

## Counterweight Assembly

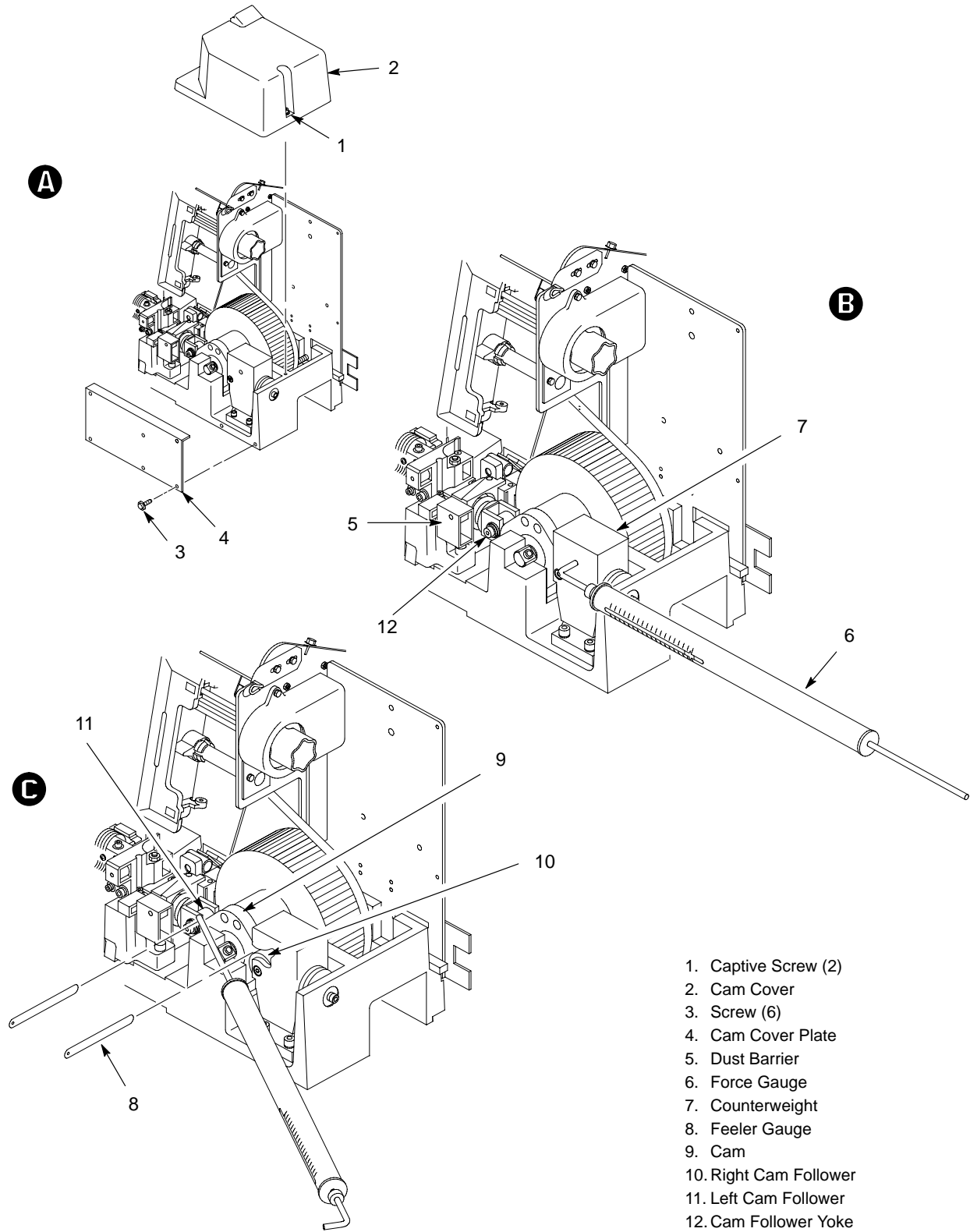
1. Unplug the printer power cord from the AC receptacle.
2. Remove the cam cover and the cam cover plate. (See Figure 6-7, page 6-40, items #4 and #12.)
3. Remove the front two allen screws from the counterweight base plate, and just loosen the rear screw. (See Figure 6-13, page 6-52, item #21.)
4. Remove one allen screw from the counter-weight assembly. (See Figure 6-13, page 6-52, item #3.)
5. To remove the counterweight, slide the assembly toward the front of the printer. Take care while removing the counterweight assembly not to lose the counterweight spring guide shims and spring seat.
6. To install the new counterweight assembly, first remove the rear base plate allen screw which was loosened in step 3. above. Position this screw in the base plate rear slot, and with the allen wrench inserted into the screw, slide the counter weight assembly into place, starting the screw into the printer deck threads. Do not fully tighten this screw yet.
7. Next, replace the the counterweight allen screw which secures the right spring seat. (Right side of printer deck) Do not tighten this screw yet.
8. Replace the two front base plate allen screws, and tighten all four screws.
9. Check and adjust the shuttle and counterweight preload (page 5-28).

## Shuttle and Counterweight Preload (Figure 5–12)

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**NOTE:** Set shuttle and counterweight preload when improper shuttling action or excessive rattle is detected, or whenever shuttle drive components have been replaced.

1. Disconnect the AC power cord from the rear of the printer. Open the printer cover.
2. Remove the ribbon deck assembly. (See page 5–2.)
3. Loosen two captive screws (1) and remove the cam cover (2). (Figure 5–12, detail A.)
4. Remove six screws (3) and the cam front cover plate (4).
5. Remove the dust barrier (5).
6. Insert the force gauge (6) in the hole in the counterweight (7). (Figure 5–12, detail B.)
7. Insert a 0.003 inch flat feeler gauge (8) between the cam (9) and the right cam follower (10).
8. Pull the force gauge horizontally to the right. Note the gauge indication when the feeler gauge comes loose.
  - a. If the indication is 12–17 pounds, go to Step 9.
  - b. If the indication is less than 12 pounds, install a shuttle counterweight shim as described on page 5–32 and repeat Steps 6. through 8.
  - c. If the indication is greater than 19 pounds, remove a counterweight spring shim and repeat Steps 6. through 8.
9. Insert a 0.003 inch flat feeler gauge between the cam and the left cam follower (11).
10. Press the rod end of the force gauge against the cam follower yoke (12), positioning the gauge as close to parallel with the shuttle shaft as possible. (Figure 5–12, detail C.)

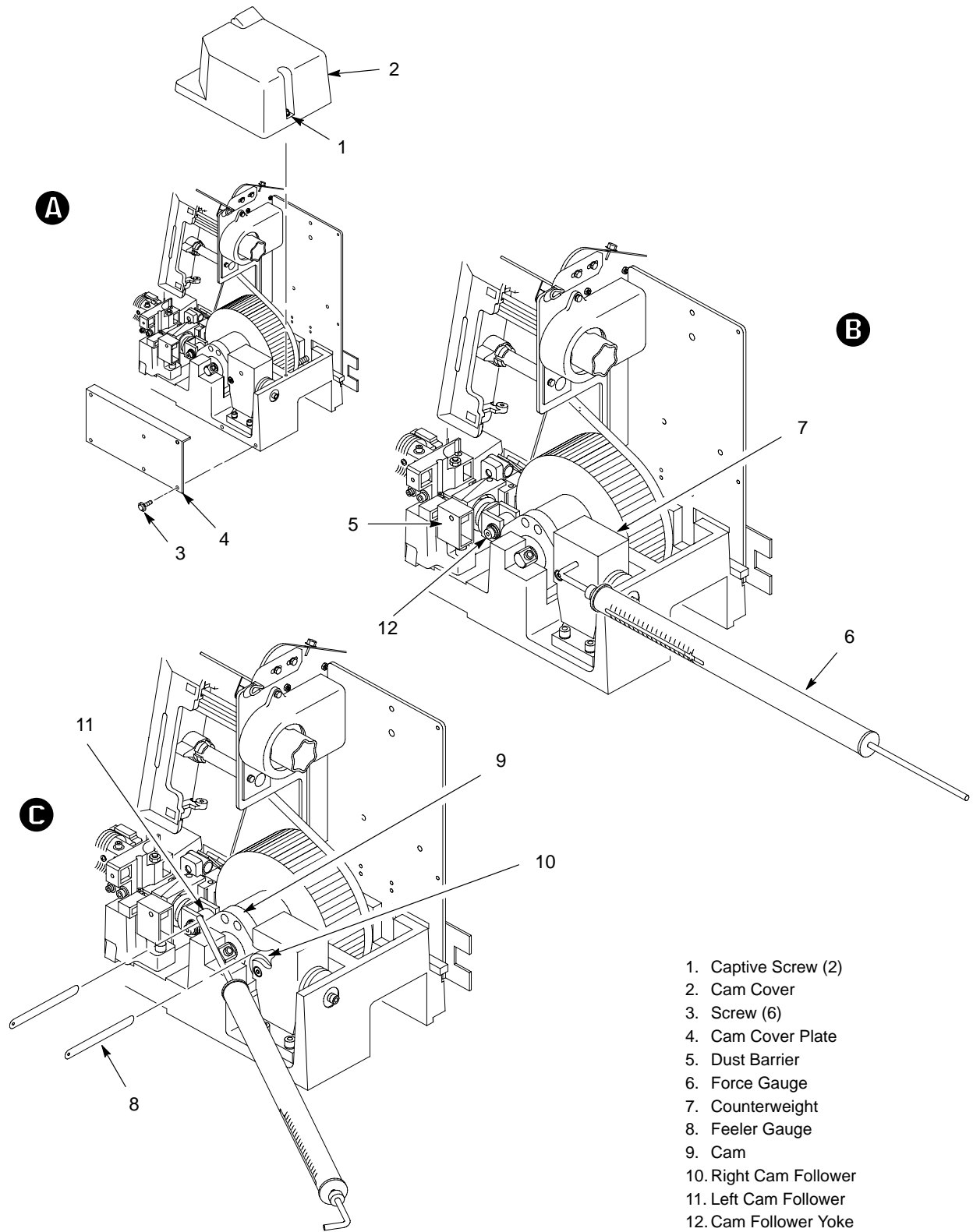


**Figure 5-12. Setting Shuttle and Counterweight Preload**

11. Push the force gauge horizontally to the left. Note the gauge indication when the feeler gauge comes loose.

**NOTE:** If springs have been replaced, set the preload at the high end of range, otherwise set it at the low end.

- a. If the indication is between 12 and 17 pounds, go to Step 12.
  - b. If the indication is less than 12 pounds, install a shuttle spring shim as described on page 5-32 and repeat Steps 9. through 11.
  - c. If the indication is greater than 17 pounds, remove a shuttle spring shim and repeat Steps 9. through 11.
12. Operate the printer.
- a. Run a shuttle/ribbon fast test for 10 minutes. Check for rattle and increase the preload if necessary.
  - b. Run a shuttle/ribbon slow test. Check for stalls or no-start conditions and decrease the preload if necessary.
13. Install the dust barrier.
14. Install the gasket, cam front cover plate, and six screws.
15. Install the cam cover and tighten the two captive cover screws.
16. Install the ribbon deck assembly by reversing the steps on page 5-2.
17. Install paper and close the printer cover.



1. Captive Screw (2)
2. Cam Cover
3. Screw (6)
4. Cam Cover Plate
5. Dust Barrier
6. Force Gauge
7. Counterweight
8. Feeler Gauge
9. Cam
10. Right Cam Follower
11. Left Cam Follower
12. Cam Follower Yoke

**Figure 5-12. Setting Shuttle and Counterweight Preload**

## Shuttle and Counterweight Spring Adjustment (Figure 5–13)

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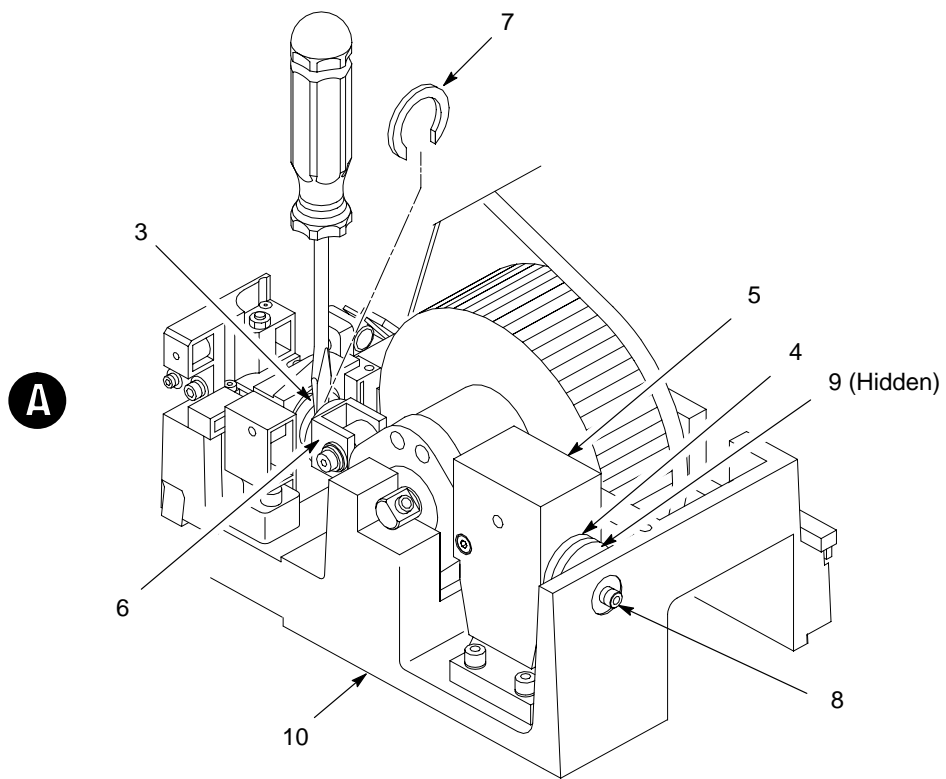
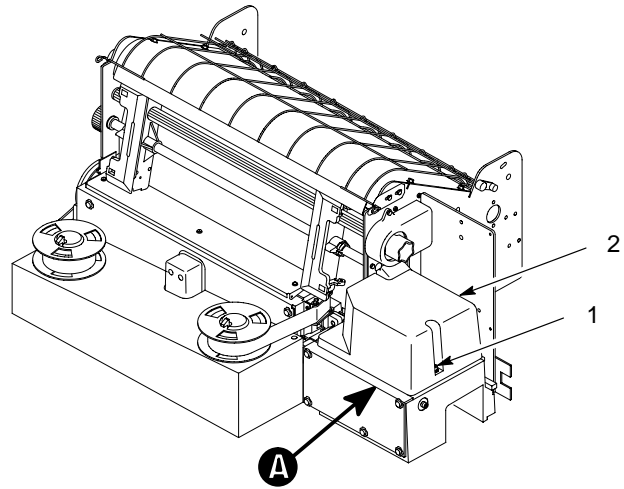
**NOTE:** You can make force adjustments with or without a force gauge. The procedure on page 5–28 describes the use of a force gauge and is the preferred method. Although the procedure below is *not* recommended, you can do it if excessive rattle is detected under the cam cover and you are unable to do the procedure on page 5–28. (Rattle under the cam cover indicates incorrect spring force, which can effect print quality.)

1. Open the printer cover.
2. Loosen two captive screws (1) and remove the cam cover (2).
3. Inspect the area around the shuttle spring (3) and the counterweight spring (4) for broken or loose shims. Replace loose shims per Steps 6 and 7 below.
4. Turn the printer on. Run the printer using a shuttle/ribbon test to keep the shuttle moving.
5. Loosen screw (8) about three turns. With the screwdriver, press in on the loosened screw to apply heavy pressure to the right side of the counterweight (5). Check for rattle.
  - a. If the rattle does not change, go to Step 6.
  - b. If the rattle decreases, go to Step 7.
6. Install a 0.01 inch shuttle spring shim as follows:

**NOTE:** More than one shim may be required to obtain the desired effect.

- a. Turn the printer off.
- b. Use a screwdriver to pry the spring away from the yoke (6).
- c. Insert a shim (7) and press down until it is flush with the yoke.

1. Captive Screw (2)
2. Cam Cover
3. Shuttle Spring
4. Counterweight Spring
5. Counterweight
6. Yoke
7. Shim
8. Screw
9. Shim
10. Base Support



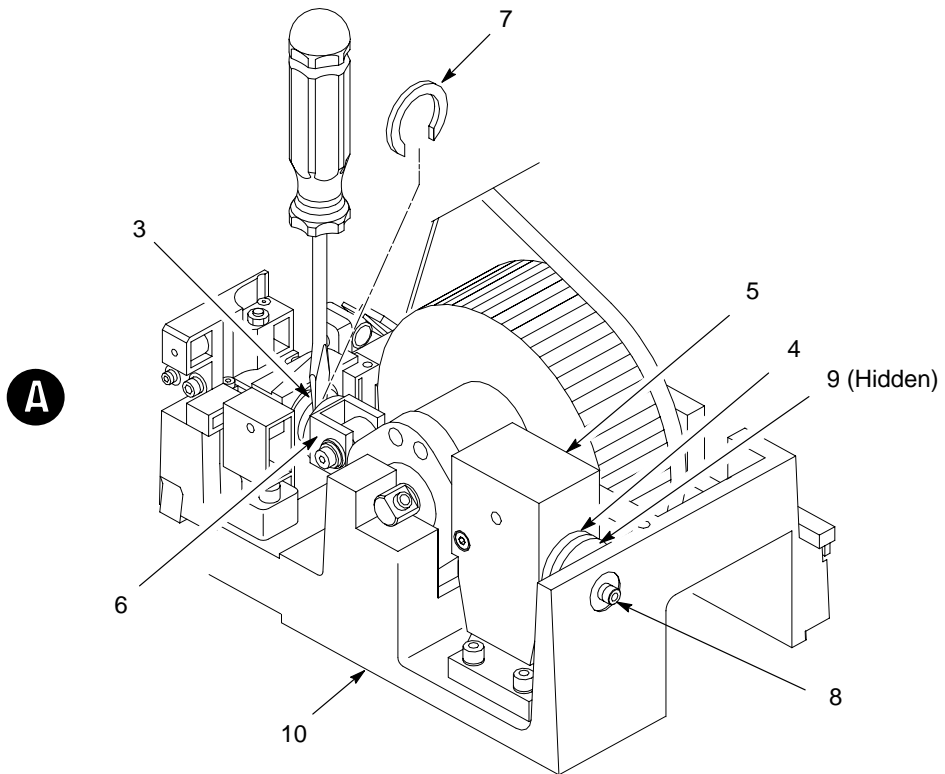
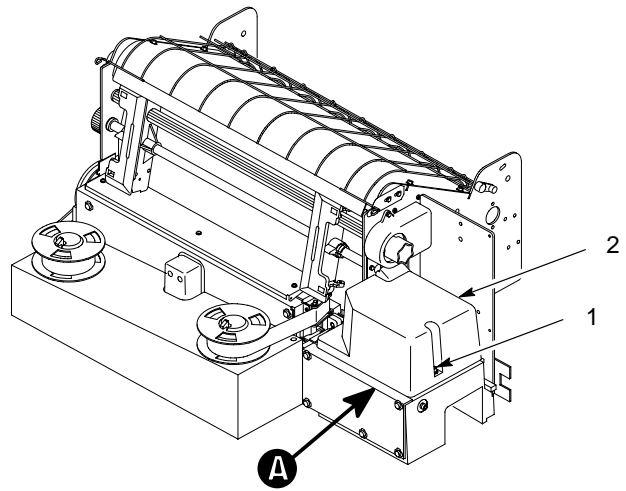
**Figure 5-13. Shuttle Spring Force Adjustment**

7. Install a counterweight spring shim as follows:

**NOTE:** More than one shim may be required to obtain the desired effect.

- a. Loosen screw (8) about three turns.
  - b. With the screwdriver, press in on the loosened screw to create space for a shim (9).
  - c. Install a shim between the spring spacer and the base support (10).
  - d. Tighten the screw.
8. Operate the printer.
- a. Run a shuttle/ribbon fast test for 10 minutes. Check for rattle and increase the preload if necessary.
  - b. Run a shuttle/ribbon slow test. Check for stalls or no-start conditions and decrease the preload if necessary.
9. Install the cam cover and attached gasket.
10. Tighten the two captive screws and close the printer cover.

1. Captive Screw (2)
2. Cam Cover
3. Shuttle Spring
4. Counterweight Spring
5. Counterweight
6. Yoke
7. Shim
8. Screw
9. Shim
10. Base Support



**Figure 5-13. Shuttle Spring Force Adjustment**