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**GROUND FIRES****Engine Fire During Start**

If an engine fire occurs during start, the following checklist should be accomplished:

**ENGINE FIRE DURING START**

F	STARTER .....	CONTINUE START
C	PRIMER .....	RELEASE
C	MIXTURE CONTROL (AFF. ENGINE) .....	ICO
F	BOOST PUMP .....	OFF
C&F	INSTRUMENTS (AFF. ENGINE) .....	MONITOR
<b>IF FIRE CONTINUES:</b>		
C	THROTTLE .....	CLOSED
C	STARTER .....	RELEASE
C	COWL FLAPS .....	CLOSED
F	ENGINE FIRE BOTTLE ...	SELECT AFF. ENGINE
F	FIRE BOTTLE T HANDLE .....	PULL
<b>IF FIRE CONTINUES:</b>		
C	AIRCRAFT .....	EVACUATE

**Landing Gear Fire**

In the event of a landing gear fire, accomplish the following items:

**LANDING GEAR FIRE**

1. TURN AIRCRAFT INTO WIND.
2. CALL TOWER FOR ASSISTANCE.
3. SHUTDOWN ENGINE ON SIDE OF AIRCRAFT NOT AFFECTED BY FIRE.
4. INCREASE POWER (MIN 2000 RPM) ON REMAINING ENGINE.
5. SHUT DOWN REMAINING ENGINE WHEN THE FIRE FIGHTING EQUIPMENT IS IN POSITION TO FIGHT THE FIRE

**POWERPLANT EMERGENCY PROCEDURES****Engine Fire or Failure – Takeoff or Initial Climb**

The following items must be accomplished upon first indication of an engine fire or failure during takeoff or initial climb:

**ENGINE FIRE OR FAILURE DURING TAKEOFF/ INITIAL CLIMB**

PF	MIXTURE CONTROLS .....	AUTO RICH
PF	PROPELLER CONTROLS .....	FULL FORWARD
PF	THROTTLES .....	48 IMP
PF	FLAPS .....	UP
PF	LANDING GEAR .....	UP
PF	AFFECTED ENGINE .....	IDENTIFY
PF	AFFECTED ENGINE .....	VERIFY
PF	AFFECTED ENGINE .....	FEATHER
PF	MIXTURE CONTROL (AFF. ENGINE) .....	ICO
<b>IF FIRE EXISTS:</b>		
F	COWL FLAPS .....	CLOSED
PNF	FIREWALL SHUTOFF (AFF. ENGINE) .....	OFF
PNF	ENGINE FIRE BOTTLE ...	SELECT AFF. ENGINE
PNF	FIRE BOTTLE T HANDLE .....	PULL

**CLEANUP ITEMS:**

PNF	IGNITION SWITCH (AFF. ENGINE) .....	OFF
PNF	GENERATOR (AFF. ENGINE) .....	OFF
PNF	BOOST PUMP (AFF. ENGINE) .....	OFF
PNF	COWL FLAPS (AFF. ENGINE) .....	CLOSED/ OFF
PNF	COWL FLAPS (OPERATIVE ENGINE) .	AS REQD
PNF	FUEL TANK SELECTOR (AFF. ENGINE) .....	OFF
PNF	FIREWALL SHUTOFF (AFF. ENGINE) .	CKD/OFF
C&F	FUEL BALANCE .....	MAINTAIN
C&F	CHT (OPERATIVE ENGINE) .....	MONITOR
C&F	OIL TEMP (OPERATIVE ENGINE) .....	MONITOR

**Engine Failure or Fire Notes**

The PF will announce the engine failure and initiate the memory items from the checklist. He will operate all the controls necessary to affect a positive engine shutdown. He will announce each action before it is taken. The PNF will confirm all actions that might affect power changes prior to having such actions executed.

The PF may direct the PNF to accomplish other required memory items. The PNF will monitor the checklist progress and situational awareness.

After the completion of the memory items, the PF will direct the PNF to accomplish the clean up items.

**Engine Failure or Fire Notes (cont'd.)**

If the engine malfunction occurs before reaching V<sub>1</sub> (84 Knots) the takeoff will normally be aborted by immediately closing the throttles on both engines and maintaining directional control. The PF shall be responsible for the decision to abort the takeoff.

If the engine malfunction occurs after V<sub>1</sub> maintain takeoff power until reaching 400 ft. AFE. After reaching 400 ft. AFE, set Maximum Continuous Power (42"/ 2550 RPM).

Use Maximum Continuous Power (42"/ 2550) during subsequent engine out climbs.

Trim the aircraft to maintain the dead engine wing between level and 5° above level.

Do not normally exceed 10° of bank especially in turbulent air conditions.

Use caution when making turns into the dead engine.

After reaching 400 ft. AFE:

- Adjust power to maintain 94 knots (Minimum) with not more than maximum continuous power.
- Monitor engine, flight, and vacuum instruments closely.
- Use cowl flaps as necessary to maintain the desired cylinder head temperature.
- Preserve electrical power when possible.

**SINGLE ENGINE APPROACH**

Do not lower the landing gear until at the FAF for a non-precision approach, and the aircraft is cleared to descend to the next lower altitude. Do not apply any flaps until landing is assured. For a single engine ILS approach, lower the landing gear after the glide slope comes alive, but before it is centered. Do not apply any flaps until landing is assured.

**SINGLE ENGINE GO-AROUND**

In the event of a single engine go-around, use the following checklist:

**SINGLE ENGINE GO-AROUND**

PNF PROPELLER CONTROL .....	FULL FORWARD
PF THROTTLE .....	48 IMP
PF AIRSPEED .....	V <sub>2</sub>
PNF FLAPS .....	UP
PNF LANDING GEAR .....	UP

**Single Engine Go-around Notes:**

Apply maximum power (42") and rotate to takeoff attitude. Use caution not to overboost operating engine (Manifold Pressure in excess of 48" is considered an overboost) unless ground contact becomes a factor. Use extreme caution during go-around when applying maximum power with one engine inoperative.

- Raise flaps slowly and maintain 84 KIAS.
- Retract gear when positive climb has been established.
- Reduce to Maximum Continuous power (42"/ 2550) at 400 ft. AFE.

**ENGINE RESTART/ UNFEATHERING – IN FLIGHT**

The following checklist will be used to restart an engine in flight:

**ENGINE RE-START/ UNFEATHERING IN FLIGHT**

PF AIRSPEED .....	MAX 130 KIAS
PNF FUEL TANK SELECTOR .....	MAIN TANK
PNF FIREWALL SHUTOFF .....	LOCKED/ ON
PNF PROPELLER CONTROL .....	FULL AFT
PNF THROTTLE .....	AS REQD
PNF IGNITION SWITCH (AFF. ENGINE) .....	BOTH
PNF PROPELLER FX BUTTON .....	OPERATE TO
	800 RPM
PNF MIXTURE .....	AUTO RICH
C&F OIL PRESSURE .....	MONITOR
C&F THROTTLE .....	18 IMP
C&F CHT .....	MONITOR
C&F COWL FLAPS .....	AS REQD
C&F OIL TEMP .....	MONITOR
F GENERATOR .....	ON

**CAUTION: UNLESS A GREATER EMERGENCY EXISTS, ATTEMPT TO OBTAIN NORMAL OPERATING TEMPERATURES AND PRESSURES BEFORE RESTORING CRUISE POWER.**

**Note:** Eighteen inches of Manifold Pressure should be used to warm up the engine to obtain zero thrust (approx.) and minimize rapid changes of engine temperature and pressure.

If a propeller overspeeds while unfeathering:

- Assure speed is below 130 KIAS.
- Move the Propeller Control full forward.
- Then move the Propeller Control slowly aft and forward and watch for an RPM response.
- If the above does not result in propeller governor control, accomplish the Propeller Overspeed Enroute checklist.

**PROPELLER OVERSPEED DURING TAKEOFF**

Accomplish the following items if an engine overspeeds during takeoff:

**PROPELLER OVERSPEED DURING TAKEOFF**

PNF THROTTLE (AFF. ENGINE) .....	REDUCE
PNF PROPELLER CONTROL (AFF. ENGINE)	REDUCE
PF AIRSPEED .....	$V_2$
PNF FLAPS .....	UP
PNF LANDING GEAR .....	UP
PNF RPM .....	CONTROL WITH FEATHER BUTTON
<b><i>IF PROPELLER UNCONTROLLABLE:</i></b>	
PNF AFFECTED ENGINE .....	FEATHER
PNF MIXTURE CONTROL (AFF. ENGINE) .....	ICO

***CLEANUP ITEMS:***

PNF IGNITION SWITCH (AFF. ENGINE) .....	OFF
PNF GENERATOR (AFF. ENGINE) .....	OFF
PNF BOOST PUMP (AFF. ENGINE) .....	OFF
PNF COWL FLAPS (AFF. ENGINE) .....	CLOSED/ OFF
PNF COWL FLAPS (OPERATIVE ENGINE) .	AS REQD
PNF FUEL TANK SELECTOR (AFF. ENGINE) .....	OFF
PNF FIREWALL SHUTOFF (AFF. ENGINE) .	CKD/OFF
PNF PROP CONTROL (AFF. ENGINE) .....	FULL AFT
PNF THROTTLE (AFF. ENGINE) .....	CLOSED
C&F FUEL BALANCE .....	MAINTAIN
C&F CHT (OPERATIVE ENGINE) .....	MONITOR
C&F OIL TEMP (OPERATIVE ENGINE) .....	MONITOR

**Propeller Overspeed Notes:**

If a propeller overspeeds during takeoff or initial climb:

- Immediately reduce the throttle on the affected engine.
- Immediately retard the Propeller Control to attain an RPM of less than 2700.
- If necessary, hold RPM below 2700 by alternately operating and releasing the feathering switch until sufficient altitude is attained to safely accomplish the checklist and return to the airport.

An overspeed greater than 3050 RPM requires an engine change.

**ENGINE SEIZURE - DELIBERATE**

In the event of a propeller overspeed, various aspects must be considered prior to determining the course of action to be followed.

Deliberate engine seizure should be used only when there is no other alternative. If an overspeed does not result in severe aircraft vibrations or fire, the immediate course of action should be:

- Slow down the aircraft and attempt to regain control of the propeller, and
- Fly the aircraft at as low an altitude as is practicable for the route.
- Keep all personnel away from the plane of propeller rotation and land as soon as possible.

These steps should reduce the RPM of the runaway propeller. In this scenario, the aircraft would be controllable and could be safely landed. If the immediate action had been an attempt to seize the engine, however, the following might result:

- The drag of a frozen propeller would be greater than the drag of a windmilling propeller and engine and therefore more power would be required to maintain flight.
- If the engine froze and the propeller uncoupled, rotation would continue without benefit of lubrication (this would be true regardless of the subsequent positioning of the oil shutoff valve).
- The friction heat that would result from the above would in all probability ignite a fire in any engine having a magnesium nose case and this section has no means of fire control.
- Eventually this heat would cause the propeller to become disengaged and, in so doing, various parts of the aircraft could be severely damaged.

If an overspeed results in severe aircraft vibration or a fire and all means to regain control of the propeller prove to no avail, seizure of the engine might be dictated. In the event that this proves necessary, proceed as follows:

- Propeller Control - Full aft.
- Reduce airspeed to minimum practicable with full flaps if altitude permits, to reduce windmilling speed.
- Firewall shutoff valve - OFF.
- Flaps up when engine seizes.

***NOTE:*** This procedure will reduce windmilling RPM and minimize inertia forces thereby lessening the possibility of failing the reduction gear or losing the propeller.

**FIRE OR SMOKE****Cabin, Cargo Compartment, or Cockpit Fire**

If a fire occurs in the cockpit or cabin, accomplish the following checklist:

**CABIN SMOKE OR FIRE**

PF LAND .....	AS SOON AS POSSIBLE
PNF COCKPIT/CABIN DOOR .....	CLOSED
PNF RAM AIR VALVE .....	AS REQD
F COCKPIT HEAT VALVE .....	COLD
F CABIN AIR TEMP CONTROL .....	COLD
PNF .....	ATTEMPT TO EXTINGUISH FIRE

**Cabin, Cargo Compartment, or Cockpit Fire Notes:**

Consider cutting off the circulation of fresh air before attempting to extinguish the fire.

- In case of a cabin fire, determine whether the smoke needs to be cleared before fire extinguishing procedures are started. In general fire fighting should be started first but the potential need for smoke removal, to prevent asphyxiation, must also be recognized.
- The decision to restrict airflow, however, should be tempered by consideration for the relative seriousness of:
  - The toxic and other noxious effects of smoke or extinguishing agent, and
  - The urgency of restricting airflow to control the fire. Ventilation should be maintained as long as possible and restored as soon as possible.

**ELECTRICAL OR RADIO FIRE**

If an electrical fire occurs, proceed to the nearest landing area and accomplish the following checklist as time permits:

**ELECTRICAL SMOKE OR FIRE**

PF LAND .....	AS SOON AS POSSIBLE
PNF GENERATOR SWITCHES .....	OFF
PNF BATTERY SWITCH .....	OFF

**AFTER FIRE IS OUT**

PNF ELECTRICAL SWITCHES .....	OFF
PNF AVIONICS MASTER .....	OFF
PNF BATTERY SWITCH .....	BATTERY
PNF L GENERATOR SWITCH .....	ON
PNF R GENERATOR SWITCH .....	ON
PNF ELEC. SWITCHES (ONE AT A TIME) .....	ON
PNF AVIONICS MASTER .....	ON

**Electrical or Radio Fire Notes:**

Do not use liquids to extinguish an electrical fire until power has been removed.

After the fire is out attempt to recover items by restoring power slowly and methodically.

If the fire originated in the radio area, pull the radio circuit breakers before placing the Avionics Master Switch on. Then restore radios as necessary by resetting the appropriate circuit breakers.

**HEATER FIRE**

If a heater fire occurs, accomplish the following items:

**HEATER FIRE**

F MAIN HEATER SWITCH .....	OFF
PNF RAM AIR VALVE .....	CLOSE
PNF CO <sub>2</sub> .....	DISCHARGE

**SMOKE EVACUATION - COCKPIT OR CABIN**

After a fire has been extinguished, the following checklist may be used to evacuate the remaining smoke from the aircraft:

**SMOKE EVACUATION**

F RAM AIR VALVE .....	CLOSED
F COCKPIT HEAT VALVE .....	COLD
F CABIN AIR TEMP CONTROL .....	COLD
F AFT EMERGENCY EXIT WINDOW .....	AS REQD
F CABIN TO COCKPIT DOOR .....	AS REQD
F F/O SLIDING WINDOW .....	OPEN

**EMERGENCY DESCENT**

The following checklist should be accomplished for any situation that requires a maximum performance/ emergency descent:

**EMERGENCY DESCENT**

PF THROTTLES .....	CLOSED
PF AIRSPEED .....	AS REQD
PNF ATC .....	NOTIFY
PNF TRANSPONDER .....	7700
PF LANDING GEAR .....	AS REQD
PF FLAPS .....	AS REQD

**Emergency Descent Notes:**

There are two methods of accomplishing a maximum performance/ emergency descent: high speed and low speed. The method used will depend upon the circumstances that dictated the need for such a descent.

**High Speed Emergency Descent**

Landing Gear ..... UP  
 Flaps ..... UP  
 Airspeed ..... NTE 190 KIAS

The high speed/ minimum drag method of descent should normally be used for the following reasons:

- No deceleration period is necessary.
- If an engine fire is in an area which has no CO<sub>2</sub> protection, the higher airspeed will result in better engine cooling airflow for blowing out the fire and for cooling engine surfaces. In case of fire, landing gear and wing flap extension should be delayed as long as possible before landing.

**Low Speed Emergency Descent**

Landing Gear ..... DOWN  
 Flaps ..... FULL  
 Airspeed ..... NTE 97 KIAS

The low speed/ maximum drag method of descent should be used when circumstances require it. The following examples would suggest it as a safer course of action:

- Engine failure, propeller overspeeding, or propeller cannot be feathered.
- When airplane structural damage has occurred.
- When descent is made in turbulent air.

**FUEL PRESSURE FAILURE**

**LOSS OF FUEL PRESSURE WITH ACCOMPANYING ENGINE MALFUNCTION**

Accomplish the following items:

- Turn on electric boost pump.
- Switch fuel selector valve to tank containing fuel.

**LOSS OF FUEL PRESSURE WITH NORMAL ENGINE OPERATION**

Accompanied by fuel pressure warning light ON. Accomplish the following items:

- Turn boost pump on momentarily.
- If there still is no fuel pressure, turn the boost pump off and shut down the engine immediately.

**CAUTION**

*When fuel pressure is lost and the engine continues to operate normally, a broken pressure gauge line is indicated. This represents a potential fire hazard. Shutdown the engine and turn the fuel off.*

**HYDRAULIC SYSTEM FAILURE**

**LOSS OF HYDRAULIC PRESSURE WITHOUT LOSS OF FLUID**

**HYDRAULIC PRESSURE/ FLUID LOSS**

PNF GEAR/FLAP HANDLES ..... NEUTRAL  
 F COWL FLAPS ..... OFF  
 CONTINUED IN POM

Use the Emergency hydraulic hand pump to supply pressure to operate:

- Landing gear,
- Wing flaps,
- Cowl flaps,
- Brakes, and
- To pump up accumulator pressure.

**EMERGENCY LANDING GEAR OPERATION (LOSS OF FLUID AND PRESSURE)**

The Landing Gear may be lowered without fluid pressure by use of the following Free Fall Procedure:

- Landing Gear Control Handle - DOWN.
- Dive airplane, if necessary, and follow with a pull-up.
- Landing Gear Control Handle - NEUTRAL.

**LANDING GEAR LATCH FAILURE**

If the green Landing Gear light does not come on and the Landing Gear Latch will not engage, repeat the above procedure and/or accomplish the following:

- Landing Gear Control Handle – DOWN.
- Use the Emergency Hand Pump to apply maximum pressure on the landing gear to engage latches.
- Return Landing Gear Handle to NEUTRAL.
- Visually check that landing gear is fully down.
- Make a normal landing regardless of red warning light indication.
- Do not taxi after landing until landing gear pins have been installed. After the landing gear pins have been inserted, taxiing may be continued with caution.

**CAUTION**

*When braking with the gear unlatched, landing gear pressure will increase. Use caution when applying brakes to prevent the landing gear pressure from exceeding 1500 psi.*

**Landing Gear Latch Failure Notes:**

The Star Valve should remain CLOSED at all times.

In case of complete loss of hydraulic fluid, wing flaps and brakes are inoperative.

A partial hydraulic line failure will usually allow the landing gear or flaps to be lowered under pressure. When control handles are returned to NEUTRAL, the Landing Gear Hydraulic Pressure Gauge will drop to zero. An internal leak with no loss of fluid from the system will react in the same manner.

A hydraulic line failure will result in the loss of hydraulic fluid down to the emergency fluid level.

**EMERGENCY WING FLAP OPERATION (WITH FLUID AVAILABLE FOR THE EMERGENCY HAND PUMP.)**

Accomplish the following items:

- Star Valve - CLOSED
- Flap Handle - DOWN
- Use Emergency Hand Pump to lower flaps to the desired setting.
- Return Flap Handle to NEUTRAL.

*Note: Consider minimizing the use of the Emergency Hand Pump for flap extension in order to preserve the remaining fluid in the reservoir for brake operation after landing.*

If flaps will not go down do not make repeated attempts to lower them because of the probability of a leak in the flap down line.

**EMERGENCY USE OF BRAKES (WITH FLUID AVAILABLE FOR THE EMERGENCY HAND PUMP)**

If emergency braking is required, use the following procedure:

**EMERGENCY BRAKING**

(HYDRAULIC PRESSURE LESS THAN 675 psi)

F	LANDING GEAR HANDLE .....	NEUTRAL
F	FLAP HANDLE .....	NEUTRAL
C	BRAKE PEDALS .....	DEPRESS
F	HAND PUMP .....	ACTUATE

**Emergency Braking Notes:**

The Star Valve must remain CLOSED.

Do not operate brakes by alternately applying and releasing the brake pedals. Each time the pedals are released all built up pressure is lost, requiring several additional strokes of Emergency Hand Pump to restore pressure.

Before landing depress brake pedals and operate hand pump until a slight pressure is felt against the pedals. This will indicate that brakes will be operable after landing.

Do not taxi after landing unless necessary to clear runway while depending on the Emergency Hand Pump.

**EMERGENCY EVACUATION PROCEDURES**

**PASSENGER EVACUATION**

If an emergency evacuation is required, accomplish the following checklist:

**EVACUATION**

F THROTTLES .....	CLOSED
F MIXTURE CONTROLS .....	ICO
F IGNITION SWITCHES .....	OFF
F IGNITION MASTER .....	OFF
F BOOST PUMPS .....	OFF
F FUEL TANK SELECTORS .....	OFF
F FIREWALL SHUTOFFS .....	OFF
F BATTERY SWITCH .....	OFF
C&F AIRCRAFT .....	EVACUATE

The purpose of an aircraft evacuation during an emergency is to remove all passengers and crewmembers safely from the aircraft in the minimum time.

In an emergency or anticipated emergency resulting in the need for a rapid and orderly evacuation of passengers, crewmembers must give forceful instructions as the situation demands ascertaining that these instructions are clearly understood.

The following prescribed crewmember duties are presented as a guide to assist each crewmember in coordinating individual duties.

Various types of emergencies and good judgment may require deviations from these duties in the interest of safety.

**Captain's Duties**

- Declare an emergency - notify ATC.
- Identify the flight - give position and nature of emergency and assistance needed.
- Advise plan of action and other information that may expedite subsequent aid to rescue operations.
- Consider delaying landing until ground emergency crews are available.

**First Officer's Duties**

- Secure all loose equipment, heavy articles and baggage. Place all loose cabin articles in the lavatory.
- Assist in determining and correcting cause of emergency as directed by the Captain.
- Assist in providing passengers comfort as required.
- Any other duties as requested by the Captain.

**EMERGENCY EXITS AND USE**

**Captain's Duties**

- Complete the Emergency Evacuation Checklist and secure the cockpit.
- Direct the evacuation of the aircraft and arrange for comfort of passengers.

**First Officer's Duties**

- Leave aircraft through the front cargo door with the fire axe.
- Proceed to main cabin door if available for evacuation and assist passengers to the ground from this or other exits being used.
- If the airplane is in a nose down attitude, assist passengers through front cargo door.
- Assist Captain in arranging passenger comfort after completing evacuation.

**EMERGENCY EQUIPMENT**

An 18 lb. Dry Chemical hand fire extinguisher is provided at the buffet.

A fire axe is located on the aft side of the bulkhead behind the Captain's seat.

A First Aid Kit is located in the upper buffet compartment.

————— END OF FTM —————