



Squeeze Roll Applicator (16 inch)

Information Folder 9.4

June 2014

Replaces IF 9.4 dated February 2013

Safety

Hard Stop button: Pushing the Hard Stop button on the operator control panel stops the machine instantly. When the machine stops, the nips open. To reset the Hard Stop, pull out the Hard Stop button, and press the RESET button next to it.

Machine Guard: A plexiglas guard encloses the web handling section of the machine. A safety switch is mounted on the guard to prevent continuous machine operations when the guard is open. However, the machine can operate in the JOG mode with the guard open.

CAUTION!

Guard on back of applicator must be in place when operating the machine.

Nip and Pinch Points: When the machine runs in the JOG mode with the guard open, nip and pinch points are exposed. Use extreme care not to catch clothing, tools or body parts in the machine.

Electrical Connections: The applicator and the ERF are electrically connected. Disconnect electrical power on both machines before servicing. The applicator main disconnect is in the lower right part of the electrical panel.

CAUTION!

All electrical panel doors/covers must be closed during operation.

Machine Description

A. General Information

The power-operated 16-inch Squeeze Roll Applicator (SRA) is designed to apply preprinted graphic reflective sheeting to flat coil stock while maintaining accurate repeat pattern on the preprinted graphic sheeting. The machine draws 3M™ Reflective License Plate Sheeting directly from the roll, strips off the liner and rolls the sheeting down onto the metal stock in one controlled operation. See Figure 1.

B. Machine Specifications

Machine: 40 inches long x 48 inches wide x 70 inches high with guard (101.6 cm long x 121.9 cm wide x 177.8 cm high).

Electrical Panel: 36 inches wide x 12 inches deep x 67 inches high (91.4 cm wide x 30.5 cm deep x 170.2 cm high).

Construction: Steel and aluminum plate and structural shapes. Steel, rubber-covered rollers.

Maximum Size Metal Stock Handled: Up to 16 inches (40.6 cm) wide by any length.

Motor: 1/2 HP DC motor.

Power Supply: 110 volt, 60 cycle, single phase, 15 amp service

Production Speed: Speed is variable from 0 to 50 feet per minute (0 to 15.24 meters per minute).

Note: Recommended speed in graphic mode is 40 feet per minute; minimum speed is 20 feet per minute.

Operators Required: One, to load and monitor applicator.

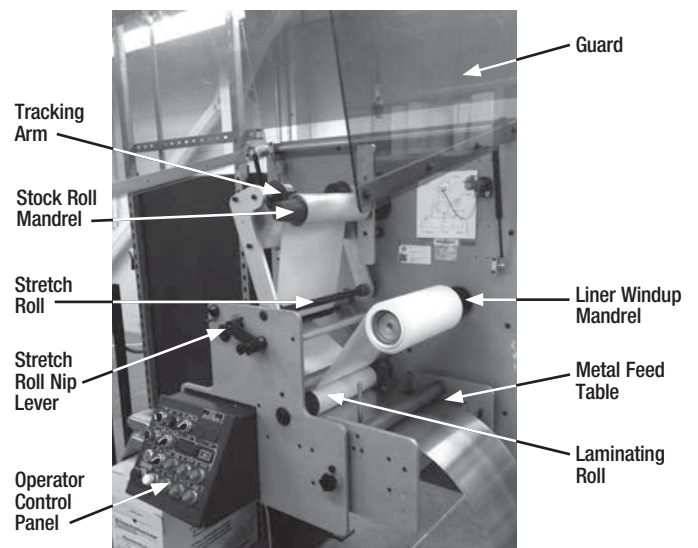


Figure 1

C. Controls

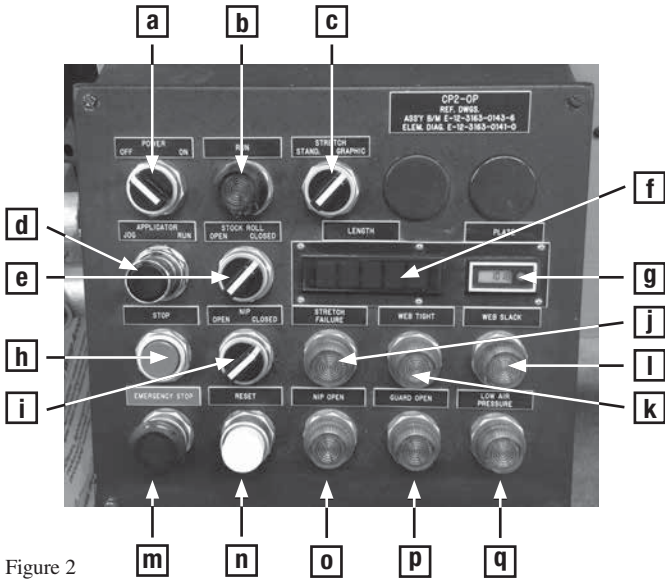


Figure 2

1. Control Panel

- Power** (two-position selector switch): Turn the switch ON to power up the machine. The Reset indicator lights when the power is turned on, and must be pushed in to reset the machine before beginning operations.
- Run** (green indicator light): This indicator lights when machine is ready to run or is operating in either JOG or RUN mode. The press is interlocked with the applicator, and the press will not cycle in the RUN mode unless this light is on.
- Stretch** (two-position selector switch): Select STAND to apply plain reflective sheeting or GRAPHIC to apply preprinted graphic sheeting.
- Applicator Run/Jog** (two-position selector and pushbutton switch): Select RUN for normal production, and press the pushbutton to start the machine. If no indicator lights are flashing, the machine runs.
Select JOG for manual machine control during threading or maintenance when the guard is not in place. To run the machine in JOG mode, press the Applicator pushbutton. The machine runs as long as the button is pressed. The machine operates in JOG mode even though indicator lights are flashing.
- Stock Roll** (two-position selector switch): Turn this switch to raise or lower the tracking arm. When the tracking arm is open, the Nip Open indicator light flashes.
- Length** (digital display): This display shows one of three parameters in graphic mode: actual length of plate produced, average length of

10 plates produced, or the ratio of the number of pulses from encoder to stepper motor. The display mode is determined by the setting of the three-position switch in the electrical panel.

Note: This switch should be in the center position during operations. The other positions are for servicing only.

- Plate** (counter): The counter displays the number of plates produced in the GRAPHIC mode. In the STANDARD mode, it counts the number of feet the machine processes.
- Stop** (red pushbutton): Press the Stop button to discontinue normal operations. The applicator stops and the press continues operations until it reaches the top of the stroke and then stops. The nips remain closed when the Stop button is pressed.
- Nip** (two-position selector switch): OPEN or CLOSE the laminating roll nip with this switch. When the nip is open, the Nip Open indicator light flashes.
- Stretch Failure** (amber indicating light): When 10 graphic plates do not meet the programmed stretch tolerance, the light comes on. After three plates in a row meet tolerance, the light shuts off. The light can also be turned off by turning the Stretch selector switch to STANDARD position and then back to GRAPHIC.
In GRAPHIC mode, if a registration mark is not detected within 20 inches (50.8 cm), the light flashes and the applicator stops. This indicates a web break, end of roll, or optics misaligned.
- Web Tight** (amber indicating light): When the loop in the laminated strip is too tight and trips the switch on the ultrasonic speed controller, the Web Tight indicator flashes and the press continues operations until it reaches the top of the stroke and then stops. They must be restarted manually. To do this, select the Applicator switch JOG mode, and jog the machine until the loop is slack. Turn the Applicator switch to RUN, and press the pushbutton to start the applicator.
- Web Slack** (amber indicating light): When the loop in the metal web is too long, it trips a web slack switch below the ultrasonic indicator and applicator operation pauses. The indicator light turns on. When the press takes up the slack, the applicator resumes operation. The indicator light turns off when the web lack switch is released.
If the web slack switch trips frequently during normal operation of the applicator/press, the ultrasonic bias pot requires adjustment.

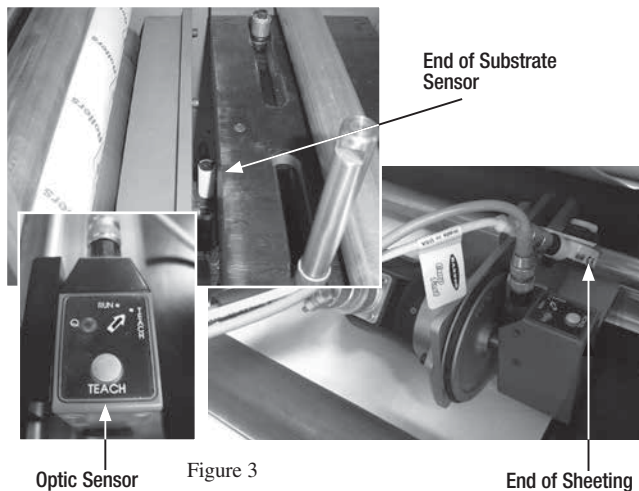
- m. **Hard Stop** (red, mushroom pushbutton): Press the Hard Stop button to stop the applicator instantly. The press will topstop. The applicator laminating nip roll opens and the Hard Stop button lights. To restart the applicator after a Hard Stop, pull out the Hard Stop button, press the RESET button, select the JOG or RUN mode, and press the Applicator RUN pushbutton.
- n. **Reset** (white indicating light): When the applicator is first powered up or when the Hard Stop has been pressed, the Reset indicator light turns on. Press the Reset button to clear the machine controls and prepare to run.
- o. **Nip Open** (amber indicating light): This light flashes when either the laminating nip roll or tracking arm is open.
- p. **Guard Open** (amber indicating light): This light flashes when:
 - Guard is not completely closed
 - Run out of sheeting
 - Run out of metal substrate
- q. **Low Air Pressure** (amber indicating light): This light flashes when there is insufficient air pressure to operate the applicator.
NOTE: If any lights on the control panel are flashing, the machine will not operate.

2. Stretch Roll Nip Lever

Use the stretch roll nip lever to open and close the stretch roll nip. To open the nip, pull out the knob on the end of the lever and move the lever to the right. To close the nip, pull out the knob and move the lever to the left. When the machine is shut down, this nip should be open to prevent flat spots on the rubber roller.

3. Optic Sensor (See Figure 3)

The optic sensor detects registration marks on graphic sheeting, which actuate the applicator's automatic stretch control system in the GRAPHIC mode.



4. End of Sheeting Sensor (see Figure 3)

The proximity sensor will not allow the laminator to run (Green Light) unless sheeting is threaded through the laminator. There are two LEDs on the sensor body. Green indicates power is being supplied to the sensor. Amber indicates the sensor is seeing sheeting. Both LEDs must be on in order to run the laminator. When not sensing sheeting, the Guard Open light will flash.

5. End of Substrate

The proximity sensor will not allow the laminator to run (Green Light) unless substrate is threaded through the laminator. There are two LEDs on the sensor body. Green indicates power is being supplied to the sensor. Amber indicates the sensor is seeing substrate. Both LEDs must be on in order to run the laminator. When not sensing substrate, the Guard Open light will flash.

Note: There are three components which will activate the GUARD OPEN pilot light and stop the laminator from operating in the run mode:

The guard open No sheeting No substrate

6. SICK Optic Sensor

- a. **Calibration:** Turn the adjustment arrow on the top of the sensor from the Run position to the Teach position.

Place the registration mark under the sensor LED (located on the bottom of the sensor).

Push down on the Teach button for one second and release.

Slide the sheeting so that the contrast color (background color) is now under the LED.

Push down on the Teach button for one second.

Turn the adjustment arrow to the Run position. The sensor should now be adjusted.

Note: With the SICK Optic sensor in the teach mode, the Amber LED on the top of the sensor will start to strobe slowly after the Teach button is pushed the first time. This indicates that the sensor has identified the target color and is now ready to be calibrated to ignore the background color of the license plate.

After moving the background color under the optic sensor, push the Teach button again for one second. The Amber LED should now shut off. Note that the LED lights may change color from Red, Blue or Green.

The optic sensor determines the best LED color array to contrast between the targeted color and the background color.

The Amber LED on the top of the sensor should only come on when the targeted color is under the LEDs on the bottom of the sensor.

7. Ultrasonic Speed Control (See Figure 4)

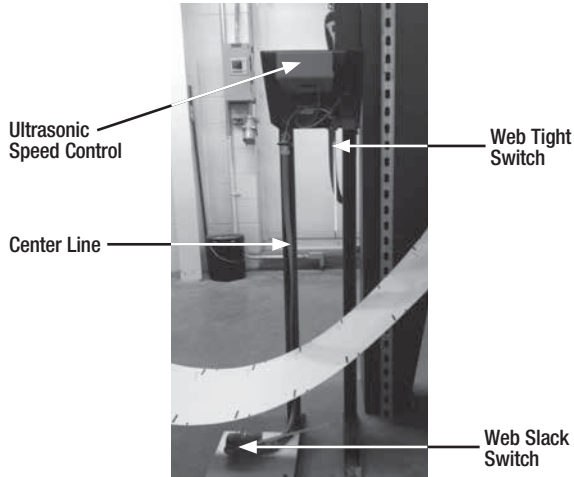


Figure 4

The ultrasonic speed control matches the applicator speed with the speed of the blanking press. To work accurately, the ultrasonic speed control must be centered over the bottom of the loop.

Two switches limit the loop size.

Web Tight Switch: When the web loop is too short and contacts the Web Tight switch on the ultrasonic sensor box, the applicator stops and the press operation continues until it reaches the top of the stroke and then stops.

Web Slack Switch: When the press stops, the web loop increases until it contacts the Web Slack switch. This switch stops the applicator and turns on the Web Slack indicator light.

8. Drive Rollers

The drive rollers must be locked tight to their shafts to prevent spinning of rollers on shafts.

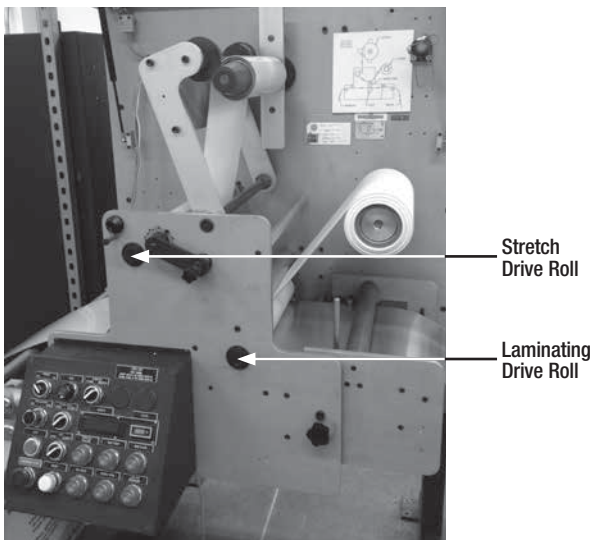


Figure 5

9. Control Center

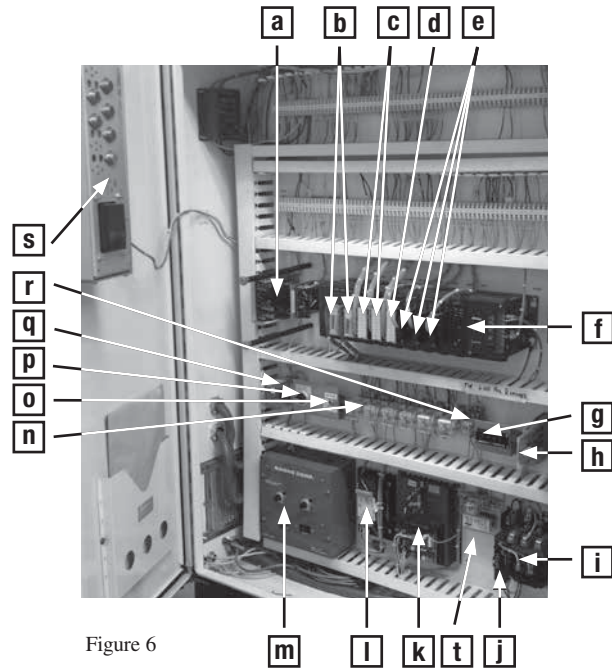


Figure 6

Control module components are identified on Figure 6.

- a DC power supply (x2)
- b. 115V output (x2)
- c. 24V input (x2)
- d. 24V output
- e. High speed counter (x3)
- f. CPU module
- g. Thumbwheel
- h. Count switching circuit board
- i. Power contactor
- j. Circuit breaker/Main disconnect
- k. DC motor drive control
- l. Stepper motor control
- m. Ultrasonic controller
- n. 110V AC relays (x6)
- o. 3-position switch
- p. JOG speed control
- q. Isolator
- r. 24V DC relay
- s. 24V DC power supply
- t. MA4-2 Amplifier

Operation

A. Machine Startup

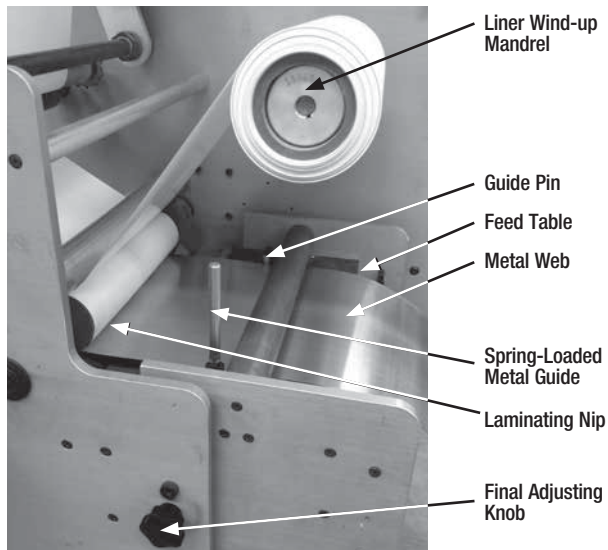


Figure 7

1. Metal Substrate Thread-Up

- a. Open the machine guard.
- b. Run enough metal substrate from the metal straightener to reach the applicator laminating nip roll.
- c. Pull the spring-loaded metal guide toward you. Bring the metal web over the feed table between the metal guide and guide pin, and thread it through the laminating nip. Release the spring-loaded metal guide.

2. Reflective Sheeting Thread-Up

- a. Turn ON the Power switch.
- b. Push the Reset button.
- c. Set the Stretch switch to STAND(ard) mode to apply non-printed sheeting, or to GRAPHIC mode to apply printed sheeting.
- d. Open the stock and laminating nips by selecting OPEN with both the Stock and Nip switches.
- e. Open the stretch roll nip lever (right position).
- f. Slide an empty core onto the liner windup mandrel all the way back to the stop collar and inflate core chuck.
- g. Slide a roll of sheeting onto the stock roll mandrel, pushing it all the way to the roll stop and inflate core chuck. Make sure the sheeting leader hangs down on the left side of the roll.
- h. Pull the sheeting roll out about one inch. Raise the tracking arm by hand against the sheeting roll. Move the sheeting roll until the roll edge fits between the guide roller flanges on the tracking arm (Figure 8). Close the stock nip by selecting CLOSE with the Stock Roll switch.

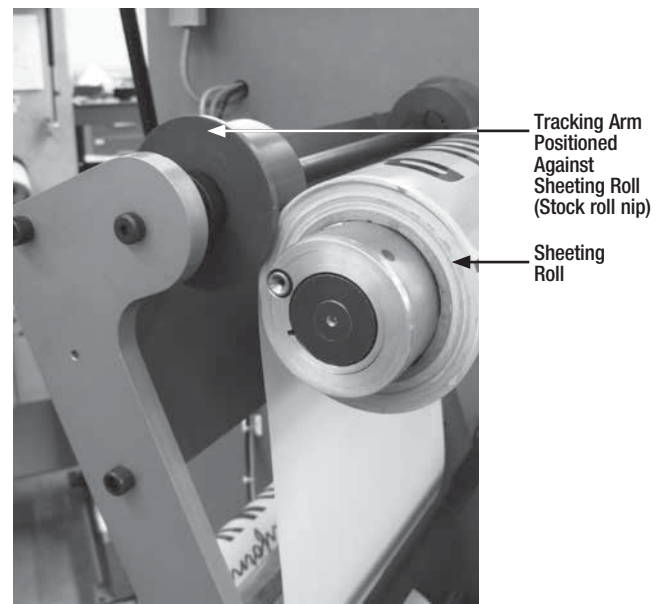


Figure 8

- i. Thread the leader through the stretch roll nip. Then close the stretch roll nip by moving the nip lever to the left. The machine will guide the sheeting so it is lined up correctly as it is threaded.
- j. Select JOG on the Applicator switch. Press the Applicator pushbutton and run enough web so the liner can be wound around the liner roll clockwise as shown on the thread-up diagram (Figure 9).

Note: Make sure the sheeting tab passes through the stretch roll nip without folding back.

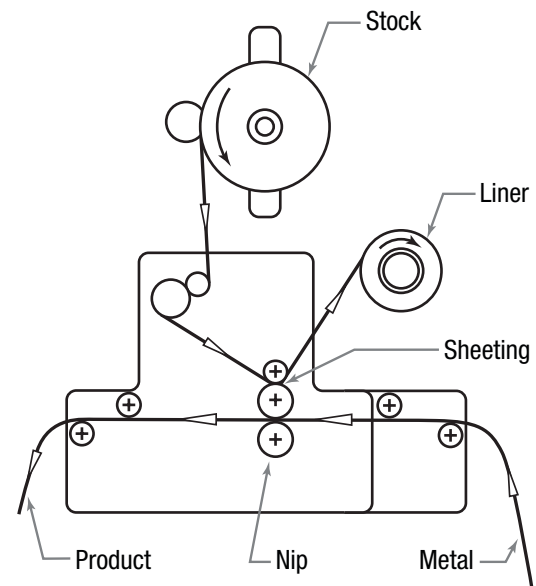


Figure 9

Tape the liner to the liner roll core (Figure 10). Continue to jog the applicator to move the sheeting tab to the stripping roll.



Figure 10

- k. Jog the applicator until the sheeting tab passes over the stripping roll. Pull the sheeting tab toward the laminating nip, and continue to jog the applicator until enough sheeting is stripped to reach through the laminating nip. The liner winds on the empty core.
- l. Thread the sheeting through the laminating nip, aligning it with the metal web (Figure 11). Close the laminating nip by selecting CLOSE on the Nip switch. Jog the applicator until enough sheeting has been laminated to allow the removal of the sheeting tab. Tear off the sheeting tab from the laminated strip.

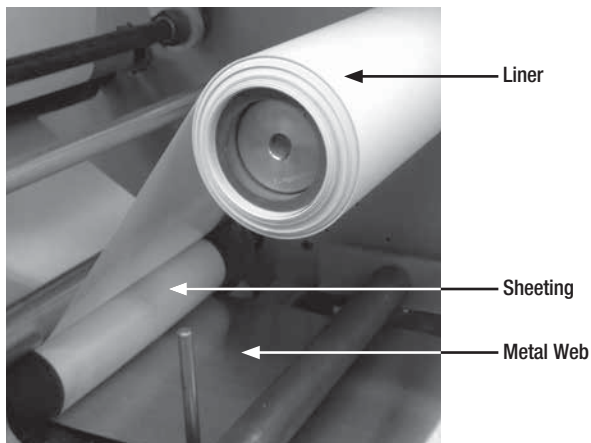


Figure 11

- m. For graphic sheeting, the optic sensor must line up with the registration mark. To move the sensor toward or away from the operator control panel, loosen the locking collar on the sensor mount, slide the sensor horizontally to the required position, and tighten the locking collar. With the encoder wheel on the web, adjust the sensor height to 3/8 inch above the laminated strip (Figure 12).

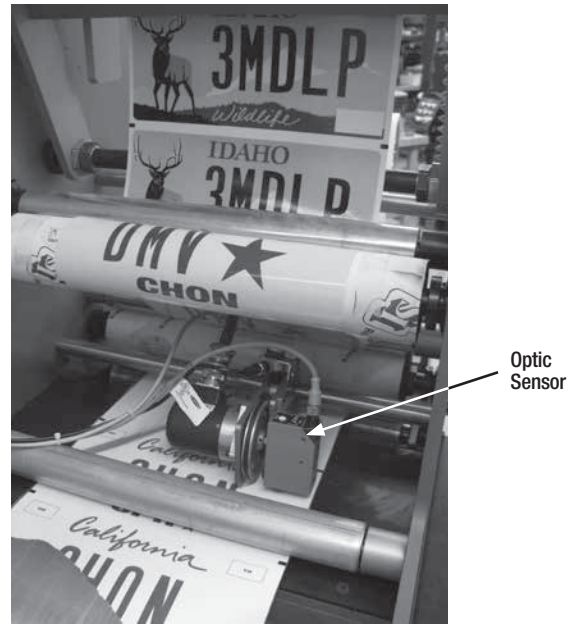


Figure 12

- n. Close the machine guard.
- o. Jog the applicator until you have enough laminated strip to feed into the press roll feed unit.
- p. Start the applicator by turning the Applicator switch to RUN and pressing the pushbutton.
- q. If necessary, make final adjustments in the alignment of the metal substrate and sheeting with the adjusting knob on the feed table (Figure 7). Turning the knob counterclockwise moves the metal back toward the machine. Turning the knob clockwise moves the metal forward towards the operator.

Note: Any adjustment in the metal web position on the feed table is magnified when the machine runs. To avoid over-correcting the web position, make very small adjustments and check by running the machine.

Air Chucks

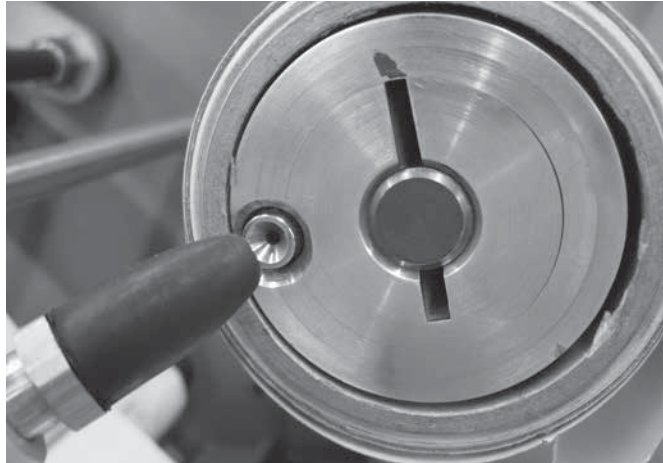


Figure 13

The air chucks hold the sheeting and liner cores in place. Place the cores on the mandrels. Use the air filler nozzle to fill the cores with air. Push in on the filler valve and hold for a couple of seconds. Quickly remove the filler nozzle so that air does not escape. The air chucks require a small volume of air at a minimum of 90 PSI. The air regulator has a fixed rate of 90 PSI. To deflate the air chucks, push in slightly on the air chuck valve stem with your finger nail. Remove the core.

Shutdown

- A. Press the Stop pushbutton on the operator control panel. The applicator stops. The press continues until it reaches the top of its stroke and then stops.
- B. Turn the Power switch OFF. The laminating nip opens automatically.
- C. Open the machine guard, and open the stretch nip by moving the stretch nip lever to the right.

Adjustments and Maintenance

A. Electrical Panel Adjustments

The components listed below are numbered on the figure.

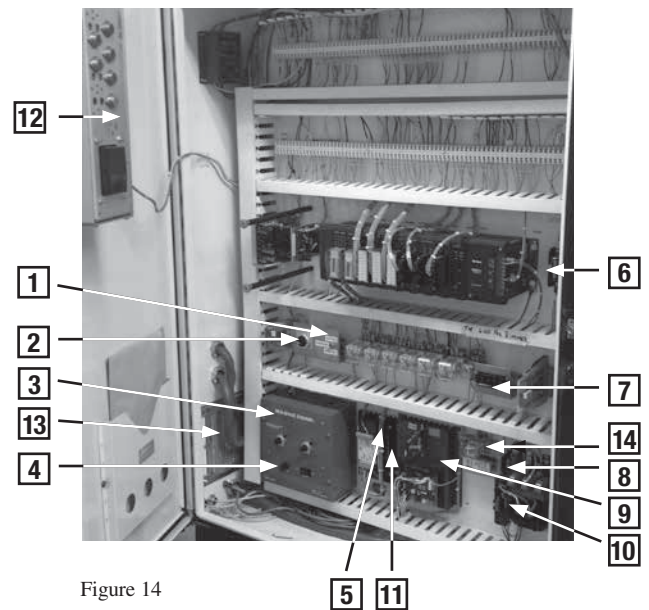


Figure 14

1. 3-Position Switch

Set the 3-position switch to select the readout to be shown on the operator control panel length display.

Upper position: Displays actual length of plate run (for service only).

Center position: Displays average length of every 10 plates run (normal operating position).

Lower position: Displays the ratio of the pulses from the encoder to the stepper motor (for service only).

2. Jog Speed Control

Set the applicator speed in JOG mode with the jog speed control. Turn the control counterclockwise to decrease jog speed. Turn the control clockwise to increase jog speed.

3. Ultrasonic Speed Control Adjustment

Set the base speed and the rate of speed change of the ultrasonic speed control with the two potentiometers (pots) on the Magne Corp control box. The pot on the left sets the bias (base speed); the lower the setting number, the higher the speed. The pot on the right sets the gain (rate of change); the higher the setting number, the faster the change.

Note: The power switch on the Magne Corp control box must be ON for the ultrasonic speed controller to operate. Normally, this switch is left in the ON position.

4. Ultrasonic Speed Control Fuse

AGC 1/4 amp.

5. Stepper Motor Control

6. Auxiliary fuse

KTK-R10.

7. Thumbwheel

Set the desired length of the plates run in inches. A decimal is inserted after the first digit (x.xx). The settings can range from 0.00 to 9.99 inches.

8. Main Circuit Breaker/Main Power Disconnect

15 amp circuit breaker. Turn off the main power disconnect on the applicator and on the press before servicing the applicator.

9. DC Motor Drive

Main drive motor speed control, with plug in Horsepower Resistor. Mounted on a heat sink.

10. Power Contactor

11. DC Motor Drive Fuse

MDL 8 amp.

12. 24 V DC Power Supply Fuse

AGC 4 amp.

13. Cabinet Filter

14. MA4-2 Time Adjust (SICK Optic Sensor)

Location: To adjust the dwell time on the signal sent from the SICK Optic sensor:

Turn the small potentiometer on the face of the MA4-2 clockwise to increase the amount of time or counterclockwise to decrease the amount of time the 24-volt DC signal from the SICK Optic Sensor is received.

B. Maintenance Inside the Applicator Back

NOTE: Remove protective guard to access back of applicator.

CAUTION!

This guard must be in place during normal operation.

1. Control Air Pressure Regulators

The air pressure regulators in the back enclosure of the applicator control web handling at the laminating nip, tracking arm, rewind clutch and unwind brake (Figure 15). The air supply entering the applicator must be regulated to 90 PSI, minimum. Each individual air pressure regulator is adjustable; turn the control above the dial to change the regulator setting.

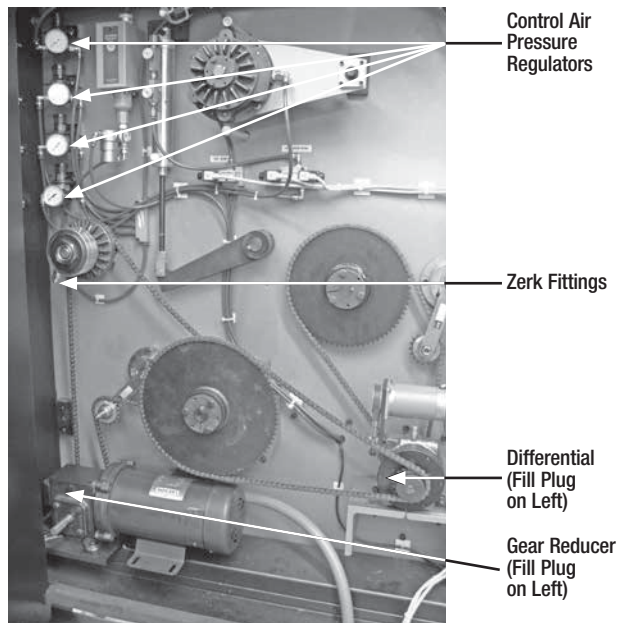


Figure 15

2. Lubrication

The frequency required for lubrication depends on the hours the machine runs and the operating conditions. The following recommendations are for operations running 40 hours a week in average environmental conditions.

<u>Frequency</u>	<u>Procedure</u>
Monthly	Clean air filter for electrical cabinet (see Figure 14, number 13)
3 months	Lubricate the drive chains with a light, non-detergent motor oil.
12 months	Grease the zerk fittings with a nonoxidizing grease. Check the oil level in the gear reducer, and fill with appropriate cylinder oil. Cylinder Oil #680 to the oil level plug. Check the oil level in the differential and fill with APG 90 to the fill plug.

C. Applicator Rolls

Keep the applicator rolls clean with mild soap and water. Do not use solvents to clean the rubber rollers. Do not use sharp tools that may cut the rollers. Remove all reflective sheeting from all rubber and steel rolls.

Laminator Problems

Problem: Finished blanks are 1/16" greater than or less than the target length.

Measure: Use a Vernier caliper to measure the stretched sheeting in the loop between the press and the laminator. If the plate lengths are consistent in length, and compare with the Laminator Thumb-wheel, the problem will be at the Electronic Roll Feed LP-ERF. (See Electronic Roll Feed Information Folder.)

If the measured plate lengths are inconsistent compared to the Laminator Thumb-wheel, the following Troubleshooting tips should be followed.

Check: The position of the GRAPHIC/STANDARD selector switch. The switch must be in the graphic position while running graphic sheeting.

Check: The position of the SICK optic sensor. Is the sensor located in line with the registration mark on the graphic sheeting? If not: Relocate sensor to align with the registration mark.

Check: Verify that the amber LED on the top of the SICK optic sensor turns on whenever the registration mark is under the sensor optic. (20 inches passing under the sensor without detecting a registration mark will stop the laminator and flash the STRETCH FAILURE pilot light.)

Check: If the registration mark color changes with a roll change, you must re-calibrate the SICK Optic Sensor.

Problem: Stretched sheeting is consistently longer than the targeted plate length.

Place the 3-position toggle switch in the lower position (STRETCH RATIO).

IF: The number on the digital display is higher than 20 but less than 40.

TRY: Decreasing the target length on the thumb-wheel. This should decrease sheeting stretch (plate size).

IF: The number on the digital display is higher than 40.

TRY: Decreasing the lamination nip regulator air pressure. (Not lower than 40 PSI.)

Problem: Finished plates consistently short.

Place the 3-position toggle switch in the lower position (STRETCH RATIO).

IF: The STRETCH RATIO number is 20 or higher.

TRY: Increasing the target length on the thumb-wheel number, which will increase sheeting stretch (plate length).

IF: The STRETCH RATIO number is less than 20.

TRY: Increasing the regulator air pressure for the laminating nip roller.

* Process parameter ranges for normal operating conditions

16" SRA

Lamination pressure 40-100 PSI

Stretch Ratio 15-60

Warming/Cleaning tank

Temperature 150-165°F

FOR INFORMATION OR ASSISTANCE

CALL:

1-877-777-3571

IN CANADA CALL:

1-800-265-1840

Internet:

www.3M.com/mvss

3M assumes no responsibility for any injury, loss or damage arising out of the use of a product that is not of our manufacture. Where reference is made in literature to a commercially available product, made by another manufacturer, it shall be the user's responsibility to ascertain the precautionary measures for its use outlined by the manufacturer.

Important Notice

All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, or conditions express or implied. Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct, special or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his/her intended use, and user assumes all risk and liability whatsoever in connection therewith.

Statements or recommendations not contained herein shall have no force or effect unless in an agreement signed by officers of seller and manufacturer.

3M is a trademark of 3M. Used under license in Canada.



Traffic Safety and Security Division

3M Center, Building 225-04-N-14
P.O. Box 33225
St. Paul, MN 55144-1000
www.3M.com/mvss

3M Canada Company

P.O. Box 5757
London, Ontario N6A 4T1
1-800-3MHELPS

3M México, S.A. de C.V.

Av. Santa Fe No. 55
Col. Santa Fe, Del. Alvaro Obregón
México, D.F. 01210

Please recycle.

© 3M 2014. All rights reserved.