

# AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

## AIRWORTHINESS DIRECTIVE

**No: 2014.01**

**Date: 7 April 2014**

**Subject: Gyroz Gyroplanes – rudder cable mounting bracket**



ABN 53 412 417 012

### **Background.**

The investigation into a recent fatal accident involving a Gyroz gyroplane revealed that the rear rudder cable mounting bracket was loose allowing the bracket to rotate such that up to 15 degrees of uncommanded rudder input could be experienced.

Despite the fact that the pilot complained of directional control problems, he continued to operate the gyroplane without having it inspected by an ASRA TA. Relatively strong, gusty winds on the day of the accident combined with the above defect and resulted in the gyroplane essentially turning sideways in flight with attendant loss of control. It plunged to the ground with fatal consequences.

### **DIRECTIVE**

#### **With immediate effect:**

1. All Gyroz gyroplanes are grounded immediately until the rudder control system is inspected by an ASRA TA or another person authorised by the ASRA Technical Manager. The inspection must ensure that the angled rear cable mounting bracket has not been moving and cannot be moved by hand.
2. The forward cant or forward-tilting angle of the bracket is to be measured and then the clamp is to be removed.
3. A set of replacement clamp sideplates is to be fabricated as shown on page 2, with the angle of the clamp being transferred over to the front edge of each sideplate as shown on page 2. The replacement sideplates are to be secured by 4, rather than 2, AN 4 bolts.
4. A record of the replacement having been undertaken is to be noted in the gyroplane logbook.
5. Prior to each and every flight, the pilot in command must ensure that the special areas of concern listed in page 2 are especially closely inspected.

#### **The geometry of the brackets**

The picture on the left below shows the arrangement of the keel brackets as depicted in the G511 registration photograph. The foremost keel bracket is angled to allow for the rudder push-pull cable to angle upwards to meet the bellcrank. It will be obvious to all readers that if the angled bracket loosens at the top bolt (as occurred in this fatality)

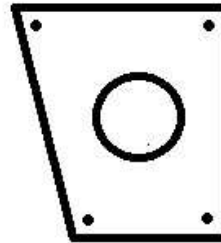
then the angled bracket will pivot to the vertical and over to an equal amount as it does when clamped and secured tilting forward.

By studying the geometry of the bracket in the registration photograph it is easy to see that if the angled clamp tilts (pivots) to the rear, the bellcrank will further pivot to cause the all-moving vertical stabilizers to deflect harshly inducing a severe right yaw.

To maintain the upward angle of the push-pull cable, it will be necessary for a new set of side plates for the clamp - now secured by 4 AN4 bolts - to be fabricated so that rearward pivoting of the clamp will then become impossible. See the picture to the right. Note that the forward edge of the replacement sideplates is to be cut at precisely the same angle as the existing 2-bolt clamp. Workmanship is to be of a very high standard.



**GYROZ forward keel clamp**  
**Material 6061-T6**



**Minimum thickness 0.160"**  
**Lightening hole optional**

While this "fix" will eliminate the direct cause of the Nowra fatality, it should be noted that ASRA still remains concerned that the bellcrank pivot clamp immediately in front of the horizontal stabilizer could possibly slide along the keel if one of both of the 2 securing bolts loosened. This could result in a similar compromising of directional control as occurred at Nowra. **Before every flight this critical clamp is to be closely inspected.**

ASRA also remains concerned that the pivots of the all-moving vertical stabilizers may loosen in service. **Before every flight the vertical stabilizers are to be specifically checked for looseness.** The way to determine whether any looseness exists is to grasp the top of the each vertical stabilizer one at a time and see if there is any relative movement (tilting back and forth or side to side). If movement or slop is detected the owner is required to contact the Operations Manager or the Technical Manager.

Authorised by:

ASRA Operations Manager  
 ASRA Technical Manager