Appendix F: Seat Retention Leash Instructions

The following is a description of a leash mechanism designed to discourage theft and prevent over extension of seats and seatposts. The leashes were constructed of materials common to a bicycle shop. One custom, but simple tool was needed to install the leashes. The construction of the tool will be outlined as well.

Star Nut Setting Tool Instructions:
A standard star nut setting tool (Figure F-1 left) will be solid. Since we need to have a cable running through the star nut as it is set, we needed to improvise a star nut setting tool with a hollow center for the cable to pass though (Figure F-1 right). The tool was made from the following:

- ½" "deep" socket
- ½" flanged nut
- Barrel adjuster bolt and nut from brake caliper
- Epoxy

Figure F-1: Standard Star Nut Setting Tool (left) and Custom Hollow Tool (right)

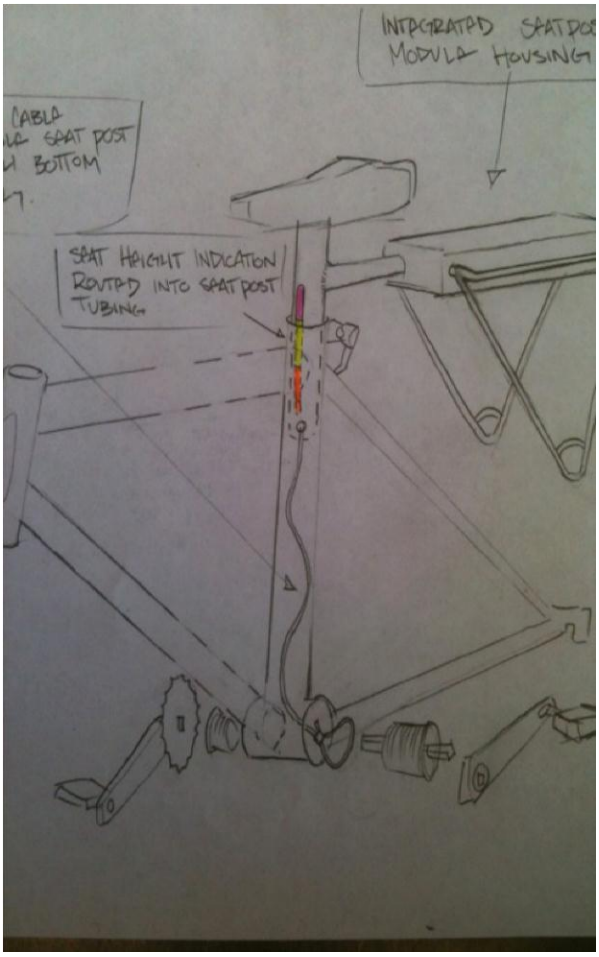
1. Grind or file the barrel adjuster bolt to fit into the square drive end of the socket.
2. Grind or file a channel (deep enough for the brake cable to drop into) into the flanged face of the nut.
3. Use the epoxy to secure the flanged nut into the hexagonal drive end and the barrel adjuster bolt into the square drive end of the socket.

Figure F-2 shows the sequence along with the orientation of the star nut and brake cable.

Figure F-2: Customized Star Nut Setting Tool

Seat Retention Leash Instructions:
Figure F-3 is a preliminary drawing which describes the concept of the leash; join a cable from the seatpost to a fixed point lower inside the frame to restrict removal of the seatpost from the frame. The cable should be long enough to allow adjustment of the seatpost within its recommended range. The drawing shows the cable looped around a cartridge bottom bracket; space constraints between the frame's bottom bracket shell and the bottom bracket forced us to rethink the attachment method (see Figure F-5).

Figure F-3: Diagram of Retention Leash



1. The Breezer Uptown Fleet bicycles used for the OBI pilot were equipped with 27.2mm (od) seat posts.

Figure F-4: Star Nut and Lower Section of Seat Post

2. With a road style brake cable laced through the center hole, we installed a star fangled nut from a 1" threadless headset into the bottom of the seatpost. The brake cable bead is too large to pass through the center hole of the star nut and will limit the seatpost from moving any higher than the cable length dictates.

3. Install a fastener to clamp the cable low on the frame. The Breezers had a threaded hole and bolt on the underside of the bottom bracket shell that held a cable housing clamp. We drilled a small hole adjacent to the bolt. The cable will be routed through the seat tube, into the bottom bracket shell, around the cartridge bottom bracket, through the small hole and clamped by a fender washer added onto the factory bolt.

Figure F-5: Fastener Clamp Placement

4. Remove seatpost, invert and secure.

5. Thread the star nut onto the improvised starnut setting tool.

6. Lace the brake cable through the star nut and star nut tool.

7. Lay the tail of the brake cable into the channel carved into the nut flange.

8. Hammer the star nut into the bottom of the seat post (depth is not important as long as the star nut is fully engaged an you can still retrieve your tool).

9. Remove crankset and bottom bracket from the bike.

10. Thread the brake cable tail down the interior of the frame's seat tube, through the bottom bracket shell and out the small hole that was drilled previously.

11. Install the seatpost, clamping it at its maximum recommended height.

12. Reinstall the bottom bracket working it around the cable - be careful not to cross thread the bottom bracket as the cable may want to push the bottom bracket from center.

13. With the seat post at maximum extension, pull the brake cable through the bottom bracket and clamp under the fender washer and factory bolt.

14. Cut off the excess cable and install end cap.