

LEDCO ECONOCRAFT 30/50/60 PRESSURE SENSITIVE ROLL APPLICATOR PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
Laminating rollers do not operate	No power	Check power cord.	1	*
		Check main power drive switch position.	2	*
		Check forward/reverse switch position.	3	*
		Check manual/foot pedal control switch position.	4	*
		Disengage emergency stop switches,make sure feed tray and safety shield are in proper operating positions.		*
		Check 3 amp fuse (location "H" in wiring diagram).	5	*
		Check for wires that are disconnected,broken or shorting out.	6	*
	Emergency stop switch or feed tray safety switch failure.	Check continuity of e-stop switches and/or feed tray safety switch(s).	7	**
		Replace e-stop switch.	7	**
		Replace micro switch.	8	**
	Safety shield clamp,slide, and/or plexiglass location block malfunction/failure.	Check safety shield clamp, slide,and plexi block.	9	
		Replace safety shield, clamp,and/or plexi block.	9	**
	Main power drive switch failure.	Check main power drive switch.	2	**
		Replace main power drive switch.	2	**
	Forward/reverse switch failure.	Check forward/reverse switch.	3	**
		Replace forward/reverse switch.	3	**

Skill Level Index: * Basic,End-User ** Intermediate or Dealer *** Advanced or Servicing Dealer/Technician

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Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
No reverse drive.	Manual/foot pedal control switch failure.	Check manual/foot pedal control switch.	4	**
		Replace manual/foot pedal control switch.	4	**
	Foot pedal (foot switch) failure.	Check foot pedal.	10	**
		Replace foot pedal.	10	**
	Drive motor control board failure.	Check drive motor control board.	11	**
		Replace drive motor control board.	11	**
	Speed dial potentiometer failure.	Check speed dial potentiometer.	12	**
		Replace speed dial potentiometer.	12	**
	Drive motor failure.	Check drive motor.	13	**
		Replace drive motor.	13	***
	Drivetrain mechanical failure.	Check drive chains.	14	*
		Check drive sprockets.	15	*
		Replace drive motor.	13	***
	Forward/reverse switch failure.	Check forward/reverse switch.	3	**
		Replace forward/reverse switch.	3	**
Laminating rollers operate intermittently, sometimes with a clunking, skipping or grinding noise	Drivetrain failure	Check drive chain.	14	*
		Check drive sprockets.	15	*
	Film "wrap-around"	Clear minor "wrap-around"	16	*
		Clear "wrap-around" by removing and cleaning or replacing rolls	17	**
	Drive motor gear failure	Replace drive motor	13	***

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Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
Release liner takeup bar won't rotate.	No power	Check all motor drive related procedures above.		
Release liner takeup rotates, but has trouble pulling release liner from film.	Release liner takeup mechanism component failure.	Check/adjust release liner takeup components.	18	**
		Replace specific release liner takeup components.	18	**
The lamination has wrinkles	Item being laminated has been folded, rolled, bent or wrinkled.	Smooth item on feed table as it is being laminated.		
	Laminating two pieces of unequal thickness side by side.	Only laminate items of the same thickness side by side.		
	Thicker material causes wrinkles on outside edges of laminated item.	This is normal. Trim off excess, wrinkled material.		
	Inadequate supply roll tension.	Add tension to take wrinkles out of film before it goes into the nip.		
		Check supply roll gripper rods.	19	*
		Check supply roll hex adaptor spring pin position.	20	*
Drifting or steering of item being laminated, resulting in wrinkling on predominantly one side.	Unevenly trimmed items or not feeding items squarely into the nip.	Trim items square before feeding the leading edge parallel into the nip.		*
	Improper rubber roll gap (pressure) setting.	Set rubber roll gap as detailed in operation manual and instructional video.		*
	Excessive rubber roll wear.	Check rubber rolls.	17	*
		Replace rubber rolls	17	***

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Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
The film does not adhere to the document	Thicker documents absorb the heat.			
	Thin (1.5 mil) films lose heat from heat shoe to the roller nip.	Run at a higher temperature 320° to 340°		
	Thicker films do not absorb enough heat.			
	Film between heat shoe and nip cool while idle.	Run a few inches of film before inserting sheets to be laminated.		
	Inkjet print still wet.	Let inkjet prints dry at least 2 hours.		
	Incompatible Inkjet print media and inks.	Test samples before laminating many pieces.		
Film shrinks as it passed over heat shoe.	Excessive supply roll tension	Reduce supply roll tension.		
	Excessive heat.	Reduce heat.		
Laminated item has "oily" spot near the leading edge.	Excess adhesive is created when machine left hot and idle for a few minutes.	Run a few inches of film before inserting sheets to be laminated.		
Milky, hazy line appears after initial warm-up	Rollers not evenly heated.	When warming up the machine, keep the rollers moving slowly.		
The machine squeals when laminating	Dirty heat shoes.	Clean heat shoes.		
	Excessive heat.	Reduce heat.		
	Excessive supply roll tension.	Reduce supply roll tension.		
	Coating on film	Try different type or different brand of film.		

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LEDCO ECONOCRAFT 30/50/60 PRESSURE SENSITIVE ROLL APPLICATOR PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
Laminated item has pitted, irregular surface.	Adhesive build-up or dirt on rollers.	Clean the rollers.		
	Cuts or other damage to the rubber rollers	Replace rubber rolls.	34	***
General haziness or cloudiness in film after lamination	Not enough heat.	Increase the temperature.		
Bubbles in the center of the web and/or film not sticking to center	Excessive laminating roll pressure	Adjust rubber rolls	35	**
	Worn rollers	Check rubber roll dwell line.	33	*
		Replace rubber rolls.	34	***
		Adjust rubber rolls	35	**

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LEDCO ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

1. Check power cord.

- a. Power cord must be securely inserted into the wall outlet (110v AC or 220v AC depending on model).
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2. Check main power drive switch position.

Main power drive switch must be in the up or "I" position as marked on switch.

To check continuity of main power drive switch:

- a. **Disconnect the power cord.**
- b. Remove the right side housing cover by first removing the roll pressure handle and tension control knob (using a 1/8" and 3/32" allen wrench respectively), then use a phillips head screwdriver to remove the 9 truss head screws that secure the housing cover to the housing. Remove the housing cover.
- c. Locate and identify the main power drive switch (location "A" in wiring schematic) and respective wire leads. Visually examine all wires and connectors to and from their respective components. Use the wiring schematics included for reference. Reconnect or replace wires exactly as shown in specific schematic.
- d. Using a multimeter set to check continuity, place your probes on the two wired terminals of the switch. Turning the switch on and off should allow you to engage and break continuity. If not, the switch is faulty and should be replaced (part # PRS290).

To replace main power drive switch:

- a. **Disconnect the power cord.**
 - b. Follow steps b and c above. Disconnect the wire leads into the switch making note of their locations for proper reconnection later.
 - c. Remove switch by gently depressing the four small mounting tabs directly behind the face plate allowing you to carefully pull the switch out of the housing.
 - d. Replace with new switch, reassemble and rewire in exact reverse order.
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3. Check forward/reverse switch position.

The forward/reverse switch must be in the up (forward) or down (reverse) position to engage motor drive. If the switch is in the middle, neutral position, there will be no motor drive.

To check continuity of forward/reverse switch:

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above.
- c. Locate and identify forward/reverse switch (location "D" in wiring schematic) and respective wire leads. Visually examine all wires and connectors to and from their respective components. Use the wiring schematics included for reference. Reconnect or replace wires exactly as shown in specific schematic.
- d. Using a multimeter set to read continuity, place one probe on the middle terminal (with white wire lead) and the other probe on the terminal directly below it. Engaging the switch up, or forward, should give you continuity. Similarly, with a probe still on the middle terminal and the other probe on the terminal directly above it, engaging the switch down, or reverse, should also give you a positive continuity reading.
- e. Next, move one probe to the inner, middle terminal of the switch (with black wire lead) and repeat the procedure, checking the terminals directly above and below the inner, middle terminal.
- f. If any of these check points yield no continuity, the switch is faulty and should be replaced (part # PRS277).

LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

To replace forward/reverse switch:

- a. **Disconnect the power cord.**
 - b. Remove right side housing cover as described in 2-b above.
 - c. Locate and identify forward/reverse switch (location "D" in wiring schematic) and respective wire leads. Using a straight blade screwdriver, loosen the screws that secure the wire leads to their respective terminals.
 - d. Disconnect the wire leads, making careful note of their locations for proper reconnection later.
 - e. Using a small adjustable wrench, loosen and remove the thin hexnut that secures the switch to the face of the housing.
 - f. Remove the switch from the back of the housing, replace with new, reassemble in exact reverse order and rewire exactly as shown in schematic.
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4. Check manual/foot pedal control switch position.

The manual/foot pedal control switch (or mode selector switch as denoted location "I" in the wiring schematic) must either be in the up, "manual", or down, "foot pedal" (with foot pedal depressed) position to engage motor drive.

To check continuity of manual/foot pedal (mode selector) switch:

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above.
- c. Locate and identify manual/foot pedal control switch (location "I" in wiring schematic) and respective wire leads. Visually examine all wires and connectors to and from their respective components. Use the wiring schematics included for reference. Reconnect or replace wires exactly as shown in specific schematic.
- d. Using a multimeter set to read continuity, place one probe on the middle (common) terminal closest to you, and the other probe on the terminal directly below it. Engaging the switch up, "manual", should give you continuity. Similarly, with a probe still on the middle terminal and the other probe on the terminal directly above it, engaging the switch down, "foot pedal", should also give you a positive continuity reading.
- e. Next, move one probe to the inner, middle (common) terminal of the switch and repeat the procedure, checking the terminals directly above and below the inner, middle terminal.
- f. If any of these check points yield no continuity, the switch is faulty and should be replaced (part # PRS048).

To replace manual/foot pedal (mode selector) switch:

- a. **Disconnect the power cord.**
 - b. Remove right side housing cover as described in 2-b above.
 - c. Locate and identify forward/reverse switch (location "I" in wiring schematic) and respective wire leads. Using a straight blade screwdriver, loosen the screws that secure the wire leads to their respective terminals.
 - d. Disconnect the wire leads, making careful note of their locations for proper reconnection later.
 - e. Using a small adjustable wrench, loosen and remove the thin hexnut that secures the switch to the face of the housing.
 - f. Remove the switch from the back of the housing, replace with new, reassemble in exact reverse order and rewire exactly as shown in schematic.
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5. Check 3 amp fuse.

- a. **Disconnect the power cord.**
 - b. Gently pop out the spring loaded fuse holder and fuse from the rear of the machine next to the power cord. Give it a half turn counter clockwise and pull out.
 - c. Visually examine the 3 amp fuse (part # PRF127).
 - d. If the fuse appears discolored and/or the element inside is broken, replace it with a new 3 amp fuse. Always replace fuses with exactly the same rated fuse.
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LED CO ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

6. Check for wires that are disconnected, broken, or shorting out.

- a. **Disconnect the power cord.**
 - b. Remove right side housing cover as described in 2-b above. Similarly remove the left side housing cover. Use a 1/8" allen wrench to remove the roller gap adjustment handle.
 - c. Visually inspect all wires, connectors, and components for the motor drive and safety systems. Use the wiring schematics included for reference.
 - d. If a wire is disconnected, broken, or shorted out, replace and/or reconnect exactly as shown in schematic.
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7. Check continuity of emergency stop switches and/or feed tray safety switch(s).

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above. Similarly remove the left side housing cover. Use a 1/8" allen wrench to remove the roller gap adjustment handle.
- c. Locate and identify the emergency stop switches (location "E" in schematic) and feed tray safety switches (location "F" and "G" in schematic) and related wiring.
- d. **To check E-stop switches:**
 1. **Disconnect the power cord.**
 2. Using a multimeter set to check continuity, place the probes in the respective wire lead screw holes at the base of the switch.
 3. With the large, red E-stop button engaged (pushed in), there should be no continuity. Disengaging the switch (1/2 turn clockwise) should yield continuity. If not, that switch is faulty and should be replaced (part # PRS 054).

To replace E-stop switches:

1. Disconnect wire leads from their respective terminals on the switch using a small phillips head screwdriver.
2. Gently remove the yellow plastic retaining tab exposing the brass retaining lever within.
3. Push retaining lever to the left (counter clockwise) to disengage contact block from the actuator.
4. Remove failed contact block, replace with new, reassemble and rewire in exact reverse order.

NOTE: If the mechanical actuator (large red button) is faulty, that should be replaced as well. Simply unscrew the black plastic retaining ring, remove old actuator and replace with new. Again, reassemble in exact reverse order.

f. To check safety switch(s):

1. The safety switches (micro switches) are located on the right and left side panels respectively. They are adjacent to and activated by the small metal tab of the safety shield clamp, slide and plexi location block assembly that secures the safety shield in place (it has 4 preset locations) when operating the machine. Locate and identify the safety switches and respective wire leads.
 2. With the power cord disconnected, and using a multimeter set to check continuity, place one probe on the upper most terminal (common) and the other probe on either the middle terminal or the lower terminal. Manually engaging the micro switch (you should hear an audible clicking sound) will make and/or break continuity. If not, the switch is faulty and should be replaced (part # PRS 053).
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LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR REPAIR PROCEDURES

8. Replace safety switch(s).

- a. **Disconnect the power cord.**
 - b. Remove right side housing cover as described in 2-b above. Similarly remove the left side housing cover. Use a 1/8" allen wrench to remove the roller gap adjustment handle.
 - c. Locate and identify the feed tray safety switches (location "F" and "G" in schematic) and related wiring.
 - d. Remove the wire leads from the switch using a phillips head screwdriver.
 - e. Using a 7/64" allen wrench, loosen and remove the two cap head allen screws that secure the switch to the side panel.
 - f. Remove faulty switch, replace with new, reassemble in reverse order and rewire exactly as shown in schematic.
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9. Check safety shield clamp, slide, and plexi location block.

- a. **Disconnect the power cord.**
- b. Visually and physically examine the left and right side safety shield clamps, slides, and plexi location block pieces by first pulling up and out the feed tray, and then up and away with the safety shield to get an unobstructed view of the clamp, slide, and plexi location block mechanism. **Use the safety shield clamp, slide, and location block diagram at the back of this guide as a reference.**
- c. Pay particular attention to the plexi location block(s). If broken or cracked, replace with new (part # EP30 017.4).
- d. Next, check the inner most piece of the assembly, the safety shield slide. The slides have one inch tabs that protrude through the side panels and activate the feed tray safety switches (see section 8 above). With the safety shield and feed tray in proper operating position, the slides (and their tabs) should move forward enough to activate the micro switch button of the feed tray safety switches. You should hear an audible "click". If the tabs are bent or mis-shapen in any way, they can easily be bent back into shape so they effectively activate the safety switch. If the tab or any part of the slide piece is broken, it should be replaced with new (part # EP30 016.4 Left or Right).

To replace safety shield clamp, slide, and/or plexiglass location block:

****IMPORTANT SAFETY NOTE****

AS THE SAFETY SHIELD CLAMP, SLIDE, AND PLEXIGLASS LOCATION BLOCK ASSEMBLIES ARE SECURED WITH TAMPER PROOF SCREWS, ANY REPAIR, MAINTENANCE, OR MODIFICATION OF THESE ASSEMBLIES WITHOUT THE EXPRESS WRITTEN CONSENT OF LEDCO INC WILL RESULT IN VOIDING THE WARRANTY (IF APPLICABLE) AND THE CUSTOMER ASSUMING ALL RESPONSIBILITY FOR ANY INJURY OR LOSS AS A RESULT THEREOF.

- a. **Disconnect the power cord.**
 - b. Remove right side housing cover as described in 2-b above. Similarly remove the left side housing cover. Use a 1/8" allen wrench to remove the roller gap adjustment handle.
 - c. Locate and identify the safety shield clamp, slide, and plexiglass location block assemblies and respective tamper proof screws and nuts that secure them to their respective side panels.
 - d. After procuring the special tamper proof bit from Ledco (see important safety note above), loosen and remove the tamper proof screws that secure the assembly to the side panel. Make **very** special note of the component positions for correct reassembly later.
 - e. Replace broken or worn out components with new and reassemble in exact reverse order.
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LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

10. Check foot pedal.

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above.
- c. Locate and identify the foot pedal wires as they pass thru the lower face of the right side housing cover. These wires will be referenced as location "J" in the wiring schematic, as older units were equipped with a removeable cord plug and receptacle (the wiring is identical however).
- d. Visually examine the wires and connections from the foot pedal to the mode selector switch (location "I" in the schematic). If a wire is disconnected, broken, or shorted out, replace and/or reconnect exactly as shown in schematic.
- e. The next check involves removing the hinged top cover of the foot pedal mechanism using a phillips head screwdriver to loosen and remove the 2 phillips head screws that secure the cover to the base. Visually examine the wire leads and respective connectors inside the base of the foot pedal. If a wire is broken, disconnected, or shorted out, replace and/or reconnect exactly as shown in the "TREADLITE II foot operated switch" diagram included at the back of this guide.
- f. To check the continuity of the foot pedal switch using a multimeter, place one probe on the terminal labeled "com" (common) and the other probe on the terminal labeled "N O" (normally open). With the multimeter set to check continuity, manually depress the small switch lever inside the base of the switch. You should be able to make and break continuity by depressing and releasing the switch. If not, the switch has failed, and should be replaced (part PRS280).

To replace foot pedal:

- a. **Disconnect the power cord.**
 - b. Remove top cover of the foot pedal as instructed in "e" above.
 - c. Disconnect existing wire leads from failed pedal, making careful note their locations for proper reconnection later. Remove wire leads and cord from failed pedal. Shut can old pedal.
 - d. Replace with new pedal, rewire exactly as disconnected (use TREADLITE diagram as reference) and reassemble in exact reverse order.
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11. Check drive motor control board.

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above.
- c. Locate and identify the motor control board (location "C" in the wiring schematic), and respective wire terminals and leads. Visually check for any wires that are disconnected, broken, or shorting out. Reconnect or replace wires exactly as shown in the wiring schematic.
- d. Plug the machine in.

*****WARNING***WARNING***WARNING***WARNING**

EXTREME CAUTION MUST BE USED WHEN TESTING ANY MACHINERY WHERE LIVE VOLTAGE IS PRESENT. ONLY A QUALIFIED SERVICE TECH OR ELECTRICIAN SHOULD PERFORM SUCH TESTS.

- e. Using a multimeter set to read Volts DC, place one probe on terminal A1 and the other probe on terminal A2 of the motor control board.
- f. Set the forward/reverse switch to forward and the mode selector switch to the up, "drive switch" position.
- g. Engage the motor drive on/off switch. With the speed dial potentiometer at its lowest (counter-clockwise) setting, you should have 0 volts on the meter. As you turn the speed dial potentiometer slowly clockwise, you should get a gradual increase in voltage. With the speed dial potentiometer at the highest (clockwise) position, you should get 90 volts on the meter.
- h. If no voltage is present, the motor control is faulty and should be replaced (part # PRM 218C). If the prescribed range of voltage is present and there is still no motor drive, the drive motor may be faulty.

LED CO ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

To replace motor control board:

- a. **Follow steps a,b,c as detailed above.**
 - b. Disconnect all wire leads to the board making careful note of their locations (use schematic for reference).
 - c. Using a phillips head screwdriver, loosen and remove the two 8-32 truss head phillips screws that secure the motor control board to the side panel.
 - d. Remove failed board and replace with new. Reassemble in exact reverse order and rewire exactly as shown in schematic.
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12. Check speed dial potentiometer.

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above.
- c. Locate and identify the speed dial potentiometer (location "B" in the wiring schematic), and respective yellow, orange, and grey wire leads. Visually check for any wires that are disconnected, broken, or shorting out. Reconnect or replace wires exactly as shown in the wiring schematic.
- d. Locate and identify the motor control board (location "C" in the wiring schematic), and respective wire terminals and leads. Note the grey, yellow, and orange wires that come from the speed dial potentiometer, and connect to terminals S1, S2, and S3 respectively on the motor control board.
- e. Disconnect the yellow wire and the orange wire of the speed dial from their respective terminals (S2 and S3) on the motor control board and place your multimeter probes in the quick-connect ends of these wires. Set the multimeter to read ohms resistance.
- f. With the pot set at zero (all the way counter clockwise), you should get a resistance reading of approximately 10.00 K ohms, gradually decreasing as you rotate the speed dial clockwise to wide open.
- g. At wide open you should get a resistance reading of approximately 00.0 ohms. If the meter shows open or closed circuit, or if there is resistance but it does not change when rotating the potentiometer, the potentiometer is bad and should be replaced (again reference part # PRM 218C).

To replace speed dial potentiometer:

- a. **Follow steps "a" thru "e" as detailed above.**
 - b. Disconnect the grey, yellow, and orange wires of the potentiometer from their respective terminals on the motor control board.
 - c. Using a small straight blade screwdriver, loosen the small screw that secures the speed dial knob to the shaft of the potentiometer and remove the knob.
 - d. Using a small adjustable wrench, loosen and remove the retaining nut that secures the potentiometer to the face of the housing.
 - e. Remove failed potentiometer and wires, replace with new, prewired potentiometer. Reassemble in exact reverse order and rewire exactly as shown in schematic.
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13. Check drive motor.

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above.
- c. Locate and identify forward/reverse switch (location "D" in wiring schematic) and respective wire leads. Visually examine all wires and connectors to and from their respective components. Use the wiring schematics included for reference. Reconnect or replace wires exactly as shown in specific schematic.
- d. Plug the machine back in.

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LEDCO ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

- e. Using a multimeter set to read Volts DC, place one probe on the right, center terminal and the other probe on the left, center terminal of the forward/reverse switch.
- f. Set the forward/reverse switch to forward and the mode selector switch to the up,"drive switch" position.
- g. Engage the motor drive on/off switch. With the speed dial potentiometer at its lowest (counter-clockwise) setting, you should have 0 volts on the meter. As you turn the speed dial potentiometer slowly clockwise, you should get a gradual increase in voltage. With the speed dial potentiometer at the highest (clockwise) position, you should get 90 volts on the meter. If the prescribed range of voltage is present and there is still no motor drive, the drive motor has failed and should be replaced (part # PRM 2000).

To replace drive motor:

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above.
- c. Locate and identify the drive motor shaft, sprockets and chains, and mounting plate and bolts inside the lower, right side housing.
- d. Using a 5/32" allen wrench, loosen the four 1/4 28 button head allen bolts that run thru the motor mounting plate and secure the motor to the side panel.
- e. Next, using a 3/32" allen wrench, loosen the sets screws in the hubs of the motor sprockets and rubber roll sprocket that secure them to their respective shafts. Make note of the sprockets alignment for proper reassembly later.
- f. Slide the outer motor sprocket, rubber roll sprocket and chain off of their respective shafts making special note of the half moon shaped woodruff keys that help secure the sprockets to the shafts. You can slide the motor up and to the left to give you enough chain slack to remove these sprockets.
- g. Next, you can take the chain off of the inner motor sprocket by again sliding the motor up and over enough to just slip the chain off of the inner motor sprocket. Remove the sprocket from the shaft.
- h. Before removing the motor, use a straight blade screwdriver to gently pry open the wire retaining strip (located on the interior spanner bar below the exit table on the interior of the machine near the motor) to access the motor wire leads and cap connectors within. Cut the wires at their connectors making note of their locations for proper reconnection later.
- i. You can now remove the four motor mounting bolts and the motor mounting plate to remove the drive motor, extracting it from the inside, bottom of the machine.
- j. Replace with new drive motor (part # PRM 2000), reassemble in exact reverse order paying particular attention to sprocket placement and chain tension. Rewire the motor exactly as shown in schematic.

NOTE: When re-installing drive motor sprockets, make sure they are in line with the other respective sprockets, parallel to the side panel. Also, make the final chain tension adjustments with the rubber rolls in the down and locked position, with an allowance of 3/16" to 1/4" play in the drive chains.

14. Check drive chains.

- a. **Disconnect the power cord.**
 - b. Remove right side housing cover as described in 2-b above.
 - c. Visually inspect the inner and outer drive chains for excessive wear, damage or missing parts.
 - d. If a connecting link is missing or damaged, replace the connecting link (part # PRC084).
 - e. If a drive chain is excessively worn or damaged, replace with proper length of chain (part # PRC 083.1). You can remove and install chains using the procedures described in "13" above or totally disconnect chains at their connecting links and reconnecting new chain in similar fashion.
 - f. Remove left side housing cover as described in "7-b" above. Inspect the left side "helper" chain in the same manner as the right side chains. Remember to always reassemble components in exact reverse order of disassembly.
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LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

15. Check drive sprockets.

- a. **Disconnect the power cord.**
- b. Remove right side housing cover as described in 2-b above. Similarly remove the left side housing cover. Use a 1/8" allen wrench to remove the roller gap adjustment handle.
- c. Visually inspect two motor sprockets, one rubber roll sprocket, and one rewind sprocket on the right side and the two rubber roll sprockets and one idler sprocket on the left side of the machine for loose or missing parts, excessive wear or damage.

If a sprocket is not tight on its shaft:

- a. Check motor sprockets and rubber roll sprockets (both left and right sides) to be sure they have the small, half moon shaped woodruff keys in place. If a woodruff key is missing or damaged, replace with new (part # M161KEY).
- b. With the woodruff keys properly in place, align the inner motor sprocket, chain, and rewind sprocket 1" from the side panel and tighten the motor sprocket to the motor shaft using a 3/32" allen wrench. Similarly, align the outer motor sprocket, chain and rubber roll sprocket 1 3/4" from the side panel tightening the rubber roll sprocket to its respective shaft with a 1/8" allen wrench.
- c. Turning to the left side of the machine, align the top and bottom rubber roll sprockets, chain, and idler gear 1 1/2" from the side panel. Tighten the rubber roll sprockets to their respective shafts using a 1/8" allen wrench.

If a sprocket is broken or excessively worn, it must be replaced:

- a. Remove the chain at the connecting link.
- b. Remove the sprocket in question (and respective woodruff key) and replace with new.
- c. Align and reassemble in exact reverse order. Refer to previous section for alignment and chain tension adjustments.

***Note* Part numbers for sprockets are as follows:**

PRS258A motor sprockets for EP30, 50, and 60 (2 each)
PRS258B rubber roll sprockets for EP30, 50 (3 each)
PRS258C rubber roll sprockets for EP60 (3 each)
PRS255A w/brng rewind sprockets EP30, 50, and 60 (1 each)
PRS249 w/brng left side idler sprocket for EP30, 50, and 60 (1 each)

16. Clear minor "wrap-around".

- a. Turn off the drive.
- b. Visually inspect the rubber rolls for any film "wrap around" or anything stuck to the rollers.
- c. Carefully cut the web of incoming film just above and in front of the top rubber roll, and just behind the rollers at the exit tray (if possible).
- d. Open the rolls, grasp the free end of film in front and above the top roll, put machine in reverse and slowly unwind the wrap around by manually pulling the film off the roll as they are reversed.

NOTE: Never cut the film directly on the rubber roll, as it will result in damage to the rubber roll. Cuts and divots in the rollers can create inconsistent finish in the laminated or premasked piece, and in severe cases, the rolls will need to be replaced (expensive and time consuming).

LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

17. Clear "wrap-around" by removing or replacing rubber rolls.

To remove the rubber rollers:

- a. **Disconnect the power cord.**
- b. Flip the switch to the forward position.
- c. Remove right side housing cover as described in 2-b above. Similarly remove the left side housing cover. Use a 1/8" allen wrench to remove the roller gap adjustment handle.
- d. Remove drive chain, outer motor sprocket and rubber roll sprocket from the right side (see 13, 14, and 15 above).
- e. Remove the idler chain on the left side of the machine by firmly lifting up on the spring loaded idler bar/ idler sprocket to create enough chain slack to slip the chain off of the respective sprockets.
- f. Remove the left side rubber roll sprockets (see 15 above).
- g. Using a 5/32" allen wrench, remove the stop collars from the left and right journal ends of the top rubber roll.
- h. Loosen and remove (turn counter clockwise) the gap adjustment lock handle shafts from the cam shaft (see 42 and 43 in the partial exploded view diagram at the back of this guide). You may need to remove the black plastic handles (89) from the shafts to facilitate complete removal of the shafts. Do this on both right and left sides.
- i. Using a 5/32" allen wrench, remove the stop collars that secure the cam shaft locks (43) to the gap adjustment cam shaft. Do this on both sides of the machine making careful notes of component alignment for proper reassembly later. The cam shaft locks can now be slid off the shafts and removed.
- j. Using the same 5/32" allen wrench, loosen and remove the stop collars that secure and align the gap adjustment arms (41 in diagram) to the **rubber roll** cam shaft. Then using a 1/4" allen wrench loosen and remove the 1/2"x 1" shoulder bolts that secure the gap adjustment arms to the side panels. The arms can now be slid off the ends of the gap adjustment cam shaft and the rubber roll cam shafts respectively.
- k. You can now slide the connecting plate assemblies (7, 8, 9 in diagram) along with the pressure springs and bolts and top safety shield mounting blocks off the journal ends of the rubber rolls.
- l. This will allow you to lift the rubber rollers up and out thru the large key holes in the side panels.
Note: When removing the top roll, make note and keep track of the white delrin rubber roll guide bushings and their locations. Also, when removing the bottom rubber roll, you must gently push or tap the sealed bearings *in* towards the shoulder of the roll, while supporting the roll, to free up the bottom roll for removal.
- m. Remove and thoroughly clean rolls and/or replace with new, reassemble in exact reverse order.

18. Check/adjust release liner takeup components.

- a. Increase or decrease the drag for the release liner takeup by turning the appropriate direction as denoted by the label behind the release liner takeup tension knob.
 - b. If a release liner cannot be adequately separated from the film being laminated, and you have increased the tension to maximum, there may be component wear or failure. Remove right side housing cover as described in 2-b above (**disconnect power cord first**).
 - c. Using the partial exploded view diagram at the back of this guide as a reference, examine the components of the release liner takeup clutching mechanism for any that are worn, broken, or missing. Pay particular attention to the friction plates (2, 74 in diagram) and the woodruff key thereof, also the leather friction washers (106) and the takeup drive sprocket (98) and chain.
 - d. If any release liner takeup components are worn out, broken, or missing, replace with new and reassemble in exact reverse order of disassembly.
-

LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR REPAIR PROCEDURES

19. Check supply roll gripper rods.

- a. Check to see if the supply roll gripper rods that run the width of the supply roll are not bent, damaged, or overly loose.
 - b. If damaged or missing, replace with new (part # EP30 003.4, or EP50 003.4, or EP60 003.4).
 - c. Occasionally the cardboard cores of the premasks or overlaminates run slightly larger than 3" resulting in the roll of film slipping on the supply roll, not getting enough tension and resulting in wrinkles in the finished lamination. To alleviate this, try wrapping some masking tape around intermittent sections of the gripper rods (Thereby slightly increasing the overall gripping diameter). Also heat shrink tubing will work in the same manner.
-

20. Check supply roll hex adaptor spring pin.

- a. The supply roll hex adaptor, located to the inside of the tension knob and spring, is held in place on just one end of the supply roll by a split drive pin. This pin is located inside a small, milled slot.
 - b. This pin should never be all the way to the right or left of the inside of this slot as you will have no remaining range of tension adjustment from one side to the other.
 - c. The best technique for initial supply roll tension setting is to loosen the tension knobs so they are just touching the tension springs, making note to keep the hex adaptor drive pin fairly centered in its slot, then give it three to four hand turns of tension on one side then the same on the other side.
 - d. If the hex adaptor spring pin is sheared or missing, it will have to be replaced (drive the remainder of the sheared pin out with a center punch and replace with a new 1/8 x 3/4" split drive pin).
-

LED CO ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

21.

- b. On the **right** side of the machine:
 - (1.) Remove the stop collars from the ends of the top laminating and pull rollers. (1/8" allen wrench)
 - (2.) Loosen the socket head cap screw that runs through the orange rubber roll pressure spring so the bottom shoulder of the socket head cap screw is barely touching the spring washer. (5/32" allen wrench)
 - (3.) Remove the rubber roll spring holder (part # LC25 032.4). (5/32" allen wrench)
 - (4.) Remove the rubber roll pressure bar, spring holder, pressure spring and screw by gently sliding them off the ends of their respective shafts.
 - (5.) Remove the safety plate (part # LC25 034.4) covering the roll change openings with a phillips head screwdriver.
 - (6.) Remove the four small mounting screws from the heat control board and gently swing away.
 - c. On the **left** side of the machine:
 - (1.) Remove the chain at the connecting link.
 - (2.) Remove the sprockets (1/8" allen wrench)
 - (3.) Remove the rubber roll gear retaining clip rings using clip ring pliers.
 - (4.) Remove the rubber roll gears (part # LC25 PRG131).
 - (5.) Loosen the socket head cap screw that runs through the orange rubber roll pressure spring so the bottom shoulder of the socket head cap screw is barely touching the spring washer. (5/32" allen wrench)
 - (6.) Remove the rubber roll spring holder (part # LC25 032.4). Use the 5/32" allen wrench to remove the two socket head cap screws and acorn nuts.
 - (7.) Remove the rubber roll pressure bar, spring holder, pressure spring and screw by gently sliding them off the ends of their respective shafts.
 - (8.) Remove the safety plate (part # LC25 034.4) covering the roll change openings with a phillips head screwdriver.
 - d. Remove the top anti-wrap shield (part # LC25 012.4) by unscrewing the two phillips head screws on each side.
 - e. Remove the top motor cover (part # LC25 092.4) by unscrewing the two phillips head screws on each side.
 - f. Remove rear rubber rolls by moving the roll to the roll change opening and pulling through the left side.
 - g. **Reassemble in reverse order of disassembly noting the following:**
 - (1.) The 18 tooth sprocket is installed on the front laminating roll and the 17 tooth sprocket is installed on the rear pull roll.
 - (2.) Reinstall the spring holder assembly by tightening the sockethead cap screws, then back off one complete turn (the flat washers between the cap screws and the spring holder should be just barely loose). This allows the rubber rolls to "float" under the prescribed spring pressure and to accommodate substrates up to 1/8" thick. The acorn nuts can now be tightened.
 - (3.) Adjust the rubber roll spring pressure:
 - (a.) Turn the socket head cap screw running through the spring clockwise until the bottom shoulder of the cap screw is just barely touching the flat washer at the top of the spring.
 - (b.) Using a 5/32" allen wrench, turn the cap screws 5 complete clockwise turns on the right side and 6 complete clockwise turns on the left side. This will return the rubber roll pressure spring adjustments to factory specifications.
-

LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

22. Check Drive Motor wires.

- a. Obtain access to the drive motor as described in procedure 21.
 - b. Check wiring for disconnected, broken or shorted wires.
 - (1.) #18 Red wire from switch to motor capacitor.
 - (2.) #18 White wire from switch to motor capacitor.
 - (3.) Red (110) or Gray (220v) wire from the motor capacitor to the motor.
 - (4.) Black (110v) or Blue (220v) wire from the motor capacitor to the motor.
 - (5.) Wire from the motor capacitor to the fan motor.
 - (6.) White wire from the motor to the terminal T3 on the heat control board.
 - c. If a wire is disconnected, re-connect exactly as shown in the wiring schematic.
-

23. Check drive motor .

- a. Obtain access to the drive motor as described in procedure 21.
 - b. Trace the Red and Black (110v) or Gray and Blue (220v) wires to the capacitor and remove them.
 - c. Check for continuity in the motor using a multimeter.
 - (1.) Trace the white wire from the motor to the wire cap connection and place one probe of the multimeter in this connection.
 - (2.) Hold the Red and Black (110v) or the Gray and Blue (220v) wires together and place the other probe of the multimeter on these wires.
 - d. If the motor has no continuity, the motor must be replaced
 - (1.) Use a 1/8" allen wrench to remove the 4 mounting screws of the left of the machine.
 - (2.) Replace the drive motor and gearbox (part # PRM229).
-

24. Check motor capacitor.

- a. Obtain access to the drive motor capacitor as described in procedure 21.
 - b. Remove all the leads from the capacitor.
 - c. Check for continuity in the capacitor using a multimeter.
 - (1.) Place one probe on the body of the capacitor.
 - (2.) Place the other probe on any lead from the capacitor.
 - d. If the test shows continuity, the capacitor must be replaced (part # PRM 216A) exactly as shown on the schematic.
-

25. Clear minor "wrap-around".

- a. Visually check all four rolls for any film wraparound or foreign objects.
 - b. Carefully remove foreign objects.
 - c. If a "wrap-around" occurs while the laminator is cold, reverse the direction of the rubber rolls, permitting the laminator to release the film from the rolls.
 - d. If a "wrap-around" occurs while the laminator is hot,
WARNING: Be very careful not to touch the heat shoes when the machine is hot.
 - (1.) Leave the heat on so that the adhesive does not harden.
 - (2.) Remove the feed tray.
 - (3.) Cut the film on the top and bottom, just in front of the idler bars.
 - (4.) Loosen the film from the heat shoes and grip the two loose ends, holding them together.
 - (5.) Turn the drive switch to the reverse jog position and allow the laminator to back out the film that is wrapped around the rolls. Pull the film off the roller.
-

LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

26. Clear "wrap-around" of front laminating rolls.

- a. Remove the left plastic housing as described in 3 above.
 - b. Remove the heat shoe(s) to gain access to the "wrap-around"
 - (1.) Using a 9/64" allen wrench, remove the 4 socket head cap screws that secure either the top or the bottom heat shoe.
 - (2.) Swing away the heat shoes (without necessarily disconnecting them).
 - c. Create a free end of film and use the reverse jog to unwind.
-

27. Clear "wrap-around" of rear laminating rolls.

- a. Obtain access to rolls as described in procedure 21.
 - b. Create a free end of film and pull off of the roller(s).
-

28. Clear "wrap-around" by removing and cleaning or replacing rolls.

- a. Obtain access to rolls as described in procedure 21.
 - b. Remove the top heat shoe to gain access to the laminating rolls.
 - (1.) Using a 9/64" allen wrench, remove the 4 socket head cap screws that secure the heat shoe.
 - (2.) Swing away the heat shoe (without necessarily disconnecting them).
 - c. Remove the rolls by sliding them to the roll change openings and pulling them through.
 - d. If the "wrap-around" prevents the roll from fitting through the opening, some of the film must be removed **being very careful not to damage the rolls**.
 - e. After the rolls are removed, remove the remaining film and clean the rolls thoroughly.
 - f. If the rolls are damaged, they must be replaced (part # 0500-040.4).
-

29. Replace drive motor.

- a. Obtain access to drive motor as described in procedure 21.
 - b. Use a 1/8" allen wrench to remove the 4 mounting screws of the left of the machine.
 - c. Replace the drive motor and gearbox (part # PRM229).
-

30. Check cooling fan.

- a. Obtain access to the cooling fan as described in procedure 21.
 - b. Disconnect the small disconnect plug from the fan housing.
 - c. Check voltage being received at the fan motor with a multimeter.
 - (1.) Place the multimeter probes into the two recessed plug leads.
 - (2.) Set the Multimeter to volts AC.
 - (3.) Connect the power cord.
 - (4.) Engage the forward drive switch.
 - d. If the reading is approximately 120v, the fan must be replaced (part # PRF 133) and rewired exactly as shown on the schematic.
-

31. Check supply roll dog.

- a. Check to see if the brass supply roll dog located in the center of the supply roll mandrel is missing or loose.
 - b. If the brass supply roll dog is missing, replace it (part # 0285-015.4).
 - c. If the brass supply roll dog is loose, tighten the retaining screw with a phillips head screwdriver.
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LEDco ECONOCRAFT 30/50/60 ROLL APPLICATOR

REPAIR PROCEDURES

32. Check supply roll spring pin.

- a. The supply roll hex adapter (part # 0285 023.4) on the supply roll opposite the black knob is secured to the round supply roll shaft with a spring pin.
 - b. If you can turn the supply roll hex adapter without turning the round supply roll shaft, the spring pin has sheared, making it impossible to put any tension on the supply roll mandrel.
 - c. Replace the supply roll mandrel.
-

33. Check rubber roll dwell line.

- a. Create a "dwell line". The "dwell line" is the imprint the front laminating rolls leave in the web of a threaded and heated laminating machine after being stationary for 90 seconds.
 - b. Thread the laminator with a good quality film.
 - c. Warm up the laminator.
 - d. After the laminator is warm, run a short length of film and stop the drive motor for at least 90 seconds.
 - e. Advance the film 12 to 15 inches and look at the impression the laminating rollers left on the film.
 - f. This impression, "dwell line" should be two parallel lines running the full width of the film measuring approximately 3/16" to 1/4" in width.
 - (1.) If the dwell line is very narrow, the rubber roll pressure may not be great enough to grip and pull the film taut, resulting in wrinkles in the web that can't be corrected with supply roll tension.
 - (2.) If the dwell line is over 1/4" wide, there is too much pressure resulting in shifting of the film towards the path of least resistance, adding wrinkling in the area with less pressure.
 - (3.) If the dwell line is narrow on one side and much wider on the other, the roll pressure is not adjusted correctly, contributing to wrinkling problems.
 - (4.) If the dwell line has an hour glass appearance (wide on both ends and much narrower in the middle), there is either too much pressure on both ends or the rubber rolls are worn excessively.
-

34. Replace rubber rolls.

- a. If the rubber rolls have been damaged or produce an hour glass dwell line that can not be corrected with adjustments to the pressure as outlined in procedure 35, the rolls need to be replaced.
 - b. Obtain access to rolls as described in procedure 21.
 - c. Remove the top heat shoe to gain access to the laminating rolls.
 - (1.) Using a 9/64" allen wrench, remove the 4 socket head cap screws that secure the heat shoe.
 - (2.) Swing away the heat shoe (without necessarily disconnecting them).
 - d. Remove the rolls by sliding them to the roll change openings and pulling them through.
 - e. Replace the rubber rolls (part # 0500-040.4).
-

35. Adjust rubber rolls.

- a. Remove the left plastic housing as described in 3 above.
 - b. If the spring holder assembly is tightened hard against the side panel, adjust by tightening the sockethead capscrews, then backing off one complete turn. The flat washers between the cap screws and the spring holder should be just barely loose. This allows the rubber rolls to "float" under the prescribed spring pressure and to accommodate substrates up to 1/8" thick. The acorn nuts can now be tightened.
 - c. Adjust the rubber roll spring pressure:
 - (a.) Turn the socket head cap screw running through the spring clockwise until the bottom shoulder of the cap screw is just barely touching the flat washer at the top of the spring.
 - (b.) Using a 5/32" allen wrench, turn the cap screws 5 complete clockwise turns on the right side and 6 complete clockwise turns on the left side. This will return the rubber roll pressure spring adjustments to factory specifications.
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