



# ***THE GLIDING FEDERATION OF AUSTRALIA INC.***

## **Basic Airworthiness Course Workbook**

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## Basic Airworthiness Course Workbook

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# BASIC AIRWORTHINESS COURSE WORKBOOK

NAME: .....

GLIDER TYPE:.....REG. VH- .....

Please work through this worksheet in conjunction with your supervising inspector. You don't have to follow the sequence, but you are expected to have every exercise completed by the conclusion of the course. Plan accordingly. Feel free to approach any inspector for assistance.

The exercises are based on work practices described in the Basic Sailplane Engineering (BSE), Airworthiness Advisory Notices (AN's), Airworthiness Directives (AD's), and naturally on your own work experience.

Commence the exercises by considering the directions set out in Section 1.3 Sailplane Inspection, "Guidelines for Annual Inspections" and The GFA Form 2 Inspection Schedule.

## HAVE YOU OBTAINED THE FOLLOWING?

Logbook..... Y/N

Current maintenance release/DI book ..... Y/N

Flight and Maintenance Manual ..... Y/N

All applicable airworthiness Directives ..... Y/N

AAF kit (for study purpose only) ..... Y/N

Current C. of A. or Permit to Fly..... Y/N

Current Certificate of Registration ..... Y/N

Check for fatigue life limited components in the logbook for time expiry dates.

Comments:.....

.....

.....

Check maintenance release for possible pilot or inspector comments.

## ASSEMBLE GLIDER FOR INITIAL INSPECTION.

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**1. WEIGH YOUR SAILPLANE.**

Following the procedures in Section 1.23 weigh your glider and complete Form W1. Form W2 will be completed by your inspector.

**2. MEASURE CONTROL SURFACE DEFLECTION**

For information see Section 1.13.2.

CONTROLS		FLT/SERV MAN	ACTUAL
Aileron left	up	.....	.....
	down	.....	.....
Aileron right	up	.....	.....
	down	.....	.....
Elevator	up	.....	.....
	down	.....	.....
Rudder	left	.....	.....
	right	.....	.....
Trim	up	.....	.....
	down	.....	.....
Flap left	up	.....	.....
	down	.....	.....
	down	.....	.....
	down	.....	.....
Flap right	up	.....	.....
	down	.....	.....
	down	.....	.....
	down	.....	.....
Airbrakes out		.....	.....

**CHECK CONTROL SYSTEM STOPS AND STATE WHERE THEY ARE LOCATED.**

For information see 1.13.4.

- Ailerons: .....
- Elevator: .....
- Rudder: .....
- Trim: .....
- Flap: .....
- Airbrakes: .....

**CORRECT ANY RIGGING ERRORS IF POSSIBLE, BEFORE DE-RIGGING THE SAILPLANE.**

State "Finagles Law". You will find it in AN 38.

.....

.....

.....

**3. MEASURE CONTROL SURFACE FREEPLAY.**

Read 1.13.5 for the required information.

If the manufacturer has not specified the freeplay limits, how do you determine the maximum permissible control surface freeplay?

.....

.....

CONTROLS		PERMISSIBLE	ACTUAL
Aileron	left	.....	.....
	right	.....	.....
Elevator		.....	.....
Rudder		.....	.....
Trim		.....	.....
Flap	left	.....	.....
	right	.....	.....

**4. MEASURE CONTROL SYSTEM FRICTION.**

For information see Section 1.13.6.

CONTROLS	PERMISSIBLE	ACTUAL
Elevator	.....	.....
Aileron	.....	.....
Rudder	.....	.....
Trim	.....	.....
Flaps	.....	.....
Airbrakes	.....	.....
Tow release	.....	.....
Undercarriage retract	.....	.....
Water ballast dump	.....	.....

**5. MEASURE WING AND TAILPLANE RIGGING ANGLES**

For information see Section 1.13.11.

When should this angle be checked?.....  
.....  
.....

Using method described in Section 1.13.11.1. level the aircraft to the Levelling Datum and measure the:

Wing angle ..... degrees  
Tailplane angle: .....degrees  
Wing twist (washout) left: ..... degrees  
Wing twist (washout) right: ..... degrees

**6. MEASURE WING BENDING FREQUENCY.**

Measured wing frequency .....cycle/min  
What was the original frequency .....cycle/min

COMMENT:.....  
.....

**7. CHECK GLIDER FOR DANGEROUS PROTUBERANCES.**

Is the aircraft safe in accordance to AN 57?..... Y/N

If no, state reason:.....  
.....  
.....

As far as you can determine, have any unauthorised modifications been carried out:..... Y/N

If in doubt, discuss it with your inspector, or higher authority.

**8. CHECK THE GLIDER FOR CORRECT PLACARDING.**

Where will you find placarding requirements? .....  
.....  
.....

Is the glider correctly placarded? ..... Y/N

What placards should be added? .....  
.....

**9. MANOMETER CHECK OF ASI SYSTEM.**

Calibrate an A.S.I. and complete the attached calibration chart. For information see Section 1.4.6.1.2

Is the instrument serviceable?..... Y/N

Carry out a manometer leak check of the ASI system..

Was there a leak in pressure? ..... Y/N

If yes, what was the fault? .....  
.....

How much Pitot system leak is acceptable? .....

How much static system leak is acceptable? .....

Carry out a total system test on the aircraft. See Section 1.4.6.2.2.

Is the static system satisfactory?..... Y/N

Is the Pitot system satisfactory?..... Y/N

Is the total energy system satisfactory? ..... Y/N

NOTE: The instrument repair shops LOVE YOU, if you use SILASTIC to seal instrument plumbing leaks?

Why?.....  
.....

**10. ELECTRICAL SYSTEM INSPECTION**

Know the electrical system of your glider.

Sketch the circuit, indicating components including location of fuses.

SKETCH

Any suggested improvements?..... Y/N

If yes, give details:.....  
.....  
.....

**11. WATER BALLAST LEAK TEST.**

For information see AD 165

Find a suitable glider. Type:.....VH-.....

For how long did it retain pressure? ..... min

If not satisfactory, what action is recommended? .....  
.....  
.....

**12. USE OF INTERNAL/EXTERNAL MICROMETER/CALIPERS TO CHECK PIN/HOLE DIMENSIONS.**

Sketch and dimension a rigging pin and hole combination on your glider, where you have to use the following measuring instruments:

- Micrometer
- Vernier calliper
- Small hole gauge

SKETCH. IF IN DOUBT ASK.

**13. CHECK L'HOTELLIER COUPLINGS.**

For information see AN 29. State the force to be used to check the correct engagement of the coupling ..... kg

Read AD 177 carefully.

Part one of your maintenance release must be endorsed with:

- a.....
- b. ....
- c.....

What is the frequency of lubrication ..... hours or ..... months

At what intervals must the balls be inspected for wear ..... hrs

Based on sketch 1 & 2 of AD 177 measure two couplings of your choice.

Dimension	"A"	.....mm
	"B"	.....mm
Dimension	"A"	.....mm
	"B"	.....mm

Are safety pins fitted?..... Y/N

Check sliding latch spring.

Preload	.....g
Max force (Just before stop)	.....g

**14. ESTABLISH SCREWED PUSHROD SAFETY.**

Refer Sect. 1.13.10.1. Check on your aircraft that the pushrod and fittings are in safety.

What method of establishing safety is being used?

- .....
- .....
- .....

If your aircraft has no pushrods, find another:

Type:.....VH-.....

**15. MAKE UP A SAMPLE CONTROL CABLE USING THE NICOPRESS SYSTEM**

For information see Section 1.6.2.1.1 & 1.6.9

Use 1/8" 7 x 19 control cable, splice both ends of a sample length using the correct sleeves and thimbles.

Sleeve No.....Thimble No.....

List the four ways of inspecting a finished Nicopress splice.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

**16. LOCK WIRE TURNBUCKLE**

For information see Section 1.6.8

Lockwire a turnbuckle and show it to your inspector.

**17. CABLE TENSION EXERCISE.**

For information see Section 1.6.7 and AN 23

Simulate correct cable tension as on Blanik

Elevator cable ..... 18kg

Rudder cable ..... 16kg

For more information see AN 49 page 13.

Exercise carried out? ..... Y/N

**18. INSPECT AND OVERHAUL A TOW RELEASE SYSTEM.**

State the minimum mandatory maintenance required during Form 2 inspection? (For information see section 1.17.5).

- 1. ....
- 2. ....
- 3. ....
- 4. ....
- 5. ....

How often must the release overcentre test be carried out?

According to AD 277.....

According to AD 293.....

What is the difference in test procedure between AD 277 and AD 293?

.....  
 .....

Carry out a complete release test.

**18.1 18.1 TOST RELEASE**

Test 1: Overcentre load test, complete chart.

Test 2: Test main spring load:                      min .....kg                      max .....kg

Test 3: Mainspring pull back force load:                      .....kg

Test 4: Automatic back release load:                      .....kg

**19. CRACK DETECTION EXERCISE**

For information see Section 3.8.5 and AN 58, Defect 2.

Nominate an aircraft part to be inspected by the dye penetrant method.

Nominated part: .....

Demonstrate the procedure to your inspector.

Inspection carried out: ..... Y/N

**20. REMOVAL AND REPLACEMENT OF BEARINGS**

For interesting reading see AN 24.

Remove and mount a bearing with tools supplied.

Exercise completed? ..... Y/N

**21. LUBRICATION OF BEARINGS.**

Clean and lubricate a rod end bearing.

Clean and lubricate a ball bearing using a "simple grease gun" as described in Section 1.11.7.

Exercise completed?:..... Y/N

What dictates your choice of lubricant? .....  
.....  
.....

**22. MASS BALANCE CHECK - CONTROL SURFACE.**

For information see Section 1.16.4.1.

Select a control surface:.....

Does it have to be removed for balancing? ..... Y/N

	FLT/SER.MAN	ACTUAL.
Balance moment	.....	.....
Weight	.....	.....

Is the surface balance satisfactory? ..... Y/N

**23. CHECK A FRP GLIDER FOR STRUCTURAL DAMAGE AND GEL COAT CRACKING**

Refer to 2.2.

Using a sailplane of your choice: Type.....VH-....

What sort of damage to the FRP might you find? .....  
.....  
.....

What are the different ways you can inspect for damage?

.....  
.....  
.....

Refer to AN 69

What sort of gel coat cracking is evident?.....  
.....  
.....

What type of gel coat are you inspecting?.....

.....  
What is your recommended action, considering long term airworthiness.  
.....  
.....  
.....  
.....

**24. COMPLETE FORM 2**

Before commencing with the paper work, study section 1.3 Sailplane Inspection and “Guidelines for Annual Inspections”.

Complete attached form 2 marked for study purpose only.

Form completed? ..... Y/N

**25. COMPLETE A MAINTENANCE RELEASE.**

Complete the attached Maintenance Release.

Completed? ..... Y/N

**26. COMPILE A LOGBOOK ENTRY.**

Compile a recommended logbook entry for your aircraft, (attach copies of logbook pages) Refer section 1.3.7.

Completed..... Y/N