M20R
OVATION

EMERGENCY PROCEDURES

CONDITION	RECOMMENDED SPEED
ENGINE FAILURE AFTER TAKEOFF	
Wing Flaps UP	85 KIAS
Wing Flaps DOWN	80 KIAS
BEST GLIDE SPEED	
3368 lb/1528 kg	91.5 KIAS
3200 lb/1452 kg	89.0 KIAS
2900 lb/1315 kg	84.5 KIAS
2600 lb/1179 kg	80.0 KIAS
MANEUVERING SPEED	
3368 lb/1528 kg	127 KIAS
3300 lb/1497 kg	126 KIAS
2430 lb/ 1102 kg	108 KIAS
2232 lb/1012 kg	103 KIAS
PRECAUTIONARY LANDING WITH ENGINE POWER	
Flaps DOWN	75 KIAS
PRECAUTIONARY LANDING ABOVE 3200 LBS	
Flaps DOWN	80 KIAS
EMERGENCY DESCENT (GEAR UP)	
Smooth Air	196 KIAS
Turbulent Air	
3368 lb/1528 kg	127 KIAS
3300 lb/1497 kg	126 KIAS
2430 lb/1102 kg	108 KIAS
2232 lb/1012 kg	103 KIAS
EMERGENCY DESCENT (GEAR DOWN)	
Smooth Air	165 KIAS
Turbulent Air	
3368 lb/1528 kg	127 KIAS
3300 lb/1497 kg	126 KIAS
2430 lb/1102 kg	108 KIAS
2232 lb/1012 kg	103 KIAS

ENGINE

POWER LOSS - DURING TAKEOFF ROLL

Throttle	CLOSED
Brakes	AS REQUIRED TO STOP AIRCRAFT
Fuel Selector	OFF
Magneto/Starter Switch	OFF
Master Switch	OFF

POWER LOSS - AFTER LIFTOFF

Airspeed	85 KIAS (Flaps UP)
	80 KIAS (Flaps TAKEOFF/DOWN)
KEEP THE AIRCRAFT UNDER CONTROL - then:	
Fuel Selector	SELECT OTHER TANK
Throttle	FULL FORWARD
Magneto switch	Verify on BOTH
Mixture	FULL FORWARD
Propeller	FULL FORWARD
LOW Boost Pump Switch	ON - to attempt re-start
If Engine Quits - then:	
HIGH BOOST Pump (guarded switch)	ON - to attempt re-start

LAND AS SOON AS PRACTICABLE; CORRECT MALFUNCTION PRIOR TO NEXT FLIGHT.
If engine does not re-start, proceed to **FORCED LANDING EMERGENCY**.

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///**WARNING**///
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Engine may run rough due to overrich mixture. Lean mixture until engine operates smoothly.

| **NOTE** |

If high power is required, mixture may require enrichening.

POWER LOSS - IN FLIGHT (RE-START PROCEDURES)

Airspeed	85 KIAS minimum
Fuel Selector	SELECT OTHER TANK (Verify fullest tank)
LOW Boost Pump Switch	ON - to attempt re-start
Throttle	FULL FORWARD
Propeller	FULL FORWARD
Mixture	AS REQUIRED to restore power
Magneto/Starter Switch	VERIFY on BOTH
LOW Boost Pump Switch	OFF if engine does not start immediately
HIGH BOOST Pump (guarded switch)	ON - to attempt re-start
Alternate Air Door	Manually Open

If engine does not start after initial attempts:

Mixture	IDLE CUT-OFF (Initially)
	then advance slowly toward RICH until engine starts.

If engine does not re-start after several attempts establish best glide speed (Refer to Maximum Glide Distance Chart) and proceed to **FORCED LANDING EMERGENCY**.

After engine re-start:

Throttle	ADJUST as required
Propeller	ADJUST as required
Mixture	RELEAN as required for power setting
HIGH BOOST Pump Switch	OFF

| **NOTE** |

If engine fails when HIGH BOOST pump is turned OFF, suspect engine driven fuel pump failure. Proceed to ENGINE DRIVEN FUEL PUMP FAILURE.

LAND AS SOON AS PRACTICABLE; CORRECT MALFUNCTION PRIOR TO NEXT FLIGHT.

~ ~ ~ ~ ~ ~
~ CAUTION~
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Should engine excessively cool during engine out, care should be exercised during re-start to avoid excessive oil pressure. Allow engine to warm up.

OPERATING THE ENGINE AT TOO HIGH AN RPM BEFORE REACHING MINIMUM OIL TEMPERATURES MAY CAUSE LOSS OF OIL PRESSURE.

POWER LOSS - PRIMARY ENGINE INDUCTION AIR SYSTEM BLOCKAGE

Blockage of the primary engine induction air system may be experienced as a result of flying in cloud or heavy snow with cold outside air temperatures (0°C or below). At these temperatures, very small water droplets or solid ice crystals in the air may enter the primary engine induction inlet in cowl opening and travel inside inlet duct to the induction air filter. Ice particles or water droplets may collect and freeze on the air filter causing partial or total blockage of the primary engine induction system.

If primary induction air system blockage occurs, the alternate engine induction air system will automatically open, supplying engine with an alternate air source drawn from inside the cowling rather than through the air filter. The alternate air system can also be manually opened at any time by pulling the control labeled ALTERNATE AIR. Automatic or manual activation of the alternate induction system is displayed in the cockpit by the illumination of the ALT AIR light in the main annunciator panel. When operating on the alternate air system, available engine power will be less for a given propeller RPM compared to the primary induction air system. This is due to loss of ram effect and induction of warmer inlet air.

The following checklist should be used if a **partial power loss** due to primary induction air system blockage is experienced:

Alternate Air . . . . . *Verify OPEN (annunciator light ON)*
Manifold Pressure . . 1 - 2 inches less than normal, due to warm induction air

| NOTE|

The alternate air door should open automatically when primary induction system is restricted. If alternate air door has not opened (Annunciator light-OFF) it can be opened manually by pulling alternate air control.

Throttle . . . . . INCREASE as desired
Propeller . . . . . INCREASE as required
. . . . . .
Mixture . . . . . RELEAN to desired EGT
Flight . . . . . *CONTINUE - request altitude with warmer air, if able.*

In the unlikely event that a **total power loss**, due to primary engine induction air blockage, is experienced, the following checklist should be used:

Airspeed . . . . . BEST GLIDE SPEED
Alternate Air . . . . . Manually OPEN
LOW Boost Pump Switch . . . . . ON
Throttle . . . . . Full FORWARD
Propeller . . . . . FULL FORWARD
Mixture . . . . . AS REQUIRED to restore power
Magneto/Starter Switch . . . . . Verify on BOTH

After engine re-start:

Throttle . . . . . ADJUST as required
Propeller . . . . . ADJUST as required
Mixture . . . . . RELEAN as required for power setting
. . . . . .
LOW Boost Pump Switch . . . . . OFF

If engine does not re-start after several attempts, maintain best glide speed & proceed to **FORCED LANDING EMERGENCY.**

ENGINE ROUGHNESS

Engine Instruments . . . . . CHECK
Fuel Selector . . . . . OTHER TANK
Mixture . . . . . READJUST for smooth operation
Magneto/Starter Switch . . . . . Select R or L or BOTH
If roughness disappears on single magneto, monitor power and continue on selected magneto.

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//**WARNING**//
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The engine may quit completely when one magneto is switched off if the other magneto is faulty. If this happens, close throttle to idle and mixture to idle cutoff before turning magnetos ON to prevent a severe backfire. When magnetos have been turned back ON, proceed to POWER LOSS - IN FLIGHT. Severe roughness may be sufficient to cause propeller separation. Do not *continue to operate a rough engine* unless there is no other alternative.

Throttle . . . . . REDUCE
. . . . . check for a throttle setting that may cause roughness to decrease.
If severe engine roughness cannot be eliminated, LAND AS SOON AS PRACTICABLE.

HIGH CYLINDER HEAD TEMPERATURE

Mixture . . . . . .ENRICH As Required
Airspeed . . . . . INCREASE As Required
Power . . . . . REDUCE – if temperature cannot be maintained within limits

HIGH OIL TEMPERATURE

|NOTE|

Prolonged high oil temperature indications will usually be accompanied by a drop in oil pressure. If oil pressure remains normal, then a high temperature indication may be caused by a faulty gauge or thermocouple.

Airspeed . . . . . INCREASE
Power . . . . . REDUCE

PREPARE FOR POSSIBLE ENGINE FAILURE IF TEMPERATURE CONTINUES HIGH.

LOW OIL PRESSURE

Oil temperature and pressure gauges . . . . . Monitor
Pressure below 10 PSI . . . . . **EXPECT ENGINE FAILURE,**
. . . . . proceed to **FORCED LANDING EMERGENCY.**

ENGINE DRIVEN FUEL PUMP FAILURE

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///**WARNING**///
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When operating engine at moderate power with "HIGH BOOST" ON and engine driven fuel pump has failed, engine may quit or run rough when manifold pressure is reduced, unless manually leaned.

An engine driven fuel pump failure is probable when engine will only operate with HIGH BOOST pump ON. Operation of engine with a failed engine driven fuel pump and auxilliary fuel pump HIGH BOOST **ON** will require smooth operation of engine controls and corresponding mixture change when throttle is repositioned or engine speed is changed. When retarding throttle or reducing engine speed, adjust mixture to prevent engine power loss from an overrich condition. Enrich mixture when opening throttle or increasing engine speed to prevent engine power loss from a lean condition. Always lean to obtain a smooth running engine.

The following procedure should be followed when a failed engine driven fuel pump is suspected:

HIGH BOOST Pump (guarded switch) . . . . . ON
Throttle . . . . . CRUISE Position or as required for engine operation
Mixture . . . . . ADJUST for smooth engine operation.
LAND AS SOON AS PRACTICABLE & CORRECT MALFUNCTION.

FUEL VAPOR SUPPRESSION (Fluctuating Fuel Flow)

Low Fuel Boost Pump Switch . . . . . ON to clear vapors
Engine operation . . . . . MONITOR
Low Fuel Boost Pump Switch . OFF - (If condition still exists, REPEAT PROCEDURE).

FIRES

ENGINE FIRE - DURING START ON GROUND

Magneto/Starter Switch . . . CONTINUE cranking or until fire is extinguished.
If engine starts:
Power . . . . . 1500 RPM for several minutes
Engine . . . . . SHUTDOWN; inspect for damage
If engine does NOT start:
Magneto/Starter Switch . . . . . CONTINUE CRANKING
Mixture . . . . . IDLE CUTOFF
Low Fuel Boost Pump Switch . . . . . OFF
Throttle . . . . . FULL FORWARD
Fuel Selector Valve . . . . . OFF
Magneto/Starter Switch . . . . . OFF
Master Switch . . . . . OFF
FIRE . . . . . **EXTINGUISH** with Fire Extinguisher

ENGINE FIRE - IN FLIGHT

Fuel Selector Valve . . . . . OFF
Throttle . . . . . CLOSED
Mixture . . . . . IDLE CUTOFF
Magneto/Starter Switch . . . . . OFF
Cabin Ventilation & Heating Controls . . . . . CLOSED

| NOTE|

If fire is not extinguished, attempt to increase airflow over engine by increasing glide speed. Proceed with FORCED LANDING EMERGENCY. DO NOT attempt an engine restart.
If necessary, use fire extinguisher to keep fire out of cabin area.

ELECTRICAL FIRE - IN FLIGHT (Smoke in Cabin)

Master Switch . . . . . OFF

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//WARNING//
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Stall warning and landing gear warning, not available with Master Switch OFF.

Alternator Field Switch . . . . . OFF
Cabin Ventilation . . . . . OPEN
Heating Controls . . . . . CLOSED
Circuit Breakers . . . . . CHECK to identify faulty circuit if possible
LAND AS SOON AS POSSIBLE.

If electrical power is essential for flight, attempt to identify and isolate faulty circuit as follows:

Master Switch . . . . . ON
Alternator Field Switch . . . . . ON

Select ESSENTIAL switches ON one at a time; permit a short time to elapse before activating an additional circuit.

EMERGENCY DESCENT PROCEDURE

In the event an emergency descent from high altitude is required, rates of descent of least 3,000 feet per minute can be obtained in two different configurations:
(1) With landing gear and flaps retracted, an airspeed of 196 KIAS will be required for maximum rate of descent.

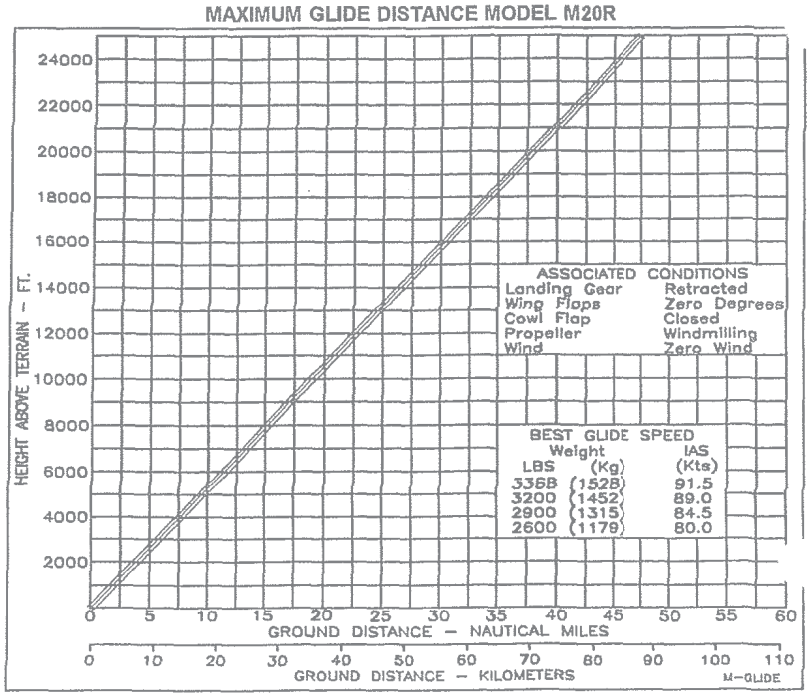
(2) With the landing gear extended and flaps retracted an airspeed of 165 KIAS will also give approximately the same rate of descent. At 165 KIAS and the gear extended, the angle of descent will be greater, thus resulting in less horizontal distance traveled than a descent at 196 KIAS. Additionally, descent at 165 KIAS will provide a smoother ride and less pilot work load.

THEREFORE; The following procedure is recommended for an emergency descent:

Power	RETARD INITIALLY
Airspeed	*140 KIAS*
Landing Gear	EXTEND
Airspeed	INCREASE TO 165 KIAS after landing gear is extended.
Wing Flaps	UP
Airspeed	MAINTAIN 165 KIAS during descent.
Speedbrakes (If installed)	EXTEND
Altitude	AS DESIRED
Power During Descent	AS REQUIRED to maintain CHT 250°F (121°C)minimum.

GLIDE

MAXIMUM GLIDE DISTANCE MODEL M20R



FORCED LANDING EMERGENCY

GEAR RETRACTED OR EXTENDED

Emergency Locator Transmitter	ARMED
Seat Belts/Shoulder Harnesses	SECURE
Cabin Door	UNLATCHED
Fuel Selector	OFF
Mixture	IDLE CUTOFF
Magneto/Starter Switch	OFF
Wing Flaps	Full DOWN
Landing Gear	DOWN-If conditions permit
Approach Speed	80 KIAS
Master Switch	OFF, prior to landing
Wings	*LEVEL Attutude*

OVERWEIGHT LANDING PROCEDURES

In the event it is necessary to land with weight exceeding 3200 Lbs. (1452 Kg.) (max. landing weight) the following procedure is recommended in addition to normal APPROACH FOR LANDING procedures:

Approach Airspeed	80 KIAS

Use a flatter approach angle than normal, with power as necessary until a smooth touch-down is assured.
Expect landing distance over a 50 feet obstacle to increase at least 600 ft.
Conduct Gear and Tire Servicing inspection as required.

SYSTEMS EMERGENCIES

PROPELLER

PROPELLER OVERSPEED

Throttle	RETARD
Oil Pressure	CHECK
Propeller	DECREASE RPM, re-set if any control available
Airspeed	REDUCE
Throttle	AS REQUIRED to maintain RPM below 2500 RPM

FUEL

LOW FUEL FLOW

Check mixture	ENRICH
Fuel Selector	SWITCH TANKS

If condition persists, use Fuel Boost Pump as necessary. LANDING should be made as soon as PRACTICABLE.

ELECTRICAL

ALTERNATOR OVERVOLTAGE

(Alternator warning light illuminated steady and Alternator Field circuit breaker tripped.)

Alternator Field Circuit Breaker	RESET

If circuit breaker will not reset, the following procedures are required:

SPINS

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//WARNING//
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Up to 2,000 ft. altitude may be lost in a one turn spin and recovery;
STALLS AT LOW ALTITUDE ARE EXTREMELY CRITICAL.

NOTE

The best spin avoidance technique is to avoid flight conditions conducive to spin entry. Low speed flight near stall should be approached with caution and excessive flight control movements in this flight regime should be avoided. Should an unintentional stall occur, the aircraft should not be allowed to progress into a deep stall. Fast, but smooth stall recovery will minimize the risk of progressing into a spin. If an unusual post stall attitude develops and results in a spin, quick application of antispin procedures should shorten the recovery.

INTENTIONAL SPINS ARE PROHIBITED.

In the event of an inadvertent spin, the following recovery procedure should be used:

Throttle . . . . . RETARD to IDLE
Ailerons . . . . . NEUTRAL
Rudder . . . . . Apply FULL RUDDER opposite direction of spin

Control Wheel . . . . . FORWARD of neutral in a brisk motion

ADDITIONAL FORWARD elevator control may be required if rotation does not stop.

– – HOLD ANTI-SPIN CONTROLS UNTIL ROTATION STOPS – –

Wing Flaps (if extended) . . . . . .RETRACT as soon as possible
Rudder . . . . . .NEUTRALIZE when spin stops
Control Wheel . . . . . SMOOTHLY MOVE AFT
to bring the nose up to level flight attitude.