Preparing The Printer For Maintenance

**WARNING**
Unplug the printer power cord from the printer or power outlet before you do any maintenance procedure. Failure to remove power could result in injury to you or damage to equipment. If you must apply power during maintenance, you will be instructed to do so in the maintenance procedure.

**IMPORTANT**
Do not attempt field repairs of electronic components or assemblies. Do not de-solder any circuit board components. Replace a malfunctioning electronic assembly with an operational spare. Most electronic problems are corrected by replacing the printed circuit board assembly, sensor, or cable that causes the fault indication. The same is true of failures traced to the hammer bank: replace the entire shuttle frame assembly. It is not field repairable. Hammer spring assemblies are the only replaceable components of the shuttle frame assembly.

To prepare the printer for maintenance, do the following steps before you make any adjustments:

1. Set the printer power switch to O (off).
2. Unplug the printer power cord from the printer or AC power source.
3. Disconnect the data (signal) cable from the printer interface.
4. Open the printer cover.
5. Unload paper.
6. Remove the ribbon.
7. Read the entire maintenance procedure before you begin working on the printer.
8. Gather the necessary parts before you begin working on the printer.
Chapter 4  Platen Gap Adjustment

Platen Gap Adjustment

**IMPORTANT**  Only do this procedure if the original equipment shuttle frame assembly or platen has been replaced by a new or refurbished unit.

1. Prepare the printer for maintenance (page 128).
2. Remove the shuttle cover assembly (page 178).
3. Loosen the platen open belt (page 132, steps 2, 3, and 4).
4. Raise the forms thickness lever (1) to the fully open position.

**CAUTION**  Do not force the platen against the feeler gauge and do not move the feeler gauge laterally across the hammer bank. Damage to the hammer tips will result.

5. Insert a 0.011 inch (0.28 mm) flat feeler gauge (2) straight down between the hammer bank cover plate (3) and ribbon mask (4), within four hammer positions of the left end of the hammer bank.

**CAUTION**  Adjust the platen setscrews less than 1/4 turn on one side, then check the other side. Adjustment sensitivity is approximately 0.03 inch per revolution of the setscrew. Also, insert the feeler gauge no more than 2 inches down from the top of the ribbon mask.

6. Gently close the forms thickness lever (1) all the way. As the platen is closing, gently slide the feeler gauge up and down, keeping it between the hammer tip and ribbon mask. If the feel is too tight when the platen is being closed, adjust the 3/32 inch setscrew (5) at the end of the platen counterclockwise. If the feel is too loose, adjust the setscrew clockwise. With the forms thickness lever closed all the way, the feeler gauge should contact both the tips and the ribbon mask and move with light friction. Shift the gauge slightly to verify.

7. Repeat steps 4 through 6 at the right end of the hammer bank.
8. After adjusting both sides, check the gap again at both ends. Readjust if necessary.

**NOTE:**  Gap widths other than 0.011 inch (0.28 mm) in the middle/inner sections of the platen are okay, provided the gap at each end of the platen is 0.011 inch (0.28 mm).

9. When the platen gap is correct at both ends of the platen, adjust the platen open belt (page 132).
10. Install the shuttle cover assembly (page 178).
11. Check the hammer phasing adjustment (page 149).
12. Return the printer to normal operation (page 129).
Legend:
1) Forms Thickness Lever
2) Feeler Gauge
3) Hammer Bank Cover
4) Ribbon Mask
5) Setscrew, 3/32 inch hex (2)

Figure 14. Platen Gap Adjustment

NOTE: Left side adjustment shown. Right side is the same.
Cover Assembly, Top, Pedestal Models

Removal
1. Prepare the printer for maintenance (page 128).
2. Loosen, but do not remove, the two #2 Phillips hold-down screws on the rear of the printer. (See page 231, item 5.)
3. Open the printer cover.
4. Loosen the four captive #1 Phillips screws until the control panel is released from the printer top cover. (See page 231, items 1 and 2.) Set the control panel assembly on the shuttle cover assembly.
5. Loosen the two captive #2 Phillips screws in the lower front corners of the top cover. (See page 231, item 3.)
6. Lift the top cover assembly off the printer base.

Installation
1. Reverse steps 2 through 6 of the removal procedure.
2. Return the printer to normal operation (page 129).
Figure 33. Pedestal Details
Paper Path

NOTE: This procedure applies only to cabinet models.

Removal
1. Prepare the printer for maintenance (page 128).
2. Loosen the three paper path hold-down screws (page 233, item 6).
3. Slide the paper path to the left and lift it off the card cage.

Installation
1. Position the paper path offset slightly to the left on the card cage with the keyway cutouts over the three loosened hold-down screws page 233, Figure 34).
2. Slide the paper path to the right, engaging the three hold-down screws in the keyway slots. Slide the paper path to the right as far as it will go.
3. Tighten the three hold-down screws (page 233, item 6).
4. Return the printer to normal operation (page 129).
Figure 34. Inside Covers, Cabinet Models
Chapter 5  Section I: Replacement Procedures

Cover Assembly, Shuttle

Removal
1. Prepare the printer for maintenance (page 128).
2. Loosen the shuttle cover screws (page 233, item 2).
3. Grasping the edges of the shuttle cover assembly, tilt the rear edge up and lift the shuttle cover assembly out of the printer.

Installation
1. Place the shuttle cover assembly in the printer. Tilt the forward edge of the cover down slightly and work the cover into position.

NOTE: Make sure the holes in the cover are over the locating pins on the base casting.
2. Tighten the shuttle cover screws (page 233, item 2).
3. Return the printer to normal operation (page 129).
1. Prepare the printer for maintenance (page 128).

2. Cabinet Models: Remove the paper path (page 196).
   Pedestal Models: Remove the top cover assembly (page 179).

3. Remove the platen open belt cover (1) by squeezing the top and bottom to release the plastic tabs from the slots in the side plate.

4. Loosen the two 5/16 inch motor mount screws (2) enough to permit movement of the platen open motor. (Some motors are mounted with nuts and bolts; other motors have threaded flanges, eliminating the need for nuts.)

5. Close the forms thickness lever all the way.

   **CAUTION**  Too much tension on the platen open belt can cause the platen gap to change, which can lead to premature wear of the platen, damaged hammer tips, and poor print quality.

6. Using a force gauge, apply 10 pounds (44.48 N) of tension to the shank of the platen drive pulley (3) by pushing in the direction away from the large platen pulley.

7. Reduce tension to 5 pounds (22.24 N) and torque the 5/16 inch motor mount screws (2) to 18 ± 2 inch-pounds (2.03 ± 0.23 N•m).

   **NOTE:** Belt tension is correct if the belt deflects 1/8 inch midway between the pulleys.

8. Snap the platen open belt cover (1) into the slots in the side plate.

   Pedestal Models: Install the top cover assembly (page 179).

10. Return the printer to normal operation (page 129).
Legend:
1) Belt Cover
2) Motor Mount Screw (2)
3) Platen Open Motor Shaft

Figure 11. Platen Open Belt Adjustment
Chapter 4  Platen Open Motor Pulley Alignment

Platen Open Motor Pulley Alignment

1. Prepare the printer for maintenance (page 128).
2. Cabinet Models: Go to step 3.
   Pedestal Models: Remove the top cover assembly (page 179).
3. Remove the platen open belt cover (1) by squeezing the top and bottom to release the plastic tabs from the slots in the side plate.
4. Loosen the 1/16 inch setscrew (2) in the motor pulley.
5. Bottom out the platen open motor pulley (3) on the motor shaft and torque the 1/16 inch setscrew (2) to 11 ± 2 inch-pounds (1.24 ± 0.23 N•m).
6. Check the platen open belt tension (page 132). Adjust if necessary.
7. Snap the platen open belt cover (1) into the slots in the side plate.
   Pedestal Models: Install the top cover assembly (page 179).
9. Return the printer to normal operation (page 129).
Legend:
1) Belt Cover
2) Setscrew
3) Platen Open Motor Pulley
4) Platen Shaft Pulley

Figure 15. Platen Open Motor Pulley Alignment
Hammer Phasing Adjustment

You must check and adjust hammer phasing if the controller board is replaced, the shuttle frame assembly is removed, or if the MPU is replaced.

The hammer phase value is a timing parameter that permits you to adjust the vertical alignment of dots in character printing. The phase value numerical units are relative; they do not represent a physical measurement or value. Thus there is no "correct" value or range. But, if the phasing value is far enough from the theoretical ideal value on a particular printer, errors can occur. If, for example, you are adjusting phasing and an error such as PAP FIFO UNDRFL* occurs, the phase value may be too high. Try a lower value.

The factory prints the initial phase value on the shuttle assembly casting, next to the motor housing. Adjust the phasing to this value and recheck the vertical alignment. When vertical alignment is acceptable, write the new phasing value on the shuttle.

Phasing should be adjusted with the printer printing at full paper width.

IMPORTANT

The printer must be printing the Phase pattern of "H's" when the Phasing Value is changed, or the New Phasing Value will not be written into NVRAM. If the value is changed when not printing, the printer will return to its default phasing value when powered off then back on.

1. Raise the printer cover.
2. Install the ribbon.
3. Load full width (136 column) paper and set the top of form.
4. Power on the printer.
5. If the printer is on-line, press the ON LINE key to place the printer off-line. "OFFLINE / CONFIG. CONTROL." displays.
6. On the control panel, press the ▲ + ▼ keys to unlock the ENTER key. "ENTER SWITCH UNLOCKED" briefly displays. (If "LOCKED" displays, simply press ▲ and ▼ again. This is the default key combination. The lock/unlock key combination can be programmed by the user. If ▲ + ▼ does not unlock ENTER, get the combination from the user.)
7. Press the ◄ key. "OFFLINE / DIAGNOSTICS" displays.
10. Press ◄ until "Printer Tests / Phase Printer" displays.
11. Press ENTER. The display shows "Printer Tests / Phase Printer" and the test begins. The current phasing value is printed on the left of the printed pattern of all H's. As the pattern prints, compare the H's to the figure below. If the phasing needs adjustment, go to step 12. If the phasing is OK, go to step 15.

13. Press ‹ to increase or › to decrease the phasing index value, then press ENTER to activate the value as it prints. Continue to increase or decrease the phasing index until the pattern of H’s is acceptable.


15. Press ENTER to stop the test.


17. Press ▲ + ▼ (or the key combination set by the user). “ENTER SWITCH LOCKED” briefly displays.

18. Close the printer cover.

19. Press the ON LINE key to place the printer on-line.

NOTE: If you changed the phasing value, power down the printer, remove the shuttle cover, and write the new phase value on the aluminum shuttle casting.
Dynamic Paper Tension Adjustment

This procedure helps you identify and eliminate conditions that contribute to paper jams, excessive tension on the paper feed motor, and vertical dot compression or expansion.

1. Open the printer cover.
2. Unload paper. Make sure a ribbon is installed in the printer.
3. Unlock both tractors and move them outward to the sides as far as they will go.
4. Prepare a length of 14 inch wide paper consisting of three sheets that are still attached at the perforations. (The paper must be single part, 18 lb maximum weight, 0.0036 inch maximum thickness.) Open the cabinet front door and feed the paper up through the print station until the first page clears the ribbon mask by about one inch. (See Figure 19.)
5. Fold a two-inch piece of plastic tape over the top sheet, midway between the sides, as shown in Figure 19.

Figure 19. Preparing Paper for Tension Measurement
6. Close the forms thickness lever all the way (pointer at ‘A’).

7. Attach the hook of a “fish scale” force gauge through the tape you installed in step 5.

8. Pull the paper slowly straight up through the print station for about six inches and note the maximum force exerted on the scale. Do not pull any page perforations through the print station. (See Figure 20.)

9. Repeat steps 6 through 8 several times to get a consistent average value of force on the gauge.

10. The average tension should be 6 to 12 ounces. If the average value is greater than 13 ounces, paper handling and print quality problems are likely.

11. If the average value is greater than 13 ounces, check the platen gap (page 140), adjust if necessary, and recheck the dynamic paper tension.

12. If the platen gap is correct, remove the shuttle frame assembly (page 215) and check the following:
   a. Inspect the hammer bank cover assembly for ribbon debris, paper debris, or other foreign matter. If the ribbon mask or hammer bank cover is damaged or deformed, replace it.
   b. Inspect the paper ironer for distortion or misalignment. Reposition or replace it if necessary.
   c. Check for correct position and function of the paper motion detector assembly. Reposition or replace if necessary.
   d. Inspect the paper path from above (below the paper ironer), and from below (above the paper entrance guide), for debris, foreign matter, or anything that could inhibit paper motion. Correct as necessary.
Returning The Printer To Normal Operation

When you are finished servicing the printer, test its operation and return it to service by doing the following steps:

1. Install the ribbon.
2. Load paper.
3. Connect the data (signal) cable to the printer interface.
4. Plug the AC power cord into the printer and the power source.
5. Close the cabinet doors.
6. Set the printer power switch to | (on).
7. Test printer operation by selecting and running one of the operator print tests. (See page 111.)
8. Select the emulation. (Refer to the User's Manual.)
9. Set the top-of-form. (Refer to the User's Manual.)
10. Close the printer cover.