Recovery

- Shear Pin Retention Strategy

Shear Pin Retention Strategy

We want a way to retain shear pins that both will not fail and is easy to use. At IREC 2026, we failed in part because the tape that was holding the pins in came out, and because the holes were drilled too large for the pins.

We want to thread the shear pins into the rocket somehow. We cannot thread into the coupler or bulkhead like we do with the 1/4-20 retention bolts, as the act of tightening the bolts would press the body tube into the coupler tube and create an undetermined amount of friction, which would invalidate pop testing from run to run without extremely tight controls on torque. This means we need to thread the body tube, which is sketchy as there is not enough length to get threads in, and tapped carbon fiber is not the most durable thing in the world.

A proposed solution is a threaded insert that will be epoxied to the outside of the body tube, with a lip going inside to locate the insert. There are two ways to approach this, a 3D printed shell with a brass heat-set insert, or a custom metal printed insert with internal and external threads that will interface with a tapped body tube.