

## Dynon Servo Shear Screw Replacement Instructions

In the event that a servo's shear screw breaks or becomes loose, action must be taken to service the screw. When followed properly, these instructions enable the customer to perform this task in the field. If the customer does not feel comfortable performing these actions, Dynon will be happy to inspect and/or repair servos as necessary.

- ❗ A shear screw is “loose” if the threadlocker is not holding the screw in place properly. This can be observed by holding the attachment disc (the round piece that the shear screw threads into) completely still and attempting to rotate the arm/capstan. No movement should be possible. If there is any movement at all between these two parts, your shear screw is loose and should be repaired per the following instructions. However, slight movement of the ENTIRE arm/capstan/disc/shaft relative to the internal gearing is expected. This is inherent to the design and due to designed-in drive gear lash and tolerance of the shaft captured in the servo housing. Small amounts of movement here are normal and should not be confused with a loose arm/capstan or shear screw.
- ❗ Care should always be taken when reworking the safety mechanisms on the servos. These features were specifically designed to fail under certain conditions. Deviation from these instructions could result in property damage, injury, or death.

### ***Removing Arm/Capstan***

To fully access the shear screw the arm/capstan must be removed. To do this, the cotter pin must be removed from the castellated nut. Note that cotter pins should never be reused; **replace with a new pin**. Unthread the castellated nut, remove wave and nylon washers, and finally remove the arm or capstan. Put all these pieces aside - they will be reused.

### ***Replacement of Broken or Loose Shear Screw***

If the shear screw head has broken off, inspect the remaining threaded portion of the screw in the attachment disc. If the remaining threaded screw piece does not interfere with the arm - as is the case most of the time - it is not necessary to remove it as the threadlocker will keep it in place. However, if the broken neck tip of the screw protrudes past the face of the attachment disc hole or if the remaining screw portion seems loose, it must be removed. Clean the face of the attachment disc to remove any hardened threadlocker to prepare the area for the new hardware.

If the shear screw has loosened, simply unscrew it completely and clean any loose threadlocker off the screw.

Clear the shear screw hole of any loose debris using compressed air.

### ***Preparing/Installing Replacement Shear Screw***

- ❗ This step requires Loctite 271 red liquid threadlocker. **Substitutions are not permitted.**
- ❗ This step requires a torque wrench/driver that can measure 16 in-oz (1 in-lb) of force.

The servo attachment disc was designed with 3 threaded shear screw holes. This allows a new screw to be installed even when the lower half of a previously sheared screw remains.

Apply a single drop of red Loctite 271 threadlocker to the threads of the replacement shear screw, **ensuring that the liquid wicks to all of the threads**. Install in any of the attachment disc holes. Tighten the shear screw to **16 in-oz (1 in-lb)**. **This torque value MUST NOT be exceeded** as it may fatigue or break the shear screw. Remember that in this application, it is the threadlocker's job to keep the screw in place, not the stress of the screw's threads or head against the disc. Wipe excess threadlocker from around the head of the shear screw and allow it to cure for at least 24 hours before the servo is reinstalled.

- !** Never “re-torque” or “re-tighten” the shear screw while it is installed in the servo. After the threadlocker has started to cure, it **MUST** be removed and reinstalled with fresh threadlocker per the above instructions.

### ***Reassembling the Arm/Capstan Stack***

Once the threadlocker has cured, reverse the disassembly steps to install the remaining hardware. The order of the stack - from bottom to top - is:

1. arm/capstan
2. nylon washer
3. wave washer
4. castellated nut

Tighten the castellated nut to finger tight, and then tighten until a slot in the nut lines up with the hole in the shaft for the cotter pin. **DO NOT EXCEED 72 in-oz (4.5 in-lb)**. If this nut is too tight, it will require an extreme amount of control stick force to shear the screw since the arm/capstan will be rigidly clamped to the attachment disc.

Install a new cotter pin following the standard method of trimming and bending the pin legs.

Servo arm/capstan rotation should be smooth. After the cure period, no movement should be observed between the arm/capstan and the attachment disc as described earlier.