

C.A.A. APPROVED  
SUPER DC-3 AIRPLANE FLIGHT MANUAL  
EMERGENCY OPERATING PROCEDURES

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**2.1. ENGINE FAILURE ON TAKE-OFF.**

**2.1.1 ENGINE FAILURE BEFORE REACHING SAFE SINGLE-ENGINE AIRSPEED ON THE GROUND.**

1. Cut Both Throttles
2. Firewall shut-off valve controls – Pull “CLOSED”.
3. Mixture controls – “IDLE CUT-OFF”.
4. Ignition, Generator, and Battery Switches – “OFF”.
5. Fuel tank selector valve controls – “OFF”.
6. Apply Brakes.

**2.1.2. ENGINE FAILURE AFTER REACHING SAFE SINGLE-ENGINE SPEED.** – If an engine fails after reaching the safe single-engine airspeed, proceed as follows:

1. Maintain take-off climb speed V<sub>2</sub>, as shown in the Performance Data section of the AFM.
2. Feather propeller on inoperative engine when auto-feather is not used.
3. Adjust power controls of the remaining engine to ensure safe single-engine performance.
4. Maintain the cowl flaps on the operating engine in the climb position. Close cowl flaps on feathered engine.
5. Retrim the airplane as required.
6. If a subsequent attempt is made to start the engine, follow the procedure in paragraph 2.2.2, following.

**2.2. ENGINE ISOLATION.**

**2.2.1. PROPELLER FEATHERING PROCEDURE** – If it becomes necessary to shut an engine down in flight, feather the propeller as follows. The feathering procedures are grouped into Phases, the individual steps of which may be performed in a sequence suitable to the operator. All operations in Phase I, however, must be accomplished prior to any operations in Phase II, etc.

**PHASE I.** Mixture Control – “IDLE CUT-OFF”.  
Feathering Button – push IN.

**Note:**

If there is any evidence of fluid supply line failure ahead of the firewall or of fire in the nacelle area, pull up the firewall shut-off valve handle to shut off the oil, fuel, and hydraulic fluid to that engine at the firewall.

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SUPER DC-3 AIRPLANE FLIGHT MANUAL  
**EMERGENCY OPERATING PROCEDURES**

---

**PHASE II.** Oil Cooler Control – “CLOSED”, then “OFF”.  
Cowl Flap Control – “CLOSED”, then “OFF”.  
Fuel Booster Pump – “OFF”.  
Generator Switch – “OFF”.  
Ignition switch – “OFF”.  
Throttle – “CLOSED”  
Propeller RPM Control – “DECREASE RPM”  
Fuel Tank Selector Valve Control – “OFF”.  
Gear and Flaps – CHECK.

**2.2.2. PROPELLER UNFEATHERING PROCEDURE.** – If an attempt is made to start an inoperative engine in flight (and the engine was not shut down because of fire), proceed as follows:

**PHASE I.** Reduce airspeed to 138 Knots (or Less)  
Firewall Shut-off Valve Control – PUSH DOWN.  
Fuel Tank Selector Valve Control – AS DESIRED.  
Carburetor Air Control – “COLD”.  
Throttle – “CLOSED”  
Propeller RPM Control – “DECREASE RPM”.  
Ignition Switch – “BOTH”.  
Fuel Booster Pump Switch – “ON”.  
Oil Cooler Control – “AUTO”.  
Cowl Flap Control – “CLOSE”.

**PHASE II.** Propeller Feathering Button – push IN until propeller windmills at 600 to 800 RPM; then pull button OUT.  
Mixture Control – “AUTO RICH”.

**PHASE III.** Warm the engine up gradually to ensure complete oil circulation, then increase power to desired settings.

C.A.A. APPROVED  
SUPER DC-3 AIRPLANE FLIGHT MANUAL  
EMERGENCY OPERATING PROCEDURES

---

## 2.3 FIRE CONTROL

**2.3.1 ENGINE SECTION FIRE** – The engine section is divided into two zones: the power section, forward of the inner ring, and the accessory section, aft of the inner ring and forward of the firewall. Both zones are equipped with the fire detectors, but only the accessory section is protected by CO<sub>2</sub>. If an engine section fire occurs in flight, immediately perform the following operations on the affected engine. These are grouped into phases, the individual steps of which may be performed in any suitable sequence. All operations in Phase I, however must be accomplished prior to any operations in Phase II, etc.

**PHASE I:** Propeller – feather.  
Mixture control – “IDLE CUT-OFF.”  
Firewall shut-off valve control – PULL UP. CO<sub>2</sub> selector control – select area for discharge.  
CO<sub>2</sub> discharge handle – PULL (LH handle—straight pull; RH handle – push button on handle, then pull. Push button on RH handle provides a different kind of action to release to reduce possibility of pilot discharging both CO<sub>2</sub> charges in rapid sequence inadvertently).  
Cowl flaps – full “OPEN,” then “OFF.”

**PHASE II:** Booster pumps – OFF  
Generator – OFF  
Ignition – OFF  
Throttle – CLOSED  
Propeller rpm – “DECREASE RPM.”  
Fuel tank selector valve control – “OFF.”

**PHASE III:** Cowl flaps (after fire is out)  
“CLOSED,” then “OFF.”  
Oil cooler doors – “CLOSED,” then “OFF.”  
Carburetor air control – “COLD.”  
Vacuum selector control – “CAPT. INST. LIVE ENGINE.”

**DO NOT RESTART ENGINE IN WHICH A FIRE HAS OCCURRED.  
LAND AS QUICKLY AS PRACTICABLE.**

**Note:** Do not extend the landing gear or flaps until the last possible moment before landing to prevent extensive fire damage to the landing gear system or flaps. If a second fire occurs in the same area, or the first fire is not extinguished with the first discharge of CO<sub>2</sub>, pull UP the second discharge handle. However, do not release the second CO<sub>2</sub> discharge until the first discharge has proved ineffective to avoid wasting CO<sub>2</sub>. See paragraph 2.4. for emergency descent procedures.

C.A.A. APPROVED  
SUPER DC-3 AIRPLANE FLIGHT MANUAL  
EMERGENCY OPERATING PROCEDURES

---

**2.3.2. FUSELAGE FIRE.** – In the event of smoke or fire in the cockpit, cabin, or heater compartment, perform the following steps immediately before taking any fire control action. After these preliminary steps have been accomplished, subsequent operations will depend on the various types of fire, as detailed in the applicable paragraphs immediately following.

**PHASE I.**

1. Combustion heater – OFF
2. Ventilating air check valve control – “OPEN”
3. Cockpit and windshield temperature control – “COLD”
4. Cabin temperature control – “COLD.”

**PHASE II.**

1. Fuel booster pumps – OFF
2. Alcohol de-icer system – OFF
3. Passenger oxygen system – OFF

**2.3.3. HEATER COMPARTMENT FIRE.** – If a fire occurs in the heater or the heater compartment, proceed as follows after completing the preliminary steps in paragraph 2.3.2.

1. Start descent to lowest safe altitude.
2. Fire extinguisher selector control – “HEATER COMPT.”
3. CO<sub>2</sub> discharge handle – pull UP (LH handle – straight pull; RH handle-push button on handle, then pull. (Push button on RH handle provides a different kind of action to release to reduce possibility of pilot discharging both CO<sub>2</sub> charges in rapid sequence inadvertently).
4. Land as soon as practicable.

**Note:** If a second discharge of CO<sub>2</sub> is required, do not release the CO<sub>2</sub> until three minutes after the first discharge.

C.A.A. APPROVED  
SUPER DC-3 AIRPLANE FLIGHT MANUAL  
EMERGENCY OPERATING PROCEDURES

---

**2.3.4. ELECTRICAL SYSTEM FIRE.** – If smoke or fire is definitely determined as being of electrical origin, and the source is found, proceed as follows – after performing the preliminary steps in paragraph 2.3.2 preceding.

1. Battery and generator switches – “OFF.”
2. Use hand fire extinguishers to combat fire.

WARNING

ALTHOUGH NOT TOXIC HALON PRODUCES AN ATMOSPHERE FREE OF OXYGEN THAT WILL NOT SUPPORT LIFE – USE OF ONBOARD OXYGEN OR OPENING A WINDOW FOR VENTILATION IS REQUIRED FOR THE FLIGHT CREW.

3. Make certain the circuit breaker for the involved electrical circuit is tripped before restoring power.

**If the source of the electrical fire is not determined, proceed as follows:**

1. All circuit breakers (except those bordered with red) – “TRIPPED.”
2. Generators and field circuit breakers (one circuit breaker at a time) – “SET.”
3. Battery switch – “ON.”
4. Inverter switch – “ON.”
5. Other circuit breakers (one at a time) – “SET.”
6. When the source of fire or smoke has been determined, leave that circuit inoperative and restore power to the remaining circuits.

Note:

If the involved circuit cannot be determined, trip circuit breakers except those with red borders, and land as soon as practicable.

C.A.A. APPROVED  
SUPER DC-3 AIRPLANE FLIGHT MANUAL  
**EMERGENCY OPERATING PROCEDURES**

---

**2.3.5. SMOKE EVACUATION.** In the event of heavy smoke concentration in the COCKPIT, set the heating controls serving the affected area to “COLD” or “OFF;” “OPEN” the ventilating air check valve and perform the following steps immediately:

1. Start descent to lowest safe altitude.
2. Keep door between cockpit and cabin closed.
3. Keep cockpit side windows closed.
4. Open forward cargo door.

**In the event of heavy smoke concentration in the FORWARD END OF THE CABIN, perform the following steps immediately:**

1. Start descent to lowest safe altitude.
2. Open door between cockpit and cabin.
3. Keep cockpit side windows closed.
4. Open forward cargo door.

**In the event of heavy smoke concentrations in the AFT END OF THE CABIN, perform the following steps immediately:**

1. Start descent to lowest safe altitude.
2. Keep door between cockpit and cabin closed.
3. Keep cockpit side windows closed.
4. Keep forward cargo door closed.
5. Open aft cargo compartment emergency ventilator.

**In the event of heavy smoke concentrations in the AFT CARGO COMPARTMENT, perform the following steps immediately:**

1. Notify pilot to start descent immediately.
2. Keep door between cockpit and cabin closed.
3. Keep forward cargo door closed.
4. Keep emergency ventilator in aft cargo compartment closed.
5. Find source of smoke and use hand fire equipment.
6. Open emergency ventilator ONLY AFTER FIRE IS OUT.

C.A.A. APPROVED  
SUPER DC-3 AIRPLANE FLIGHT MANUAL  
EMERGENCY OPERATING PROCEDURES

---

**2.3.6 VENTILATION SYSTEM SMOKE.** – If smoke is evidenced in the ventilating system by discharging from the ventilating outlets, proceed as follows – after performing the preliminary steps in **paragraph 2.3.2.**

1. Descend to lowest safe altitude.
2. Ventilating air check valve control – “OPEN.”
3. Cabin temperature control – “COLD.”
4. Cockpit and windshield temperature controls – “COLD.”
5. Forward cargo door – OPEN.
6. Door between cockpit and cabin – OPEN.
7. Emergency ventilator – “OPEN.”

**2.3.7 MISCELLANEOUS FIRE EQUIPMENT.** – Hand fire extinguishers are located in the cabin and cockpit to be used on localized fires at the crew’s discretion. Operating instructions for each extinguisher are attached to each extinguisher. In the event of a localized fire in the cabin or cockpit, the following steps are to be taken immediately:

1. Start descent to the lowest safe altitude
2. Fight the fire with a portable fire extinguisher or any other non-inflammable liquid available.
3. If fire or smoke is severe, follow the smoke evacuation and/or emergency descent procedure.

**2.4. EMERGENCY DESCENT PROCEDURE.** - When an emergency demands a descent from altitude at the highest possible speed, use the following procedure:

1. Descend at a maximum of 250 mph TIAS, (217 KIAS) gear and flaps “UP.”
2. If this procedure cannot be used, descend as rapidly as possible, observing flap and gear down speed restrictions.

**Note:** Consider a turning descent to minimize negative “G” loading and afford better forward visibility for maintaining traffic watch and locating suitable emergency landing fields.

C.A.A. APPROVED  
SUPER DC-3 AIRPLANE FLIGHT MANUAL  
**EMERGENCY OPERATING PROCEDURES**

---

**2.5. TWO-ENGINE GO-AROUND.** – A normal go-around with both engines operating can be performed as follows:

1. Apply throttle and rpm as required to the maximum allowable limits.
2. A climb-out attitude should be attained smoothly.
3. Unlock landing gear control safety latch lever.
4. Raise landing gear.
5. Pull flaps full “UP.” Increase the attitude of the airplane sufficiently to ensure no loss of altitude.

**Note:** *Flaps and gear may be raised simultaneously.*

6. Allow airspeed to increase slowly to 130 mph TIAS. (113 KIAS)
7. Set cowl flaps to maintain cylinder head temperatures within limits.

**2.6. SINGLE-ENGINE GO-AROUND.** -- A single-engine go-around in this airplane can be accomplished by observing the same procedures as those for two-engine go-around. For single engine control of the airplane in flight, refer to paragraph 2.7. following.

**2.7. SINGLE-ENGINE APPROACH.** – A single-engine approach can be performed as follows:

1. Maintain airspeed 10 mph (8 knots) higher during a single-engine approach than during a normal approach.
2. Do not lower more than half flaps until it is certain the throttle can be cut and a safe landing can be made.
3. The use of ailerons to bank the airplane towards the operating engine will reduce rudder angle and forces.

**2.8. MALFUNCTIONING HEATER.**

If the combustion heater will not furnish heat in flight, perform the following steps to attempt to bring it into operation:

1. Check for adequate fuel supply in the right front center wing tank.
2. Check the heater and ground blower circuit breakers to make certain they are all set.
3. Check to see if the heater-inoperative warning light is on. If it is, check to make certain the cabin air check valve control is in the “OPEN” position. If it is, the heater drop-out switch has tripped, causing the heater main fuse to blow; no further operation of the heater is possible until the condition causing the switch to trip has been determined and corrected and the fuse replaced by the ground crew.

C.A.A. APPROVED  
SUPER DC-3 AIRPLANE FLIGHT MANUAL  
EMERGENCY OPERATING PROCEDURES

---

**2.9. HYDRAULIC SYSTEM FAILURE.**

The following procedures can be used to operate the hydraulic system units in the event of main system failure. Failure of the normal hydraulic system will usually be indicated by the loss of both system pressure and of fluid in the sight gage on the reservoir (the hydraulic fluid reserve of 3.2 quarts does not show on the sight gage). In the event of system failure, reduce airspeed, place the controls of all hydraulically operated units to the "OFF" or "NEUTRAL" positions, and proceed as follows:

1. To lower the landing gear, reduce airspeed below 166 mph TIAS (144 knots), place the landing gear control lever down, and operate the hydraulic hand pump to extend and lock the gear. If the green landing gear lights do not come on, indicating the gear is down and locked, the gear can then be snapped down and locked by applying 1.4 to 1.6 "G" acceleration to the airplane (this is equivalent to the force resulting from a normal 30-degree turn).
2. To lower the wing flaps, reduce airspeed below 125 mph TIAS (108 knots), place the wing flap control "DOWN" and operate the hydraulic hand pump. It will require approximately 11 cycles of the hand pump to fully extend the wing flaps.
3. To operate the brakes, make a normal landing and operate the hydraulic hand pump for the required braking action. Avoid pumping the brake pedals, as pressure will be lost with each pump.

**2.10. AIR BRAKE OPERATION.** – If no hydraulic pressure is available to the brakes, stop the airplane with the air brake system. Apply the brakes slowly and intermittently after ground speed has been reduced by an extended roll, gradually increasing the braking power rather than applying it suddenly.

**2.11. USE OF FUEL BOOSTER PUMPS.** - It is recommended that the fuel booster pumps be operated under the following conditions:

1. For engine start.
2. For take-off at any time the ground temperature is above 100 degrees F.
3. For take-offs above 2500 feet pressure altitude.
4. During climb after reaching 10,000 feet (if take-off was made with the booster pumps on, leave them on throughout climb to cruising altitude).
5. When selecting a new fuel supply.
6. At any time that fuel pressure falls below 17 PSI or fluctuates.