

LEDCO DIGITAL 42 & 60 SERIES LAMINATOR PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
Laminator will not heat up,heat switches (red) and respective digital displays do not illuminate when engaged.	No power.	Check power cord.	1	*
		Check master power switch position.	2	*
		Check 8 amp main drive power fuses (location "D" in fuse diagram).	3	*
		Check .5 amp fuses(location "A" in fuse diagram).	3	*
		Check for wires that are disconnected, broken or shorting out.	4	*
		Check master power switch.	5	**
Laminator will not heat up,heat switches do not illuminate when engaged, but digital displays do.	Emergency stop switch(s) engaged,housing door(s) not firmly closed and screwed shut,feed tray and/or safety shield not in proper position.	Disengage emergency stop switches,make sure both housing doors are firmly closed and screwed shut,make sure feed tray and safety shield are in proper operating positions.		*
		Fuse(s) for 24 volt transformer blown.	3	*
24V transformer failure.		Check 24V transformer.	7	**
		Replace 24V transformer.	7	**
Safety switch power relay failure.		Check safety switch power relay(location "E" in wiring diagram).	8	**
		Replace safety switch power relay.	8	**
Emergency stop switch or proximity switch failure.		Check continuity of e-stop switches and/or proximity switches.	9	**
		Replace e-stop switch.	9	**
		Replace proximity switch.	9	**
Heat switch failure.		Check upper and lower heat switches.	10	**
		Replace heat switch.	10	**

LEDCO DIGITAL 42 & 60 SERIES LAMINATOR PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
Skill Level Index: * Basic,End-User ** Intermediate or Dealer *** Advanced or Servicing Dealer/Technician				

LEDCO DIGITAL 42 & 60 SERIES LAMINATOR

PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
Digital display and heat switch illuminate when engaged, but heat shoe will not heat up (display reads room temperature).	Heat system fuse(s) blown.	Check 12 amp (D42) or 20 amp (D60) fuses (location "C" in fuse diagram).	3	*
	Heat relay failure.	Check heat relays (locations "C" and "D" in wiring diagrams).	11	**
	Heater failure.	Check heaters.	12	**
	Heat sensor failure.	Check heat sensor.	13	**
	Heat control board transformer failure.	Check specific heat control board terminals.	14	**
	Heat control board relay coil failure.	Check heat control board heat sensor terminals.	15	**
	Heat control board relay switch failure.	Check heat control board relay switch terminals.	16	**
Heat switch illuminates, but digital display does not.	Ribbon cable wires to display disconnected, loose or broken.	Re-connect plastic wire harness to the back of digital display.	17	**
		Re-connect plastic wire harness to heat control circuit board.	17	**
	Digital display failure.	Replace digital display.	18	**
	Ribbon cable failure.	Replace ribbon cable.	17	**
Heat switch does not illuminate when engaged, digital display shows three dashes (- - -).	Heat sensor wires disconnected or loose.	Check heat sensor wires.	12	*
	Heat sensor failure .	Replace heat sensor.	12	***
	Ribbon cable failure.	Replace ribbon cable.	19	**
	Heat control board failure at specific terminals.	Check specific terminals on heat control board.	15,16	**
	Heat control board failure.	Replace heat control board.	20	**

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

LEDCO DIGITAL 42 & 60 SERIES LAMINATOR PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level	
Laminator heat cannot be controlled.	Heat controls set to "C" for Celsius instead of "F" for Fahrenheit.	Reset heat control for "F" per instructions in owners/operators manual.		*	
	Heat sensor failure.	Check heat sensor wires.	13	**	
		Check heat sensor.	13	**	
		Replace heat sensor.	13	**	
	Heat relay failure.	Check heat relays (locations "C" and "D" in wiring diagrams).	11	**	
		Replace heat relay(s).	11	**	
	Heat control board failure .	Check specific heat control terminals.	15,16	**	
		Replace heat control board.	20	**	
	Laminating rollers do not operate.	No power.	Check power cord.	1	*
			Check main power switch position.	2	*
Disengage emergency stop switches, make sure both housing doors are firmly closed and screwed shut, make sure feed tray and safety shield are in proper operating positions.				*	
Check 8 amp main drive power fuses (location "D" in fuse diagram).			3	*	
Check .5 amp fuses (location "A" in fuse diagram).			3	*	
Check for wires that are disconnected, broken or shorting out.			4	*	
Fuse(s) for 24 volt transformer blown.			Check .5 amp fuses between terminal block (M) and 24V transformer (G)	3	*
24V transformer failure.		Check 24V transformer.	7	**	
		Replace 24V transformer.	7	**	
Safety switch power relay failure.		Check safety switch power relay (location "E" in wiring diagram).	8	**	
	Replace safety switch power relay.	8	**		

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LEDCO DIGITAL 42 & 60 SERIES LAMINATOR PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level	
	Emergency stop switch or proximity switch failure.	Check continuity of e-stop switches and/or proximity switches.	9	**	
		Replace e-stop switch.	9	**	
		Replace proximity switch.	10	**	
Drive switch failure.		Check drive switch.	21	**	
		Replace drive switch.	21		
Drive power relay failure.		Check motor drive relay (location "JJ" in wiring diagram).	22	**	
		Replace drive power relay.	22	**	
Forward/reverse selector switch failure.		Check forward/reverse selector switch.	23	**	
		Replace forward/reverse selector switch.	23	**	
Drive motor control board failure.		Check drive motor control board.	24	**	
		Replace drive motor control board.	24	**	
Speed dial potentiometer failure.		Check speed dial potentiometer.	25	**	
		Replace speed dial potentiometer.	25	**	
Drive motor failure.		Check drive motor.	26	**	
		Replace drive motor.	27	***	
Drivetrain mechanical failure.		Check drive chains.	28	*	
		Check drive sprockets.	29	*	
		Replace drive motor.	27	***	
No reverse drive.	Forward/reverse selector switch failure.	Replace selector switch.	23	**	
		Momentary switch failure.	Check momentary switch.	30	**
			Replace momentary switch.	30	**
	Forward/reverse relay failure.	Replace forward/reverse relay.	31	**	

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LEDCO DIGITAL 42 & 60 SERIES LAMINATOR PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
Laminating rollers operate intermittently, sometimes with a clunking, skipping or grinding noise.	Drivetrain failure.	Check drive chain.	28	*
		Check drive sprockets.	29	*
	Film "wrap-around".	Clear minor "wrap-around".	32	*
		Clear "wrap-around" of front laminating rolls.	33	*
		Clear "wrap-around" of rear laminating rolls.	34	**
	Clear "wrap-around" by removing and cleaning or replacing rolls.	35	***	
	Drive motor gear failure.	Replace drive motor.	27	***
Cooling fans do not operate.	No power.	Check power cord, main power switch position and safety switches.	1	*
		Check fan switch position.	36	*
		Check fan motor fuses (location "B" in fuse diagram).	3	*
	Fan switch failure	Check fan switch.	37	**
		Replace fan switch.	37	**
	Fan system relay failure.	Check fan power relay.	38	**
		Replace fan power relay.	38	**
	Fan motor failure.	Check cooling fans.	39	**
Replace fan motor(s).		40	***	
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 each side.	This is normal. Trim off material with wrinkles.		
	Inadequate supply roll tension.	Add tension to take wrinkles out of film before it gets past the heat shoes.		
		Check supply roll gripper rods.	41	*
	Check supply roll hex adaptor spring pin position.	42	*	

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LEDCO DIGITAL 42 & 60 SERIES LAMINATOR

PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
	Improper rubber roll pressure.	Check rubber roll dwell line.	44	*
		Adjust rubber rolls.	45	**
		Replace rubber rolls.	46	***
The film does not adhere to the document.	Thicker documents absorb the heat.	Run at a higher temperature not to exceed 340 degrees.		
	Thin (1.5 mil) films lose heat from heat shoe to the roller nip.	Run at higher temperature increase speed slightly.		
	Thicker media, such as mounting boards, not absorbing enough heat.	Reduce speed.		
	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.		
Lamination has a repeating crescent shaped wrinkle or pocket (usually from the center out).	Leading edge of document contacting top or bottom web of film before the nip.	Make sure the document remains flat when feeding it into the nip by using the hold down bar on the feed tray.		
		Adjust hold down bar.	43	
	Excessive laminating roll pressure.	Check rubber roll dwell line.	44	**
		Adjust rubber rolls.	45	
	Worn rollers.	Check rubber roll dwell line.	44	*
		Adjust rubber rolls.	45	**
		Replace rubber rolls.	46	**
Lamination has wavy, rippling, almost "boat wake" like appearance.	Excessive heat	Reduce heat		
	Laminating too slow causing prolonged heat exposure of document at the nip.	Increase laminating speed.		
Film shrinks as it passes over heat shoe.	Excessive supply roll tension.	Reduce supply roll tension.		
	Excessive heat.	Reduce heat.		

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LEDCO DIGITAL 42 & 60 SERIES LAMINATOR

PROBLEM DIAGNOSTIC CHARTS

Problem	Possible Cause	Repair Procedure	Procedure Number	Skill Level
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 open and 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.		
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.	46	***
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.	45	**
		Worn rollers.		
		Check rubber roll dwell line.	44	*
		Adjust rubber rolls.	45	**
	Replace rubber rolls.	46	***	

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LEDCO DIGITAL 42 and 60 SERIES LAMINATOR REPAIR PROCEDURES

1. Check power cord.

- a. Power cord must be securely inserted into proper 220 VAC wall outlet. Refer to Electrical Power Supply Charts at the back of this guide for proper electrical requirements.
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2. Check master power switch position.

Master power switch (located at the back of the machine) must be in the up (on), position.

3. Check fuses.

- a. **Disconnect the power cord.**
 - b. Using a phillips head screw driver, loosen the two half-turn screws that secure shut the right side housing door.
 - c. Open the door, locate and identify fuse(s) in question. Use the fuse diagram at the back of this guide for reference.
 - d. If a fuse appears discolored and the element inside is broken, it has most likely failed and should be replaced with exact same amperage fuse.
 - e. If after initial visual inspection you are still unsure if the fuse is operational or has failed, there are two ways to determine this:
 - (1.) Take a good fuse from another area of the machine that uses the exact same amperage fuse as one suspected of failure. EX: take the top heat shoe power supply fuse and exchange it with the bottom power supply fuse; the failure should follow the fuse exchange. If the failure follows the fuse exchange then the fuse has failed; if the failure does not follow the exchange then the fuse is good.
 - (2.) Use a multi-meter or continuity tester to check the continuity of the fuse. If the fuse has continuity, it is good. If not, it has failed and should be replaced with the exact same amperage fuse as denoted in the fuse diagram.
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4. Check for wires that are disconnected, broken, or shorting out.

- a. **Disconnect the power cord.**
 - b. Open right side housing door and access electrical components and wiring within as described in 3 above.
 - c. Visually examine all wires and connectors to and from their respective components. Use the wiring diagrams included at the back of this guide for reference. Re-connect or replace wires exactly as shown in specific wiring diagram.
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5. Check master power switch.

- a. Open right side housing door and access electrical components and wiring within as described in 3 above.
- b. Locate main drive power fuses (location "D" in fuse diagram).
- c. Using a multi-meter, check for proper voltage from master power switch:
 - (1.) Set multi-meter for Volts AC with the probes on the top terminals of the main drive power fuses.
 - (2.) With the machine plugged in, turn on (flip up) the master power switch.
 - (3.) There should be between 208 and 220 volts present between these terminals. If no voltage is present, the main power switch has failed and should be replaced. Part #'s are PRS 057 30 amp breaker (standard D42), PRS 350 40 amp breaker (D42 Thermoglide and standard D60), and PRS 353 60amp breaker (D60 Thermoglide).

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

**EXTREME CAUTION MUST BE USED WHEN TESTING ANY MACHINERY
WHERE LIVE VOLTAGE (ESPECIALLY 220) IS PRESENT. ONLY A QUALIFIED
SERVICE TECH OR ELECTRICIAN SHOULD PERFORM SUCH TESTS.**

6. Replace master power switch.

- a. To replace master power switch:
 - (1.) **Disconnect power cord.**
 - (2.) Open both right and left side housing doors as described in 3 above.
 - (3.) Locate and remove the 4 round head square drive self tapping screws that secure the rear pull roll anti-wrap shield to the side panels,using a # 2 square drive bit.Gently remove the anti-wrap shield.
 - (4.) Remove the 8 truss head phillips screws that secure the top fan guard/motor cover using a phillips head screwdriver.Gently lift out the top fan guard/motor cover to allow access to the main power breaker switch.
 - (5.) Disconnect all wire leads from main power breaker switch making careful note of their locations for reconnection later.
 - (6.) Using a phillips head screwdriver, loosen and remove the 4 pan head phillips screws that secure the main power breaker switch to the rear housing.
 - (7.) Remove failed breaker switch with new;rewire exactly as shown in wiring diagram,and re-assemble in exact reverse order.
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7. Check 24 volt transformer.

- a. Open right side housing door as described in 3 above.
 - b. Locate and identify 24 volt transformer (location "G" in the wiring diagram).
 - c. Check voltage from transformer using a multimeter set to volts AC :
 - (1.) Place the probes on the two yellow output wire connectors at terminal block (location "M" in wiring diagram).
 - (2.) With the machine plugged in and the main power switch on,you should get a reading of approximately 24 volts AC.If no voltage is present,the transformer has failed and should be replaced (part # PRT 335).
 - d. To replace 24 volt transformer :
 - (1.) Using a phillips head screwdriver,loosen the phillips head screw that secures the transformer to its mounting bracket.This allows you to gently lift and rotate the transformer to remove the two yellow wire leads secured to the back of the transformer with two phillips head screws.
 - (2.) Disconnect the black and white wire leads that come out the front of the transformer from their respective fuse connections (location "A" in the fuse diagram,"W" in the wiring diagram).
 - (3.) Remove failed transformer,replace with new.Rewire exactly as shown in schematic and re-assemble in exact reverse order.
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8. Check safety switch power relay.

- a. Open right side housing door as described in 3 above.
 - b. Locate and identify the safety switch power relay (location E in wiring diagram).
 - c. To check safety switch power relay :
 - (1.) You will need a small magnet to engage the proximity switch at the bottom of the right side housing door that you've opened to perform this check.
 - (2.) With all emergency stop switches disengaged and the feed tray and safety shield in proper operating positions,plug in the machine and turn on the main power switch at the back of the machine.
 - (3.) Use the small magnet to activate the proximity switch at the bottom of the right side housing door. Upon doing so you should hear the safety switch power relay engage (an audible clicking sound) and actually see the small reset tab on the side of the relay retract.
 - (4.) If the safety switch power relay does not engage (click on) upon activation of the proximity switch (provided that all emergency stop switches and other proximity switches are functional),the relay has failed and should be replaced (part # PRR 231).
 - d. To replace safety switch power relay :
 - (1.) Turn off main power switch.Disconnect power cord.
 - (2.) Disconnect all wire lead connectors from the relay making careful note of their locations.
 - (3.) Use a small straight blade screwdriver to gently persuade the relay from its mounting bracket.
 - (4.) Remove old relay and replace with new,re-assembling in exact reverse order and rewire exactly as shown in schematic.
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9. Check continuity of Emergency stop switches and/or proximity switches.

- a. Open both right and left side housing doors as described in 3 above.
- b. Locate and identify all emergency stop switches, proximity switches, safety shield micro switch (refer to wiring diagram for locations and related wiring).
- c. To check E-stop switches :
 - (1.) Turn off main power switch. Disconnect power cord.
 - (2.) Using a multimeter set to check continuity, place the probes in the respective wire lead screw holes in 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 give continuity. If not, that switch is bad and should be replaced (part # PRS 054).
- d. To replace E-stop switch :
 - (1.) Disconnect wire leads from their respective terminals 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. Remove failed contact block, replace with new and re-assemble, 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 re-assemble in exact reverse order.

- e. To check magnetic proximity switches :
 - (1.) Locate the proximity switches at the base of the housing doors and at the right hand edge of the feed tray.
 - (2.) Disconnect the two red wires coming off the magnetic base from their respective quick-connects.
 - (3.) Using a multimeter set to check continuity, place the probes in the respective quick-connect leads from the magnetic base.
 - (4.) Using a small magnet as described in 8-C above, activate the proximity switch. This should give you continuity. If not, or if there is a continuity reading without engaging the switch with the magnet, the switch is faulty and should be replaced (part # PRS 351).
 - (5.) To replace proximity switch (and/or activating magnet), loosen and remove the two screws and nuts that secure them to their respective locations. Replace with new and reassemble, rewire in exact reverse order.
 - f. To check safety shield micro switch (N/A Thermo-glide models) :
 - (1.) Locate safety shield micro switch on inside, left side panel.
 - (2.) Using a multimeter set to check continuity, place one probe on the outside terminal (common) and the other probe on either the middle terminal or the inside terminal. Manually engaging the micro switch will make and/or break continuity. If not, the switch is faulty and should be replaced (part # PRS 313).
 - (3.) To replace micro switch, remove the three wire leads to the switch using a phillips head screwdriver; then using a 9/64 allen wrench, loosen and remove the two cap head allen screws that secure the switch to its mounting bracket. Remove faulty switch, replace with new, re-assemble and rewire in exact reverse order.
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10. Check upper and lower heat switches.

- a. To check heat switches :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate top heat switch and respective wire leads (use wiring diagram for reference).
 - (4.) Using a multimeter set to check continuity,place one probe on the grey/black wire terminal and the other probe on the orange/black wire terminal of the top heat switch.
 - (5.) Engage (push in) the top heat switch.You should have continuity at these terminals.
Further,place one probe on the black/brown wire terminal and the other probe on the yellow/black wire terminal of the top heat switch and engage the switch.You should have continuity here as well.
 - (6.) If no continuity is present at either of these check points,the switch is faulty and should be replaced (part # PRS 017).
 - (7.) Similarly checking the bottom heat switch at the white/red wire terminal and the white/brown terminal,then checking the white/blue wire terminal and the blue/red wire terminal,continuity should also be present at these check points when the bottom heat switch is engaged.If not, the switch is faulty and should be replaced (again part # PRS 017).
 - b. To replace a heat switch :
 - (1.) Disconnect wire leads from the back of the switch.Make note of their locations for proper reconnection later.
 - (2.) Using a small straight blade screwdriver,remove the yellow plastic retaining tab that covers the small brass locking lever at the middle of the switch.Rotate the locking lever 1/8 turn toward you to separate the bottom terminal section of the switch from the top push button section.Remove the bottom section of the switch.
 - (3.) To remove the top push button section of the switch,loosen and remove the round,black plastic retaining nut that secures the upper section of the switch to the face of the machine housing. Remove the remaining section of the switch,replace with new and re-assemble in exact reverse order.Rewire exactly as shown in schematic.
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11. Check heat system relays.

- a. To check heat system relays :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify heat system relays (locations "C" and "D" in wiring diagram).
 - (4.) Using a small magnet as described in 8-C above to activate the proximity switch,plug the machine in and turn on the master power switch.
 - (5.) Engage (push in) the top heat switch.The top heat relay should make an audible clicking sound and you should see the small reset tab on the side of the relay retract.If this is not happening,chances are the relay is faulty.
 - (6.) To thoroughly check the relay with a multimeter,start by setting your meter at volts AC and put one probe on terminal 1 and the other probe on terminal 0 of the relay.With the heat switch engaged there should be a reading of 24 volts at these terminals (provided the circuitry in line before it is functioning properly).
 - (7.) With the proper 24 volts coming into the relay,check for proper 220 volts coming into the relay by placing one probe on terminal 2 and the other on terminal 8 of the relay.Again (with the machine plugged in,master power switch on and the proximity switch activated) engage the heat switch. You should get a reading of 220 volts (or thereabouts) at these terminals.
 - (8.) Lastly,and most important,check for 220 volts coming out of the relay that powers the heaters by placing one probe on terminal 4 and the other probe on terminal 6 of the relay (the heater wire lead terminals).Again (with the machine plugged in,master power switch on and proximity switch activated) engage the heat switch.The relay should then engage and show 220 volts out of these terminals.If not,for certain the relay is faulty and should be replaced (part # PRR 251).
- b. To replace a heat relay :
 - (1.) **Follow steps 1,2,3 as detailed above.**
 - (2.) Disconnect all wire leads to relay making careful notes of their location (use wiring diagram for reference).
 - (3.) Using a phillips head screwdriver,loosen and remove the two round head phillips screws that secure the relay to the base of the housing.
 - (4.) Remove faulty relay,replace with new,re-assemble in exact reverse order and rewire exactly as shown in schematic.

NOTE : Diagnostic,repair,and replacement procedures are exactly the same for top and bottom heat relays.

12. Check cartridge heaters.

- a. To check cartridge heaters :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate heater wires coming from top and bottom cartridge heaters (locations "Z" and "Y" in wiring diagram).
 - (4.) Disconnect heater wire leads from their respective terminals on the heat relays.
 - (5.) Using a multimeter set to check resistance, place the probes on the wire lead ends coming from the top cartridge heater. You should get a resistance reading of around 19.2 ohms.
 - (6.) Using the same procedure, you should get a similar reading for the bottom cartridge heater. If there is no resistance, the cartridge heater is faulty and should be replaced (part # PRH171 for D42 cartridge heaters and PRH172 for D60 cartridge heaters).
 - (7.) Using a similar procedure with the multimeter set for continuity will tell you if a cartridge heater is faulty as well. If the cartridge heater has no continuity, it is faulty and should be replaced.
- b. To replace cartridge heaters :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate heater wires and heat sensor wires coming from top and bottom cartridge heaters and disconnect them from their respective relays and heat control boards.
 - (4.) Remove top heat shoe assembly from the machine by first removing the top S-wrap idler (N/A for thermo-glide models); then using an adjustable wrench, loosen and remove the two hollow pivot bolts that secure the top heat shoe to the right and left side panels.
 - (5.) Gently lift the heat shoe assembly and wiring out of the machine and place on a flat work surface.
 - (6.) Using a 7/16 wrench, loosen and remove the two bolts and spacers that secure the heat shoe mounting brackets to the heat shoes.
 - (7.) Carefully trim away the heat shrink tubing that encases the heat shoe wires with the heat sensor wires.
 - (8.) Using a small piece of dowel or something similar, gently tap the non-wired end of the cartridge heater enough to allow you to grasp the metal body of the cartridge and gently but firmly pull the cartridge out of the shoe.
 - (9.) Replace the faulty cartridge heater with a new one, install it in exact reverse order of dis-assembly. You should protect and shield the wires with some heat shrink tubing (part # PRI 163) or at least wrap them with electrical tape before installing the heat shoe assembly back into the machine.
 - (10.) Re-assemble all components in exact reverse order, rewire exactly as shown in schematic.

NOTE : The procedure for removal of the bottom heat shoe and replacement of its cartridge heater is exactly the same as the top with the addition of removing the two 3/8 x 1/2 shoulder bolts that secure the bottom heat shoe and brackets to the side panel. This requires a 3/16 allen wrench.

13. Check heat sensors.

- a. To check heat sensors :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate heat sensor wires (thin black wires with red plastic quick-connects) coming from top and bottom cartridge heaters and disconnect them from the terminals of their respective heat control boards.
 - (4.) Check the resistance of the heat sensors using a multimeter set to read ohms. At room temperature a functional heat sensor should have a resistance of approximately 1.089 ohms.
 - (5.) If a sensor has no resistance (or reads open line or circuit), the sensor is faulty and should be replaced (part # PRC 212S).
 - b. To replace a heat sensor :
 - (1.) Remove top or bottom heat shoe from the machine and carefully trim away the heat shrink tubing from wires as described in section 12 above.
 - (2.) The heat sensor is accessible from the front face of the heat shoe. Remove it by carefully pushing it to the right with a screwdriver or punch that fits in the channel that holds the sensor.
 - (3.) Remove the sensor and the teflon tube that protects the wires, replace with new (simply slide the new sensor and protective teflon tube onto the same location as the old one), re-assemble all components in exact reverse order and rewire exactly as shown in schematic.
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14. Check the heat control board transformer.

- a. To check heat control board transformer :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify top and bottom heat controls (locations "A" and "B" in wiring diagram).
 - (4.) Disconnect all wire leads from their respective terminals on the heat control board,make note of their locations.
 - (5.) Check for proper resistance readings with a multimeter by placing the probes on terminals:
 - T4(common) and T1(208V) should read approximately .910 k ohms.
 - T4 and T2(240V) should read approximately .765 k ohms.
 - T4 and T3 should read approximately .410 k ohms.

All readings at room temp.,if any of these terminal checks show an open (infinite) or closed (no resistance) the heat control board has failed and should be replaced.

15. Check the heat control board relay coil.

- a. Access heat control board(s) as described in step 14 above.
 - b. Disconnect wire leads from terminals T10 and T11.
 - c. Check the resistance of the relay coil with a multimeter by placing probes on terminals T10 and T11.The resistance should read 32.9 k ohms.
If the reading shows an open or closed circuit,the board has failed and should be replaced.
-

16. Check heat control board relay switch.

- a. Access heat control board(s) as described in step 14 above.
 - b. Disconnect wire leads from terminals T6 and T7.
 - c. Check the resistance of the relay switch with a multimeter by placing a probe on terminals T6 and T7.
 - d. With no power, there should be an open reading.
 - e. If you get a closed circuit reading with no power, the board has failed and should be replaced.
-

17. Check,re-connect the digital display ribbon cable harnesses.

- a. To check ribbon cable plastic wire harnesses :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify top and bottom digital heat displays and the grey ribbon cables coming from the back of the displays to their respective top and bottom heat control boards.
 - (4.) Be sure the plastic harness ends of the ribbon cables are seated securely in their receptacles at the back of the digital displays and also at the heat control boards.The harnesses will only insert one way in the receptacles with the small,depressable plastic tab gently locking them in place.
-

18. Replace digital display.

- a. Access the backs of the digital displays as described above.
 - b. Gently disconnect the plastic wire harness and ribbon cable from its receptacle on the back of the display by depressing the small tab on the harness.
 - c. Unscrew three plastic acorn nuts from back of display board to remove.
 - d. Install new display board in exact reverse sequence.
-

19. Replace ribbon cable

- a. Disconnect plastic wire harness and ribbon cable from the digital display as described in 18 above.
- b. Access heat control board as described in 14 above.
- c. Remove and replace the ribbon cable from the heat control board in the same manner as described in 18-b.
- d. Re-assemble in exact reverse sequence.

Note: The digital display and the ribbon cable are integral to part # PRH 130 heat control kit.

20. Replace heat control board.

- a. Access heat control board as described in 14 above.
 - b. Disconnect all wire leads from their respective terminals on the heat control board, make note of their locations.
 - c. Remove the heat control board from its 4 plastic stand-offs by gently depressing the very small retaining tabs on the stand-off legs.
 - d. Replace with new heat control board (part # PRH130).
- Reassemble in exact reverse sequence and rewire exactly as shown in the schematic.
-

21. Check drive switch.

- a. To check drive switch :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify top green push button drive switch (location "FF" in wiring diagram), and respective wire leads.
 - (4.) Using a multimeter set to check continuity, place one probe on the black wire w/jumper terminal and the other probe on the orange wire terminal of the drive switch. Engaging (pushing in) the switch you should get continuity at these checkpoints.
 - (5.) Similarly, place one probe on the yellow wire terminal and the other probe on the red wire terminal, engaging the switch should show continuity at these checkpoints as well. If no continuity is present at either of these checkpoints, or if the button will not stay depressed when engaged, the switch has failed and should be replaced (part # PRS 018).
 - b. To replace drive switch :
 - (1.) Disconnect wire leads from the back of the switch. Make note of their locations for proper reconnection later.
 - (2.) Using a small straight blade screwdriver, remove the yellow plastic retaining tab that covers the small brass locking lever at the middle of the switch. Rotate the locking lever 1/8 turn toward you to separate the bottom terminal section of the switch from the top push button section. Remove the bottom section of the switch.
 - (3.) To remove the top push button section of the switch, loosen and remove the round, black plastic retaining nut that secures the upper section of the switch to the face of the machine housing. Remove the remaining section of the switch, replace with new and re-assemble in exact reverse order. Rewire exactly as shown in schematic.
-

22. Check motor drive relay.

- a. To check motor drive relay :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify motor drive relay (location "JJ" in wiring diagram).
 - (4.) Using a small magnet as described in 8-C above to activate the proximity switch, plug the machine in and turn on the master power switch.

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

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- (5.) With the forward/reverse selector switch set to forward, engage (push in) the green drive switch. The motor drive relay should make an audible clicking sound and you should see the small reset tab on the side of the relay retract. If this is not happening, chances are the relay is faulty.
- (6.) To thoroughly check the relay with a multimeter, start by setting your meter at volts AC and put one probe on terminal 1 and the other probe on terminal 0 of the relay. With the drive switch engaged there should be a reading of 24 volts at these terminals (provided the circuitry in line before it is functioning properly).
- (7.) With the proper 24 volts coming into the relay, check for proper 220 volts coming into the relay by placing one probe on terminal 2 and the other on terminal 8 of the relay. Again (with the machine plugged in, master power switch on and the proximity switch activated) engage the drive switch. You should get a reading of 220 volts (or thereabouts) at these terminals.
- (8.) Lastly, and most importantly, check for 220 volts coming out of the relay to the motor control board by placing one probe on terminal 4 and the other probe on terminal 6 of the relay. Again (with the machine plugged in, master power switch on and proximity switch activated) engage the drive switch. The relay should then engage and show 220 volts out of these terminals; if not, for certain

the relay is faulty and should be replaced (part # PRR 251).

- b. To replace the motor drive relay :
 - (1.) **Follow steps 1,2,3 as detailed above.**
 - (2.) Disconnect all wire leads to relay making careful notes of their location (use wiring diagram for reference).
 - (3.) Using a phillips head screwdriver,loosen and remove the two round head phillips screws that secure the relay to the base of the housing.
 - (4.) Remove faulty relay,replace with new,re-assemble in exact reverse order and rewire exactly as shown in schematic.
-

23. Check the forward/reverse selector switch.

- a. To check forward/reverse selector switch :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify the forward/reverse selector switch (location "GG" in wiring diagram),and respective wire leads.
 - (4.) Using a multimeter set to check continuity,place one probe on the black wire terminal and the other probe on the empty wire terminal two spaces directly above.With the selector switch in the forward position (all the way to the left) you should get continuity at these checkpoints.
 - (5.) Silmilarly,place one probe on the brown wire terminal and the other probe on the empty terminal two spaces directly above,with the switch in forward,you should have continuity at these checkpoints as well.
 - (6.) Next,with the selector switch in the reverse (all the way to the right) position,place one probe on the black wire terminal and the other probe on the terminal directly above it that has the black jumper to the momentary switch.You shoud have continuity at these checkpoints.
 - (7.) Similarly,place one probe on the brown wire terminal and the other on the gray wire terminal directly above;with the switch in reverse,you should get continuity at these checkpoints as well.
 - (8.) If no continuity is present at any of these checkpoints,the forward/reverse selector switch has failed and should be replaced (part # PRS 020).
 - b. To replace forward/reverse selector switch :
 - (1.) **Follow steps 1,2,3 as detailed above.**
 - (2.) Disconnect all wire leads to switch making careful notes of their location (use wiring diagram for reference).
 - (3.) Loosen and remove the round,black plastic retaining nut that secures the switch to the face of the housing.
 - (4.) Remove failed switch,replace with new.Re-assemble in exact reverse sequence and rewire exactly as shown in schematic.
-

24. Check motor control board.

- a. To check motor control board :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify motor control board (location "H" in wiring diagram).
 - (4.) Using a small magnet as described in 8-C above to activate the proximity switch, plug the machine in and turn on the master power switch.

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- (5.) With your multimeter set to read Volts DC, place one probe on terminal A1 and the other probe on terminal A2 of the motor control board.
 - (6.) Engage the green motor drive switch. With the speed dial potentiometer at 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.
 - (7.) With the speed dial potentiometer at highest (clockwise) setting, you should get between 180 to 186 volts on the meter.
 - (8.) If no voltage is present, the motor control is faulty and should be replaced (part # PRM 218A). If the prescribed range of voltage is present and there is still no motor drive, the forward/reverse relay may be faulty or the drive motor may be faulty (see procedure 26).
- b. To replace motor control board :
 - (1.) **Follow steps 1,2,3 as detailed above.**
 - (2.) Disconnect all wire leads to the board making careful notes of their location (use wiring diagram for reference).
 - (3.) Using a phillips head screwdriver, loosen and remove the 4, 8-32 truss head phillips screws that secure the motor control board to the side panel.
 - (4.) Remove failed board, replace with new. Re-assemble in exact reverse order and rewire exactly as shown in schematic.

25. Check speed dial potentiometer.

- a. To check speed dial potentiometer :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify speed dial potentiometer (location "P" in wiring diagram) and respective wire leads.
 - (4.) Disconnect the yellow wire and the orange wire 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.
 - (5.) 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 in resistance as you increase the speed dial (turning clockwise) to wide open.
 - (6.) 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, potentiometer is bad and should be replaced (ref part # PRM 218A).
- b. To replace speed dial potentiometer :
 - (1.) **Follow steps 1,2,3 as detailed above.**
 - (2.) Disconnect the gray, yellow and orange wires of the potentiometer from their respective terminals on the motor control board.
 - (3.) 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.
 - (4.) Using a small adjustable wrench, loosen and remove the retaining nut that secures the potentiometer to the face of the housing.
 - (5.) Remove failed potentiometer and wires, replace with new, pre-wired potentiometer. Re-assemble in exact reverse order and rewire exactly as shown in the schematic.

26. Check drive motor.

- a. To check drive motor :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify forward/reverse motor relay (directly below location "JJ" in wiring diagram),and respective wire terminals.
 - (4.) Using a small magnet as described in 8-C above to activate the proximity switch,plug the machine in and turn on the master power switch.

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- (5.) With your multimeter set to read Volts DC, place one probe on terminal A1 and the other probe on terminal 43/41 of the forward reverse motor relay.
- (6.) With the forward/reverse selector switch set to forward and the speed potentiometer set at 0,engage the green motor drive switch.
- (7.) With the potentiometer set at 0 there should be a voltage reading of near 0.As you rotate the speed dial clockwise,the voltage will gradually increase to the maximum of 180 volts.
- (8.) 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).

27. Replace drive motor.

- a. To replace drive motor :
 - (1.) **Disconnect power cord.**
 - (2.) Open both right and left side housing doors as decribed in 3 above.
 - (3.) Locate and remove the 4 round head square drive self tapping screws that secure the rear pull roll anti-wrap shield to the side panels,using a # 2 square drive bit.Gently remove the anti-wrap shield.
 - (4.) Remove the 8 truss head phillips screws that secure the top fan guard/motor cover using a phillips head screwdriver.Gently lift out the top fan guard/motor cover to allow access to the drive motor.
 - (5.) Disconnect all wire leads from the drive motor at their quick connects,making careful note of their locations for reconnection later.
 - (6.) Inside the left side housing locate the two 1/4-28 cap head allen bolts and the two 1/4-28 button head allen bolts that secure the drive motor to the left side panel.Note that the two bottom cap head screws pass thru the chain adjustment block/idler sprocket assembly.
 - (7.) Using a 3/16" allen wrench and a 5/32" allen wrench for the button head bolts,loosen these bolts allowing you to slide the motor,shaft and respective sprockets assembly up and down and also allowing you to slide the chain adjustment block from side to side,loosening or tightening the chains as required.
 - (8.) After loosening both chains,remove the bottom idler sprocket (ref. Part # PRS 320 in the drive chain schematic) from the chain adjustment block using a 1/4 " allen wrench.Similarly,remove one of the two middle idler sprockets from the idler sprocket mounting block.This allows you to pull both chains away from the motor sprockets without totally removing the the chains from the machine.
 - (9.) Remove the tandem motor sprockets (part # PRS 323) from the motor shaft using a 1/8" allen wrench.Make careful note of their positions for correct re-installation and be sure not to lose the 1/8" key that helps secure the sprockets to the shaft.
 - (10.) Once you have removed the motor sprockets,remove the four motor mounting allen bolts and carefully lift the drive motor out of the machine.Replace with new drive motor and re-assemble in exact reverse order and rewire 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 final chain tension adjustments with the rubber rolls in the down and locked position,with an allowance of 1/4 to 5/16" play in the drive chains.

28. Check drive chains.

- (1.) **Disconnect power cord.**
- (2.) Open left side housing door as described in 3 above.
- (3.) Visually inspect the upper and lower drive chains. Use the drive chain schematic at the back of this guide for reference.
- (4.) If a connecting link is missing or damaged, replace the connecting link (Part # PRC 087).
- (5.) If a drive chain is damaged, replace with proper length drive chain (Part # PRC086).

Refer to previous section for proper chain tension adjustments and settings.

29. Check drive sprockets.

- (1.) **Disconnect power cord.**
 - (2.) Open left side housing doors as described in 3 above.
 - (3.) Visually inspect the drive sprockets as well as the idler sprockets. Use the drive chain schematic at the back of this guide for reference.
- a. If a sprocket is not tight on its shaft:
- (1.) Check drive sprockets to be sure they have the small, half-moon-shaped woodruff key in place. If the key is missing or damaged, replace with new (part # M161KEY).
 - (2.) With the woodruff key properly in place, align the sprocket and drive chain 1 and 13/16" from the side panel for the outer, lower chain. Align the inner, upper chain and respective sprockets 1 and 1/8" from the side panel.
 - (3.) Tighten drive sprockets to their respective shafts with a 1/8" allen wrench.
 - (4.) Tighten any loose idler sprocket mounting, shoulder bolts using a 1/4" allen wrench.
- b. If a sprocket is broken or excessively worn, it must be replaced:
- (1.) Remove the chain at the connecting link.
 - (2.) Remove the sprocket (and woodruff key for drive sprockets) and replace with new.
 - (3.) Align and re-assemble in exact reverse order.
 - (4.) Refer to section 27 for proper chain adjustments.
-

30. Check reverse momentary switch.

- a. To check reverse momentary switch :
- (1.) **Disconnect power cord.**
 - (2.) Open right side housing doors as described in 3 above.
 - (3.) Locate and identify the red, push button reverse momentary switch and wire leads (location "HH" in wiring diagram).
 - (4.) Using a multimeter set to check continuity, place one probe on the black wire terminal (without jumper) and the other probe on the black wire terminal (with jumper) two spaces directly above. There should be continuity at these checkpoints without engaging the switch. Engaging the switch should break continuity.
 - (5.) Similarly, place one probe on the black wire terminal (without jumper) and the other probe on the empty terminal directly above it; engaging the switch will read continuity and letting off on the switch will in turn break continuity.
 - (6.) If any of these checks yield negative results, the switch has failed and should be replaced (part # PRS 016).
- b. To replace reverse momentary switch :
- (1.) Disconnect wire leads from the back of the switch. Make note of their locations for proper reconnection later.
 - (2.) Using a small straight blade screwdriver, remove the yellow plastic retaining tab that covers the small brass locking lever at the middle of the switch. Rotate the locking lever 1/8 turn toward you to separate the bottom terminal section of the switch from the top push button section. Remove the bottom section of the switch.
 - (3.) To remove the top push button section of the switch, loosen and remove the round, black plastic retaining nut that secures the upper section of the switch to the face of the machine housing. Remove the remaining section of the switch, replace with new and re-assemble in exact reverse order. Rewire exactly as shown in schematic.
-

31. Replace forward/reverse relay.

- (1.) Gain access to forward/reverse relay as instructed in section 26 above.
 - (2.) Disconnect all wire leads to the relay making careful notes of their location (use wiring diagram for reference).
 - (3.) Using a small straight blade screwdriver, gently pry open the relay mounting bracket and remove the faulty relay.
 - (4.) Replace with new relay (part # PRR 250). Re-assemble in exact reverse sequence and rewire exactly as shown in schematic.
-

32. Clear minor "wrap-around".

- a. Visually check all four rolls for any film "wrap-around" 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.
-

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

- a. Swing away top heat shoe to gain greater access to top front rubber roller.
- b. Remove feed tray.
- c. Using a 3/16" allen wrench, remove the shoulder bolts that secure the bottom heat shoe brackets to the side panels.
- d. Swing away the bottom heat shoe (without necessarily disconnecting it) to gain greater access to bottom front roller.
- e. Create a loose end of film and use the reverse jog to unwind "wrap-around".

NOTE : It may be necessary to remove the chain and sprockets from the drive side to allow unrestricted rotation of the rolls. See 27, 28, 29 above for procedures.

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

- a. Remove rear pull roller anti-wrap shield as described in procedure 9 above to gain greater access to rear rollers.
 - b. Remove the chain and sprockets (see 27 and 28 above) to allow unrestricted rotation of the rolls.
 - c. Create a free end of film and manually pull film off rollers.
-

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

- a. To remove the rubber rollers :
 - (1.) **Disconnect power cord.**
 - (2.) Put the rubber rolls in the down, but **not** locked position.
 - (3.) Open both right and left side housing doors as described in 3 above.
 - (4.) Remove drive chains, sprockets and all spacers from the left side (see 27, 28 and 29 above).
 - (5.) Remove split shaft stop collars (use a 3/16 allen wrench) and spacers from the right side.
 - (6.) Remove top heat shoe as described in section 12 above.
 - (7.) Remove the two 3/8 x 1/2" shoulder bolts that secure the bottom heat shoe to the side panels (use a 3/16" allen wrench) and lower the shoe away from the front bottom rubber roller.
 - (8.) Remove both sets of front and rear connecting (pressure) plate assemblies. There is no need to loosen or remove the pressure adjustment bolts or springs. However, you will probably have to move the drive power relay and the forward/reverse relay to make room to remove the front right connecting plate and similarly move the safety switch power relay to remove the rear, right connecting plate assembly.
 - (9.) Remove the pull roll anti-wrap shield as detailed in section 6.
 - (10.) Remove the brass bushings from both top rubber rollers.
 - (11.) Remove the roller bearings from both bottom rubber rollers. They are press fit into the side panels; gently tap with a plastic or rubber mallet to dislodge.
 - (12.) You can now remove the rollers by lifting them up and sliding them out thru the large "keyholes" in the side panels.
- b. 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.**
- c. After the rolls are removed, remove any remaining film and clean the rolls thoroughly.
- d. If rolls are damaged, they must be replaced (part # D105-040.4 for Digital 42 and D60-040.4 for Digital 60)

**Reassemble in exact reverse order of dis-assembly and rewire exactly as shown in schematic.
Use drive chain schematic and left side, right side roll diagrams as reference guides.**

36. Check fan switch position.

- a. Depress the blue, push button fan switch. It should illuminate. Fans should operate.
-

37. Check fan switch.

- a. To check fan switch :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing doors as described in 3 above.
 - (3.) Locate and identify the blue, push button fan switch and wire leads (location "CC" in wiring diagram).
 - (4.) Using a multimeter set to check continuity, place one probe on the center black/white wire terminal and the other probe on the black wire terminal (with jumper) directly above. There should be continuity at these checkpoints when engaging the switch. Disengaging the switch should break continuity.
 - (5.) Similarly, place one probe on the black/white wire terminal next to the one you just tested, and the other probe on the red/blue wire terminal directly above it. Engaging the switch will read continuity and letting off on the switch will in turn break continuity.
 - (6.) If any of these checks yield negative results, the switch has failed and should be replaced (part # PRS 019).
 - b. To replace fan switch :
 - (1.) Disconnect wire leads from the back of the switch. Make note of their locations for proper reconnection later.
 - (2.) Using a small straight blade screwdriver, remove the yellow plastic retaining tab that covers the small brass locking lever at the middle of the switch. Rotate the locking lever 1/8 turn toward you to separate the bottom terminal section of the switch from the top push button section. Remove the bottom section of the switch.
 - (3.) To remove the top push button section of the switch, loosen and remove the round black plastic retaining nut that secures the upper section of the switch to the face of the machine housing. Remove the remaining section of the switch, replace with new and re-assemble in exact reverse order. Rewire exactly as shown in schematic.
-

38. Check fan power relay.

- a. To check fan power relay :
 - (1.) **Disconnect power cord.**
 - (2.) Open right side housing door as described in 3 above.
 - (3.) Locate and identify fan power relay (location "KK" in wiring diagram).
 - (4.) Using a small magnet as described in 8-C above to activate the proximity switch, plug the machine in and turn on the master power switch.
 - (5.) Engage (push in) the blue fan switch. The fan power relay should make an audible clicking sound and you should see the small reset tab on the side of the relay retract. If this is not happening, chances are the relay is faulty.
 - (6.) To thoroughly check the relay with a multimeter, start by setting your meter at volts AC and put one probe on terminal 1 and the other probe on terminal 0 of the relay. With the fan switch engaged, there should be a reading of 24 volts at these terminals (provided the circuitry in line before it is functioning properly).
 - (7.) With the proper 24 volts coming into the relay, check for proper 220 volts coming into the relay by placing one probe on terminal 2 and the other on terminal 8 of the relay. With the machine plugged in, master power switch on and the proximity switch activated, you should get a reading of around 220 volts at these terminals without having to engage the switch.

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- (8.) Lastly, and most important, check for 220 volts coming out of the relay that powers the fan(s) by placing one probe on terminal 4 and the other probe on terminal 6 of the relay (the fan motor wire lead terminals). Again (with the machine plugged in, master power switch on and proximity switch activated) engage the heat switch. The relay should then engage and show 220 volts out of these terminals. If not, for certain the relay is faulty and should be replaced (part # PRR 251).
- b. To replace fan power relay :
 - (1.) **Follow steps 1,2,3 as detailed above.**
 - (2.) Disconnect all wire leads to relay making careful notes of their location (use wiring diagram for reference).
 - (3.) Using a phillips head screwdriver, loosen and remove the two round head phillips screws that secure the relay to the base of the housing.
 - (4.) Remove faulty relay, replace with new, re-assemble in exact reverse order and rewire exactly as shown in schematic.

39. Check fan motor(s).

- a. To check fan motor(s) :
 - (1.) **Disconnect power cord.**
 - (2.) Open both right and left side housing doors as described in 3 above.
 - (3.) Locate and remove the 4 round head square drive self tapping screws that secure the rear pull roll anti-wrap shield to the side panels, using a # 2 square drive bit. Gently remove the anti-wrap shield.
 - (4.) Remove the 8 truss head phillips screws that secure the top fan guard/motor cover using a phillips head screwdriver. Gently lift out the top fan guard/motor cover to allow access to the fan motor(s).
 - (5.) Visually inspect all wires and connectors to fan motors, replace or rewire as needed per schematic.
- b. Check voltage being received at the fan motor(s) with a multimeter.

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- (1.) Trace the brown and grey wires from fan power relay to the terminal block next to the fan(s).
 - (2.) Set the Multimeter to volts AC.
 - (3.) Plug the machine in and engage the master power switch.
 - (4.) Engage the fan switch.
 - (5.) Place probes on the fan motor wire leads of the terminal block checking for 220 volts.
 - c. If proper voltage is evident thru the entire circuit and one or more of the fan motors fails to engage, that fan motor(s) has failed and should be replaced (part # PRF134).
-

40. Replace fan motor(s).

- a. To replace fan motor(s) :
 - (1.) Access fan motor(s) as described in steps 1-4 above.
 - (2.) Disconnect fan motor(s) wire leads from terminal block.
 - (3.) As the fan motors are secured by rivets to the bottom motor cover, you will have to tilt the machine back to take a 1/8 drill and drill out the rivets, allowing you to remove the fan motor.
 - (4.) Replace with new fan motor (part # PRF 130), pop rivet back into place, rewire exactly as shown in schematic and re-assemble in exact reverse order.
-

41. Check supply roll gripper rods.

- a. Check to see if the three supply gripper rods that run the width of the supply rolls are not bent, damaged or overly loose.
 - b. If damaged or missing, replace it (part # D105 -021.4 or D60 021.4).
 - c. Occasionally the cardboard cores of the laminating films 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.
-

42. 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 each respective 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 three to four hand turns of tension on one side then the same amount of turns 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 new 1/8 x 3/4" split drive pin).
-

43. Adjust hold down bar.

- a. Be sure the adjustable aluminum hold down smoother bar is positioned so it is just making contact with the item to be laminated. This will help keep the work piece flat and wrinkle free as it enters the nip of the rollers.
 - b. The hold bar (N/A on Thermoglide models) is located just in front of the plexi safety shield near the leading edge of the feed tray. It features thumb screw adjustment with a maximum of 1" thick allowance.
-

44. 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 1/4" to 5/16" 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 3/8" wide, there may be 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.
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45. Adjust rubber rolls.

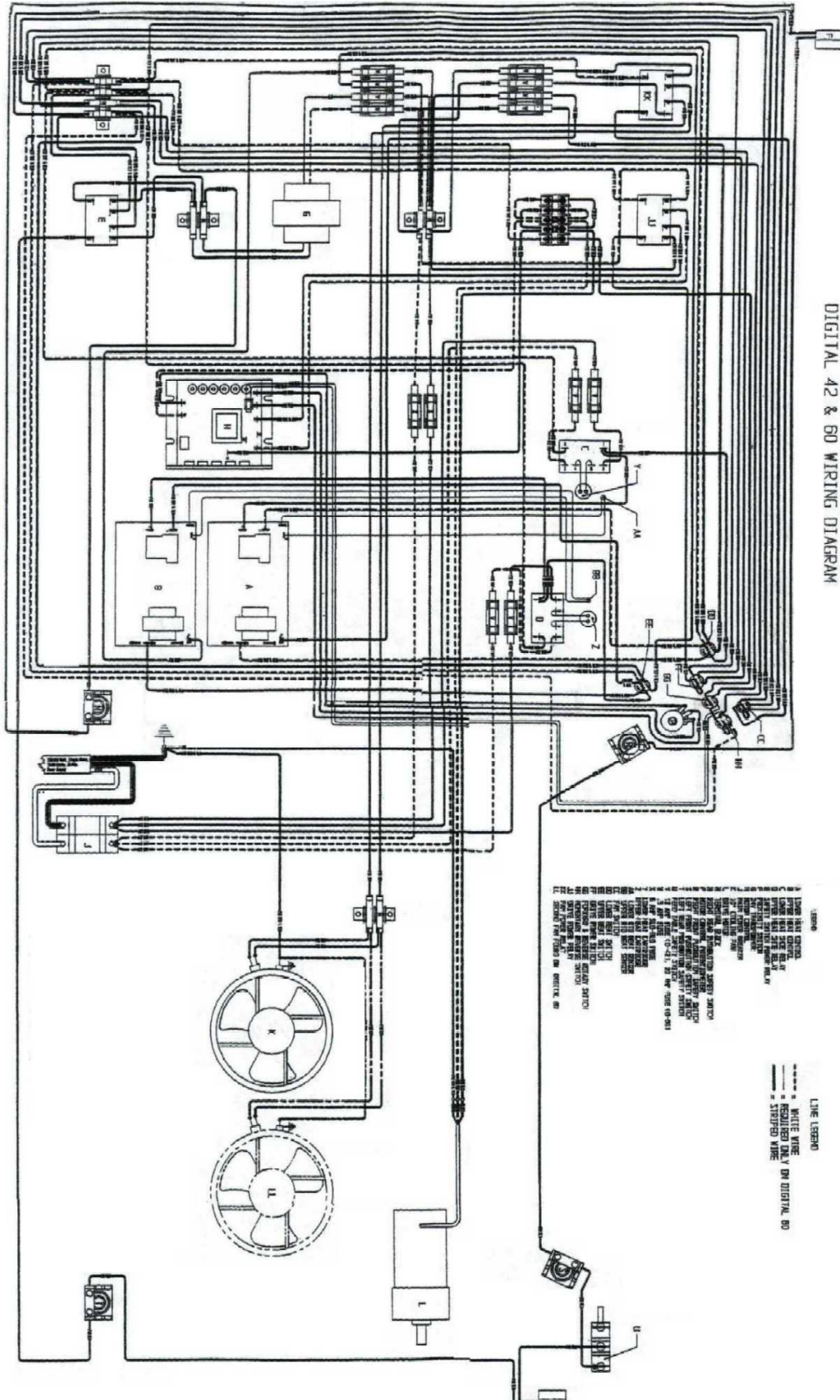
a. To adjust rubber rolls :

- (1.) **Disconnect power cord.**
- (2.) Open both right and left side housing doors as described in 3 above.
- (3.) Locate the connecting pressure plate assemblies, springs and 1/4 20 x 4 1/2 " hex head bolts therein.
- (4.) Using a 7/16" flat wrench, adjust the bolt and rubber roll pressure springs to the optimal measurement settings as specifically denoted in factory roll pressure spring measurement setting diagram at the back of this guide.

NOTE : All measurements and adjustments are to be made with the rolls in the "down but not locked position".

46. Replace rubber rolls.

- a. If the rubber rolls have been damaged or produce an unacceptable dwell line that cannot be corrected with adjustments to the pressure as outlined in procedure 39, the rolls need to be replaced.
 - b. Replace rubber rolls as detailed in procedure 35.
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DIGITAL 42 & 60 WIRING DIAGRAM

LINE LEGEND
--- WHITE WIRE
--- RED WIRE
--- BLACK WIRE
--- STRIPPED WIRE

NOTES
1. THIS WIRING DIAGRAM IS FOR THE DIGITAL 42 & 60 SYSTEM.
2. THE WIRING IS BASED ON THE ORIGINAL DESIGN.
3. THE WIRING IS SUBJECT TO CHANGE WITHOUT NOTICE.
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