

# Engine Fire at Ground Start

- **Ignition** continue cranking

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## Engine Starts?

- **Throttle** 1800 RPM allow fuel in lines to combust
- **Mixture** idle shut off fuel source

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## Engine NOT Starts?

- **Ignition** continue cranking
- **Throttle** full
- **Mixture** idle
- **Fuel Shutoff Valve** aft out
- **Fuel Pump** off

# Short Field Takeoff

## Short Field Takeoff

- Designate obstacle clearance height
- Flaps 10°
- Check approach end clear

### Position

- Position for full length of runway
- Brakes apply
- Power full
- Check engine gauges

### Take Off

- Brakes release
- Accelerate to Vr 50 KIAS

### Clear Short Field

- Rotate
- Pitch down into ground effect, subtly
- Accelerate to Vx 62 KIAS

### Clear Obstacle

- Climb to obstacle clearance

### Normal Climb Speed

- Pitch down
- Accelerate to Vy 74 KIAS

### Normal Climb Configuration

- Flaps retract slowly

# Engine Fire at Takeoff

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## Stop on Ground

- **Throttle** idle
  - **Brakes** apply
  - **Flaps** retract
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## Shut Down Engine

- **Mixture** idle/cut-off
- **Ignition** off
- **Alternator & Battery Master** off

## Short Field Landing

- Designate point of intended landing

### Approach

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- Pattern normal approach to landing
- Decelerate to 61 KIAS add gust factor
- Touch down

### Touchdown

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- Nose lower assertively
- Flaps raise
- Braking heavy
- Elevator pull back force tail down
- Full stop

# Engine Fire in Flight

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## Prepare for Forced Landing

- Identify point of landing evaluate properly
  - **Navigate** towards point of landing
- 

## Attempt Engine Restart ('flow')

- **Mixture** aft idle
  - **Fuel Shutoff Valve** aft closed
  - **Auxiliary Fuel Pump** off verify
  - **Alternator & Battery Master** off
  - **Pitch** down for high airspeed > 100 KIAS
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## Time Permitting?

- **Checklist** use
  - **Communicate** declare emergency
- 

## Land

- **Land** forced

## Soft Field Takeoff

- Designate obstacle clearance height
- Flaps 10°
- Check approach end clear

No braking

Enter

- Elevator pull back fully
- Power full, smoothly
- Check engine gauges

Take Off

- Elevator relax but allow nose off ground
- Accelerate to Vr 50 KIAS

Clear Soft Field

- Rotate, then
- Pitch down into ground effect, subtly
- Accelerate to Vx 62 KIAS

Clear Obstacle

- Climb to obstacle clearance

Normal Climb Speed

- Pitch down
- Accelerate to Vy 74 KIAS

Normal Climb Configuration

- Flaps retract slowly

# Engine Failure after Takeoff

- Pitch 70 KIAS

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## Land

- <5 hft AGL? **Land** ahead
- <10 hft AGL? **Land** ahead or return
- *Else?* **Land** return

# Soft Field Landing

## Approach

- Normal approach

No braking

## Touchdown

- Land as long as necessary
- Power use to minimize sink
- Main gear down

## Deceleration and Exit

- Elevator nose down gently and lightly
- Exit runway

# Soft Field Landing



# Engine Failure in Flight

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## Prepare for Forced Landing

- **Pitch** up for  $V_g$  68 KIAS
  - Identify point of landing evaluate properly
  - **Navigate** towards point of landing
- 

## Attempt Engine Restart ('flow')

- **Fuel Selector** both verify
  - **Fuel Shutoff Valve** forward open verify
  - **Mixture** forward rich
  - **Throttle** forward open
  - **Auxiliary Fuel Pump** on
  - **Ignition** both verify
  - ¿*Propeller still stopped?* **Ignition** start
  - **Auxiliary Fuel Pump** off
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## Time Permitting?

- **Checklist** use
  - **Communicate** declare emergency
- 

## Land

- ¿*Engine still failed?* **Land** forced
- ¿*Engine restarted?* **Land** precautionary

## Go Around

- Throttle full
- Flaps retract 20°
- Climb positive rate

Reconfigure

- Flaps retract 10°
- Climb positive rate

Reconfigure

- Flaps retract 0°

# Electrical or Cabin Fire

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## Prepare for Forced Landing

- **Pitch up** roughly  $V_g$  attitude
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## Extinguish Fire

- **Alternator & Battery Master** off
  - ??? off
  - **Vents** close
  - **Fire Extinguisher** use
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## Prepare for Forced Landing

- **Pitch up** for  $V_g$  68 KIAS
  - **Identify point of landing** evaluate properly
  - **Navigate** towards point of landing
- 

## Time Permitting?

- **Checklist** use
- 

## Land

- **Land** forced

## Slow Flight

- Pre-maneuver

Elevator & trim to maintain altitude

## Slow Flight

### Entry

- Power reduce 1500 RPM
- Decelerate to Vfe10 110 KIAS
- Flaps lower 10°
- Decelerate to Vfe 85 KIAS
- Flaps lower 20°, then 30°
- Power increase in anticipation
- Decelerate to Vs + 10 50 KIAS

### Maintenance

- Power to maintain airspeed

### Recovery

- Power full
- Flaps retract 20°
- Accelerate

### Recovery

- Flaps retract 10°
- Accelerate

### Recovery

- Flaps retract 0°
- Accelerate to cruise

# Oil Pressure Low + Temperature High

Engine failure imminent presumed

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Time Permitting?

- **Checklist** use
  - **Communicate** declare emergency
- 

Engine Failure Imminent (presumed)

- **Land** forced

Oil Pressure Low + Temperature High

## Power-On Stall

- Pre-maneuver

Heading maintain

### Takeoff Configuration

Altitude maintain

- Power reduce
- Decelerate to Vr 55 KIAS

### Entry

No aileron only rudder

- Power full
- Pitch increase smoothly;  $\leq 30^\circ$
- Stall

### Recovery

- Elevator relax to break stall
- Accelerate to Vy 74 KIAS

## Power-On Stall

# Oil Pressure Low

Temperature Normal? Failed pressure sensor presumed, no emergency

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Time Permitting?

- **Checklist** use
- 

Land

- **Land** precautionary

# Power-Off Stall

- Pre-maneuver

Heading maintain

## Landing Configuration

Altitude maintain

- Power reduce for approach
- Flaps full, in steps
- Decelerate to approach speed 65 KIAS
- Power idle
- Pitch landing attitude lose 200 ft

## Entry

No aileron only rudder

- Pitch to hold altitude
- Stall

## Recovery

- Elevator relax to break stall
- Power full
- Rudder right anticipate left-turning
- Elevator pull to stop descent
- Check positive climb; flaps 20°
- Check positive climb; flaps 10°
- Check positive climb; flaps 0°
- Accelerate to Vy 74 KIAS

# Power-Off Stall



# Oil Temperature High

Pressure Normal? Engine overheating presumed

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## Cool Overheating Engine

- **Pitch** down
- **Throttle** minimum power

# Steep Turns

## Steep Turns

- Pre-maneuver

Altitude maintain  $\pm 1$  hft  
Airspeed maintain  $\pm 10$  KIAS  
Bank maintain  $\pm 5^\circ$

### Maneuver

- Airspeed  $\leq V_a$  e.g. 90 KIAS 2300 RPM
- Bank  $45^\circ$

# Electrical Discharge

Ammeter discharge  
Voltmeter low  
Annunciator low volts

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## Recover from Spurious Overcharge

Circuit Breaker ALT FLD?

- **Avionics Bus 1 & 2** off
- **Alternator & Battery Master** off
- **ALT FLD Circuit Breaker** push to reset
- **Alternator & Battery Master** on
- **Avionics Bus 1 & 2** on

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## Actual Discharge

¿Still discharging?

- **Alternator & Battery Master** off
- **Electrical Equipment Nonessential** off

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## Time Permitting?

- **Checklist** use
- **Communicate** declare emergency

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## Land

- **Land** precautionary

# Ground Reference Maneuvers

## Ground Reference Maneuvers

- Pre-maneuver

Altitude maintain  $\pm 1$  hft  
Airspeed maintain  $\pm 10$  KIAS

### Maneuver

- **Altitude** 6-10 hft AGL traffic pattern altitude
- **Airspeed** for traffic pattern e.g. 90 KIAS 2300 RPM
- Rectangular Course? enter L or R downwind
- S-Turns? enter perpendicular to reference line
- Turns Around a Point?

# Electrical Overcharge

*Ammeter full scale deflection*

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## Remove Overcharge Source

- **Alternator Master** off
- **Electrical Equipment Nonessential** off

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## Prepare for Precautionary Landing

- **Identify point of landing** evaluate properly
- **Navigate** towards point of landing

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## Time Permitting?

- **Checklist** use
- **Communicate** declare emergency

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## Land

- **Land** precautionary

## Pre-Maneuver

Prepare

- **Altitude** ≥ 15 hft AGL
- Clearing turns
- Enter as appropriate for maneuver

Define

- **Define** maneuver
- **Designate** altitude
- **Designate** reference point

Begin

- **Announce**