

Purpose

This guide provides instructions for field replacement of a broken shear screw in a Dynon Avionics autopilot servo.

Materials

The 102991-000 Shear Screw Replacement Kit includes the following items:

- Qty 1 Shear Screw
- Qty 1 MS24665-210 Cotter Pin
- Qty 1 Hex Wrench 5/64"
- Qty 1 Red Loctite™ 271 Capsule

Servo Shear Screw Replacement Instructions

A Dynon autopilot servo can receive up to two shear screw replacements before the it must be returned to Dynon for servicing. If all three holes in the servo attachment disc have broken shear screws in them, contact Dynon Technical Support (support@dynonavionics.com) to arrange to have the servo serviced.



DO NOT replace a shear screw with any type of fastener other than a Dynon shear screw. Doing so will void the servo's warranty and can cause the aircraft to be unsafe for flight.

All autopilot servos come with either a capstan, arm, or linear actuator installed as shown in [Figure 1](#). The following procedures apply to all servos.

Capstan, Arm, and Linear Actuator Removal

Refer to [Figure 1](#) while performing the following steps:

1. Remove cotter pin that secures castellated nut to output shaft.
2. Remove castellated nut from output shaft.
3. Remove wavy washer and then nylon washer from output shaft.
4. Remove capstan, arm, or linear actuator from output shaft.
5. Remove head of broken shear screw from hole in capstan, arm, or linear actuator.

Servo Attachment Disc Inspection

The threaded shaft of the broken shear screw will remain in the servo attachment disc. Inspect the servo attachment disc to ensure the broken shear screw has no burrs protruding above the mating surface. If the broken shear screw has a burr, remove the burr with a file. The disc and the broken screw should be smooth to the touch.

If the broken shear screw shaft is loose and rotating in the threads of the servo attachment disc, it must be removed to prevent it from jamming the controls. If you are unable to remove the loose shear screw shaft, contact Dynon Technical Support to have the servo repaired.



DO NOT use a servo with a broken shear screw that can rotate in the threads of the servo attachment disc. If the loose shear screw shaft vibrates out of the servo attachment disc, it may jam the flight controls.

Shear Screw Installation

Refer to [Figure 1](#) while performing the following steps:

1. Apply a light strip of red thread-locking compound to one side of lower half of shear screw threads.
2. Insert shear screw into an unused threaded hole in servo attachment disc.
3. Using provided 5/64" hex wrench and hand-tightening strength only, tighten shear screw until head is fully seated against servo attachment disc.



DO NOT over-tighten the shear screw. Doing so can weaken the shear screw and may cause it to break prematurely.



The shear screw head MUST be fully seated against the servo attachment disc. If the shear screw head is not in full contact with the disc, the shear screw may break prematurely.

4. Remove any excess thread-locking compound from around base of shear screw head and servo attachment disc.

Allow thread-locking compound to cure for 15 minutes before re-installing the capstan, arm, or linear actuator onto the servo output shaft. Allow thread-locking compound to cure for a minimum of one-hour before flight.

Capstan, Arm, and Linear Actuator Re-installation

Refer to [Figure 1](#) while performing the following steps:

1. Install capstan, arm, or linear actuator onto output shaft, aligning hole with head of shear screw located in servo attachment disc.
2. Place nylon washer, and then wavy washer, onto output shaft.
3. Finger tighten castellated nut onto output shaft, and then use wrench to tighten until slot in castellated nut lines up with hole for cotter pin in output shaft.



DO NOT overtighten the castellated nut! Tightening the castellated nut beyond 4 in-lbs. of torque may prevent the capstan from separating from the servo output shaft if the controls become jammed.

4. Install new cotter pin to secure castellated nut to output shaft.

5. Perform servo calibration procedure provided in the appropriate installation manual for airplane make/model.

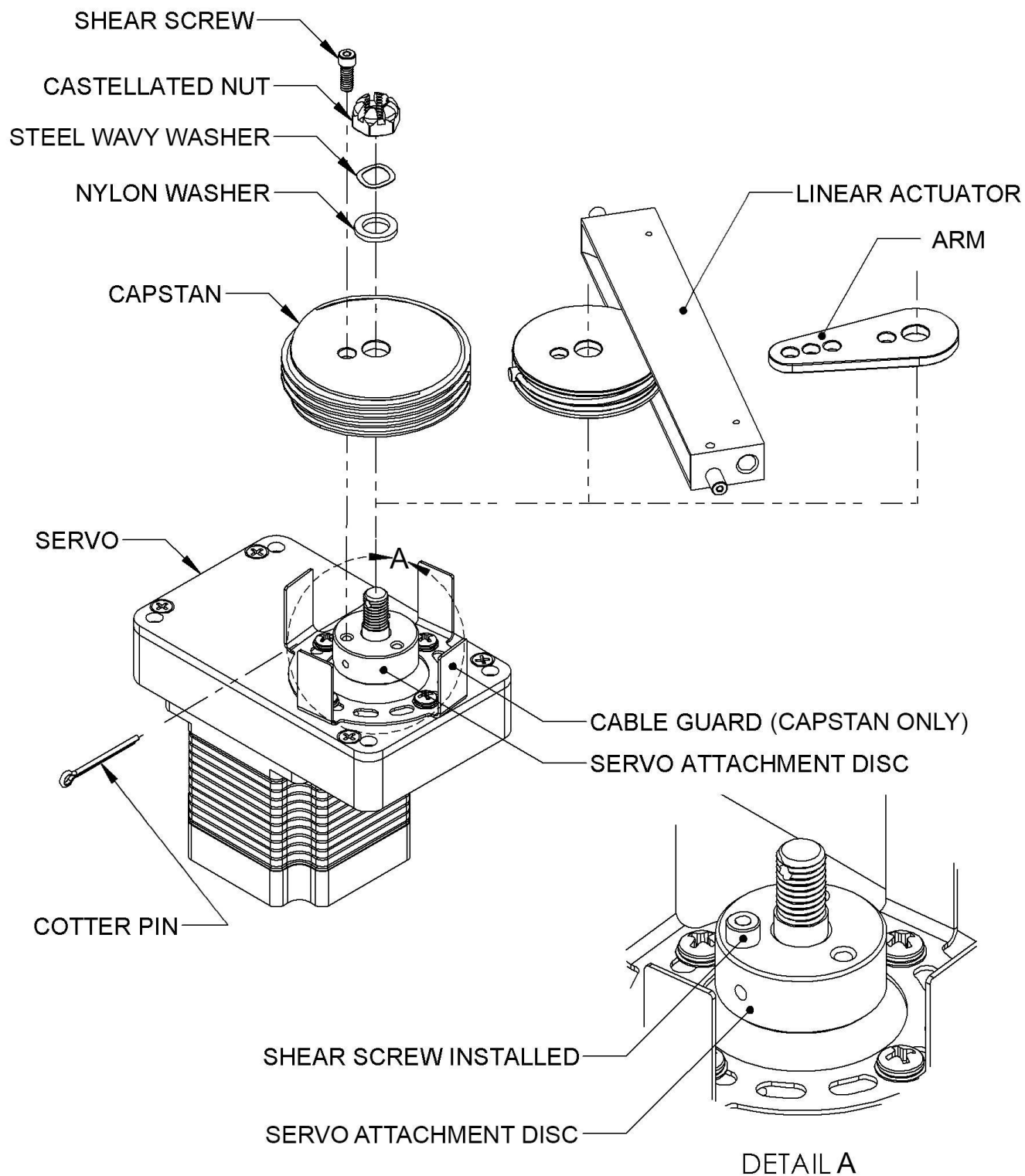


Figure 1: Servo Shear Screw Replacement



Revision History

REV	DATE	APPROVED	DESCRIPTION OF CHANGES
A	02/08/2017	ECO 250166	Initial Release
B	07/08/2020	ECO 349216	Completely revised document to support certified autopilot installations and FAA requests. Applied new end-user document template to content.
C	02/18/2025	ECO 393936	Added important note on Page 1 about using only Dynon shear screws.