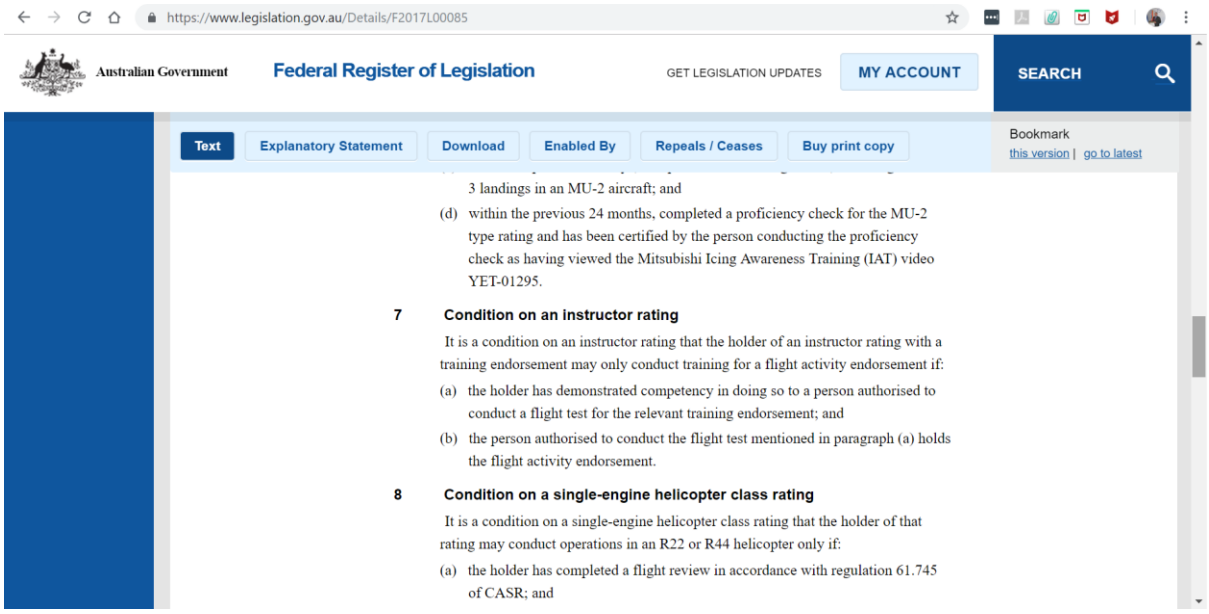
INTRODUCTION

All flight crew will retain their current flying privileges throughout and following the 1 September 2014 transition. For most people, the only noticeable change is that they will be issued a licence in a slightly different format.

Well, that is what you were told about transitioning to your Part 61 licence, but it is not true with respect to flight activity training endorsements for instructors - they are not worth the paper they were written on.

THE LEGISLATIVE INSTRUMENT

Buried in amongst all the bland stuff on CASA's website https://www.casa.gov.au/rules-and-regulations/standard-page/legislative-and-non-legislative-instruments is a link to this document at https://www.legislation.gov.au/Details/F2017L00085 which has this text buried in it:



WHAT IT MEANS

This applies to flight instructors who were teaching flight activities prior to Part 61 and given a flight activity training endorsement upon transition to a Part 61 licence. Those flight activity training endorsements cannot be exercised until a check by a flight examiner has been done.

CASA said that this was introduced to "baseline everyone" – to get those with legacy logbook approvals up to the new Part 61 standard.

In my case, I've complied with that requirement for spinning and aerobatics as I have completed multiple flight instructor proficiency checks and flight school checks covering those areas as that is pretty much all I do. I doubt whether many flight instructors in this situation would've had the same opportunity as most PCs and S&P checks would be focused on other privileges of a flight instructor rating. My guess is that many flight instructors will now find that they require a specific check by someone with flight examiner privileges.

I also teach formation flying and the cost of demonstrating my competency to a flight examiner means that it is not viable for me to continue doing it. I would probably want to practice a bit – its not a test but I wouldn't want to be told to get remedial training then come back for another check. Hiring two aeroplanes and another pilot for several hours plus the examiner's fees is a large amount of money which I would never recoup through instructing formation flying so I am not interested. It would be the same for many others I am sure.

The same with spin and aerobatic training – if you are going to demonstrate competency to a flight examiner then it is up to you to get to that standard by hitting the textbooks for the underpinning knowledge and perhaps in-flight practice if you are rusty.

Some online quizzes to help at http://ozaeros.net.au/?page_id=675

SPIN AND AEROBATIC TRAINING ENDORSEMENT COMPETENCY DEMONSTRATIONS

I'm in a position where I can do these spin and aerobatics checks for others so here is a nominal plan for instructors to undertake a refresher and complete that demonstration of relevant competencies.

I still hold approval, Instrument Number CASA.61040AP.0469 Revision 1 to conduct flight tests for the spinning training endorsement and aerobatics training endorsement and to grant those endorsements. It expires on 31 January 2019.

Incidentally, my earlier 61.040 approval expired at the end of 2017 and I completed all the ground training for a Flight Examiner Rating as I was told that the 61.040 approval would not be extended. I applied to CASA to do the flight test in February 2018 for my Flight Examiner Rating for spin and aerobatics instructor training endorsements in my Super Decathlon. I had expected a bit of a delay as whoever they tasked with testing me would need to comply with the general competency requirements to be pilot in command on the type and also, I guess, do this same demonstration of competency themselves in spinning and aerobatics to the Part 61 standards. Anyway, I followed up on my test application and was instead told that my earlier 61.040 approval should've had a later expiry date so I was given a new one! I look forward to doing my Flight Examiner flight test with CASA next year.

Here is a nominal plan to complete that demonstration of competency:

- Underpinning knowledge to the required standard i.e. a "thorough understanding". I'd expect the instructor to print out the list of underpinning knowledge elements from the MOS to use as a checklist to ensure that their briefing material is complete. Let's flick through the briefing material (hopefully on Powerpoint) and consider items on that list. Many of the spin items were in the old day VFR syllabus so just a few new things there. Before Part 61 there were no underpinning knowledge requirements although CAAP 155-1 of 2007 introduced some recommended standards that, hopefully, instructors would be familiar with – but there are some new items and, in general, some are straightforward while some are important. The duration will be different for different people.
- Demonstration of skill in performing the manoeuvres.
- Instructional ability – along with the above as per the usual Form 61-1509.

Expect it to take about as long as a flight test for the two training endorsements – it may take longer if an instructor requires additional training. It is not a test and the outcome is not required to be reported to CASA however, as I have done, it is in your own interest to retain evidence of you having completed this demonstration of competency.

David Pilkington
29/10/18

CASA Instrument Number 07/17 Conditions on authorisations — flight crew licences and aircraft endorsements (Edition 2)

"**7 Condition on an instructor rating**

It is a condition on an instructor rating that the holder of an instructor rating with a training endorsement may only conduct training for a flight activity endorsement if:

(a) the holder has demonstrated competency in doing so to a person authorised to conduct a flight test for the relevant training endorsement; and

(b) the person authorised to conduct the flight test mentioned in paragraph (a) holds the flight activity endorsement."

GENERAL

Demonstrate knowledge of the following topics:

- Privileges and limitations of the spin and aerobatic training endorsements
- Preparing a student for training
- Specific to the training endorsement:
    - Aeronautical knowledge
    - Practical training aspects
    - Assessment techniques and standards
    - Common errors and methods to resolve them
    - Supervision
    - Managing common threats and errors

NB: spin competencies are required for the aerobatic training endorsement also.

SPIN UNDERPINNING KNOWLEDGE

The underpinning knowledge specified in FA-8, Spinning:

(a) actions required to recover from an incipient spin (wing drop at point of stall);

I note that CASA's FIM (Flight Instructor Manual) has separate and different recovery actions for recovery from a stall when the wing drops (pages 34 and 53) and recovery from an incipient spin (page 52).

(b) what control inputs, with an aeroplane in any attitude, at the point of stall, are likely to cause a spin;

(c) blanketing effects the elevator can have on the rudder during spin recovery;

(d) significance of stick and control wheel position with respect to spin recovery;

(e) aerodynamic causes of a spin;

(f) what aerodynamic factor determines the direction of a spin;

(g) how to recognise a stable spin;

(h) difference between a stable spin and an unstable spin;

(i) effects of C of G position on spin performance and acceleration;

(j) difference between a spin and spiral dive;

(k) factors which may lead to a flat spin;

The FIM page 53 hints at the effects of inspin and outspin aileron and that different types have different behavior. What about the types that you train in?

(l) difference between an upright and an inverted spin;

CAAP 155-1 assists here.

(m) visual indications used to determine the direction of a spin;

CAAP 155-1 assists here.

(n) instrument indications used confirm the direction of a spin;

(o) standard spin entry and recovery techniques for the aircraft being flown;

(p) number of turns normally required for spin recovery in the aeroplane type;

(q) height normally required entering and recovering from a stable spin;

(r) Mueller-Beggs spin recovery action and limitations on its application;

CAAP 155-1 assists here.

(s) 'g' and any other limitations applicable to spinning for the aeroplane type.

AEROBATICS UNDERPINNING KNOWLEDGE

The underpinning knowledge (to a nominated scope) specified in FAE-1, Aerobatics – 3,000 ft AGL:

(Note that if the instructor holds an aerobatic endorsement to a lower altitude then those additional underpinning knowledge requirements would also apply)

(a) meaning of the terms positive and negative 'g';

(b) symmetrical positive and negative 'g' limits for the aircraft flown;

Look at the standard form of the structural flight envelope in the FAA's Handbook of Aeronautical Knowledge with respect to this item. Note that is for FAR 23 and older certifications from Australia and the UK are quite different.

(c) meaning of the term rolling 'g';

(d) rolling 'g' limits for the aircraft flown;

(e) how to calculate the rolling 'g' limitation of an aircraft;

(f) relationship during rolling manoeuvres between pitch angle required on commencement of a roll and rate of roll;

(g) engine RPM limitations for the aircraft flown;

(h) physiological effects of positive and negative 'g';

(i) the 'g' figure that a normal person may experience 'g' induced loss of consciousness (G-LOC);

(j) differences between grey out, black out, and G-LOC;

(k) conditions under which G-LOC is likely to occur;

(l) time period that disorientation may occur for after recovery from G-LOC;

(m) factors that can reduce G-LOC tolerances;

(n) physiological effects of sustained and rapid changes of ‘g’ loading;

(o) relationship between tunnel vision and loss of consciousness;

(p) hazards and consequences of performing aerobatics with blocked eustachian tubes;

(q) physiological factors that can reduce ‘g’ tolerance;

(r) physical actions that may increase ‘g’ tolerance;

(s) minimum altitude to perform aerobatic manoeuvres;

(t) relationship between pre-stall buffet and rate of turn or rate of pitch;

(u) effect of increasing airspeed on stick force;

(v) structural irregularities that indicate an aircraft has been overstressed;

(w) effect of increased ‘g’ loading on stall speed;

(x) airspeed limitations;

Every pilot should know these limitations, especially those associated with Manoeuvre Speed however I find that the general level of knowledge is abysmal – CAAP 155-1 is dangerously deficient in this respect.

Limitations on use of the flight controls at speeds up to Manoeuvre Speed and their use at higher speeds is important.

(y) VA, VNE and VNO;

(z) effect of aircraft weight on VA and what precautions must be taken;

(za) recovery from manoeuvre-induced disorientation;

(zb) how to assess personal fitness for aerobatic flight;

(zc) maximum rate turn criteria;

(zd) minimum radius criteria.

SPIN FLIGHT TRAINING

Pre-flight brief.

The flight tolerances specified in table 2 in Section 1 of Schedule 8 of the MOS – specific relevant items are at spin entry wrt nominated heading ±5°and altitude ±100 ft.

Refer also:

FAE-8 Spinning

1 Unit description

This unit describes the skills and knowledge required to execute and recover from an upright spin manoeuvre.

2 Elements and performance criteria

2.1 **FAE-8.1 – Recover from spin**

(a) perform pre-manoeuvre checks;

(b) enter and establish an upright spin;

(c) identify upright spin and direction of yaw;

(d) close throttle;

(e) stop yaw;

(f) unstall wing by reducing AOA;

(g) recover to controlled flight;

(h) recover within the number of turns normally required for upright spin recovery in the aircraft type, within the aircraft and height limitations.

3 **Range of variables**

(a) activities are performed in accordance with published procedures;

(b) day VFR flight in VMC;

(c) within the lateral and vertical limitations of the planned manoeuvring airspace using an approved aerobatic aeroplane.

AEROBATIC FLIGHT TRAINING

Pre-flight briefs:

1. Loop
2. Roll
3. Stall turn
4. Unusual attitudes – especially vertical up at low airspeed, steep spiral dive and nose low inverted

Include the important, relevant threats and errors – CAAP 155-1 may help here:

- Strong winds and/or turbulence
- Other traffic
- Hight terrain or obstacles
- Pre-existing structural damage
- Setting altimeter sub-scale incorrectly
- Aircraft handling errors
- Failure to use or achieve manoeuvre entry parameters
- Impulsive deviation from intended routine
- Not observing G or other limitations

Refer:

Table 8: Aerobatics

1. Applicability

1.1 The flight tolerances in this subsection apply to the aerobatics endorsements.

2. Requirements

2.1 A person is required to perform flight manoeuvres within the flight tolerances mentioned in this table to be assessed as competent in the associated unit of competency.

3. Flight tolerances

Manoeuvres	Parameter	Tolerances
Looping manoeuvres	Nominated line feature	±10°
	Nominated airspeed	±10 kts
	Entry and recovery heights	±100 ft
Rolling manoeuvres	Nominated airspeed	±10 kts
	Direction	±10°
	Altitude	±100 ft
Stall turn-hammerhead	Nominated air speed	±10 kts
	Nominated line feature 180°	±15°

And

SECTION 6 FLIGHT ACTIVITY ENDORSEMENT STANDARDS

FAE-1 Aerobatics — 3,000 ft AGL

1 Unit description

This unit describes the skills and knowledge required to perform aerobatic manoeuvres not below 3,000 ft AGL.

2 Elements and performance criteria

2.1 FAE-1.1 – Prepare for aerobatic flight

(a) select suitable airspace that allows the completion of all aerobatic manoeuvres above the authorised minimum altitude;

(b) perform pre-manoeuvre checks and select appropriate aircraft configuration;

(c) maintain lookout using a systematic scan technique at a rate determined by traffic density, visibility or terrain.

2.2 FAE-1.2 – Perform looping manoeuvre

(a) pitch the aircraft vertically at a continuous rate through 360° in balanced flight, maintaining wings parallel to the Earth's horizon, positive 'g', without stalling and maintaining alignment with a nominated line feature from a nominated airspeed that will ensure completion of a loop;

(b) comply with engine, airframe and physiological limitations;

(c) observe entry and recovery heights.

2.3 FAE-1.3 – Perform rolling manoeuvre

(a) roll the aircraft from a nominated airspeed around the fore and aft axis through 360° while maintaining direction and altitude, or a height loss appropriate to the aircraft type;

(b) observe entry and recovery height.

2.4 FAE-1.4 – Perform stall turn-hammerhead (vertical yaw reversal)

(a) pitch aircraft from a nominated airspeed to the vertical in balanced flight with the wings parallel to the horizon and terminate the pitch at the vertical;

(b) maintain the aircraft vertical and yaw through 180°, descending vertically in balanced flight and recover the aircraft from the dive to straight and level flight, aligned with a nominated line feature 180° to the original heading;

(c) observe entry and recovery height.

2.5 FAE-1.5 – Recover from unusual attitudes

(a) recover aircraft to controlled flight, in the height available, from any attitude, bank angle or speed within the limitations of the aircraft;

(b) recover aircraft to controlled flight, in the height available from any inverted negative 'g' attitude, bank angle or speed within the limitations of the aircraft.

2.6 **FAE-1.6 – Recover from spin**

(a) perform pre-manoeuvre checks;

(b) enter and establish an upright spin;

(c) identify upright spin and direction of yaw;

(d) close throttle;

(e) stop yaw;

(f) unstall wing by reducing AOA (aeroplane);

(g) recover to controlled flight;

(h) recover within the number of turns normally required for upright spin recovery in the aircraft type, within the aircraft and height limitations.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) aeroplanes approved to conduct aerobatic flight.

REFERENCES

1. FAA-H-8083-3 – Airplane Flying Handbook
2. FAA-H-8083-25 – Pilot's Handbook of Aeronautical Knowledge
3. Stalls, Spins and Safety by Sammy Mason – available on Amazon – essential reading, in my opinion, for a spin instructor
4. Aerobatics in the Super Decathlon by David J Pilkington – available on Amazon or from Skylines – especially for the 8KCAB and the underpinning knowledge for the spin and aerobatic endorsements
5. The Basic Aerobatic Manual by William K Kershner – especially for the Cessna 150/152
6. Stall/Spin Awareness by Rich Stowell – the "bible" if you want to know everything!
7. CASA Flight Instructor Manual – see Chapter 9 Stalling and Chapter 13 Spins and spirals
8. CASA CAAP 155-1, Aerobatics - hopelessly out of date with some false information.

CERTIFICATE OF DEMONSTRATION OF COMPETENCY

FLIGHT INSTRUCTOR FULL NAME _____ ARN _____

ELEMENT	DATE	EXAMINER NAME	ARN	SIGNATURE
SPIN TRAINING ENDORSEMENT				
FIR-TE18.1 - Demonstrate knowledge of competency based training as applied to training for a spinning flight activity endorsement				
FIR-TE18.2 - Demonstrate understanding of principles and methods of instruction				
FIR-TE18.3 - Conduct aeronautical knowledge training				
FIR-TE18.4 - Develop briefings and plan flight training				
FIR-TE18.5 - Conduct pre-flight briefing				
FIR-TE18.6 - Conduct airborne training				
FIR-TE18.7 - Conduct-post-flight briefing				
FIR-TE18.8 - Complete post-training administration				
AEROBATIC TRAINING ENDORSEMENT				
FIR-TE19.1 - Demonstrate knowledge of competency based training as applied to aerobatics endorsement training				
FIR-TE19.2 - Demonstrate understanding of principles and methods of instruction				
FIR-TE19.3 - Conduct aeronautical knowledge training				
FIR-TE19.4 - Develop briefings and plan flight training				
FIR-TE19.5 - Conduct pre-flight briefing				
FIR-TE19.6 - Conduct airborne training				
FIR-TE19.7 - Conduct post-flight briefing				
FIR-TE19.8 - Complete post-training administration				