VLF Trendsetter

Laser Plate Fly-off Detector Installation (ECO B573)

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Revision History

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1. SCOPE

This procedure describes field installation of the Laser Plate Fly-off Detector System as required by ECO B573.

2. PARTS AND TOOLS

Parts:

For 5080 models: upgrade kit 05-0034

For 5880 models: upgrade kit 05-0035

Tools:

- 1 set metric allen keys
- small side cutters
- static wrist strap
- Loctite 242
- masking tape
- ty-wraps
- reed switch tester (10-3622A) (optional)

3. INSTALLATION PROCEDURE

1. Download and install revised firmware version 2.14 or higher, if not already installed.
2. Set the workstation to terminal mode.
3. Disable head laser using the command: `set head wenable 0.`
4. Raise load table: `table up`
5. Turn the main power switch off.
6. Remove back panel, engine "home" side panel, and front panel on card cage side.
7. Remove the drum drive belt guard assembly.
8. Remove the existing fly-off emitter and swivel mount from the pulley end clamp plate. Keep the swivel mount on hand; it will be re-used.
9. Remove the existing fly-off receiver from the hole in the frame casting at the encoder end. Keep the receiver on hand; it will be re-used.

10. Remove the engine satellite electronics (ESE) cover.

11. Attach a static wrist strap to the grounding jack. Disconnect the existing fly-off sensor cable (10-3475A) from the engine satellite board (see Figure 1). Connect the new sensor cable (10-3475B) to the same port. Remove the original cable and run the new cable inside the engine casting to the encoder end. Replace the ESE cover.

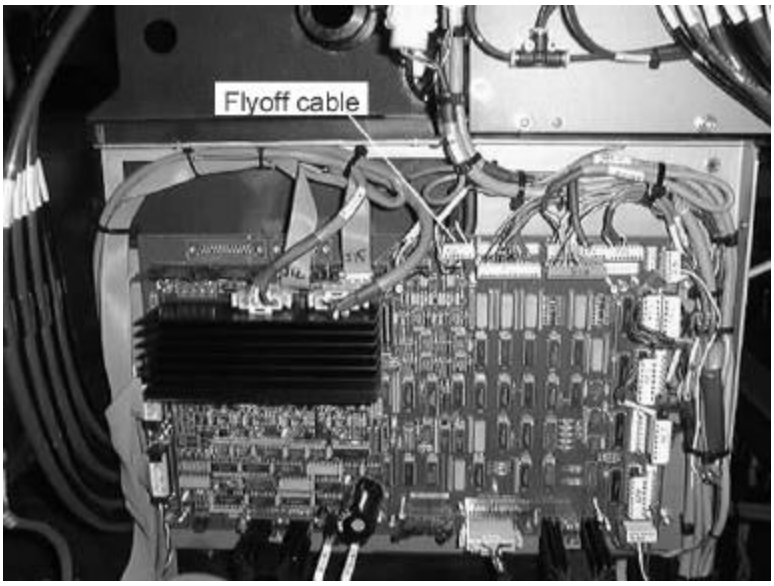


Figure 1: Fly-off sensor cable

12. Disconnect door sensor cable 10-3538A at backplane in card cage (see Figure 2). Plug male connector of cable 10-3608A into door sensor port and plug original door sensor cable 10-3538A into female plug of cable 10-3608A. Run new cable through the cable tray to the engine casting and down to the encoder end. Secure both new cables with ty-wraps.

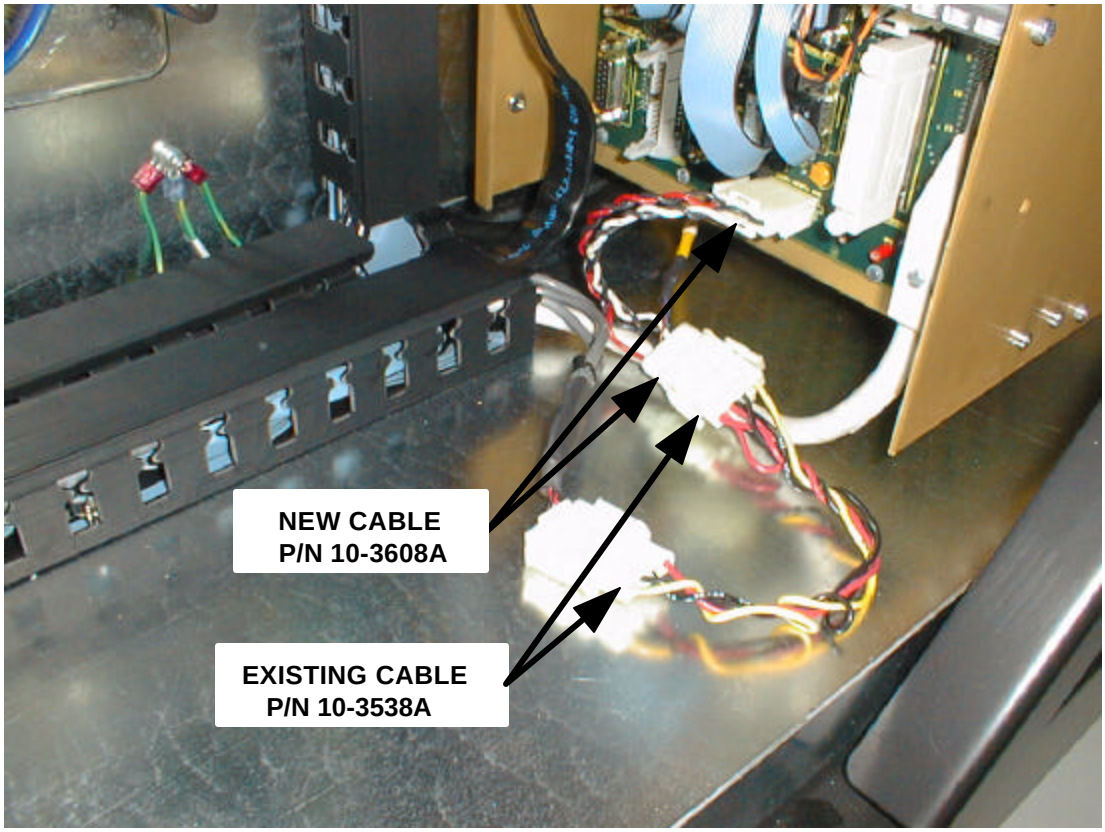


Figure 2: Card cage

13. Using a 6 mm hex key, remove the two M8 screws from the pulley end clamp plate assembly. Also using a 6 mm hex key, install the mirror mount bar (57-4594B) beside the plate stiffener bar with two M8x40 capscrews (52-4495) and Loctite 242 (see Figure 3).

    Note: Refer to pulley end assembly drawing 77-0036A in Figure 10.

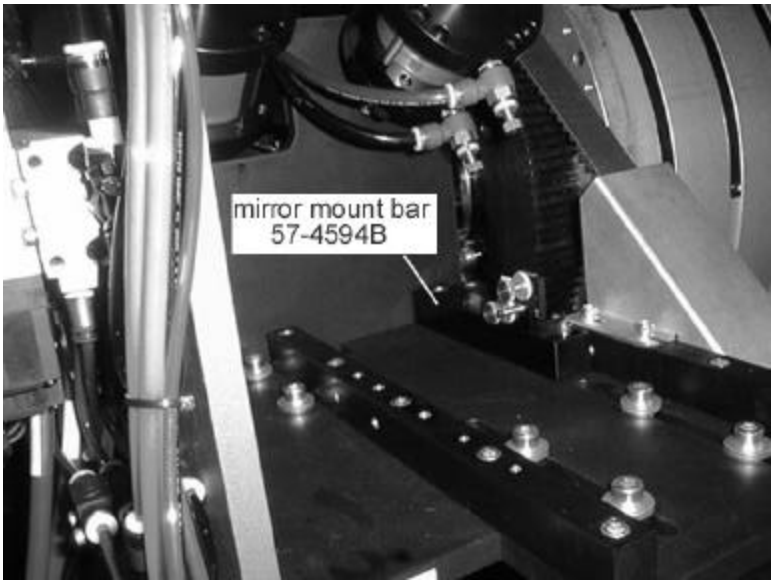


Figure 3: Installing the mirror mount bar

14. Using a 4 mm hex key, start two M5x10 capscrews (52-4483) for the mirror cover that will be installed later.

15. Using a 2.5 mm hex key, install the mirror mount (50-1491A) with two M3x12 capscrews (52-4428) and Loctite 222. Ensure that the mirror mount unit is reasonably square to the mount bar.

16. Using a 5 mm hex key, install the sensor mount bar (57-4593B) on the encoder end clamp plate using three M6x30 capscrews (52-3130) and Loctite 242.

    Note: Refer to encoder end assembly drawing 77-0037A in Figure 11. Ensure that the two offset M5 holes are located as shown.

17. Mount the laser emitter (36-3145) and the sensor unit (36-3118) from the original installation in the ball swivel mounts (18-3134) with the jam nuts on the backside of the ball nut. Using a 4 mm hex key, install it on the mounting bar as shown (*where*?) using M5x50 capscrews (52-4420) and M5 flat washers (52-4375) with Loctite 242. The sensor unit should protrude from the front of the ball nut by no more than 5 mm. Snug up the mounting screws but do not tighten at this time. Position the laser emitter and the sensor units so that their indicator lights are visible from the front. Tighten the jam nuts.

18. Connect the cables. Cable 10-3608A goes to the laser emitter and cable 10-3475B goes to the sensor unit. When the sensor cable is connected, the sensor's green indicator light should come on. If the light is not on, check the cable connections. Install ty-wrap push-in anchors in two holes in the frame (see Figure 4). Secure the cables as required with ty-wraps.

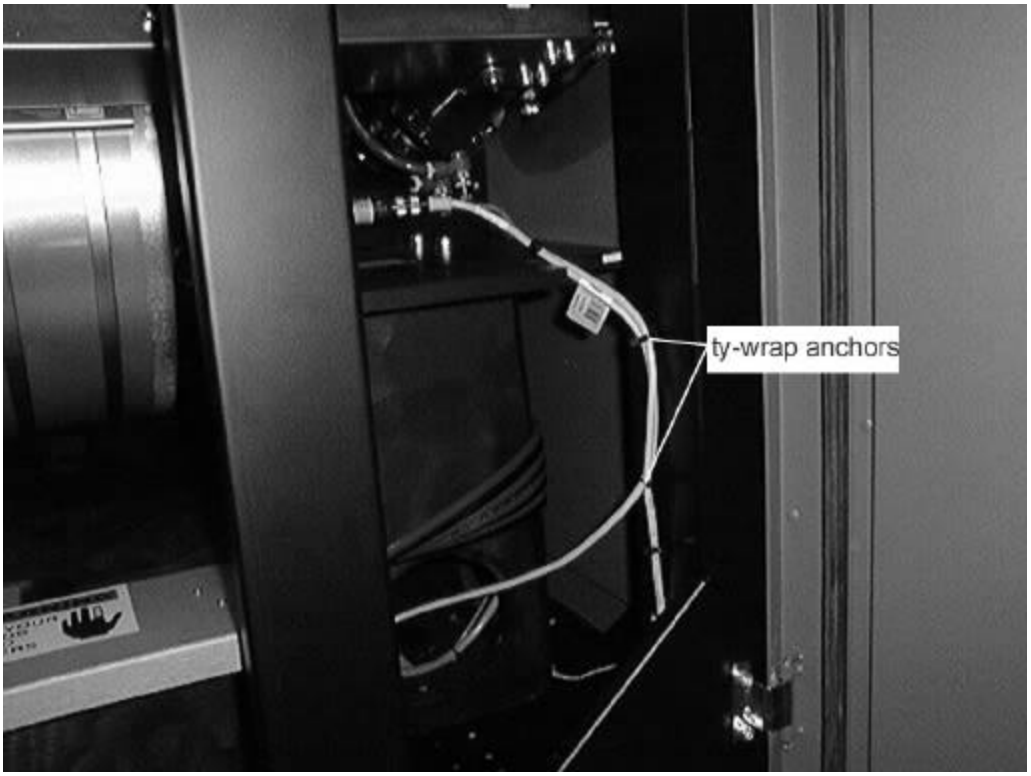


Figure 4: Securing the cables with ty-wraps

19. Install the laser warning label (74-3151A) as shown on the encoder end assembly drawing 77-0037A (see Figure 11).

4. ALIGNMENT PROCEDURE

1. Tape the reed switch magnets to the four door reed switches. This should complete the door interlock loop and supply power to the laser emitter. The green indicator light on the laser emitter should come on. If the light is not on, readjust the magnets on the reed switches using the reed switch tester (10-3622A), or check the cable connections.

2. Mount the alignment target (50-1490A) on the pulley end stiffener bar (see Figure 5) 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 5: Mounting the alignment target

3. Loosen the laser emitter's mounting screws so that the laser can be aligned. Hold a sheet of white paper in front of the laser to locate the visible red beam (see Figure 6). 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.

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

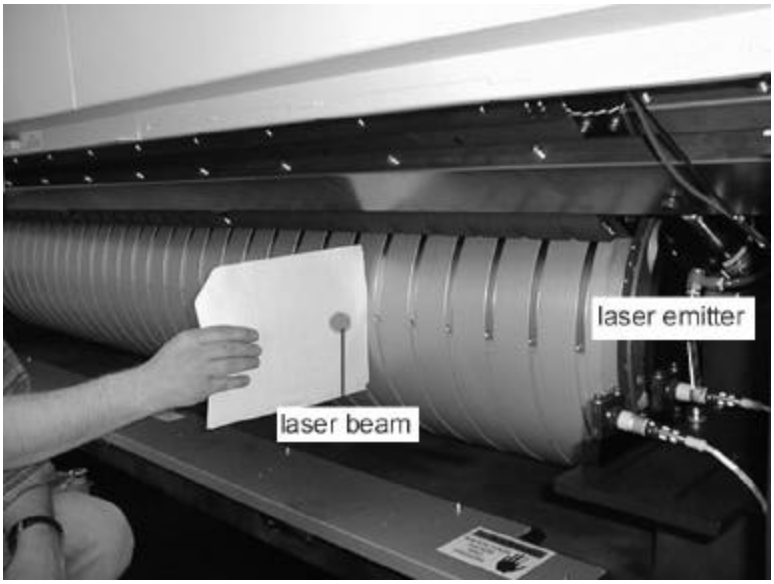


Figure 6: Locating the visible red beam of the laser

4. 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 the TE clamps by approximately 3 mm.

5. Remove the alignment tool from the pulley end and mount on the sensor mounting bar at the encoder end (see Figure 7). Ensure that the target is reasonably square to the bar.

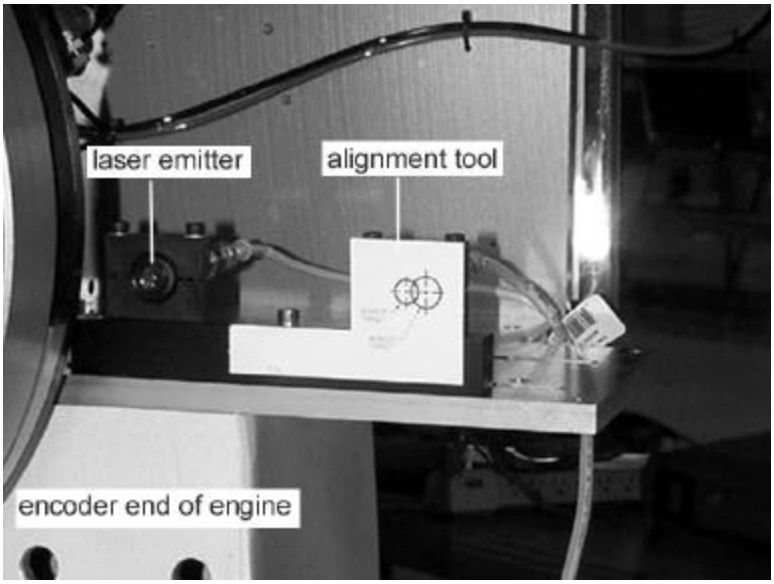


Figure 7: Alignment tool on the sensor mounting bar

6. Loosen the jam nuts on the mirror mount adjusting screws (see Figure 3). 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.

   To initially locate the return beam, try holding a white sheet of paper by the sensor unit (but don't block the beam from the laser emitter) (see Figure 8). Fine tune the alignment by adjusting the mirror mount until the beam is centered in the small circle labeled "sensor target". When beam is aligned, carefully tighten the adjusting screw jam nuts. Check that beam is still on target. Remove the alignment tool.



Figure 8: Locating the return beam

7. Install the drive belt guard.

   On 5080 models, the Belt Guard Bracket 57-4142A-A is replaced by 57-4142A-B. Apply foam tape as in the original installation.

   On 5880 models, the Belt Guard Side Panel 57-4218A-A is replaced by 57-4218A-B. Apply foam tape as in the original installation.

   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 9). The beam should be approximately 5 mm from edge of the belt guard side cover plate. Adjust the belt guard assembly as required.



Figure 9: Checking that the return beam clears the belt guard side cover plate

8. 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.

9. 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.

10. 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 (see Drawing 77-0037A in Figure 11).

11. 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.

12. At the terminal, turn the fly-off detector on using the command `set drum chkfly 1.`

13. 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.

14. Spin the drum at 50 RPM and interrupt the laser beam to check for correct operation of the fly-off detector.

15. Remove the magnets from the door reed switches and replace all access panels.

16. Cycle 3 or 4 plates through the machine to confirm proper operation of the unit.

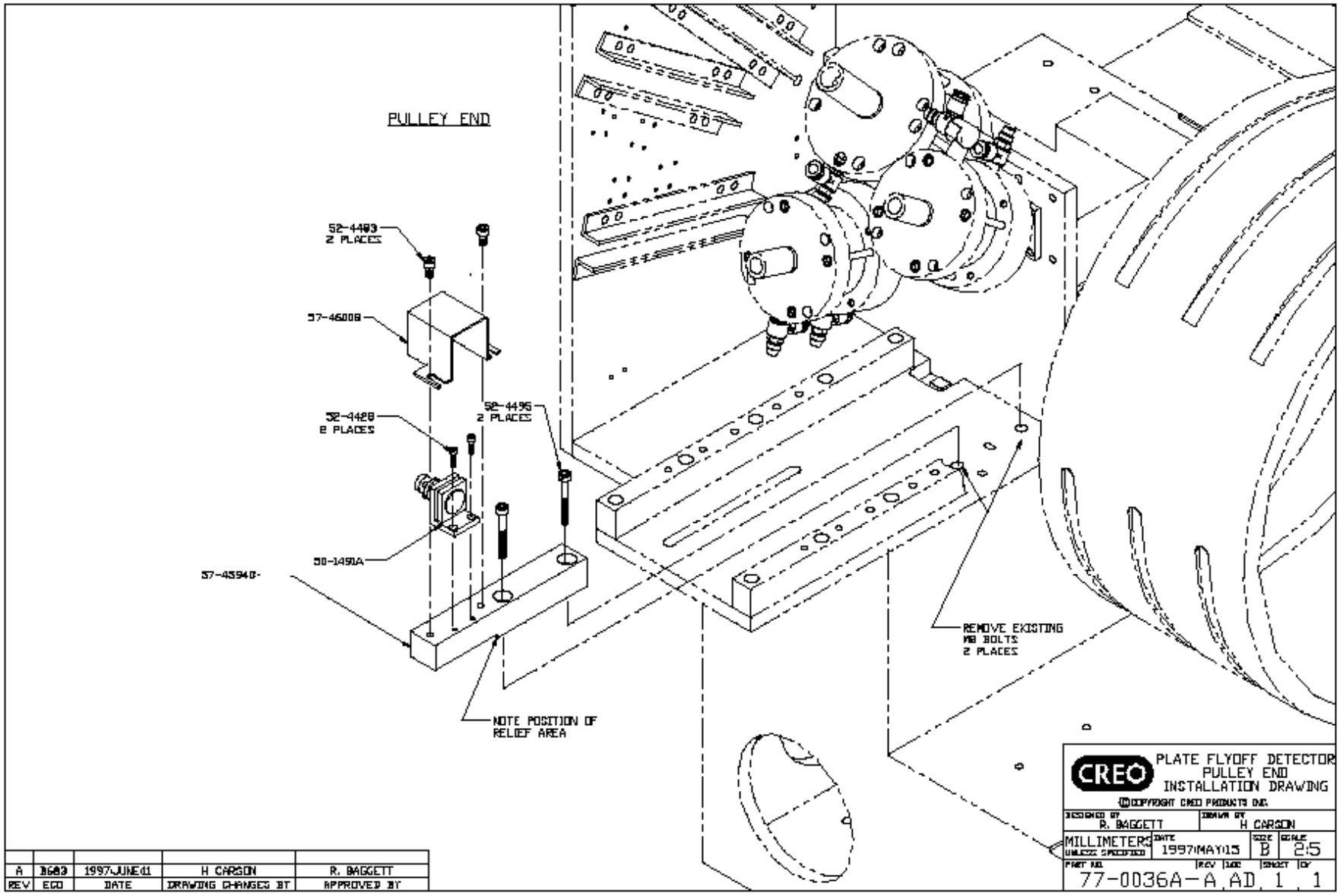


Figure 10: Plate flyoff detector installation – pulley end

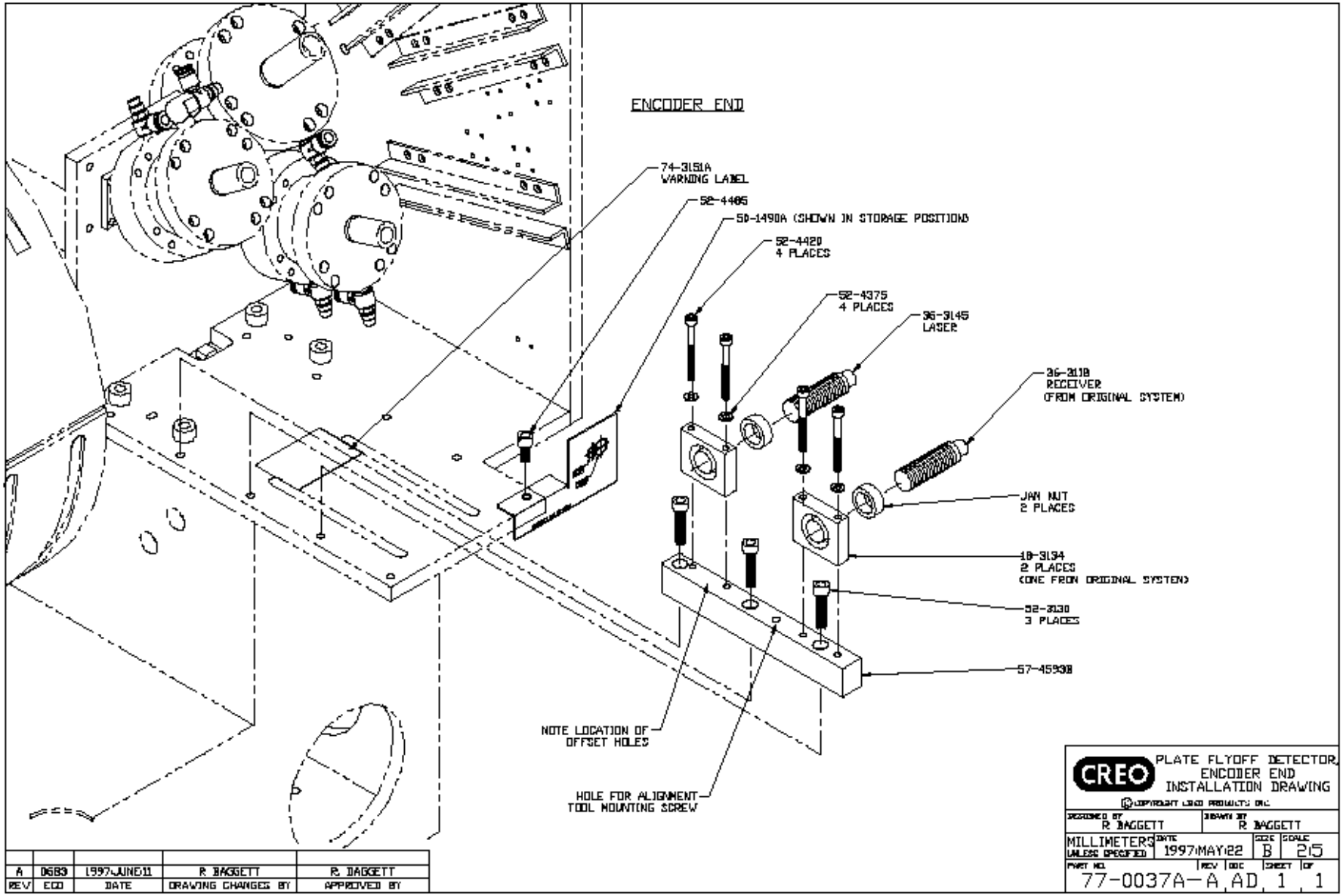


Figure 11: Plate flyoff detector installation – encoder end