



GLIDING NEW ZEALAND INCORPORATED

ADVISORY CIRCULAR
AC 3-01

GLIDER DAILY INSPECTION

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1 Introduction

This Advisory Circular provides guidance on the following:

- The regulatory requirements for Daily Inspections (DI) and Duplicate Checks after rigging.
- Performing a Daily Inspection (DI) and a Duplicate Check after rigging.
- Training persons to perform a DI and a Duplicate Check after rigging.

2 Definitions

- 2.1 “Daily Inspection” means an inspection to confirm that no defects have occurred that render the glider unsafe for flight.
- 2.2 “Duplicate Check after Rigging” means an independent check that the glider has been rigged correctly.
- 2.3 “Rigging” means to assemble a glider or powered glider from its transport or stored state, to a state ready for flight.

3 Regulatory Requirements

- 3.1 The individual pilot in command is responsible for ensuring the glider is airworthy prior to flight, following the procedure set out in the Daily Inspection & Tech-Log, TECH 19.
- 3.2 A Daily Inspection (DI) is to be carried out on each glider and powered glider prior to first flight each day, and after each rigging. A DI is to be carried out in accordance with the instructions in the Daily Inspection & Tech-Log, the guidance in this AC, and the glider’s flight manual.
- 3.3 A Duplicate Check of rigging is to be carried out on each glider and powered glider after each rigging. A Duplicate Check is to be carried out in accordance with the instructions in the Daily Inspection & Tech-Log, and the guidance in this AC.
- 3.4 On completion of a Daily Inspection or a Duplicate Check, the person carrying out this inspection or check is to complete and sign the Daily Inspection record in the correct manner, thus signifying that the inspection or check has been carried out fully and correctly.

4 Eligibility.

- 4.1 Any member of a Gliding Club affiliated to GNZ, including any person undergoing flying training, is eligible for Daily Inspection training.
- 4.2 Persons who are not glider pilots who may be called upon to carry out Duplicate Checks, such as tow pilots and crew, are also eligible for DI training.

5 Training

5.1 Daily Inspection training may be carried out by any GNZ Instructor.

5.2 Training is to consist of:

- An explanation of the information outlined in this AC.
- An oral test, using the questions and model answers in this AC, in which the trainee is to correctly answer at least 7 out of 10 randomly selected questions.
- Showing the trainee the Daily Inspection and Tech Log TC-19 “DI Book” and ensuring that they understand the first two pages titled “Authority” and “Instructions for using this Book”.
- Showing the trainee the Tech-19a Certificate of Release to Service (blue page) and ensuring that they are able to determine if the glider is airworthy or not airworthy, and the date of the next maintenance or inspection. (Note that if the glider is a microlight, show the trainee the RAA NZ or SAC annual inspection sticker, which is required in lieu of the blue page.)
- A demonstration by the trainee, under the supervision of a GNZ instructor, of a DI and a Duplicate Check after rigging, using the glider that the trainee is flying.

5.3 This AC, including the oral questions and model answers should be made available for the student to study prior to the training.

5.4 It is important that the student is able to understand the answers to ALL of the questions, not just those that the instructor selects. Therefore, before the oral examination, the instructor should:

- Ensure that the student has studied the question bank and the model answers.
- Invite the student to seek explanation or clarification on any questions and answers that they did not fully understand.

5.5 The instructor is to explain the correct answer for any question that the student has answered incorrectly or incompletely.

5.6 If the student fails to correctly answer 7 questions out of 10, the instructor may continue to ask additional questions from the question bank until he is satisfied that the student has demonstrated an adequate level of understanding. If the student is unable to do this, the instructor should insist that the student studies the question bank and model answers again before requesting a re-examination.

6 Daily Inspection

6.1 The Daily Inspection (DI) on such a simple aircraft as a glider is a straightforward task, and one that does not require specialist skills. The qualities which are needed are care, and honesty. If the job is to be done at all, it must be done thoroughly, and the aircraft should not be signed out as serviceable unless the person doing it is prepared to justify their reasons, and is fully comfortable with their decision.

- 6.2 In regards to a “just rigged” glider, it is the responsibility of the person doing the DI to ensure that a duplicate check of rigging and control linkage is made by another authorised person who must initial the appropriate column.
- 6.3 Defects in a glider can arise in four ways:
- (a) Fair wear and tear.
 - (b) Maladjustment.
 - (c) Careless handling.
 - (d) Severe flight or landing loads.
- 6.4 The defects may include:
- (a) Actual failure. (Cracked skin, frayed cable, delamination, etc.)
 - (b) Deterioration. (Rotten wood, brittle fabric, rusty steel, chipped gelcoat, etc.)
 - (c) Excessive wear, looseness, or lack of lubrication. (Control system backlash, fore/aft play at wing tips, dry bearings, etc.)
 - (d) Incorrect assembly, wrong adjustment, or actual loss of a particular part.
 - (e) Presence of foreign bodies.
- 6.5 It is quite impractical to ensure that an aircraft is airworthy by merely insisting on the inspection of a number of listed items, since to include every conceivable eventuality would call for a fantastically lengthy list.
- 6.6 All that can be done, therefore, is to call for the inspection of a limited number of items and to trust to the sharp eyes and imagination of the inspector to notice trouble. Signs which often act as indicators of more serious trouble are cracks in the paint or gelcoat, distortion of fabric or thin skins, or the excessive flexibility of components.
- 6.7 Once a fault has been discovered it is necessary to find the cause and to ascertain the full extent of the trouble. In doing this it is important not to jump to conclusions. For example, if a control cable is found to be unusually slack, it is most unlikely that the cable has stretched, and it is far more probable that a control horn has been bent, or a lever or pulley bracket been strained.
- 6.8 The inspector should take nothing for granted and should devote his energies to actually inspecting the aircraft. Above all, he should realise what he does not know, and if in the slightest doubt should ask someone with more experience.

7 Daily Inspection Schedule

- 7.1 The following lists are not intended to be comprehensive and may not be appropriate for every glider. The glider’s flight manual will include a section that details pre-flight inspection requirements. The inspector should be familiar with these requirements to ensure that any aspects particular to the type of glider are not overlooked.
- 7.2 Clean the glider, if appropriate. Use a soft rag or chamois and a little water. Wipe dry.
- 7.3 The actual Daily Inspection is to include all applicable parts of the following lists:

(1) Start at the cockpit. Check the DI book/Tech-Log for:

- Correct glider.
- Validity of dates. (No point going further if it is not valid.)
- Reported faults, especially those that make the glider unfit to fly.
- Confirm that the correct documents are in the correct glider.

(2) Cockpit. Checking for:

- Condition of interior of the cockpit. Any dirt cleaned out if necessary.
- Seats, cushions and straps in good order.
- No loose objects in cockpit or on luggage shelf.
- Battery(s) in and secure.
- Instruments set and reading correctly. No broken glass. All pointers at zero. Turn altimeter baroscale adjustment knob to zero all three pointers, then set QNH.
- Radio, transponder, and electric vario on and working, then turn off.
- Removable ballast, if fitted, is secure.
- All controls, including trim, flaps and airbrakes/spoilers are full and free and operate in the correct sense.
- Lock airbrakes/spoilers open, if possible. Flaps extended, if applicable.
- Canopy is clean and locks correctly. (Then close and lock it.) No unacceptable cracking.
- Nose wheel/main wheel is correctly inflated and checked for damage.
- Tow Release(s), cleanliness and operation.

(3) Centre Section. Checking for:

- Main and drag wing pins home, secure and locked.
- All control connectors correctly attached and locked. (Ailerons x 2, Airbrakes x 2, Flaps x 2 if fitted, water ballast valves x 2.) Check safety locking!

(Note: On some gliders, access to the main and drag pins and control connections requires disassembly of some fixtures and fittings. The Inspector should ensure that an appropriate Duplicate Check after Rigging has been performed after the last rigging, in order to avoid unnecessary disassembly of the aircraft. If there is any doubt about this, the disassembly of fixtures and fittings must be performed to provide sufficient access for the items to be inspected).

(4) Move to the wing root:

- Check wing joint tape.
- Walk along the wing leading edge checking for damage.
- Look along the top of the wing as you go, check the dive brake caps and arms for play and security, look inside air brake boxes for foreign objects, water, etc, then look under the wing checking for damage. Check inside inspection covers.

(5) At the wing tip:

- Check for ground contact damage, including damage to the tip skid.
- Look along the bottom of the wing looking for discontinuities.
- At the ailerons, check for ground damage and damage to hinges and actuating arms.

- (6) Walk along the trailing edge of the wing checking:
- Aileron hinges and actuating rods, control horns, and flap hinges and actuating rods for play and security.
 - Attachment of control seals, and Mylar tapes.
 - Top wing surface for unevenness, damage.
- (7) Moving along the rear fuselage, check for;
- Damage to rear fuselage.
 - Static ports not blocked, or taped over.
 - At the fin; pitot and static tubes secure.
 - Attachment of tailplane. Excessive tailplane play.
 - Check inside inspection panels.
- (8) Walk around the tail, checking:
- Tailplane security and locking.
 - Elevator and trim tab hinges, control connections and safety locking.
 - Rudder hinges and cables or pushrod connections.
 - Tailplane-to-fin joint tape or fairings.
 - Tail skid fitted and secure.
- (9) Move back along the other side of fuselage, as per 7 above, in reverse.
- (10) Move out along wing, as in 4, 5 and 6 above, in reverse.
- (11) Move to the leading edge wing root, checking along nose:
- Static and pitot holes clear.
 - Nose tow release; for cleanliness and operation.
- (12) Minor faults (such as gelcoat chips, etc.) which do not ground the glider, should be written up in the “Minor Faults” area of the DI Book.
- (13) If the glider is serviceable, make the appropriate entry and sign the DI Book in accordance with the instructions in the front of the DI Book.
- (14) If found unserviceable, note the problem in the “Major Defect” area, and leave the DI book open on the seat as an indication to others, and tell an Instructor or other senior club member of your findings.
- (15) Leave the glider in the correct configuration: brakes and flaps set as appropriate for the glider and the wind conditions on the ground; canopy closed and locked; electrics off.

8 Duplicate Check of Rigging.

- 8.1 The Duplicate Check of Rigging is to be performed by a person who is not performing the DI.
- 8.2 The Duplicate Check of Rigging is to consist of the following:
- A check that the main and drag pins that connect wings to fuselage are correctly installed, secure and locked.
 - A check that all controls are correctly attached and locked including Ailerons x 2, Airbrakes x 2, Flaps x 2 if fitted, water ballast valves x 2. (On some gliders it may not be practicable to view the connections. On gliders with automatic connections it will not be necessary)
 - A check that the tailplane is correctly attached and locked and the elevator and trim tab controls are correctly connected and locked.
 - A full control movement check, using a second person to apply resistance at the control surfaces, to ensure correct attachment, and correct direction of movement.
- 8.3 If the check is satisfactory, sign the duplicate check column of the DI Book. If problems are found, *DO NOT SIGN*.

9 Daily Inspection and Duplicate Check Privileges and Limitations

- 9.1 A person holding a Daily Inspection Approval is authorised to carry out:
- The DI, in accordance with the Daily Inspection Schedule detailed in this AC, of a glider or powered glider, on which they are rated to fly.
 - The Duplicate Check after Rigging, in accordance with this AC, of a glider or powered glider, on which they are rated to fly.
- 9.2 On gaining a Cross-Country Pilot Certificate (XCP), sufficient experience will have been gained to allow the Duplicate Check after rigging to be carried out on any glider. The limitation, “on which they are rated to fly”, is removed in the case of the Duplicate Check.
- 9.3 On gaining either an XCP Certificate or Instructor rating, sufficient experience will have been gained to allow a DI to be carried out on any glider. The limitation, “on which they are rated to fly”, no longer applies.
- 9.4 Persons who are not glider pilots but who may be called upon to carry out Duplicate Checks, such as tow pilots and crew, may do so, subject to being instructed in Duplicate Check requirements by the person performing the daily inspection.

10 Currency Requirements

Currency is deemed to be maintained as long as the approval holder is a current pilot or crew.

11 Issue of Approval

Approval is certified by the following statement being entered into the Pilot's logbook and signed by an Instructor.

Daily Inspection Approval issued in accordance with AC3-01 -Daily Inspection.

Signed.

Dated.

12 Validity Period

Subject to currency, the approval is valid while the holder remains a member of a Gliding Club affiliated to GNZ, or is a tow pilot or crew.

13 Supplement Particular to Powered Gliders

The following is a guide only for powered gliders. The inspector should consult and be familiar with the Manufacturer's Maintenance Manual for the particular powered glider.

- (1) Check engine for oil and fuel leaks. Check fuel lines, filters and tank attachments.
- (2) Check the following for security of attachment and condition, looking for looseness, cracking of parts, and cleanliness.
 - Engine mountings.
 - Exhaust mountings.
 - Propeller.
 - Spark Plugs.
 - Wiring.
 - Drive Belts.
- (3) Check support links, and lifting gear. Check doors and cowlings.
- (4) Check decompression. (Turbos.)
- (5) Check fuel and oil quantities.

14 Daily Inspection Oral Test

The Instructor performing the training is to select ten of the following questions. The person under training must demonstrate a reasonable understanding of the topic on at least seven of the selected questions.

	Question	Model Answer
1	What should you check in the DI book, prior to carrying out a DI?	You are checking for any minor faults found and entered by previous DI inspectors, so that you may compare their findings to your own and thus be able to make an informed judgment on allowing a particular fault to continue in service. (eg Has the fault increased since last DI?) You should also check the major defects page so that you do not waste time DI'ing a grounded glider.
2	Where would you find the correct tyre pressure for the glider?	In the glider's Flight Manual. It is sometimes placarded by the wheel.
3	Why is loose tape on a control surface a danger?	Loose tape will disturb the airflow behind it and make the control surface less effective. In extreme cases, it can cause control blanketing with associated handling problems. It can also work into a position where it can restrict or jam a control. It may also set up an unnerving vibration through the controls and an annoying high pitched whistling sound.
4	What effect does a deflated tyre have on the glider's performance?	None once airborne... but it will slow take off acceleration and delay lift off, thereby requiring a longer take off distance to be available. On landing, it will slow the glider quicker but reduce the vertical energy absorption that an inflated wheel provides. When braking, it is more prone to tube rotation and subsequent tyre assembly damage.
5	Would you write up a split in the rubber of the wall of the tyre as a defect?	A split in the rubber of the tyre wall will not necessarily ground the glider however, it should be noted in the DI book as a minor fault, and the approximate length and position recorded, so that at each subsequent DI it can be assessed and, if growing larger, action can then be taken. On the other hand, a split going right through the tyre wall should ground the glider.
6	What happens if the static ports are blocked?	The instruments that derive a static pressure reading will be in error; the ASI, Altimeter and the Varios.
7	What is the purpose of the duplicate check after rigging?	To ensure that the glider is correctly rigged, and that all locking pins are fully home and secured, and that all controls are connected and functioning correctly.

	Question	Model Answer
8	How do you check that the controls of a glider are correctly connected?	Have someone hold the control surface gently and then apply a cockpit control movement in both directions to the full travel of the control, ensuring the response at the control surface is appropriate to the control input.
9	Where might you find the static ports, and what do they do?	Static ports are usually small holes in each side of the fuselage connected to tubes inside, and are used by the instruments to measure the static (non moving) air pressure outside the glider. They are placed equally each side of the fuselage to ensure a correct reading is obtained. The position can vary from glider to glider. Some are fitted just back on each side from the nose; others at the maximum width of the fuselage. Others are well back along the rear fuselage, often with four holes at equal distance around the fuselage. Static ports can also be fitted on a metal probe sticking up from the fuselage top, or mounted on and projecting forward of the vertical fin. In this case, they will be a series of holes or slots positioned out of the direct force of the airflow.
10	Why are loose articles in the storage locker of a glider dangerous?	Any loose articles in a glider are a hazard, particularly in turbulence or in sudden decelerations. In both cases, even small objects may be accelerated and strike the glider's structure or the pilot with serious consequences. Pilots have been killed by batteries coming loose and striking them in the head during accidents.
11	What is FOD and why is it dangerous?	Foreign Object Damage; a term that describes damage from any undesirable loose article in an aircraft that subsequently causes damage either directly or indirectly. An example of indirect damage is something like a coin or a small tool that is left in a glider, which works its way into the control mechanism and jams the flight controls, leading to a crash. We all need to do our bit in ensuring FOD is not left in the gliders we fix or fly.
12	How do you check rudder cables for serviceability?	Slowly run your fingers along a cable. If there is any fraying, you will be pricked in the finger! Ouch!! Be sure to check around the likely fray zones where cables run through holes or around pulleys.
13	Can you carry out a DI on a glider on which you are not rated to fly?	Not until you gain either a Silver Badge or an Instructor Rating. You may only DI a glider with which you are familiar, however by the time you gain either of the above, sufficient experience will have been gained to carry out a DI on any glider.

	Question	Model Answer
14	What should you be particularly cautious about on DI'ing a glider that has been left out overnight in the rain without tape on the static ports?	Rain water may have entered into the static or pitot ports. If you believe this may have happened, do NOT blow into any pitot or static port or tube. Immediately advise an instructor or engineer of the problem. This requires careful removal of all instrument tubes from the instruments, and warm dry air to be gently blown through the tubes from the instrument end. Gliders tied down outside at night should have their static and pitot ports taped over to prevent water ingress. Use bright coloured tape to make them clearly visible to those doing the DI the next day.
15	Can you carry out a Duplicate Check on a glider that you are not cleared to fly?	Yes, but only if you are an XCP, or have been instructed on the particular glider in accordance with AC 3-01 Daily Inspection.
16	Why is tape sealing of the wing/fuselage joint important?	Sealing of joints prevents air spilling from the fuselage out over the wing and from below the wing to the top of the wing... all of which would increase drag.
17	What do you check in a glider's Certificate of Release to Service?	Check that it is for the glider it is in, that it is current and that any special conditions or requirements, and any other maintenance, is within the due date and hours.
18	Does the compass need to be serviceable for flight?	Yes. It is legally required even for VFR flight.
19	What action do you do if you find a small hole in the fabric behind the main wheel?	Contact an engineer and have it checked. It may be repaired with a temporary patch but this needs to be authorised by an engineer.
20	What Placards must be displayed in the cockpit?	The speed and weight placards must be displayed in the cockpit in such a way that they can be read by the pilot from the normal seated position. The speed placard details the designed maximum speeds for various flight regimes, and the weight placard, shows empty weight, max weight, max. and min cockpit loads, water ballast load, etc.
21	What three cockpit controls must be colour coded? What are those colours?	The three mandatory colour coding for controls are: Canopy release and jettison = Red. Airbrakes = Blue. Tow release = Yellow.
22	Who is responsible for ensuring that a glider has had a DI and a Duplicate Check?	The pilot in command who intends to fly the glider.

	Question	Model Answer
23	What particular hazards can insecure instruments pose?	Insecure instruments could fall out of the instrument panel and jam the controls, causing a serious accident.
24	Why is it important for a canopy to be free of dust, dirt and finger marks?	Any blemish on a canopy reduces visibility, especially when flying towards the setting or rising sun, which increases the risk of mid-air collision, flying into hillsides or a landing or take-off accident.
25	What must be avoided when cleaning a canopy?	Avoid any cleaning action or material that could cause scratching. Use only a chamois and lots of water for the initial cleaning, and only materials recommended for perspex for the final polish.
26	Which areas of a glider are most likely to provide tell-tale signs of overstress caused by incidents such as a heavy landing?	On the fuselage just aft of the wing root, and just forward of the fin. Signs of unusual cracking should be reported to an engineer.
27	Why is it important to check the tail skid?	Most gliders have a tail skid that is glued on so it can break off in an accident and prevent more significant damage to the glider. Skids are prone to coming loose after a lot of landings and takeoffs. If a glider takes off or lands with the skid missing, this can cause further damage.
28	If the tailplane was removed in order to check something, would a duplicate check be necessary?	Yes, but only of the tailplane attachment, locking and operation.
29	How should the glider be left after the DI is completed?	In a safe configuration with regard to the glider type and weather conditions. This means setting airbrakes, flaps and electrics to the appropriate setting; locking the canopy; and possibly, fitting the canopy cover.
30	If the glider is unserviceable, what would be a good way of ensuring that someone does not fly it in this condition?	Leave the DI book in the cockpit and open at the Major Defects page so that everybody can see it.
31	Why is any damage to the "D" nose section of the wing critical to airworthiness of the glider?	The D nose section forward of the main spar provides strength to withstand the torsional twisting loads imposed on the wing in flight. Damage to this section can greatly reduce the structural integrity of the wing.
32	What documents must be carried in the glider? (Not a microlight glider)	The Daily Inspection Book & Tech-Log with valid Certificate of Release to Service, Airworthiness Certificate, Radio Station Approval, Weight & Balance Data, and Flight Manual. But, if all of the placards necessary for safe operation are readily visible in the cockpit then the Flight Manual need not be carried.