

# G - TYPE CONVERSION

## INTRODUCTION

Introducing trainees to a new type of two-seater is easy – you will probably be flying it with them to remind them about anything they have forgotten!

Single seaters are different. You have one chance to brief them on everything, and they have one chance of remembering it all. Once they have taken off, they are on their own.

Whilst a briefing is helpful, (if not essential), it is the pilot's responsibility to ensure they are familiar with the aircraft, so they must **read the glider's flight manual**, plus any briefing notes which are available.

The subsequent briefing should contain only the minimum essential information needed by the pilot to be safe (so that they stand a chance of remembering it). Take into account their prior experience on other, similar types.

To brief for type conversion, the instructor should be appropriately familiar with the aircraft and be able to list the significant points that are required. Otherwise find an instructor or senior pilot that is familiar with it.

In general trainees will be keen to progress onto new types but are seldom 'converted' until they are well up to the standard required. Nonetheless, a disproportionate number of accidents occur during type conversions or early on flying a new type. This may be contributed to by a 'briefing failure', or lack of supervision.

It is not the handling characteristics so much as the workload that makes new types difficult. It is the overall combination of pilot and glider which matters, not the glider itself. The briefing's objective is to reduce the pilot's workload so that they can concentrate on the flying.

Type conversion flights can be stressful, so the pilot needs to be properly prepared, and the weather needs to be suitable.

The trainee's suitability for the type may need to be reconsidered in the light of their reaction to the briefing points made. Very occasionally, it may be prudent to delay the conversion until another day, perhaps when the weather is a little easier and the workload correspondingly lower.

## THEORY & BRIEFING

In the case of 'type conversions' the presence of the glider in question is required at some point.

Not all the material below will be relevant to a particular glider, and instructors should be experienced enough to emphasise or ignore items, as appropriate. Alternatively, a type conversion card is a good way of ensuring that nothing gets overlooked.

- The briefing should be conducted by **one** instructor or nominated senior pilot – other contributions may simply be a distraction or cause confusion.

- The instructor should be familiar with the type being converted to, and the one from which the conversion is being made.
- An external walk-around similar to a DI can be a useful introduction to the glider, especially if it is a completely unfamiliar type.
- Unless the basic flight controls function differently from gliders flown previously by the trainee, they do not usually need mentioning.

**If the glider has a retractable undercarriage** the important points are:

- how to raise and lock the undercarriage up
- how to lower and lock it down
- is there an alarm?

After the launch (at sufficient height, try retracting retract the undercarriage then cycle it, (i.e. lower it and retract it again) so that any unforeseen snags can be dealt with calmly.

It may be worth practising raising the undercarriage on the ground: the technique can be best practiced by supporting the glider in its belly dolly (preferably rigged), making sure that the wheel is clear of the ground. It is worth wearing a parachute and closing the canopy for this.

**The airbrakes may also be different.** Common variations include:

- The airbrake lever may look like and/or be right next to the wheel and/or flap lever (not uncommon), requiring positive visual identification before use.
- The cockpit ergonomics may be different restricting full range of travel. Check before launching the first time.
- Enormously powerful over-centre locks, -if the pilot does not realise the lock is not engaged, it would easy to take-off with the brakes unlocked.
- The airbrakes may be less effective than the pilot is used to, or they may be quite fierce (more common amongst older gliders.)
- They may suck open and require substantial force to close - especially at higher speeds - or a positive force may be needed to hold them open.
- Variations in deploying the wheel brake.

**Flaps** should be taught in a two-seater, but this is often not available. [For more detail on flap usage, see chapter 5b]. The minimum advice required is:

- always read the flight manual
- the flap setting for take-off
- the nominal setting in free flight and limiting speeds for the various flap settings.
- the setting for landing. Warn the pilot that if landing flap is used, the approach speed must be maintained.

Care should be taken, even with experienced pilots where large differences in performance from the type(s) they are familiar with exist. Higher performance is rarely an issue, but a pilot who has not flown anything worse than an ASK 21 will be at great risk when encountering sink or unexpected headwind in the circuit flying most wooden gliders. Undershooting is a real risk.

### Pre-flight preparations

In addition to reading the flight manual and a briefing, the trainee should:

- sit in the glider for a sufficient time, before arriving at the launch point, to become thoroughly familiar with the positions of the instruments and all controls. Including canopy latches and ventilation, and jettison.
- check that they can adjust the straps to properly secure themselves. (Do not use soft, compressible cushions behind the pilot. 'Cushions' under the pilot **MUST** be either impact absorbing foam, or solid.)
- check that they can easily get full movement to:
  - reach all the controls, especially full forward stick and full airbrake.
  - apply full rudder and stick together, in the same direction. Check that when full left rudder is applied, for example, the pilot's left leg is not at full stretch, making it impossible to apply full left stick at the same time.
  - reach the cable release easily.
- know and understand the various limiting speeds, especially maximum manoeuvring speed ( $V_A$ ), maximum winching speed ( $V_W$ ) and the never exceed speed ( $V_{NE}$ )
- decide sensible minimum launch and approach speeds for the day.
- Nominate stick and trim positions for take-off.

The use of ballast is strongly recommended, unless the is a very experienced pilot. For trainees this should be at least 10kg (22 lbs) above the placarded minimum figure.

Ancillary equipment should be understood, especially on/off and volume controls for the radio and any audio variometer. If the variometer is complicated, what is the minimum the pilot needs to know to get something sensible out of it? Some kit may be better switched off for a first flight.



### In the air:

Ideally, a type conversion should take place at a familiar site, using a launch method with which the pilot is comfortable. Too many 'firsts' in one flight, increase both the workload and the risks significantly.

The most dangerous phase of any type conversion flight is a launch failure during the first few seconds. If the pilot is familiar with and in practice at aero-towing, it is preferable to winching for a first 'on-type' flight. Things tend to happen more slowly, and more height - and therefore time - can be taken.

If a real or perceived emergency arises, the pilot may revert to previously learned, but in the circumstances, inappropriate behaviour. For example, the undercarriage is cycled up and down in mistake for the airbrakes.

Immediately before the first flight, double check that flying conditions remain appropriate for the trainee to make this conversion. and consider TEM for this exercise.

### TEM

#### Threats:

'Helpful' friends or Syndicate partners may confuse the pilot with unhelpful or irrelevant information.

#### Mitigation:

Ensure only the most current and knowledgeable conduct the briefing.

#### Errors:

The pilot may confuse or misuse unfamiliar controls in a more complex type.

Ensure the pilot is thoroughly familiar with all the controls, particularly 'new' ones before flight.

The pilot may not allow for large differences in performance.

Brief and ensure the pilot understands the issues and how to allow for them.

During the flight the pilot should, as a minimum, assess the low-speed handling characteristics of the glider and find out the stalling speed. Soaring out of range of base is not normally appropriate.

The trainee's first flight on a new type is effectively a first solo, so try and be around to monitor its progress. and if possible, the circuit and landing.

### DE-BRIEFING

A re-briefing rather than a de-briefing is often required. It should emphasise the main points again, explaining subtler points that, in the interests of brevity, were left out of the original briefing. The trainee will extend their knowledge gradually on second and subsequent flights.

Ask your trainee some open questions about the glider's characteristics. The answers will tell you what they have discovered, and whether it has been understood.

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**COMMON DIFFICULTIES**

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**P**IO on take-off owing to holding the stick forward initially.

**W**heel-up landing. This often happens if the wheel was left down throughout the flight and then retracted as part of a pre-circuit 'check.'

**P**oor speed control initially, as the attitude may be different from the type the pilot is used to and through not monitoring the ASI

**P**oor speed control on approach is often associated with inadequate skill in using the airbrakes, commonly compounded by using a much too close 'super-safe' circuit, followed by an inevitable overshoot.

This may lead to excessive wheel-braking to 'spot-land'. The glider tips on its nose and then the tail slams back down.

**A**fter landing the pilot reports sink 'everywhere.' This may mean that they were flying much too fast. Another possibility is that the airbrakes were not locked properly on take-off and were partially out for some of the flight. Pilots are reluctant to admit this when it happens. It is also conceivable that there really was sink just about everywhere!

**U**npreparedness for cable-break or other emergencies.

**F**ull conversion and exploration of the type does not take place after the initial flight resulting in problems later.