=SAFTEY AUXILARY CONTACT	1A CN7
PIN 22--- BIT 1	=LOW LEVEL TENSION	1C CN7
PIN 23--- BIT 2	=LIFTER 2 RELEASE SENSOR	5 CN6
PIN 25--- BIT 3	=LIFTER 1 RELEASE SENSOR	9 CN6
PIN 21--- BIT 4	=STOP PUSH BUTTON	3 CN6
PIN 27--- BIT 5	=MICRO UPPER COVER GUARD	13 CN6
PIN 24--- BIT 6	=MICRO INFEED COVER GUARD	7 CN6
PIN 26--- BIT 7	=START PUSH BUTTON	11 CN6

HYBRID 2

BIT 0	=CAM AT REST 5A CN7	15 CN7
BIT 1	=OUTLET BELT CONSENT	17 CN7
BIT 2	=OK MACHINE RELAY	19 CN7
BIT 3	=SEALING PLATE RELAY	21 CN7
BIT 4	=BLOWER OUT	9A CN7
BIT 5		9C CN7
BIT 6	=DISTRIBUTION MAGNET	10A CN7
BIT 7		10C CN7

HYBRID 3

BIT 0	=CAM SENSOR	23 CN6
BIT 1	=BACK INFEED 2 POSITION SENSOR	27 CN6
BIT 2	=FORWARD INFEED 2 POSITION SENSOR	28 CN6
BIT 3	=POWER RELAY CONTROL	30 CN6
BIT 4	=DANDY SENSOR	25 CN6
BIT 5	=INTERMIDIATE INFEED 2 SENSOR	32 CN6
BIT 6	=AL/AB MOTOR INFEED 1 SENSOR	29 CN6
BIT 7	=KNIFE SENSOR	31 CN6

HYBRID 4

BIT 0	=KEYBOARD DATO A	33 CN6
BIT 1	=KEYBOARD DATO B	35 CN6
BIT 2	=KEYBOARD DATO C	36 CN6
BIT 3	=KEYBOARD DATO D	38 CN6
BIT 4	=KEYBOARD DO ADDRESS	34 CN6
BIT 5	=KEYBOARD D1 ADDRESS	40 CN6
BIT 6	=TOTALIZER	37 CN6
BIT 7	=KEYBOARD LATCH	39 CN6

HYBRID 5

BIT 0	=PHOTO CELL EXIT PRODUCT	41 CN6
BIT 1	=TEMPERATURE/CUTTING PUSH-BUTTON	43 CN6
BIT 2	=LIFTER IN1	44 CN6
BIT 3	=PROGRAM SELECT, PUSH BUTTON	46 CN6
BIT 4	=FOLDER IN 1	42 CN6
BIT 5	=FOLDER IN2	48 CN6
BIT 6	=CLAMPS IN1	45 CN6
BIT 7	=MACHINE/SCALE SELECT. PUSH BUTTON	47 CN6

HYBRID 6

BIT 0	=START WEIGHING	49 CN6
BIT 1	=START LABELING	51 CN6
BIT 2	=MACHINE ERROR	52 CN6
BIT 3	=EXTERNAL INFEED CONSENT	54 CN6
BIT 4	=FOLDER OUT 1	50 CN6
BIT 5	=FOLDER OUT 2	56 CN6
BIT 6	=CLAMPS OUT 1	53 CN6
BIT 7	=FRONTAL LED OUT	55 CN6

HYBRID 7

BIT 0	=OUT BELT STOP MACHINE	57 CN6
BIT 1	=END WEIGHING	59 CN6
BIT 2	=END LABELING	60 CN6
BIT 3	=SCALE ERROR	63 CN6
BIT 4	=LIFTER PHOTOCELL	58 CN6
BIT 5	=INFEED INPUT PHOTOCELL	61 CN6
BIT 6	=LABEL POSITION PHOTOCELL	64 CN6
BIT 7	=EXTENSION INFEED SELECTOR	62 CN6

MACHINES : MEGA XR VALID FROM SERIES 4
MEGA MAX VALID FROM SERIES 1

FUNCTION : OPTIONALS BOX DIAGRAM

DRW.: Montaguti
CONTROL R.G.

DESIGN: E211153i.prg
DRAWING: E211153A.SCH

SHEET: 12 OF 12
DATE: 02-06-00

NO.	CHANGE	E.R. NO.	BY	DATE
	ORIGINAL RELEASE NO. 101300-01			

Mettler-Toledo, Inc. 3817 NICHOLSON ROAD FRANKSVILLE, WI 53126 414-535-4411

TITLE: ELECTRICAL DIAGRAM-MEGA

DATE: 10/18/00 MATERIAL:

DRAWN BY: RS DRAWING NO.: A83165600A

PAGE 12 OF 12

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1900 Polaris Parkway
Columbus, Ohio 43240
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P/N: 83166500A

(11/00).00