

# Emergency Procedures

## Section III

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**NOTE:**

All airspeeds quoted in this section are indicated airspeeds (IAS) and assume zero instrument error. Each aircraft should be calibrated to determine its specific error for various configurations. A Pacer method is suggested, flying against a "known" aircraft.

This section is also written for the RG configuration *Express*. If you have an FG ignore the gear position suggestions.

## EMERGENCY AIRSPEEDS

(Best airspeeds will vary based on your airframe construction- verify and adjust as required.)

ITEM	CONDITION
Emer Descent	153 kts
Best Glide	90 kts (103 mph)
Ldng Appr (w/o Pwr)	80 kts (92 mph)

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**NOTE**

The following check-lists are presented to capture in a compact format those pilot tasks requiring rapid action. These check-lists should be kept handy for ready access by the pilot, and he should familiarize him/her self with them before flying the aircraft. Knowledge of the switch, control, gauge, etc. location quickly, even blindfolded, is highly desirable. "Cockpit time" prior to ever flying or after an absence is time prudently spent. Where more time would likely be available, rationale will be added and alternative choices offered. It must be remembered however that each situation will be unique in some manner and must be treated as such.



## ENGINE FAILURE

### Take-off Ground Roll/Low Altitude (<700'AGL)

Maintain control of the aircraft. If runway permits, land and attempt stop on runway. If at low altitudes (less than approximately 700 ft. AGL, pick the most suitable site within  $\pm 30^\circ$  off the nose and set up the approach. If time permits, attempt engine start.

ITEM	CONDITION
Establish	90 kts
Declare	EMERGENCY
Check Fuel Boost Pump	ON
Mixture	RICH
Magneto, Cycle, return to	BOTH
Flaps (when on final)	FULL
Gear up or Down as appropriate for terrain (If RG)	

### In Flight

Establish 90 kt glide. Climb to reduce speed if practical, pick landing site. Attempt AIR START.

ITEM	CONDITION
Check main tank for fuel	Select Tank If Req'd
Fuel Boost pump	ON Emergencies
Mixture	RICH
Cycle mags & return to	BOTH
Engage starter and attempt engine start	
Declare	EMERGENCY
Give position on freq, if none, on	121.5
Set transponder (if available) to	7700

**NOTE**

If power is restored and there is any doubt as to the cause of the engine stoppage, land at the nearest airport and determine the cause.

## ROUGH RUNNING ENGINE

ITEM	CONDITION
Adjust Mixture	<b>RICH</b>

If no improvement carefully lean for improvement as follows:

ITEM	CONDITION
Pwr setting to approx	<b>2100 rpm (see Eng Manual)</b>
Mags, Sw to LT., BOTH, RT, then to	<b>BEST</b>
Readjust mixture for	<b>best operation</b>

**NOTE**

If power is restored and there is any doubt as to the cause of the engine roughness, land at the nearest airport and determine the cause.

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## ENGINE FIRE

### In FLIGHT

Determine if fire is electrical (acrid smell).

ITEM	CONDITION
Avionics Master	<b>OFF</b>
Master Switch	<b>OFF</b>
All Radios, lights, etc.	<b>OFF</b>

If fire/smell clears, turn master switch ON then each item of equipment one at a time, waiting long enough to isolate cause. If no smell, assume an unknown source and;

Land as soon as possible, find and correct cause.

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If fire continues;

ITEM	CONDITION
Throttle	IDLE
Mixture	CUT-OFF
Fuel Shut-off Valve	OFF
Fuel Boost Pump	OFF
Transponder	7700
Radio	"EMERGENCY & Location" (Use active frequency or 121.5)

Land immediately and exit the aircraft.

## On ground (engine start or taxi)

ITEM	CONDITION
Throttle to	IDLE
Mixture	CUT-OFF
Radio, (Twr, Unicom, etc.)	"EMERGENCY" & "Position"
Master Switch	OFF

Continue cranking if during start to pull fire back into the engine. Stop and exit aircraft if taxiing. If unable to stop fire by above means, loose dirt, sand, may be used thru cooling intakes to quench fire if no extinguisher is available.

## EMERGENCY DESCENT

ITEM	CONDITION
Power to	IDLE
Propeller to	HIGH RPM
Maintain	153 kts (176) mph
Transponder	7700 (or as requested)

## MAXIMUM GLIDE CONFIGURATION

ITEM	CONDITION
Establish	90 kts (103 mph)
Flaps	UP
Propeller	LOW RPM

Glide distance is approximately 1.3 nm (1 1/2 statute miles) per 1000 feet of altitude above the terrain, however this may vary significantly. It is suggested that it be established for your individual aircraft.

## LANDING EMERGENCIES

### Landing without power

When landing site is selected and committed to landing the following checklist can be completed. If the terrain is harsh the gear may well absorb energy and although resulting in substantial damage to the aircraft may, in that process, afford some protection to the occupants and thereby a desirable result. When assured of reaching the landing area or committed;

ITEM	CONDITION
Seat Belts/Shldr Harness	TIGHT
Door	LATCHED
Fuel Boost Pump	OFF
Mixture	CUT-OFF
Mags	OFF
Flaps	AS REQD
Master	OFF
Airspeed	Decrease to Touch Down

Attempt to fly the aircraft and keep the wings level through the approach and landing until the aircraft comes to a complete rest. **EXIT THE AIRCRAFT** and remain clear until assured there is no possibility of fire.

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## SYSTEMS EMERGENCIES

### PROPELLER OVERSPEED

The controllable pitch propellers with governors generally used on the *Express* utilize oil pressure from the governor to increase pitch (low rpm), others operate in an opposite manner. Therefore it is the responsibility of the pilot to know his aircraft and its system specifically.

It is however dangerous to run any engine over its rated rpm and thus the method to reduce any overspeed is to **immediately reduce the throttle to idle** and reduce airspeed to the point where rpm control is regained. Slowly add throttle and hold airspeed well below that at which the overspeed occurred. Mixture may need to be adjusted also for smooth operation. If the overspeed was significant, i.e. over 200 rpm over redline, an engine inspection is called for upon landing. Engine operation for the balance of the flight must be monitored closely.

### PROPELLER DAMAGE

As with any major component of an aircraft, the propeller demands proper care. Nicks, scratches and other types of damage require care. While the construction varies, all are highly stressed and these nicks cause stress concentrations to a greater or lesser degree which are dangerous. Refer to the manual for your propeller for proper limits of damage, the proper "care and feeding" of your propeller. Preflight your aircraft accordingly. The loss on any significant portion of a blade can be catastrophic. The pilot should be aware of any rpm range where vibration can be noticed. This could be an indication of an engine/prop/airframe incompatibility and operation in this range **MUST** be avoided lest structural damage be incurred. The result must be avoided.

## ELECTRICAL SYSTEM FAILURE

The electrical system of your aircraft is key to safe operation in today's environment. It is required for night or IFR operations. If a voltmeter is installed it will be your key indicator of alternator failure which then places the entire electrical load on the battery. The battery will read approximately 12.4 volts on a full battery, and 14+ on the generator. If you experience alternator failure;

ITEM	CONDITION
<b>If IFR/IMC</b>	<b>Notify ATC Immediately</b>
Master Switch	OFF
Avionics Master	OFF
Lights	OFF
Circuit Breakers	CHECK

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A check of the Circuit Breakers may reveal a popped breaker indicating the source of the trouble. If so, turn all individual equipment OFF, reset the breaker and turn the Master Switch ON. If the breaker does not activate again after a few minutes, slowly turn various elements of your system ON one at a time watching for another malfunction attempting to isolate the problem.

If you believe the problem has been isolated and you elect to continue the flight, remain alert for another anomaly caused by the first difficulty.

## LANDING GEAR - (A Pending Option)

Your *Express* gear is fixed. Kits will soon be available which provide for a retractable mechanism. Upon their availability, this manual will be revised to account for both the fixed and the retractable configurations (FG & RG). A retractable gear will provide higher cruising speeds for given cruising horsepower, but at the expense of more complications, costs, and the associated pilot workloads. When considering this option, your type of flying and experience level should be considered.



## UNLATCHED COCKPIT DOOR IN FLIGHT

The *Express* door must not be opened in flight. Should a latch become disengaged from the locked position, cautiously slow the aircraft to approximately 85 kts (100 mph) and attempt to relock without opening any further and/or have a passenger hold the door closed. If this fails, continue the flight at that speed to destination and land, or land and repair the latch or latches.

## SPINS

Intentional spins are not allowed. If a spin is entered inadvertently, reduce the power to idle, neutralize the stick or place forward long enough to break the stall, and place the rudder full against the direction of the spin until rotation is stopped. At this point, the aircraft should be recovered to level flight, with smooth, positive load factor (pull-out), wings level, of no more than 4 g's (4 g's can generally be noticed by a noticeable sagging of your jaw and cheeks) taking particular care not to reenter an accelerated stall (noticeable by sharper, more positive than normal pre-stall buffeting) and another spin. Should this pullout buffeting occur, simply relax somewhat on the back pressure till buffeting ceases and continue the pullout. If the spin has been allowed to develop, a temporary application of power may aid in recovery.

## WARNING

The *Express* aircraft are aerodynamically very clean and thus can consume a lot of altitude with such maneuvers

## EMERGENCY SPEED/ALTITUDE REDUCTION

In an emergency, the landing gear is used to assist in reducing the altitude of the aircraft quickly holding 153 kts. This should only be used with a sound aircraft structurally. Speed reductions should be accomplished by idle power settings and high rpm settings to allow the engine and propeller to assist in the speed reduction. This will cause rapid cooling of the engine but is an acceptable alternative in most cases. This procedure may be appropriate after entry into IMC by a disoriented, or non-rated pilot. Even flaps can be extended if necessary, however, after any such somewhat drastic measures the appropriate inspections are required.









*Express™*

NOTES:

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