

Task XIII.D: Emergency Descent

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Lesson Overview

Objective

Reference

- Aircraft Flight Manual / Pilot's Operating Handbook
- Airplane Flying Handbook (FAA-H-8083-3B, page(s) 17-6)

Key Elements

1. Configuration
2. Airspeed and Load
3. Recovery

Elements

1. General
2. The Maneuver

Equipment

1. White board and markers
2. References
3. iPad

Instructor Actions

1. Discuss lesson objectives
2. Present Lecture
3. Ask and Answer Questions
4. Assign homework

Student Actions

1. Participate in discussion
2. Take notes
3. Ask and respond to questions

Schedule

1. Discuss Objectives
2. Review material
3. Development
4. Conclusion

Completion Standards

The student understands the situations which necessitate an emergency descent and can properly perform the maneuver with a smooth, controlled recovery.

Instructor Notes

Attention

This maneuver is a lot of fun to practice, partly because there is not a lot too it, but also because the airplane is put in a very nose low attitude and is descending very fast. You're dive bombing the ground.

Overview

- Review Objectives and Elements/Key ideas

What

An emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Why

The need for this maneuver may result from an uncontrollable fire, a sudden loss of cabin pressurization or any other situation demanding an immediate and rapid descent.

Lesson Details

The, fairly obvious, objective of the emergency descent is to descend as quickly as possible within the structural limits of the airplane, and under control. There are a number of situations that might necessitate an emergency descent : fire, smoke, loss of cabin pressure, or any other situation demanding a rapid descent and possible landing. The consequences of failing to identify a need for an emergency descent can be severe, particularly in the case of a fire or decompression where hypoxia can be a risk. Always follow the procedures outlined in the POH/AFM for the aircraft, if they are available.

Performing an Emergency Descent

Before Starting

1. First perform the pre-maneuver checklist
 - a. Fuel Pump - ON
 - b. Mixture - RICH
 - c. Gauges - GREEN
2. Ensure that the area is clear of traffic below, above, and at your altitude.
3. Ensure that the aircraft has sufficient altitude before starting the maneuver.
4. Announced intentions on CTAF

Procedure

1. Reduce power to idle
2. Extend the flaps and gear as required by the manufacturer
 - a. This provides maximum drag to make the descent as rapid as possible without excessive build up of speed
3. Nose down to maintain maximum allowable airspeed
 - a. This will be approximately a 12° pitch down, but may be adjusted based on the aircraft configuration. It may also depend upon flap used and whether the conditions are turbulent, but should never exceed Vne or Vfe if flaps are extended.
4. Begin a 90° left turn with a 45° bank
 - a. This acts as a clearing turn, and if on an airway helps exit the airway. The turn is made to the left because traffic passes on the right, The 45° bank puts a positive load on the aircraft countering the negative load from the descent.
5. Maintain airspeed until close to the desired altitude

Leveling Off

1. This is commonly the most difficult part of this maneuver, and the recovery should be slow and smooth.
2. Start the level off when 10% of the rate of descent from the desired altitude
 - a. Example: If descending at 1500fpm level off 150 feet above the desired altitude
3. Power will need to be increased back to cruise power
4. Once straight and level, return the airplane to a normal configuration
 - a. Bring flaps and gear back up, if deployed
5. Re-trim the aircraft, and re-lean the engine if needed
 - a. Recovery requires a transition between flight phases that can be dangerous if mishandled. Be sure to make a smooth recovery so as to not exceed the aircraft's critical load factor

limits.

Common Errors

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- The consequences of failing to identify reason for executing an emergency descent
- Improper use of the prescribed emergency checklist to verify accomplishment of procedures for initiating the emergency descent
- Improper use of clearing procedures for initiating the emergency descent
- Improper procedures for recovering from an emergency descent

Conclusion

An emergency descent is used in a situation where altitude must be lost quickly in order to make a landing as soon as possible. If possible, the manufacturer's procedures should be followed. The airplane is put into a configuration which will allow for the maximum descent rate. Recovery should be smooth and controlled as straight and level cruise flight is reestablished.

ACS Requirements

CFI PTS Standards

To determine that the applicant exhibits instructional knowledge of the elements related to emergency descents appropriate to the airplane being flown by

Exhibiting instructional knowledge of the elements related to an emergency descent by describing:

1. Situations that require an emergency descent.
 - a. Proper use of the prescribed emergency checklist to verify accomplishment of procedures before initiating and during the emergency descent.
 - b. Proper use of clearing procedures before initiating and during the emergency descent.
 - c. Procedures for recovering from an emergency descent.
 - d. Manufacturer's procedures.
2. Exhibits instructional knowledge of common errors related to an emergency descent by describing:
 - a. The consequences of failing to identify reason for executing an emergency descent.
 - b. Improper use of the prescribed emergency checklist to verify accomplishment of procedures for initiating the emergency descent.
 - c. Improper use of clearing procedures for initiating the emergency descent.
 - d. Improper procedures for recovering from an emergency descent.

3. Demonstrates and simultaneously explains emergency descents from an instructional standpoint.
4. Analyzes and corrects simulated common errors related to emergency descents.

Private Pilot ACS Skills Standards

1. Clear the area.
2. Establish and maintain the appropriate airspeed and configuration appropriate to the scenario specified by the evaluator and as covered in POH/AFM for the emergency descent.
3. Demonstrate orientation, division of attention and proper planning.
4. Use bank angle between 30° and 45° to maintain positive load factors during the descent.
5. Complete the appropriate checklist.

Commercial Pilot ACS Skills Standards

The same as the Private Pilot, except

1. Maintain appropriate airspeed +0/-10 knots, and level off at specified altitude, ±100 feet.