Alignment of Plate Fly-Off Detector

Context

VLF Trendsetter

VLF Platesetter

Background

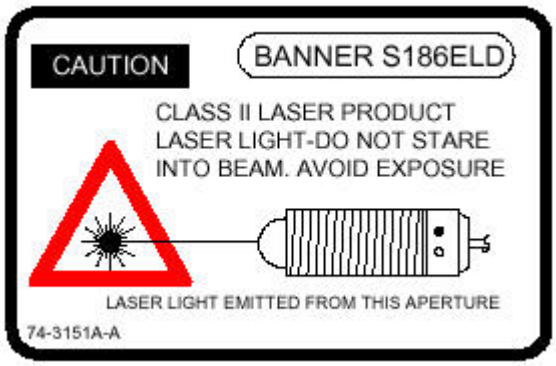
During normal operation, the plate flyoff detector on the VLF Trendsetter and VLF Platesetter halts drum rotation immediately upon detection of a plate fly-off. The current detector system consists of a Banner S186ELDQ Class II laser Diode emitter and a Banner S18SN6RQ receiver.

Use this alignment procedure after replacing a defective laser emitter or receiver on a VLF Trendsetter or VLF Platesetter, or when aligning an existing sensor. Alignment of the plate fly-off detector requires overriding the access panel interlocks via the safety interlock switch located in the power box.

Creo Field Service Engineers (FSEs) may perform this procedure only after successfully completing a VLF Trendsetter or VLF Platesetter System Maintenance Course. The course may be presented by Creo training groups, a Product Specialist, or an engineering support team and must provide thorough instruction in safe laser practices.

DANGER: Do NOT stare into beam or view directly with optical instruments. Prolonged exposure may cause eye damage.

A laser emitter warning label (as shown below) is affixed to the engine plate near the laser emitter's mount.



Tools and parts

- Set of metric allen keys
- Loctite 242

Steps

1. Power up the VLF TS/PS
2. Disable the laser head in firmware by entering the following commands:

>>laser off
>>set head wenable 0
>>nvs save head
>>laser

DANGER: Proceed only when laser status indicates laser disabled. Failure to perform this step with the preceding commands and while an access panel is open could result in permanent eye damage.

3. Open access panels as required to access the drive motor side of the engine.
4. Remove or open power box access panel
5. Insert key into safety interlock override switch and rotate to the **LASER HAZARDS** position. See Figure 1.



Figure 1: Safety Interlock Override switch label

Note: A spare key is located at the panel under the key switch and may be removed using a 3mm hex key. Notify customer and Creo if key is missing.

6. Remove the belt guard assembly.

7. Mount the alignment target (50-1490A) on the pulley end stiffener bar (see Figure 2) using one of the belt guard's M6 mounting capscrews. Ensure that the target is reasonably square to the stiffener bar. Check that the circle labeled "mirror target" is in position in front of the mirror unit.



Figure 2: Mounting the alignment target

8. Loosen the laser emitter's mounting screws so that the laser can be aligned. If the laser beam cannot be seen on the alignment tool's face, hold a sheet of white paper in front of the laser to locate the visible red beam (see Figure 3).

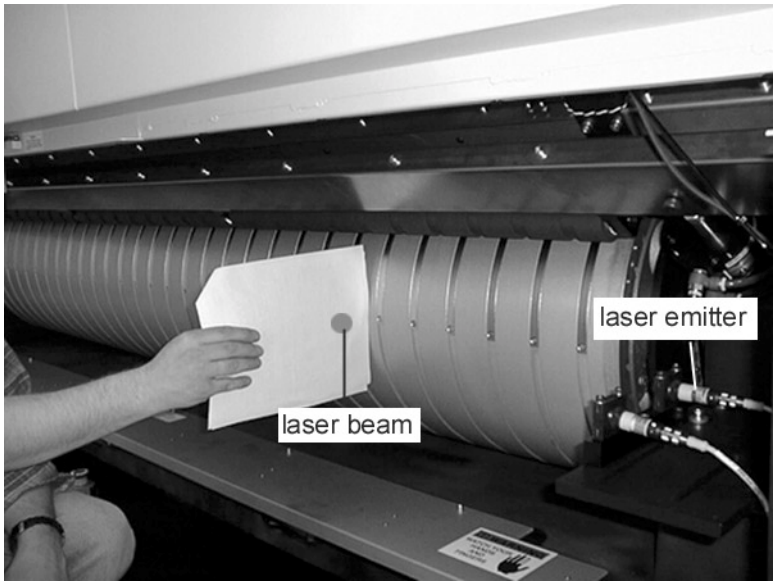


Figure 3: Locating laser beam

9. Move the paper along the drum towards the pulley end and adjust the laser as required so that the beam will be seen on the target.

   It may be helpful to dim the room lights, if possible. Carefully center the beam in the mirror target circle and tighten the laser emitter mounting screws. You will find that the beam will move as the mounting screws are tightened. We have found that by holding the laser emitter on target as you carefully tighten the mounting screws, the shifting can be kept to a minimum.

   Caution: Avoid over-tightening the mounting screws as the mounting bracket is easily broken.

10. Rotate the drum so that the trailing edge clamps are approximately in line with the laser beam. By moving a piece of white paper along the back of the TE clamps, you can check that the laser beam will clear them by approximately 3 mm.

11. Remove the alignment tool from the pulley end and mount on the sensor mounting bar at the encoder end (see Figure 4). Ensure that the target is reasonably square to the bar.

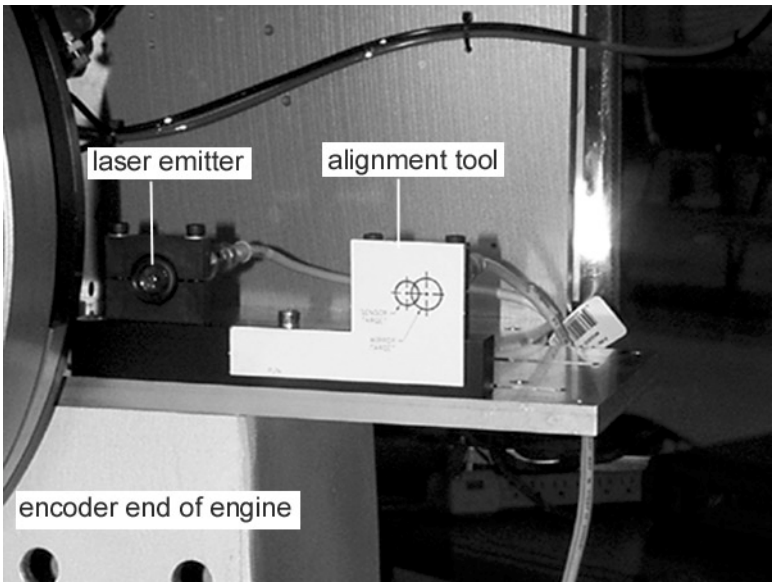


Figure 4: Alignment target on encoder end

12. At the drive motor end, loosen the knurled jam nuts on the mirror mount adjusting screws. Adjust the mirror so that the mirror face is reasonably perpendicular. This will help ensure that the return beam is at the same level as the laser emitter beam.

13. To locate the return laser beam at the encoder end, it may be helpful to have an assistant hold a piece of white paper vertically in front of the alignment tool, but do not block the beam from the laser emitter. When the return beam is located, adjust the mirror mount adjustment screws until the laser beam is centered in the circle labeled "sensor target" on the

alignment tool.

14. Install the drive belt guard.
15. Check that the return beam clears the belt guard side cover plate by using a piece of white paper to locate the return beam (see Figure 5).The beam should be approximately 5 mm from edge of the belt guard side cover plate. Adjust the belt guard assembly as required.



Figure 5: Checking belt guard clearance.

16. At the terminal, enter "**`set drum chkfly 0`**"to disable the fly-off detector, then enter **`"spin drum 100"`**. Observe the beam at the sensor target to see if there is any excessive movement (i.e., greater that 3 mm) in the beam at the receiver. If there is, stop the drum and check all fasteners for tightness. Repeat the test.
17. If you have an assistant or can connect a terminal to the diagnostic port, watch the laser dot on the receiver target while the drum is spun at different speeds. When the drum accelerates and decelerates, the laser spot should not move more than 3 mm. If it does, check all mounting fasteners for tightness.
18. Remove the alignment target and bolt to the encoder end clamp plate using one of the M6 tapped holes in the end of the clamp plate.
19. Align the receiver unit until it is reasonably square to the return laser beam and shows a steady yellow indicator light Secure the mounting screws but do not over-tighten.
20. At the terminal, turn the fly-off detector on using the command **`"set`**

`drum chkfly 1"`.

21. Spin the drum at 4 or 5 different speeds to test for fly-off stability when the drum is accelerated and decelerated. The fly-off detector should not trip. If it does, check that the beam is centered on the sensor and the mirror mounting bar fasteners are tight. Also check that the laser emitter mounting screws are secure.
22. Spin the drum at 50 RPM and interrupt the laser beam to check for correct operation of the fly-off detector.
23. Verify that all wiring and connectors are secure.
24. Return the safety interlock keyswitch in the power box to the **NORMAL OPERATION** position.
25. Remove the key and fix to panel location with the M4 capscrew (3 mm. hex key).
26. Install or close all access panels.
27. Enable laser in firmware by entering the following commands:

    >>set head wenable 1
    >>nvs save head