

Component Examination

The sealed crate was received at Robinson Helicopter Company on May 5, 2015, and placed in a secured area.

On June 22, 2015, an examination of the components was performed. Present for the examination were Pam Sullivan (NTSB) and Thom Webster (RHC).

The crate was unsealed and its contents photographed.

C018-1 Clutch

C188-4 Shaft S/N 3832

C188-3 Sprag S/N 4845

Visual examination of the clutch assembly revealed an excessive amount of oil on the forward face of the sheave and around the aft yoke. Both retainers had broken paint around the seals consistent with the seals being replaced since new.

The actuator support bearing rotated smoothly by hand.

When rotating the sheave on the shaft, there was a slight roughness.

The sheave rotated on the shaft when moved in one direction and when moved in the opposite direction, the shaft rotated with the sheave. The sheave grooves appeared to have no abnormal wear.

The oil was drained from the clutch assembly into a filter and cup. The amount removed appeared to be the proper quantity. Very small metallic flakes were caught in the filter. The oil was dark but did not smell burnt.

The clutch assembly was disassembled. A small amount of oil was present inside the shaft between the aft plug and the aft yoke indicating that the plug had been leaking.

Visual inspection of the sprag revealed no anomalies. The shaft and the inside surface of the sheave had slight impressions matching the size and spacing of the sprags, consistent with an over-torque event.

Both bearings felt rough when rotated by hand. Both bearings were flushed with solvent into a filter and cup. Three small metallic flakes were caught in the filter.

Both bearings rotated smoother but still had areas of slight roughness. A visual inspection of the bearing races using a 10x eye loupe revealed no damage or discoloration.

A190-3 V-Belts

Rev Y

Visual inspection of the V-belts revealed small cracks in the contact surface on two of the belts. The wear on all four belts appeared to be consistent with the reported time in service.

C051 -2 Actuator

S/N 3388

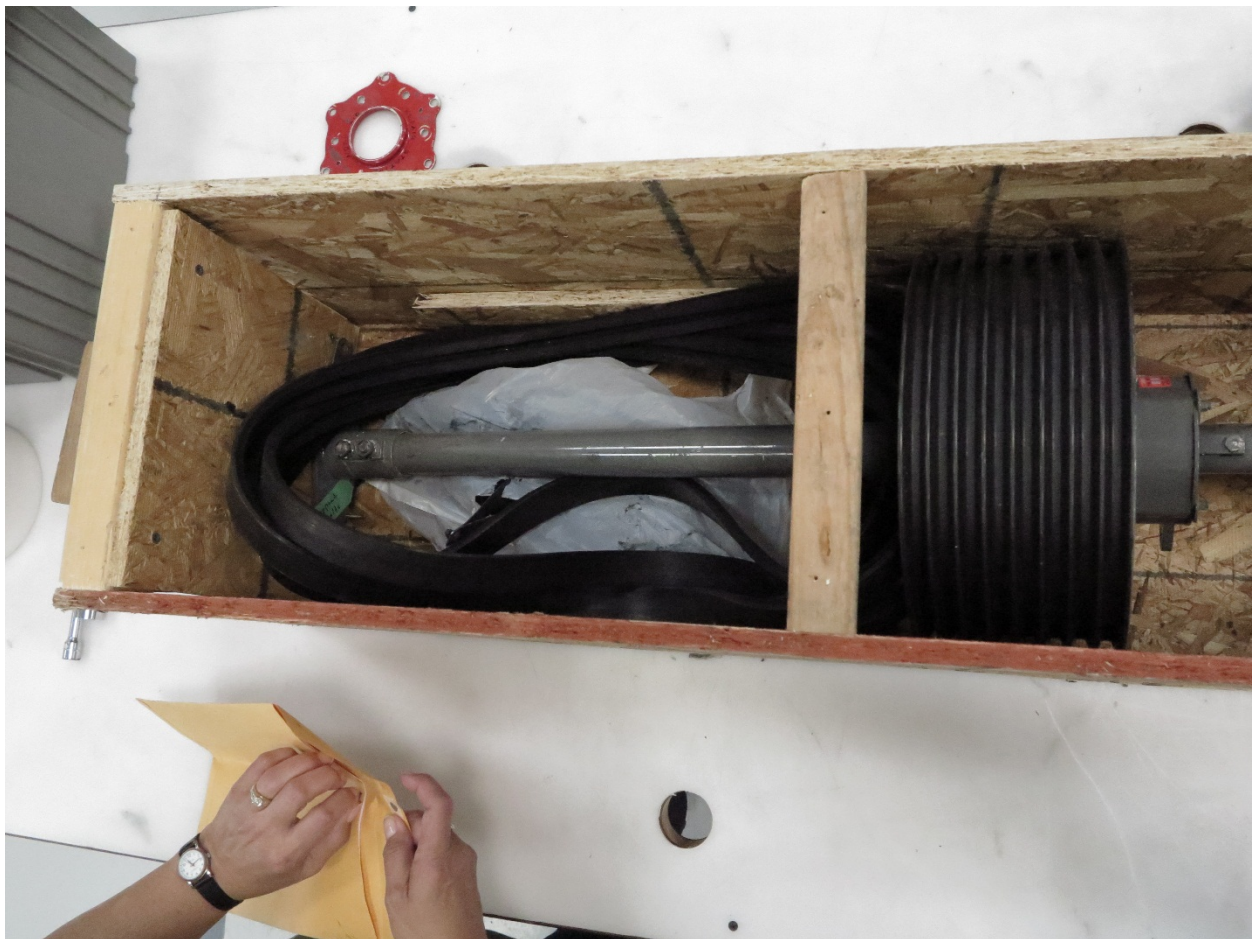
Visual examination of the actuator revealed impact damage to the end of the motor. The screw tube was bent to the left (looking forward) and the left side stack of springs were also bent.

The heat shrink on both spring switches was red and blue in color (factory heat shrink is black).

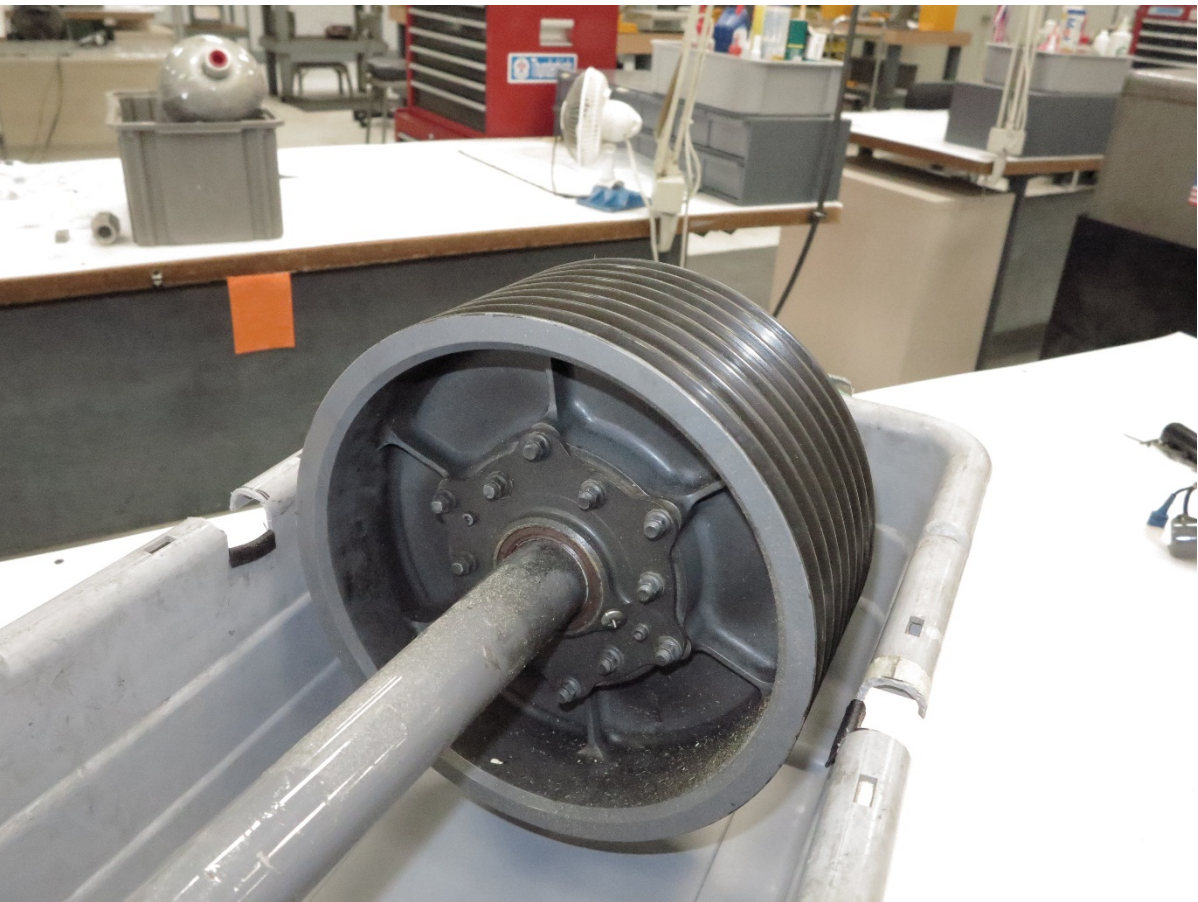
The extension distance was approximately 1.3" measured between the scissor mounting blocks (typical extension is .08" – 1.1"). The down limit adjustment screw was extended approximately 0.4".

The actuator was connected to a test fixture and power was applied. The motor rotated in both directions, raising and lowering the upper section, with no anomalies. All four switches operated properly. The setting and function of the springs could not be determine due to the damage to the assembly.

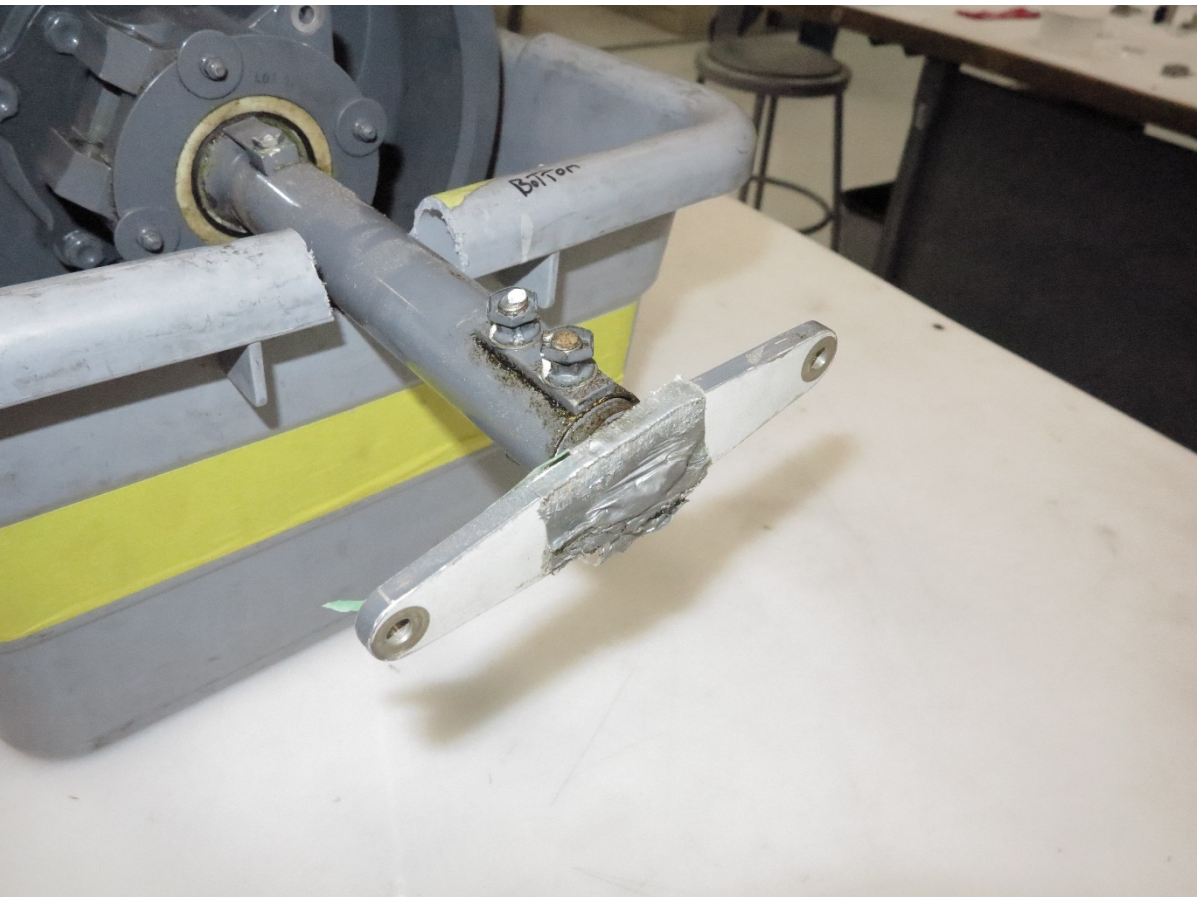
This examination found no evidence of mechanical failure in any of the components.



Components as received.



Oil on forward face of sheave.



Oil around aft yoke area.



Oil drained from clutch assembly.



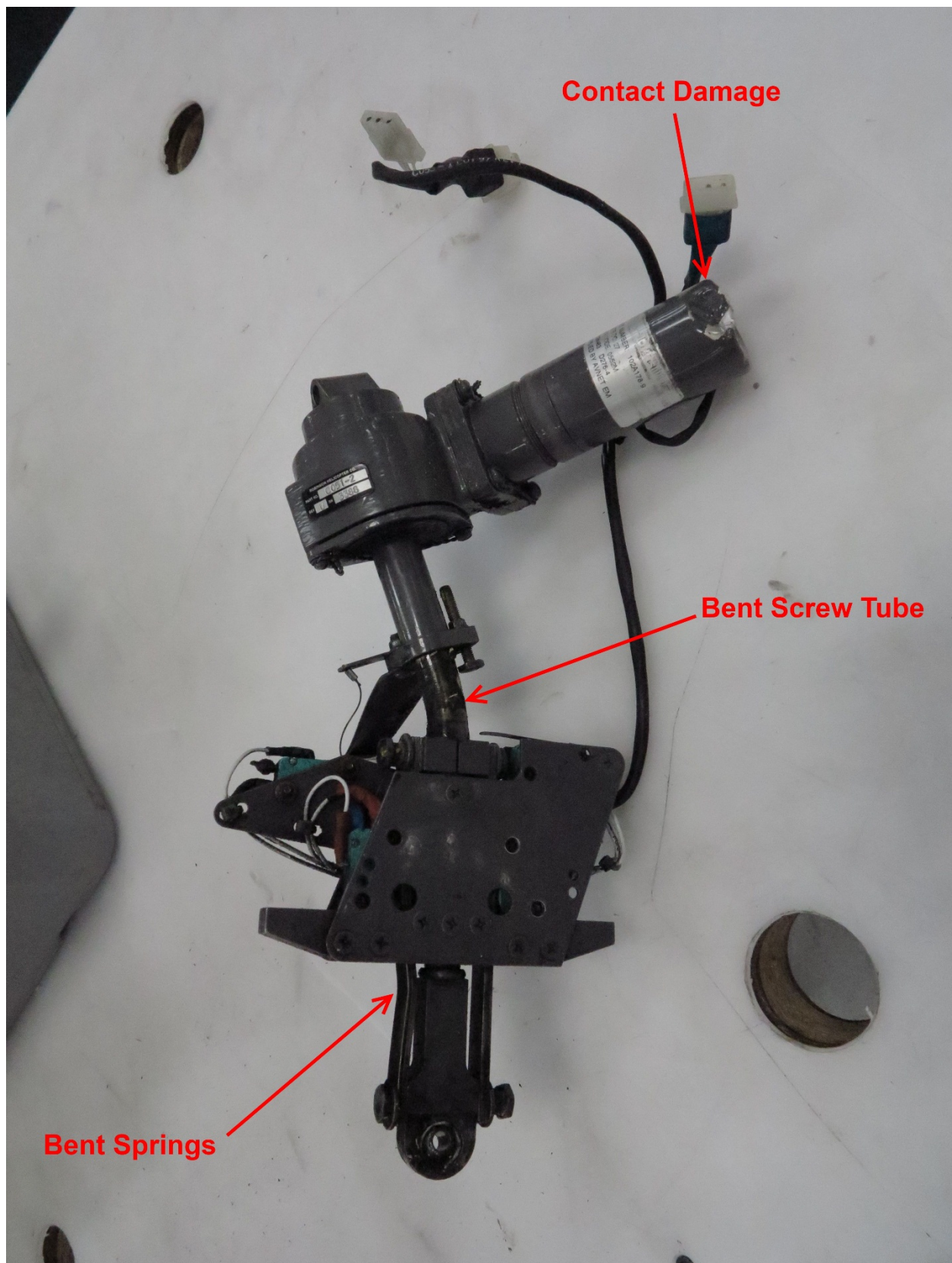
Sprag surface of clutch shaft.



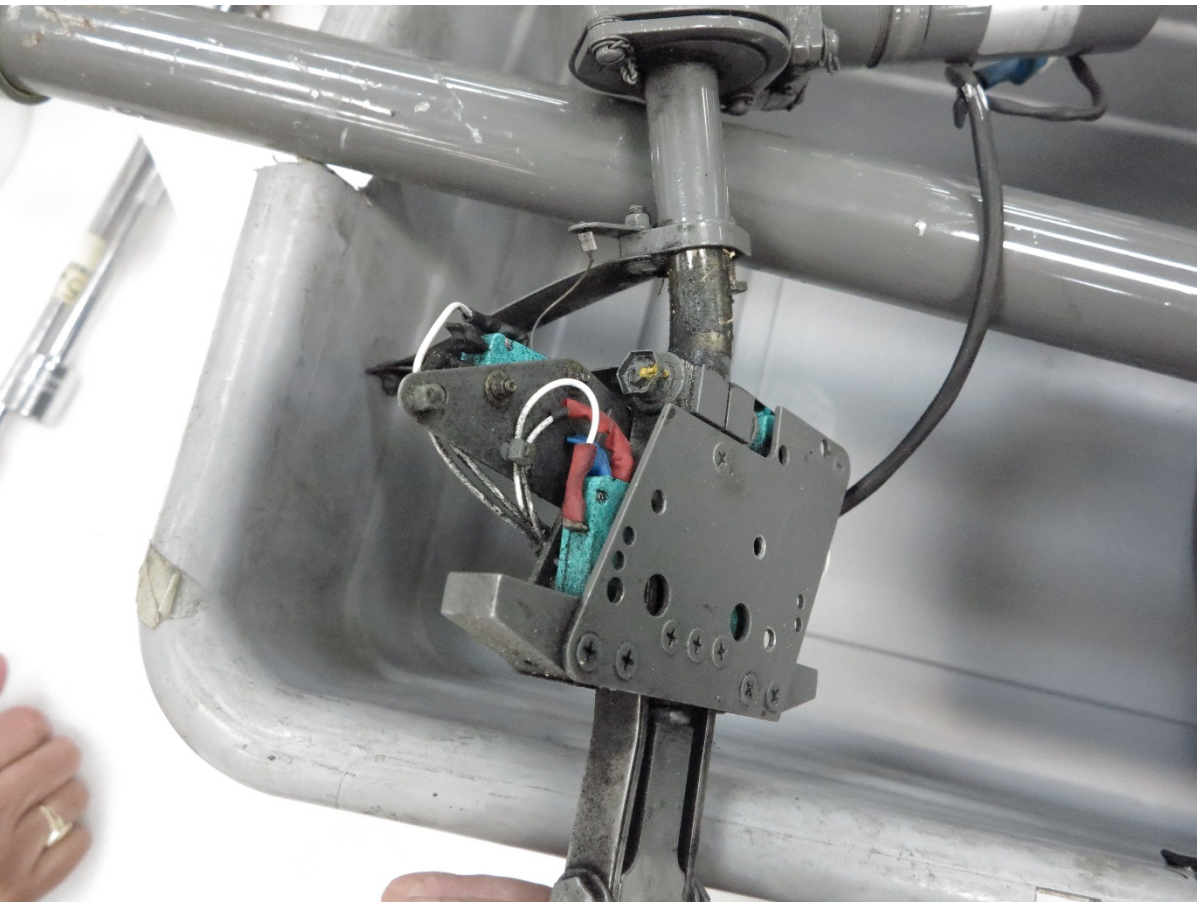
Sheave support bearings.



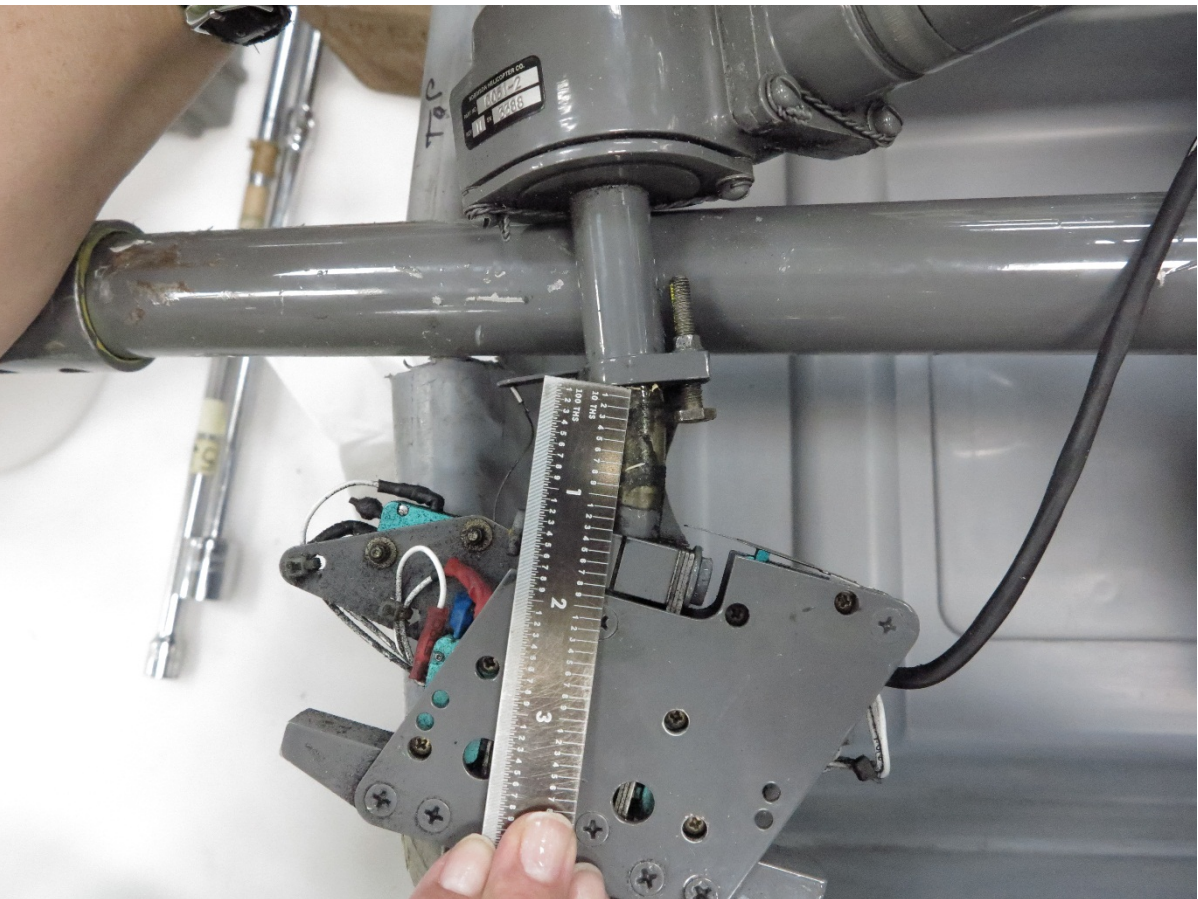
V-belts.



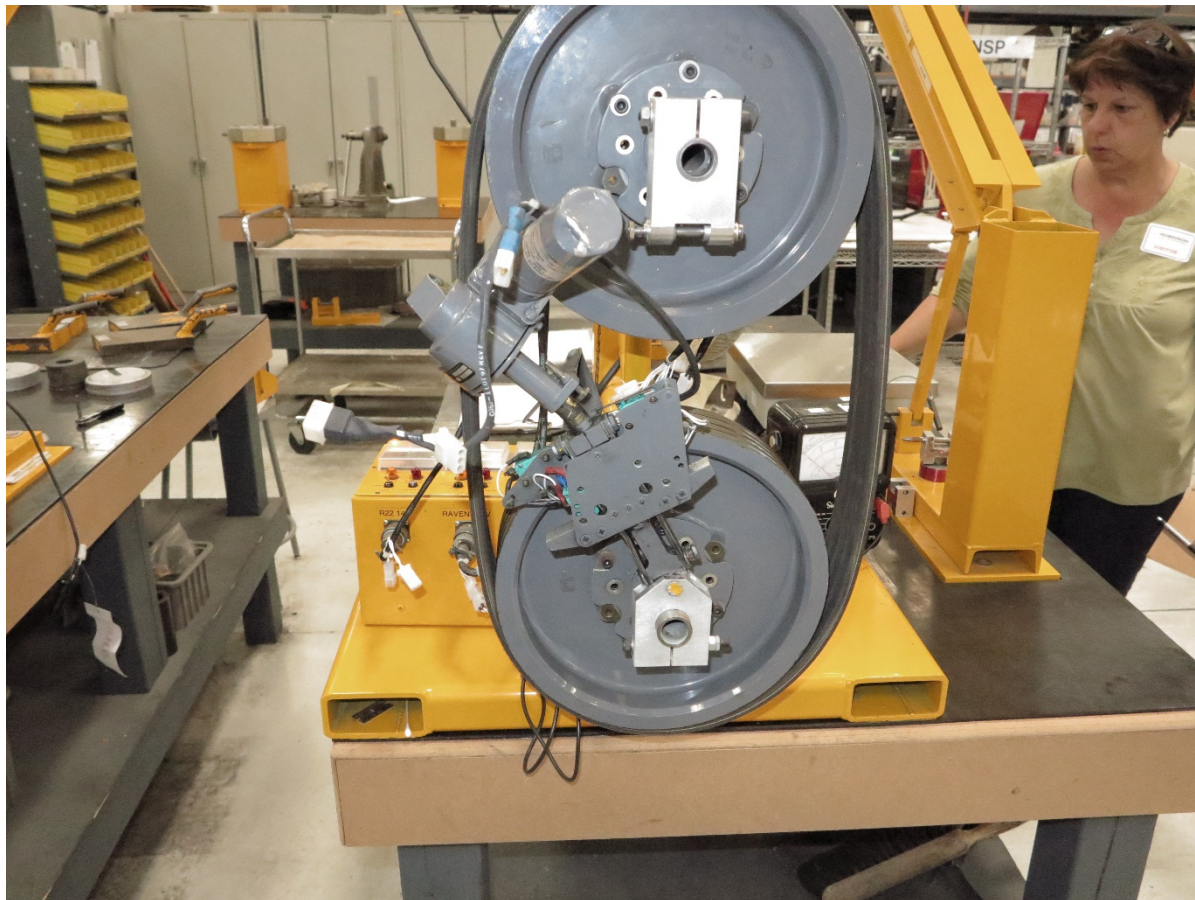
Damage to actuator assembly.



Red and blue heat shrink on spring switches.



Extension distance between scissor blocks.



Actuator on test fixture.