

Area of Operation **XII** - Task **E**

# Recovery from Unusual Flight Attitudes (Instrument)

## Content

1. Introduction
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### Key References:

- Airplane Flying Handbook
- Instrument Flying Handbook

# 1. Introduction

- **What:** An airplane attitude not normally required for flight
- **Why:** Without proper training on instrument interpretation and aircraft control, a pilot can quickly aggravate an abnormal flight attitude into a potentially fatal accident
- **About Unusual Attitudes:**
  - Not intentional, often unexpected → Reactions are **instinctive and often dangerous** (instead of intelligence/deliberate)
  - **Situations that lead to unusual attitude:**
    - Turbulence
    - Inattention or Distractions (e.g. cockpit duties)
    - Confusion and Spatial Disorientation (e.g. VFR into VMC)
    - Instrument failure
    - Careless crosscheck or errors in interpretation
  - **Goal:** recover to straight-and-level as quickly/safely as possible
  - **Trust your Instruments** and ignore your own perceptions



- ➡ **Standard (ACS):**
- Recognize and recovery, correct procedure and coordination

## 2. Recognizing Unusual Attitudes

**Identify:** Instrument movement/indication **other than those associated w/ the basic instrument flight** maneuvers

### Nose High ↑ (Climbing Turn)

- Attitude Indicator: **Nose high, a lot of blue**
- Airspeed Indicator: **Decreasing airspeed**
- Altimeter / VSI: **Increasing altitude** / Positive rate of climb
- Turn Coordinator: Usually indicate a bank



### Nose Low ↓ (Descending Turn)

- Attitude Indicator: **Nose low, a lot of brown**
- Airspeed Indicator: **Increasing airspeed**
- Altimeter / VSI: **Decreasing altitude** / Negative rate of climb
- Turn Coordinator: Usually indicate a bank



# 3. Recovery Procedure

**Identify:** Instrument movement/indication **other than those associated w/ the basic instrument flight** maneuvers

**Recovery:** must be **smooth and coordinated** → risk of **stall**, **spin**, **disorientation** and **overstress** the airframe (**Gs**) if careless or abrupt

## Nose High ↑ (Climbing Turn)

- Increase Power (as necessary) while **simultaneously...**
- lowering the nose (avoid stall) **and then** leveling the wings

### NOSE-HIGH ATTITUDE



### Indications

The first thing you should see is lots (and lots) of blue sky in the attitude indicator. The altimeter confirms that the airplane is climbing, and the vertical speed indicator shows a decreasing airspeed getting perilously close to stall.



### Recovery

Simultaneously add full power while leveling the wings and lowering the nose to the horizon.

## Nose Low ↓ (Descending Turn)

- First Power to idle, and then...
- Level the wings first, and then Smoothly bring nose up

These must be done in the proper sequence to avoid over-loading the wings

### NOSE-LOW ATTITUDE



### Indications

Does the attitude indicator show lots of brown? You're heading downward. The altimeter will be unwinding, and the vertical airspeed indicator shows the airplane is gaining airspeed.



### Recovery

Unlike the nose-high recovery, the nose-low recovery must be completed in separate consecutive steps.



1 Bring power to idle.



2 Level wings (trying to bring the nose up before you roll out of a descending turn may be impossible and you may overstress the airframe).



3 Smoothly recover from the dive.

## 4. Common Errors

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1. Failure to recognize an unusual flight attitude
2. Consequences of attempting to recover from an unusual flight attitude by “feel” rather than by instrument
3. Inappropriate control applications during recovery
4. Failure to recognize from instrument indications when the airplane is passing through a level flight attitude

# Questions?

