

Tuning tail mounted vibration absorber

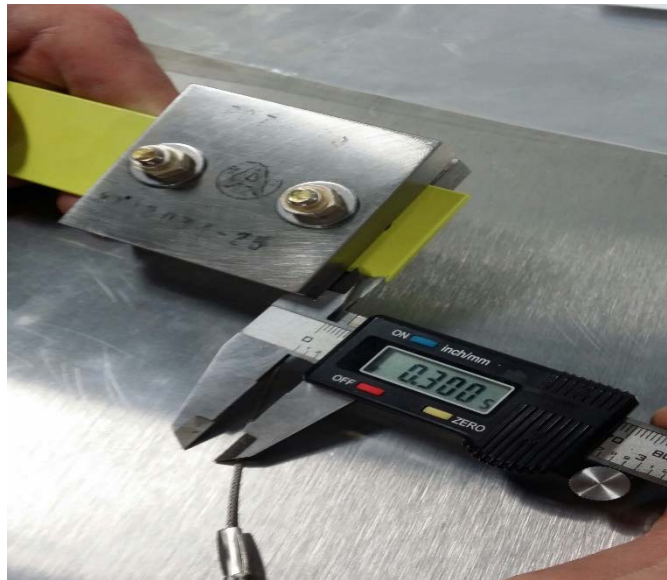
Helicopter rotors have two primary vibration frequencies. The primary and largest vibration frequency is called a “one per” and is the vibration that we feel when the main rotor blades are out of track. The second most noticeable frequency is determined by the number of main rotor blades. A two bladed rotor system like a Jet Ranger will have a “two per”, a three bladed rotor system like the Enstrom and Schweitzer have a “three per”, and a five bladed rotor system like the MD-500 will have a “five per”.

The purpose of the tail mounted vibration absorber on the Enstrom 480 series helicopters is to reduce this “three per” vibration. The “three per” is most noticeable when the helicopter is passing through translational lift while transitioning from a decent into a hover and also as a lateral shuffle at high cruise speeds.

This procedure is a process to tune the vibration absorber to the customer’s preference, usually the airspeed that the helicopter is commonly flown at. This is because the vibration absorber can only be optimally set at one airspeed. For instance, if the vibration absorber is to be set at 100Kts, as the “three per” vibrations are reduced at 100Kts, they will increase at 30Kts. This is normally acceptable as the helicopter is normally at or near 30Kts when transitioning into a hover from an approach.

The customer has the option of selecting the airspeed to tune the vibration absorber to. An example might be a helicopter that is used for power line patrol and normally operating at 70 or 80Kts.

1. Begin by adjusting the weight on the absorber beam to .300 inches/7.6 mm from the end of the end of the beam.



Tuning tail mounted vibration absorber

2. Fly the helicopter and take a spectrum analysis and record the IPS reading and airspeed on the chart.
 - a. Hover.
 - b. 30Kts.
 - c. Most commonly used airspeed. (Customers choosing.)
 - d. 100Kts.
3. Adjust weight aft by .050 inches/1.2 mm.
4. Fly the helicopter at the same torque setting and airspeed. Repeat spectrum analysis and record the data under flight test# 2.

NOTE

Adjusting weight to a previously recorded spectrum setting may have a different reading.

5. At the desired airspeed note if the 'three per' IPS increases or decreases.
6. If "three per" IPS decreases, move the weight aft an additional .050 inches. If 'three per' IPS increase move FWD .050.
7. Generally if the IPS reading at cruise speed decreases it will increase at 30 Kts.
8. It is up to the customer to determine what airspeed the vibration absorber will be tuned to.
9. The adjustments can be corrected until the IPS reading at desired airspeed stops decreasing and begins increasing.
10. Weight should be secured at the point before IPS begin to increase.