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AIRWORTHINESS DIRECTIVE

THE GLIDING FEDERATION OF AUSTRALIA Inc

GFA AD 609 Issue 4

Date: 25 Sep 2017

Note: This Airworthiness Directive is issued by the Gliding Federation of Australia

Type Certificate Holder	Allstar PZL Glider Sp. z o.o.
Manufacturer(s)	PZL Bielsko
Types/Models Affected	SZD-50-3 “Puchacz”
Serial Numbers	All
Subject	Introduction Of Extra Cable Segment In The Rudder Control.
Implementation	**MANDATORY**
Background	Issue 1 addressed the inspection, identification and possible replacement of the rear seat rudder cable turnbuckle and protective sheath assembly IAW Mandatory Bulletin BE-054/SZD-50-3. This addressed fatigue caused by bending of the turnbuckle assembly from side loads applied by the rear pilot’s foot. Fatigue failures of the turnbuckle could lead to disconnection of the rudder from the pedals. Issue 2 mandated incorporation of ALLSTAR PZL GLIDER Sp. Zo.o modification as detailed in Mandatory Bulletin No.BE-057/SZD-50-3/2006 “Puchacz” (Appendix A). Issue 3 added an alternate means of compliance by incorporating GFA Approved Modification Puchacz-2006-Rear Rudder Pedal Issue 1 (Appendix B). During installation of either modification it was found that variations between aircraft caused pedal rigging issues unless the specified length of the added cable segment was altered. Issue 4 allows the length of the added cable segment to be altered to allow the rudder pedal position to be returned to the original foot angle. Issue 4 also allows the front rudder cable to be replaced and the replacement cable length adjusted to return the front rudder pedals to the original foot angle.

Documentation	1. Mandatory Bulletin BE-054/SZD-50-3 2. Mandatory Bulletin No.BE-057/SZD-50-3/2006 3. Puchacz-2006-Rear Rudder Pedal Issue 1
Required Action(s)	1. At the next Annual Inspection after 14 April 2016, carry out the installation of the rudder cable segment as per the SZD Mandatory Bulletin BE-057/SZD-50-3/2006 (Appendix A) or alternatively incorporate the GFA Approved Modification Puchacz-2006-Rear Rudder Pedal Issue 1. **CLARIFICATION:** *Both modifications specify the length of the additional cable segment to be added to the rear rudder cables. If during installation of either modification it is found that the rear seat rudder pedal is unable to be rigged to the original pedal angle, replace the additional cable segment and alter its length so that the correct rudder pedal angle can be achieved. Ensure that the rudder cable turnbuckle does not contact the sheath of the wheel brake cable or elsewhere on the airframe throughout the full range of rudder pedal movement.* *GFA Approved Modification Puchacz-2006-Rear Rudder Pedal Issue 1 adds Link plates at the rear rudder pedals which effectively lengthen the front rudder cables. It may be necessary to replace and shorten the front rudder cables so that the correct front rudder pedal angle can be achieved.*
Compliance, Compliance Time(s) and Frequency	Compliance with this Airworthiness Directive is mandatory and compliance, including action taken pursuant to this Airworthiness Directive must be recorded in the aircraft log book. When certifying compliance with this AD the log book entry must state which modification has been performed.
Effect on Weight and Balance	No effect on W&B.
Effective Date	25 September 2017

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GICA-CAIB Approval No P-023

ACCEPTED BY	APPROVED BY
President of Allstar PZL Glider Sp. z o.o.	EASA
on: *[---],* .	AD No: 2006-0317
(signature, date)	16 October 2006
Andrzej Papiorek, MSc. Eng.	

MANDATORY BULLETIN
No BE-057/SZD-50-3/2006 „PUCHACZ”

DESIGNATION-TYPE/MODEL:	SZD-50-3 “PUCHACZ”
SERIA / NUMBER:	All gliders of SZD-50-3 “PUCHACZ” model
CONCERNS:	Introduction of an extra pull rod segment in the rudder control system
COMPLIANCE:	On receiving this Bulletin

ELABORATED BY:	AGREED WITH
Responsible for Type Design	Civil Aviation Office Southern Division, Krakow
Marian Kroczek, MSc. Eng.	
[---], (signature, date)	*[---],* (signature, date)

Translated by

.....
Tadeusz Zboś

Allstar PZL Glider Sp. z o.o.	**MANDATORY BULLETIN No BE-057/SZD-50-3/2006 "PUCHACZ"**	Page: 2 of: 3

1. SUBSTANCE OF THIS BULLETIN

Herewith, an extra segment of pull rod ((1) – Fig (1), of approx 140mm length “l”, is being introduced between the rear pedals (2) and turnbuckle (3) of pull rod connected to a rudder.

2. GROUNDS FOR ISSUANCE OF THIS BULLETIN

This modification is aimed at elimination of the lateral load component applied at turnbuckle terminal by {pilot} foot. In several instances this has brought to fatigue failure and break of the terminal at the site of transition into eyelet.

3. LIST OF FACTORY NOS COVERED WITH THIS BULLETIN

This Bulletin concerns all gliders of SZD-50-3 “PUCHACZ” model.

4. DESCRIPTION OF MODIFICATION

4.1 , On the gliders, where the eyelet terminal of the turnbuckle is connected directly to the pedals, the terminals are to be disconnected from the left-, and right pedal and scrapped. The eyelet type terminals are to be replaced with fork type with the same thread (right/left hand).

4.2 Between the pedals (2) and turnbuckle (3), install a short pull rod (1) of aircraft type steel cable with 3 mm diameter core and approx 140mm length “l”. The length is to be adjusted so that the shield of the wheel brake pull rod (4), on a left side board, remains between the turnbuckle lateral screws (5) over the whole travel of turnbuckle (fore-aft).

4.3 Shorten the pull rods (6) connecting a rudder with rudder by a value obtained by adding the length of extra pull rod with a difference between the eyelet- and fork terminal lengths.

4.4 The M4 nuts, securing the connection between the pull rod and pedal are to be of a castellated, thin type with 1 mm diameter cotter pin.

5. PARTS NECESSARY FOR THE MODIFICATION

The parts necessary for modification are available at Allstar PZL Glider, or substitutive aircraft parts may be used – capable to withstand a load of 6100N at minimum.

6. FINAL CONCLUSIONS

6.1 Entry on the compliance with this Bulletin is to be done at appropriate position in a Glider Log Book.

6.2 For gliders, on which the extra pull rod segment described under item 4.2 has already been introduced, this fact is to be recorded in a Glider Log Book. Item 4.4 of this Bulletin applies.

Allstar PZL Glider Sp. z o.o.	**MANDATORY BULLETIN No BE-057/SZD-50-3/2004 "PUCHACZ"**	Page: 3 of: 3

6.3 The revisions to Technical Service Manual, resulting of compliance with this Bulletin, will be contained in the next bulletin, concerning the revisions resulting of the model service life extension to 12000 flying hours.

6.4 The operator is introducing this Bulletin at his own cost.

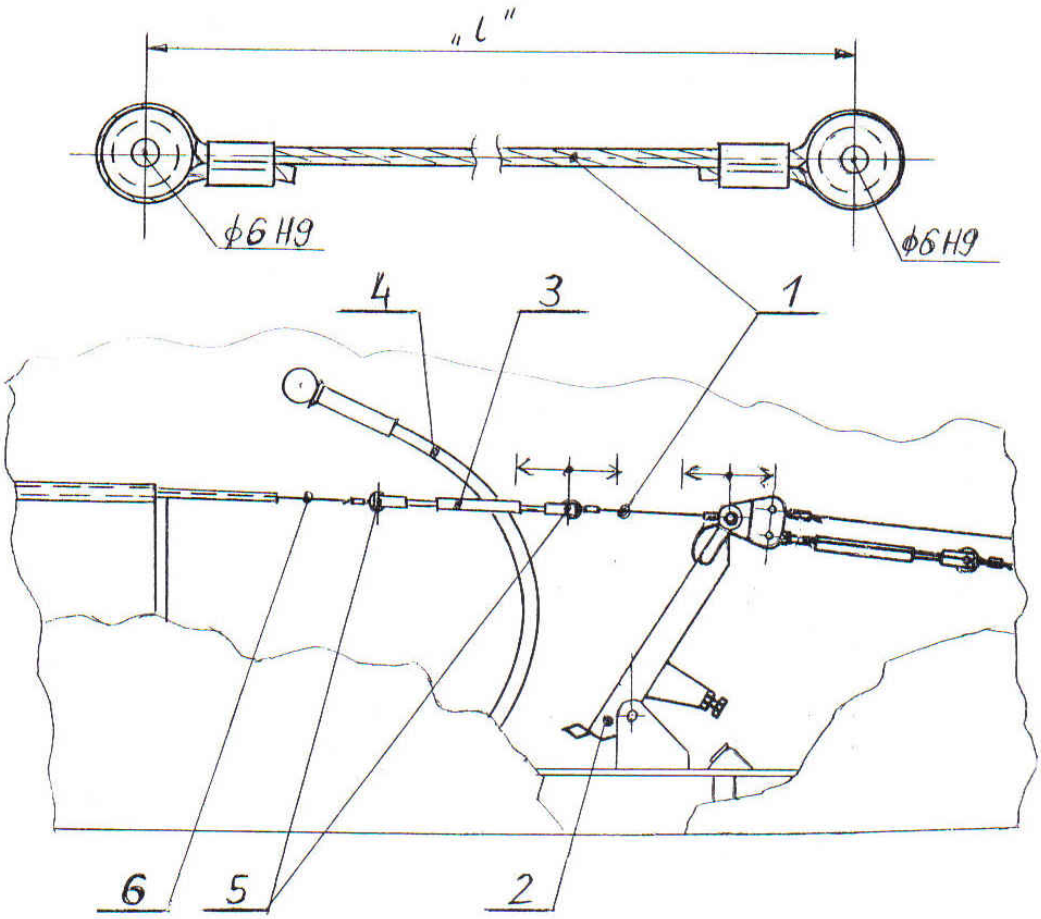


Fig. 1

- THE END -

PUCHACZ: MODIFICATION TO REAR RUDDER PEDALS
Puchacz-2006-Rear Rudder Pedal Issue 1

SZD 50-3 PUCHACZ: MODIFICATION TO REAR RUDDER PEDALS

Date: May 2009 This final version replaces draft version of 2 October 2006
Modification Number: Puchacz-2006-Rear Rudder Pedal Issue 1

Applicable gliders: Allstar PZL Glider - SZD 50-3 Puchacz
Including VH-XQB serial number B-2037

Modification Purpose:
The SZD 50-3 Puchacz has the known issue of the possible bending of the turnbuckle ends attaching the rearwards running rudder cables to the rear rudder pedals. The danger of the rear occupant's foot pressing sideways at the top of the rudder pedal and onto the turnbuckle end leading to high loads and eventual fracture of the turnbuckle end is advised in the following factory bulletin.

ALLSTAR PZL GLIDER Sp.z.o.o., Mandatory Bulletin BE-054/SZD-50-3/2003 "Puchacz" – "Inspection of turnbuckle in rudder control system". Gliding Federation of Australia Airworthiness Directive 609 issue 1 issued 3 June 2004 refers.

The factory had proposed mid 2004 to issue a modification scheme to remove this hazard. However the factory had not as at 2 October 2006 issued a modification bulletin to Australian operators of the Puchacz via the GFA. No details of the proposed factory modification was at that stage 2 October 2006 known. Continuance of the Puchacz in operation with this possible hazard was no longer acceptable.

Two other additional issues exist with the original design of the rudder cable attachment to the rudder pedal:

i. The bracket attaching the two forward running cables (3.2mm rudder cable and 2.4 mm rudder circuit completion cable) to the rear rudder pedal top has two laminations of thin steel sheet and over time the thin sheet cuts into the original 6 mm diameter pin welded into the top of the rear rudder pedal.
ii. The 6 mm diameter pin at the top of the rear rudder pedal projects to outboard and is stepped down at the outboard end to a 4 mm diameter threaded section which provides for a washer and 4 mm nyloc nut to secure the turnbuckle end & cable bracket to the pedal. It is contrary to standard aircraft practice, although apparently approved by the Polish Authorities in the certification of the Puchacz, to use a nyloc nut for securing a turning control circuit component where the turning component bears against the nyloc nut. As a minimum step, a castle nut and cotter pin (split pin) should be used for securing but even then the 4 mm thread size is impractical for this purpose.

The modification action here addresses all three issues.

Subsequently, Allstar issued Mandatory Bulletin BE-057/SZD-50-3/2006 "Puchacz" – titled "Introduction of an extra pull rod segment in the rudder control system" and dated 16 October 2006. This bulletin attempts to deal with the original problem and it does that to a degree, but it does not introduce better integrity of the securing at the pivot because the use of the 4 mm nut is still retained (although 4 mm castellated nut replaces the 4 mm nyloc nut). Considering the loads on the rudder pedal, and particularly the inadvertent sideways foot

loads, retention of the 4 mm diameter scheme is not practical, and the modification action with a ¼" bolt as below is superior.

Modification Actions:

1. Remove the projecting 6 mm diameter pins from the rear rudder pedals up to the existing shoulder, for example by use of a bench grinder. Unbolt and remove the rudder pedal facing, ie the rubber foot grip pieces.

2. Clean off the paint from the rear of the pedal plate of the rear rudder pedals prior to welding. Finish by grit blasting where appropriate.

3. Obtain 2 of AN4 bolts dash number -35A or longer. (If longer bolts are used then cut back the length at the head of the bolt so that the projection is 20 mm beyond the existing shoulder mentioned at step 1. Undrilled bolts are required because the split pin hole is drilled later in a suitable position provided it is done with care. With -35A bolts, grind the head of the bolt away to round concentric with the shank. Remove the cadmium plating from the bolt surfaces by sanding (say 320 grit paper) along the plain shank of the bolts.

4. Ensure that when fitted to position the projecting length of bolt beyond the <u>outboard</u> face of the ¼" AN970-4 "penny" washer is more than 17.5 mm. Start with around 18.5 mm (= 20 mm at step 3 less the penny washer thickness) projecting and trim back <u>later</u>. Grind the 'head' end to match the radius as shown in the photo so that the 'head' end nests into the weld radius.

5. Weld the AN4 bolt into place at the 'head' end, at the location of the underlying rosette weld and the outer end adjacent to the penny washer. Weld the AN970-4 penny washer into place at 90 degrees to the bolt axis. Use the TIG welding process. Use welding filler rod as appropriate to welding AISI 4130N aircraft steel or the German filler rod to DIN 1.7734.2 for TIG welding aircraft low alloy parts such filler rod as provided by Schempp-Hirth Segelflugzeugbau. Welding to be carried out by a welder holding a CASA welding authority.

6. Clean up the exterior of the parts following welding. Fill all the tube interiors with linseed oil. Drain off excess. Alternatively paint the tube interiors with zinc chromate primer paint by flooding. Drain off excess. Paint the affected exterior surfaces with Stitts epoxy zinc chromate primer and finish with enamel paint.

7. Manufacture two flanged bushes from high quality machining steel with 8.5 mm OD and 0.25” ID. Refer drawing below.

8. Manufacture link plates from steel SAE 4130N plate and aluminium 2024-T3 plate. Refer drawing below.

9. Install the flanged bushes, plus AN960-416 washer (light series 0.032” thick, or if necessary use washer from Schempp-Hirth 0.5 mm thick 6 mm ID washer opened out to 0.25” ID) and the AN310-4 or AN320-4 castle nut (according to space).

10. Re-install the rear rudder pedals and ensure adequate clearance to the cockpit wall during rotation, particularly with the pedal on the forward stop. Remove the pedals. Remove excess bolt threaded end which should see the length of bolt beyond the outboard face of the (welded in place) penny washer being around 17.0 to 17.5 mm.

11. Assemble the bushes, washers & castle nut, and tighten the castle nuts to final position. Using a 1/16” drill, drill through the castle nut and centrally through the AN 4 bolts to enable 1/16” MS24665 cotter (“split”) pins to be installed. Drill along the hole axis half way through the bolt from either side first and then complete drilling all the way.

12. Reinstall pedals. The thick aluminium link plate goes on the inboard side and the thinner steel link plate goes to the outboard side. Install link plates and attach the front 1/8” diameter rudder cable and the 3/32” diameter rudder circuit completion cable re-using the original rudder cable (1/8” diam) and circuit cable (3/32” diam) to rudder pedal connecting link (steel). Use Nicopress swaging process. Attaching hardware is described below.

13. From the link plate and travelling rearwards of the rear rudder pedal, install a short connecting length of 1/8" rudder cable, making a link 150 mm long. Install the turnbuckle between this short link cable and the remaining rear rudder cable. Use Nicopress swaging process. Attaching hardware is described below.

14. Tighten the castle nuts holding the flanged bushes and secure the castle nuts with the cotter pins.

15. Adjust the turnbuckles and rudder pedal stops to achieve:
- neutral rudder with rear rudder pedals centralised,
- left and right rudder deflection as specified and with pedal stops adjusted to suit, and
- the required rudder circuit tension.

Lockwire the turnbuckles, or use safetying clips (Martin(?) clips) if the turnbuckle has provision for such clip-locking.

16. Carry out a duplicate inspection for correct completion of the rudder circuit work.

17. Record the modification in the glider logbook. (Negligible affect on weight and balance.)

Parts installed:

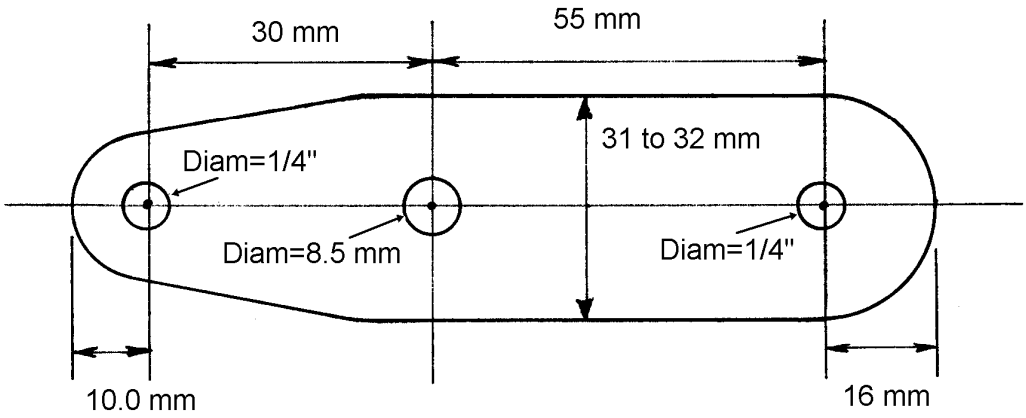
New link plate attachment to rudder pedal:
2 of AN4-35A bolts or longer as detailed
(Source: Example - Aviaquip, Cheltenham Victoria.)
2 of AN960-416 washers – light series (= 0.032" thick)
(Or 0.5 mm thick 6 mm nominal ID washers sourced from Schempp-Hirth opened out to ¼" ID)
2 of AN970-4 penny washers
2 of AN310-4 castle nuts or AN320-4 shear castle nuts – may need to use AN320-4 if the thinner profile they have is needed
2 of MS24665-130 or -132 cotter pins (1/16" diameter) for the castle nuts on the AN4 welded in place bolts

Cable attachment at front (via original part) and rear of new link plates:
4 of ¼" diameter clevis pins AN394 or MS20392-3C length to suit (Used to attach the cables to front and rear ends of the link plates)
4 of MS24665 cotter ("split") pins, length to suit the clevis pins
AN960-416 – regular series - washers to use with the clevis pins
Additional AN960-416 washers to pack out between link plates at the front end

2 of Turnbuckles comprising MS21251-B5S barrels, MS21255-5LS & M21255-5RS eye ends for cable attachment
AN100-3 and AN100-4 thimbles
Nicopress 18-2-G and 18-3-M swages
Galvanised carbon steel 7x19 aircraft control cable in 1/8" and 3/32" diameters to MIL-W-83420

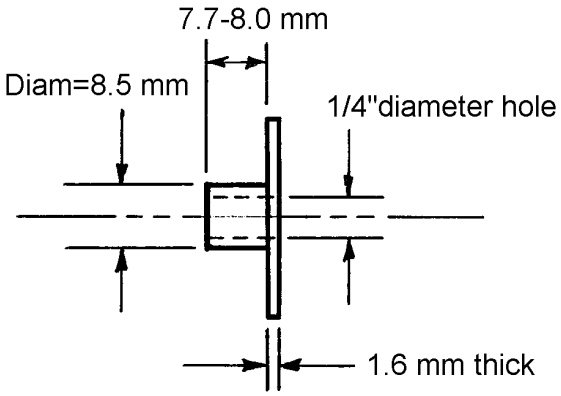
Link plates as per drawing.

PUCHACZ: Rear rudder pedal - Improved attachment of rudder cables

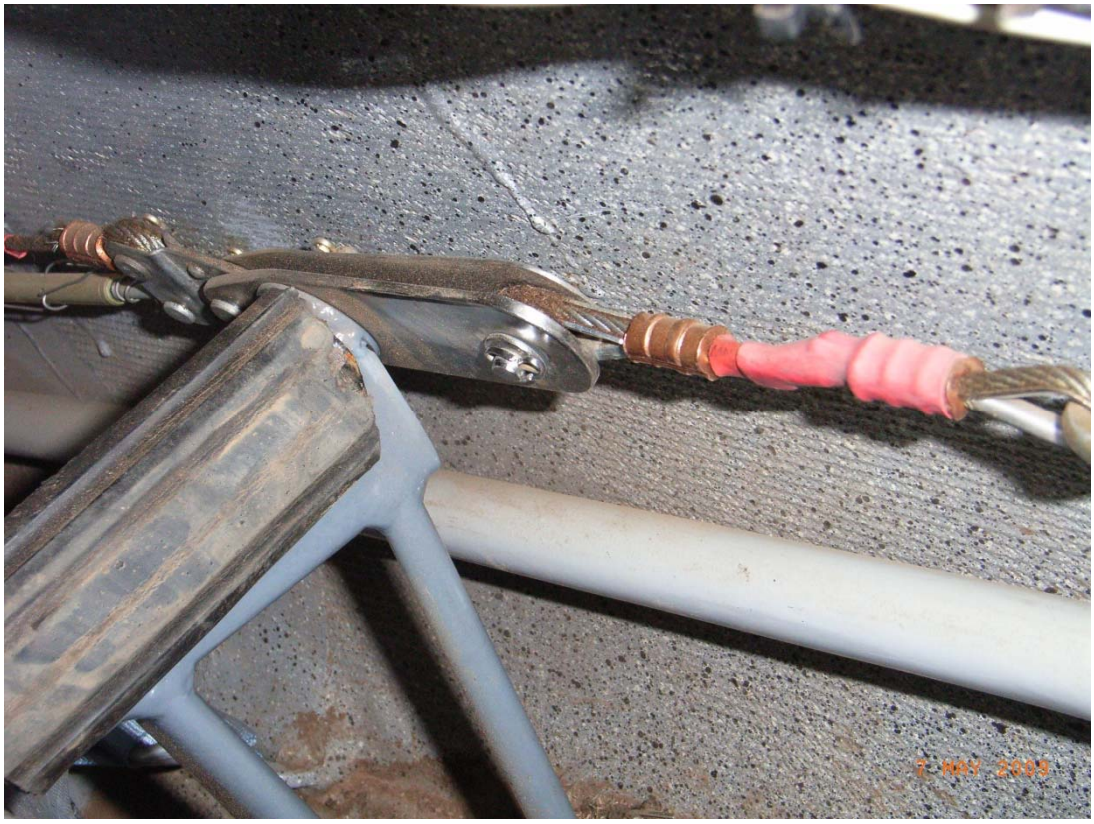


Link plates: 2 of 4130N steel plate, 0.40" to 0.64" thickness
2 of 2024-T3 aluminium plate, 1/8" thickness

Puchacz - Rear rudder pedal bush - steel



Flange is 22 mm diameter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