XIII.D. Emergency Descent

References: FAA-H-8083-3; POH/AFM

Objectives
The student should develop knowledge of the elements related to an emergency descent, when the descent is required, and the proper procedure when performing the maneuver. The student will have the ability to perform the maneuver as required in the PTS.

Key Elements
1. Configuration
2. Airspeed and Load
3. Recovery

Elements
1. General
2. The Maneuver

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

Equipment
1. White board and markers
2. References

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

SP’s Actions
1. Participate in discussion
2. Take notes
3. Ask and respond to questions

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

Attention
Interesting fact or attention grabbing story
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.

How:

1. General
   A. Objective
      i. To descend as rapidly as possible, within the structural limitations of the airplane
   B. Situations
      i. Fire, smoke, loss of cabin pressurization, any other situation demanding (medical, injury, etc.)
      ii. CE - The consequences of failing to identify reason for executing an emergency descent
          a. If a emergency descent is necessary and not executed the situation can become very dangerous
             • A fire can grow and spread
             • In the case of decompression, symptoms of hypoxia can begin to set it
   C. Follow the procedures outlined in the Emergency Procedures section of the POH
      i. None in the DA20 POH

2. The Maneuver
   A. Prior to the Maneuver
      i. Clear the Area visually
         a. CE - Improper use of clearing procedures for initiating the emergency descent
            • Clear the area (below too) and broadcast intentions to alert other aircraft
      ii. Announce intentions to alert aircraft in the area
      iii. Pre-Maneuver Checklist: Fuel Pump ON, Mixture RICH, Lights ON, Gauges GREEN
      iv. CE - Improper use of the prescribed emergency checklist to verify accomplishment of procedures for initiating the emergency descent
         a. If the airplane is not configured correctly, the rate of descent may be lacking and the airplane could be structurally damaged
   B. Procedure
      i. Reduce power to idle
      ii. Extend the flaps and gear as required by the manufacturer
         a. This provides maximum drag to make the descent as rapidly as possible, without excessive airspeed
iii. A radio call announcing descent intentions is appropriate to alert other traffic
iv. Put the nose down to maintain the maximum allowable airspeed based on the situation
   a. Nose down pitch is approximately 12°, but may be adjusted based on the configuration
   b. This speed may vary depending on flaps used and in turbulent conditions
      • Never exceed $V_{NE}$ or $V_{FE}$ and always maintain positive control of the airplane
v. Begin a 90° left turn with 45° of bank
   a. This turn acts as a clearing turn (below and to each side) and gets the airplane off the airway
   b. The turn is made to the left because faster traffic passes on the right (right of way rules)
   c. The 45° bank puts positive load on the aircraft (countering the negative load from the descent)
vi. Maintain the airspeed until close to the desired altitude
C. Leveling Off (This is the most difficult part)
i. The recovery should be a slow and smooth, and initiated at an altitude ensuring a safe recovery
   a. Level off when 10% of the rate of descent from the desired altitude
      • EX: If descending at 1500 fpm, level off 150’ above the desired altitude
ii. Power will need to be increased back to cruise power
iii. Once straight and level, return the airplane to a normal configuration (flaps, gear, etc. are retracted)
iv. Re-trim the aircraft and adjust/lean the mixture as necessary
v. CE - Improper procedures for recovering from an emergency descent
   a. Recovery requires a transition between flight phases that can be dangerous
      • Be sure to make a smooth recovery to avoid exceeding the airplane’s critical load factor

Common Errors:
• 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:
Brief review of the main points
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.

PTS Requirements:
To determine that the applicant exhibits instructional knowledge of the elements related to emergency descents appropriate to the airplane being flown by:
1. Exhibiting instructional knowledge of the elements related to an emergency descent by describing:
   a. Situations that require an emergency descent.
   b. Proper use of the prescribed emergency checklist to verify accomplishment of procedures before initiating and during the emergency descent.
   c. Proper use of clearing procedures before initiating and during the emergency descent.
   d. Procedures for recovering from an emergency descent.
   e. 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.