

Piper Aircraft Corporation SB No. 753

Subject:

Expanded Spin Recovery Procedures. (1)

Models Affected:

PA-28-140

Serial Numbers Affected:

28-20000 through 28-7725290

Compliance Time:

Upon receipt.

Purpose:

To provide expanded spin recovery procedures to assure that proper safety practices and procedures relative to utility category flight operations are in effect. Spin training is permitted only in the utility category.

Accompanying this Service Bulletin is an expanded information placard to be installed in the cockpit in full view of the pilot. This Service Bulletin is to be retained at all times in the airplane with the aircraft paperwork.

Instructions:

Weight and Balance

It is the responsibility of the pilot and aircraft owner to determine that the aircraft remains within the allowable weight versus centre of gravity envelope while in flight.

The PA-28-140 is certified for operations in both normal and utility categories. Spins and certain other aerobatic manoeuvres are permitted only when the aircraft is configured in the utility category, which requires that the gross weight and centre of gravity not exceed 1,950 pounds and 86.5 inches aft of datum, respectively. Fuel loading is the primary factor controlled by the pilot that affects the weight and centre of gravity.

The pilot and co-pilot seat location of 85.5" as specified in the A.F.M. (2) is the centre position of the seat track. This may vary from a full forward

position arm of 80.5” to 90.5” at the most rearward position. Each hole from the centre position of 85.5” changes the arm of the seat location 1.25”.

The seat position to be used for spins should be determined and the correct arm should be used in calculating the aircraft weight and centre of gravity prior to beginning the flight.

To determine the weight and balance limitations refer to the Weight and Balance Section in the appropriate Airplane Flight Manual.

Manoeuvres

The PA-28-140 is approved for certain aerobatic manoeuvres, provided it is loaded within the approved weight and centre of gravity limits (refer to Limitation Section in the appropriate Airplane Flight Manual.) The approved manoeuvres are spins, steep turns, (3) lazy eights, and chandelles.

Spins

Before Spinning

Carrying baggage during the spin is prohibited and the pilot should make sure that all loose items in the cockpit are removed or securely stowed, including the second pilot's seat belts if the aircraft is flown solo. (4)

Seat belts and shoulder harnesses should be fastened securely and the seat belts adjusted first to hold the occupants firmly into the seats before the shoulder harness is tightened. With the seat belts and shoulder harness tight, check that the position of the pilots' seats allows full rudder travels to be obtained in both the full back and full forward control wheel movements. Finally, check that the seats are securely locked in position.

The PA-28-140 is approved for intentional spinning only when the flaps are fully retracted. Spins should be started only at altitudes high enough to recover fully by at least 3,000 feet AGL, so as to provide adequate margin of safety. A one-turn spin, properly executed, will require approximately 1,000 feet to complete, and a six-turn spin will require approximately 3,000 feet to complete.

The airplane should be trimmed in a power-off glide at approximately 96 MPH before entering the stall prior to spinning. This trim airspeed assists in achieving a good balance between airspeed and “g” loads in the recovery dive. Spin recovery has been demonstrated up through six turns.

Spin Entry

The spin should be entered from a power-off glide by reducing speed at about 1 kt/sec. until the airplane stalls. (5) Apply full aft control wheel and

full rudder in the desired spin direction. This control configuration with the throttle closed should be held throughout the spin. The ailerons must remain neutral throughout the spin and recovery, since aileron application may alter the spin characteristics to the degree that the spin is broken prematurely and that recovery is delayed.

Spin Recovery

- Apply and maintain full rudder opposite to the direction of rotation.
- As the rudder hits the stop, rapidly move the control wheel full forward and be ready to relax the forward pressure when the spin rotation has stopped.
- As rotation stops, neutralize the rudder and smoothly recover from the dive. Normal recoveries may take up to 1½ turns when proper technique is used : improper technique can increase the turns to recover and the resulting altitude loss.

Further Advice on Spinning

Spin Entry

Application of full aft control wheel and full rudder before the airplane stalls is not recommended as it results in large changes in pitch attitude during entry and the first turn of the spin. (6)

The recommended procedure has been designed to minimise turns and altitude loss during recovery.

In all spin recoveries the control column should be moved full forward briskly. (7) This is vitally important because the steep spin attitude may inhibit pilots from moving the column forward positively.

The immediate effect of applying normal recovery controls may be an appreciable steepening of the nose down attitude and an increase in rate of spin rotation. It is essential to maintain full anti-spin rudder to continue to hold the control wheel full forward until the spin stops. The airplane will recover from any point in a spin in not more than one and one half additional turns after application of controls as recommended.

Mishandled Recovery

Improper application or delay in application of recovery controls can increase the number of turns to recover and the resulting altitude loss.

Delay in moving the control wheel forward may result in the aircraft suddenly entering a very fast, steep spin mode which could disorient a pilot. Recovery will be achieved by briskly moving the control wheel fully forward and holding it there while maintaining full recovery rudder. (8)

In certain cases the steep, fast rotation has developed into a spiral dive in which the rapid rotation continues, but indicated airspeed increases rapidly. It is important to recognize this condition. The aircraft is no longer

auto-rotating in a spin and the pilot must be ready to neutralize the rudder so as to ensure that the airspeed does not exceed 129 MPH (Va) with full rudder applied.

Recovery to Level Flight

In most cases spin recovery will occur as the control wheel reaches the fully forward position. The aircraft pitches nose down quickly when the elevator takes effect and, depending on the control column position, it may be necessary to move the column partially back almost immediately to avoid an unnecessarily steep nose down attitude, possible negative “g” forces and excessive loss of altitude.

Because the aircraft recovers from a spin in a steep nose down attitude, speed builds up quickly in the recovery. The rudder should be neutralized as soon as the spin stops. Delay in neutralizing the rudder may result in yaw and “fish-tailing.” If the rudder is not neutralized it would be possible to exceed the maximum manoeuvre speed (Va) of 129 MPH with the surface fully deflected.

Engine

Normally the engine will continue to run during a spin, sometimes very slowly. If the engine stops, take normal spin recovery action, during which the propeller will probably windmill and restart the engine. If it does not, set-up a glide of 83 MPH and restart using the starter motor.

Complement

- This Service Bulletin is to be kept with the aircraft paperwork at all times.
- Install the placard provided with this Service Bulletin on instrument panel in full view of the pilot. Note : Peel protective cover from face of Placard.
- Make appropriate log book entry of compliance with this Service Bulletin.

Material Required:

- One (1) each Placard, Piper Part Number 87369-44.

Availability of Parts:

- Placard enclosed.
- Additional copies of Service Bulletin 753, if required, are available from Customer Services, Piper Aircraft Corporation, Lock Haven, PA.

Effectivity Date:

This Service Bulletin is effective upon receipt.

Summary:

- This information is submitted to owner/operators of the above referenced aircraft to assist in insuring proper operation of the aircraft.

- Each pilot should be made aware of the importance of absolutely observing these procedures.

References

1. This document is reproduced in its original format dated December 15, 1982. All footnotes are inserted by Langley Flying School.
2. AFM meaning Aircraft (or Airplane) Flight Manual, or what is commonly referred to as the Pilot Operating Handbook.
3. Steep turns here being defined as turns in excess of 45° bank.
4. Note that solo spin training at Langley Flying School is prohibited.
5. Langley Flying School instructors typically enter normal spins from a level stalled condition.
6. Langley Flying School procedures are for the rudder to be first fully deflected prior to the stall, and for the stall to be effectively induced with aggressive but smooth full nose-up deflection on the control column—the sequence being “kick . . . pull.”
7. Langley Flying School procedures prescribe “smooth but aggressive” full-forward” movement of the control column—typically, the spin recovery becomes effective before full forward deflection is required. Note that in the event of an inadvertent spin with normal non-utility category loading, full and immediate forward movement of the control column will be required.
8. Again, forward movement should be smooth but aggressive, and the pilot must be prepared to input full deflection should recovery not be immediate—typically, however, recovery during spin training is soon as the control column begins the forward travel.