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# **SAFETY UPDATE (INCIPIENT) SPIN RECOVERY TRAINING**

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# Interim Advice from Pilkington:

- ⦿ Part 61 MOS requires execution of an incipient spin
- ⦿ That is not permitted in normal category aircraft

## **Maneuver Limits**

Aerobatic maneuvers are prohibited.

Spins are prohibited.

This airplane is certified in the normal category and is not designed for aerobatic operations. Only those operations incidental to normal flight are approved. These operations include normal stalls, chandelles, lazy eights, and turns in which the angle of bank is limited to 60°.

- ⦿ An incipient spin is a spin
- ⦿ Normal stalls do not include intentional incipient spins

# From the old Day VFR Syllabus

## A5.2 Recover from incipient spin

- Performs pre-manoevre checks
- Terminates yaw
- Adjusts aeroplane attitude and power setting following incipient spin entry (stall with wing drop) and resumes normal balanced flight
- Recovers at incipient spin stage during a turn and resumes controlled flight
- Achieves height loss consistent with aircraft type.

## Part 61 Incipient Spin Training for RPL

### A5.2 – Recover from incipient spin

This element only applies to single engine aeroplanes.

- (a) perform pre-manoevre checks for an incipient spin;
- (b) recognise an incipient spin;
- (c) use the aeroplane's attitude and power controls to execute an incipient spin manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate with the available altitude (simulated ground-base height may be set):
  - (i) straight and level flight;
  - (ii) climbing;
  - (iii) turning.

# CASA Flight Instructor Manual

## RECOVERY WHEN THE WING DROPS

Use the standard recovery, i.e. simultaneous use of power and forward movement of the control column. In addition rudder must be used to prevent the nose of the aeroplane yawing into the direction of the lowered wing. The ailerons should be held neutral until control is regained, when the wings should be levelled.

## RECOVERY AT THE INCIPIENT SPIN STAGE

Brief the student that you will be demonstrating the entry to the spin in the normal manner. Point out that before the spin develops fully you will be recovering by ensuring the throttle is closed and the controls are centralised followed by recovery from the ensuing unusual attitude.

## RECOVERY FROM THE INCIPIENT STAGE

Carry out the pre-spinning checks. From a straight glide use the controls as for the entry to a fully developed spin. As soon as the aeroplane has stalled and commenced to yaw take the appropriate recovery action. Increase power, apply sufficient rudder to prevent further yaw and ease the control column forward sufficiently to un-stall the aeroplane. Point out that if power is to materially assist recovery action it must be applied before the nose of the aeroplane has pitched too far below the horizon otherwise its use will only increase the loss of height.

# FAA AC 23-8C FAR 23 Flight Test Guide

## § 23.221 Spinning.

### a. Explanation.

(1) *Spin.* A spin is a sustained autorotation at angles-of-attack above stall. Motions of the spin may have oscillations in pitch, roll, and yaw superimposed. A fully developed spin is attained when the trajectory has become vertical and the spin

(1) *Objective.* The basic objective of normal category spin testing is to assure that the airplane will not become uncontrollable within one turn (or three seconds, whichever takes less time). "A margin of safety" is designed to provide adequate controllability when recovery from a stall is delayed. Section 23.221(a) does not require investigation of the controllability in a true spin condition for a normal category airplane. Essentially, the test is a check of the controllability in delayed recovery from a stall.

# FAA AC 61-67C Stall & Spin Awareness Training

**a. Normal Category.** Normal category airplanes are not approved for the performance of acrobatic maneuvers, including spins, and are placarded against intentional spins. However, to provide a margin of safety when recovery from a stall is delayed, normal category airplanes are tested during certification and must be able to recover from a one turn spin or a 3-second spin, whichever takes longer, in not more than one additional turn with the controls used in the manner normally used for recovery or demonstrate the airplane's resistance to spins. In addition for

**402. PILOT AWARENESS.** The pilot of an airplane placarded against intentional spins should assume that the airplane may become uncontrollable in a spin.

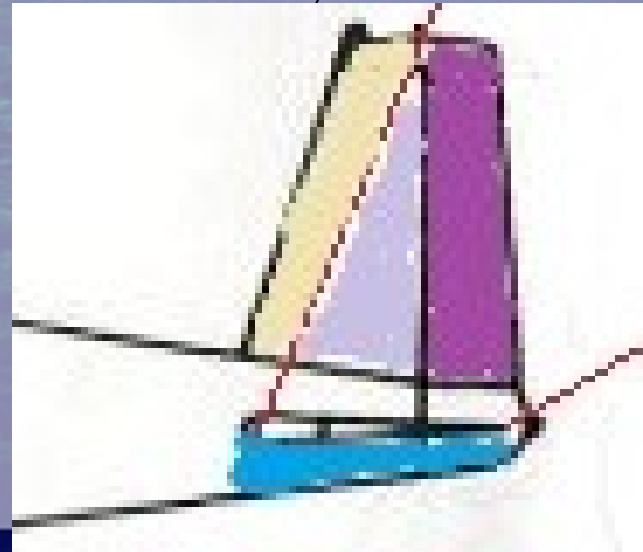
LSA spin test requirements are less stringent than FAR 23 normal category.

# Tail Design for Spin Recovery

- Note in POH:

There is evidence that permitting the airplane to go beyond one turn without initiating proper recovery procedures can allow a spin mode to develop from which recovery is not possible.

- NASA tests went beyond certification flight tests and showed the spin to be unrecoverable.
- Other aircraft not approved for intentional spins likely the same however not tested beyond one turn.
- Note blanketing of the fin and rudder of this tail design.
- Even the Cessna 172 has an unrecoverable spin mode near aft CG.





# An Incipient Spin is a Spin!

From FAA AC 61-67C:

## 110. TYPES OF SPINS.

a. An incipient spin is that portion of a spin from the time the airplane stalls and rotation starts, until the spin becomes fully developed. Incipient spins that are not allowed to develop into a steady state spin are commonly used as an introduction to spin training and recovery techniques.

**An intentional entry to an incipient spin is an intentional spin so is not permitted in either normal category airplanes or LSA.**

# CASA 23/5/19 Safety update: spin recovery training

Flight training operators, their Heads of Operations and Flight Examiners are obliged to ensure that aircraft used for training, flight reviews and testing purposes are certified for the manoeuvres being performed.

The recent ATSB investigation into a **fatal accident** involving a Diamond DA-40 found the conduct of **advanced stall training** was a contributing factor to the cause of the accident.

It also highlighted that there can be **varying interpretations of an 'incipient spin'**,

and this has led to **aircraft not approved for intentional spins being used for incipient spin training** and assessment.

# Intentional Spins Are Prohibited

ATSB:

- “**AO-2017-096-SAN-012:** Operating an aircraft within the stated limitations is essential to the safe conduct of a flight. Training organisations are required to conduct incipient spin recovery training, which includes intentionally inducing a spin and recovering before it fully develops. Some organisations may be conducting this training in aircraft not approved for intentional spinning. The ATSB advises these training organisations to clarify with aircraft manufacturers the extent to which the intentional entry into the early stages of a spin, including an incipient spin, is permissible.”
- From Diamond: **“The aircraft’s manuals state that intentional spins are prohibited. During the ATSB investigation, the aircraft manufacturer clarified that this limitation prohibits any action that is intended to induce a spin, even if the aircraft is immediately recovered.”**

# How to Recover from a Spin?

## 3.8 RECOVERY FROM AN UNINTENTIONAL SPIN

### CAUTION

Steps 1 to 4 must be carried out **immediately** and **simultaneously**.

1. POWER lever ..... IDLE
2. Ailerons ..... neutral
3. Rudder ..... full deflection against direction of spin
4. Elevator (control stick) ..... **fully forward**

— NO SMOKING —

- Take action *immediately*.
- Incipient spin unless ...?
- CASA FIM has 2 different methods for an incipient spin, plus a fully developed spin?
- *Stalled and autorotating* -
- Use the *single* spin recovery method in the AFM.
- Spin recovery method we teach is for the type trained on – *significantly different!*

# Further CASA Guidance

**“CASA is developing further guidance material in relation to the conduct of incipient spins and advanced stalls and how to meet the flight training and testing standards in the Part 61 manual of standards. We expect to finalise these over the coming weeks.”**

***Please publish guidance material before implementing the regulations .....***

# Summary

- FAR 23 flight test guide – if it is stalled and autorotating then it is a spin.
- FAA AC 61-67C & CASA FIM - an incipient spin is the start of a spin.
- Normal category aircraft & LSA – normal stalls only.
- An incipient spin is a spin – so requires an aircraft approved for spins.
- Use the method in the AFM/POH.


# Pilkington Advice:

- Part 61 MOS requires execution of an incipient spin.
- An incipient spin is a spin.
- Only do that in a type approved for spins.
- Instructors should get appropriate spin training. Know the AFM/POH.

# Further Reading

Chapter 4

## Maintaining Aircraft Control: Upset Prevention and Recovery Training



**Introduction**

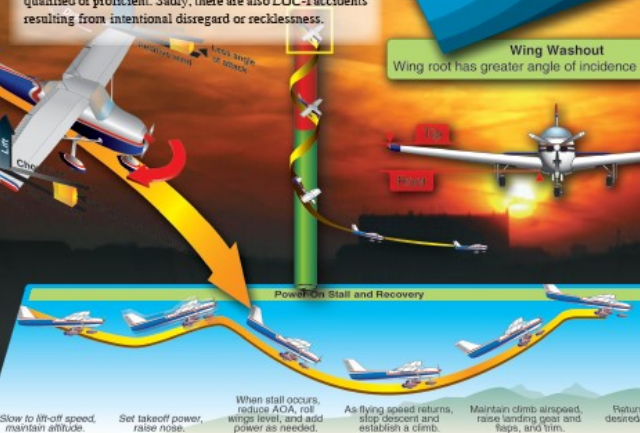
A pilot's fundamental responsibility is to prevent a loss of control (LOC). Loss of control in-flight (LOC-I) is the leading cause of fatal general aviation accidents in the U.S. and commercial aviation worldwide. LOC-I is defined as a significant deviation of an aircraft from the intended flightpath and it often results from an airplane upset. Maneuvering is the most common phase of flight for general aviation LOC-I accidents to occur; however, LOC-I accidents occur in all phases of flight.

To prevent LOC-I accidents, it is important for pilots to recognize and maintain a heightened awareness of situations that increase the risk of loss of control. Those situations include: uncoordinated flight, equipment malfunctions, pilot complacency, distraction, turbulence, and poor risk management – like attempting to fly in instrument meteorological conditions (IMC) when the pilot is not qualified or proficient. Sadly, there are also LOC-I accidents resulting from intentional disregard or recklessness.

**Wing Washout**  
Wing root has greater angle of incidence

**Power-On Stall and Recovery**

Slow to lift-off speed, maintain altitude. Set takeoff power, raise nose. When stall occurs, reduce AOA, roll wings level, and add power as needed. As flying speed returns, stop descent and establish a climb. Maintain climb airspeed, raise landing gear and flaps, and trim. Return desired.



# Aerobatics Down Under



Revised and Updated Edition

## David J Pilkington

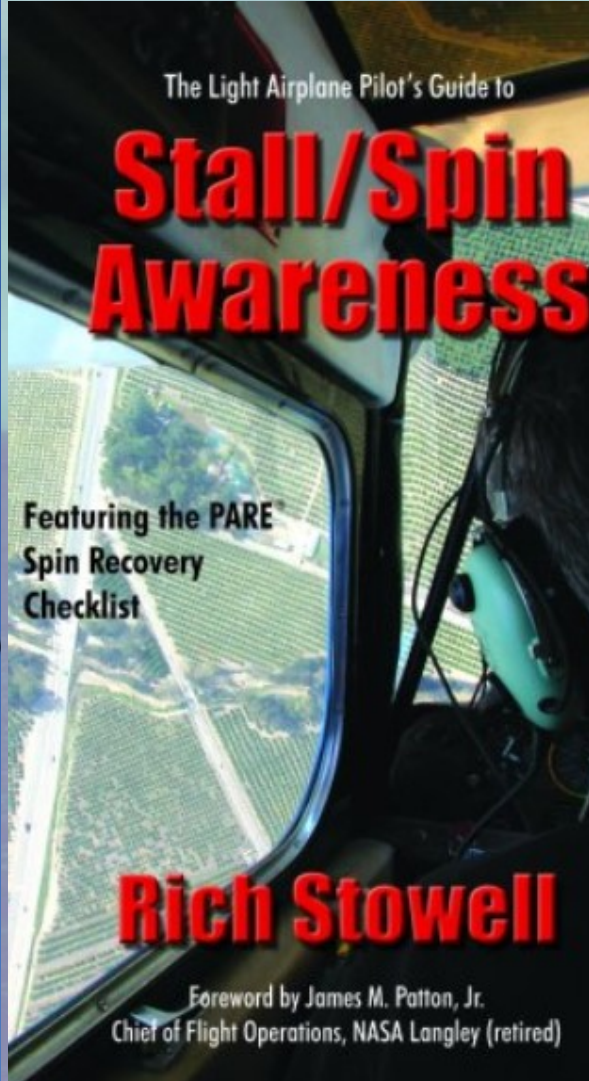
The Light Airplane Pilot's Guide to

# Stall/Spin Awareness

Featuring the PARE<sup>™</sup> Spin Recovery Checklist


## Rich Stowell

Foreword by James M. Patton, Jr.  
Chief of Flight Operations, NASA Langley (retired)



# STALLS, SPINS, AND SAFETY

Revised Edition



This practical book takes you through spins from the pilot's point of view.

**It could save your life!**

## Sammy Mason