EMERGENCY PROCEDURES

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INTRODUCTION

Section 3 provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunctions are extremely rare if proper preflight inspections and maintenance are practiced. Enroute weather emergencies can be minimized or eliminated by careful flight planning and good judgment when unexpected weather is encountered. However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem. In any emergency situation, the most important task is continued control of the airplane and maneuver to execute a successful landing.

Emergency procedures associated with optional or supplemental equipment are found in Section 9, Supplements.

AIRSPEEDS FOR EMERGENCY OPERATIONS

ENGINE FAILURE AFTER TAKEOFF
Wing Flaps UP . . . . . 70 KIAS
Wing Flaps 10° - FULL . . . . . 65 KIAS

MAXIMUM OPERATING MANEUVERING SPEED
1320 POUNDS . . . . . 89 KIAS
1200 POUNDS . . . . . 85 KIAS
1100 POUNDS . . . . . 80 KIAS

DESIGN MANEUVERING SPEED . . . . . 102 KIAS

MAXIMUM GLIDE . . . . . 70 KIAS

PRECAUTIONARY LANDING WITH ENGINE POWER. . . . . 60 KIAS

LANDING WITHOUT ENGINE POWER
Wing Flaps UP . . . . . 70 KIAS
Wing Flaps 10° - FULL . . . . . 65 KIAS

EMERGENCY PROCEDURES

Procedures in the Emergency Procedures Checklist portion of this section shown in **bold faced** type are immediate action items which should be committed to memory.

ENGINE FAILURES AND MALFUNCTIONS

ENGINE FAILURE DURING TAKEOFF ROLL

1. **THROTTLE Control - IDLE (pull full out)**
2. **Brakes - APPLY**
3. Wing Flaps - RETRACT
4. MIXTURE Control - IDLE CUTOFF (pull full out)
5. MAGNETOS Switch - OFF
6. MASTER Switch (ALT and BAT) - OFF

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. **Airspeed - 70 KIAS - Flaps UP**
   65 KIAS - Flaps 10° - FULL
2. MIXTURE Control - IDLE CUTOFF (pull full out)
3. FUEL SHUTOFF Valve - OFF (pull full out)
4. MAGNETOS Switch - OFF
5. Wing Flaps - AS REQUIRED (FULL recommended)
6. MASTER Switch (ALT and BAT) - OFF (when landing is assured)
7. Land - STRAIGHT AHEAD
8. Secondary Interior Door Latch (if installed) - OPEN
9. Primary Interior Door Latch - OPEN (just prior to touchdown)

CAUTION

NON-EMERGENCY FLIGHT WITH DOOR(S) OPEN IS PROHIBITED.

NOTE

Both cabin doors are equipped with gas struts and should open automatically when unlatched. Delaying opening until just prior to touchdown will reduce cabin buffeting and wind noise.

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ENGINE FAILURES AND MALFUNCTIONS (Continued)

ENGINE FAILURE DURING FLIGHT (Restart Procedures)

1. **Airspeed - 70 KIAS (best glide speed)**
2. **THROTTLE Control - IDLE (pull full out)**
3. **CARB HEAT Control Knob - ON (pull full out)**
4. **FUEL SHUTOFF Valve - ON (push full in)**
5. **MIXTURE Control - RICH (if restart has not occurred)**
6. PRIMER (if installed) - IN and LOCKED
7. MAGNETOS Switch - BOTH (or START if propeller is stopped)

NOTE

If the propeller is windmilling, engine will restart automatically within a few seconds. If propeller has stopped (possible at low speeds), turn MAGNETOS switch to START, advance throttle slowly from idle and lean the mixture from full rich as required to obtain smooth operation.

OIL PSI INDICATOR IN RED BAND RANGE (RED DIGITS)

1. OIL °F - CHECK

IF OIL °F ABOVE GREEN BAND RANGE OR OIL °F RISING (engine failure imminent)

2. Throttle Control - REDUCE POWER IMMEDIATELY
3. Airspeed - 70 KIAS (best glide speed)
4. Land as soon as possible (refer to EMERGENCY LANDING WITHOUT ENGINE POWER)

IF OIL °F WITHIN GREEN BAND RANGE

2. OIL °F - MONITOR
3. OIL PSI - MONITOR
4. Land as soon as practical. (nearest suitable airport recommended)

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ENGINE FAILURES AND MALFUNCTIONS (Continued)

CARB °F INDICATOR IN YELLOW BAND RANGE (YELLOW DIGITS)

1. ENGINE - MONITOR FOR ROUGHNESS AND/OR RPM LOSS

NOTE

Carb °F indicator in yellow band range indicates temperatures may support carb icing formation.

IF ENGINE ROUGHNESS AND/OR RPM LOSS IS DETECTED (CARB °F IN YELLOW BAND RANGE)

2. CARB HEAT Control Knob - ON (pull full out)
3. THROTTLE Control - FULL (push full in)
4. MIXTURE Control - LEAN (as required)
5. CARB °F Indicator - CHECK

IF ENGINE ROUGHNESS CONTINUES

6. CARB °F Indicator - MONITOR
7. ALTITUDE - CONSIDER CHANGE (to warmer or drier air mass if terrain permits)
8. Land as soon as practical.

IF ENGINE ROUGHNESS AND/OR RPM LOSS IS NOT DETECTED

2. CARB °F Indicator - MONITOR
3. CARB HEAT Control Knob - AS REQUIRED
4. Continue flight as normal.

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

1. **Seats and Seat Belts - SECURE**
2. **Airspeed -70 KIAS - Flaps UP**
   65 KIAS - Flaps 10° - FULL
3. **MIXTURE Control - IDLE CUTOFF (pull full out)**
4. **FUEL SHUTOFF Valve - OFF (pull full out)**
5. Radio - ALERT ATC or TRANSMIT MAYDAY ON 121.5 MHZ, (give location, intentions and SQUAWK 7700)
6. MAGNETOS Switch - OFF
7. Wing Flaps - AS REQUIRED (FULL recommended)
8. MASTER Switch (ALT and BAT) - OFF (when landing is assured)
9. ELT - ACTIVATE
10. Secondary Interior Door Latch (if installed) - OPEN
11. Primary Interior Door Latch - OPEN (just prior to touchdown)

CAUTION

NON-EMERGENCY FLIGHT WITH DOOR(S) OPEN IS PROHIBITED.

NOTE

Both cabin doors are equipped with gas struts and should open automatically when unlatched. Delaying opening until just prior to touchdown will reduce cabin buffeting and wind noise.

12. Touchdown - SLIGHTLY TAIL LOW
13. Brakes - APPLY HEAVILY

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FORCED LANDINGS (Continued)

PRECAUTIONARY LANDING WITH ENGINE POWER

1. Seats and Seat Belts - SECURE
2. Airspeed - 70 KIAS
3. Wing Flaps - 10° or 25°
4. Radio - ALERT ATC or TRANSMIT MAYDAY ON 121.5 MHZ, (give location, intentions and SQUAWK 7700)
5. Selected Field - FLY OVER (noting terrain and obstructions)
6. Wing Flaps - FULL (on final approach)
7. Airspeed - 60 KIAS
8. MASTER Switch (ALT and BAT) - OFF (when landing assured)
9. ELT - ACTIVATE
10. Secondary Interior Door Latch (if installed) - OPEN
11. Primary Interior Door Latch - OPEN (just prior to touchdown)

CAUTION

NON-EMERGENCY FLIGHT WITH DOOR(S) OPEN IS PROHIBITED.

NOTE

Both cabin doors are equipped with gas struts and should open automatically when unlatched. Delaying opening until just prior to touchdown will reduce cabin buffeting and wind noise.

12. Touchdown - SLIGHTLY TAIL LOW
13. MIXTURE Control - IDLE CUTOFF (pull full out)
14. MAGNETOS Switch - OFF
15. Brakes - APPLY HEAVILY

FORCED LANDINGS (Continued)

DITCHING

1. Radio - TRANSMIT MAYDAY on 121.5 MHz, (give location, intentions and SQUAWK 7700)
2. Heavy Objects (in baggage area) - SECURE (if possible)
3. Seats and Seat Belts - SECURE
4. Wing Flaps - 25° or FULL
5. Power - ESTABLISH 300 FT/MIN DESCENT AT 60 KIAS

NOTE

If no power is available, approach at 70 KIAS with Flaps UP or at 65 KIAS with Flaps 10°.

6. Approach - High Winds, Heavy Seas - INTO THE WIND
   Light Winds, Heavy Swells - PARALLEL TO SWELLS
7. ELT - ACTIVATE
8. Secondary Interior Door Latch (if installed) - OPEN
9. Primary Interior Door Latch - OPEN (just prior to touchdown)

CAUTION

NON-EMERGENCY FLIGHT WITH DOOR(S) OPEN IS PROHIBITED.

NOTE

Both cabin doors are equipped with gas struts and should open automatically when unlatched. Delaying opening until just prior to touchdown will reduce cabin buffeting and wind noise.

10. Touchdown - LEVEL ATTITUDE AT ESTABLISHED 300 FT/MIN DESCENT
11. Face - CUSHION AT TOUCHDOWN (with folded coat)
12. Airplane - EVACUATE THROUGH CABIN DOORS

FIRES

DURING START ON GROUND

1. **MAGNETOS Switch - START (continue cranking to start the engine)**

IF ENGINE STARTS

2. Power - 1800 RPM (for a few minutes)
3. Engine - SHUTDOWN (inspect for damage)

IF ENGINE FAILS TO START

2. **THROTTLE Control - FULL (push full in)**
3. **MIXTURE Control - IDLE CUTOFF (pull full out)**
4. **MAGNETOS Switch - START (continue cranking)**
5. **FUEL SHUTOFF Valve - OFF (pull full out)**
6. **MAGNETOS Switch - OFF**
7. **MASTER Switch (ALT and BAT) - OFF**
8. Engine - SECURE
9. Parking Brake - RELEASE
10. Fire Extinguisher - OBTAIN (have ground attendants obtain if not installed)
11. Airplane - EVACUATE
12. Fire - EXTINGUISH (using fire extinguisher, wool blanket, or dirt)
13. Fire Damage - INSPECT (repair or replace damaged components and/or wiring before conducting another flight)

ENGINE FIRE IN FLIGHT

1. **MIXTURE Control - IDLE CUTOFF (pull full out)**
2. **FUEL SHUTOFF Valve - OFF (pull full out)**
3. **MASTER Switch (ALT Only) - OFF**
4. Cabin Vents - OPEN (as needed)
5. CABIN HEAT Control Knob - OFF (push full in) (to avoid drafts)
6. Airspeed - 85 KIAS (If fire is not extinguished, increase glide speed to find an airspeed, within airspeed limitations, which will provide an incombustible mixture)
7. Forced Landing - EXECUTE (refer to EMERGENCY LANDING WITHOUT ENGINE POWER)

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FIRES (Continued)

ELECTRICAL FIRE OR CABIN FIRE IN FLIGHT

1. **MASTER Switch (ALT and BAT) - OFF**

WARNING

OUTSIDE VISUAL REFERENCE MUST BE USED TO MAINTAIN SITUATIONAL AWARENESS. ALL FLIGHT INSTRUMENTS, RADIOS, AND PITCH TRIM WILL BE INOPERATIVE WHEN MASTER SWITCH IS TURNED OFF.

2. **Cabin Vents - CLOSED (to avoid drafts)**
3. **CABIN HEAT Control Knob - OFF (push full in) (to avoid drafts)**
4. **Fire Extinguisher - ACTIVATE (if available)**
5. AVN MASTER Switch - OFF
6. All Other Switches (except MAGNETOS switch) - OFF

IF FIRE HAS NOT BEEN EXTINGUISHED

7. **MASTER Switch (ALT and BAT) - ON**
8. **Rapid Descent - EXECUTE (Perform sideslip to rapidly lose altitude and shorten exposure time).**
9. AVN MASTER Switch - ON
10. Radio - ALERT ATC or TRANSMIT MAYDAY ON 121.5 MHZ, (give location, intentions and SQUAWK 7700)
11. Forced Landing - EXECUTE (refer to PRECAUTIONARY LANDING WITH ENGINE POWER)

NOTE

The G300 self-test and ADAHRS alignment may take several minutes to establish thus delaying display of flight instrument data. It may be necessary to execute landing without airspeed or altitude information.

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FIRES (Continued)

ELECTRICAL FIRE OR CABIN FIRE IN FLIGHT (Continued)

IF FIRE HAS BEEN EXTINGUISHED AND ELECTRICAL POWER IS NECESSARY FOR CONTINUED FLIGHT TO NEAREST SUITABLE AIRPORT OR LANDING AREA

WARNING

AFTER THE FIRE EXTINGUISHER HAS BEEN USED, MAKE SURE THAT THE FIRE IS EXTINGUISHED BEFORE EXTERIOR AIR IS USED TO REMOVE SMOKE FROM THE CABIN.

7. Cabin Vents - OPEN (when sure that fire is completely extinguished)
8. CABIN HEAT Control Knob - ON (pull full out) (when sure that fire is completely extinguished)
9. Circuit Breakers - CHECK (for OPEN circuit(s), do not reset)
10. MASTER Switch (ALT and BAT) - ON
11. AVN MASTER Switch - ON
12. Land the airplane as soon as possible to inspect for damage.

WING FIRE

1. **LDG Light Switch - OFF**
2. **NAV Light Switch - OFF**
3. **STROBE Light Switch - OFF**

NOTE

Perform a sideslip to keep the flames away from the fuel tank and cabin.

4. Land as soon as possible.

ICING

INADVERTENT ICING ENCOUNTER DURING FLIGHT

1. **Turn back or change altitude to exit icing conditions.** Consider lateral or vertical flight path reversal to return to last "known good" flight conditions (to obtain an outside air temperature that is less conducive to icing). Maintain VFR flight.

WARNING

FAILURE TO ACT QUICKLY MAY RESULT IN AN UNRECOVERABLE ICING ENCOUNTER.

2. **CABIN HEAT Control Knob - ON (pull full out)**
3. **A/P DISC/CWS (if installed) - PRESS** (verify autopilot disengages and aural alert is heard)

WARNING

DO NOT ENGAGE AUTOPILOT WITH VISIBLE ICE ON AIRFRAME OR AFTER ENCOUNTERING ICING CONDITIONS.

4. Watch for signs of induction air filter icing and apply carburetor heat as required. Monitoring the G300 Carb °F Indicator may assist early detection. A loss of engine RPM could be caused by carburetor ice or ice blocking the air intake filter. Adjust the throttle as necessary to hold engine RPM. Adjust mixture as necessary for any change in power settings or if carburetor heat is used continuously.
5. Watch for ice accretion on pitot tube and signs of pitot-static icing. Airspeed and altimeter indications may become unreliable.
   a. Attitude and Heading information will remain reliable in event of airspeed and altimeter failure. Use attitude indicator to monitor pitch and bank.
   b. Reference GS (ground speed) in conjunction with GPS derived wind information to determine an approximate airspeed.

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ICING (Continued)

INADVERTENT ICING ENCOUNTER DURING FLIGHT (Continued)

c. Reference GPS ALTITUDE on MFD INFO page (if installed) or select G300 TERRAIN Profile page. GPS Altitude is provided by the white arrowhead on the left side of the TERRAIN Profile display.
d. Navigate using Heading Strip, Lateral Deviation, and GPS moving map (GPS moving map and TERRAIN Profile can not be displayed at the same time).

NOTE

GPS information is not as accurate as barometric data but will provide an approximate value for comparison to pitot-static instruments or a back-up if barometric instruments become unreliable.

6. Plan a landing at the nearest airport. With an extremely rapid ice build-up, select a suitable off airport landing site.
7. With an ice accumulation of 0.25 inch (6.35 mm) or more on the wing leading edges, be prepared for significantly higher power requirements, higher approach and stall speeds, and a longer landing roll. Gently pitch and yaw the airplane periodically to keep ice bridging on the controls to a minimum.
8. Leave wing flaps retracted. With a severe ice build-up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.
9. Perform a landing approach using a forward slip, if necessary, for improved visibility.
10. Approach at 65 to 70 KIAS (estimated 70 KTS if using GPS for airspeed indication) depending upon the amount of ice accumulation.
11. Perform landing in level attitude.
12. Go arounds should be avoided whenever possible because of severely reduced climb capability.

ABNORMAL LANDINGS

LANDING WITH PARTIAL OR NO FLIGHT INSTRUMENT INFORMATION

1. Transponder - Select Pressure Alt display using FUNC button (ADAHRS may be providing altitude information to transponder).
2. Selected Field - FLY OVER (noting terrain, obstructions, and any visual cues that may be used for speed references (i.e. traffic on nearby highway, etc))
3. Approach - NORMAL
4. Wing Flaps - AS REQUIRED (FULL recommended)
5. Speed - Use best pilot judgment and experience to reference speed cues such as flap extension forces, slipstream sounds, etc. Stall warning horn will function and provide approximately 5 knot stall warning.
6. Touchdown - NORMAL
7. Directional Control - MAINTAIN

NOTE

Without accurate speed information, landing may be made at faster than normal speeds. Gently apply brakes while continuing to “fly” the airplane during roll-out. Loss of directional control may result from locked brakes and skidding tires due to over braking.

LANDING WITH A FLAT MAIN TIRE

1. Approach - NORMAL
2. Wing Flaps - FULL
3. Touchdown - GOOD MAIN TIRE FIRST (hold airplane off flat tire as long as possible with aileron control)
4. Directional Control - MAINTAIN (using rudder and brake on good wheel as required)

ABNORMAL LANDINGS (Continued)

LANDING WITH A FLAT NOSE TIRE

1. Approach - NORMAL (choose longest runway if possible)
2. Wing Flaps - AS REQUIRED
   a. 65 to 70 KIAS - Flaps UP - 10°
   b. Below 65 KIAS - Flaps 10° - FULL
3. Touchdown - ON MAINS (tail slightly low)
4. Elevator - continue stick to full aft as airplane slows (hold nosewheel off the ground as long as possible)
5. When nosewheel touches down, maintain full up elevator as airplane slows to stop.
6. Directional Control - MAINTAIN (using full rudder control) Attempt to limit differential braking.
7. Braking - Use brakes only as needed to lessen chance of prop strike. Rolling drag of the flat nose tire will increase braking effect.

DOOR OPEN IN FLIGHT

WARNING

INTENTIONAL FLIGHT WITH DOOR(S) OPEN IS PROHIBITED.

1. CABIN DOOR - LEAVE OPEN (do not attempt to close)
2. THROTTLE Control - REDUCE (as necessary)
3. Airspeed - 80 KIAS (or less)
4. Seat Belts - CHECK (verify secure and tight)
5. Cabin - CHECK (stow loose materials)
6. Land as soon as practical.

LANDING WITH DOOR OPEN

1. Wing Flaps - AS REQUIRED
   a. 65 to 70 KIAS - Flaps UP - 10°
   b. Below 65 KIAS - Flaps 10° - FULL
2. Landing Approach - NORMAL (limit sideslip angle if possible)
3. Touchdown - NORMAL

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

LOSS OF ALL ELECTRICAL POWER (EXCEPT PFD)

1. MAIN CB RESET Switch - PRESS MOMENTARILY

IF ELECTRICAL POWER RESUMES NORMAL OPERATION

2. Continue flight and land as soon as practical.

IF ELECTRICAL POWER REMAINS INOPERATIVE (EXCEPT PFD)

2. Land as soon as possible.

NOTE

The PFD will be operating on the secondary battery only. The secondary battery is not a back-up battery. It is included in the electrical system to limit display presentation issues that might arise during the voltage drop which occurs during engine start. In good condition, the secondary battery may provide 5 to 10 minutes of PFD operation.

3. Prepare for total loss of electrical power and PFD. Refer to ABNORMAL LANDINGS, LANDING WITH PARTIAL OR NO FLIGHT INSTRUMENT INFORMATION.

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ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS (Continued)

LOW VOLTS ANNUNCIATOR COMES ON OR VOLTS INDICATION BELOW GREEN BAND RANGE OR VOLTS LESS THAN 12.5

NOTE

Volts indication below the green band range or less than 12.5 volts may occur during low RPM conditions with an electrical load on the system such as during a low RPM taxi. Under these conditions, the volts indication will increase into the green band range (12.5 - 15.0 volts) at higher RPM. The master switch need not be recycled since an overvoltage condition has not occurred to deactivate the alternator system.

1. AVN MASTER Switch - OFF

NOTE

Radio, Transponder, Pitch Trim, and options (MFD, Autopilot, and PS Intercom), if installed, will be inoperative with AVN MASTER Switch in the OFF position.

2. START/ALT Circuit Breaker - CHECK IN (if open, reset (close) circuit breaker. If circuit breaker opens again, do not reset)
3. MASTER Switch (ALT Only) - OFF
4. MASTER Switch (ALT Only) - ON
5. MAIN CB RESET Switch - PRESS MOMENTARILY
6. VOLTS - CHECK 13.5 Volts (minimum)
7. AMPS - CHECK CHARGING (positive)
8. AVN MASTER Switch - ON (only if VOLTS are 12.5 and AMPS are charging)

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ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS (Continued)

LOW VOLTS ANNUNCIATOR COMES ON OR VOLTS INDICATION BELOW GREEN BAND RANGE OR VOLTS LESS THAN 12.5 (Continued)

IF VOLTS INDICATION REMAINS BELOW GREEN BAND RANGE OR LESS THAN 12.5 VOLTS

9. MASTER Switch (ALT Only) - OFF
10. Electrical Load - REDUCE as follows:
    a. LDG Light Switch - OFF (use as required for landing)
    b. NAV Light Switch - OFF
    c. STROBE Light Switch - OFF
    d. AVN MASTER Switch - OFF

NOTE

Radio, Transponder, Pitch Trim, and options (MFD, Autopilot, and PS Intercom), if installed, will be inoperative with AVN MASTER Switch in the OFF position.

11. Land as soon as practical.

NOTE

A fully charged battery in good condition should provide power under reduced load for 30 minutes.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS (Continued)

VOLTS INDICATION ABOVE GREEN BAND RANGE OR VOLTS MORE THAN 15

1. MASTER Switch (ALT Only) - OFF
2. Electrical Load - REDUCE as follows:
   a. LDG Light Switch - OFF (use as required for landing)
   b. NAV Light Switch - OFF
   c. STROBE Light Switch - OFF
   d. AVN MASTER Switch - OFF

NOTE

Radio, Transponder, Pitch Trim, and options (MFD, Autopilot, and PS Intercom), if installed, will be inoperative with AVN MASTER Switch in the OFF position.

3. Land as soon as practical.

NOTE

A fully charged battery in good condition should provide power under reduced load for 30 minutes.

AIR DATA, ATTITUDE AND HEADING REFERENCE SYSTEM (ADAHRS) FAILURE

RED X - PFD OR MFD INDICATORS (AIRSPEED, ALTITUDE, ATTITUDE, HORIZONTAL SITUTATION INDICATOR (HSI), OR ENGINE INDICATING SYSTEM (EIS))

1. ADAHRS Circuit Breaker - CHECK IN
   a. If open, reset (close) circuit breaker. If circuit breaker opens again, do not reset.
   b. If closed, pull (open) ADAHRS Circuit Breaker, and pull (open) SEC PWR Circuit Breaker (overhead Panel Light will go off) then reset (close) both circuit breakers.
2. Affected Indicator (other than EIS) - RED-X STILL DISPLAYED
   a. Reference GS (ground speed) in conjunction with GPS derived wind information to determine an approximate airspeed.
   b. Select COMPASS ARC from G300 MAP SET-UP for approximate GPS derived heading information or monitor magnetic compass (if installed).
   c. Reference GPS ALTITUDE on TERRAIN PROFILE page (GPS altitude is the white arrowhead on left side) or MFD INFO page (if installed) for approximate altitude.
   d. Navigate using pilotage and GPS moving map if available.
   e. Land as soon as possible.
3. EIS Engine Indicating System - RED-X STILL DISPLAYED
   a. If only the EIS is RED X (no other PFD or MFD RED X is present), continue monitoring. Non-emergency full throttle operation should be limited to prevent engine overspeed or exceeding temperatures. Descents should be made at idle with carburetor heat applied.
   b. Land as soon as possible.
4. Affected Indicator - RED-X HAS CLEARED (indicator normal)
5. Land as soon as practical.

PFD/MFD DISPLAY MALFUNCTION OR FAILURE

PFD OR MFD DISPLAY BLACK (NO INFORMATION)

1. PANEL LIGHTS Control Knob - FULL BRIGHT (full clockwise rotation)
2. PFD/MFD Circuit Breaker - CHECK IN
   a. If open, reset (close) circuit breaker. If circuit breaker opens again, do not reset.
   b. If closed, pull (open) PFD/MFD Circuit Breaker, and pull (open) SEC PWR Circuit Breaker (overhead Panel Light will go off) then reset (close) both circuit breakers.
3. Affected Display - CONTINUED BLACK SCREEN
   (No information displayed) - Use other display (if installed).
   a. Transponder - Select Pressure Alt display using FUNC button (ADAHRS may be providing altitude information to transponder).
   b. Navigate using pilotage and magnetic compass (if installed) to nearest suitable landing site.
   c. Land as soon as possible. Refer to LANDING WITH PARTIAL OR NO INSTRUMENTATION INFORMATION.
4. Affected Display - NORMAL SCREEN
   a. Land as soon as practical.

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PFD/MFD DISPLAY MALFUNCTION OR FAILURE
(Continued)

PFD OR MFD DISPLAY INFORMATION NOT UPDATING

1. Pull (open) the following circuit breakers:
   a. ADAHRS Circuit Breaker - OPEN
   b. PFD/MFD Circuit Breaker - OPEN
   c. SEC PWR Circuit Breaker - OPEN (overhead panel light will go off)
2. Reset (close) all three circuit breakers
   a. ADAHRS Circuit Breaker - CLOSE
   b. PFD/MFD Circuit Breaker - CLOSE
   c. SEC PWR Circuit Breaker - CLOSE
3. Affected Display(s) - NOT UPDATING (use other display) (if installed)
   a. Transponder - Select Pressure Altitude display using FUNC button (ADAHRS may be providing altitude information to transponder).
   b. Navigate using pilotage and magnetic compass (if installed) to nearest suitable landing site.
   c. Land as soon as possible. Refer to LANDING WITH PARTIAL OR NO INSTRUMENTATION INFORMATION.
4. Affected Display - NORMAL SCREEN
   a. Land as soon as practical.

ELECTRIC PITCH TRIM FAILURE

1. AVN MASTER Switch - VERIFY ON
2. TRIM/AP Circuit Breaker - CHECK IN
   a. If open, reset (close) circuit breaker. If circuit breaker opens again, do not reset.
   b. If closed, pull (open) TRIM/AP Circuit Breaker, then reset (close) the circuit breaker.

ELECTRIC PITCH TRIM SYSTEM REMAINS INOPERATIVE

3. Reduce pitch control forces by changing speed or flap configuration (within airspeed limitations).
4. CRUISE - Consider range reduction and destination change if cruise speed is reduced by flap speed limitations.
5. APPROACH - Establish stabilized approach using normal speeds is preferred. This may include change of destination for longer runway.
6. LANDING WITH FAILED TRIM - Consider making Flaps UP landing if pitch control force increases uncomfortably when lowering landing flaps.
7. Land as soon as practical.

ELECTRIC PITCH TRIM SYSTEM RESUMES NORMAL OPERATION

3. Land as soon as practical.

AMPLIFIED EMERGENCY PROCEDURES

The following Amplified Emergency Procedures provide additional information beyond that in the Emergency Procedures Checklists portion of this section. These procedures also include information not readily adaptable to a checklist format, and material to which a pilot could not be expected to refer in resolution of a specific emergency. This information should be reviewed in detail prior to flying the airplane, as well as reviewed on a regular basis to keep pilot's knowledge of procedures fresh.

ENGINE FAILURE

If an engine failure occurs during the takeoff roll, stop the airplane on the remaining runway. Those extra items on the checklist will provide added safety after a failure of this type.

If an engine failure occurs immediately after takeoff, in most cases, the landing should be planned straight ahead with only small changes in direction to avoid obstructions. Altitude and airspeed are seldom sufficient to execute the 180° gliding turn necessary to return to the runway. The checklist procedures assume that adequate time exists to secure the fuel and ignition systems prior to touchdown.

After an engine failure in flight, the most important task is to continue flying the airplane. The best glide speed, as shown in Figure 3-1, should be established as quickly as possible. While gliding toward a suitable landing area, an effort should be made to identify the cause of the failure. If time permits, an engine restart should be attempted as shown in the checklist. If the engine cannot be restarted, a forced landing without power must be completed.

MAXIMUM GLIDE

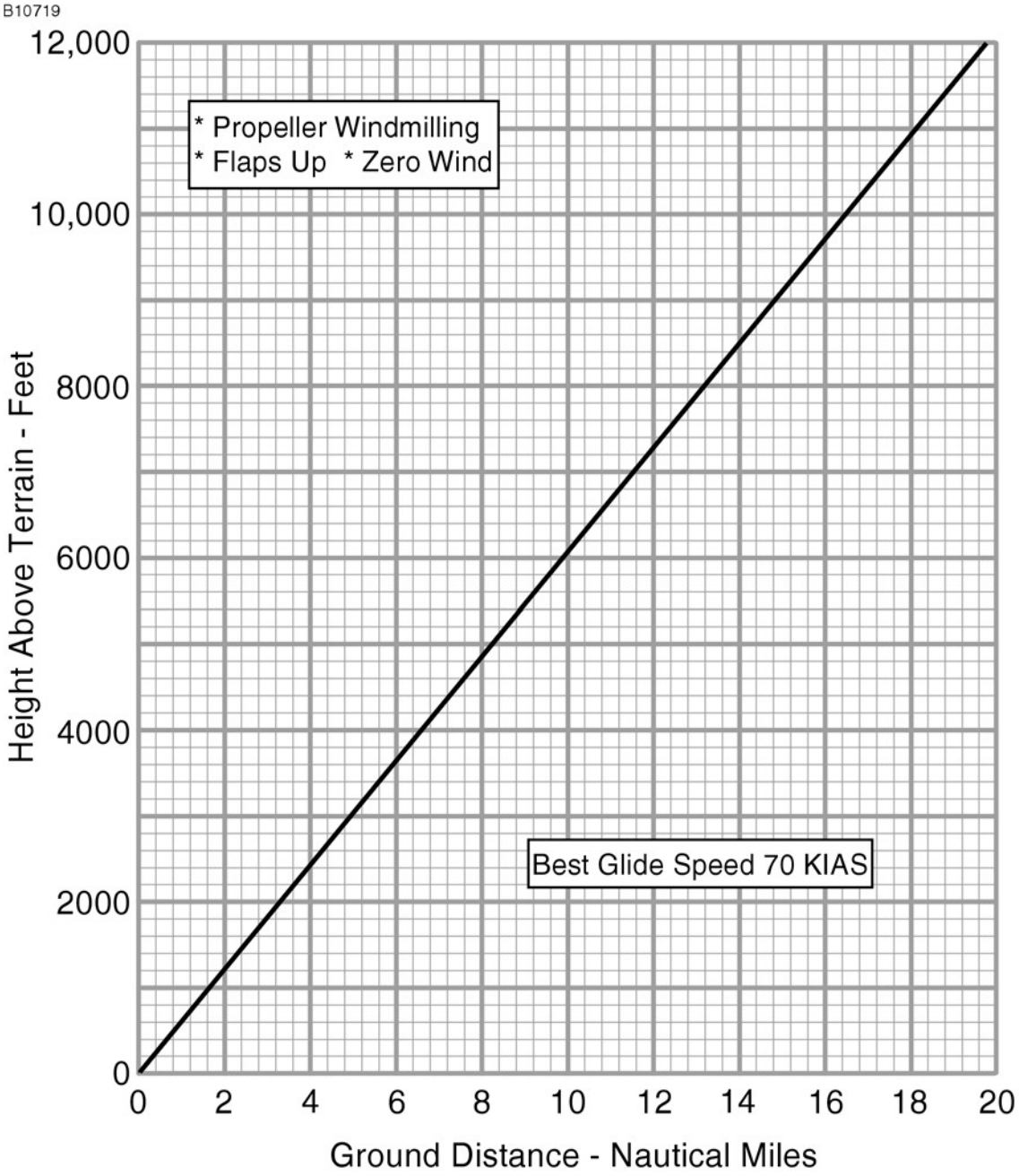

Figure 3-1

FORCED LANDINGS

If all attempts to restart the engine fail and a forced landing is imminent, select a suitable field and prepare for the landing as discussed under the Emergency Landing Without Engine Power checklist. Transmit Mayday message on 121.5 MHz giving location, intentions and squawk 7700.

Before attempting an off airport landing with engine power available, one should fly over the landing area at a safe, but low altitude, to inspect the terrain for obstructions and surface conditions, proceeding as discussed in the Precautionary Landing With Engine Power checklist.

On Airplanes 16200241 and on, and airplanes 16200002 thru 16200240 incorporating SB11-52-01 the secondary door latch assembly must be rotated to the OPEN position prior to disengaging the primary interior door latch assembly when ditching or attempting an off-airport landing.

Prepare for ditching by securing heavy objects located in the baggage area and collect folded coats for protection of occupants' face at touchdown. Transmit Mayday messages on 121.5 MHz giving location, intentions and squawk 7700. Avoid a landing flare because of the difficulty in judging height over a water surface. The checklist assumes the availability of power to make a precautionary water landing. If power is not available, use of the airspeeds noted with minimum flap extension will provide a more favorable attitude for a power off ditching.

In a forced landing situation, DO NOT turn off the MASTER switch (BAT side) or AVN MASTER switch before the landing is assured unless specifically instructed by the emergency procedure checklist. Premature deactivation of these switches will disable all airplane electrical systems. Note however there are specific emergency procedures (such as Electrical Fire) which do require the MASTER switch (ALT side) to be turned off. Exercise caution when performing these procedures to make sure that only the ALT side is selected off.

Before completing a forced landing, especially in remote and mountainous areas, activate the ELT by pressing the ELT ON button in the remote switch panel located on the right side of the instrument panel. For complete information on ELT operation, refer to Section 9, Supplements.

LANDING WITHOUT ELEVATOR CONTROL

Using throttle and electric elevator trim switch, trim for horizontal flight at 55-60 KIAS with flaps 25° selected. Then **do not change the elevator trim or the flap setting**; control the glide angle by making small changes in power.

Power changes should be made slowly and smoothly. The electric elevator trim is powerful. It is best to bump, or pulse, the trim switch to make changes. Holding the trim switch can result in over trimming and may start a Pilot Induced Oscillation (PIO) condition resulting in chasing the trim. If this occurs, it is best to let the airplane stabilize then start again by just bumping the trim switch.

When in the flare, the elevator trim switch should be pulsed aft toward the full-nose-up position at the same time slowly reducing power so that the airplane is rotated to a slightly nose-above-the-horizon attitude for touchdown. During the landing flare or round-out, the nose will come down when power is reduced and the airplane may touch down on the nosewheel before the main wheels. Maintain directional control and close the throttle at touchdown.

FIRES

Although engine fires are extremely rare in flight, if a fire is encountered, the steps of the appropriate checklist should be followed. After completion of the checklist procedure, execute a forced landing. Do not attempt to restart the engine. The first sign of an electrical fire is usually the smell of burning insulation. The checklist procedure for electrical fires calls for electrical power to be turned off. All flight instruments and navigation will be lost at this time. The checklist procedure should result in the elimination of the fire. When the fire is extinguished, electrical power may be turned on to those systems not involved. Navigation and flight information, if unaffected, should be reposted to instruments within 1-2 minutes. If the fire is not extinguished, a rapid descent should be initiated and the electrical system turned back on. This may provide airspeed and altitude data in preparation for a forced landing.

EMERGENCY OPERATION IN CLOUDS

The Model 162 Skycatcher is not equipped or certified for IFR flight. The following instructions assume that the pilot is not very proficient at instrument flying and is flying the airplane without the autopilot engaged (if installed). The autopilot (if installed) will not operate if the ADAHRS unit fails.

EXECUTING A 180° TURN IN CLOUDS (ADAHRS FAILED)

Upon inadvertently entering the clouds, an immediate turn to reverse course and return to VFR conditions should be made. With ADAHRS FAILED, magnetometer (magnetic) heading information is not available. The G300 map display should be configured with the COMPASS ARC from the MAP SET-UP menu. The COMPASS ARC will provide GPS derived heading information on the moving map display. GPS derived heading information is not as accurate as magnetic heading; it will provide a means of situational awareness and the moving map can provide navigation. Other GPS information such as track (TRK), etc. are also available with a functioning G300 system. Refer to the G300 Pilot's Guide.

If the optional magnetic compass is installed, the magnetic compass maybe used in place of the G300 compass arc. The magnetic compass will be subject to normal magnetic compass A.N.D.S. variations during maneuvering.

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EMERGENCY OPERATION IN CLOUDS (Continued)

EMERGENCY DESCENT THROUGH CLOUDS (ADAHRS FAILED)

When returning to VFR flight after a 180° turn is not practical, a descent through the clouds to VFR conditions below may be appropriate. If possible, obtain an ATC assistance and clearance for an emergency descent through the clouds.

Before descending into the clouds, prepare for a stabilized descent as follows:

1. Reference optional magnetic compass (if installed) or select G300 map with COMPASS ARC from MAP SET-UP menu for GPS derived approximate heading information on moving map display.
2. If MFD is installed, select the INFO page and reference the GPS ALTITUDE. GPS ALTITUDE is not the same as barometric altitude but it will give an altitude approximation.
3. TERRAIN - Select G300 TERRAIN - ON. If RED terrain warning is issued, apply full power and climb at 58 KIAS estimated. Stall warning will provide approximate 5 knot stall warning margin.
4. Monitor Ground Speed (GS) - GPS derived GS in combination with GPS derived wind vector information will allow approximation of airspeed.
5. MIXTURE Control - RICH (push full in)
6. CARB HEAT Control Knob - ON (pull full out)
7. THROTTLE Control - REDUCE (1700 - 1800 RPM)
8. Approximate Airspeed - 70 - 75 Knots (estimate airspeed from GS and wind vector data)
9. Elevator Trim - ADJUST (as required)
10. Maintain descent - procedure will provide 500 TO 800 FT/MIN descent rate.
11. Upon breaking out of clouds, resume normal cruising flight.

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EMERGENCY OPERATION IN CLOUDS (Continued)

RECOVERY FROM SPIRAL DIVE IN THE CLOUDS (ADAHRS FAILED)

ADAHRS FAILURE

If a spiral is entered while in the clouds, continue as follows:

1. THROTTLE Control - IDLE (pull full out)
2. Remove feet from rudder pedals.
3. Stop turn by carefully leveling the wings using aileron control while referencing COMPASS ARC or optional magnetic compass (if installed) and moving map for heading and turn information.
4. Cautiously apply elevator back pressure to slowly reduce airspeed to approximately 70 KIAS. Monitor speed and do not reduce airspeed below 70 KIAS. Slowly advance throttle to approximate 1700-1800 RPM as speed reaches 70-75 Knots.
5. Elevator Trim - ADJUST (maintain 70-75 KIAS glide speed)
6. Use aileron control to maintain wings level and constant heading.
7. CARB HEAT Control Knob - ON (pull full out)
8. Clear engine occasionally, but avoid using enough power to disturb the trimmed glide.
9. Resume EMERGENCY DESCENT THROUGH THE CLOUDS procedure.
10. Upon breaking out of clouds, resume normal cruising flight.

INADVERTENT FLIGHT INTO ICING CONDITIONS

Flight into icing conditions is prohibited and extremely dangerous. While an inadvertent encounter with these conditions can be resolved using the checklist procedures, the best action is to turn back or change altitude immediately to escape icing conditions.

Watch for signs of pitot-static icing and ice accretion on the unheated pitot tube. If airspeed and altimeter indications become unreliable, GPS derived flight information can provide approximate values for back-up. GPS derived ground speed (GS) and GPS ALTITUDE on the MFD INFO page (if installed) may be used for comparison to barometric instruments. GPS ALTITUDE information also replaces barometric altitude in the TERRAIN Page PROFILE window (indicated by a white arrowhead) when the ADAHRS is inoperative.

In the event of an icing encounter, an unexplained loss of engine power could be caused by carburetor ice or ice blocking the air intake filter. Should this happen, apply full carburetor heat and adjust throttle to obtain maximum RPM. In some instances, the throttle may need to be reduced for maximum power. The mixture should then be adjusted, as required, to obtain maximum RPM. The G300 CARB °F indicator should be monitored during carb heat application to ensure carb temperature rises. Refer to the CARBUETOR ICING AMPLIFIED EMERGENCY PROCEDURE section.

Maximum cabin heat should be applied, by pulling the CABIN HEAT Control Knob to the full out position, in an attempt to clear ice from the windshield. GPS moving map navigation may assist if ice creates a loss of visibility. If available, select G300 TERRAIN - ON for additional altitude and obstacle awareness during reduced visibility. Use of a forward slip can improve forward and over-the-nose landing visibility inhibited by windshield ice. FLAPS should NOT be used for landing if airframe ice is present.

The autopilot, if installed, should be disconnected at first indication of airframe icing and remain disconnected after any icing encounter due to the possibility of unseen residual ice on the airframe.

SPINS

Should an inadvertent spin occur, the following recovery procedure should be used:

1. **IMMEDIATELY RETARD THROTTLE TO IDLE POSITION.**
2. **PLACE AILERONS IN NEUTRAL POSITION.**
3. **APPLY AND HOLD FULL RUDDER OPPOSITE TO THE DIRECTION OF ROTATION.**
4. **JUST AFTER THE RUDDER REACHES THE STOP, MOVE CONTROL BRISKLY FORWARD FAR ENOUGH TO BREAK THE STALL. Full down elevator may be required at aft center of gravity loadings to assure optimum recoveries.**
5. **HOLD THESE CONTROL INPUTS UNTIL ROTATION STOPS.** Premature relaxation of the control inputs may extend the recovery.
6. **AS ROTATION STOPS, NEUTRALIZE RUDDER, WINGS LEVEL, FLAPS UP AND MAKE A SMOOTH RECOVERY FROM THE RESULTING DIVE. AVOID OVERSTRESSING AND OVERSPEEDING THE AIRFRAME.**

NOTE

If the rate of the spin makes determining the direction of rotation difficult, the magenta turn rate trend vector in the heading strip over the PFD Attitude Indicator will show the rate and direction of the turn. The HSI compass card will rotate in the opposite direction. Hold full rudder opposite the direction of the turn indicated by the turn rate trend vector.

ROUGH ENGINE OPERATION OR LOSS OF POWER

CARBURETOR ICING

A gradual loss of RPM and eventual engine roughness may result from the formation of carburetor ice. To clear the ice, apply full throttle and pull the CARB HEAT control knob full out until the engine runs smoothly; then reduce carburetor heat and readjust throttle as necessary. Monitor the G300 CARB °F indicator to verify the carburetor temperature rises out of the amber caution range. If conditions require the continued use of carburetor heat in cruise flight, use the minimum amount of heat necessary to prevent ice from forming and lean the mixture for smoothest engine operation. The G300 CARB °F indicator provides advisory information but does not replace the need to monitor engine condition and adjust carburetor heat or mixture as needed for safe engine performance.

SPARK PLUG FOULING

A slight engine roughness in flight may be caused by one or more spark plugs becoming fouled by carbon or lead deposits. This may be verified by turning the MAGNETOS switch momentarily from BOTH to either L or R position. An obvious power loss in single magneto operation is evidence of spark plug or magneto trouble. Leaning the mixture to the recommended lean setting for cruising flight may resolve a spark plug fouling issue. If the problem does not clear up in several minutes, determine if a richer mixture setting will produce smoother operation. If not, proceed to the nearest airport for repairs using the BOTH position of the MAGNETOS switch unless extreme roughness makes the use of a single MAGNETO position necessary.

MAGNETO MALFUNCTION

Sudden engine roughness or misfiring is usually a sign of a magneto problem. Changing the MAGNETOS switch from BOTH to the L and R switch positions will identify which magneto is malfunctioning. Select different power settings and enrichen the mixture to determine if continued operation on BOTH magnetos is possible. If not, change to the good magneto and continue to the nearest airport for repairs.

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ROUGH ENGINE OPERATION OR LOSS OF POWER
(Continued)

IDLE POWER ENGINE ROUGHNESS

An excessively rich idle fuel flow may cause low speed engine roughness during flight. During most in-flight low engine speeds (power off stalls, approach to landing, etc.), the mixture control is normally in the full-rich position. However, to improve engine roughness during low engine speeds while in flight, you should rotate the vernier mixture control to lean of fuel mixture. You may also have to lean the fuel mixture if this low engine speed results in power loss and you need to restart the engine during flight. In all cases, you should land the airplane at the nearest airport for repairs if low speed engine roughness requires you to adjust the fuel mixture control to improve engine operation.

LOW OIL PRESSURE

If the low oil pressure indicator (OIL PSI) turns red, and oil temperature indicator (OIL °F) remains normal, it is possible that the oil pressure sending unit or relief valve is malfunctioning. Land at the nearest airport to determine the source of the problem.

If a total loss of oil pressure and a rise in oil temperature occur at about the same time, it could mean that the engine is about to fail. Reduce power immediately and select a field suitable for a forced landing. Use only the minimum power necessary to reach the landing site.

Oil pressure indication in either the low caution or high caution yellow band range could indicate a oil system problem. Monitor both oil pressure and oil temperature as needed and be prepared for engine failure. Land at the nearest airport to determine the source of the problem.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

Malfunctions in the electrical power supply system can be detected through regular monitoring of the main battery ammeter (AMPS) and the electrical bus voltmeter (VOLTS); however, the cause of these malfunctions is usually difficult to determine. A broken alternator shaft, excessive brush wear, or an internal wiring issue is most likely the cause of alternator failures, although other factors could cause the problem. Problems of this nature constitute an electrical emergency and should be dealt with immediately. Electrical power malfunctions usually fall into two categories: excessive rate of charge and insufficient rate of charge. The following paragraphs describe the recommended remedy for each situation.

EXCESSIVE RATE OF CHARGE

After engine starting and heavy electrical usage at low engine speeds, such as extended taxiing, the battery condition may be low enough to accept above normal charging during the initial part of a flight. However, after thirty minutes of cruising flight, the main battery ammeter (AMPS) should be indicating less than 5 amps of charging (+) current. If the charging current remains above this value on a long flight, the battery electrolyte could overheat and evaporate.

Electronic components in the electrical system can be adversely affected by higher than normal voltage. The built-in overvoltage protection circuit will automatically disconnect the alternator if the charge voltage increases to more than 16.5 volts. If the overvoltage sensor circuit does not operate correctly, as shown by voltage more than 16.5 volts on the electrical bus voltmeter, the MASTER switch ALT section should be set to the OFF position. Unnecessary electrical equipment should be de-energized and the flight terminated as soon as practical.

If excessive rate of charge is indicated but the electrical bus voltmeter indicates less than 15 volts, no immediate action is required. Continue monitoring and land as soon as practical.

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ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS (Continued)

INSUFFICIENT RATE OF CHARGE

When the overvoltage circuit, or other fault, opens the alternator (START/ALT) circuit breaker and de-energizes the alternator, a discharge (-) current will be shown on the main battery ammeter (AMPS) and the red LOW VOLTS annunciator will be displayed on the PFD. The Alternator Internal Control Unit (AICU) can de-energize the alternator due to minor disturbances in the electrical system, resulting in a nuisance opening of the START/ALT circuit breaker. If this happens, an attempt should be made to energize the alternator system.

To energize the alternator system

1. MASTER Switch (ALT Only) - OFF
2. START/ALT Circuit Breaker - CHECK IN
3. MASTER Switch (ALT Only) - ON

If the problem was a minor AICU disturbance in the electrical system, normal main battery charging will start. A charge (+) current will be shown on the main battery ammeter (AMPS) and the LOW VOLTS annunciator will go off.

If the red LOW VOLTS annunciator is displayed and a discharge (-) current is still shown on the AMPS Indicator, there is an alternator system problem. Do not repeat steps to energize the alternator system. Decrease the electrical load on the battery by de-energizing nonessential electrical equipment and avionics (consider exterior lights and radio equipment) because the battery can supply the electrical system for only a short time. Reduce electrical load as soon as possible to extend the life of the battery for landing. Land as soon as practical.

OTHER EMERGENCIES

WINDSHIELD DAMAGE

If a bird strike or other incident should damage the windshield in flight to the point of creating an opening, a significant loss in performance may be expected. Decrease airspeed and set power as necessary to maintain best glide speed (70 KIAS) to minimize stress on windshield and airframe structure. If airplane performance or other adverse conditions prevent landing at an airport, prepare for an off airport landing in accordance with the PRECAUTIONARY LANDING WITH ENGINE POWER or DITCHING checklists.

G300 FAILURES

The Garmin G300 system provides all flight and engine instrument information via the Air Data Attitude and Heading Reference System (ADAHRS) unit. Individual sensors within the ADAHRS unit provide air and flight data information as well as serve as the central gateway for the engine data displayed on the Primary Flight Display (PFD) and optional Multi-Function Display (MFD).

Failure of the ADAHRS unit or the individual sensors may leave only GPS derived flight data for situational awareness and navigation. The pilot should be thoroughly familiar with the G300 operation, page and information location, and methods of accessing the GPS flight data before beginning any flight in the Model 162 Skycatcher. It is recommended that the pilot step through each of the G300 emergency procedures in the Emergency Procedures Checklist for familiarization before operating the airplane.

Failure of the G300 PFD display will cause an automatic reversion of the PFD display to the MFD display (if installed). Failure of the PFD without an installed MFD display will leave the pilot to rely largely on external cues for pilotage and navigation. The Emergency Procedures Checklist contains suggestions for managing a successful PFD failure and landing. It is recommended that the pilot become familiar with this checklist before operating the airplane.