

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

AIRWORTHINESS DIRECTIVE



ABN 53 412 417 012

No: AD 2010.2

Date: August 31st 2010

Subject: Cables – Primary control systems

Background. The pilot of a compliant gyro suffered an in-flight rudder control failure that resulted in a serious accident which destroyed the gyro and hospitalised the pilot.

Post accident inspection revealed that the left hand rudder cable had pulled thought one of the swages in that system rendering the application of left rudder impossible. Anomalies were found with the sizes of the swages, the type of cable used and possibly the type of tool used to effect the swage crimps. Additionally, all the swages were sheathed with heat shrink plastic which precluded a satisfactory inspection of the swages during pre-flight procedures.

Following is a part excerpt from the Compliant Gyroplane Standard:

D145 Cable Systems

- (a) Each cable, cable fitting, turnbuckle, splice, and pulley used must meet stated specifications. In addition:
 - (i) No cable smaller than 2.4 mm (3/32 in.) diameter may be used in primary control systems;
 - (ii) 7 by 19 strand flexible control cable shall be used in primary control systems;
 - (iv) There must be means for visual inspection at each fairlead, pulley, terminal, and turnbuckle.

The cable that failed causing the above accident was identified as a semi flexible 2mm 7 by 7 cable. Clearly this is less than the minimum requirements for this class of gyroplane. It is possible that the standard applicable to Basic Gyroplanes was used by mistake.

DIRECTIVE.

- 1. With immediate effect, paragraph D85 Cable Systems of the ASRA Construction Requirements for Basic Gyroplanes is amended as follows:**

“D85 Cable Systems

- (a) No cable smaller than 2.4 mm (3/32”) diameter and less than 7 by 19 strand flexible cable may be used in primary control systems**

and there must be means for visual inspection at each cable guide, pulley, terminal and turnbuckle.”

2. Any gyroplane registered with ASRA that does not comply with these requirements must cease operations immediately and remain grounded until this directive is satisfied.
3. Prior to the initial use in-flight of a primary control cable, the cable and its associated terminals must be subjected to a steady pull of at least 100kgs without suffering any failure.

Attention is drawn to the requirement that there must be a means for visual inspection of cable terminals. This requirement precludes the use of heat shrink plastics to cover swaged terminals. Heat shrink plastic may be used on the ends of cables only to prevent fraying.

It is further recommended that a suitable material be used on the cables either side of a swaged terminal in order to detect early movement of the cables through a swage. Nail polish has proven to be such a material.

CAUTION. Care must be taken to ensure that the swaging (crimping) tool is calibrated for the type of hardware upon which it will be used, be that metric or imperial. Failure to adhere to this caution may result in improperly swaged terminals that may result in in-flight failure.

This directive remains in effect until the respective Construction Requirements have been amended, when it will be cancelled.

ASRA Operations Manager.